



**MESTRADO EM SISTEMAS E COMPUTAÇÃO**

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**CONCILIATING XBRL FINANCIAL REPORTING AND HCI**

Salvador  
2021

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Dissertation presented to the Programa de Pós-graduação em Sistemas e Computação of UNIFACS - Universidade Salvador - Laureate International Universities as partial requirement to obtain the title of Master of Computing Science.

Advisor: PHD Artur Henrique Kronbauer.

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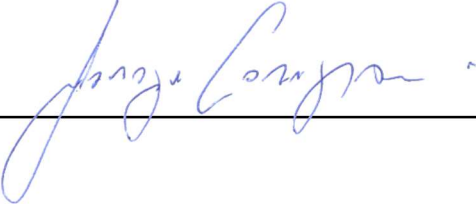
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### CONCILIATING XBRL FINANCIAL REPORTING AND HCI

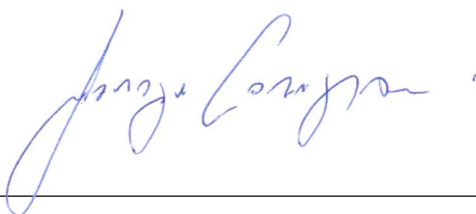
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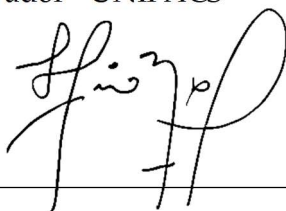
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## RESUMO

Embora existam exemplos de práticas de IHC relacionadas ao governo eletrônico, pesquisas bibliográficas revelaram uma carência de estudos similares na área de relatórios financeiros XBRL, que é representativa da governança eletrônica G2G. Portanto, existia um elo perdido entre essas áreas. Na etapa de entendimento do projeto, um questionário aplicado a alguns voluntários também apontou demandas técnicas (custo, compatibilidade, validação, conhecimento, entre outros) e de IHC (interfaces intuitivas, adaptação de metáforas, simplificação de interações, usabilidade, feedback sobre interações com software, otimização de navegação e outros) na área de relatórios financeiros. A pesquisa também verificou que essas demandas conduzem os relatores financeiros a problemas como desvio de função/posição, desperdício de recursos humanos e materiais e retrabalho, quando os dados do relatório apresentam inconsistências. Essa situação também degrada a eficiência das governanças eletrônicas G2G e G2B porque alguns governos exigem que entidades públicas e privadas apresentem esses relatórios financeiros XBRL. Diante dessa realidade, esta pesquisa investigou como o design de IHC pode mitigar o problema de pesquisa apresentado por meio de um protótipo de software (o Open Financial Reporting) construído sob as premissas de design de IHC, e que fornece abstração de conhecimento XBRL, aumentando assim a eficiência das tarefas de composição dos relatórios XBRL, melhorando G2G e-Governance. Durante o aprofundamento da investigação, o software passou por avaliações formativas de usabilidade, comunicabilidade e UX com usuários remotos que compuseram versões restritas dos relatórios financeiros XBRL do Siconfi. Em seguida, esta pesquisa realizou um novo conjunto de avaliações para fins conclusivos, com a versão redesenhada do software (no âmbito de design de IHC), com o mesmo cenário de teste, e com outro grupo de usuários remotos. De acordo com os resultados obtidos na avaliação conclusiva, a eficiência da tarefa medida foi maior com a segunda versão do software. Dessa forma, esta pesquisa provou que o design de IHC é uma abordagem válida para aumentar a eficiência das tarefas dos profissionais relacionados aos relatórios XBRL, melhorando assim a governança eletrônica G2G. Esta pesquisa também obteve outras contribuições relevantes nas áreas de IHC e governo eletrônico, tais como: encontrar o elo perdido entre IHC, governança G2G e relatórios financeiros XBRL, encontrar uma abordagem metodológica reproduzível para conduzir estudos semelhantes no contexto da governança G2G, identificar os desafios para a realização de estudos semelhantes, identificar soluções gratuitas para apoiar avaliações de HCI, preservando a qualidade e integridade dos dados coletados, identificar soluções que provêm suporte a estudos IHC remotos, desenvolver uma ferramenta válida para apoiar a tarefa de composição de relatórios financeiros XBRL, entre outras.

**Palavras-chave:** XBRL, IHC, design de IHC, relatórios financeiros, governo digital.

## ABSTRACT

Even though there are examples of HCI practices related to e-Government, bibliographic research revealed that there is a lack of studies regarding the XBRL financial reports area, which is representative of the G2G e-governance. So, there was a missing link between those areas. In this project awareness step, a questionnaire applied to some volunteers also pointed out technical (cost, compatibility, validation, knowledge, and others) and HCI (intuitive interfaces, metaphors adaptation, interactions simplification, usability, feedback on interactions with software, navigation optimization, and others) demands in the financial reporting area. This research also verified that those demands lead financial reporters toward problems as deviation from the agreed role/position, waste of human and material resources, and rework when the report data contains inconsistencies. This situation also degrades the efficiency of G2G and G2B e-Governance because some government institutions require private and public entities to submit those XBRL financial reports. Before that reality, this research investigated how HCI design can mitigate the presented research problem through a software prototype (the Open Financial Reporting) built under HCI design matters that provides XBRL knowledge abstraction, thus increasing task efficiency and improving G2G e-Governance. For further investigation, the software underwent formative usability, communicability, and UX evaluations with remote users that composed smaller versions of Siconfi's XBRL financial reports. Then, this research performed a new set of evaluations for conclusive purposes, with the software's redesigned (under HCI design matters) version, with the same testbed, and with another group of remote users. According to results obtained in the conclusive evaluation, the measured task efficiency was greater with the second version of the software. In that way, this research proved HCI design is a valid approach to increase the XBRL reporting professionals' task efficiency, thus improving G2G e-Governance. This research also attained other relevant contributions in the HCI and e-Government areas such as: finding the missing link between HCI, G2G e-Governance, and XBRL financial reporting, finding a reproducible methodological approach to conduct similar studies in the context of G2G e-Governance, identifying the challenges for conducting similar studies, identifying free solutions for supporting HCI practices, thus preserving the gathered data quality and integrity, identifying solutions supporting remote HCI evaluation studies, developing a valid tool for supporting the XBRL financial report composition task, and others.

**Keywords:** XBRL, HCI, HCI design, financial reports, e-government.



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ACM	Association for Computing Machinery
ASRJETS	American Scientific Research Journal for Engineering, Technology, and Sciences
B2G	Business-to-Government
C2G	Citizen-to-Government
CC BY-NC-ND 4.0	Attribution-NonCommercial-NoDerivatives 4.0 International Creative Commons
COVID-19	Corona Virus Disease - 2019
EGDI	E-Government Development Index
e-Governance	Electronic Governance
e-Government	Electronic Government
e-MAG	Model of Accessibility to Electronic Government
ESMA	The European Securities and Markets Authority
ETL	Extraction, Transformation, and Load
G2B	Government-to-Business
G2C	Government-to-Citizen
G2E	Government-to-Employee
G2G	Government-to-Government
HCI	Human-Computer Interaction
ICH	Interação Humano-Computador
ICT	Information and Communication Technology
IEEE	Institute of Electrical and Electronics Engineers
INM	Mexican National Migration Institute
ISO	International Organization for Standardization
IxD	Interaction Design
MD	Progressional Degree
MVC	Model-View-Controller
OFR	Open Financial Reporting
OS	Operating System
OSI	Online Services Index
PAD	Pleasure, Arousal, and Dominance
PhD	Doctor of Philosophy
Premo	Product Emotion Measurement
QUIS	Questionnaire of User Interface Satisfaction
RTA	Retrospective Think-Aloud
SAM	Self-Assessment Manikin
Siconfi	Sistema de Informações Contábeis e Fiscais do Setor Público Brasileiro
STN	Secretaria do Tesouro Nacional
SUS	System Usability Scale
TII	Telecommunications Infrastructure Index
UN	United Nations
UX	User eXperience

XBRL  
XML

eXtensible Business Reporting Language  
Extensible Markup Language

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## 1 INTRODUCTION

The Human-Computer Interface (HCI) design is about analyzing the current situation (problem), synthesizing an intervention, and evaluating how it affected the situation in an iterative matter. Such a process allows designers to produce solutions better oriented to their ends (their users' actual needs) (BARBOSA; SILVA, 2010).

HCI design processes aim to serve the users and the stakeholders. That is why a number of them are user-centered. They also highlight how it is important to allow users to take part in the decision making processes of a solution's development. The earlier the users get involved in a project, the better the final solution's perceived quality and value (BARBOSA; SILVA, 2010).

To use an interactive system consists of interacting with the system's interface to meet specific ends within a given context. In that scenario, Human-Computer Interaction evaluation studies allow accessing whether a system's interaction and interface are adequate or not (our translation, COSTA, 2016). Such studies typically encompass communicability, usability and User eXperience (UX).

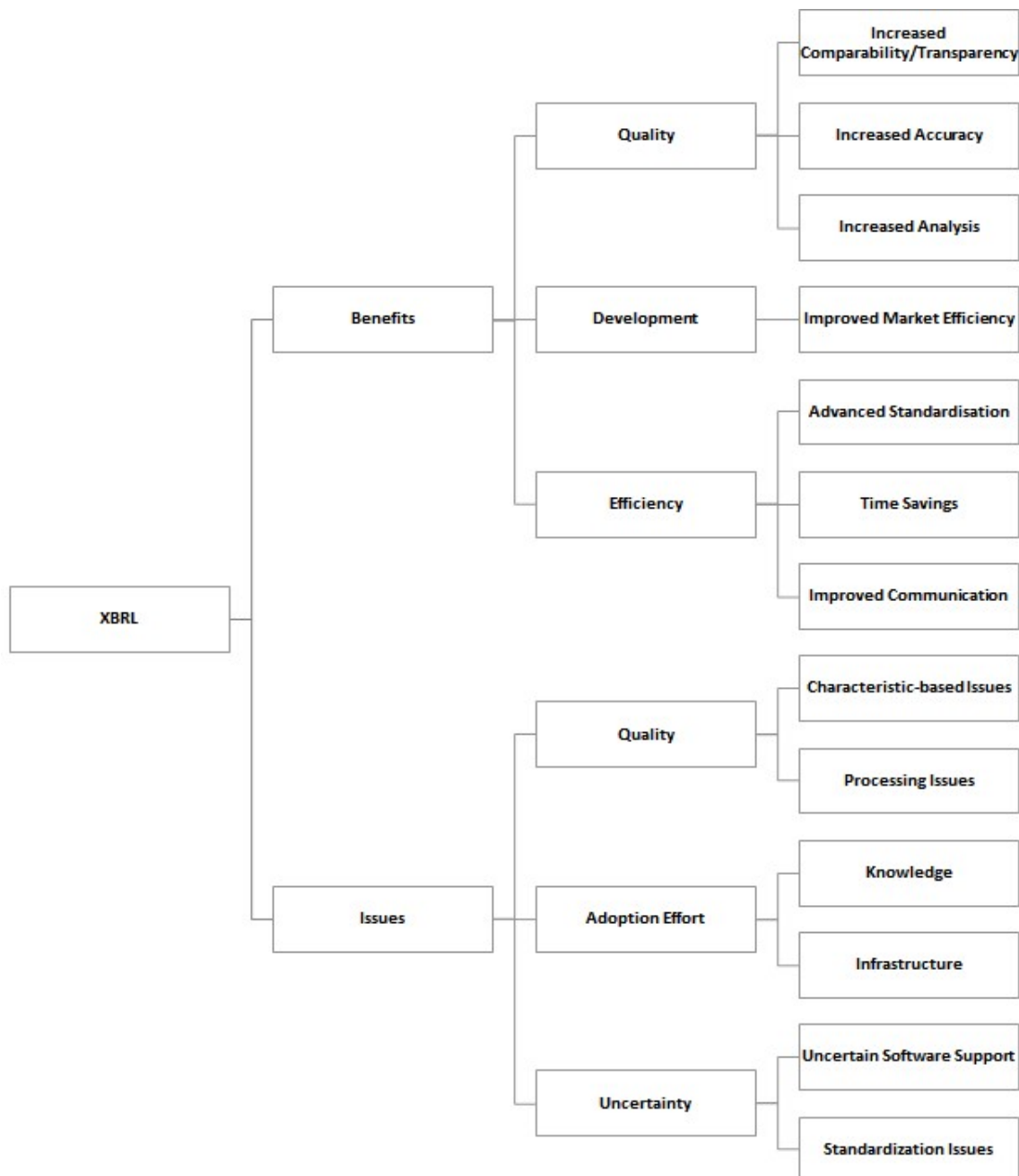
According to Costa (our translation, 2016), usability means how easily systems can get used regarding learning ability, operability, aesthetics, and other aspects. This author also states that during a UX, the users interact with a product or system in a way that their experience interest is measurable or observable. UX measurement has been a helpful tool for improving software under development regardless of their lifecycle project (RIVERO; CONTE, 2017).

Usability is also an important feature for issuers, investors, competent authorities, and people who adopt electronic or digital financial reporting. They are always seeking better solutions than the current practices that provide better accessibility features, better-reported information analysis, better comparability of annual financial reports, and more suitable ways to financially describe their business' specific characteristics (ESMA, 2015). Over 50 countries apply the eXtensible Business Reporting Language (XBRL) as a way to attain those financial reporting characteristics. They use it to "represent the contents of financial statements or other kinds of compliance, performance and business reports" (XBRL INTERNATIONAL, 2020).



However, due to the XBRL issues as knowledge and uncertain software support (Figure 1), some XBRL users still struggle to elaborate on the financial reports government forces them to send to oversight custody. Those problems also degrade the efficiency of Government to Government and Business to Government Electronic Governance (e-Governance).

Figure 1 - XBRL benefits and issues The European Securities and Markets Authority (2015) report named



Source: Adapted from ESMA (2015).

A real example of this problematic situation also happens in Brazil (oral information)<sup>1</sup>. In this country, 5,570 municipalities, 26 states, the Federal District, and the Federal Union have to submit accounting, financial, and tax statistics information as XBRL financial reports to the Sistema de Informações Contábeis e Fiscais do Setor Público Brasileiro (Siconfi) of the Secretaria do Tesouro Nacional (STN) (TESOURO NACIONAL, 2020a).

The aforementioned problem context is an example of a scenario in which HCI design practices typically show potential solutions. Following this line of thought, this research conduction investigated if HCI Design is an alternative to mitigate the XBRL knowledge required to elaborate XBRL financial reports problem, improve XBRL financial reporting task efficiency, thus improving Business-to-Government (B2G) and Government-to-Government (G2G) e-Governance practices.

## 1.1 PROBLEM CONTEXTUALIZATION

Even though there are many third-party software for composing XBRL financial reports, performing such task typically encompasses: dealing with XBRL problems ESMA (2015) highlighted, taking professionals out of their role to compose XBRL financial reports and wasting time dealing with the mistakes or inconsistencies committed (oral information)<sup>2</sup>. Design problems such as non-interactive systems, poor user interface design, the lack of affordance and communicability, poor browsing and metaphors, the lack of flexibility, mismatching between users' needs, or goals, and usability parameters could cause the reported situations.

As this research conduction is an attempt to change the aforementioned reality while enriching the HCI community Electronic Government (e-Government) related background, the problem this research focuses on is the G2G electronic governance degradation caused by the lack of HCI design solutions and the XBRL knowledge problems within the financial reporting context.

The following subtopics describe the adopted processes results to identify and contextualize the correlated problems this research aims to mitigate – the XBRL knowledge required to elaborate XBRL financial reports, the HCI design solutions

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<sup>1</sup> Information presented by Paulo Caetano da Silva, Daniel Diaz and Renato Pucci, During the 46th World Continuous Auditing & Reporting Symposium, Salvador-Ba, in Jun 2019.

<sup>2</sup> Information presented by Paulo Caetano da Silva, Daniel Diaz and Renato Pucci, During the 46th World Continuous Auditing & Reporting Symposium, Salvador-Ba, in Jun 2019.

that XBRL financial reporting demands, and the lack of HCI studies related to B2G, and G2G e-Government practices.

### **1.1.1 Awareness quiz**

For problem contextualization purposes, after applying an online quiz to several volunteers spread around Brazil's states and the World, the results showed some HCI design-related demands in the area and highlighted the XBRL knowledge issue the European Securities and Markets Authority (2015) report identified. In that way, the financial report generation area lacks the application of HCI design practices, which reinforces the relevance of the study in progress.

### **1.1.2 HCI and e-Government**

As this research proposes an HCI solution for improving e-Government digital interactions in the financial reporting area, it is important to research the existing efforts and academic studies concerning this topic. So, it was necessary to conduct a literature review that aimed to identify previous primary researches published in ACM and IEEE Xplore research database, and the Brazilian Symposium on Human Factors in Computing Systems from 2015 to 2019 that consider HCI solutions related to e-Government.

Section 3.2 presents the full review report. For problem contextualization purposes, the review results denoted studies regarding the other interactions, G2G, Government to Employees (G2E), or Government to businesses/commerces (G2B), should represent relevant literature contributions. Based on this result, this research aims to improve the aforementioned interactions through HCI techniques, applied in the financial reporting area, to present relevant contributions.

## **1.2 JUSTIFICATIVE**

The Brazilian Conselho Federal de Contabilidade (CFC) put effort into aligning XBRL technology implementation with the Brazilian jurisdiction constitution (CFC, 2020). The CFC highlights that sharing XBRL knowledge, information, and

tools improves the continued dynamic and cooperative contribution between agents that are key factors for Brazil to overcome the challenges of adopting XBRL (CFC, 2020).

Overcoming such challenges does improve G2G e-governance providing information transparency, accessibility, and reusability. As XBRL financial reports are important within the context of e-Government, it is worth investigating ways, methods, and techniques to mitigate the undesired impacts of the low task efficiency and the deep knowledge demand in it.

HCI Design is a way to provide knowledge abstraction and improve task efficiency, so it relevant to investigate if it's a valid approach for optimizing G2G e-Governance in the context of the XBRL financial reports. Such investigation is an opportunity to address:

- How the involved academic communities (Software engineering, HCI, and XBRL) currently address that problem.
- How HCI design practices help out improving G2G e-Governance.
- How HCI design practices with geographically distributed users can provide viable design solutions.

As the investigation process demands providing XBRL reporting professionals a tool for the sake of data comparability and consistency, it is also an opportunity to verify how UX and usability technologies support the correction of the identified HCI software problems.

After the research conduction, the Brazilian government might have, at its disposal, the prototype of a tool capable of optimizing its e-Governance practices in public administration accounting after the research conduction. The community of HCI will also benefit from this study results related to the contexts of remote stakeholders and G2G e-Governance.

### 1.3 RESEARCH GOALS

Based on Sections 1.1 and 1.2, it is possible to stand the following question: Is HCI design a valid approach to increase the XBRL reporting professionals' task efficiency, thus improving G2G e-Governance? If HCI is not a valid solution path, to

go through such an effort would be a waste of time and resources that would prevent or delay finding another path to solve the research problem.

In that way, it is necessary to perform exploratory research, like this one, whose main goal is to investigate how HCI design can mitigate the presented research problem through a software prototype built under HCI design matters (undergoing usability, communicability, and UX evaluations) that provides XBRL knowledge abstraction to answer the aforementioned research question. Some minor steps, or specific goals, to accomplish the main goals encompasses:

- To perform exploratory researches to identify suitable supportive tools and technologies for the research conduction.
- To develop an open-source XBRL financial reporting instantiation high-fidelity software prototype to undergo usability and UX evaluations.
- To re-design the developed high-fidelity software prototype according to HCI usability and user experience evaluations results (HCI Design premise).
- To perform conclusive HCI usability and user experience evaluations for data collection.
- To answer the research question and identify the research's contributions, the lessons learned, and future work's guidelines.

Attaining this research's main goal provides a relevant academic contribution to the e-Government area, which lacks G2B and G2G e-Governance HCI Design-related improvement practices within the context of the XBRL financial reporting. Other benefits of this research conduction may include:

- Finding the missing link between HCI, G2G e-Governance, and XBRL financial reporting.
- Finding a reproducible methodological approach to conduct similar studies in the context of G2G e-Governance.
- Identifying the challenges for conducting similar studies.
- Identifying free solutions for supporting HCI practices, thus preserving the gathered data quality and integrity.
- Identifying solutions supporting remote HCI evaluation studies.
- Developing a valid tool for supporting the XBRL financial report composition task.

Even though identifying existing XBRL financial reporting tools for comparison, analysis, or evaluation purposes is not part of this research's scope, it may be productive in future works.

#### 1.4 SUMMARY

This chapter introduced the research purposes, motivation, and contributions, and contextualized the research problem. The remaining of this document has the following structure: Chapter 2 presents the key concepts and the theoretical background needed for understanding this research conduction and results, Chapter 3 brings the results of the literature reviews needed for conducting this research, Chapter 4 presents a detailed description of the methodological procedures adopted in this research conduction, Chapter 5 describes the proposed software high-fidelity prototype and its architecture, Chapter 6 brings the results obtained from the high-fidelity prototypes' formative and the conclusive usability/UX evaluations, Chapter 7 presents the main lessons learned through the research conduction process, Chapter 8 summarizes the main research conclusions, and the References chapter brings all the literature that supported this research conduction.

## 2 UNDERSTANDING THE RESEARCH'S LINKED AREAS

This chapter presents some concepts related to XBRL, Usability, UX, and e-Government. In Section 2.1, the reader shall better understand e-Government, e-Governance. The relation between them and XBRL financial reports has a strong connection with the research's study object.

Section 2.2 the reader shall get familiar with XBRL and its importance, XBRL documents structure, and the way that Siconfi deploys them in its e-governance policies. This Section shall also allow a better understanding of the Open Financial Reporting software's features, described in a later chapter.

Section 2.3 aims to present the basic concept of usability as well as describe and highlight the usability evaluation methods adopted for this research conduction so the reader may have a better comprehension of the results presented in the later chapters. Section 2.4 has the same characteristics that the aforementioned one, but it is related to UX.

This chapter provides a better understanding of the content within the other chapters and shall ease comprehending choices' justification through this document. It also aims to fulfill one of the multidisciplinary criteria from the Unifacs Systems and Computing master's degree program, which is to provide enough background for researchers from other knowledge areas to understand and verify this research's methodology and results.

### 2.1 ELETRONIC GOVERNMENT

According to Caves (2005), the term e-government describes the use of information technology in government operations and public services. It also encompasses the new communication linkages developed between a government and its citizens, other government agencies, employees, and internal businesses/commerces.

The innovations in computers, database systems, geographic information systems, internet access represent both: an opportunity for better and direct citizen-government interaction and a challenge to overcome cybersecurity, traditional agency organizations, and digital divide issues (CAVES, 2005). Hai e Jeong (2007)

states that the adoption of those innovations aims to "improve and enhance the efficiency and effectiveness of service delivery in the public sector."

The United Nations (UN) regularly publishes surveys about the global and the regional panorama of e-Government through trends recognition, analysis, and initiatives from all member countries. UN also created an indicator to rank countries based on their e-Government development, the E-Government Development Index (EGDI) (UN, 2020).

The EGDI consists of three other indicators, namely: the Online Services Index (OSI), the Telecommunications Infrastructure Index (TII), and the Human Capacity Index (HCI). The first one regards the scope and quality of online services. The second one considers the development status of the telecommunication infrastructure. The third corresponds to the inherent human capital (UN, 2020).

The understanding of e-government also encompasses the concept of e-governance, which Bose and Rashel (2007) defined as

the application of Information and Communication Technology (ICT) for delivering Government Services, exchange of information, communication transactions, integration various standalone systems and services between Government and Citizens (G2C), Government and Business (G2B) as well as back-office processes and interactions within the entire Government framework.

G2C e-governance aims to provide services to citizens efficiently, economically while allowing more democratic popular participation promoting transparency and accountability within the public sector. G2G e-governance supports processes that aim to make government administration more transparent, speedy, and accountable. It encompasses the interactions between Government's organizations, departments, and authorities. In the G2B e-governance, business and companies have fewer barriers to provide immediate information, perform transactions with government organizations, and get information to plan and forecast through a data-driven future.

Web portals through which citizens can apply for a birth certificate, apply for building permit, apply for a business license, apply for a death certificate, apply for driver's license, apply for environmental permits, apply for government vacancies online, apply for land title registration, apply for a marriage certificate, apply for a personal identity card, apply for social protection programs, apply for a visa, declare to police, pay fines, pay for utilities, register a business, register a motor vehicle,



submit a change of address, and submit income taxes are examples of G2C e-governance (UN, 2020).

As an example of G2G and G2B e-governance, some countries such as Brazil, Germany, and Spain require issuers (investors, businesses, companies, government organizations, and others) to elaborate their annual financial report documentation in XBRL format containing all financial statements (ESMA, 2015). That is why it is important to have a closer look at XBRL through Section 2.2.

## 2.2 THE EXTENSIBLE BUSINESS REPORTING LANGUAGE

XBRL is a language developed for financial reporting purposes in conformity with the XML1.0 specification. It is an open international standard for digital financial reporting managed by the XBRL International consortium, which is supported by private and public organizations. According to the European Securities and Markets Authority (2015, p. 33), “XBRL is currently the only standard for financial reporting that is globally accepted”.

The report from the European Securities and Markets Authority (2015) revealed XBRL seems to be “the most widely used technological option” among European Union countries because it “would allow quality, accuracy, validation and greater comparability of Annual Financial Reports”. It also presented evidence “supporting XBRL as a “de facto” International standard” (ESMA, 2015, p.82).

XBRL adoption benefits accumulate over the time and tend to be limited for small and medium sized companies. However, it requires training, study, and experience to understand and manipulate XBRL data. “XBRL is supported by a very wide range of software from vendors large and small, allowing a very wide range of stakeholders to work with the standard” (XBRL INTERNATIONAL, 2020a).

Taxonomies are an important feature in XBRL. They consists of sets of authoritative definitions (schemas and linkbases) for the meaning contained in all of the reporting terms and business rules within a business report (XBRL INTERNATIONAL, 2020).

Even though extensible core taxonomies development aims to mitigate financial statements comparability degradation, not all company’s specific elements can be tagged and converted into a structured data format causing information loss.

The use of taxonomy extensions can lead to inaccuracy, analysis burden (labour-intensive, time-consuming and error-prone) increase and even worse comparability. It also poses a great challenge for comparative studies on the effort expended to the development of taxonomies.

There might be a concern about which kind of information should be in a structured or unstructured data format. For example, investors usually demand or need the information included in the notes (in a human-readable format) to understand the primary financial information for decision and investment protection purposes. If structured data rendering is not available for free, they might rely on documents in other formats such as paper or Portable Document Format.

As “the extent of consumption of data might significantly differ depending on whether the information is in the machine-readable or the human-readable format” (ESMA, 2015, p. 31), it is clear that composing reports in a machine-readable format and presenting reports in a human-readable format may have usability-related requirements. So, it is also important to visit Section 2.3 after going through this one.

### **2.2.1 XBRL documents' creation**

Taxonomies define the structure of XBRL documents. They are a set of XML Schema elements (element and annotation) and attributes that work as a library of financial statements that can compose a financial report. Taxonomies consist of structural rules, labels, mathematical relations, presentation order, and other elements' characteristics (SILVA, 2003). Silva (2003) describes the elements of a taxonomy file, their subelements, and their attributes. Figure 2 presents an example of an XBRL Schema document.

There are also documents called Linkbases that define the relationship or hierarchy between the elements of a taxonomy (e.g., financial statements) through Xlink elements (linkbaseRef, calculationLink, definitionLink, presentationLink, labelLink, referenceLink, locator, resource, arc, calculationArc, presentationArc, definitionArc, labelArc, referenceArc, link:loc, link:footnote, and link:footnoteArc). Silva (2003) describes the elements of a Linkbases file, their subelements, and their attributes. Figure 3 presents an example of an XBRL Linkbase Schema document. (SILVA, 2003).

Item, context, tuple, group, footnote and linkbaseRef are the elements used to create the XBRL instance document (the financial report) according to the taxonomy specifications. Silva (2003) describes each one of them, their subelements, and their attributes. Figure 4 presents an example of an XBRL instance document.

Figure 2 - A piece of a real taxonomy XBRL Schema file

```
<?xml version="1.0" encoding="UTF-8"?>
<schema targetNamespace="http://www.xbrl.org/2001/instance" xmlns:xbrli="http://www.xbrl.org/2001/instance"
xmlns:link="http://www.xbrl.org/2001/XLink/xbrlinkbase" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xlink="http://www.w3.org/1999/xlink" xmlns="http://www.w3.org/2001/XMLSchema"
elementFormDefault="qualified" xsi:schemaLocation="http://www.w3.org/2001/XMLSchema
http://www.w3.org/2001/XMLSchema.xsd">
  <annotation>
    <documentation>
      Taxonomy schema for XBRL.
      This schema extends the XSchema schema with several linking structures useful for XBRL taxonomies.
    </documentation>
  </annotation>
  <import namespace="http://www.xbrl.org/2001/XLink/xbrlinkbase"
    schemaLocation="xbrl-linkbase.xsd"/>
  <!-- ***** attributes ***** -->
  <attribute name="balance">
    <simpleType>
      <restriction base="string">
        <enumeration value="debit"/>
        <enumeration value="credit"/>
      </restriction>
    </simpleType>
  </attribute>
  <!-- ***** simple types ***** -->
  <!-- _____ monetary -->
  <simpleType name="monetary">
    <annotation>
      <documentation>
        This datatype serves as the datatype for those financial concepts in a taxonomy which denote units in a currency.
        Instance items with this type should have a unit of measure from the ISO 4217 namespace of currencies.
      </documentation>
    </annotation>
    <restriction base="decimal"/>
  </simpleType>
  <!-- _____ shares -->
  <simpleType name="shares">
    <annotation>
      <documentation>
        This datatype serves as the datatype for share based financial concepts.
      </documentation>
    </annotation>
    <restriction base="decimal"/>
  </simpleType>

```

Source: Extracted from Silva (2003).

Figure 3 - A piece of a real taxonomy XBRL Linkbase Schema file

```

<?xml version="1.0"?>
<schema targetNamespace="http://www.xbrl.org/2001/XLink/xbrlLinkbase" xmlns:xlink="http://www.w3.org/1999/xlink"
xmlns:xl="http://www.xbrl.org/2001/XLink" xmlns:link="http://www.xbrl.org/2001/XLink/xbrlLinkbase"
xmlns="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified">
<import namespace="http://www.xbrl.org/2001/XLink" schemaLocation="xl.xsd"/>
<import namespace="http://www.w3.org/XML/1998/namespace" schemaLocation="xml.xsd"/>
<!-- useEnum -->
<simpleType name="useEnum">
<restriction base="string">
<enumeration value="optional"/>
<enumeration value="required"/>
<enumeration value="prohibited"/>
</restriction>
</simpleType>
<!-- xbrlArcType -->
<complexType name="xbrlArcType">
<complexContent>
<extension base="xl:arcType">
<attribute name="use" type="link:useEnum"/>
<attribute name="priority" type="decimal"/>
</extension>
</complexContent>
</complexType>
<!-- calculationLink -->
<element name="calculationLink" type="xl:extendedType" substitutionGroup="xl:extended"/>
</element>
<!-- presentationLink -->
<element name="presentationLink" type="xl:extendedType" substitutionGroup="xl:extended"/>
<!-- definitionLink -->
<element name="definitionLink" type="xl:extendedType" substitutionGroup="xl:extended"/>
<!-- labelLink -->
<element name="labelLink" type="xl:extendedType" substitutionGroup="xl:extended"/>
</element>
<!-- footnoteLink -->
<element name="footnoteLink" type="xl:extendedType" substitutionGroup="xl:extended"/>
<!-- referenceLink -->
<element name="referenceLink" type="xl:extendedType" substitutionGroup="xl:extended"/>
<!-- extendedLink -->
<element name="extendedLink" type="xl:extendedType" substitutionGroup="xl:extended"/>
<!-- calculationArc -->
<element name="calculationArc" substitutionGroup="xl:arc">
<complexType>
</complexType>
</element>
<!-- presentationArc -->
<element name="presentationArc" substitutionGroup="xl:arc">
<complexType>
<complexContent>
<extension base="link:xbrlArcType">
<attribute name="order" type="decimal" use="required"/>
</extension>
</complexContent>
</complexType>
</element>
<!-- definitionArc -->
<element name="definitionArc" type="link:xbrlArcType" substitutionGroup="xl:arc"/>
<!-- labelArc -->
<element name="labelArc" type="link:xbrlArcType" substitutionGroup="xl:arc"/>
</element>
<!-- footnoteArc -->

```

Source: Extracted from Silva (2003).

Figure 4 - Example of XBRL instance document

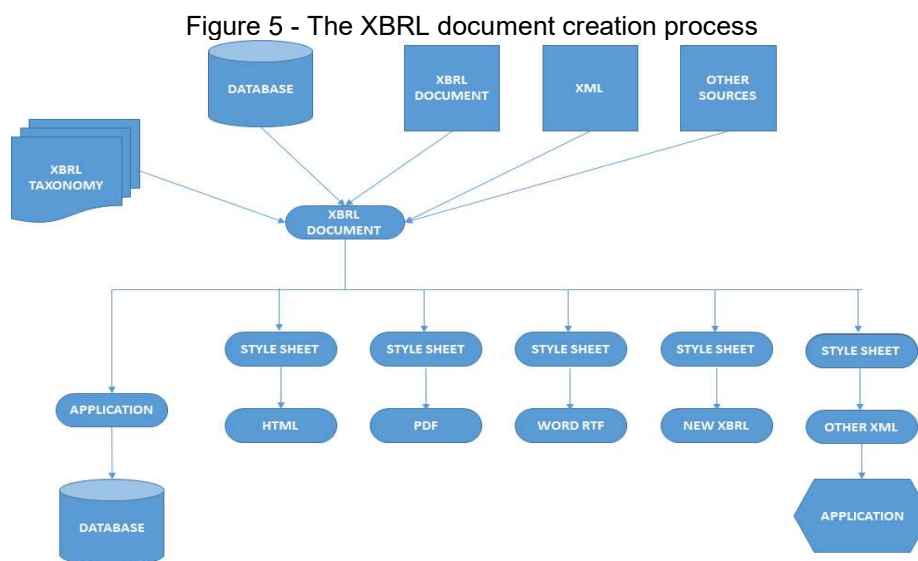
```

<?xml version="1.0"?>
<group xmlns=http://www.xbrl.org/2001/instance"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:ias="http://www.iasb.org.uk/xbrl/2001-08-16/"
  xmlns:link=http://www.xbrl.org/2001/XLink/xbrllinkbase"
  xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:iso4217=http://www.iso.org/4217
  xsi:schemaLocation="http://www.iasb.org.uk/xbrl/2001-08-16/ ias.xsd">
  <ias:bs>
    <ias:asset-cce-net numericContext="c1">100</ias:asset-cce-net>
    <ias:asset-rec-net numericContext="c1">700</ias:asset-rec-net>
    .
    .
    <ias:eq-total id="f3" numericContext="c1">1100</ias:eq-total>
    <ias:liab-total id="f2" numericContext="c1">2600</ias:liab-total>
  </ias:bs>
  <link:footnoteLink xlink:type="extended" xlink:role="Merger" xlink:title="1">
    <link:footnote xlink:type="resource" xlink:label="footnotel" xlink:title="1"
      link:role="standard" xml:lang="en">Including the effects of the
      merger.</link:footnote>
    <link:footnote xlink:type="resource" xlink:label="footnotel" xlink:title="1"
      xlink:role="standard" xml:lang="fr">Y compris les effets de la
      fusion.</link:footnote>
    <link:loc xlink:type="locator" xlink:label="fact1" xlink:href="#f1"/>
    <link:loc xlink:type="locator" xlink:label="fact1" xlink:href="#f2"/>
    <link:loc xlink:type="locator" xlink:label="fact1" xlink:href="#f3"/>
    <link:footnoteArc xlink:from="fact1" xlink:to="footnotel"
      xlink:title="fact1-footnotel"
      xlink:arcrole="http://www.xbrl.org/linkprops/arc/fact-footnote"
      xlink:show="replace" xlink:actuate="onRequest"/>
    <link:footnoteArc xlink:from="footnotel" xlink:to="fact1"
      xlink:title="footnotel-fact1"
      xlink:arcrole="http://www.xbrl.org/linkprops/arc/footnote-fact"
      xlink:show="replace" xlink:actuate="onRequest"/>
  </link:footnoteLink>
  <numericContext id="c1" precision="18" cwa="true">
    <entity>
      <identifier scheme="http://www.un.org/">Example plc</identifier>
      <segment/>
    </entity>
    <period>
      <instant>2001-08-16</instant>
    </period>
    <unit><measure>iso4217:EUR</measure></unit>
    <scenario name="Actual values">
      <ias:scenarioType>actual</ias:scenarioType>
    </scenario>
  </numericContext>
</group>

```

Source: Extracted from Silva (2003).

Before creating an XBRL document, one has to select an existing taxonomy file, extend an existing taxonomy file, or to create its own taxonomy file. The instance document contains the financial data from a database, manual entry, other XBRL, or XML documents. Then it has to undergo a validation process to assure taxonomy conformity. To use elements that do not belong to the original taxonomy, one has to extend and personalize it before validating the instance document. Style sheets allow turning XBRL machine-readable information into a human-readable format. Figure 5 depicts the whole XBRL document creation process (SILVA, 2003).



Source: Adapted from Silva (2003).

### 2.2.2 Siconfi's XBRL financial reports

Siconfi enables integrating budgetary, patrimonial and analytical accounting. It also represents a further step to reach a modern public accounting that allows public managers effective financial control of the different administrative instances and provides accurate, reliable and timely information to the multiple interested public agents (TESOURO NACIONAL, 2020a, our translation).

Siconfi adopted XBRL due to its benefits aiming to reduce the lack of information transparency inherent in the previously published means public managers adopted before. It also was expected to provide accessible and reusable information for studies and prospects about the reality of the Brazilian public sector, based on reliable and consistent data (TESOURO NACIONAL, 2020a).

Siconfi taxonomy embraces “standardized accounting and tax statements, such as the Summary Report on Budgetary Execution, the Fiscal Management Report and the Annual Accounts Statement” (TESOURO NACIONAL, 2020b).

Every Siconfi's report instance file has an associated entry point. It is an XML Schema file that identifies all resources and elements needed to represent a specific report. That includes all taxonomy files related to the report under construction. So, every instance document has a reference to an entry point file.

Siconfi's taxonomy is a dimensional one so, the organizational data model follows a hypercube structure. In that scenario, a dimension is a way to interpret

data (e.g., account information), and axes are groups of dimensions to interpret data. So, the same account information may be attached to one or more axes and dimensions. Siconfi's taxonomy contexts should bring information about the dimension to which the data refers, the entity that is reporting the information, and the period.

In a Siconfi report, every numeric account information must have a unit reference according to the ISO 4217 standard monetary tag code. However, STN only works with the tag "BRL", which is the ISO 4217 code for the Brazilian currency. Account information must have a value, a precision indicator (number of decimals used to represent the value), a unit reference, and a context reference. STN only works with two decimals so, any other number of decimals generates inconsistencies. Siconfi also allows the addition of explanatory notes referring to the contexts in each report.

## 2.3 USABILITY

ISO9241 standard defines usability as the "effectiveness, efficiency and satisfaction with which specified users achieve specified goals in particular environments" (ISO, 2019). There is a variety of methods for evaluating usability. In that way, a researcher must always look for the most fitting one(s) for the study's context before deploying one of them in evaluation sections.

In this research the ten different usability evaluation methods Lyzara et al. (2019) identified as e-Government applicable were analysed before choosing the most suitable ones for the OFR evaluation: Automated testing, Performance measurement, System Usability Scale (SUS), Think aloud, Heuristic evaluation, Focus group, Interview, Questionnaire, User feedback, and Field observation.

Different evaluators may point out widely diverse usability findings when evaluating the same user interface regardless the adoption of a single evaluation technique. Within that context, to automate some aspects of usability evaluation (the capture, analysis, or critique activities) provides systematicity of results and improved coverage in usability assessment (IVORY; HEARST, 2001).

The aforementioned method consists of relying on software facilities to perform activities such as record information about the user and the system, identify

usability problems, point out difficulties, and propose improvements. It does not capture all important qualitative and subjective information other standard inquiry methods do (IVORY; HEARST, 2001).

According to Jakob Nielsen (2012), five quality criteria learnability, efficiency, memorability, errors, and satisfaction define usability. Jakob Nielsen (2001) stated that its

most basic measures bases on the definition of usability as a quality metric: the success rate, the time a task requires, the error rate, percentage of time that users follow an optimal navigation path, the number of times they need to backtrack or consult support documentation, and users' subjective satisfaction.

The SUS consists of a questionnaire (Figure 6) with ten items, which the answers have five different values ranging from "Strongly disagree" to "Strongly agree". According to Jeff Sauro (2011), the SUS score calculation follows three rules: "for odd items subtract one from the user response, for even-numbered items subtract the user responses from 5, and add up the converted responses for each user and multiply that total by 2.5". This method measures usability and learnability dimensions (LEWIS; SAURO, 2009).

Even though the SUS score ranges from 0 to 100, it is a percentile value that needs to undergo a normalization process to become a percentage. Lewis and Sauro (2017) presented a Curved Grading Scale for the SUS (Figure 7) and found out that leaving out any of the SUS items does not have a significant effect on the resulting scores if the multiplier undergoes proper adjustment.

As the average SUS score is 68, applications with grades from F to low marginal C are below average and contain usability problems that can prevent its successful use. Applications with grades from high marginal C to A+ do not have catastrophic or severe usability problems. There is no relation between sample size and reliability in SUS, so it generates reliable results with small (two users) sample sizes. According to Jeff Sauro (2011), SUS is a valid method to "distinguish between unusable and usable systems", and has "the same level of correlation found with other post-test questionnaires".

The Interview method consists of a script-based conversation to gather information from someone. The script contains a list of conversation topics or a list of questions or both of them. It is possible to perform interviews personally, through e-



mail, chat, videoconference, and other synchronous and asynchronous communication means (BARBOSA; SILVA, 2010).

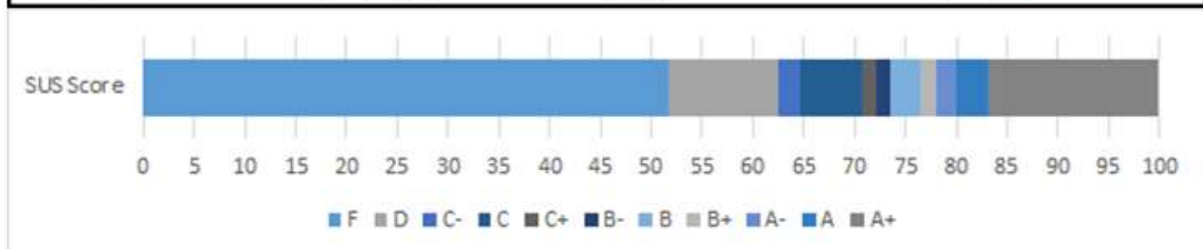
Figure 6 - The System Usability Scale questionnaire

<b>1</b>	<b>I THINK THAT I WOULD LIKE TO USE THIS SYSTEM FREQUENTLY.</b>				
•	<b>STRONGLY DISAGREE</b>				<b>STRONGLY AGREE</b>
•	1	2	3	4	5
<b>2</b>	<b>I FOUND THE SYSTEM UNNECESSARILY COMPLEX.</b>				
•	<b>STRONGLY DISAGREE</b>				<b>STRONGLY AGREE</b>
•	1	2	3	4	5
<b>3</b>	<b>I THOUGHT THE SYSTEM WAS EASY TO USE.</b>				
•	<b>STRONGLY DISAGREE</b>				<b>STRONGLY AGREE</b>
•	1	2	3	4	5
<b>4</b>	<b>I THINK THAT I WOULD NEED THE SUPPORT OF A TECHNICAL PERSON TO BE ABLE TO USE THIS SYSTEM.</b>				
•	<b>STRONGLY DISAGREE</b>				<b>STRONGLY AGREE</b>
•	1	2	3	4	5
<b>5</b>	<b>I FOUND THE VARIOUS FUNCTIONS IN THIS SYSTEM WERE WELL INTEGRATED.</b>				
•	<b>STRONGLY DISAGREE</b>				<b>STRONGLY AGREE</b>
•	1	2	3	4	5
<b>6</b>	<b>I THOUGHT THERE WAS TOO MUCH INCONSISTENCY IN THIS SYSTEM.</b>				
•	<b>STRONGLY DISAGREE</b>				<b>STRONGLY AGREE</b>
•	1	2	3	4	5
<b>7</b>	<b>I WOULD IMAGINE THAT MOST PEOPLE WOULD LEARN TO USE THIS SYSTEM VERY QUICKLY.</b>				
•	<b>STRONGLY DISAGREE</b>				<b>STRONGLY AGREE</b>
•	1	2	3	4	5
<b>8</b>	<b>I FOUND THE SYSTEM VERY CUMBERSOME TO USE.</b>				
•	<b>STRONGLY DISAGREE</b>				<b>STRONGLY AGREE</b>
•	1	2	3	4	5
<b>9</b>	<b>I FELT VERY CONFIDENT USING THE SYSTEM.</b>				
•	<b>STRONGLY DISAGREE</b>				<b>STRONGLY AGREE</b>
•	1	2	3	4	5
<b>10</b>	<b>I NEEDED TO LEARN A LOT OF THINGS BEFORE I COULD GET GOING WITH THIS SYSTEM.</b>				
•	<b>STRONGLY DISAGREE</b>				<b>STRONGLY AGREE</b>
•	1	2	3	4	5

Source: Adapted from Lewis and Sauro (2017).

Figure 7 - Curved Grading Scale for the SUS

Grade	SUS	Max-Min SUS	Percentile Range
A+	84.1 - 100	15.9	96 - 100
A	80.8 - 84.0	3.2	90 - 95
A-	78.9 - 80.7	1.8	85 - 89
B+	77.2 - 78.8	1.6	80 - 84
B	74.1 - 77.1	3	70 - 79
B-	72.6 - 74.0	1.4	65 - 69
C+	71.1 - 72.5	1.4	60 - 64
C	65.0 - 71.0	6	41 - 59
C-	62.7 - 64.9	2.2	35 - 40
D	51.7 - 62.6	10.9	15 - 34
F	0 - 51.6	51.6	0 - 14

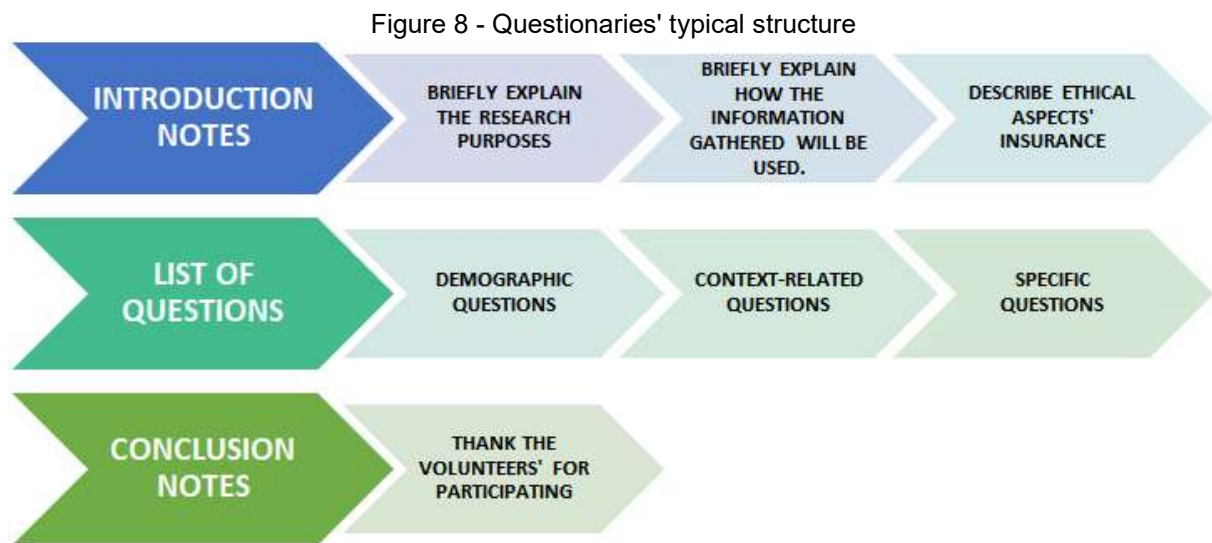


Source: Adapted from Lewis and Sauro (2017).

The interviews' procedures typically encompass introducing its goals and the interviewer, demographic data collection, information gathering, and finishing the recordings, which undergo analysis through the interparticipant (Each script item undergoes a systematic and strict analysis concerning all of the obtained answers) and interparticipant (all of the obtained answers from a single participant undergoes analysis) approaches (BARBOSA; SILVA, 2010).

The printed or online forms with multiple-choice, ranges of values, open questions, and scales researchers apply to gather data from participants are questionnaires. They demand more strict concerns about questions' unmistakability and unambiguity than interviews because there is no way the participants can take doubts about how they should answer a question (BARBOSA; SILVA, 2010). Questionnaires typically have the structure shown in Figure 8.

Even though questionnaires allow participants to choose the best time and conditions to answer it, it is not uncommon for researchers to struggle to gather enough answers. Within that scenario, some authors stated that offering prizes or rewards increases participation. However, some volunteers may not provide valuable information because they aim the reward instead of the research contribution (BARBOSA; SILVA, 2010).



Source: Own authorship.

The users' feedback method consists of gathering their "reflections concerning an interactive system, such as comments about experiential issues", coherence between the system and its context, "usability problem predictions, and design suggestions" (FØLSTAD, 2017, p. 1). A researcher records the user's reflections after the interactive process. In the context of asynchronous remote usability testing, the users self-report incidents or problems.

Flexible user tests in the field, contextual inquiry, ethnographic research, direct observation, and customer visits are field studies, which consist of "research activities that take place in the user's context rather than in your office or lab." (SUSAN FARRELL, 2016). Susan Farrell (2016) states that field studies, usually, aim to test systems under realistic conditions, understand people's needs, gather task information, or obtain data for journey maps, personas, use cases, and user stories.

The ISO9241 standard also defines satisfaction as a dimension of usability. The HCI Design practices access it through some User eXperience capture methods presented within Section 2.4.

## 2.4 USER EXPERINCE

ISO9241 standard defines UX as the “user’s perceptions and responses that result from the use and/or anticipated use of a system, product, or service” (ISO, 2019). Rivero and Conte (2017) performed a systematic mapping study to present the software applications' UX evaluation state of the art. Their study included UX evaluation-related technologies, data source, data collection, availability, location, types of assessed applications, types of assessed artifacts, and support to UX problem correction.

Scales, forms, and checklists allow gathering users' data easily and quickly, in the absence of an evaluator. Even though researchers put effort into optimizing and enhancing those tools, some of them consist of quantitative ways of measuring emotions, which make it harder to identify poor UX causes (RIVERO; CONTE, 2017).

On the one hand, in-person interviews provide a better understanding of how the application's features influence it's UX through predefined questions, but the researcher's presence may make users uncomfortable and harms the evaluation session results. On the other hand, Exploration with Acquaintances is an alternative for users to discuss the aspects of their experience without the evaluator's intervention. However, the data provided might not always be enough for performing the evaluation (RIVERO; CONTE, 2017).

Some methods deploy devices to monitor the users' physiological responses while interacting with an application. Within the controlled user monitoring scenario, the devices record psychophysiological responses or reactions towards a stimulus. In both cases, the adopted technologies can be intrusive enough to affect the way users behave.

Despite the data collection technique influences, users are the main information source to identify UX-related problems because they "can describe specific attributes that other stakeholders cannot" (RIVERO; CONTE, 2017, p.45). UX experts or the development team may not provide accurate UX feedback results (RIVERO; CONTE, 2017).

Most of the UX existing technologies demand controlled environments to observe the user interaction process, which provides objective data. There are also the ones that evaluate UX in a real uncontrolled usage situation, in which the

evaluator is not always allowed to intervene (e.g., users' report diaries and self-filming), thus providing more representative data (RIVERO; CONTE, 2017).

In most of the studies Rivero and Conte (2017, p. 47) analyzed, the researchers applied the UX evaluation after (through "retrospective analyses, written questionnaires or tools, interviews or think-aloud protocols") and during the experience. The evaluation before use regarded software and user requirements the application should attain. The authors also found out "a lack of information on whether or not the proposed technologies support the correction of the identified problems".

Developers can gather UX data through a variety of emotion-catcher techniques with different implementation complexity and intrusiveness. Proper UX capture techniques and their influences over the obtained results are challenges for accessing UX. There is not always coherence between evaluations that asking individuals how they feel during an experience and the ones that deploy physiological monitoring.

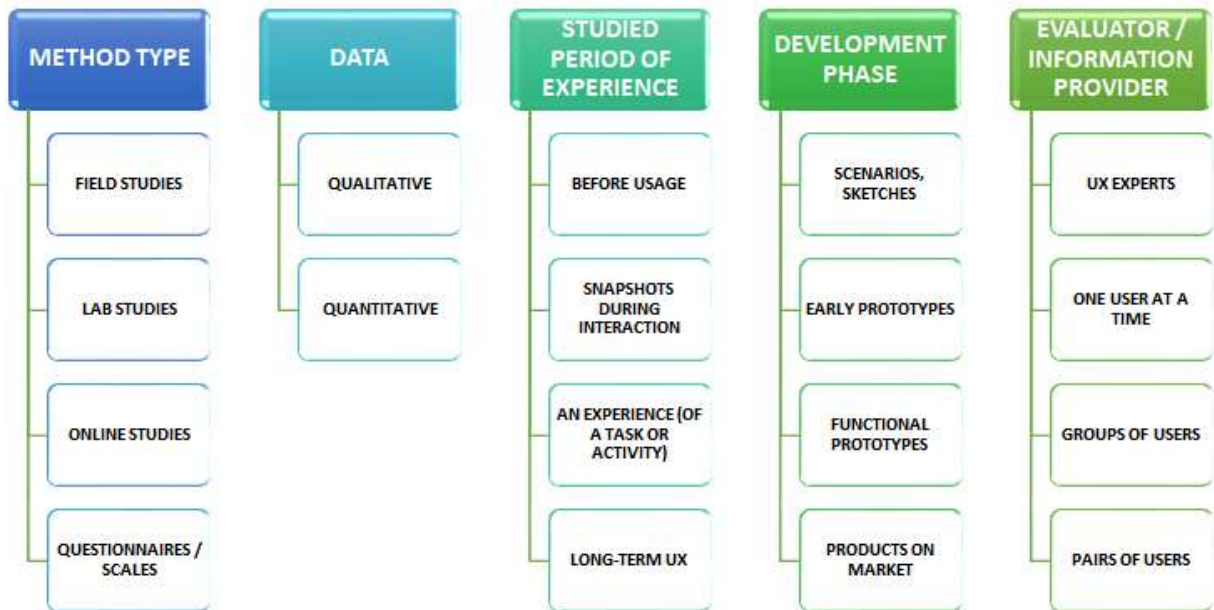
Emotion-tracking words systems deploy lexical analysis and machine learning (ORTIGOSA; MARTÍN; CARRO, 2014) (COWIE et al., 2000), emotional tags or labels (SAIF et al., 2013), taxonomic tree SCHOUTEN; FRASINCAR, 2016), and use-related posts (MENDES et al., 2014) to access UX. Their reliability lies in the research mechanisms' semantics and context recognition capabilities.

While efficient and disturb-free cognitive algorithms allow evaluators to deploy facial, vocal, and postural expressions as emotion-catcher techniques for inferential UX assessment (LIU; LEE, 2018), specific-context sensors provide it through emotion-related physiological alterations detection (LI et al., 2018).

Self-report UX techniques consist of different ways for users to report their emotions during an experience with a product, system, or service, whose accuracy relies on user-provided information. However, they are not as intrusive or complex-of-implement as the aforementioned ones.

The All About UX volunteer community collected eighty-six from the existing UX evaluation methods and sorted them into five categories with subcategories (Figure 9). Each method fits at least one category, so this section presents information about the three (Emocards, PrEmo, and Self-Assessment Manikin (SAM)) ones that better suit this research UX evaluation categorization demands.

Figure 9 - The categorization for UX evaluation methods, according to the All About UX volunteer community

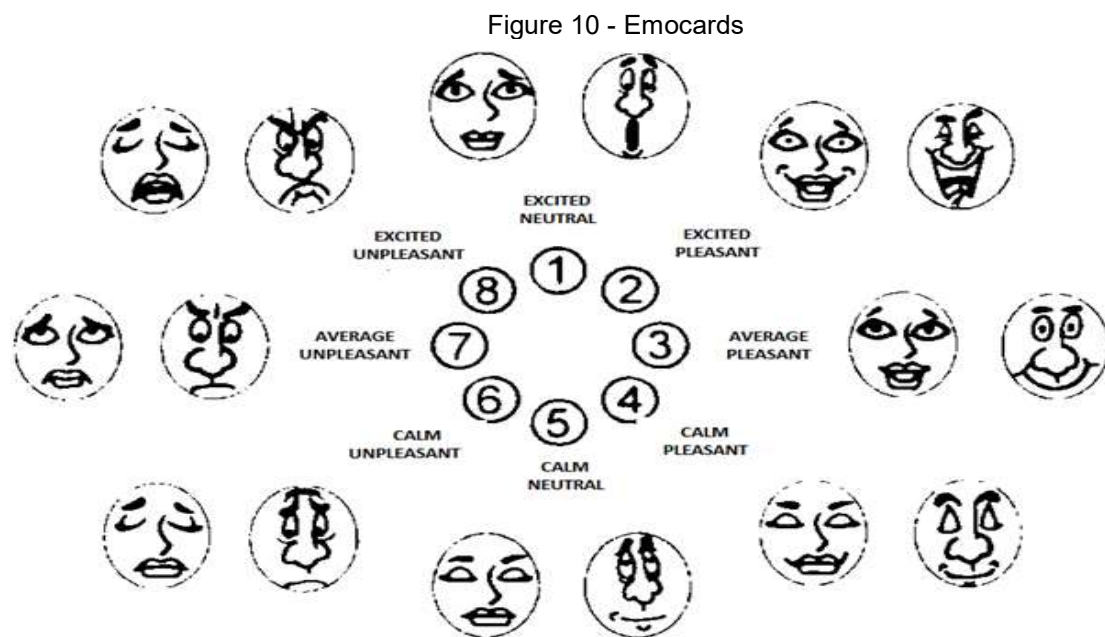


Source: Own authorship.

### 2.4.1 Emocards

Emocards (

Figure 10) is a tool for users to express their emotions without the use of words. It consists of sixteen cards with male and female cartoon faces that represent eight different emotional expressions for each gender.



Each emotion category represents an octant of Russell's circumplex of emotions (RUSSELL, 1980). At the end of every task, the user has to pick the cartoon face that best identifies how he or she is feeling about his or her interaction. Evaluators can also ask users to organize the cards according to their relevance.

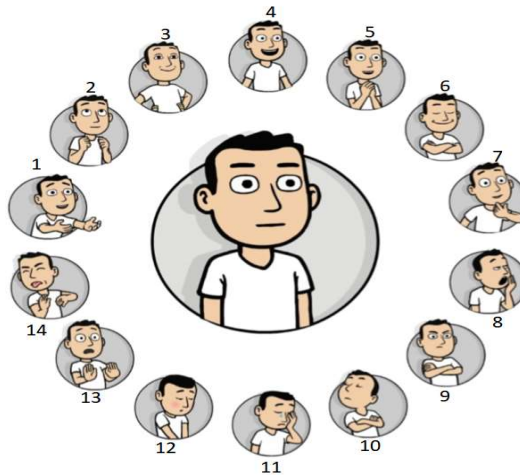


The expressions vary according to two dimensions of emotions psychology recognizes, pleasantness and arousal. Desmet, Overbeeke and Tax (2001) state “excited emotions come with high levels of arousal, and calm emotions come with low levels of arousal”. Emotions' pleasantness ranges from very pleasant to very unpleasant. However, “some emotions are neither pleasant nor unpleasant” (DESMET; OVERBEEKE; TAX, 2001).

### 2.4.2 PrEmo

Premo (Figure 11) is a non-verbal tool for users to express how they feel about product designs applied to cross-cultural environments and illiterate subjects (CAICEDO, 2009).

Figure 11 - Premo animations and their meaning



POSITION	ENGLISH	DUTCH	SPANISH
1	Desire	Verlangen	Deseo
2	Hope	Hoop	Esperanza
3	Pride	Trots	Orgullo
4	Joy	Blijdschap	Alegría
5	Admiration	Bewondering	Admiración
6	Satisfaction	Tevredenheid	Satisfacción
7	Fascination	Fascinatie	Fascinación
8	Boredom	Verveling	Aburrimiento
9	Dissatisfaction	Ontevredenheid	Disgusto
10	Contempt	Minachting	Desprecio
11	Sadness	Verdriet	Tristeza
12	Shame	Schaamte	Vergüenza
13	Fear	Angst	Miedo
14	Disgust	Walging	Repugnancia

Source: Adapted from Caicedo (2009).

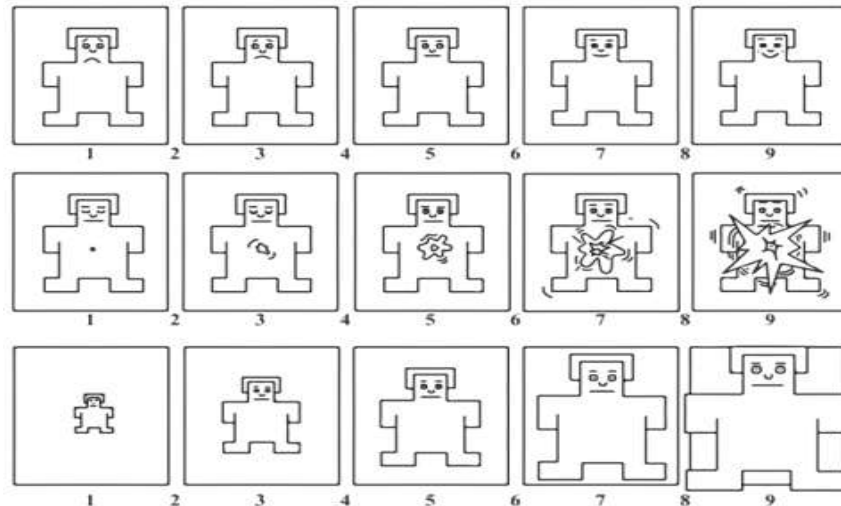
It is a set of fourteen animations of a male character that represent social context emotions (Pride, Admiration, Shame, Contempt), material context emotions (Desire, Fascination, Disgust, Boredom), expectation based emotions (Hope, Satisfaction, Fear, Dissatisfaction), and general well-being emotions (Joy, Sadness) (CAICEDO, 2009).

Each animation corresponds to one-fourteenth of an emotion circumplex (CAICEDO, 2009), so they have a circular arrangement. For each emotion, the participant indicates how intense he or she felt the emotion. A five-point scale that ranges from "did not feel the emotion" to "felt the emotion intensively" records the intensity of each emotion. Even though it is a software-based method, it can also perform with prints (one for each emotion) and some survey paper. (CAICEDO, 2009).

#### **2.4.3 Self-Assessment Manikin (SAM)**

SAM (Figure 12) is a picture-based instrument to assess pleasure, arousal, and dominance associated with the user experience with an object or event. It consists of a card with three lines of five figures of different body manikins. Each line of the SAM card assesses a different emotional dimension. The subject can place an "x" over a figure or between two of them in the same row. It results in a nine-point rating scale for each dimension (BRADLEY; LANG, 1994).

Figure 12 - SAM card



Source: Extracted from Bradley and Lang (1994).

The user expresses the pleasure related to his or her experience through the first line within a range from a smiling, happy figure to a frowning, unhappy one. The second line records the users' arousal within a range from an excited, wide-eyed figure to a relaxed, sleepy one. In the third line, the user reports his or her dominance in the experience ranging from a small manikin (low control level) to a big one (high control level) (BRADLEY; LANG, 1994).

Regarding the “Correlations for SAM Ratings and the Relevant Semantic Differential Factor Score with each of the six Adjective Pairs Associated with the Pleasure, Arousal, and Dominance Dimensions” Bradley and Lang (1994, p. 55) presented, it is possible to describe SAM results based on bipolar adjectives.

## 2.5 SUMMARY

This chapter presented key concepts and definitions about, action research, XBRL, usability, some usability capture methods, UX, Some UX capture methods, and e-Government to provide enough background to avoid readers to need external literature support to understand and verify this research's methodology and results. After going through these concepts, it is possible to understand the missing link between HCI, G2G digital governance, and XBRL, Chapter 3 presents.

### **3 THE MISSING LINK BETWEEN HCI, G2G E-GOVERNANCE, AND XBRL**

This Section presents all literature reviews performed to attain the goals described in Section 1.3. The first attempt to retrieve related works from ACM, IEEE Xplore, and Brazilian HCI through the search string "[HCI and e-Government) and (XBRL)]" that used keywords from Section 1.3 failed even considering all metadata instead of title and abstract.

In that way, it was necessary to break the literature review into two perspectives to identify related works: the HCI practices in the XBRL financial reporting domain and the HCI practices in the e-Government domain.

As the literature reviews performed in 2020's second semester, the adopted research time range was from 2015 to 2019. Once the review incurred a research gap, it was acceptable to consider fewer related works than it is commonly adopted for systematic literature reviews.

The following subtopics consists of review reports containing the research questions, defined search strings, consulted databases, exclusion criteria, information about retrieved papers and selected papers, relevant information extracted from the selected papers, and commentaries for each review conducted.

### 3.1 HCI PRACTICES IN THE XBRL FINANCIAL REPORTING DOMAIN

This literature review aimed to identify related works about HCI practices in the XBRL financial reporting domain. It adopted the following research question: what are the current HCI practices regarding XBRL financial reports or other XML-based applications?

The database choice regarded the research team's accessibility and the amount of primary and secondary studies about innovative technologies available. The research considered the ACM and IEEE Xplore research database and the Brazilian Symposium on Human Factors in Computing Systems from 2015 to 2019.

The bibliographic research started with a search string with keywords extracted from Section 1.3: "(XBRL and Human-Computer interaction)". However, it failed to retrieve related works from all selected databases. Then, they were replaced with a more generic set of keywords as an attempt to find related studies, and obtained the following set of search strings: "{[(XBRL and report) and (open-source)] and (interaction design)}", "{[(XBRL and report) and (open-source)] and (IxD)}", "{[(XBRL and relatório) and (open-source)] and (design de interação)}", "{[(XBRL and report) and (open-source)] and (HCI Design)}", "{[(XBRL and relatório) and (open-source)] and (Design de IHC)}", "{[(XBRL and open-source) and (interaction design)]", "{[(XBRL and open-source) and (IxD)]", "{[(XBRL and open-source) and (design de interação)]", "{[(XBRL and open-source) and (HCI Design)]", "{[(XBRL and open-

source) and (Design de IHC)]”, “[XBRL and Human-Computer interaction) and (Design)]”, “[XBRL and interação humano-computador) and (Design)]”, “[XBRL and HCI) and (Design)]”, “[XBRL and IHC) and (Design)]”, “(XBRL and interaction design)”, “(XBRL and design de interação)”, “(XBRL and IxD)”, “(XBRL and HCI Design)”, “(XBRL and Design de IHC)”, “(XBRL and interação humano-computador)”, “(XBRL and HCI)”, “(XBRL and IHC)”, “[[(XML and report) and (open-source)] and (interaction design)]”, “[[(XML and report) and (open-source)] and (IxD)]”, “[[(XML and relatório) and (open-source)] and (design de interação)]”, “[[(XML and report) and (open-source)] and (HCI Design)]”, “[[(XML and relatório) and (open-source)] and (Design de IHC)]”, “[[(XML and open-source) and (interaction design)]”, “[[(XML and open-source) and (IxD)]”, “[[(XML and open-source) and (design de interação)]”, “[[(XML and open-source) and (HCI Design)]”, “[[(XML and open-source) and (Design de IHC)]”, “[[(XML and Human-Computer interaction) and (Design)]”, “[[(XML and interação humano-computador) and (Design)]”, “[[(XML and HCI) and (Design)]”, “[[(XML and IHC) and (Design)]”, “(XML and interaction design)”, “(XML and design de interação)”, “(XML and IxD)”, “(XML and HCI Design)”, “(XML and Design de IHC)”, “(XML and Human-Computer interaction)”, “(XML and interação humano-computador)”, “(XML and HCI)”, “(XML and IHC)”, “[[(financial report and Human-Computer interaction) and (Design)]”, “[[(relatório financeiro and interação humano-computador) and (Design)]”, “[[(financial report and HCI) and (Design)]”, “[[(relatório financeiro and IHC) and (Design)]”, “(financial report and Human-Computer interaction)”, “(relatório financeiro and interação humano-computador)”, “(financial report and HCI)”, “(relatório financeiro and IHC)”.

The exclusion criteria embraced duplicated studies (different search strings can lead to the same paper), studies not available for reading, studies in other languages than Portuguese or English, studies not related to the search questions, and studies without the research strings within its title or abstract.

Only four search strings from the adopted set of fifty-four succeeded in retrieving related works. However, some papers may address HCI practices in the context of XBRL or XML without mentioning it in the title or abstract. So, flexibilities in the exclusion criteria and extend the research to other papers repositories would allow more consistent measurement of the literature gap between XBRL and HCI.

Table 1 shows the list of search strings adopted and the number of papers retrieved from each source.

Table 2 shows the titles, publication year, authors' references, and citation count of the selected studies. The following paragraphs present relevant information extracted from the selected studies and the commentaries on the review conduction results.

Deru and Neßelrath (2015) proposed an XML-based user-interface markup language (autoUI-ML) for the creation of automotive graphical user interfaces. They "analyzed current graphical structures of automotive user interface elements of several brands and manufacturers.", observed users interact with current automotive interface-solutions, and had technical discussions with developers and interaction designers before structuring the language.

Table 1 - Papers retrieved from the selected databases, with each search string

Search string	Number of papers retrieved		
	Brazilian IHC	ACM	IEEE
[(XML and Human-Computer interaction) and (Design)]	0	0	1
[(XML and HCI) and (Design)]	0	1	0
(XML and Human-Computer interaction)	0	0	1
(XML and HCI)	0	2	0

Source: Own authorship.

Table 2 - The selected papers's data

Title	Year	Reference	Source	Citation Count
autoUI-ML: A design language for the flexible creation of automotive GUIs based on semantically represented data	2015	DERU; NEßELRATH, 2015	ACM	0
Interruption-Sensitive Empty Result Feedback: Rethinking the Visual Query Feedback Paradigm for Semistructured Data	2015	BHOWMICK et al., 2015	ACM	7
Research on IETM authoring platform architecture based on S1000D specification	2015	XIAOFENG et al., 2015	IEEE	1

Source: Own authorship.

The autoUI-ML aims to support integration into the multimodal dialogue platform, provide clear and generic semantic, provide data encapsulation via tag-based definitions, shorter prototyping cycles, allow "handling several input sources", provide "freedom of choosing rendering technology", and personalization possibilities (DERU; NEßELRATH, 2015).

Deru and Neßelrath's (2015) work is an example of how involving users and stakeholders in the design process of a solution can lead to actual improvements. Such a contribution is also a premise of this research.

Xiaofeng et al. (2015) developed a platform to create Interactive Electronic Technical Manuals (IETMs) compliant with the S1000D specification "to solve the problems of traditional paper-based technology data storage difficulty and maintenance low efficiency.". S1000D standard consists of an XML specification regarding data format requirements, organization, management update, and release procedures for a product's technical information.

Firstly, Xiaofeng's et al. (2015) system stores all digital documentation (digitalized papers, technical documentation, pictures, audio, video, and others) in an XML file following an XML Schema. Then it maps the generated file in a relational database deploying the depth-first transversal algorithm. Next, the application server gathers the database information in an S1000D compliant XML file that undergoes an HTML conversion for web browser exhibition purposes. The authors also implemented a feature for authors to edit their IETM any time and a speech recognition feature to enhance human-computer interaction while creating or consulting an IETM.

As future work, making OFR's technical documentation S1000D compliant and accessible through a platform with speech recognition would be an improvement



to its usability and UX. It will also be possible to analyse future evaluation results to gather a better understanding of how these features enhance documentation usability and UX quality.

Interrupting users' tasks to deliver notifications while they are in high mental workload harms the task completion time and performance. It also can lead them to more errors, increase their frustration (Usability and UX quality degradation), and resumption lag (BHOWMICK et al., 2015). That is why Bhowmick et al. (2015) developed a framework (iserf) capable of detecting empty-result XML queries and delivering the users notifications with lower the interruption cost than current intrusive notifications strategies.

The iserf adopts a defer-to-breakpoint strategy. It calculates the optimal moment to interrupt a user to assure notifications only display on Medium and Fine breakpoints between tasks (BHOWMICK et al., 2015). The OFR notification features considered an adaptation of the strategy Bhowmick et al. (2015) adopted to develop the iserf, whose usefulness and effectiveness confirm through an empirical test in a visual XML querying environment.

The answer to the research question was: "there are no current HCI practices related to the XBRL financial reporting domain". The results of this literature review conduction brought up some aspects that highlight the academic importance of the proposed research conduction. Only those among the most generic search strings allowed identifying three papers that provided almost no support to this research conduction, reinforcing its innovation, originality, and convenience.

In regular literature reviews, the search string refinement process starts with generic keywords and ends with a specific enough set of words that delimitate the reviews' universe. In this research scenario, it was necessary to make them more and more generic to retrieve any information from five years of scientific publications. Regarding the selected paper sources, this is the first study regarding XBRL and HCI in the last half-decade.

In this review results, there were no analogue methodologies this research could adapt or reproduce partially in its conduction. There were also no references for supportive technology choice processes. It corroborates the line of thought in which the methodology presented in Chapter 4 might be the first one adapted for such a purpose.

In that way, this research might be the first pillar built of a whole foundation in an unexploited research area. In the last five years, if no one researched how to provide good usability and UX in XBRL financial reporting software, it is natural to identify their absence or deficiency among existing solutions. That is why these results also corroborate the representativeness of the HCI demands identified through the awareness procedures in the XBRL financial reporting area.

### 3.2 HCI PRACTICES IN THE E-GOVERNMENT DOMAIN

As this research proposes an HCI solution for improving e-Government digital interactions in the financial reporting area, it is important to research the existing efforts and academic studies concerning this topic. So, this literature review aimed to identify previous primary researches published in ACM and IEEE Xplore research database, and the Brazilian Symposium on Human Factors in Computing Systems from 2015 to 2019 that consider HCI solutions related to e-Government.

The research adopted the key research questions which one of the e-Government digital interactions (G2C, G2G, G2E, or G2B) are the HCI solutions focus on?, and what are the current HCI practices regarding the e-Government digital interactions?.

The exclusion criteria embraced duplicated papers (some papers showed up in the events' proceedings and the ACM Digital Library because some Brazilian HCI events publish papers via the ACM press), studies not available for reading, studies in other languages than Portuguese or English, studies not related to the research questions, without the search string within all metadata, and non-primary researches or non-research agendas.

The database sources' choice regarded the research team's accessibility and the amount of primary and secondary studies about innovative technologies available. The bibliographic research used the previously set search strings “{(HCI) and [(electronic-government) and (e-Government)]}” and “{(IHC) and [(governo eletrônico) and (e-Government)]}”.

Table 3 shows the amount of papers retrieved from the selected databases.

Table 4 shows the titles, publication year, authors' references, and citation count of the selected studies. The following paragraphs present relevant information extracted from the selected studies and the commentaries on the review conduction results.

Garcia, Gil, and Gómez (2015) investigated whether the Mexican National Migration Institute (INM) web portal provides the results users expect or not. They focused their analysis on the entry permit for foreign workers service, whose main users are citizens from Central American countries.

Table 3 - Papers retrieved from the selected databases, with each search string

Results	Brazilian HCI				ACM				IEEE			
	ENSS		PTSS		ENSS		PTSS		ENSS		PTSS	
Year	Retrieved	Selected	Retrieved	Selected	Retrieved	Selected	Retrieved	Selected	Retrieved	Selected	Retrieved	Selected
2015	0	0	0	0	1	1	0	0	0	0	0	0
2016	3	0	2	0	3	3	0	0	0	0	0	0
2017	3	1	6	0	0	0	0	0	0	0	0	0
2018	4	1	3	0	3	3	1	0	0	0	0	0
2019	7	0	6	1	3	1	0	0	1	1	0	0

ENSS - English Search String  
PTSS - Portuguese Search String

Source: Own authorship.

Table 4 - The selected papers's data

Title	Year	Reference	Source	Citation Count
Citizen centered e-government? the case of National Migration Institute in the Southern Mexican border.	2015	GARCIA; GIL; GÓMEZ, 2015.	ACM	1
Social Media User Behavior Analysis in E-Government Context	2016	SHWARTZ-ASHER;CHUN; ADAM, 2016.	ACM	8
Technologies for popular participation: a research agenda	2016	MACIEL ET AL., 2016.	ACM	7
The Model of Accessibility to Electronic Government: applicability in DATAPREV	2016	SOUZA; MACIEL; CAPPELLI, 2016.	ACM	2
Accessibility recommendations for mobile applications: a contribution to the Brazilian digital government standards	2018	QUISPE; ELER, 2018.	ACM	1
Redesign of User Interface for E-government Application Using Usability Testing Method	2018	ADINDA; SUZIANI, 2018.	ACM	1
Usability Evaluation of the eTax Portal for Uganda	2018	BAGUMA, 2018.	ACM	1
E-participation Service in Malaysian E-government Website: The User Experience Evaluation	2019	BASRI; ADNAN; BAHARIN, 2019.	ACM	2
An Exploratory Study to Investigate Citizens' Experience with E-Government Mobile Services in Saudi Arabia	2019	ALMREZEQ ET AL., 2019.	IEEE Xplore	0
Aceitação e Uso de Tecnologias Interativas de Governo Eletrônico por Pessoas com Deficiência	2017	OLIVEIRA; FREIRE, 2017.	Brazilian HCI	0
Analysis, Redesign and Validation of Accessibility Resources Applied to an Official Electronic Journal for the Promotion of Equal Access to Public Acts	2018	RODRIGUES; PRIETCH, 2018.	Brazilian HCI	2
Mensurando a Maturidade na Tomada de Decisão em Sistemas de e-Participação	2019	MACIEL; ROQUE;GARCIA, 2019.	Brazilian HCI	0

Source: Own authorship.

The authors' preliminary results allowed them to deduce that the government does not consider the user's needs, capabilities, and expectations. The INM web portal

only provides information about the process to obtain the card to work in Mexico. It does not have a feedback resource, and there is a lack of communication between users and the organizational process. As a result, users still spend resources like time and money trying to obtain a service. (GARCIA; GIL; GÓMEZ, 2015, p. 328).

According to Shwartz-Asher, Chun, and Adam (2016, p. 39), there is "very limited empirical research examining the social media within the public sector". They proposed a social media user behavior model regarding three user types (light, heavy, and automated). Even though users do not see the selected social network as a government communication tool, the main implications for e-government social

media strategies the authors highlighted the opening for interventions plans to change citizens' communication habits, and the ways local governments can exploit the proposed user model to "manipulate light users to transfer desired content to particular audiences and manipulate heavy users to broadcast desired originally produced content." (SCHWARTZ-ASHER; CHUN; ADAM, 2016).

To develop environments for citizens' electronic participation in government issues and educational incentives that lead "citizens to participate in public life, with transparent information and technologically mediated engagement" are challenges Maciel et al. (2016, p. 202) proposed a discussion, and further research and practice. The Authors concluded that technology allows projecting different ways of promoting popular participation with different "levels of engagement, application areas, technological resources, and proposals." (MACIEL et al. 2016, p. 209).

Maciel et al. (2016) also highlighted the aforementioned solution development diversity and multidisciplinary (management, law, humanities and social sciences, and technology) are challenges for implementing electronic participation, because strategies modeling embraces a variety of factors. They stated Brazil needs bolder and more effective e-Government strategies developed through scientific research and stronger relationships between public entities and universities.

In Brazil, the Model of Accessibility to Electronic Government (e-MAG) provides an assessment method applied to verify, through tests, how good usability characteristics and unrestricted access software interfaces provide for all citizens. It is mandatory for all Brazilian government websites and portals interfaces. Souza, Maciel, and Cappelli (2016) verified the method applicability for assessing the Empresa de Tecnologia e Informações da Previdência's website usability and accessibility, as well as the test appliers' understanding of the e-MAG's checklist.

The results showed inspectors had no difficulty using the e-MAG's checklist. However, "there was no uniformity in the item completion" (SOUZA; MACIEL; CAPPELLI, 2016, p. 291). As the auditors perceived and understood the list items in different ways, the authors suggested a model review. The government website assessment revealed it does not have a positive evaluation for all checklist items. Adopting e-MAG would help the government responsible developers to improve the website's usability and accessibility (SOUZA; MACIEL; CAPPELLI, 2016).

According to Quispe and Eler (2018, p. 1), e-MAG "does not have specific recommendations for mobile applications' digital accessibility", and "mobile applications developed by the Brazilian government present several accessibility flaws". The authors extracted some recommendations from e-MAG and adapted others. It resulted in a set of thirty-five accessibility recommendations for mobile devices, which they applied to evaluate twelve e-government's mobile applications. The results revealed all the selected applications had accessibility flaws and highlighted the demand for updating existing accessibility models and developing specific ones for mobile platforms (QUISPE; ELER, 2018).

Adinda and Suzianti (2018) analyzed the mobile application usability of the Kota Bekasi government launched to facilitate access to public service information aiming to achieve smart governance. The authors used "performance metrics, retrospective think-aloud protocol (RTA), self-reported metrics through a SUS questionnaire, and Questionnaire of User Interface Satisfaction (QUIS)" (ADINDA; SUZIANI, 2018, p. 145). The results showed the usability level of the application had SUS score 43.438. After redesigning the user interface concerning the principles of User Interface design with 10 Heuristics, and usability testing analysis, the SUS score reached 82.2 (ADINDA; SUZIANI, 2018).

Baguma (2018) evaluated Uganda's eTax Portal, a web-based tax filing and payment system, using ten usability heuristics for user interface design from Jakob Nielsen. The author presented recommendations for the Uganda Revenue Authority to fix the usability gaps found, aiming to attract and retain a user base, and to make the portal more effective, efficient, and satisfying to use.

Basri, Adnan, and Baharin (2019) conducted an exploratory study to perform an e-participation service, in the Malaysian e-government website, user experience evaluation applying aloud method, and a set of interaction experience questionnaires. As a result, the author found out "that people still experiencing problems when using e-participation service in e-government websites. Content proved to be the main component when users want to use the e-participation service." (BASRI; ADNAN; BAHARIN, 2019, p. 345).

According to Almrezeq et al. (2019, p. 188), Saudi Arabian citizens' experience with the government's mobile applications remains unknown. That's why the authors conducted an exploratory, investigative, and empirical research about

this topic. After analyzing thirty-three interviews' data, they found "citizens support the shift towards the delivery of mobile government services," but mobile applications cannot be "a primary channel of interaction with the government." (ALMREZEQ et al. 2019, p. 188).

Oliveira and Freire (2017) stated there are several users with physical disabilities that prevent them from enjoying the benefits and facilities of Brazilian e-Government web services. The authors aimed to create a theoretical e-Government evaluation model for assuring accessible web services. They also identified the main factors concerning web applications' acceptance for people with disabilities.

Rodrigues and Prietch (2018) analyzed, redesigned, and validated a Brazilian government official electronic journal to make it accessible to people with visual and hearing impairments. In their research, the authors verified that to follow the literature accessibility recommendations, "without involving users in the project," does not allow developing truly accessible systems. (RODRIGUES; PRIETCH, 2018, p. 1).

Maciel, Roque, and Garcia (2019) proposed the Modelo Interativo Governo-Cidadão to integrate consultative and deliberative processes, in which citizens participate through virtual communities. They also presented the Maturidade na Tomada de Decisão method to assess the effectiveness of citizen participation in e-democratic processes. The authors performed two experiments to validate both contributions presented.

Excepting from the study Souza, Maciel, and Cappelli (2016) performed, all the selected papers focused on G2C e-Government digital interaction. According to the review conduction results, the current HCI practices regarding the e-Government digital interactions consists of:

- To deploy quantitative/qualitative usability and UX evaluation methods to assess technical features of e-Government web portals and mobile applications (regardless of redesign purposes) concerning international and national standards of usability, accessibility, and functionality (GARCIA; GIL; GÓMEZ, 2015) (SOUZA; MACIEL; CAPPELLI, 2016)(BAGUMA, 2018)(BASRI; ADNAN; BAHARIN, 2019) (OLIVEIRA; FREIRE, 2017) (RODRIGUES; PRIETCH 2018) (ADINDA; SUZIANI, 2018) (QUISPE; ELER, 2018).



- To provide insights about how citizens interact with government mobile or web services (ALMREZEQ et al., 2019), and social media (SCHWARTZ-ASHER; CHUN; ADAM, 2016).
- To provide guidelines, a research agenda, or evaluation models for assuring usability, accessibility, and functionality of e-Government's mobile or web services, and citizen participation within the public sector (MACIEL et al., 2016)(MACIEL; ROQUE; GARCIA, 2019) (QUISPE; ELER, 2018).

The results of this literature review conduction brought up some aspects that highlight the academic importance of the proposed research conduction. Through all the paper sources, in five years of publications, there was only one study addressing an e-governance interaction different from G2C. As most of the studies regarding HCI and e-Governance focus on G2C interactions, performing studies like this that focus on improving the G2G or G2B interactions through HCI techniques applied in the financial reporting area corroborate the relevance, originality, and importance of this study's academic contribution.

Among the selected papers, there were no analogue methodologies this research could adapt or reproduce partially in its conduction. There were also no studies regarding G2G e-governance optimization through HCI design solutions or improving task efficiency in oversight custody relations such as the established via XBRL financial reports and Government regulators as STN. It also reinforces the relevance, originality, and importance of this research for the related academic communities.

### 3.3 SUMMARY

This chapter presented the literature review reports that helped to contextualize the research problem, and to identify related works regarding XBRL financial reports, HCI practices, and G2G e-Governance.

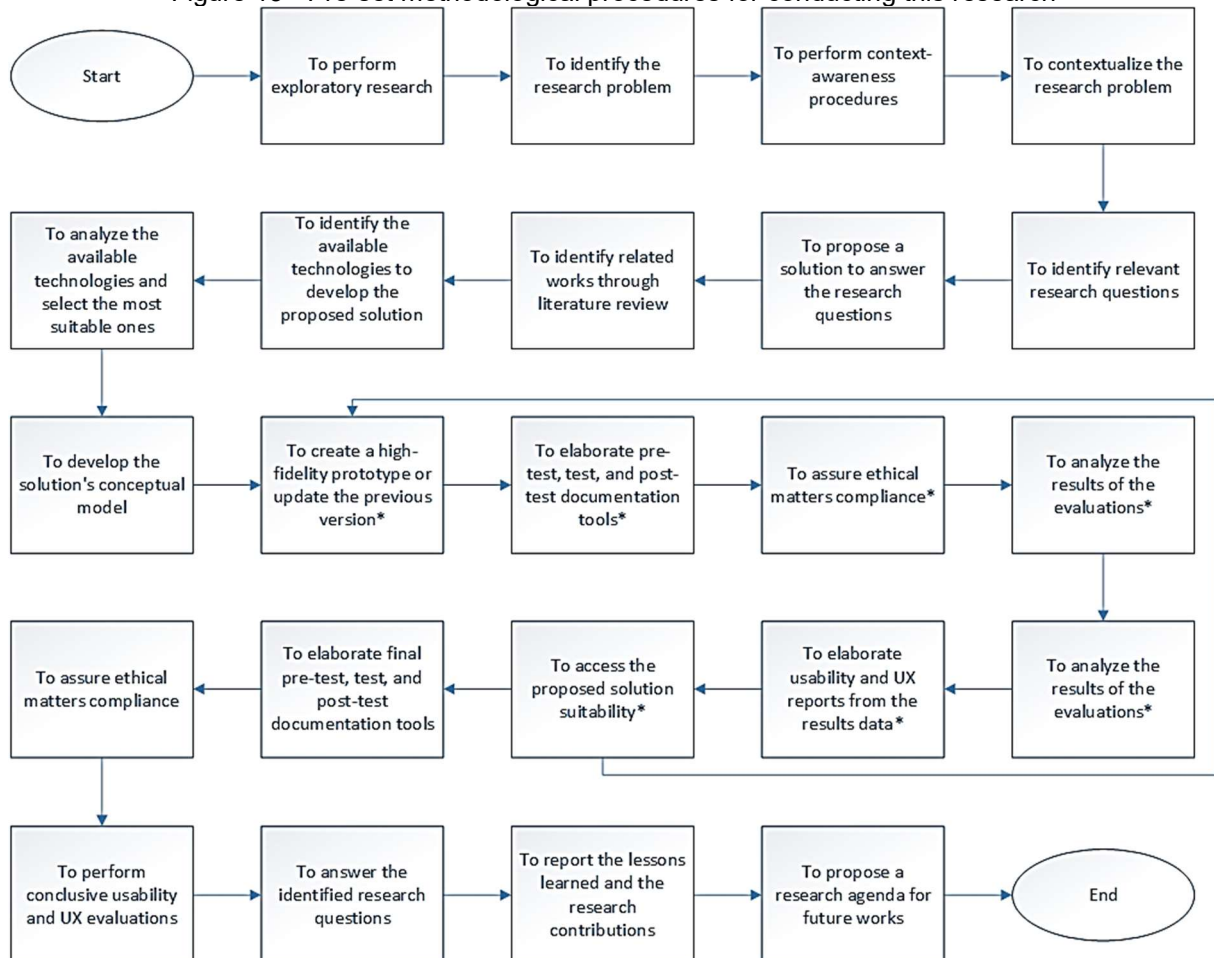
Concerning the researched articles' repositories, this is the first study that links XBRL, G2G e-Governance, and HCI in the last half-decade. In that way, the literature review did not allow identifying analogous methodologies or auxiliary technologies to support this research conduction.

This bibliographic research has two main limitations. Firstly, the literature review considered three paper repositories due to the research team's accessibility. It is necessary to expand the research dimension (considering more repositories) to assume the literature gap found is a de facto problem and to measure its extent.

## 4 METHODOLOGY

This Section aims to present the pre-set guidelines (Figure 13) to conduct this experimental research that followed the dialectical, qualitative and quantitative approaches and the monographic technical procedure, and whose conduction procedures also adopted exploratory research guidelines. It followed the thirteen scientificity criteria namely: well-defined and empirical study object, objectification, dubitability, phenomena controlled observation, originality, coherence, systematicity, consistency, social relevance, ethics, intersubjectivity and merit authority.

Figure 13 - Pre-set methodological procedures for conducting this research



Source: Own authorship.

Following the aforementioned criteria, it was possible to generate scientific knowledge with a background methodology, based on verifiable information, and provide plausible explanations or conclusions about the study object. That is why this research adopted the Scientific Method as methodological referential. The mental

operations, processes, and techniques deployed stood from the dialectical approach method.

The financial reporting demands highlighted at the ESMA (2015) report, also showed up in the online quiz applied for study object comprehension and identification. As a result, this research verified the efficiency improvement obtained in XBRL financial reporting tasks when the users adopted a tool developed under HCI guidelines to mitigate the XBRL knowledge problem.

This Section describes the adopted procedures in detail to assure objectification, controlled phenomena observation, reproducibility, and dubitability. Additionally, the chapter 2 embraces each applied technique's description. Both traits also provided better coherence, systematicity, and consistency.

This research contribution's originality and social relevance relied on mitigating the gaps and demands found in the literature (Section 3) and reinforced by the awareness online quiz (Appendix A) results, usability and User eXperience tests (Section 6) results. The volunteers had their anonymity assured while answering all quizzes. All subjects who engaged the solution's usability and user experience tests electronically signed an online agreement term, and were assured that the data provided had no other use than supporting the solution's development. It was not possible granting intersubjectivity and merit authority matters through heuristic evaluations or concerns.

To attain the goals presented in Section 1.3, Section 1.1 provided the research problem characterization and contextualization. While Section's 3 bibliographic research revealed a lack of studies to improve B2G and G2G e-Government practices under an HCI perspective, Section's 1.1.1 awareness questionnaire results allowed identifying the study object, which were the financial reporting professionals efficiency struggles through the different contexts in which professionals relate to this activity, due to the XBRL knowledge problem.

As all the volunteers did not use the same software platform to elaborate financial reports and had different technology dominance levels, it was necessary to provide them a common work basis to attain comparability among the individual evaluation results. That is why this research proposed the Open Financial Reporting (OFR) free open-code software prototype, a tool for instantiating XBRL financial reports regarding a taxonomy.

For this research purpose, providing a new software prototype had some advantages over adapting existing open code ones: to assure functionalities implementation correctness, to avoid software compatibility problems, to identify concise relations between evaluation results and source code, to ease redesign processes due to the documentation generated in the earlier step.

The OFR development context had a peculiar aspect in which a single developer played the role of all the stakeholders that were not users or volunteers, geographically distributed across Brazil's federative units and other countries. That is why all documentation whose purpose was to communicate concepts, and information among stakeholders from different knowledge areas became unnecessary. Such a peculiar aspect also demanded using a flexible development methodology to overcome the intrinsic constraints (physical, and time). Due to financial constraints, the supportive tools selection processes (Appendix B) prioritized free and open applications.

Initially, the OFR design deployed Prototyping software development strategies. OFR first high-fidelity prototype concerned only XBRL knowledge abstraction, basic requirements, and functional criteria demands. It ignored HCI matters and the other HCI issues reported in the awareness quiz results presented in Section 1.1.1. It underwent HCI formative evaluations (prototype review), whose results worked as guidelines for redesigning the OFR under HCI perspective (prototype enhancement).

The HCI Design also has the premise of preventing the idiosyncrasies influence over a project (REZENDE, 2020). That is why OFR's redesign only considered changes that the UX and usability evaluation techniques allowed identifying and highlighted by at least three of the five testers involved. The redesign process also aimed to fix all faults and bugs identified through the evaluation sections.

Then, the OFR redesigned version underwent the conclusive HCI evaluation tests to provide data for answering the research question and future works guidelines. They covered aspects such as learning easiness, remembering easiness, efficiency, usage safety, and UX. The collected data analysis allowed answering the proposed research question.

Both OFR evaluations performed under ISO9241-11 concernment. The Bigbluebutton© video conference environment and the GoogleForms© platform supported the online evaluation sections. They were tools adopted to overcome users' and volunteers' geographical distribution. The evaluation results of the second high-fidelity prototype allowed verifying:

- If the high-fidelity software prototype, built under HCI design matters, was enough to increase the reporting professionals' task efficiency.
- If the set of adopted procedures were a potential starting point for similar studies that aim to improve B2G and G2G e-Government practices.
- Whether the academic contribution to the HCI area was an unsuccessful case or not.

This research had to deploy online interaction tools (GoogleForms©) and channels (Bigbluebutton©), a software development method (Software Prototyping), a programming language (Java), usability evaluation methods (MAC, SUS, user feedback), and UX evaluation methods (Premo, Emocards, SAM) to answer the proposed research question. Appendix B presents the analysis process that favoured free and open platforms and tools over proprietary systems to avoid unnecessary costs.

Due to information accessibility convenience, this research adopted the Siconfi's Relatório Resumido da Execução Orçamentária – RREO Consórcios 2020 as the financial report representative of Brazilian G2G e-governance for both tests. This research deployed actual software development methods to develop the high-fidelity prototype for answering the proposed question. Even though this stage of the current research did not aim to provide a fully commercially competitive tool, going on with the development methodology might allow getting to it.

#### 4.1 EXPLORATORY RESEARCH METHODOLOGY

Exploratory researches aim to provide information about a specific topic through bibliographic researches, questionnaires, and interviews. It is useful for establishing and delimiting the research's theme, goals, and hypothesis. Explanatory researches investigate the reasons why a set of factors or conditions influences phenomena in certain ways through observation and data collection, processing,

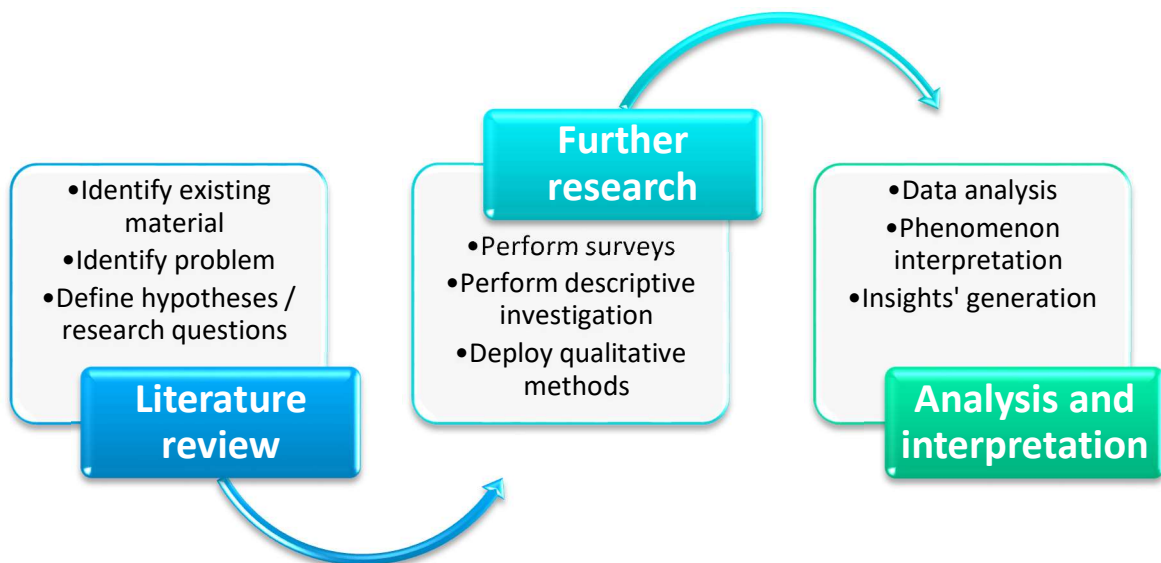
systematization, classification, analysis, and interpretation (PRODANOV; FREITAS 2013).

The exploration this research proposes aligns with the sense of examining “a thing or idea for diagnostic purposes to search it systematically for something” (e.g., the missing link between HCI, XBRL financial reporting, and G2G e-Governance) (STEBBINS, 2001). Three of the advantages of exploratory research made it suitable for conducting this study:

- It lays the foundation of a research area that can lead to further studies or exploration.
- It allows identifying if a matter is worth the investment of time and resources for further investigation.
- It allows deploying a flexible research design (non-probability sampling design, no pre-planned design for analysis, unstructured instruments for collection of data, no fixed decisions about the operational procedures) (KOTHARI, 2004).

According to Kothari (2004), exploratory researches procedures (Figure 14) rely on “the survey of concerning literature, the experience survey, and the analysis of insight-stimulating examples”. The first procedure consists of a literature review, through which the researcher has to: define the concepts to investigate, review the available material, identify the subject of research and the problem, and extract relevant hypotheses or research questions from it.

Figure 14 - Exploratory research procedures



Source: Own authorship.

The second procedure relies on performing surveys with people who have had practical experience with the problem under study and further research through descriptive investigation, which usually deploys qualitative methods. In the third one, the researcher performs an "intensive study of selected instances of the phenomenon" in order "to draw together diverse information into a unified interpretation." (KOTHARI, 2004).

This research deployed qualitative and quantitative data gathering processes (observation and interview through the usability, communicability, and UX evaluation tools), to support the argumentation about the research question answer and its validity. It also disposes of inductive-deductive reasoning for confirmatory purposes.

As this research might be the first, in a half-decade, within the contextualized problem, it was not possible to deploy the concatenated exploration approach, which is common in exploratory research. However, future exploratory studies in this area will have a previous background to concatenate.

## 4.2 AWARENESS PROCEDURES

The procedures described in this Section consist of the activities necessary for attaining the second partial goal in Section 1.3 while providing the researchers the awareness about the research problems situation, its relation with the participants, and the current related-solutions available. This research adopted a quiz and bibliographic research as valid ways to pursue this goal following Prodanov and Freitas (2013) guidelines.

Performing the bibliographic research encompassed: plan the review, conduct the review, and write the review report. In the first stage, the key research questions defined the research focus, its research strings, and its bounds. They were also the starting point for defining paper exclusion criteria. The research strings allowed topic-related studies identification that underwent a selection process following the exclusion criteria. The review report, presented in Section 3.2, contained the conduction procedures and the data extracted from selected papers.

This research identified and gathered information about the end-users and their contexts through an online quiz (available in English and Portuguese) created with GoogleForms®. This activity relied on volunteers' support from different Brazilian



federative units and countries and made public through STN and Yahoogroups® user's platforms from March to June 2020. One XBRL and one HCI experts reviewed both quiz versions to improve questions' understandability, unambiguity, objectiveness, and purpose coherence.

The information gathered from users followed some Barbosa and Silva (2010) guidelines and encompassed: demographic data (age and gender), occupational data (current occupation, experience on current occupation, current tasks, and responsibilities), educational data (academic degree, experience with computers, learning disabilities, learning abilities, and learning strategies), and information about experiences with similar products and available technology, training preferences, attitudes, and personal values, dominance, goals, tasks, errors, and failure implications.

The quiz, available within the Appendix A, was structured as follows. The questionnaire heading consisted of a title and an introductory note, which presented the research context, and its purposes. It also assured volunteer's anonymity and granted the gathered information research exclusive use. GoogleForms® privacy settings toll also helped to assure it.

While the former questions were related to demographical and contextual information, the later ones focused on specific information for research conduction and solution development. The quiz had different types of questions such as multiple-choice, differential scales, range of values, open. Whenever it was necessary, the question text contained instructions to help volunteers to understand how to fill it.

Twenty-three volunteers, within the profile shown in Table 5, from Brazil and abroad answered the quiz. It was made public through STN and Yahoogroups® user's platforms, so it would only get people related to the financial and accounting niche as respondents. In that way, all the participants were potential users of XBRL financial reporting technologies.

The most representative age group in the target audience is from 31 to 40 years old. It also consists of different personas and contexts. There is an unbalance between male and female representatives. Over 90% of the volunteers have been working in their jobs for at last two years and have a Bachelor's or higher college degree.

In the online quiz, most of the volunteers reported that reading written documentation about software and exploring its tools and functionalities by themselves are the best strategies to learn how to use it. They pointed out that their learning style is visual and practical oriented, but they also consider to receive oral explanations.

Table 5 -The user characterization results

Attribute	Amount of volunteers	
Age (years)	18-30	1
	31-40	12
	41-50	3
	51-60	4
	61-70	3
Gender	Female	3
	Male	20
College degree	High school graduate	2
	Bachelor's degree	11
	Master's degree	7
	Doctoral degree (P.h.D.)	3
Occupation	IT manager	2
	Developer	1
	Legislation specialist	1
	Business analyst	1
	Accountant	3
	System analyst	4
	Project Manager	2
	Professor	5
	Business partner	1
	Surveillance analyst	1
	XBRL senior consultant	1
IT expert	1	
Time working in that job (years)	Less than 2	2
	2-5	2
	5-10	5
	10-20	10
	More than 20	4
Total amount of volunteers		23

Source: Own authorship.

Nearly all the participants considered training sections as essential for learning how to use the software. They also highlighted it as an actual demand for

the current financial reporting technologies their entities adopt. The majority of the subjects declared to have a consistent domain of computer usage. About 39% of the volunteers were XBRL experts, 26% of them had intermediate knowledge about XBRL while 35% had some or no knowledge about it.

The Fujitsu© (FUJITSU, 2020) financial reporting application was the most cited among the ones target audience named. 52% of the participants have already had experience with XBRL financial report software. However, only 30% of them stated they were experts using the referred software. So, the majority of the volunteers do not master the financial reporting tools they use.

The volunteers mentioned what would ease the XBRL financial report elaboration task. As a result, the research identified 19 requirements related to technical matters, and 21 ones related to HCI matters such as data entry usability, user-friendliness, clear error, and feedback messages, financial reporting metadata, etc. The participants also stated an XBRL financial report software user interface should have intuitiveness, objectivity, user-friendliness, accessibility, clear feedback, and usage easiness. Most of the subjects would agree to collaborate to develop the proposed solution and spend time to learn how to use the software.

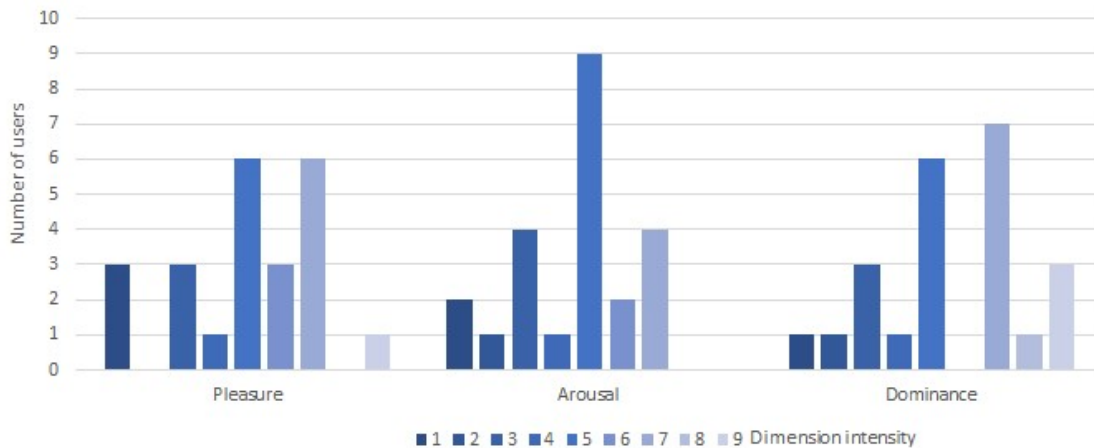
The quizzes contained a SAM card, a tri-dimensional (pleasure, arousal, and dominance) UX capture method that will be described in a further section. It is based on a psychological model, and accessed volunteers' current experience with XBRL financial reporting tools. Figure 15 shows the obtained results.

Regarding the "Correlations for SAM Ratings and the Relevant Semantic Differential Factor Score with each of the six Adjective Pairs Associated with the Pleasure, Arousal, and Dominance Dimensions" Bradley and Lang (1994, p. 55) presented, 47.82% of the volunteers felt in control, dominant or autonomous while elaborating XBRL financial reports, 21.75% of the subjects felt awed, cared for or guided performing this task, and 30.43% of them reported indifference to dominance matters (do not feel in control, but also not cared for) to accomplish the activity.

The Arousal dimension evaluation showed about 52.17% of the volunteers felt neither frenzied nor sluggish while elaborating XBRL financial reports, 30.43% of the subjects felt relaxed, sluggish or dull performing this task, and 17.4% of them reported feeling frenzied or jittery to accomplish the activity.

The Pleasure dimension evaluation revealed about 43.49% of the volunteers felt neither satisfied nor unsatisfied while elaborating XBRL financial reports, 26.08% of the subjects felt unsatisfied, annoyed or unhappy performing this task, and 30.43% of them reported feeling satisfied, pleased or happy to accomplish the activity.

Figure 15 -The results obtained from SAM UX capture technique in both quizzes



Source: Own authorship.

The target audience depends on training sections for learning how to use software. Even experts admit that training on financial reporting technologies is relevant. Despite the number of XBRL applications available, the basic demands of HCI design still go on. Although most specialists do not face difficulties in using financial reporting tools, XBRL expertise is not always able to mitigate the complexity and problems of the available platforms. Even though the results showed a variety of professionals are related to XBRL financial reporting, this research focused on the ones who must deal with it for e-Government purposes such as government surveillance.

The results also highlighted the demand for the abstraction of the complexities inherent to XBRL technology and showed evidence of relocating employees. Completing financial reporting tasks should not cause other activities postposition or users to feel unhappy, annoyed, unsatisfied, despairing, bored, frenzied, jittery, cared for, awed, submissive or guided. It reduces the efficiency and production of a professional's workday.

The obtained answers expressed demands for auxiliary documentation with metadata embedded, better usability in the process of instantiating reports, software

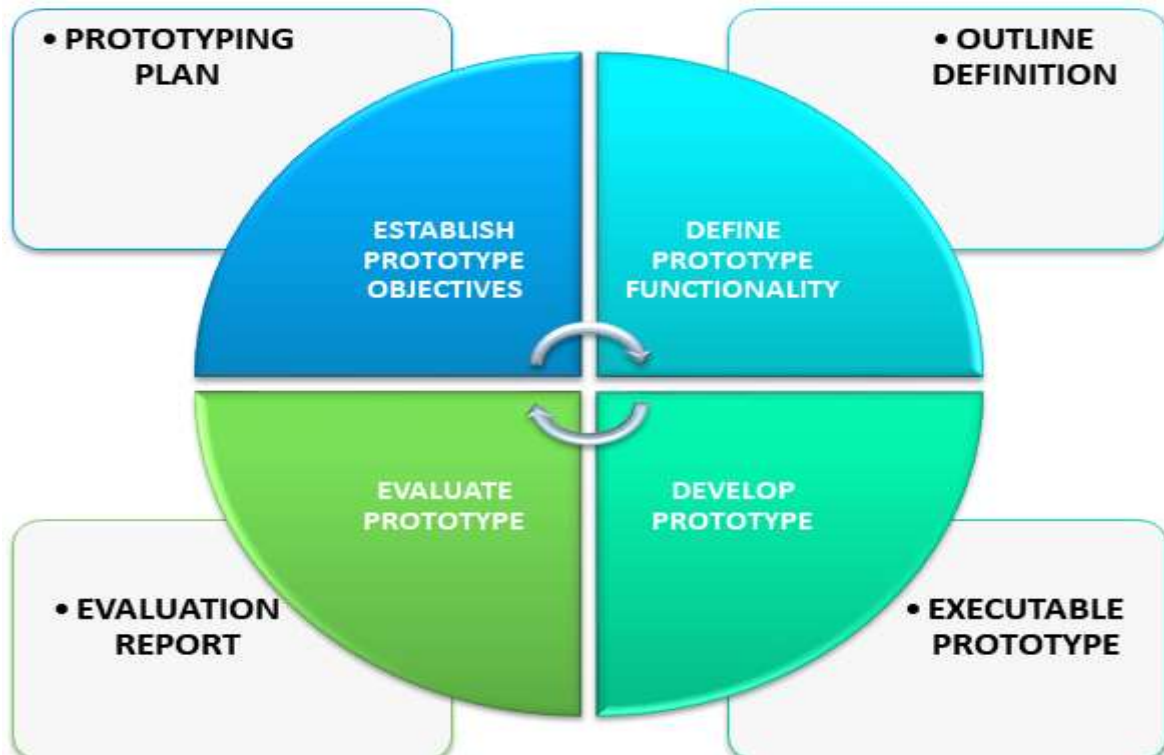
feedback and control, accessibility, and extraction, transformation, and load tool (ETL). In that way, the quiz identified not only a demand for HCI solutions but also revealed some of the financial reporting needs.

### 4.3 SOFTWARE DEVELOPMENT METHODOLOGY

The Prototyping software development life-cycle, represented in Figure 16, aims to validate (reveal errors and requirements omissions) or elicit (show how a system supports a user's work) requirements rapidly. That is why it is also a risk reduction mechanism. According to Sommerville (2001), some of the benefits that prototyping offers, which are also reasons for choosing this process over the other existing ones in the context of user-centered software development, encompass providing:

- “Improved system usability”.
- “Closer match to the system needed”.
- “Improved design quality”.
- “Improved maintainability”.
- “Reduced overall development effort”.

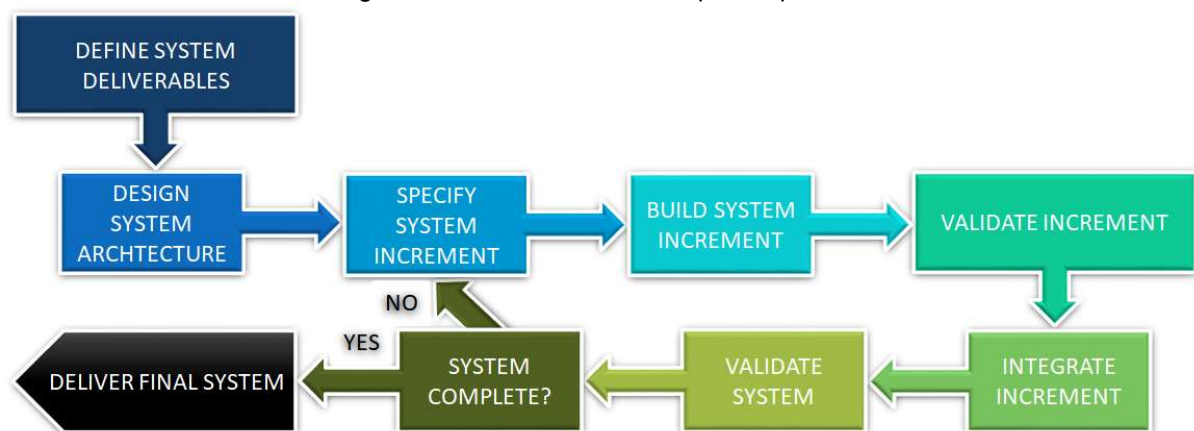
Figure 16 - Prototyping software development life-cycle



Source: Adapted from Sommerville (2001).

The OFR development followed an evolutionary approach in which the initially developed prototype was refined through some stages until reaching the final version. The first OFR prototype got started through the best-understood requirements then, it underwent HCI evaluations to verify its validity or adequacy, as following an incremental model (Figure 17), in which every set of increments undergoes specification, implementation, testing, and validation.

Figure 17 - Incremental development process



Source: Adapted from Sommerville (2001).

As this research does not aim to develop a commercial XBRL instance creation tool, the evolutionary prototyping cycles shall occur as many times as needed to answer the research question. So, for this research conduction purposes, the OFR might end at the stage of a high-fidelity prototype, and to attain its final version might be a topic for future works.

#### 4.4 HCI EVALUATION

This research aimed to mitigate the problems in the XBRL financial reporting area, through HCI design, while optimizing B2G and G2G e-Government practices. The HCI evaluation procedures strictly followed the guidelines Barbosa and Silva (2010), and Benyon (2011) provided. Both conducted evaluations concerned the following main aspects: technological appropriation (task completion, task time demanded, committed errors, demand for training, demand for external help, user satisfaction, and other variables), future design ideas, and alternatives (task learning

difficulty, error recovery support, and other variables), standard conformity, and interface interaction problems (communicability, usability, and user experience).

In the context of distributed users and volunteers, it was not possible to perform HCI evaluations personally. Instead of performing the tests in the laboratory environment Barbosa and Silva (2010) described, this research adopted an online web conference platform, through which the volunteers could decide whether or not to share their webcam content, receive training instructions (to read the supportive documentation, or to watch a video, or to have the researcher give a training section), request interaction with the researcher, share their screen content, download the test section materials, and provide feedback. All the evaluation procedures were pre-tested before being implemented.

During each evaluation section, it was necessary to explain the conduction procedures, share the supportive materials (Appendix C), solve videoconference platform-related issues, and start the training in the first 30 minutes. Within the following 10 minutes, the volunteers answered a pre-test questionnaire (Appendix C). Then, they performed the test activities, which could endure 40 minutes. After the observation and data gathering procedures, the volunteers spent 10 minutes to answer a post-test questionnaire (Appendix C), which also embraced usability and user experience evaluations. The total section-time estimated was 90 minutes. In all questionnaires and forms, all of the questions that were not a part of a UX or Usability assessment method were extracted or adapted from Bradburn, Sudman and Wansink (2004) and Smith et al. (2019).

The test activities were extracted from the awareness procedures results. They encompassed three representative activities of the financial reporting task: to create the instance document in the proper format, to input data in the instance document, and to validate the instantiated report to solve input data inconsistencies. Even though composing a financial report also encompasses tasks such as getting to know the document filling rules, their elements, and tag decision analysis, they do not relate to the XBRL knowledge problem. That is why this research did not address them.

#### 4.4.1 The volunteer recruiting process

A researcher can achieve representative user testing results through a set of three main activities: "get representative users, ask them to perform representative tasks with the design, and shut up and let the users do the talking." (SOVA; NIELSEN, 2020). The first one still poses an obstacle for most companies. However, adopting systematic recruiting programs can improve recruiting and test results quality (SOVA; NIELSEN, 2020).

Based on Sova and Nielsen's (2020) survey results, it is a common practice to provide monetary and non-monetary incentives to test participants. It is an attempt to reduce no-show rates, even though they are not controllable due to several events (weather, traffic, and personal situations). When providing incentives, a researcher must be aware they can "motivate people to exaggerate their qualifications when answering screening questions" or providing fake feedback (SOVA; NIELSEN, 2020).

Only actual users can provide valuable feedback to improve a solution's design. So, a researcher must "build up an understanding of the types of users, tasks, applications, and computer platforms." (SOVA; NIELSEN, 2020). In the early stage of this research, the awareness questionnaire gathered information about: how often users perform financial reporting tasks, the kind of knowledge, training, and experience required to compose an XBRL financial report, and the problems they are experiencing with their current systems.

The awareness quiz (Section 1.1.1) provided the background for determining the volunteer profile specifications for the HCI evaluation sections: professionals with a bachelor's or higher college degree, from 31 to 60 years old, that do not struggle to use computers, that perform financial-reporting related tasks for two or more years, regardless of their XBRL knowledge degree.

Due to the wide variety of professionals (accountants, system analysts, consultants, IT professionals, business owners, and others) who plays the role of financial reporter, it was not possible to specify a strict set of occupations for the user's profile composition. As there are financial reporters who try to avoid XBRL, and the research was going to provide the users a new software prototype that abstracts the XBRL knowledge need, it did not make sense to require them to have already had in touch with platforms for composing XBRL reports once they were



already going to learn how to use the OFR, and they should need only financial reporting knowledge to do so.

Even though significant statistical results demands performing section with at least ten participants per condition, around eighty percent of the usability problems showed up after testing four users across several projects Sova and Nielsen (2020) surveyed. So, this study considered conducting evaluation sections with five users with one backup for each one of them as mentioned in the recruiting criteria (Appendix C) plus a pilot and a dry-run participant (both of them were the only reused volunteers for both research evaluations).

It was necessary to offer training to ensure the volunteers could achieve a minimum level of expertise and to "help participants new to usability feel more comfortable". The training section procedures tried to avoid "concerning relevant aspects for the main usability test" (SOVA; NIELSEN, 2020). Across several projects, Sova and Nielsen (2020) surveyed, gifts were the most common non-monetary incentives. So, the volunteer recruiting process for the formative and the conclusive HCI evaluations offered a prize (a tablet HOW HT-705 XS) to a randomly chosen participant.

The call for volunteers consisted of a recruiting brochure (Appendix C) that was made public through the same user's platforms adopted to broadcast the awareness quiz (Section 4.2). Every subject scheduled its participation through the sign-up form (Appendix C) with the participant consent form. One day before the evaluation section, the volunteers received an event reminding message (Appendix C) and a tutorial with the online web conference platform instructions. To deal with the eventual need for recruiting volunteers from abroad, all the forms, supportive materials, user guides, and communication messages were available in two languages: English and Portuguese.

The sign-up form contained a questionnaire based on the recruiting criteria that was previously prepared (Appendix C), and the formulary introduction note had information about: sections' procedures, requirements, training, forms, and incentives. After filling the aforementioned form, the volunteers received an invitational email (Appendix C) or an excuse email (Appendix C) based on their suitability for the study. The pre-test questionnaire incorporated the PrEmo UX capture method. It was necessary to handle job seekers, competitors, technology

spies, or incentive-only seekers according to the recommendations Sova and Nielsen (2020) provided.

Every volunteer that showed up received an email with a “lucky number” (Appendix C) for the prize draw that took place at the end of each evaluation phase. At the end of the section, all of them had to answer the email to ensure they wanted to join the prize draw. Before ending the section, the participants were asked about referrals for future studies and their lucky number was their identification code in the description of the results. It was "provided repeated assurance that participant data were reported anonymously: during recruiting and screening, in participant forms, at the beginning of the study session, during the session, in the session wrap-up." (SOVA; NIELSEN, 2020).

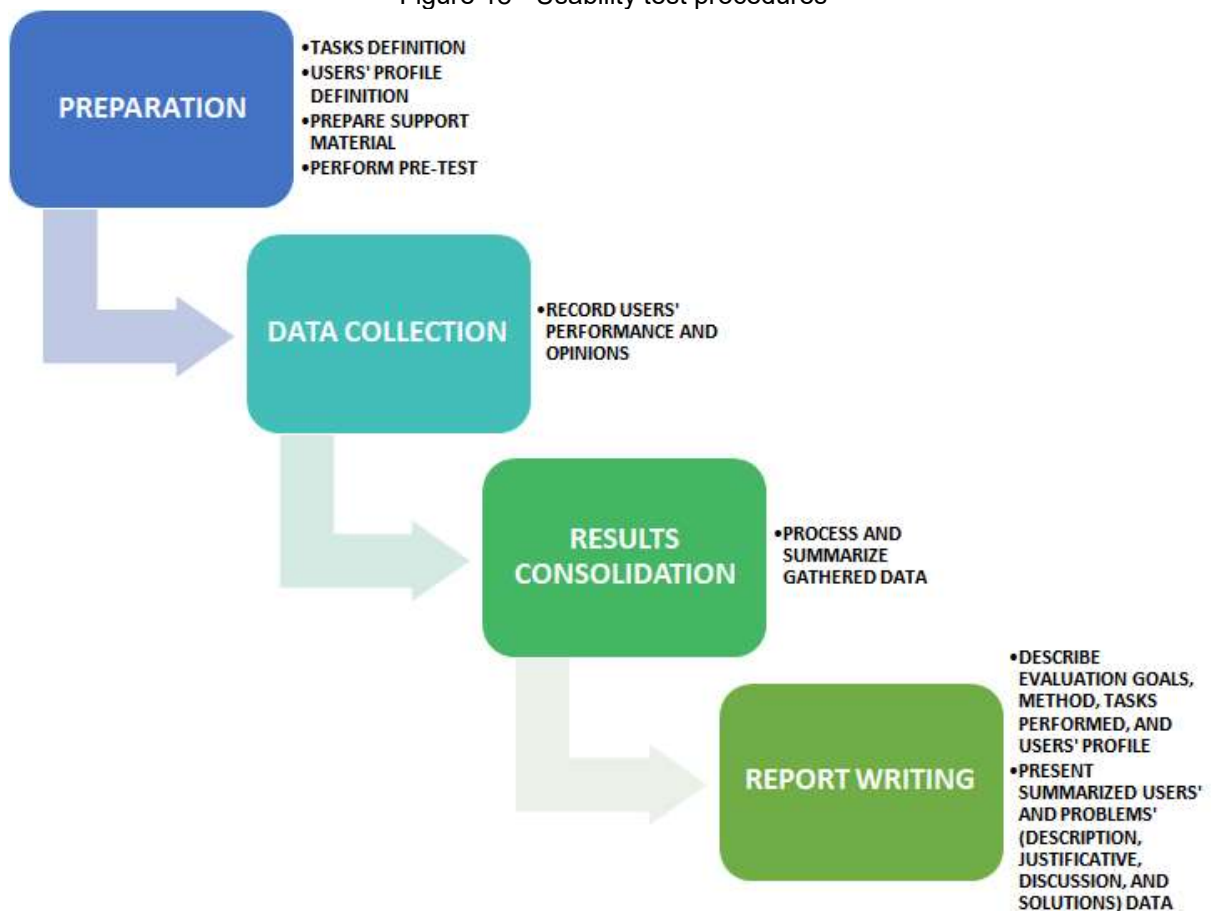
The dry-run participant section was longer than the planned ones to uncover problems related to the script, protocol, and system interaction. It was also useful for establishing usability and UX metrics. The pilot participant section followed the planned time constraints and allowed checking tasks' feasibility and timing.

This research kept the videotapes and other users' data for 24 hours from the data gathering. Within that time, there were no data sharing, no data handling under any circumstance. There was only one person with access to the collected data to fulfill the research purposes and procedures described in the Methodology section. After that period, all the users' data and videotapes were deleted. All the volunteers were aware of this procedure through the sign-up form.

#### **4.4.2 Usability evaluation concerns and procedures**

The usability test followed the procedures in Figure 18 and adopted the performance measurement, the SUS, questionnaire, and user feedback methods. The communicability evaluation performed under the procedures Barbosa and Silva (2010) presented (Figure 19), and all the obtained results were classified and interpreted according to their guidelines and reported in a further chapter. As the evaluations performed with one user at a time, all the described procedures undergone a pre-test with a volunteer XBRL specialist before the sections with the users. It allowed estimating sections and task execution time and identifying minor problems with the support materials.

Figure 18 - Usability test procedures



Source: Own authorship.

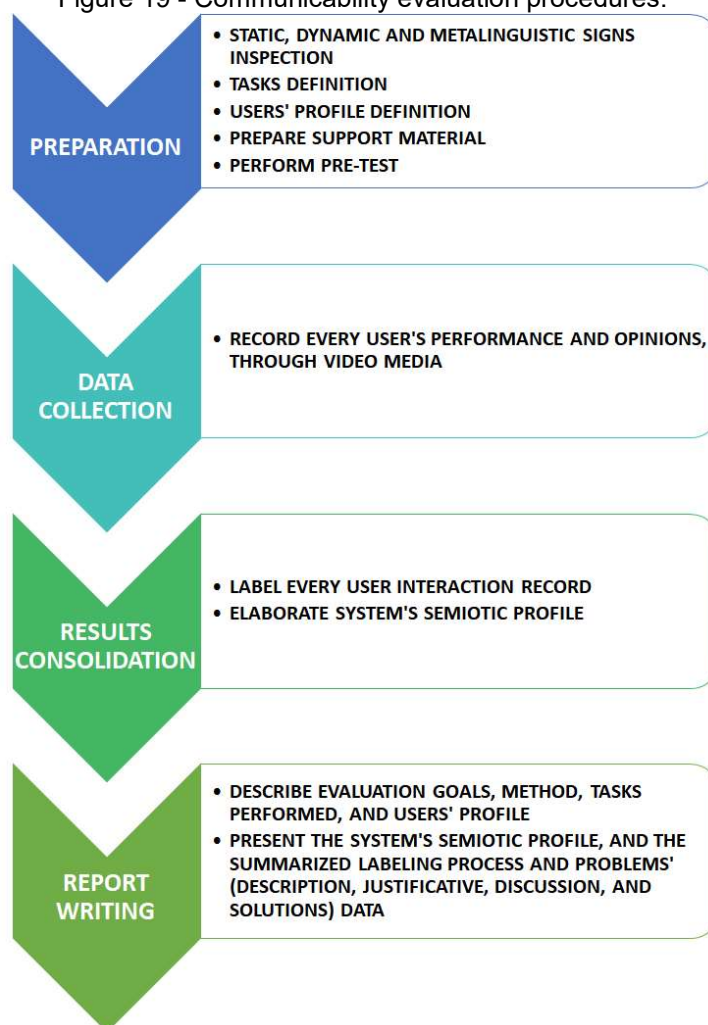
The supportive material preparation for both evaluation sections encompassed composing the users' activity instruction sheet (Appendix C) and the online forms to access users' UX and usability, configuring the web videoconference platform, testing the weblinks for the online forms, testing and calibrating the stopwatches, and preparing notepads and evaluation data sheets (Appendix C) to gather information.

The evaluator measured the success rate, the error rate, the time they spent to backtrack (the time a user deviates from the task goal to redo any previous procedure) or consult the support documentation, time users spent in the first attempt (the time a user spent to perform a task until the moment he/she decides quitting it and start it all over), and other aspects mentioned in the ISO9241-11 through annotations during the evaluation sections. The task completion time demanded two stopwatches. One of them had to stop every time the user deviated from the task goal (productive time) while the other one remained active until the end of the task

(the actual task completion time). This research did not consider the interruption time due to volunteers' requests (e.g., rest time, toilet requests, snack time) in the overall results.

The post-test questionnaire (Appendix C) contained a SUS questionnaire in both evaluation sections. In this research, the word “system” of every standard question was replaced by the word “software”. After answering it, the volunteers were free to provide any other feedback they thought relevant before ending the section.

Figure 19 - Communicability evaluation procedures.



Source: Own authorship.

In the communicability evaluation, it was necessary to watch every user video recordings to identify and label failures in the communication process between the users and the system. Figure 20 shows the deployed tags adapted from Prates, Souza e Barbosa (2000).

Figure 20 - The deployed tags and their definitions

<b>WHERE IS IT?</b>	<ul style="list-style-type: none"> <li>•THE USER INTERRUPTED HIS/HER SEMIOSIS BECAUSE HE/SHE DID NOT FIND AN APPROPRIATE WAY TO EXPRESS HIS/HER COMMUNICATION.</li> </ul>
<b>WHAT DO I DO NEXT?</b>	<ul style="list-style-type: none"> <li>•THE USER INTERRUPTED HIS/HER SEMIOSIS BECAUSE HE/SHE COULD NOT FIND A WAY TO PERFORM THE NEXT COMMUNICATION INPUT.</li> </ul>
<b>WHAT IS IT?</b>	<ul style="list-style-type: none"> <li>•THE USER TRIES TO UNDERSTAND THE COMMUNICATION PROCESS WITH THE SYSTEM THROUGH IMPLICIT METACOMMUNICATION.</li> </ul>
<b>OPS!</b>	<ul style="list-style-type: none"> <li>•THE USER REALIZES THE COMMUNICATION WAS UNSUCCESSFUL BECAUSE HE/SHE PERFORMED A WRONG INTERACTION.</li> </ul>
<b>WHERE AM I?</b>	<ul style="list-style-type: none"> <li>•THE USER REALIZES THE COMMUNICATION WAS UNSUCCESSFUL BECAUSE HE/SHE PERFORMED AN INTERACTION IN THE WRONG CONTEXT.</li> </ul>
<b>WHAT DID HAPPEN?</b>	<ul style="list-style-type: none"> <li>•THE USER INTERRUPTED HIS/HER SEMIOSIS BECAUSE HE/SHE DID NOT PERCEIVE OR UNDERSTAND THE SYSTEM'S COMMUNICATION.</li> </ul>
<b>WHY ISN'T IT WORKING?</b>	<ul style="list-style-type: none"> <li>•THE USER TRIES TO UNDERSTAND THE COMMUNICATION PROCESS WITH THE SYSTEM BY TESTING SEVERAL HYPOTHESES ABOUT THE SYSTEMS' COMMUNICATION MEANING.</li> </ul>
<b>THAT IS NOT THE WAY TO DO IT.</b>	<ul style="list-style-type: none"> <li>•THE USER REALIZES THE COMMUNICATION WAS UNSUCCESSFUL BECAUSE HE/SHE DID NOT GET THE EXPECTED RESULTS AFTER PERFORMING SEVERAL INTERACTIONS.</li> </ul>
<b>I'D RATHER MY WAY OVER YOURS.</b>	<ul style="list-style-type: none"> <li>•THE USER GIVES UP A SEMIOSIS BEFORE ATTAINING THE DESIRED RESULTS TO STARTS A NEW ONE WITH THE SAME PURPOSE BECAUSE HE/SHE DID NOT UNDERSTAND THE HCI PROPOSED SOLUTION.</li> </ul>
<b>NO, THANKS!</b>	<ul style="list-style-type: none"> <li>•THE USER GIVES UP A SEMIOSIS BEFORE ATTAINING THE DESIRED RESULTS TO STARTS A NEW ONE WITH THE SAME PURPOSE BECAUSE HE/SHE PREFERS TO PERFORM THE SEMIOSIS IN HIS/HER WAY, DESPITE UNDERSTANDING THE HCI PROPOSED SOLUTION.</li> </ul>
<b>IT'S GOOD ENOUGH.</b>	<ul style="list-style-type: none"> <li>•THE USER FINISHES AN UNSUCCESSFUL SEMIOSIS, BUT HE/SHE DOES NOT START A NEW ONE TO ACHIEVE THE DESIRED RESULTS, BECAUSE HE/SHE DID NOT NOTICE HIS/HER PERFORMANCE DID NOT MATCH THE DESIRED RESULTS.</li> </ul>
<b>HELP!</b>	<ul style="list-style-type: none"> <li>•THE USER TRIES TO UNDERSTAND THE COMMUNICATION PROCESS WITH THE SYSTEM THROUGH EXPLICIT METACOMMUNICATION.</li> </ul>
<b>I GIVE UP.</b>	<ul style="list-style-type: none"> <li>•THE USER FINISHES AN UNSUCCESSFUL SEMIOSIS, BUT HE/SHE DOES NOT START A NEW ONE TO ACHIEVE THE DESIRED RESULTS BECAUSE HE/SHE DID NOT HAVE A MEAN, THE CAPACITY, OR THE VOLITION TO KEEP TRYING. THE USER GAVE UP, EVEN THOUGH HE/SHE NOTICED HIS/HER PERFORMANCE DID NOT MATCH THE DESIRED RESULTS.</li> </ul>

Source: Adapted from Prates, Souza e Barbosa (2000).

After the labeling process, it was necessary to analyse the frequency, the context, and the order each label appeared in each video to identify the reasons users: could not express what they intended to; adopted a wrong way to do what they intended to; could not understand the system's communication; grasped a wrong understanding about the system's communication, and could not perform a communication input.

#### **4.4.3 User eXperience evaluation concerns and procedures**

This research dealt with geographically spread users within different global time zones, so the UX evaluation had to perform individually and via the internet, as in online studies. To answer the research question and redesign the software, this research considered collecting qualitative and quantitative UX data in each evaluation section. That is why the users had to perform financial reporting related tasks with OFR high-fidelity functional prototypes (first version and redesigned version) while providing pre-task and post-task completion interacting experiences feedback.

Concerning the All about UX community categorization for UX evaluation methods suitability (Appendix C), this research demanded a method that was adequate for online studies, applicable to high-fidelity functional prototypes, allows gather information from one user at a time and generates qualitative and quantitative UX data gathered before the user's interaction and after the whole task conclusion. None of the eighty-six UX evaluation methods from the All about UX community list embraced all of the demanded characteristics. However, adopting three of them (Emocards, PrEmo, and SAM) was enough to solve it, as presented in the Appendix B.

The pre-test questionnaire (Appendix C) contained a PrEmo measurement instrument from the Delft Institute of Positive Design provides the offline PrEmo version for academic research under an Attribution-NonCommercial-NoDerivatives 4.0 International Creative Commons license (CC BY-NC-ND 4.0). It assessed how volunteers expected to feel about the use of the OFR software.

The post-test questionnaire (Appendix C) contained a SAM and an Emocards measurement instrument through which the users could express how they felt after

the test. The procedures described in this subsection were adopted for both evaluation sections. The translations adopted for the Portuguese UX capture methods explanations were extracted from Silva and Kronbauer (2018).

#### **4.4.4 Ethical aspects**

As described within the Section 4.4 subtopics, this research's methodological procedures also encompassed assuring ethical aspects through the principles of autonomy, beneficence, non-maleficence, justice, and equity. All the users signed an online form authorizing the data gathering procedures in all formats demanded (written, voice audio record, and video record). In both evaluation sections, for the sake of volunteers' comfort, anonymity, privacy, autonomy, and confidentiality rights, all the enlistees were aware:

- About the research's goal.
- About which data they were going to provide.
- About how the data gathering process was going to perform.
- About how the provided data was going to be used.
- That they were going to be addressed by the fake nickname they provided in the sign-up form.
- That all information that could identify them was going to be deleted after the research conduction.
- That all the gathered data would never be shared, uploaded, handled, or transferred under any circumstances.
- That there were no data backup.
- That their sections were recorded.
- That they were not obligated to share their webcam through the videoconference sections.
- That they could request a pause in the evaluation section whenever they wanted, for any reason they had.
- That they could resign and quit whenever they needed, and still get the incentive.

#### 4.5 SUMMARY

When dealing with research gaps, a reproducible methodology provides a higher scientific level, relevant academic contribution, and a starting point for future research development. That is why this chapter presented, in detail, the adopted methodological procedures for mitigating the gap found between HCI and the XBRL financial reporting areas.



## 5 THE OPEN FINANCIAL REPORTING SOFTWARE

The Open Financial Reporting (OFR) software prototype consisted of an XBRL instance creator program with two main purposes. The first one was to allow users to elaborate XBRL financial reports, regardless of their knowledge about XBRL coding. The second one consisted of providing a common basis to investigate the impact of HCI Design on XBRL financial reporting task efficiency because users and volunteers used different and not always open-source and extensible tools.

Even though the methodological procedures description and the supportive documentation represented the major part of the planning activities, the OFR development was also part of it. The following subtopics present OFR's requirements and architecture for the software high-fidelity prototype.

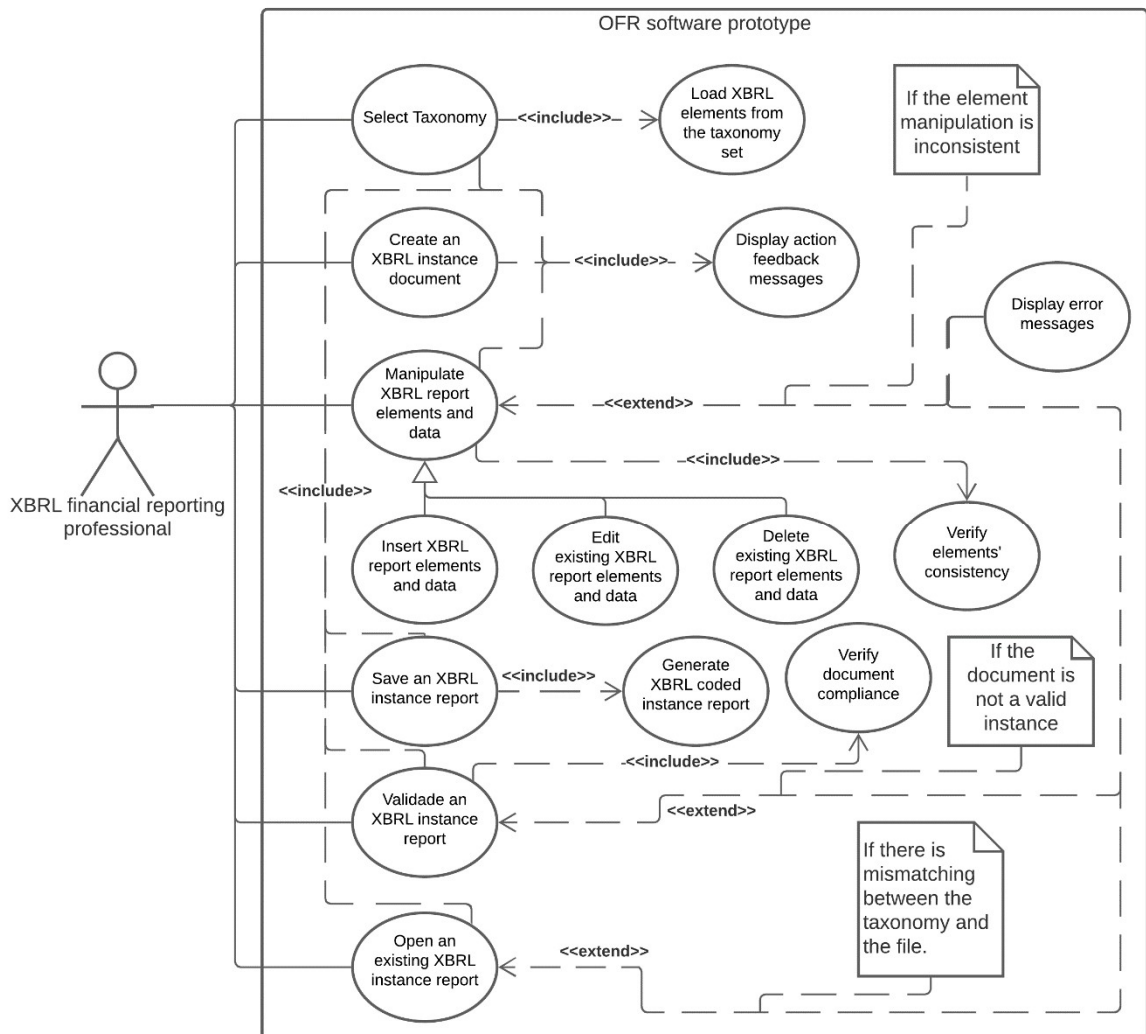
### 5.1 THE OFR'S REQUIREMENTS

The OFR's high-fidelity prototype regarded only, XBRL knowledge abstraction, and minimal functional requirements for an XBRL instance creation software obtained from an XBRL specialist (Appendix D):

- To allow a user to select taxonomy files from a directory and chose one among the supported instance documents;
- To allow a user to insert, edit and delete XBRL report elements (numeric, non-numeric, footnotes, contexts, units);
- Prevent users from adding inconsistent elements or, at least, notify them about such elements;
- To allow users to save an instance report document;
- To allow users to open existing instance report documents;
- To allow users to validate the instance document against a linkbase and generate the proper error messages, when applicable.

Figure 21 shows the OFR's use case diagram and the following paragraphs present the OFR requirements in terms of its cases of use because OFR's final development shall follow a user-centric approach. In this Section, mandatory tasks or interactions are marked by the use of the verb "shall". Optional tasks or interactions are marked by the use of the verb "may".

Figure 21 - OFR's use case diagram



Source: Own authorship.

A user shall perform five activities to compose an XBRL instance document, namely: to create the instance file, to select a taxonomy file, to insert data, to create footnotes, and to validate the instance document.

When the user initializes the system, the software shall exhibit its initial screen with the available menus, tools, and a document information panel and wait for the user's following action. Then the user needs to choose a taxonomy file (.xsd), so the application can make available the options for creating XBRL documents specified within the taxonomy.

At the click upon a taxonomy selection button, the software shall open a file location selection window (Appendix D) through which the user provides the taxonomy file path. When the user clicks on a load button, the OFR shall load the

taxonomy files and the linkbase files as well as update the options available through the remaining menus.

Next, the user shall choose one report model (an extended link from the Presentation Link linkbase) among the ones available in the taxonomy's files. To do so, the user shall click a button to select a report model (Appendix D), and the software shall exhibit the options available in a new list (Appendix D) and wait for the user to select an option or to cancel the action. After loading the desired extended link from the Presentation Link linkbase, the OFR shall make available all the elements for insertion in the report whenever he/she clicks on a button to add a new element under a menu.

To add new elements, the user shall use the OFR software data insertion windows (Appendix D) with messages and fields for the user to fill up. Each element shall demand different fields based on their definition within the taxonomy, and the software must adapt the insertion interface according to it. After inserting the data, the user shall click on an insertion confirmation button. Next, the OFR shall close the data insertion window and display the new element properly in a document information zone.

The user may want to edit or exclude existing elements from the instance document. That is why the elements' management menu shall have two additional options, to edit and exclude elements. When the user clicks on the edit option, the OFR shall exhibit a window with lists of existing elements (Appendix D). The user shall select an element to edit, input the new data and click on an edition confirmation button. At the end of the operation, the application shall replace the selected element with the new one, update the document information panel, and wait for other user actions.

If the user clicks the option to exclude an element, the OFR shall exhibit a window with lists of existing elements (Appendix D), and the user shall select one and click on an exclusion confirmation button. Next, the software shall delete the selected element, update the document information panel, and wait for other user actions.

To add a footnote associated with one or more instantiated elements, the user shall select an element from the instance document, then go to a menu and

click the option to add a footnote. As a result, the OFR software shall exhibit the footnote insertion window (Appendix D) with two fields for the user to fill up.

The first one shall allow the user to inform the footnote' ISO 693 language code in compliance with the XML rules (<http://www.w3.org/TR/2000/REC-xml-20001006#sec-lang-tag>). The second one shall allow the user to enter the footnote text. At the end of the operation, the user shall click on an insertion confirmation button. Then, the software shall generate the footnote element with all its subelements.

The user may want to edit or exclude existing footnotes from the instance document. That is why the footnotes' menu shall have two additional options to edit and exclude footnotes. When the user selects the first option, the OFR shall exhibit a window with the list of existing footnotes (Appendix D), and the user shall select a footnote, input the new data, and click on an edition confirmation button. At the end of the operation, the application shall replace the selected footnote with the new one and wait for other user action.

If the user clicks the option to exclude footnotes, the OFR shall exhibit a window with the list of existing footnotes, and the user shall select a footnote and click an exclusion confirmation button. Next, the software shall delete the selected footnote and wait for other user action.

The user may want to save his or her XBRL instance document in a file for submitting it to a government oversight entity, for example. When the user clicks on a save document button in the OFR interface (Appendix D), the software shall open a window (Appendix D) for the user to inform the path in which the application has to create the XBRL instance file. At the end of the operation, the program exhibits a message informing that it saved the file in the specified location.

When the user clicks on a validation button in the OFR interface (Appendix D), the software shall perform the validation procedures and return a message informing whether the instance document is valid or contains inconsistencies.

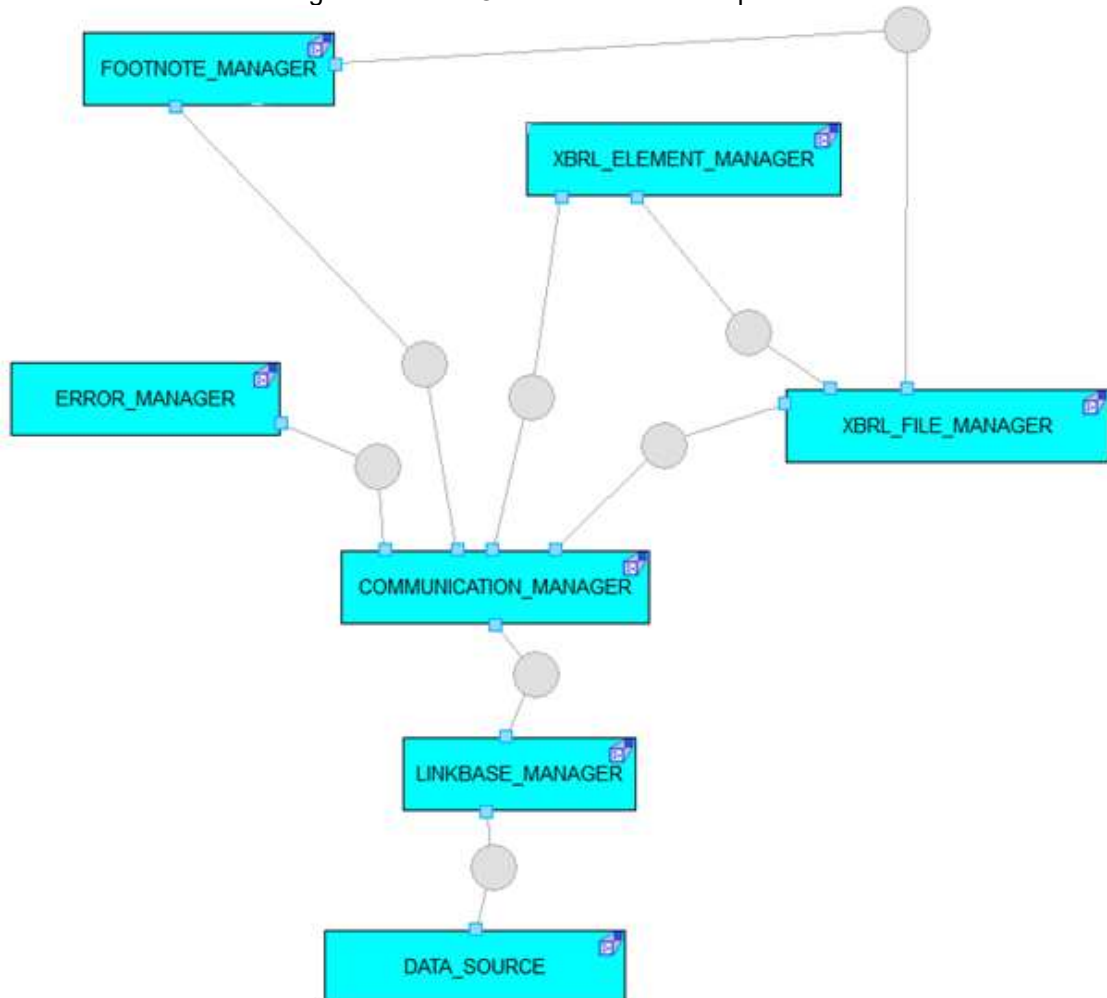
The software must also: prevent the user from inserting taxonomy inconsistent elements, prevent the user from inserting duplicated elements, warn the user whenever he/she tries to input data in an improper format, message the user whenever he/she performed a valid action, or caused inconsistency in the document

under edition. The Appendix D contains the list of all the messages the OFR software may exhibit to the users.

## 5.2 THE OFR ARCHITECTURE

According to Garlan, Monroe, and Wile (2010), "ACME is an architecture description language that aims to provide a common intermediate representation for a wide variety of architecture tools.". Then, for the sake of easing reproducibility, this research adopted ACME to describe the OFR's architecture (Figure 22). The OFR is a monolithic application in which all seven architecture components' code consist of a single java program source code. Every component has a task manager within their architecture that performs the communication with other components and selects which inner component should act each time.

Figure 22 - The OFR architecture components

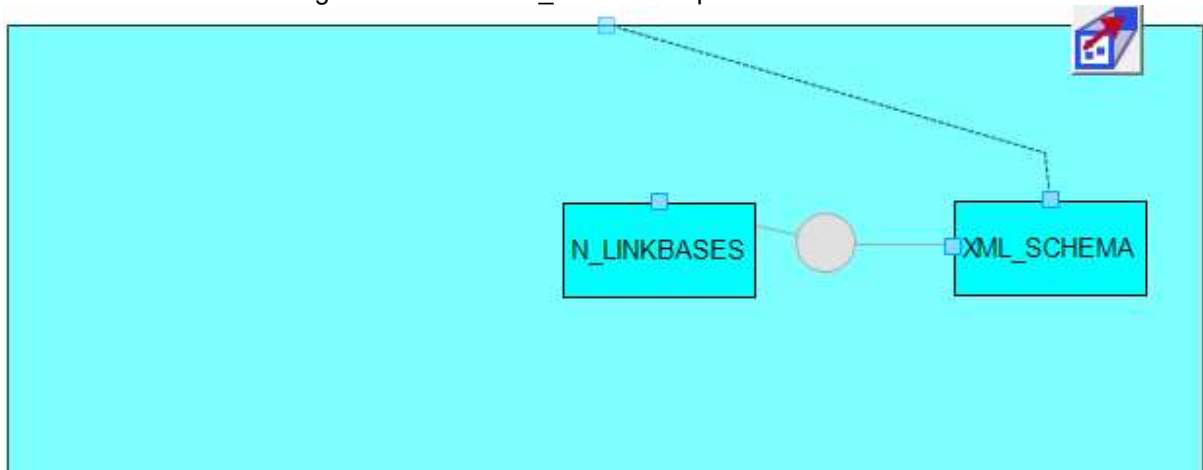


Source: Own authorship.

The component Data\_Source (Figure 23) encompasses the XBRL taxonomy files and linkbases files that the application should navigate through. The

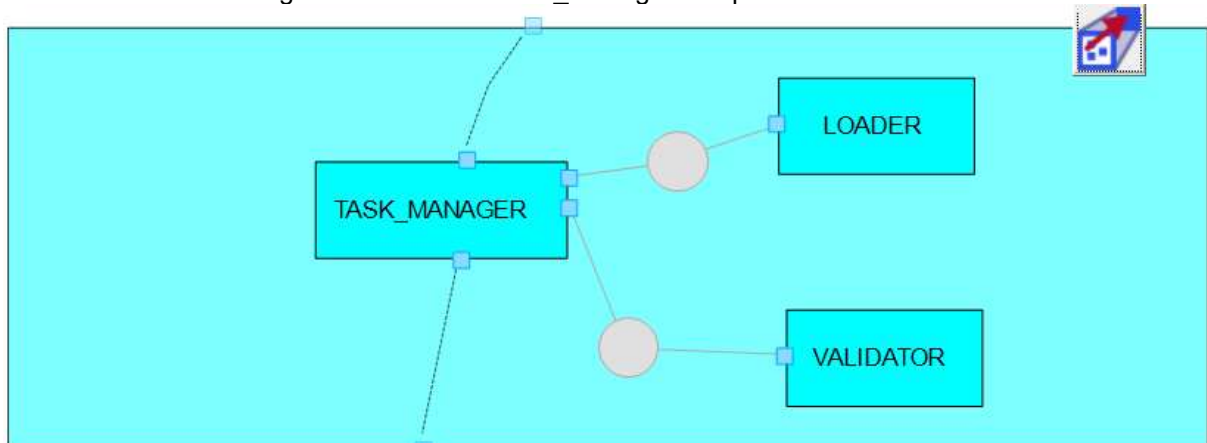
Linkbase\_Manager (Figure 24) performs the navigation through the data source files to accomplish the instance validation across linkbases, through the validator component, and uses the loader component to import information to enable internal, and user interface features (e.g., list of reports the user can instantiate, list of elements available to insert in the instance document, rules for generating the instance files, hypercube composition, and instance validation).

Figure 23 - The Data\_Source component architecture



Source: Own authorship.

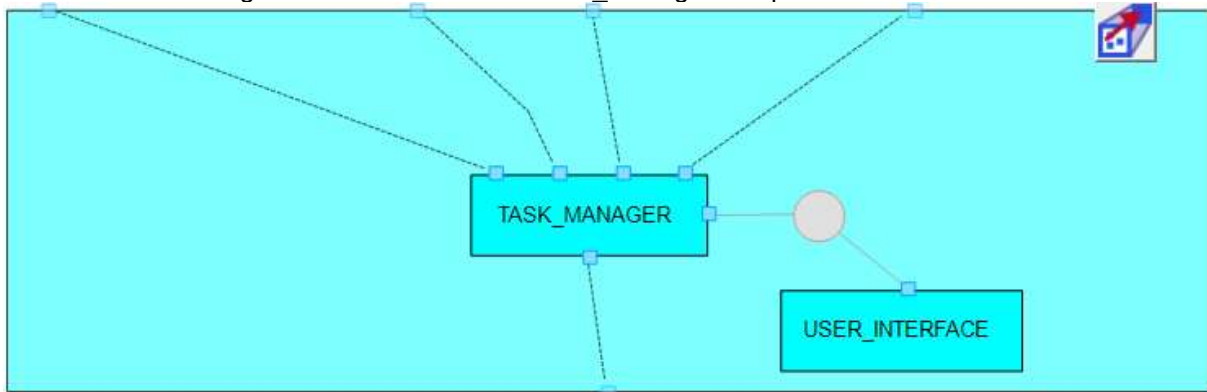
Figure 24 - The Linkbase\_Manager component architecture



Source: Own authorship.

The Communication\_Manager (Figure 25) consists of the user\_interface component and a task manager. It is a taxonomy-based self-adaptive component that gathers user's requests, forwards them to other components, and returns their results to the user. It is also responsible for sending the other architectural components all information they need from the Linkbase\_Manager.

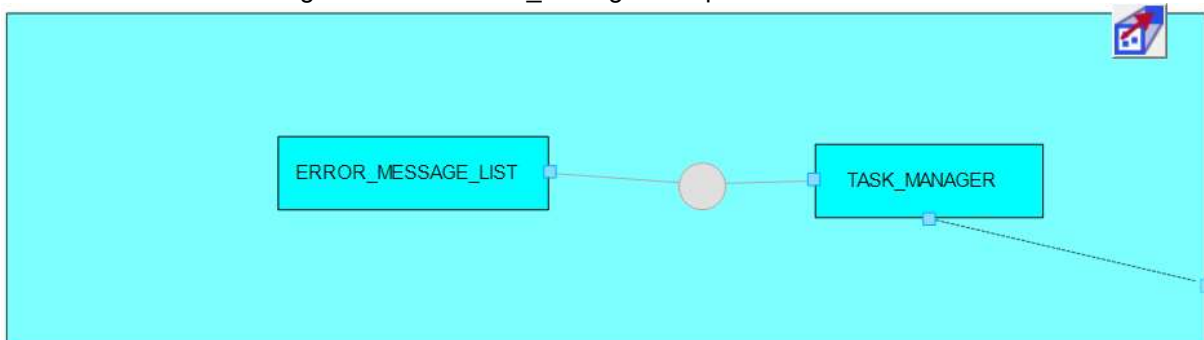
Figure 25 - The Communication\_Manager component architecture



Source: Own authorship.

Whenever the user takes an incoherent action, the Communication\_Manager receives the error treatment result from the corresponding component and requests the Error\_Manager (Figure 26) to retrieve the procedure to warn the user from the error\_message\_list component. The error\_message\_list component should contain the user interaction warn procedures generated according to information retrieved from the taxonomy set through the Linkbase\_Manager.

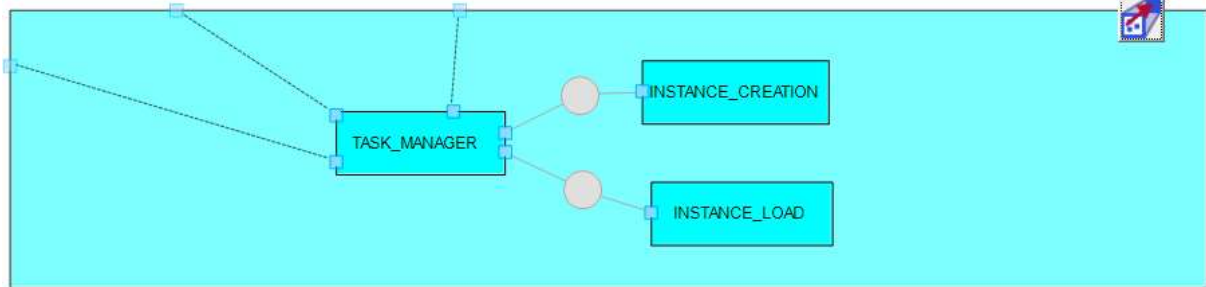
Figure 26 - The Error\_Manager component architecture



Source: Own authorship.

The XBRL\_File\_Manager (Figure 27) contains a component to create the XBRL instance document file (instance\_creation) and another to load such files (instance\_load), allowing the user to edit the report content, for example. It generates the instance files according to the taxonomy's hypercube structure, under the Communication\_Manager request. It is also responsible for storing the report under edition within the program, so the XBRL\_Element\_Manager and the Footnote\_Manager can perform operations on the instance document.

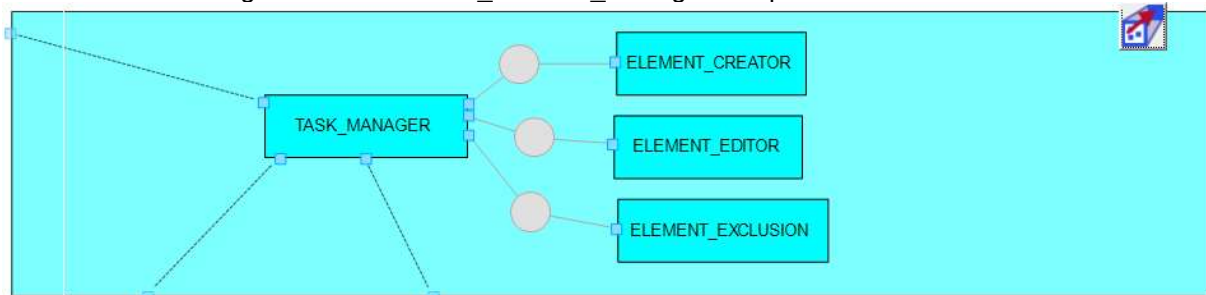
Figure 27 - The XBRL\_File\_Manager component architecture



Source: Own authorship.

The XBRL\_Element\_Manager (Figure 28) and the Footnote\_Manager (Figure 29) have similar structures for different means. While the former's components are related to operations of inclusion (element\_creator), edition (element\_editor), and exclusion (element\_exclusion) of taxonomy elements from the XBRL instance document, the latter's performs the same role for footnotes through the actions of its components (footnote\_creator, footnote\_editor, and footnote\_exclusion). Both of them perform their operations with the instance document's elements under Communication\_Manager's requests.

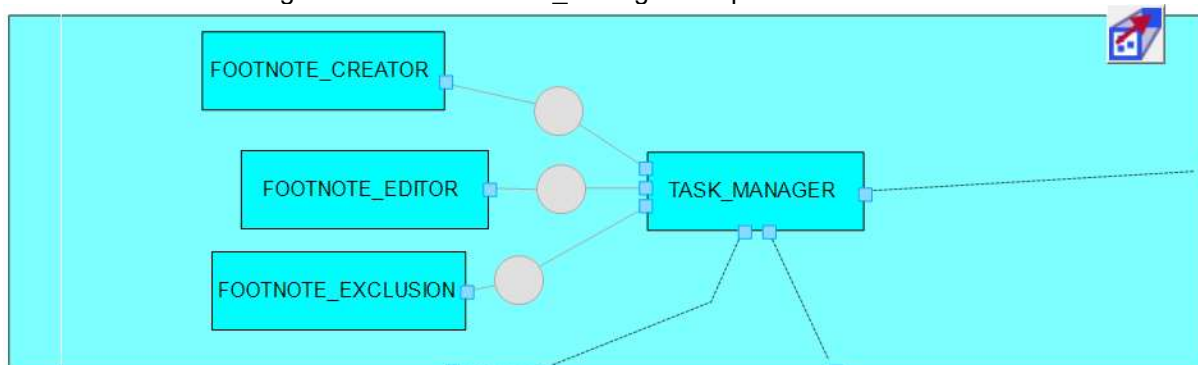
Figure 28 - The XBRL\_Element\_Manager component architecture



Source: Own authorship.



Figure 29 - The Footnote\_Manager component architecture



Source: Own authorship.

The information retrieved from the taxonomy set through the Linkbase\_Manager also determines the XBRL\_Element\_Manager operations and rules for inserting, editing, and deleting elements. This component is also responsible for keeping the taxonomy's hypercube structure in the instance documents.

The user interface components for managing an instance document's elements may vary depending on the taxonomy files loaded. For example, the amount of information the user needs to input a context depends on how many hypercube axes it couples, so the software window must display all fields to allow the user to insert it.

The components for opening and automatically generating taxonomy valid instance documents, generating error messages, and generating communication messages also vary according to each taxonomy. In that scenario, automatic programming mechanisms are a viable way to handle this peculiarity.

The Communication\_Manager, XBRL\_File\_Manager, Error\_Manager, XBRL\_Element\_Manager, and Footnote\_Manager final versions demand implementation of automatic programming features to be adaptable to whatever taxonomy the user loads. However, such features do not compose early OFR's high-fidelity prototype versions.

### 5.3 OFR'S FIRST HIGH-FIDELITY PROTOTYPE

The first high-fidelity prototype focused on implementing features and components that minimally allowed users to create the Siconfi's RREO Consórcios

2020 report without the need to validate it according to Siconfi's taxonomy Presentation link for that report.

The OFR's high-fidelity prototype regarded the partial implementation of four from the seven architectural components described in Section 5.2: `Communication_Manager`, `XBRL_File_Manager`, `XBRL_Element_Manager`, and `Error_Manager`. The `Footnote_Manager` was not implemented in the high-fidelity prototypes because Siconfis' taxonomy did not adopt footnotes in their reports. However, the `XBRL_File_Manager` could handle this element. It shall compose future high-fidelity software prototypes, in the same way, the automatic programming features.

Due to the absence of the `Linkbase_Manager`, it was necessary to adopt a provisory measure to support the high-fidelity prototype's testing while it was under construction. Instead of retrieving the information from the taxonomy with the architectural component, it was necessary to go through the taxonomy and linkbase files organizing the information the `Linkbase_Manager` should provide into text files.

Whenever the high-fidelity software prototype needed information from the taxonomy, it retrieved the information from a specific text file. It mimicked the output of the `Linkbase_Manager` component. Chart 1 presents the list of text files and the description of each file content. In that way, to enable the high-fidelity prototype to generate other reports, one had to fill up the text files with the specified content for the new Siconfi report.

Chart 1 - Text files content for simulating the Linkbase\_Manager's output

Text file name	Text file content
attachmentList	List of the existing report's attachments identifiers
attachmentMemberListN	List of the existing report's context dimensions identifiers for the attachment "N".
ContextMemberAxisN	List of the existing report's context dimensions identifiers for the axis "N".
CoupledAxisList	List of the existing report's context axes identifiers that share one or more context dimensions.
entryPointsList	List of the entry points file names
IsoCode	List of the currency codes from ISO4217 standard
schemaRefList	List of the schema references available
SecondaryContextMemberIAxisJ	List "I" of the existing report's context dimension identifiers related to the secondary context axis "J".
SecondarySiconfiAxisN	List of secondary context axes identifiers attached to the main context axis identifier "N".
SiconfiAxis	List of the main context axes identifiers.
SiconfiDimension	List of all existing context dimensions identifiers
SiconfiEntityCode	List of Siconfi's code for reporting institutions
SiconfiNonNumeric	List of existing non numeric elements identifiers
SiconfiSchema	List of schema URIs
SiconfiStatementId	List of all existing numeric elements identifiers
StatementAxisN	List of all existing numeric elements identifiers related to the context axis "N".

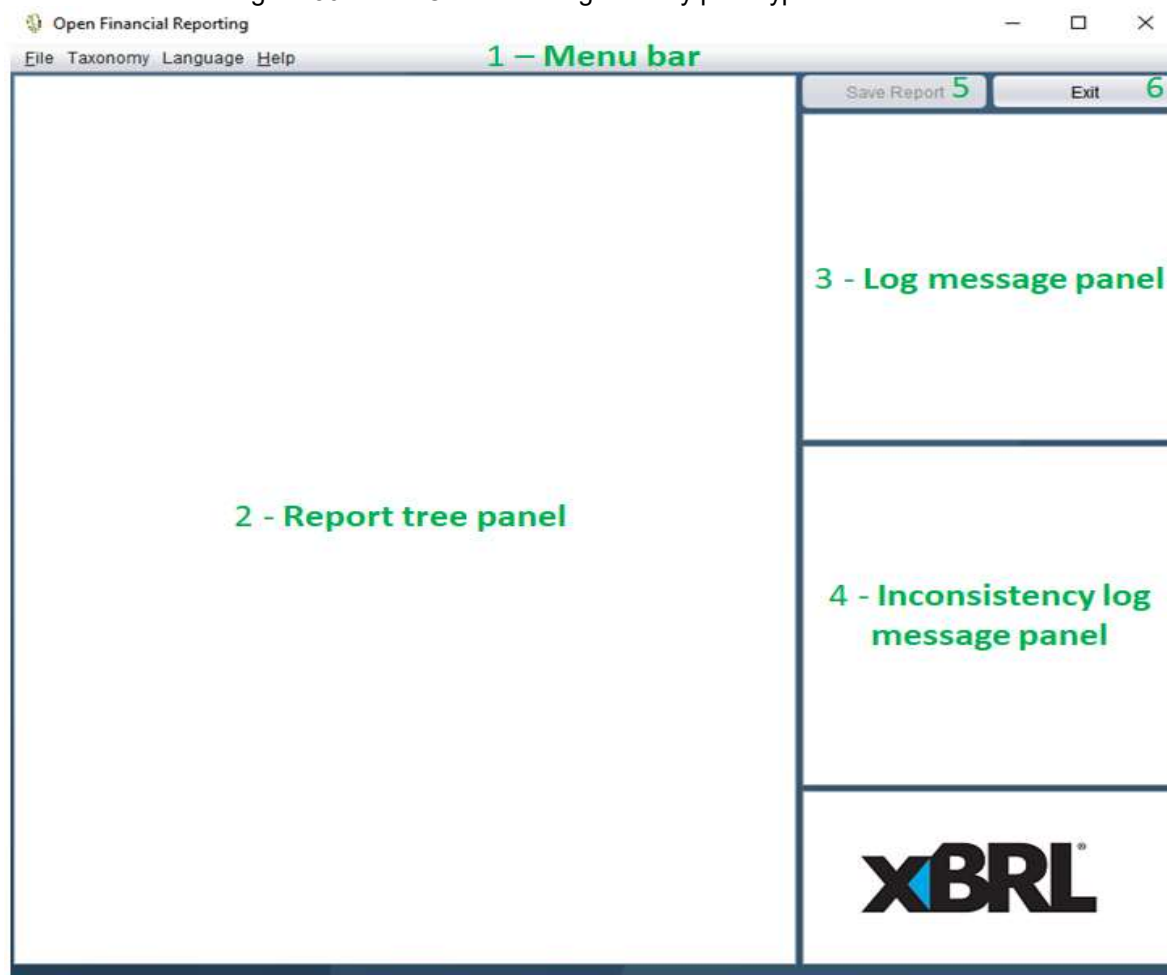
Source: Own authorship.

As depicted in Figure 30, OFR's first high-fidelity prototype interface consisted of a top menu bar (item 1), a report tree panel (item2), a log message panel (item 3), an inconsistency log message panel (item 4), a "Save Report" button (item 5), and an "Exit" button (item 6). The OFR's User guide documents within Appendix D provide a detailed description of how did this high-fidelity prototype and its interface worked. It also contained a list of all messages the software used to communicate with the user.

In the software interface (Figure 30), the "Language" menu had three subitems: "English", "Spanish", and "Portuguese". Each one of them instantly translated the whole software to the corresponding language. Regardless of the chosen option, the software kept the report elements displayed in their native language defined in the taxonomy set. It was also a component that was not part of

the software architecture. Its implementation was just a way to deal with the need to recruit volunteers from abroad for the usability and UX evaluations.

Figure 30 – The OFR's first high-fidelity prototype main screen



Source: Own authorship.

The "Taxonomy" menu had the subitem "Load Taxonomy Set". It should open a file chooser window for the user to import a taxonomy set before creating, loading, or composing the instance report. However, this functionality relied on the Linkbase\_Manager component that was under construction, so this subitem still had no functionality attached to it.

The "Instance validation" menu had one subitem to allow the users to validate their instance file against the taxonomy's Linkbase formula. Even though the validation process prevents inconsistencies in the instance file, this high-fidelity prototype implemented a reduced set of rules for two main reasons. Firstly, it did not

prevent the instance creation task. Secondly, Linkbase formulas contained mathematical validation rules for a complete instance document.

If the high-fidelity prototype implemented the full validation set, the users could never test this functionality because the scheduled section duration was smaller than the required to compose a complete report. A further version of this software shall fully implement this functionality. Meanwhile, a user that composed a complete financial report with this high-fidelity prototype version had to validate it against the taxonomy's Linkbase formula through external tools.

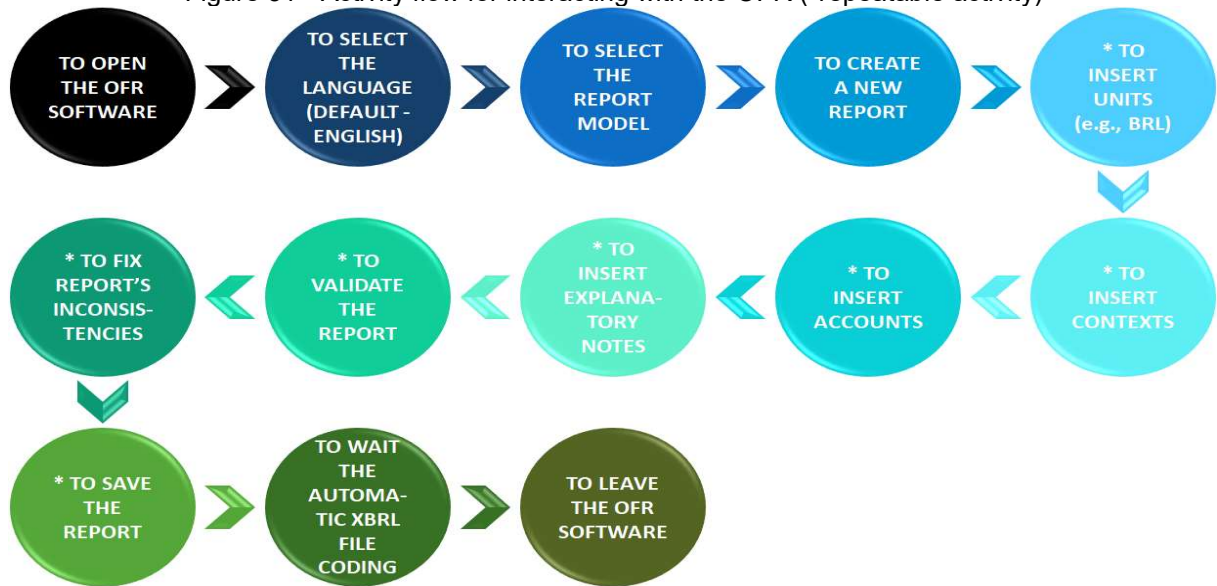
In the high-fidelity prototype interface, the menus and windows had gradual enablement according to the overall task progress as an attempt to prevent users not familiar with XBRL from getting lost through the process of composing a financial report. Figure 31 presents the activity flow a user should follow while interacting with this software version.

To the best of our knowledge, all instance files generated with this high-fidelity prototype successfully validated against Siconfi's taxonomy Linkbase presentation through the Interstage XWand Toolkit Evaluation Copy (the evaluation purpose version of the same XBRL financial reporting tool Siconfi deploys to generate its taxonomy and test instance files) (FUJITSU, 2020).

## 5.4 SUMMARY

This chapter presented the OFR, described some of its main purposes and characteristics, as well as OFR's architecture and requirements. The high-fidelity prototype described through this chapter underwent usability and UX evaluations for redesign purposes. Section 6.4 reports the redesign aspects and main changes.

Figure 31 - Activity flow for interacting with the OFR (\*repeatable activity)



Source: Own authorship.

## 6 RESULTS

This chapter presents the results of all tests performed with both OFR's high-fidelity prototypes. All demographic data collected allowed selecting volunteers with the desired user profile and to better understand the data each volunteer provided. It also had no other use than that.

All the expected values for the evaluation items were established through the pilot test and from the references mentioned within chapter 2. The error indications also accounted for the differences between the user's XBRL generated files and the one proposed in the activity sheet.

For both evaluations (formative and conclusive), the success rate was the ratio between the number of tasks completed correctly and the total number of attempts. The error rate calculation was the ratio between the number of errors and the product between the number of testers and the number of error possibilities:

- The number of errors means the times the user performed a wrong interaction or missed the pre-set sequential action course (e.g to try to insert a numeric element before adding a context or unit, to try to insert inconsistent data while creating an element).
- The number of testers means the enlistees that joined an evaluation section.
- The number of error possibilities means the universal set of errors a user could commit while following the path to perform an activity. (e.g., all the possible ways to try to insert inconsistent data while creating an element)

Generically, the error rate was:  $(\text{Number of errors}) \times 100 / (\text{Number of error possibilities} \times \text{Number of testers})$ . From that equation, it was possible to pre-set the error rate calculation expressions for each task the users performed in the evaluation sections. For example, the evaluation sections relied on five users, and the universal set of errors a user could commit in the first task was one. Thus, the error rate calculation for the first task was:  $(\text{Number of errors}) \times 100 / (1 \times 5)$ .

Similarly, the error rate calculation for the second task followed the equation:  $(\text{Number of errors}) \times 100 / (13 \times 5)$ . Regarding the third task error rate calculation, if the user had to edit a report element, it should follow the equation:  $(\text{Number of errors}) \times 100 / (11 \times 5)$ . If the user deleted a report element to insert it again, it should calculate with:  $(\text{Number of errors}) \times 100 / (19 \times 5)$ .

This Section also encompasses the OFR redesign because it is the result obtained from deploying HCI design to solve the problems found through the formative evaluations. Figure 32 summarizes the profile of the gathered volunteers for the formative evaluation sections.

## 6.1 USABILITY FORMATIVE EVALUATION RESULTS

The usability HCI formative evaluation sections performed as described in Section 4.4, the expressions for calculating some usability indicators, and all the supportive documents are available within topics “Evaluation datasheet” and “Supportive materials” of Appendix C. The following paragraphs describe the results related to the usability user tests conducted with the OFR's first high-fidelity prototype.

All of the volunteers demanded a training section before starting the experience with the OFR software, and fulfilled the task goals to create an XBRL instance with the OFR. The usability indicators related to this task showed users needed to perform one attempt on average to achieve it. They also committed no errors while performing that task.

The OFR did not fell in faulty conditions during the subjects' trials. The dry-run test results allowed estimating values for those indicators: one attempt, no user errors, and no system errors, respectively. It is also important to highlight that the average productive time was 1.11 minutes, the success rate was 100%, and the error rate of 0%. On average, users had to invest the following amounts of time to accomplish the XBRL instance creation, to perform the first attempt, and backtracking from an error were 2.01, 2.01, and 0 minutes, respectively.

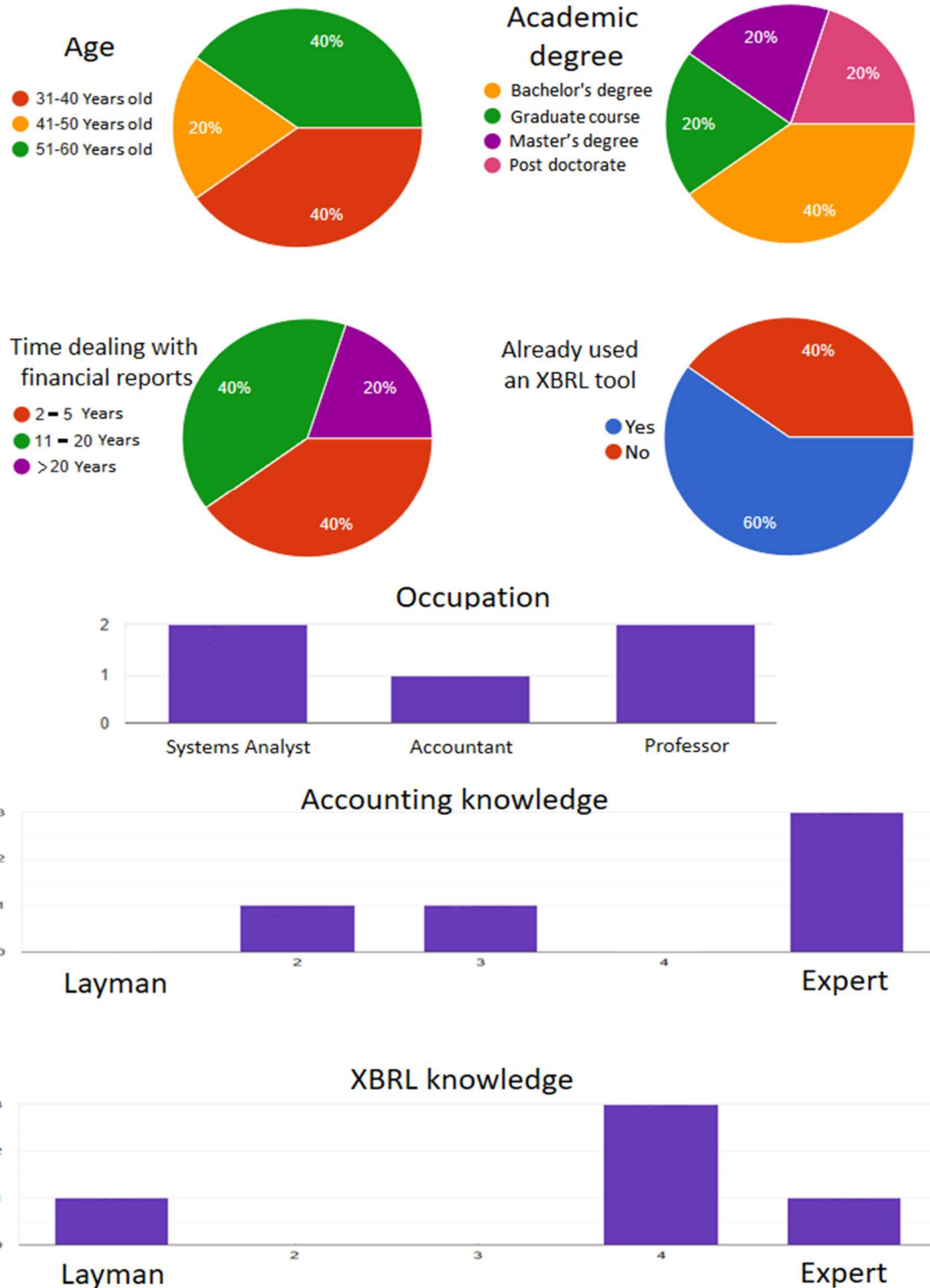
The average quantity of OFR's functions users had to deploy to accomplish the first task was two. They were supposed to use two functions. Only one volunteer requested the evaluator's assistance one time. All users did not consult the software supportive documentation to complete the referred activity. They also did not use any extra time getting how to use the OFR's functions.

Every volunteer successfully developed the second task, all of them could figure it out on the first try, and learned all functions necessitated to accomplish the task. All of the individuals terminated the task to insert data with the OFR. The results



assessed for the aforementioned task revealed that users necessitated performing one try on average to conclude it. They underwent a total of 9 failures during that task execution.

Figure 32 - The user's profile for the formative evaluation sections



Source: Own authorship.

The OFR had no errors during their attempts. From dry-run test results, the predicted rates for those indicators were one attempt, two errors per user, and no system errors, respectively. The measured average productive time was 7.95 minutes, the success rate was 100%, and the error rate was 13.85%.

The average time enlistees used to fulfil the data insertion, to perform the first attempt, and to backtrack from an error, were 12.33, 12.33, and 0.48 minutes, sequentially. On average, users needed to use five functions to finish the second task in which they should have used five ones. On medium, participants bid for the evaluator's help one time and only one volunteer went for the OFR's supportive documentation 1 time to accomplish that activity. He/she deployed 2 minutes to figure out how to use the OFR's functions.

60% of the enlistees accomplished the task to save and validate an XBRL instance with the OFR. However, 40% of the individuals did not end that task properly. The statistics regarding the aforementioned task revealed that, on average, volunteers performed 1.4 attempts to fulfil the task's goals. They also had a total of one error during that task execution.

The OFR did not present bugs or flaws during the user's attempts. Regarding the dry-run test results, the predicted values for those indicators were one attempt, no user errors, and no system errors, respectively. It was also necessary to measure the average productive time (1.68 minutes), the success rate (80%), and the error rate (1.82%). The medium time participants had to waste to save and validate an XBRL instance, to perform the first attempt, and to backtrack from an error were 5.3, 3.4, and 0.3 minutes, respectively.

The average number of functions the enlistees had to deploy to accomplish the third task was 2 while they were supposed to use 2 functions. On average, volunteers inquired the evaluator's help 0.8 times. Only one user had to consult the OFR's supportive documentation one time in the referred activity. He/she also used 2.5 minutes to understand how to use the OFR's functions.

The overall average activity accuracy completion was 91.11%, and it regarded to how close the reports the volunteers created were from valid Siconfi's reports. The average SUS score is 68, and the OFR score was 70. This matches a C grade, which means OFR does not contain catastrophic usability problems. As it is a

good method to distinguish between unusable and usable systems, it is possible to classify this version of the OFR software as usable.

The users also provided feedback information not covered in the questionnaires and tools adopted. Even though the user feedback method provides valuable design directions when the testers give concise opinions, there were no common points in the observations and information users provided, so they represent idiosyncrasies that shall not influence future design steps. Here follows the feedback obtained from each volunteer:

- I believe it could have an input sequence that resembles the real one. For example, a wizard that guides the user through the experience of inputting data. I also believe that it should be possible to keep inputting data without leaving and coming back to the input data screen in order to keep composing the report (sic)<sup>3</sup>.
- I think the hierarchical tree interface is not intuitive enough to work because we have Microsoft Excel training, and we are used to thinking of it as a spreadsheet. After completing the report, the element editing process might be hard to perform with a huge amount of elements in the hierarchical tree (sic)<sup>4</sup>.
- Will the accounts we have to input be already available within the software, or will they be input by the user according to each institution? (sic)<sup>5</sup>.

## 6.2 COMMUNICABILITY FORMATIVE EVALUATION RESULTS

Figure 33 exposes the repetition of each label that happened during the communicability assessment in the XBRL instance creation task. In total, users suspended their semiosis because they did not have a suitable way to denote their communication four times. A volunteer broke off his/her semiosis one time because he/she was not able to find the means to do the succeeding communication input. And the users attempted to learn the OFR's communication process via testing many assumptions regarding its meaning two times.

Figure 34 shows the recurrence of each label in the communicability evaluation for the second task regarding all testers' experiences. They interrupted

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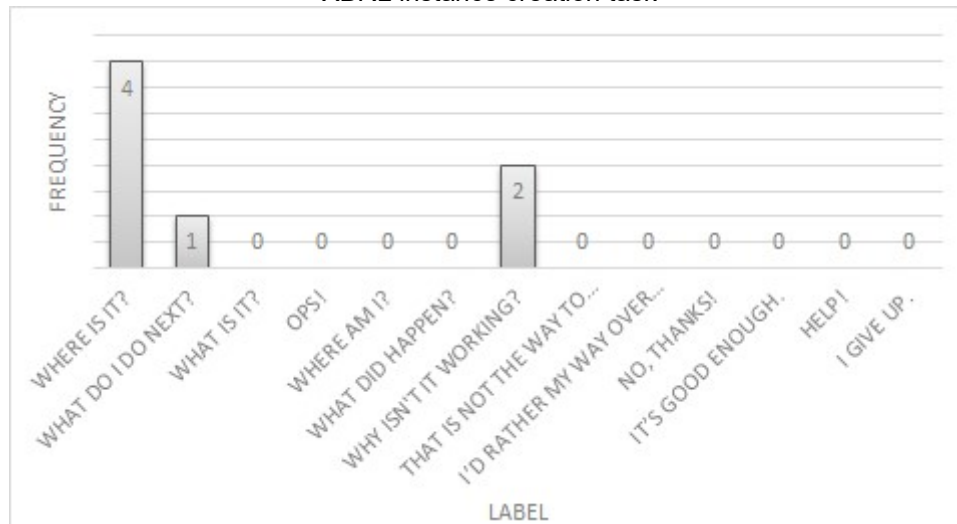
<sup>3</sup> Our translation.

<sup>4</sup> Our translation.

<sup>5</sup> Our translation.

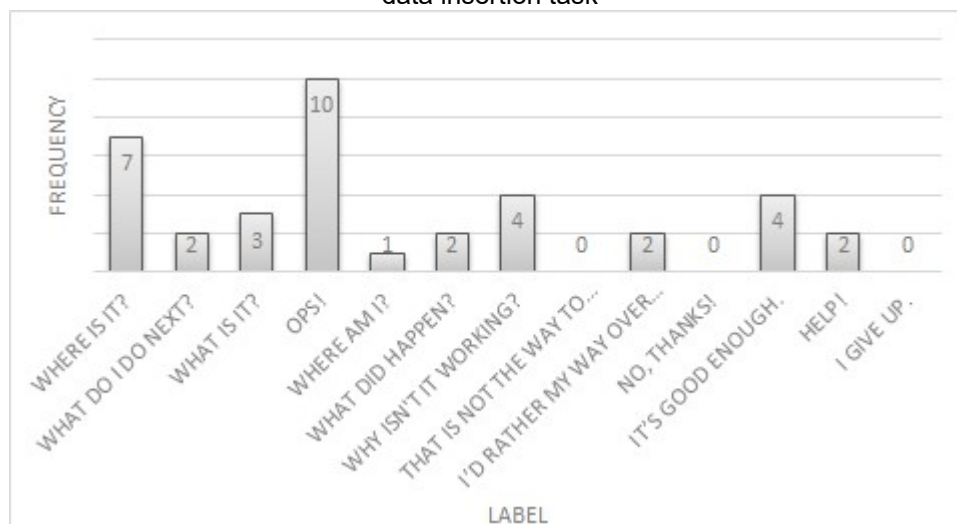
their semiosis seven times because they were unable to identify a suitable way to express their communication. And they suspended their two times semiosis because they did not get a way to do the following communication input.

Figure 33 - The frequency of each label that occurred during the communicability evaluation for the XBRL instance creation task



Source: Own authorship.

Figure 34 - The frequency of each label that occurred during the communicability evaluation for the data insertion task



Source: Own authorship.

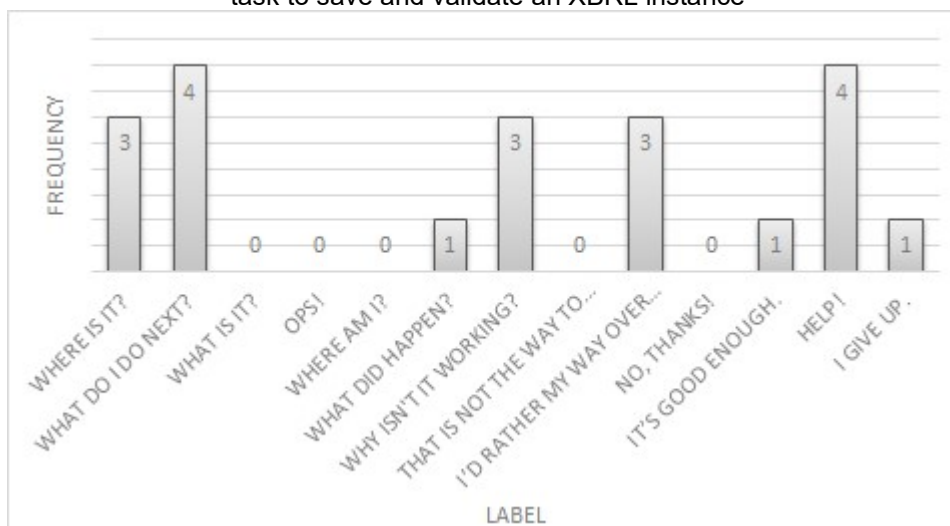
The volunteers endeavored to comprehend the communication process with the OFR by implicit metacommunication three times, and they did notice the communication was not flawless because they did something wrong in the interaction about ten times. One participant could perceive one communication attempt was faulty because he/she interacted in an incorrect context.

The individuals discontinued their semiosis a total of two times because they did not perceive the OFR's communication and put effort to grasp the communication process with the OFR via experimenting with several hypotheses about the OFR's communication meaning four times. The users gave up a semiosis two times before they could attain the wanted effects to perform a new one with the equivalent meaning because they were not able to grasp the HCI proposed solution.

The subjects performed an ineffective semiosis four times, but they did not commence a new one because they did not notice something was missing to match the coveted results. They also tried to figure out the communication process with the OFR via explicit metacommunication two times.

Figure 35 presents the incidence of each label in the communicability evaluation for the task of saving and validating an XBRL instance regarding all users' sections. The volunteers discontinued their semiosis three times because they had no proper way to express their communication and stopped their semiosis four times because they did not figure how to perform the following communication input.

Figure 35 - The frequency of each label that occurred during the communicability evaluation for the task to save and validate an XBRL instance



Source: Own authorship.

One of the enlistees broke his/her semiosis one time because he/she did not grasp the OFR's communication. And the subjects put effort into learning the communication process with the OFR by attempting several theories about the software's communication meaning three times. The subjects were inclined to understand the OFR's communication process by explicit metacommunication four

times. One user terminated an incomplete semiosis but did not try it again because he/she did not have a mean, the potential, or a wish to keep trying.

The users desisted a semiosis three times before they could attain the coveted effects to attempt to do the same thing in another way because they did not recognize the HCI proposed solution. One of the users completed an unfruitful semiosis, but he/she did not go for another one, because he/she did not regard they did not reach the desired results.

Based on the communicability evaluation, the designer thought the users were people who: had a bachelors' degree, were working with financial reports in their current job for two or more years, were from 31 to 60 years old, had no trouble using computers, were focused on details, were perfectionist, had any level of XBRL knowledge, and did not mind performing repetitive tasks in a computer.

The designer might have prioritized providing users a short way to access the tools they need and preventing them from generating inconsistent outcomes. To avoid an excess of information on the screen and to provide enough information for users to keep track of what they were doing seemed secondary goals.

The designer provided only one way for the users to perform the activities with the software. So he might have considered providing users multiple paths would cause confusion and decrease the efficiency of the straightforward repetitive tasks one has to perform while composing financial reports.

The menu bar is the main way for the user to interact with the software. Most of the software's functions and windows are only accessible through the menu bar. The users can't edit the report they are creating through other means than the internal windows created to that end. However, the users commonly lose track of the items within the menus, so they waste time browsing for the only option they have to do what they need.

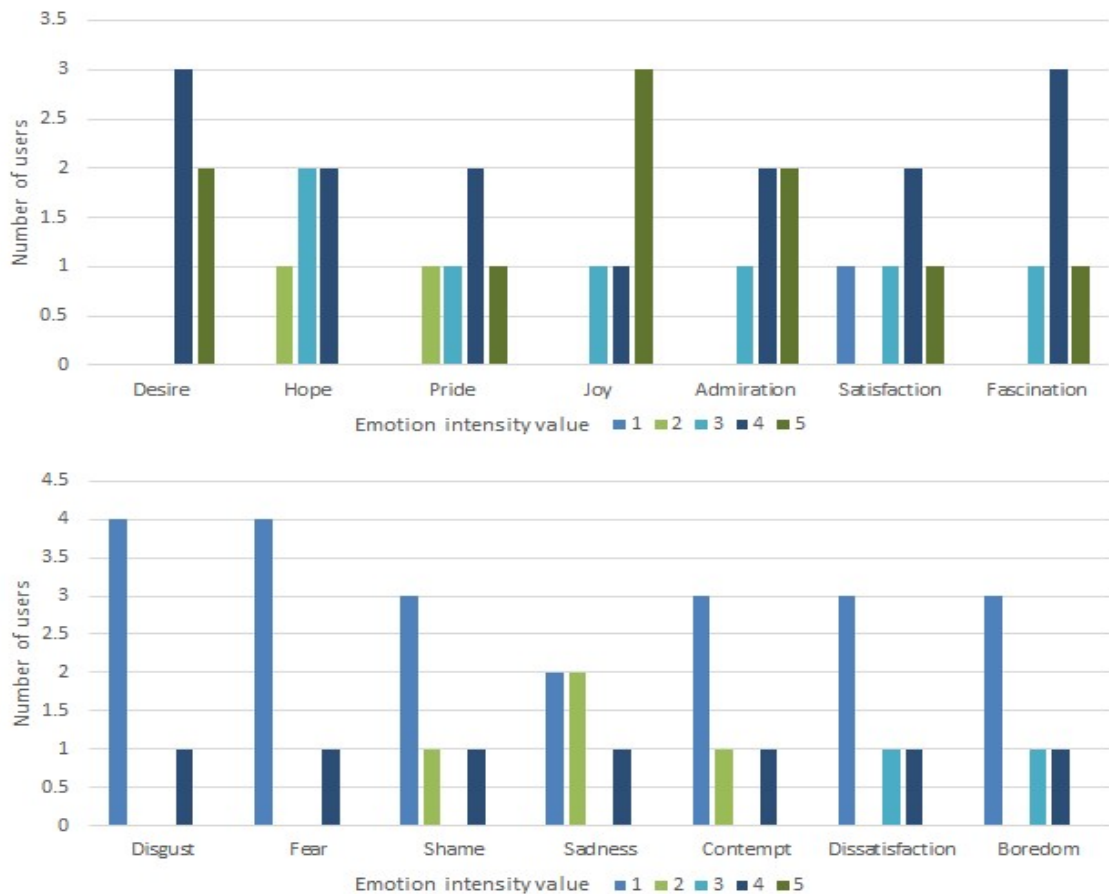
The metacommunication is not clear enough to: prevent users from not finding a way to express their communication or the next action, to prevent users from trying to understand the system communication through hypothesis testing, to prevent users from misunderstanding the proposed HCI solution, to prevent users from incurring in unsuccessful semiosis without noticing that.

### 6.3 UX FORMATIVE EVALUATION RESULTS

The UX HCI formative evaluation sections performed as described in Section 4.4, and all the supportive documents are available within topics “Evaluation datasheet” and “Supportive materials” of Appendix C. The following paragraphs describe the results related to the UX user tests conducted with the OFR's first high-fidelity prototype.

In the pre-test questionnaire, the users reported how they expected to feel before the experience with the OFR software through the PrEmo UX capture method. Figure 36 graphics present the obtained results in this initial step.

Figure 36 - Users' expectations before the experience with the OFR software through the PrEmo UX capture method



Source: Own authorship.

In the PrEmo results, the OFR should provide users with elicitations of hope, pride, admiration, satisfaction, desire, joy, and fascination. Boredom, dissatisfaction,

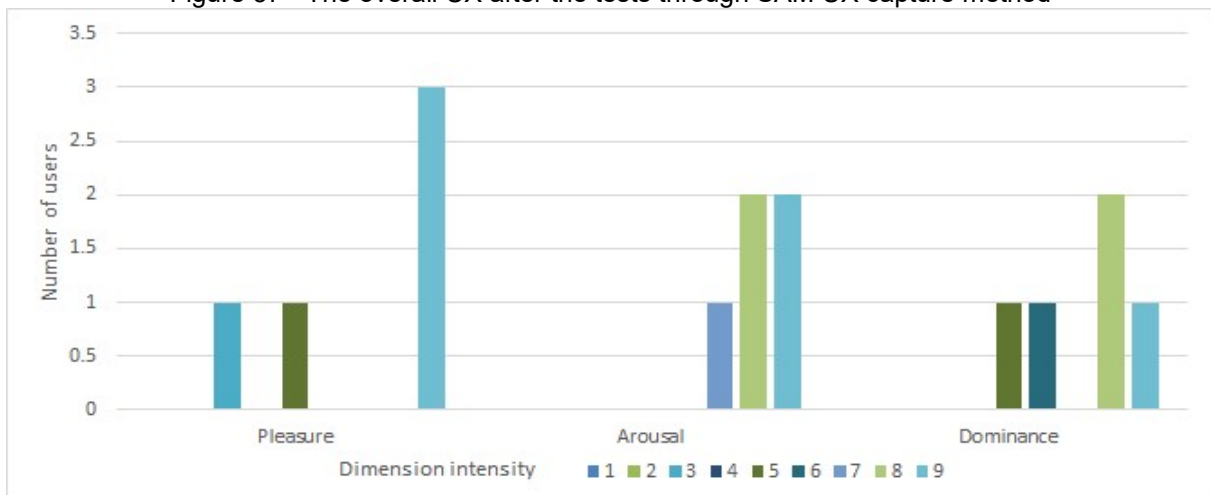
contempt, sadness, shame, fear, and disgust measured intensities should be as low as possible in the users' responses.

As predicted, most of the users did not expect to feel the negative emotions of the PrEmo circumplex. Surprisingly all the volunteers expected to feel desire, fascination, and joy with intensity up to three during their experience. Almost all subjects expected to elicit hope, pride, admiration, and satisfaction according to the foreseen expectations.

Regarding most of the users' evaluations with PrEmo, the first OFR high-fidelity prototype did not fail to elicit positive emotions in all four emotional dimensions (Social, Material, Expectation, and Well-being) PrEmo can capture about software or product (CAICEDO, 2009). So, its interface design shall carry through the next high-fidelity prototype development.

The results presented in Figure 37 and Figure 38, regard the overall UX after the tests through Emocards and SAM UX capture methods. Based on the awareness procedures results, the UX evaluation through the SAM UX capture method should result in high pleasure and dominance dimensions measurement, while the arousal measurement should attain mediocre levels.

Figure 37 - The overall UX after the tests through SAM UX capture method



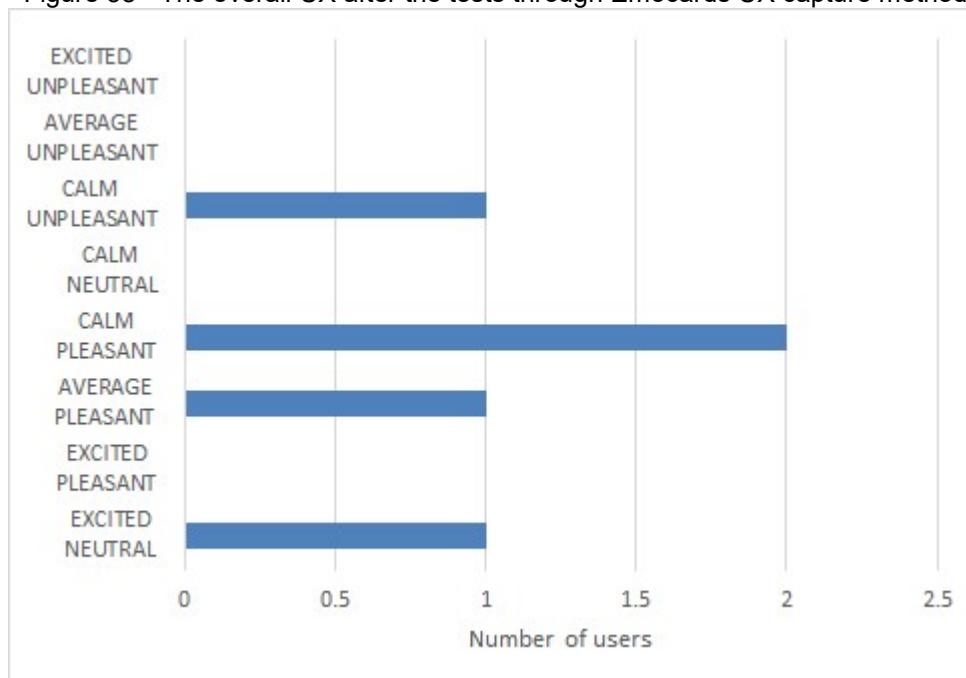
Source: Own authorship.

Regarding the “Correlations for SAM Ratings and the Relevant Semantic Differential Factor Score with each of the six Adjective Pairs Associated with the Pleasure, Arousal, and Dominance Dimensions” Bradley and Lang (1994, p. 55) presented, 60% of the volunteers felt somewhat or strongly in control, dominant or



autonomous while elaborating XBRL financial reports, and 40% of them reported indifference to dominance matters (do not feel in control, but also not cared for) to accomplish the activity.

Figure 38 - The overall UX after the tests through Emocards UX capture method



Source: Own authorship.

The OFR first high-fidelity prototype did not fail providing users the control they needed to perform the task. Once 80% of the users from the formative evaluation had previous XBRL knowledge, it's possible to infer that their context control perception benefited from that.

In the Arousal dimension evaluation all users reported feeling high levels of excitement to accomplish the activity. It might mean volunteers had put greater effort into keeping track of what they were doing or avoiding committing mistakes. So, that levels of arousal might not be desired for the task execution.

The Pleasure dimension evaluation revealed about 20% of the volunteers felt neither satisfied nor unsatisfied while elaborating XBRL financial reports, 20% of the subjects felt unsatisfied, annoyed or unhappy performing this task, and 60% of them reported feeling satisfied, pleased or happy to accomplish the activity.

The UX evaluation through the Emocards UX capture method should result in indicators ranging from average pleasant (number 3 in the

Figure 10) to calm pleasant (number 5 in the

Figure 10). 60% of the users elicited the expected emotions through the Emocards. However, the high levels of arousal did not show up in the volunteers' answers through this method.

After comparing the graphics from Figure 37, Figure 38, and the expected results, it was possible to notice that most of the users' reported emotions did not drastically differ from the ones OFR software should have caused users to elicit. It means OFR still needs some improvement to provide a better user experience. However, it does not have enough problems to cause catastrophic User eXperience results.

## 6.4 THE OFR REDESIGNED VERSION

As some usability indicators were not in conformity with the predicted values, the results described in Sections 6.1 and 6.3 allowed identifying usability and UX problems associated with the first OFR's high-fidelity prototype. This Section presents all OFR redesign aspects related to the usability indicators from Section 6.1, the UX indicators from Section 6.3, and all video analysis demanded through both sections.

Through the videotape analysis, it was possible to notice that most of users with some XBRL knowledge had a few or no problems with the OFR's metacommunication. Once those users grasped how to use the basic OFR's functions through the training section, they performed the test's tasks very quickly (they spent less time to perform the tasks than the pilot tests predicted) and almost flawlessly.

Even though users without XBRL knowledge did not struggle to learn OFR's functions during the training section, the videotapes revealed that they did struggle to grasp the OFR's metacommunication during their experience with the software. The location of some functions within the menus did not seem that intuitive for them. They also struggled to locate and choose the element type they wanted to insert through the elements' manager windows.

Letting all four elements' options available seemed to be too much information for people without XBRL knowledge. However, most of people with that previous knowledge did not show any difficulty performing the tasks with the windows. Another peculiar aspect was that the former hardly read any system's communication messages (through the log or the windows) regardless of their size. Meanwhile, the latter read almost all of them independently of their size.

Most of the users' unproductive time was related to looking for the OFR's functions they need to use to complete the proposed activity. Excepting from one user, volunteers did not use the supportive documentation and struggled to notice the instance validation feedback. One user did not complete the third task because he/she did not notice the unsuccessful validation message in the log and thought that had concluded the activity and sent a formula linkbase invalid XBRL instance.

Based on the usability and UX evaluation results and the software premise of dealing with the XBRL knowledge problem, it was clear that the designer should provide a more intuitive way for users to find the functions they need to perform their activities. This challenge consisted of turning metacommunication adequate for people with previous XBRL knowledge into intuitive for the ones who did not have it. The designer should also improve some input fillup fields to prevent users from incurring the same errors they committed in their sections and find a better way to notify users about the instance validation results.

Even though the evaluation results showed positive evidence that the OFR's prototype was a valid tool to support the XBRL financial reporting task, it had to go under redesign to mitigate the identified problems. As stated in Section 4, the HCI Design must prevent idiosyncrasies from influencing a project. Regarding that premise, OFR's redesign considered the changes identified through the UX and usability evaluation techniques. It also encompassed topics highlighted by at least three or more testers. The redesign process also aimed to fix all faults and bugs identified through the evaluation sections. In that way, the high-fidelity prototype's redesign consisted of:

- To remove the Report Models selection option from the Taxonomy menu and turn it into a new item of the OFR's menu bar.
- To add a new warn window message regarding the instance validation results;
- To remove the Elements menu from the OFR's menu bar.
- To add, in the menu bar, a new menu named Insert with four subitems: Insert Context, Insert Unit, Insert Account, and Insert Non Numeric element (Each subitem triggered the selection of the corresponding checkbox in the element management window).
- To add, in the menu bar, a new menu named Edit with four subitems: Edit Context, Edit Unit, Edit Account, and Edit Non Numeric element (Each subitem triggered the selection of the corresponding checkbox in the element management window).
- To add, in the menu bar, a new menu named Remove with four subitems: Remove Context, Remove Unit, Remove Account, and Remove Non Numeric element (Each subitem triggered the selection of the corresponding checkbox in the element management window).

- To reorder the element type fields position in every element manager screen;
- To update some of the software's messages.
- To implement a new menu item with tips about the procedures users had to perform with the software.
- To correct minor bugs caused due to the aforementioned alterations.

It is possible to improve the comprehension of the OFR's high-fidelity prototype's changes through the supportive documents "OFR's first User guide document" and "OFR's second User guide document" within Appendix D.

## 6.5 USABILITY CONCLUSIVE EVALUATION RESULTS

The usability HCI conclusive evaluation sections performed as described in Section 4.4, the expressions for calculating some usability indicators, and all the supportive documents are available within topics "Evaluation datasheet" and "Supportive materials" of Appendix C. The following paragraphs describe the results related to the usability user tests conducted with the OFR's redesigned version.

The five volunteers who signed up for the conclusive evaluation sections were: professional accountants, without any previous XBRL knowledge, with Bachelor's degree (60%) or Graduate course (40%), that have never used an XBRL financial reporting tool, and have been composing financial reports for five or more years.

Before starting the evaluation section, it was necessary to provide a training section to all of the volunteers at their request. All of the enlistees fulfilled the task to create an XBRL instance with the OFR, and they made it in the first attempt. They also committed no errors to accomplish that task, and the OFR did not cause errors during their attempts.

According to the dry-run test estimated values, those indicators should have reached one attempt, no user errors, and no system errors, respectively. The statistics about this task showed an average production time of 0.75 minutes, a success rate of 100%, and an error rate of 0%. The medium time users consumed to perform the XBRL instance creation, to complete the first attempt, and backtracking from an error were 1.1, 1.1, and 0 minutes, respectively.

Three volunteers used only the two functions needed to fulfill the task, while two of them also used the software's help function. Users did not require the evaluator's help or used the OFR's supportive documentation. They also did not employ any extra time to discover how to apply the software functions.

80% of the volunteers accomplished the task of insert data with the OFR. One user forgot to insert the explanatory note in the report before going through the next task. The indicators also showed that the volunteers performed on average one trial to complete it. The users went through a total of 2 errors performing that task.

The OFR incurred in no flaws during their attempts. Regarding the dry-run test results, the predicted rates for those indicators were one attempt, no user errors, and no system errors, respectively. 7.78 minutes was the average fruitful time, the success percentage was 80%, and the error rate was 3.08%.

The medium time spent to finish the data insertion, to complete the first attempt, backtracking from a mistake were 8.22, 8.22, and 0.28 minutes, respectively. Three enlistees utilized all five functions needed to perform the second task. Only one of them also used the software's help function, while other one forgot to use the function to insert non-numeric elements. They also did not bid for evaluator's help or checked the software documentation during the referred activity. So, they did not spend the activity time learning OFR's functions.

All of the users successfully finished the task to save and validate an XBRL instance with the OFR. They also made only one attempt to complete it. The volunteers did not incur in errors while working on that task. The OFR had error no occurrences during their attempts. Regarding the results obtained through the dry-run test, the predicted rates were one attempt, no user errors, and no system errors, respectively.

The average fruitful period was 1.14 minutes long, succeeded by a success rate of 100% and an error rate of 0%. The average time users wasted to save and validate an XBRL instance, to perform the first attempt, backtracking from an error consisted of 1.52, 1.52, and 0 minutes, respectively.

60% of the users had to deploy 3 functions to fulfill the third task in which they should have used 2 functions. All of them did not inquire the evaluator's help or accessed the OFR's supportive documents while striving to perform the referred

activity. They also consumed no extra time learning OFR's functions. The average accuracy completion for the whole activity was 95.56%.

As the average SUS score is 68, and the OFR score was 80 that matches an A- grade, it means OFR does not hold catastrophic usability problems. As SUS is a good tool to recognize unusable and usable systems, it is possible to classify this version of the OFR software as usable. The participants also gave the following feedback information that was not covered in the questionnaires and tools adopted:

- I think the software messages are too big, and they should better help us out finding our mistakes within the report (sic)<sup>6</sup>.
- Will the software's final version help us out to classify the accounts we have to input in each field? (sic)<sup>7</sup>.

## 6.6 COMMUNICABILITY CONCLUSIVE EVALUATION RESULTS

Figure 39 shows the incidence of each label that happened during the communicability evaluation for the XBRL instance creation task. One of the volunteers discontinued a semiosis because he/she did not discover a proper way to perform his/her communication. Other among them suspended a semiosis because he/she did not get the means to perform the succeeding communication input. The volunteers strived to grasp the communication process with the OFR through implicit metacommunication two times.

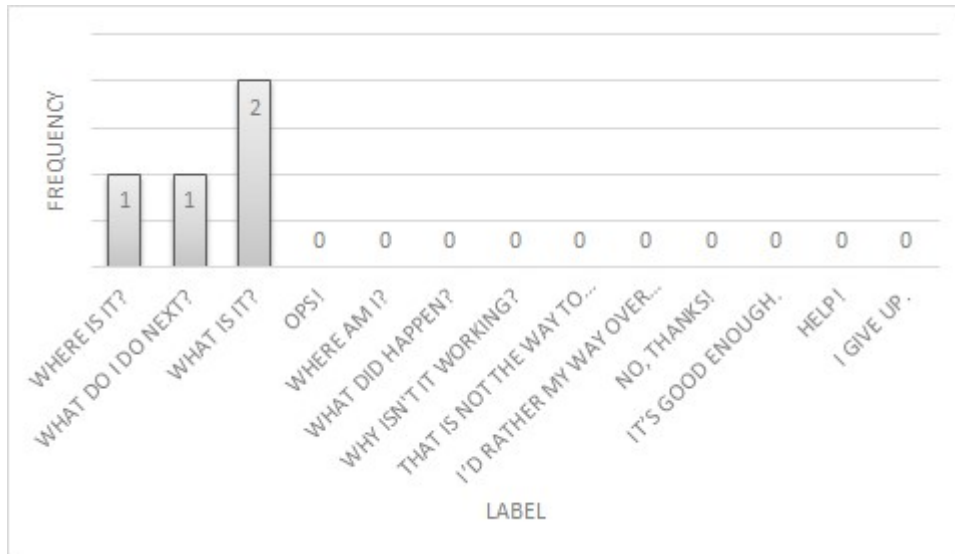
Figure 40 displays the recurrence of each label of the communicability evaluation for the data inclusion task. The users stopped their semiosis three times because it was not possible to find a suitable way to communicate. The participants attempted to conjecture the OFR's communication process by inexplicit metacommunication four times, and noticed the communication failed because they completed a wrong interaction two times. One of them realized the communication went wrong because he/she interacted in the wrong context.

Figure 39 - The frequency of each label that occurred during the communicability evaluation for the XBRL instance creation task

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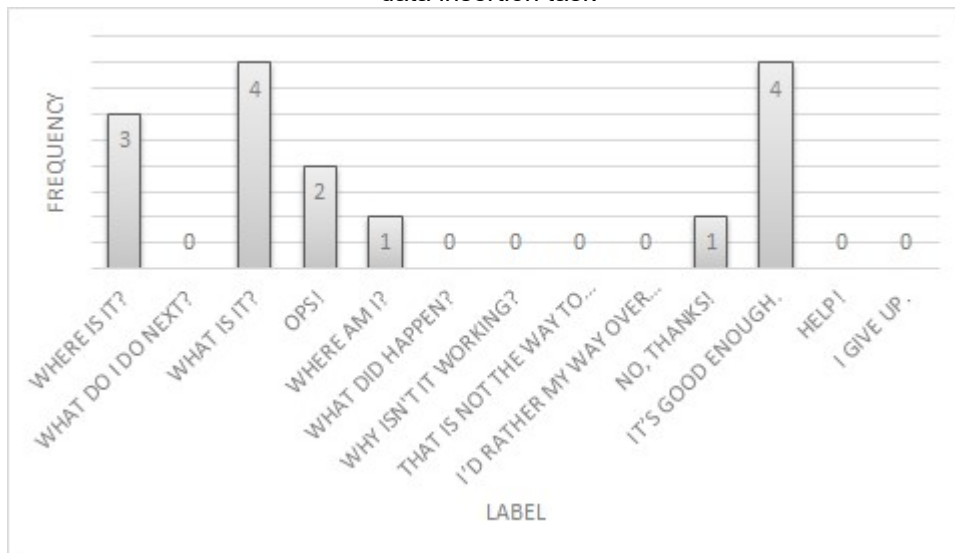
<sup>6</sup> Our translation.

<sup>7</sup> Our translation.



Source: Own authorship.

Figure 40 - The frequency of each label that occurred during the communicability evaluation for the data insertion task



Source: Own authorship.

One of the subjects left off a semiosis before accomplishing the aspired results to start another one to obtain the same effect because he/she decided to perform the semiosis in their fashion, even though they comprehended the HCI proposed solution. The users concluded a faulty semiosis, but they did not perform another one to reach the expected results, because they did not regard their achievement did not suit the aspired results four times.

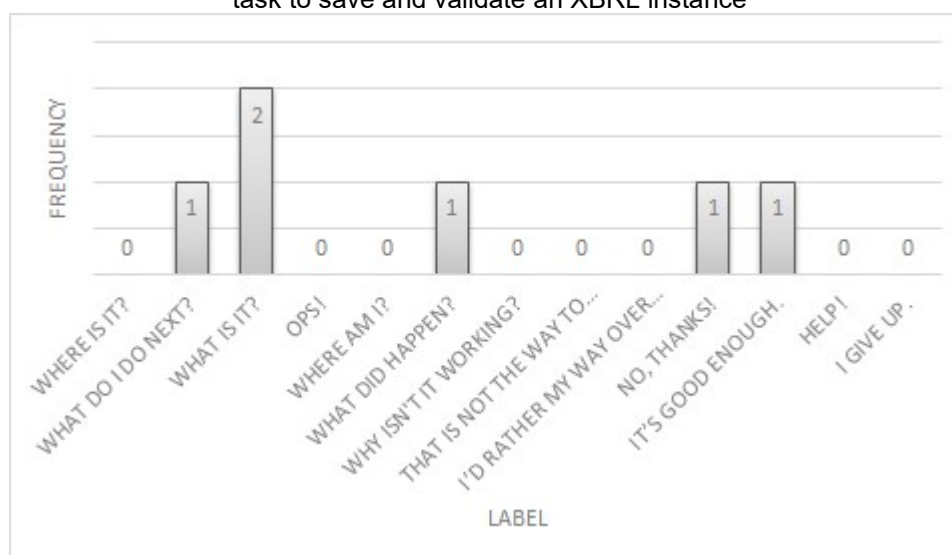
Figure 41 presents the incidence of each label in the communicability evaluation regarding the task to save and validate an XBRL instance. One of the participants broke the continuity of a semiosis because he/she has not got a way to



do the succeeding communication input. The volunteers made an effort to understand the OFR's communication process through non-explicit metacommunication two times.

One of the users caused the semiosis to stop because he/she did not comprehend the OFR's communication. One subject ceased a semiosis before achieving the aspired results to commence a new one with an identical goal because he/she had the ill to complete the semiosis in their form, despite getting the HCI offered solution. One volunteer ended an ineffective semiosis, but did not go for another try to achieve the wanted results, because he/she did not discern that it was not enough to match the desired results.

Figure 41 - The frequency of each label that occurred during the communicability evaluation for the task to save and validate an XBRL instance



Source: Own authorship.

Regarding the communicability evaluation results, the semiotic profile has not changed. The only updates are the designer's perception about:

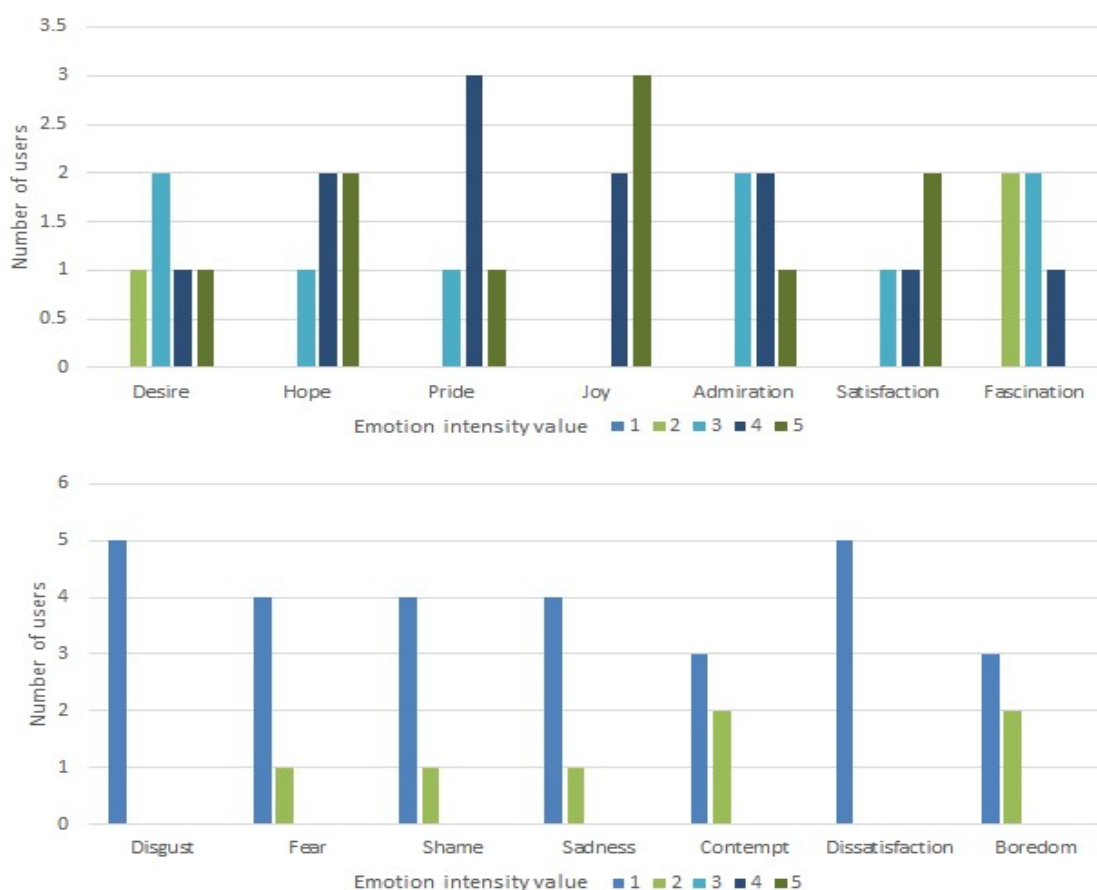
- To provide more software function intuitiveness and communication to users who do not have previous XBRL knowledge.
- To provide less information overload on the screen to avoid users getting lost during their activities.

## 6.7 UX CONCLUSIVE EVALUATION RESULTS

Section 4.4 described how the UX HCI conclusive evaluation sections were conducted, and all the documents that supported them are available within topics “Evaluation datasheet” and “Supportive materials” of Appendix C. The subsequent paragraphs describe the results related to the UX user tests conducted with the OFR's redesigned version.

In the pre-test questionnaire, the participants informed how they presumed to undergo the experience with the OFR software through the PrEmo UX capture method before interacting with it. Figure 42 graphics exhibit the achieved results in this opening step.

Figure 42 - Users' expectations before the experience with the OFR software through the PrEmo UX capture method



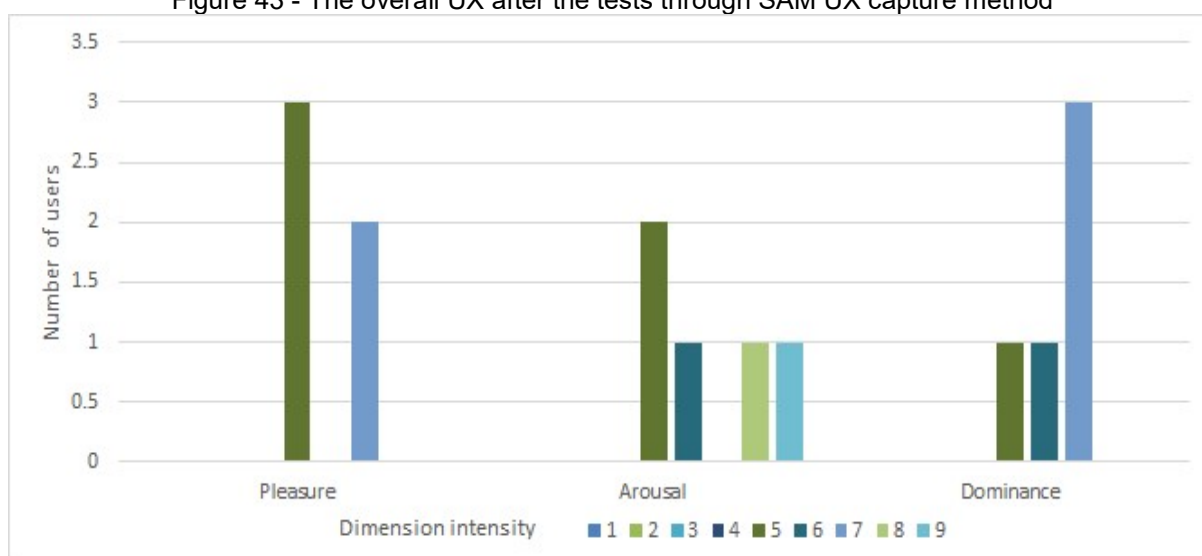
Source: Own authorship.

Regarding the PrEmo results, the OFR should cause volunteers to elicit hope, pride, admiration, satisfaction, desire, joy, and fascination. Boredom, dissatisfaction, contempt, sadness, shame, fear, and disgust should not be elicited or show up with low intensity in their replies. According to the users' evaluations with PrEmo, the redesigned high-fidelity prototype did not fail to elicit the desired

emotions in all four emotional dimensions the method can measure about software or product (CAICEDO, 2009).

The outcomes displayed in Figure 43 and Figure 44, concern the overall UX assessed after the experiments through Emocards and SAM UX capture methods. The SAM UX capture method should present high the pleasure and dominance dimensions measurement, while the expected arousal measurement was mediocre. The Emocards UX capture method indicators varied within the expected set of emotions: average pleasant, calm pleasant, and calm neutral. High levels of arousal relate to the user's tension to avoid committing mistakes or to keep track of their actions, so it is not a positive aspect for the task under evaluation and should be avoided.

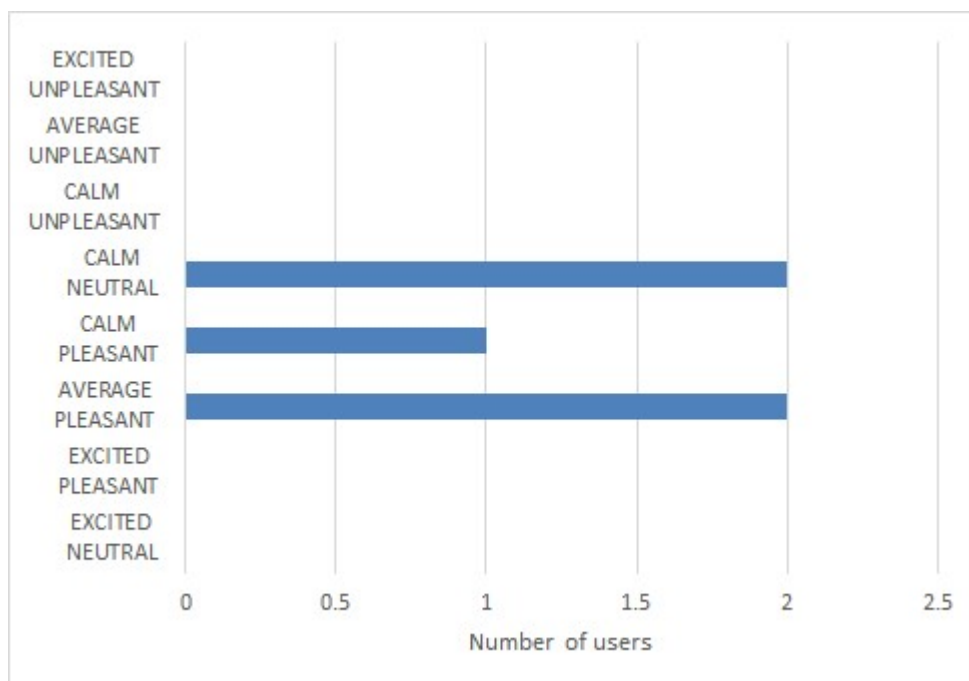
Figure 43 - The overall UX after the tests through SAM UX capture method



Source: Own authorship.

Concerning the “Correlations for SAM Ratings and the Relevant Semantic Differential Factor Score with each of the six Adjective Pairs Associated with the Pleasure, Arousal, and Dominance Dimensions” Bradley and Lang (1994, p. 55) showed, 60% of the users felt in control, dominant or autonomous through the experience. 40% of the subjects related to be indifferent to dominance matters (do not feel in control, but also not cared for) during their interaction.

Figure 44 - The overall UX after the tests through Emocards UX capture method



Source: Own authorship.

The results regarding the Arousal dimension revealed that nearly 60% of the enlistees felt neither frenzied nor sluggish through the interactions with the OFR software, and 40% of them informed feeling frenzied or jittery while performing the interactions.

The outcome from the Pleasure dimension assessment exposed that 60% of the users felt neither satisfied nor unsatisfied while performing XBRL financial reporting tasks with the OFR, and 40% related feeling satisfied, pleased, or happy for accomplishing the activity goals.

The redesigned high-fidelity prototype did not attain high context control levels, and it did not cause users to undergo an unpleasant experience. It also caused most of the users to elicit mediocre arousal levels. It is also conceivable that the context control perceived from volunteers of the conclusive evaluation has relation to their lack of previous XBRL knowledge.

After analyzing the graphics of Figure 43, Figure 44, and the awaited effects, most of the users' related emotions do not deviate from the ones OFR software should have induced users to elicit. It means OFR has provided a good user experience.

## 6.8 SUMMARY

This chapter presented the results of the formative usability and UX evaluations, their implications towards the OFR software redesign. Section 6.4 presented the main aspects of the new OFR software version. Sections 6.5 and 6.7 presented the results of the conclusive usability and UX evaluations that allowed to verify both the answer of the proposed research question and grasp the lessons learned reported in chapter 7.

In the formative evaluation section, the high-fidelity prototype provided only XBRL knowledge abstraction and some user communication messages. However, the results from the first evaluation proved that it had no catastrophic or severe usability and UX problems. But, it was still necessary to improve its easiness of learning and to make its metacommunication more intuitive for the users with little or no XBRL knowledge.

The exploratory research approach matched the prototype method of cycle interactions. It shows evidence that combining that research methodology with this software development life cycle might be a good research practice and that they are not incompatible.

The OFR design followed a generalistic approach through the prototyping software development method. Even though that method provided rich information for redesign the first high-fidelity prototype into the second one, the number of structures to change from one version to another can lead to excessive workload without a well-defined ending point.

In institutions and entities across this country and the world, several different occupations play the role of XBRL financial reporter. As a result, the Designer had to put great effort into making the requirements for using the software to be the usage instructions, the concern about the financial report the professional has to elaborate on and which data shall it contain within.

Choosing appropriated usability and UX tools showed to be very important to keep up the coherence between the users' needs and expectations and the high-fidelity prototype redesign. It avoided not addressing relevant problems that did not appear in the second OFR version.

This study adopted only free technological solutions and platforms. It highlights both that it is possible to conduct relevant research without additional costs and compromising conduction results, and how it is important to make solutions available for free to research purposes. It is one of the reasons why OFR is a free and open code solution. Online forms and videoconferencing platforms showed a satisfactory performance to support HCI evaluations' conduction with geographically spread users.

Even though the monolithic architecture approach provided easiness of implementation in both designed prototypes, it does not provide easiness to extend

the software or implement new features. Future work should include adopting a new industry-standard architecture paradigm frequently used to build scalable and extensible projects, such as The Model-View-Controller (MVC) architectural pattern (TUTORIALSPPOINT, 2014).

As this research deployed a general-purpose architecture description language, there is no problem in documenting architectural changes regarding the language specificity context. So, regarding the MVC pattern, the Communication\_Manager and the Error\_manager would become VIEW components, each of the task managers would become Controllers components, and the remaining ones would be part of Models components.

According to Sova and Nielsen (2020), gathering volunteers for UX and usability studies can be challenging without hiring a recruiting agency. The OFR tests were not an exception to it. Even working with a small population (five people) and offering a prize draw as an incentive, it was not possible to have backup participants. So, no-show rates could have compromised the study results. Even the awareness quiz had to stay available online for over a month to attain a more representative number of respondents.

UX and usability data validity regarding a product or solution is related to the measured indicators' nature and how representative the tests users' tasks and context are of the real use situation. It was already a challenging task to perform the tests within the use context of each geographically spread volunteer. However, COVID 19 pandemic turned it into an impossible task.

The pandemic situation imposed new contexts with different impacts on how people perform their job tasks all around the world (e.g., exchange the office context by the home office one). Within that period, it is not possible to perform usability or UX tests regarding the regular volunteer's context in non-pandemic days. Thus, this is a threat to this research data validity.

For the sake of users' privacy, anonymity, and confidentiality rights, it was not possible to share the collected data with other evaluators, so the communicability evaluation relied on the author's analysis. In that way, it is possible that the results contained some bias.

Another context issue that treats the data validity was the need to run tests with XBRL financial reporting professionals from other countries in a testbed that

represents Brazil's G2G e-governance. It incurred in the lack of internationality and universality of XBRL taxonomies, that is not addressed in this research.

The information to implement several mechanisms in the source code for preventing the user from inserting inconsistencies in the instance file came from taxonomy's provider documentation external to the discoverable taxonomy set (e.g., date's input format, account value's precision, institutional code). The lack of taxonomy metadata might pose another relevant challenge to implement the OFR's complete version.

In laboratory HIC evaluation sections, the setup time is part of the planning and preparation step and not a part of the section. But, not every remote user was using a computer properly prepared for the evaluation section. So, the users needed help to set up their computers before the training section within the section time. Even though Java is multiplatform, MAC OS internal security prevents users from executing Java files from unknown sources, as the OFR's high-fidelity prototype, and there is no way the user can override the security settings. As a result, it was not possible to conduct sections with volunteers who used MAC OS.

It was challenging to train users and to help them with setup procedures within a half-hour in the evaluation sections. Future studies with geographically spread users shall consider reserving a specific moment to perform setup procedures. However, a researcher must avoid increasing the total section-time over 90 minutes (it is not a good practice according to the HCI evaluation literature (SOVA; NIELSEN, 2020)).

All the volunteers scheduled their sections out of their work time and used their personal computers to download, execute and test the high-fidelity software prototypes. In the context of geographically spread users, this would pose a challenge in future works that aim to compare the OFR complete version with existing tools due to the following aspects:

- The lack of volunteers available to perform evaluation tasks in their job environments through with they have access to their entity's XBRL financial reporting tool.
- The bureaucracy to obtain permission from volunteers' entities to download and execute the OFR on their computers.



- The bureaucracy to obtain permission from volunteers' entities to record users' screens during their interaction with both software.
- The need to make one evaluator available at any time regardless of the volunteers' time zone (e.g., if a volunteer from Sydney (Australia) scheduled a section at 3 p.m. in his/her time zone, it would be necessary to have an evaluator available at 2 a.m. in Brazil's time zone).
- As Siconfi's financial report's size ranges from some megabytes to several gigabytes of confidential information, developing an online version of the OFR would demand implementing a substantial infrastructure to support the flow, the upload, and the download of such information while keeping up with the cybersecurity issues. So, it may not be viable for free or at a low cost.

People from abroad demanded a more intense training time to understand concepts related to Siconfi's financial reports. However, as they could successfully compose the XBRL proposed reports, regardless of their familiarity with Siconfi's financial reports, it was not possible to state that OFR did not match its purpose of mitigating the XBRL's knowledge complexity problem.

Even though the redesigned OFR is still not commercially competitive, the evaluation results highlight the importance of HCI matters to make products and solutions characteristics and capabilities closer to the users' actual needs.

Because the OFR is in an early prototype development stage, it was not possible to compare it with completely functional existing XBRL financial reporting tools. However, the evaluation results proved that the OFR is a valid tool to support the XBRL financial reporting task even as a prototype.

All usability (ISO efficiency and SUS), communicability (label frequency), and UX (Premo, Emocards, SAM) indicators performed better in the conclusive assessment than in the formative one. So, answering the research's question, HCI matters are capable of providing better task efficiency in the financial reporting area, thus showing its potential to improve e-Governance practices related to presenting institutions' accounting information to government oversight entities.

Through the research's question answer and the research gap found in the literature review, it is possible to concern that the methodological procedures adopted for this research conduction consist of a valid way to perform similar studies

regarding HCI, e-Government, and the XBRL financial reporting area. Or it could also be a starting point for such work development.

## 7.1 SUMMARY

This chapter analyzed the implications of the results of the conclusive evaluations, positively answer the research question, presented positive and negative aspects of the conducted research, and commented on which elements of this research may influence future works.

## 8 FINAL CONSIDERATIONS

This dissertation presented the results and procedures adopted for this multidisciplinary research conduction in the areas of HCI, XBRL financial reporting, and e-Government that positively answered the research's question. So, the link between those areas is no longer lost once HCI Design can increase the XBRL reporting task efficiency, for improving G2G e-Governance. However, it is still a needy research area to work on.

First, consulting professionals related to XBRL financial reporting through a questionnaire provided a better understanding of the HCI problems and demands the area faces. Then conducting a literature review should have allowed to identify how the academic community was addressing the existing problem, but it showed signs of research gap instead.

Next, this research investigated if providing financial reporting professionals a software prototype whose design considered HCI matters (regardless of the user geographical dispersion) was enough to increase the task efficiency. To do so, it was necessary to compare the results of two usability and UX evaluations with two versions of the same financial reporting tool that aimed to abstract the XBRL knowledge need to create XBRL financial reports.

This research considered developing both versions of the high-fidelity software prototype. While the first one focused only on minimal functional requirements, the second version focused on mitigating the HCI problems found through the formative evaluation section.

According to results obtained in the conclusive evaluation, the measured task efficiency was greater with the second version of the software. It corroborates the positive answer to the research question, so this proved that HCI design is a valid approach to improve financial reporting creation and e-Governance relations because a bigger task efficiency prevents human and material resources waste and results in a more efficient exchange of financial information between government entities and businesses.

So far, this research has generated the following academic multidisciplinary contributions:

- To provide a stimulus for academic researchers to approach this problem under other perspectives or conduct similar studies that aim to improve B2G and G2G e-Government practices through HCI design practices.
- To provide a detailed methodological description so, as the answer to the research question was positive, the adopted procedures have high reproducibility and represent a valid starting point for similar studies that aim to improve B2G and G2G e-Government practices.
- To provide an initiative or a starting point to bring HCI practices to the financial reporting area through the OFR prototype. As it is an open-source tool, other researchers can adopt, adapt, extend, and explore its potential to improve XBRL financial reports creation (it is available in GitHub at <https://github.com/araao93/OFR/blob/main/OFR.zip>).
- To provide insights for current XBRL financial reporting software providers that could benefit from this study to optimize their products and provide better solutions to their clients through HCI practices.
- To provide insights for government institutions that can benefit from the study's insights for evaluating their current G2G practices and find ways to improve them through HCI.
- To identify successful practices to conduct HCI studies in the context of geographically spread users and some challenges to overcome.
- To provide relevant academic contributions by publishing this research, its results, and findings in two papers (OLIVEIRA AND SILVA, 2020) (OLIVEIRA AND KRONBAUER, 2021) in the ASRJETS multidisciplinary journal, whose quails CAPES 2020 was A3.

As the link e-Government, XBRL financial reporting, and HCI is a promising topic of academic interest this research highlights the following topics for future works:

- To optimize the research approach on problem through the lessons learned.
- To reach a complete version of the OFR and perform comparative HCI evaluation studies with other XBRL financial reporting tools.
- To perform a field study in a government organization or business accessing the HCI adoption benefits that improve B2G and G2G e-Governance.
- To research ways to overcome the challenges highlighted in Section 7.

- To extend this research to other areas of G2G e-Governance out of the financial reporting domain while mitigating the research gaps found.

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## APPENDIX A – AWARENESS QUIZ

### Identifying the need for developing the Open Brazilian Financial Reports

There are many third-part Closed source software for composing XBRL (eXtensible Business Reporting Language) financial reports. The main problem with them is the license cost that turns them into prohibitive or not viable solutions for many companies and government institutions.

The alternatives for the ones that can't afford to pay a Closed source software license typically embrace: taking professionals out of their role to compose XBRL financial reports and wasting time dealing with the mistakes or inconsistencies committed.

We propose the Open Brazilian Financial Reports (OBFR), which will be a third-part free and Open source software, to prevent such a waste of time and resources.

The aforementioned solution is part of a UNIFACS System and Computing Master degree Program's project. Its development will apply the Human-Computer Interface (HCI) participative design techniques to ease the task of composing an XBRL financial report by putting aside its complexity.

An HCI participative design project is focused and centered on the potential final users, whose feedback information are the main guidelines for developing and implementing the software tools, and interface. So, the first step for developing the proposed solution consists of identifying the user's characteristics, context, and needs through the questionnaire below. The gathered information will provide a solid background for identifying the user's actual needs and demands. They will also be useful for coding the first draft of the software.

All the information provided will not have any other purpose than the aforementioned ones. The questionnaire also assures one's anonymity, privacy, and ethical rights. Thank you for helping us out!

OBFR Development team.

\*Obrigatório

1. How old are you? \*

*Marcar apenas uma oval.*

- I'm 18-30 years old.
- I'm 31-40 years old.
- I'm 41-50 years old.
- I'm 51-60 years old.
- I'm 61-70 years old.
- I would rather do not answer it.

2. What is your gender? \*

*Marcar apenas uma oval.*

- Female
- Male
- I would rather do not answer it.

3. What is your job? \*

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4. What are your main activities, tasks and responsibilities in your job? \*

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5. How long have you been working in that job? \*

*Marcar apenas uma oval.*

- Less than 2 years  
 From 2 to 5 years  
 From 5 to 10 years  
 From 10 to 20 years  
 More than 20 years

5. What is your college degree? \*

*Marcar apenas uma oval.*

- Less than a high school diploma  
 High school graduate  
 Some college, no degree  
 Professional certificate (career school)  
 Associate degree (academic program)  
 Bachelor's degree  
 Master's degree  
 Doctoral degree (P.h.D.)  
 Professional Degree (M.D.)

7. What is your strategy for learning how to use a software? \*

*Marque todas que se aplicam.*

- Reading texts (tutorials) while trying to use the software.  
 Asking an expert for directions while trying to use the software.  
 Exploring the software's tools and content on your own.

Outro:  \_\_\_\_\_

8. What is the better way to learn something new? \*

*Marque todas que se aplicam.*

- Reading texts, books, papers, etc. about the topic.  
 Watching classes about the topic.  
 Writing something about the topic.  
 Perform activities (exercises, prototypes, etc.) related to the topic.

Outro:  \_\_\_\_\_

9. On a scale of 1-5, how would you rate the need for training sections while learning how to use a new software? \*

*Marcar apenas uma oval.*

1	2	3	4	5	
UNNECESSARY	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	ESSENTIAL

10. On a scale of 1-5, how would you rate the need for training sections about financial report composition tools adopted in your company? \*

*Marcar apenas uma oval.*

1	2	3	4	5	
UNNECESSARY	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	ESSENTIAL

11. On a scale of 1-5, how would you rate your knowledge about computers. \*

*Marcar apenas uma oval.*

1	2	3	4	5	
AMATEUR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	EXPERT

12. On a scale of 1-5, how would you rate your knowledge about XBRL? \*

*Marcar apenas uma oval.*

1	2	3	4	5	
AMATEUR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	EXPERT

13. Which XBRL financial report softwares do you know? \*

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14. Have you ever used any XBRL financial report software? \*

*Marcar apenas uma oval.*

- Yes  
 No

15. If you have already used any XBRL financial report software, how would you rate your knowledge about it.

*Marcar apenas uma oval.*

1	2	3	4	5	
AMATEUR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	EXPERT

16. If you have already used any XBRL financial report software, how hard it was using it?

*Marcar apenas uma oval.*

1	2	3	4	5	
EASY	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	HARD

17. If you have already used any XBRL financial report software, how long did it take to learn what you needed about it?

*Marcar apenas uma oval.*

- Less than 7 days  
 From 7 to 30 days  
 From 30 to 60 days  
 From 60 to 90 days

18. How do your company composes the XBRL financial reports? \*

*Marcar apenas uma oval.*

- Manually typing the XBRL code in an XML file.
- Using thid-part Closed source software.
- Using thid-part Open source software.
- Other ways.

19. How long does it take to compose a XBRL fiancial report in your company? \*

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20. What are the main problems or difficulties that pop up while composing your company's XBRL financial reports? \*

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21. How frequently do you have to stop your ordinary activities in order to compose XBRL financial reports. \*

*Marcar apenas uma oval.*

- Never
- Rarely
- Seldom
- Frequently
- Always

22. How frequently do your company's XBRL financial reports contains mistakes or inconsistencies? \*

*Marcar apenas uma oval.*

- Never
- Rarely
- Seldom
- Frequently
- Always

23. How do your company deals with its XBRL financial reports mistakes or inconsistencies? \*

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24. How frequently do your company's XBRL financial reports demands rework? \*

*Marcar apenas uma oval.*

- Never
- Rarely
- Seldom
- Frequently
- Always

25. Which tools and features a XBRL financial reports software should have in order to turn composing such reports into an easier task? \*

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26. How should a XBRL financial reports software user interface be, in order to turn composing such reports into an easier task? \*

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27. What else could turn composing XBRL financial reports into an easier task in your company? \*

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28. Would you volunteer for cooperating with an XBRL financial reports software that aims ease composing such reports? \*

*Marcar apenas uma oval.*

- Yes
- No

29. Are you willing to spend some time learning how to use the aforementioned software? \*

*Marcar apenas uma oval.*

- Yes
- No

30. On a scale of 1-5, how would you rate the importance of being able to perform the same task in different ways? \*

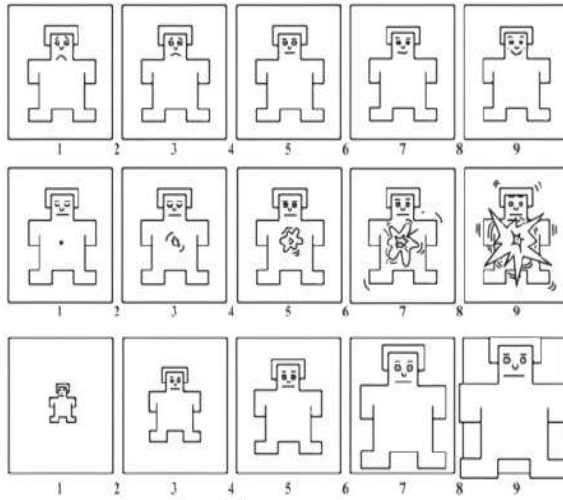
*Marcar apenas uma oval.*

1    2    3    4    5

---

UNIMPORTANT                  VERY IMPORTANT

31. Self-Assessment Manikin (SAM) is a tri-dimensional User eXperience (UX) capture that is based on a psychological model. It represents user emotions' dimension and intensity through full body dummies with different expressions. The tre-dimensions covered by SAM technique are: 1) bliss (dummies with happy and unhappy faces); 2) excitement (it associates the explosion picture size with the user's interest during the activity); and 3) dominance (it associates user's context control to the dummies size). Use the SAM pictures below to express how does it fell to compose an XBRL financial report in your company.\*



Marcar apenas uma oval por linha.

	1	2	3	4	5	6	7	8	9
<b>1</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>2</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>3</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Questionário de levantamento da necessidade de desenvolvimento do Open Brazilian Financial Reports

Embora existam, no mercado, aplicações de software como a da Fujitsu, adotada pela Secretaria do Tesouro Nacional (STN), que permitem a confecção de relatórios financeiros baseados na tecnologia XBRL (eXtensible Business Reporting Language – Linguagem extensível de relatórios de negócio), existem municípios cujas secretarias não têm acesso a tais ferramentas, pois os orçamentos municipais não comportam seu custo. As administrações de tais municípios, adotam alternativas que podem acarretar desvio de função, desperdício de recursos públicos, retrabalho e perda de tempo, principalmente, quando os dados contêm inconsistências. Tais práticas contribuem para a ineficiência da relação Government to Government (G2G) do eletrônico-Government (e-Gov) brasileiro.

Com o objetivo de tentar solucionar essa questão, está sendo desenvolvido no mestrado de Sistemas e Computação da Universidade Salvador (UNIFACS) um projeto baseado em técnicas de Interface Homem – Computador (IHC) para facilitar a criação de instâncias XBRL, abstraindo as complexidades inerentes ao uso dessa tecnologia. Neste projeto está previsto o desenvolvimento de uma ferramenta de software de código aberto e de uso público e gratuito, denominada Open Brazilian Financial Reports (OBFR), para a criação de instâncias XBRL baseada na taxonomia do SICONFI – Sistema de Informações Contábeis e Fiscais do Setor Público Brasileiro gerido pela Secretaria do Tesouro Nacional.

Uma etapa inicial deste projeto é a identificação das características dos usuários por meio do questionário que apresentamos a seguir. As informações obtidas através do questionário, após passarem por tratamentos estatísticos, servirão de base para identificação dos requisitos e demandas dos potenciais usuários, identificação do contexto de sua utilização, seleção das técnicas e métodos de design participativo e desenvolvimento distribuído de software mais coerentes ao desenvolvimento da ferramenta proposta, além de obter noções do design da interface dos potenciais usuários. Neste projeto de design participativo os potenciais usuários da aplicação desempenham papel fundamental no fornecimento de informações que irão nortear as formas de implementação e definir os recursos da ferramenta durante todo o processo de desenvolvimento.

As informações obtidas através deste questionário não serão utilizadas para nenhuma outra finalidade além das supracitadas. Este questionário garante o anonimato e a total privacidade dos voluntários que o responderem, pois, tal prática violaria princípios de ética de pesquisas envolvendo pessoas. Desde já, agradecemos a sua participação!

**\*Obrigatório**

1. Qual a sua idade? \*

*Marcar apenas uma oval.*

- 18-30 Anos
- 31-40 Anos
- 41-50 Anos
- 51-60 Anos
- 61-70 Anos
- Prefiro não informar

2. Qual seu sexo? \*

*Marcar apenas uma oval.*

- Feminino
- Masculino
- Prefiro não informar

3. Qual cargo você ocupa? \*

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4. Quais as principais atribuições e responsabilidades de seu cargo? \*

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5. Há quanto tempo você ocupa este cargo? \*

Marcar apenas uma oval.

- Menos de 2 anos  
 2-5 anos  
 5-10 anos  
 10-20 anos  
 Mais de 20 anos

6. Qual o seu grau de instrução? \*

Marcar apenas uma oval.

- Doutorado completo  
 Mestrado completo  
 Nível superior completo  
 Nível médio completo  
 Nível fundamental completo

7. Qual a sua estratégia para aprender a usar um software (programa)? \*

Marque todas que se aplicam.

- Ler textos enquanto utiliza o software.  
 Receber orientação de outra pessoa enquanto utiliza o software.  
 Explorar os conteúdos e ferramentas do software por conta própria.

Outro:  \_\_\_\_\_

8. Qual o seu estilo de aprendizado? \*

Marque todas que se aplicam.

- Visual  
 Auditivo  
 Manual (Escrita)  
 Prático (realização de atividades relacionadas ao que está aprendendo)

Outro:  \_\_\_\_\_

9. Em uma escala de 1 a 5, onde 1 equivale a pouco importante e 5 equivale a muito importante, o quanto você valoriza treinamento sobre um software novo? \*

Marcar apenas uma oval.

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Em uma escala de 1 a 5, onde 1 equivale a pouco importante e 5 equivale a muito importante, como você avalia a importância da realização de treinamento sobre as tecnologias usadas para geração de relatórios financeiros adotadas pela organização em que você trabalha? \*

Marcar apenas uma oval.

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



11. Em uma escala de 1 a 5, onde 1 equivale a leigo e 5 equivale a especialista, como você avalia seus conhecimentos sobre o uso de computadores? \*

*Marcar apenas uma oval.*

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Em uma escala de 1 a 5, onde 1 equivale a leigo e 5 equivale a especialista, como você avalia seus conhecimentos sobre XBRL? \*

*Marcar apenas uma oval.*

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Quais aplicações (programas) você conhece para geração de relatórios financeiros em XBRL? \*

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14. Você já teve alguma experiência com alguma aplicação (programa) para geração de relatórios financeiros em XBRL? \*

*Marcar apenas uma oval.*

- Sim  
 Não

15. Se você já tem experiência em usar aplicações para geração de relatórios financeiros em XBRL, como você avalia seu domínio sobre o programa? Na escala de 1 a 5, 1 equivale a leigo e 5 equivale a especialista.

*Marcar apenas uma oval.*

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Se você já tem experiência em usar aplicações para geração de relatórios financeiros em XBRL, como você avalia a dificuldade de adquirir domínio sobre o software? Na escala de 1 a 5, 1 equivale a nenhuma dificuldade e 5 equivale a bastante dificuldade.

*Marcar apenas uma oval.*

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. Se você já tem experiência em usar aplicações para geração de relatórios financeiros em XBRL, quanto tempo você precisou investir para dominar o referido programa?

*Marcar apenas uma oval.*

- Menos de 7 dias  
 7 - 30 dias  
 30 - 60 dias  
 60 - 90 dias

18. De que forma a organização na qual você trabalha gera os relatórios financeiros que envia ao Tesouro Nacional (STN)? \*

*Marcar apenas uma oval.*

- Através da digitação manual do relatório em código XBRL.  
 Através de software proprietário.  
 Através de software aberto (livre).  
 Através da geração de arquivos em formatos aceitos pelo STN (como CSV, por exemplo).  
 Outro: \_\_\_\_\_

19. Quanto tempo é gasto para a geração dos relatórios financeiros que sua organização envia à STN? \*

\_\_\_\_\_

20. Quais as principais dificuldades que você enfrenta para a geração dos relatórios financeiros que sua organização envia à STN? \*

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

21. Com que frequência você interrompe a execução de suas demais atribuições para realizar atividades relacionadas a geração dos relatórios financeiros que sua organização envia à STN? \*

*Marcar apenas uma oval.*

- Nunca  
 Raramente  
 Esporadicamente  
 Frequentemente  
 Sempre

22. Com que frequência os relatórios financeiros que sua organização envia à STN contém inconsistências ou erros? \*

*Marcar apenas uma oval.*

- Nunca  
 Raramente  
 Esporadicamente  
 Frequentemente  
 Sempre

23. Como as inconsistências ou erros dos relatórios financeiros enviados à STN são tratados, na organização em que você trabalha? \*

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24. Com que frequência os relatórios financeiros que sua organização envia à STN demandam retrabalho? \*

*Marcar apenas uma oval.*

- Nunca  
 Raramente  
 Esporadicamente  
 Frequentemente  
 Sempre

25. Quais tipos de recursos / funcionalidades um software de geração de relatórios financeiros deveria ter para facilitar o referido procedimento na organização em que você trabalha? \*

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26. Como deveria ser a interface com o usuário um software de geração de relatórios financeiros deveria ter para facilitar o referido procedimento na organização em que você trabalha? \*

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27. O que facilitaria a geração dos relatórios financeiros que sua organização envia à STN ? \*

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28. Você colaboraria, voluntariamente, com o desenvolvimento de um produto que aumentasse a eficiência da confecção de relatórios financeiros em XBRL? \*

*Marcar apenas uma oval.*

- Sim  
 Não

29. Você investiria tempo para aprender a utilizar a o produto proposto na questão anterior? \*

Marcar apenas uma oval.

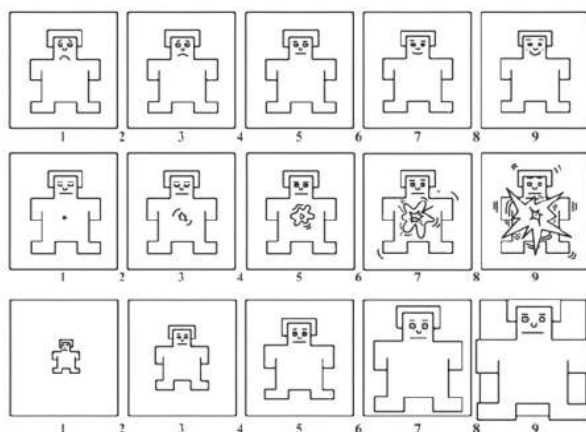
- Sim  
 Não

30. Em uma escala de 1 a 5, onde 1 equivale a pouco importante e 5 equivale a muito importante, como você avalia a importância de explorar novas formas de fazer o mesmo trabalho? \*

Marcar apenas uma oval.

1	2	3	4	5
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

31. Self-Assessment Manikin (SAM) é uma técnica tridimensional de captura de User eXperience (UX) baseada em um modelo psicológico. Ela usa imagens de bonecos de corpo inteiro com expressões para representar o nível de intensidade de cada dimensão. As dimensões adotadas são: 1) prazer (de expressões faciais felizes a infelizes); 2) excitação (relaciona o tamanho da explosão da imagem com o grau de interesse pela atividade); e 3) dominância (relaciona o controle de contexto do usuário ao tamanho da imagem). Utilize as imagens da técnica SAM abaixo, para expressar o que você sente ao compor um relatório financeiro para a STN nas condições atuais da organização em que você trabalha. \*



Marcar apenas uma oval por linha.

	1	2	3	4	5	6	7	8	9
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## **APPENDIX B - SUPPORTIVE TECHNOLOGIES CHOICES**

The following subtopics present the choice process to adopt each required technology.

### **Online interaction tools choice**

This study used online formularies to assemble the user profile in the awareness stage and to gather users' feedback and emotional assessment data in both evaluation sections. It was necessary to adopt an online formulary builder that provides results spreadsheet download, question reuse, multiple answers types (e.g., text boxes, checkboxes, multiple-choice selections, and dropdown menus), and question multimedia insertion (images or videos) features to accomplish those tasks. The software could also not have respondents or question number limits.

Matthew Guay (2020) tested more than thirty online form builders designed to work on any website and highlighted nine best ones regarding flexibility (support for multi-purpose formularies), easiness of use, and task completion time (time spent to create a formulary): Google Forms, Microsoft Forms, Typeform, Wufoo, JotForm, Formstack, Paperform, Formsite, and Formbakery.

Among the aforementioned form builders, only Google Forms and Microsoft Forms have no respondents or question number limits for free users that have a Google or Microsoft free account. Both of them also provide all of the demanded features for free. As Matthew Guay's (2020) article did not provide enough information to support further comparative analysis, this study adopted the Google Forms because a member of the research team has an active Google free account.

This study used a web conference software to provide interaction between the researcher and the volunteers during the evaluation sections, which demanded screen sharing, webcam sharing, audio sharing, live whiteboard, compliance with a data protection regulation, and chat features. Recording meeting sessions were necessary for this research conduction. However, this feature was not a critical criterium for the choice process because a research team member's operational system already had a screen recorder embedded application (Ultra Screen Recorder).

According to Sarah Rose Miller (2019), a free and Open-source web conferencing software provides long term viability without vendor lock-in, relies on a community of developers for review, support, maintenance, configuration, and keep up with technology trends. She performed a comparative analysis of eight "free and open-source web conferencing software solutions that are successfully driving out the market.", namely: BigBlueButton, OpenMeetings, ezTalks Cloud Meeting, Jitsi, Mconf, Jami, Linphone, and Riot.

All of the software Sarah Rose Miller (2019) considered support video conferences, screen sharing, and have tutorials to the visitors on their website. Linphone and Riot are the only ones that do not provide a recording's download feature. In BigBlueButton, it's only available for premium users. All of them provide webcam sharing features with some or none restrictions.

Only BigBlueButton, OpenMeetings, and ezTalks match the desired features while compliant with the General Data Protection Regulation (a regulation law on data protection and privacy that also addresses the transfer of personal data). This criterium excluded the five remaining software from the selective process, for the sake of volunteers' data protection. The OpenMeetings and ezTalks software demand users to download and install features on their devices while BigBlueButton does not.

This study adopted the BigBlueButton software to avoid asking volunteers to download third-party software in their devices and dealing with installation or compatibility problems during the evaluation sections.

### **Software development method choice**

OFR development concerned Interaction Design (IxD) guidelines aiming to consider the end-users' goals to be a supportive and suitable XBRL financial reporting solution for their jobs. According to the Interaction Design Association (2020), IxD defines the structure and behavior of interactive systems to create meaningful relationships between people and the products and services that they use, from computers to mobile devices to appliances.

An IxD process encompasses understanding users' profiles, activities, and context to establish requirements; designing alternatives to satisfy them; prototyping

in an iterative way to test viability and user acceptance; evaluating the final product's quality, performance, and purpose matching (ALVES; MATOS, 2017).

This research adopted Prototyping over other software development methods available (e.g., Agile and Waterfall) because its procedures improve and increase users' design process participation. Once it requires users to interact with a high-fidelity prototype to provide better and more complete feedback and specifications, it matches IxD premises (LUQI; BERZINS; YEH, 1988).

### **Programming language choice**

Several programming languages are available to develop financial reporting instantiation applications. However, each one of them has particular aspects that make one better or worse than others for a specific end. Prechelt (2000) performed an empirical comparison between seven different programming languages (C, C ++, Java, Perl, Python, Rexx, and Tel).

The aforementioned author gathered eighty codes in the evaluated languages from different programmers to solve the phone coding problem. It consists of associating telephone numbers from a file with strings to generate all the possible words corresponding to each telephone number. Then, Prechelt (2000) compared the codes considering different criteria such as loading and data initialization, processing, memory consumption, code extension, inserted comments, reliability, runtime, and productivity.

Aruoba and Fernández-Villaverde (2015) performed comparative studies between different programming languages (C ++, Fortran, Java, Julia, Matlab, Python, R, Mathematica, and hybrid programs) for a neoclassical stochastic growth model mathematical processing application. The tests were performed on Mac and Windows platforms using more than one compiler for the same language on both operational systems. Aruoba and Fernández-Villaverde (2015) and Prechelt's (2000) studies didn't address characteristics such as multiplatform programs and the number of support tools (libraries). However, they were also important for choosing OFR's programming language.

Although they were slower than C, Java algorithms had fewer exceptions handling errors than C did. Even with shorter algorithms, Python proved to be less

efficient than C and Java for loading files. C algorithms were faster than Java ones, were not fully multiplatform, and suffered significant interference from the compilers. On the other hand, Java is a multiplatform language, so it demands no adaptation to run on any of the three main existing operational systems platforms (Linux, Mac, and Windows).

Analyzing the documentation about XML file manipulation available for each one of the programming languages, the Java platform showed to have the most extensive and consolidated documentation. Java also has a greater amount of image processing libraries, which may reduce the proposed application's programming time due to code reuse. Java showed better run time than Python in the macroeconomics application, which required more mathematical processing than the Prechelt's (2000) test. Java language showed an intermediate performance to Python and C / C ++ in both studies.

The OFR must allow users to open, read, and create XBRL financial reports. As the report file size influences these tasks completion time, the file load time is a relevant characteristic to prevent time waste due to file or taxonomy load. To operate XML files can also demand high insensibility to exception treatment errors to avoid corrupt data. Based on Prechelt's (2000) and Aruoba and Villaverde's (2015) special issues and OFR specifications (Section 5), Java programming language proved to be the most suitable one for the proposed application development.

### **Usability evaluation methods choice**

Lyzara et al. (2019, p. 1) stated poor usability is one of the barriers for e-Government initiatives to reach their goal of delivering benefits to "government and citizens by improving transparency, efficiency, trust, and citizen participation." The authors conducted a systematic literature review to identify the usability evaluation methods suitable for e-Government, whose results revealed "System Usability Scale (SUS) was the simplest approach to evaluate a system based on user's perspectives in usability testing with a small number of potential users to participate", and performance measurement was an alternative method (LYZARA et al. 2019, p. 252).

Even though Lyzara et al. (2019) research showed performance measurement, questionnaires, and user feedback as time-consuming and



representative respondents demanding usability inquiry and testing methods, Rodrigues and Prietch (2018) results highlighted only following literature and heuristic recommendations, without involving users in the project, does not allow truly attaining usability criteria. So, this research adopted performance measurement, questionnaires, and the SUS method as a way to prevent OFR development incurs in the same HCI problems the awareness quiz (Section 1.1.1) revealed.

### **User eXperience evaluation methods choice**

Emocards, PrEmo, and SAM showed to be the most suitable UX evaluation methods for this study among the ones listed by the All about UX community. The chapter 2 presents further description about those methods. Emocards was the only method that provided qualitative data, had descriptive bibliographical references available, was suitable for online studies and functional high-fidelity prototypes of PC software, and allowed to gather UX information on how volunteers felt about the system after executing a task.

PrEmo was the only method with the same classification that Emocards, but allowed to gather UX momentary experiences information while the participants were interacting with the system instead of after the experience. It also generated both qualitative and quantitative UX data.

Geneva Emotion Wheel (SCHERER et al., 2013), Hedonic/Utilitarian scale (VOSS; SPANGENBERG; GROHMANN, 2003), Human-Computer trust (MADSEN; GREGOR, 2000), Intrinsic Motivation Inventory (MCAULEY; DUNCAN; TAMMEN, 1989), PAD scale (MEHRABIAN, 2010), SAM, Software Usability Measurement Inventory (KIRAKOWSKI; CORBETT, 1993), and Unified Theory of Acceptance and Use of Technology (VENKATESH et al., 2003) UX evaluation methods satisfied the remaining demands criteria (the same classification that Emocards, but allowed to gather UX quantitative data instead of qualitative).

Eight UX evaluation methods satisfied the remaining demands criteria (the same classification that Emocards, but allowed to gather UX quantitative data instead of qualitative). So, it was necessary to conduct a literature review to answer the following key research question: Which one of these methods currently applies to

contexts similar to the OFR (Online UX assessment due to geographically distributed users)?

This literature review aimed to identify previous primary researches from 2019 related to the aforementioned research question, and published in ACM and IEEE Xplore research database, and the Brazilian Symposium on Human Factors. The research period was one year long because analyzing the selected methods' employment over the years was not a review scope. The exclusion criteria embraced duplicated papers (some papers showed up in the events' proceedings and the ACM Digital Library because some Brazilian HCI events publish papers via the ACM press), studies in other languages than Portuguese or English, studies not available for reading, studies without the search strings within all metadata, studies not related to the research question, and non-primary researches.

The database sources' choice regarded the research team's accessibility and the amount of primary and secondary studies about innovative technologies available. The bibliographic research used the previously set search strings “{[(User eXperience) and (Online)] and (Geneva Emotion Wheel)}”, “{[(User eXperience) and (Online)] and (Hedonic/Utilitarian scale)}”, “{[(User eXperience) and (Online)] and (Human-Computer trust)}”, “{[(User eXperience) and (Online)] and (Intrinsic Motivation Inventory)}”, “{[(User eXperience) and (Online)] and (PAD scale)}”, “{[(User eXperience) and (Online)] and (Self-Assessment Manikin)}”, “{[(User eXperience) and (Online)] and (Software Usability Measurement Inventory)}”, and “{[(User eXperience) and (Online)] and (Unified Theory of Acceptance and Use of Technology)}”.

Table 6 shows the number of papers retrieved from the selected databases. Table 7 chart shows the titles, UX method deployed, authors' references, and citation count of the selected studies. The following paragraphs present relevant information extracted from the selected studies and the commentaries on the review conduction results.

Lessel et al. (2019) recruited participants through social media to participate in an online image tagging process. Some participants could choose to perform the tasks with and without gamification, while others couldn't. After performing each image tagging task, the participants filled out "the three items relating to the enjoyment scale of the validated German short scale of the Intrinsic Motivation Inventory" regarding the image tagging process.

Table 6 - Papers retrieved from the selected databases, with each search string.

Results Search string	IHC		ACM		IEEE	
	Retrieved	Selected	Retrieved	Selected	Retrieved	Selected
{{(User eXperience) and (Online)] and (Geneva Emotion Wheel)}}	0	0	0	0	0	0
{{(User eXperience) and (Online)] and (Hedonic/Utilitarian scale)}}	0	0	0	0	0	0
{{(User eXperience) and (Online)] and (Human-Computer trust)}}	0	0	1	0	0	0
{{(User eXperience) and (Online)] and (Intrinsic Motivation Inventory)}}	0	0	3	1	0	0
{{(User eXperience) and (Online)] and (PAD scale)}}	0	0	0	0	0	0
{{(User eXperience) and (Online)] and (Self-Assessment Manikin)}}	4	1	10	2	0	0
{{(User eXperience) and (Online)] and (Software Usability Measurement Inventory)}}	0	0	3	1	0	0
{{(User eXperience) and (Online)] and (Unified Theory of Acceptance and Use of Technology)}}	1	0	8	0	1	0

Source: Own authorship.

Assunção and Neris (2019) developed the m-Motion mobile application for music recommendation and reproduction based on the user's desired emotional state. It also provided a Scherer interface and an adapted SAM to the users that

installed the m-Motion in their cellphones to evaluate the emotional state achieved after listening to an entire recommended playlist. All evaluation metadata was stored in an external server then retrieved to undergo analysis. Even though the study does not mention if the researchers had in-person interactions with the participants, the methodological procedures are also valid in the context of distributed users.

Table 7 - The selected papers's data.

Title	Reference	Method	Source	Citation Count
"Enable or Disable Gamification?" – Analyzing the Impact of Choice in a Gamified Image Tagging Task	(LESSEL; ALTMAYER; SCHMEER; KRÜGER, 2019)	Intrinsic Motivation Inventory	ACM	4
m-Motion: A mobile application for music recommendation that considers the desired emotion of the user	(ASSUNÇÃO; NERIS, 2019)	SAM	Brazilian HCI	0
How Can They Know That? A Study of Factors Affecting the Creepiness of Recommendations	(TORKAMAAN; BARBU; ZIEGLER, 2019)	SAM	ACM	2
Understanding Worker Moods and Reactions to Rejection in Crowdsourcing	(GADIRAJU; DEMARTINI, 2019)	SAM	ACM	2
Assessing the usability of the Saudi Digital Library from the perspective of Saudi scholarship students	(ALGHANEM, 2019)	Software Usability Measurement Inventory	ACM	0

Source: Own authorship.

Torkamaan, Barbu, and Ziegler (2019) performed an online experiment regarding movies, hotels, and health domains to investigate the creepiness of recommendations from recommender systems. The authors conducted their experiment in the SoSci Survey platform and adopted SAM to capture "the emotional aspect of receiving a creepy recommendation."

Gadiraju and Demartini (2019) aimed "to understand worker moods and how workers react to rejections in microtask crowdsourcing.". After completing ten tasks, the workers received a message of approval or rejection regardless of their true performance and expressed how they felt through SAM. The authors adopted the SAM UX capture method due to its brevity and because it's applicability in a variety of emotion elicitation methods.

Alghanem (2019) employed the Software Usability Measurement Inventory to assess the usability of the Saudi Digital Library through an electronic questionnaire, distributed among all Saudi scholarship students in the USA, including demographic

data and the method's five criteria for assessment, namely: effect, efficiency, learnability, control, and helpfulness.

Based on the review results, the currently used UX evaluation methods to perform online studies in which a researcher does not get in-person contact with the users are the Intrinsic Motivation Inventory, SAM, and Software Usability Measurement Inventory. Among those three methods, SAM showed a higher occurrence (three studies) and a greater applicability context variety (music mobile application, recommender systems, and crowdsourcing). Thus this research adopted SAM to gather UX quantitative data during the evaluation sections.

The supportive technologies selection process considered existing reviews about some of the available solutions for this research demands. The authors did not perform any comparative analysis concerning all existing technological solutions because it was out of the scope of this study. However, there might be better and unanalyzed tools to accomplish the established goals.

## **APPENDIX C - USABILITY AND USER EXPERIENCE EVALUATION TOOLS AND SUPPORTIVE DOCUMENTS**

The following subtopics show the adopted Usability and user eXperience evaluation tools and supportive documents. The evaluation data sheet concerned the Usability requirements specification and contained indicators recommended by ISO 9241-11 standard. The e-mails, messages, forms, and terms for interacting with users within this appendix are adapted versions from the ones available in Sova and Nielsen (2020).

### **Usability requirements specification**

Product: Open Financial Reporting (OFR) software

This specification defines OFR's usability requirements. OFR aims to optimize XBRL financial reports elaboration, while abstracting one of this technology's inherent complexity, the level of XBRL previous knowledge.

Usage context

- User specification: Professionals with a bachelor's or higher college degree, from 31 to 60 years old, that do not struggle to use computers, that perform financial-reporting related tasks for two or more years, regardless of their XBRL knowledge degree. None of the users will be familiar with the OFR software and will use it for the first time. So, they will demand some training before getting started with the tests.
- Environment description: The user shall access a computer/laptop with a mouse/touchpad, a keyboard, and a monitor to use the software. There are no requirements related to operating systems (OS) however, it must support Java8 applications.
- Task specification: The software shall allow people with and without previous XBRL knowledge to elaborate financial reports based on that technology. The usability requirements specification regards the following main tasks: to create

an XBRL instance document, to insert data in the financial report, and to validate the XBRL instance document.

#### Usability measures specification

The usability measures specification for effectiveness and efficiency followed the one within the evaluation datasheet in this appendix for every task. Self-report usability (SUS) and UX (SAM, Premo, Emocards) techniques accessed the satisfaction dimension.

## Evaluation datasheet

### OFR individual HCI evaluation data sheet

This form recorded the data from the OFR evaluation sections with the volunteers (Researcher use only).

\*Obrigatório

Volunteer ID \*

Sua resposta

Did volunteer demand training? \*

Yes

No

To create an XBRL instance task data

Status \*

Complete

Incomplete

Not done





The number attempts \*

Sua resposta

The number of errors committed \*

Sua resposta

The number of OFR software errors \*

Sua resposta

The total task completion time (minutes) \*

Sua resposta

The estimated total task completion time (minutes) \*

Sua resposta

The time spent in the first attempt (minutes) \*

Sua resposta



The time volunteer spent with backtrack (minutes) \*

Sua resposta

The number of OFR functions used \*

Sua resposta

The expected number of functions needed \*

Sua resposta

The number of times the volunteer asked for support \*

Sua resposta

The number of times the volunteer used the supportive documentation \*

Sua resposta

The time spent to learn the OFR functions (minutes) \*

Sua resposta



The productive time (minutes) \*

Sua resposta

To insert data task data

Status \*

- Complete
- Incomplete
- Not done

The number attempts \*

Sua resposta

The number of errors committed \*

Sua resposta

The number of OFR software errors \*

Sua resposta



The total task completion time (minutes) \*

Sua resposta

The estimated total task completion time (minutes) \*

Sua resposta

The time spent in the first attempt (minutes) \*

Sua resposta

The time volunteer spent with backtrack (minutes) \*

Sua resposta

The number of OFR functions used \*

Sua resposta

The expected number of functions needed \*

Sua resposta



The number of times the volunteer asked for support \*

Sua resposta

The number of times the volunteer used the supportive documentation \*

Sua resposta

The time spent to learn the OFR functions (minutes) \*

Sua resposta

The productive time (minutes) \*

Sua resposta

To save and validate an XBRL instance task data

Status \*

- Complete
- Incomplete
- Not done



The number attempts \*

Sua resposta

The number of errors committed \*

Sua resposta

The number of OFR software errors \*

Sua resposta

The total task completion time (minutes) \*

Sua resposta

The estimated total task completion time (minutes) \*

Sua resposta

The time spent in the first attempt (minutes) \*

Sua resposta



The time volunteer spent with backtrack (minutes) \*

Sua resposta

The number of OFR functions used \*

Sua resposta

The expected number of functions needed \*

Sua resposta

The number of times the volunteer asked for support \*

Sua resposta

The number of times the volunteer used the supportive documentation \*

Sua resposta

The time spent to learn the OFR functions (minutes) \*

Sua resposta



The productive time (minutes) \*

Sua resposta

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## OFR individual communicability evaluation data sheet

This form recorded the data from the OFR evaluation sections with the volunteers to compose the semiotic profile (Researcher use only).

**\*Obrigatório**

Volunteer ID \*

Sua resposta

To create an XBRL instance task data

The number of times the lable "WHERE IS IT?" appeared \*

Sua resposta

The number of times the lable "WHAT DO I DO NEXT?" appeared \*

Sua resposta

The number of times the lable "WHAT IS IT?" appeared \*

Sua resposta



The number of times the lable "OPS!" appeared \*

Sua resposta

The number of times the lable "WHERE AM I?" appeared \*

Sua resposta

The number of times the lable "WHAT DID HAPPEN?" appeared \*

Sua resposta

The number of times the lable "WHY ISN'T IT WORKING?" appeared \*

Sua resposta

The number of times the lable "THAT IS NOT THE WAY TO DO IT." appeared \*

Sua resposta

The number of times the lable "I'D RATHER MY WAY OVER YOURS." appeared \*

Sua resposta



The number of times the lable "NO, THANKS!" appeared \*

Sua resposta

The number of times the lable "IT'S GOOD ENOUGH." appeared \*

Sua resposta

The number of times the lable "HELP!" appeared \*

Sua resposta

The number of times the lable "I GIVE UP." appeared \*

Sua resposta

**To Insert data task data**

The number of times the lable "WHERE IS IT?" appeared \*

Sua resposta

The number of times the lable "WHAT DO I DO NEXT?" appeared \*

Sua resposta



The number of times the lable "WHAT IS IT?" appeared \*

Sua resposta

The number of times the lable "OPS!" appeared \*

Sua resposta

The number of times the lable "WHERE AM I?" appeared \*

Sua resposta

The number of times the lable "WHAT DID HAPPEN?" appeared \*

Sua resposta

The number of times the lable "WHY ISN'T IT WORKING?" appeared \*

Sua resposta

The number of times the lable "THAT IS NOT THE WAY TO DO IT."  
appeared \*

Sua resposta



The number of times the lable "I'D RATHER MY WAY OVER YOURS." appeared \*

Sua resposta

The number of times the lable "NO, THANKS!" appeared \*

Sua resposta

The number of times the lable "IT'S GOOD ENOUGH." appeared \*

Sua resposta

The number of times the lable "HELP!" appeared \*

Sua resposta

The number of times the lable "I GIVE UP." appeared \*

Sua resposta

To save and validate an XBRL instance task data



The number of times the lable "WHERE IS IT?" appeared \*

Sua resposta

The number of times the lable "WHAT DO I DO NEXT?" appeared \*

Sua resposta

The number of times the lable "WHAT IS IT?" appeared \*

Sua resposta

The number of times the lable "OPS!" appeared \*

Sua resposta

The number of times the lable "WHERE AM I?" appeared \*

Sua resposta

The number of times the lable "WHAT DID HAPPEN?" appeared \*

Sua resposta



The number of times the lable "WHY ISN'T IT WORKING?" appeared \*

Sua resposta

The number of times the lable "THAT IS NOT THE WAY TO DO IT." appeared \*

Sua resposta

The number of times the lable "I'D RATHER MY WAY OVER YOURS." appeared \*

Sua resposta

The number of times the lable "NO, THANKS!" appeared \*

Sua resposta

The number of times the lable "IT'S GOOD ENOUGH." appeared \*

Sua resposta

The number of times the lable "HELP!" appeared \*

Sua resposta



The number of times the lable "I GIVE UP." appeared \*

Sua resposta

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## Supportive materials



## OFR Usability/UX evaluation activity sheet

**Antônio Ricardo d'Araujo Amâncio Oliveira**

Salvador-Ba

2021-02-07



## Abstract

This document contains directions for the volunteers to use the Open Financial Reporting software to compose a short version of an XBRL financial report from Siconfi's taxonomy while participating in the Usability/Ux evaluation. The remaining of this document structures as follows. Section 1 brings an introduction to XBRL. Section 2 presents an introduction to Siconfi's XBRL financial reports. Section 3 contains the directions to test the software. The References section presents the works that supported the creation of this document. **If you are familiar with the introductory concepts, you may skip to section 3.**



## 1. Introduction to XBRL

XBRL is a language developed for financial reporting purposes in conformity with the XML1.0 specification, XBRL provides a standardized way to make financial data available in a machine-readable (e.g., computers) format. So, regulators, companies, governments, data providers, analysts, investors, and accountants can use XBRL documents for many different purposes. However, it requires training, study, and experience to understand and manipulate XBRL data. “XBRL is supported by a very wide range of software from vendors large and small, allowing a very wide range of stakeholders to work with the standard” (XBRL INTERNATIONAL, 2020a).

Taxonomies define the structure of XBRL documents. They are a set of XML Schema (files with extension .xsd) elements and attributes that work as a library of financial statements that can compose a financial report. Taxonomies consist of structural rules, labels, mathematical relations, presentation order, and other elements' characteristics (SILVA, 2003). There are also documents called Linkbases that define the relationship or hierarchy between the elements of a taxonomy.

Contexts, units, and accounts are typical elements of an XBRL document. According to Brasil (2020), contexts are a way to interpret XBRL instance document data coherently. They identify the entity that is reporting the information, the period and provide other information. Units are a way to define the measurement unit of all numeric data within a report. An Account is a piece of reported information (data) that has a value and refers to a unit and a context. Explanatory notes are optional elements in those documents.



## 2. Introduction to Siconfi's reports

Brazil is among the countries undertaking electronic financial projects. In 2014 the Brazilian Secretaria do Tesouro Nacional (STN), a government core entity for financial planning, coordination and control, presented the Sistema de Informações Contábeis e Fiscais do Setor Público Brasileiro (Siconfi), an XBRL based tool designed to receive accounting, financial and tax statistics information (TESOURO NACIONAL, 2020a).

Siconfi taxonomy embraces standardized accounting and tax statements, such as the Summary Report on Budgetary Execution (RREO), the Fiscal Management Report (RGF) and the Annual Accounts Statement (DCA) (our translation, TESOURO NACIONAL, 2020b). Every Siconfi's report has an associated entry point. It is an XML Schema file that identifies all resources and elements needed to represent a specific report. That includes all taxonomy files related to the report under construction. So, every instance document has a reference to an entry point file.

Siconfi's taxonomy is a dimensional one so, the organizational data model follows a hypercube structure (Figure 2.1). In that scenario, a dimension is a way to interpret data (e.g., account information), and axes are groups of dimensions to interpret data. So, the same account information may be attached to one or more axes and dimensions. Siconfi's taxonomy contexts should bring information about the dimension to which the data refers, the entity that is reporting the information, and the period.

In a Siconfi report, every numeric account information must have a unit reference according to the ISO 4217 standard monetary tag code. However, STN only works with the tag "BRL", which is the ISO 4217 code for the Brazilian currency. Account information must have a value, a precision indicator (number of decimals used to represent the value), a unit reference, and a context reference. STN only works with two decimals so, any other number of decimals generates inconsistencies. Siconfi also allows the addition of explanatory notes referring to the contexts in each report.

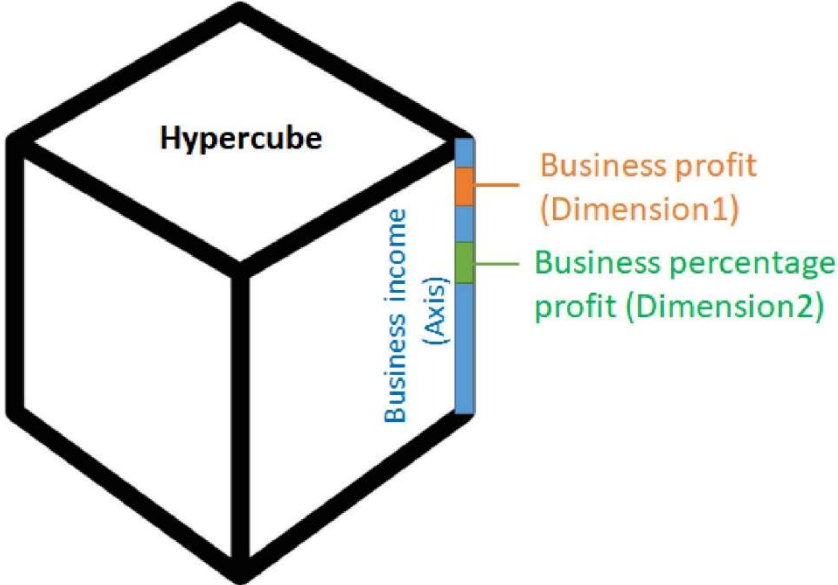


Figure 2.1 - Example of hypercube structure



### 3. Testing the Open Financial Reporting (OFR) software

#### Set up procedures

1 - Download the Open Financial Reporting software .zip file at [bit.ly/ofrhci](https://bit.ly/ofrhci)

2 - Unzip the downloaded file. If you don't know how to unzip a file, here is a link for a tutorial:

Windows <https://www.youtube.com/watch?v=5Wm4PwF8DqY>

Linux [https://www.youtube.com/watch?v=pya5truC\\_\\_E](https://www.youtube.com/watch?v=pya5truC__E)

Mac <https://www.youtube.com/watch?v=PGp1daVIBcs>

3 - If you do not have Java 8 or later installed, please download it at <https://www.java.com/en/download/manual.jsp> and install it before starting the procedures. That link also has instructions for downloading and installing Java.

#### Evaluation procedures

Now you have everything needed to start creating XBRL financial reports. In the "OpenFinancialReporting" extracted folder, you may find three items: a "doc" folder, a "lib" folder, and the OFR application. The "lib" folder contains auxiliary files the software needs to work properly. The "doc" folder contains the software's supportive documentation. If you want training, you can ask the evaluator to provide it **or** watch the video before starting your experience. However, you are not obligated to undergo training. Here is a link to the video regarding software training: [bit.ly/ofrtvy](https://bit.ly/ofrtvy).

This evaluation goal is to identify if the OFR can help users composing XBRL financial reports regardless of their XBRL knowledge level. If the software is not providing such aid, the evaluation shall provide information to the development team to make the software better meet its end. In the opposite scenario, the development team will have information to optimize the OFR's functionalities and interface. So, the OFR is the subject under analysis, **and not you**. If you can't accomplish the following tasks, it means a design or implementation problem and has nothing to do with your capabilities.



### First task – Creating an empty XBRL instance document

- A. Access the link [bit.ly/ofrpretest](http://bit.ly/ofrpretest) and answer the pre-test questionnaire.
- B. Open the OpenFinalcialReporting folder and open the OFR.
- C. Select the proper software language for your experience.
- D. Select the **siconfi-rreo-consorciospublicos\_2019-12-31** report model.
- E. Create a new report.

### Second task – Inserting data in the XBRL instance document

Tagging decision problems are out of OFR's scope. Each taxonomy provider also has to present information about how to classify primary accounting information among the report account elements. So, the values you will insert for the accounts are already the definitive ones.

- A. Use the option under the **Elements** menu to input the contexts of the following table:

Context declaration						
Name	Institution	Axis	Dimension	Schema	Start date	End Date
C1	2927408EX	EstagiosReceita Orcamentaria	PrevisaoAtualizada	siconfi. tesouro. gov.br	2020-01-01	2020-02-29
C2	2927408EX	EstagiosReceita Orcamentaria	ReceitasRealizadasAte OBimestre	siconfi. tesouro. gov.br	2020-01-01	2020-02-29
C3	2927408EX	EstagiosReceita Orcamentaria	SaldoReceita	siconfi. tesouro. gov.br	2020-01-01	2020-02-29

Note: 2927408EX = Prefeitura Municipal de Salvador - BA

- B. Use the option under the **Elements** menu to input the unit from the following table:

Unit declaration	
Name	ISO code
U1	BRL



- C. Use the option under the **Elements** menu to input the accounts from the following table:

Account declaration					
Tag	Value	Decimals	Unit	Context	
ReceitasExcetoIntraOrcamentarias	50765748	2	U1	C1	
ReceitasExcetoIntraOrcamentarias	5072777	2	U1	C2	
ReceitasExcetoIntraOrcamentarias	45692971	2	U1	C3	

- D. Use the option under the **Elements** menu to input the explanatory note from the following table:

Non numeric element declaration		
Tag	Context reference	Content
Notas explicativas	C1	Fonte:Siconfi, Unidade Responsável: Prefeitura Municipal de Salvador - BA, Data de emissão 2020-02-02

- E. Save the report to generate the XBRL instance document file.

### Third task – Validating the XBRL instance document

- Use the option under the **Instance validation** menu to try to validate the instance file.
- If it is unsuccessful, check the data you did input, through the document tree panel, against the data presented in the tables from the last task. Edit the data you input differently and try validating again.
- If it is successful, you can just exit the OFR interface and mail your report file to the researcher at [antoniocardo1993@gmail.com](mailto:antoniocardo1993@gmail.com)
- Now you completed your experience with the OFR, access the link [bit.ly/ofrpostests](https://bit.ly/ofrpostests) and answer the post-test questionnaire.





#### References:

BRASIL. MINISTÉRIO DA ECONOMIA. Guia de Implementação da Taxonomia Siconfi: [rreo: relatório resumido da execução orçamentária] [rgf: relatório de gestão fiscal] [dca: declaração de contas anuais]. Brasília - Df: Siconfi, 2020. 16 p.

SILVA, Paulo Caetano da. EXPLORANDO LINGUAGENS DE MARCAÇÃO PARA REPRESENTAÇÃO DE RELATÓRIOS DE INFORMAÇÕES FINANCEIRAS. 2003. 154 f. Dissertação (Mestrado) - Curso de Redes de Computadores, Área de Concentração em Tecnologias Web e Aplicações Distribuídas, Universidade Salvador, Salvador, 2003.

TESOURO NACIONAL. **Apresentação**. Available at: <<https://siconfi.tesouro.gov.br/siconfi/pages/public/conteudo/conteudo.jsf?id=21>>. Accessed at: 17 Jun. 2020. a.

TESOURO NACIONAL. **Taxonomia Siconfi**. Available at: <<https://siconfi.tesouro.gov.br/siconfi/pages/public/conteudo/conteudo.jsf?id=584>>. Accessed at: 17 Jun. 2020. b.

XBRL INTERNATIONAL. An introduction to XBRL: The basics of XBRL for business and accounting professionals. Available at: <<https://www.xbrl.org/the-standard/what/anintroduction-to-xbrl/>>. Accessed at: 17 Jun. 2020.



## Folha de atividades da avaliação de usabilidade e UX do OFR

**Antônio Ricardo d'Araujo Amâncio Oliveira**

Salvador-Ba

2021-02-07



## Resumo

Este documento contém instruções para os voluntários usarem o programa Open Financial Reporting para compor uma versão resumida de um relatório financeiro XBRL da taxonomia do Siconfi, durante a participação na avaliação de Usabilidade/Ux. O restante deste documento é estruturado da seguinte maneira: a seção 1 traz uma introdução ao XBRL; a seção 2 apresenta uma introdução aos relatórios financeiros XBRL do Siconfi; a seção 3 contém as instruções para testar o programa; a seção Referências apresenta os trabalhos que apoiaram a elaboração deste documento. **Se você estiver familiarizado com os conceitos introdutórios, pule para a seção 3.**



## 1. Introdução ao XBRL

XBRL é uma linguagem desenvolvida para fins de criação de relatórios financeiros em conformidade com a especificação XML1.0. O XBRL fornece uma maneira padronizada de disponibilizar dados financeiros em um formato legível por máquina (e.g., computadores). Portanto, reguladores, empresas, governos, provedores de dados, analistas, investidores e contadores podem usar documentos XBRL para muitas finalidades diferentes. No entanto, seu uso requer treinamento, estudo e experiência para entender e manipular dados em XBRL. “O XBRL é compatível com uma grande variedade de programas de fornecedores grandes e pequenos, permitindo que uma ampla gama de partes interessadas trabalhe com o padrão” (XBRL INTERNATIONAL, 2020a).

As taxonomias definem a estrutura dos documentos XBRL. Elas são um conjunto de elementos do XML Schema (arquivos de extensão .xsd) e atributos que funcionam como uma biblioteca de declarações financeiras que podem compor um relatório. Taxonomias consistem em regras estruturais, rótulos, relações matemáticas, ordem de apresentação e características de outros elementos (SILVA, 2003). Existem também documentos chamados de bases de links (*linkbases*) que definem a relação ou hierarquia entre os elementos de uma taxonomia.

Contextos, unidades e contas são elementos típicos de um documento XBRL. Segundo Brasil (2020), contextos são uma forma coerente de interpretar dados de documentos de instância XBRL. Eles identificam a entidade que está relatando a informação, o período e fornecem outras informações. As unidades são uma forma de definir a unidade de medida de todos os dados numéricos em um relatório. Uma conta é uma informação relatada (dados) que tem um valor e se refere a uma unidade e a um contexto. As notas explicativas são elementos opcionais nestes documentos.



## 2. Introdução aos relatórios do Siconfi

O Brasil está entre os países que realizam projetos financeiros eletrônicos. Em 2014, a Secretaria do Tesouro Nacional (STN), entidade governamental central para o planejamento, coordenação e controle financeiro, apresentou o Sistema de Informações Contábeis e Fiscais do Setor Público Brasileiro (Siconfi), uma ferramenta baseada em XBRL destinada ao recebimento de informações fiscais, contábeis e financeiras (TESOURO NACIONAL, 2020a).

A taxonomia Siconfi abrange “declarações contábeis e fiscais padronizadas, como o Relatório Resumido de Execução Orçamentária (RREO), o Relatório de Gestão Fiscal (RGF) e a Declaração de Contas Anuais (DCA)” (TESOURO NACIONAL, 2020b). Cada relatório do Siconfi tem um ponto de entrada associado. É um arquivo XML Schema que identifica todos os recursos e elementos necessários para representar um relatório específico. Isso inclui todos os arquivos da taxonomia relacionados ao relatório em construção. Portanto, cada documento de instância tem uma referência a um arquivo de ponto de entrada.

A taxonomia do Siconfi é dimensional, portanto, o modelo organizacional de dados segue uma estrutura de hipercubo (Figura 2.1). Nesse cenário, uma dimensão é uma forma de interpretar os dados (por exemplo, informações da conta) e os eixos são grupos de dimensões para interpretar os dados. Portanto, as informações de uma conta podem ser acopladas a um ou mais eixos e dimensões. Os contextos da taxonomia do Siconfi devem trazer informações sobre a dimensão a que se referem os dados, a entidade que está reportando a informação, e o período.

Em um relatório do Siconfi, todas as informações numéricas da conta devem ter uma referência de unidade de acordo com o código padrão ISO 4217. Porém, a STN só trabalha com a tag "BRL", que é o código ISO 4217 para a moeda brasileira. As informações da conta devem ter um valor, um indicador de precisão (número de decimais usados para representar o valor), uma referência a uma unidade e uma referência a um contexto. STN só trabalha com dois decimais, portanto, qualquer outro número de decimais gera inconsistências. O Siconfi também permite o acréscimo de notas explicativas referentes aos contextos de cada relatório.

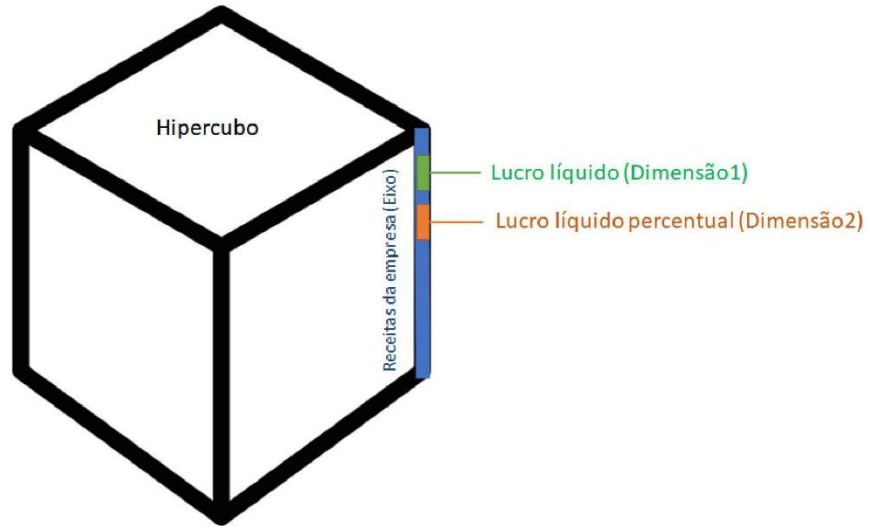


Figura 2.1 – Exemplo de estrutura de um hiper cubo



### 3. Testando o programa Open Financial Reporting (OFR)

#### Procedimentos de configuração

1 - Baixe o arquivo .zip do software Open Financial Reporting em [bit.ly/ofrhci](https://bit.ly/ofrhci)

2 - Descompacte o arquivo baixado. Se você não sabe como descompactar um arquivo, aqui está um link para um tutorial:

Windows <https://www.youtube.com/watch?v=5Wm4PwF8DqY>

Linux [https://www.youtube.com/watch?v=pya5truC\\_\\_E](https://www.youtube.com/watch?v=pya5truC__E)

Mac <https://www.youtube.com/watch?v=PGp1daVIBcs>

3 - Se você não tiver o Java 8 ou posterior instalado, faça o download em <https://www.java.com/pt-BR/download/manual.jsp> e instale-o antes de iniciar os procedimentos. Esse link também contém instruções para baixar e instalar o Java.

#### Procedimentos da avaliação

Agora você tem tudo o que precisa para começar a criar relatórios financeiros XBRL. Na pasta extraída "OpenFinancialReporting", você pode encontrar três itens: uma pasta "doc", uma pasta "lib" e o programa OFR. A pasta "lib" contém arquivos auxiliares que o programa precisa para funcionar corretamente. A pasta "doc" contém a documentação de suporte do programa. Se você deseja um treinamento, pode pedir ao avaliador para ministrá-lo ou assistir ao vídeo antes de iniciar sua experiência. No entanto, você não é obrigado a se submeter a um treinamento. Aqui está um link para o vídeo sobre treinamento do programa: [bit.ly/ofrtvpty](https://bit.ly/ofrtvpty).

O objetivo dessa avaliação é identificar se o OFR pode ajudar os usuários na composição de relatórios financeiros XBRL, independentemente de seu nível de conhecimento sobre XBRL. Caso o programa não o auxilie nesta tarefa, a avaliação deve fornecer informações à equipe de desenvolvimento para que o programa atenda melhor ao seu objetivo. Se o OFR atingir sua finalidade, o teste de avaliação deve fornecer informações à equipe de desenvolvimento para otimizar os recursos e a interface do programa. Então, o OFR é o objeto sob análise, e **não**



**você.** Se você não conseguir realizar as tarefas a seguir, isso significa **apenas** um problema de design ou implementação no programa.

#### Primeira tarefa - Criação de um documento de instância XBRL vazio

- Acesse o link [bit.ly/ofrpretestpt](http://bit.ly/ofrpretestpt) e responda ao questionário do pré-teste.
- Abra a pasta OpenFinalcialReporting e abra o OFR.
- Selecione o idioma adequado para sua experiência no programa.
- Selecione o modelo de relatório **siconfi-rreo-consorciospublicos\_2019-12-31**.
- Crie um novo relatório.

#### Segunda tarefa - Inserir dados no documento de instância XBRL

Problemas de classificação de contas estão fora dos objetivos do OFR. Cada provedor de taxonomia também deve apresentar informações sobre como classificar as informações primárias de contabilidade dentre os elementos do relatório. Então, os valores que você vai inserir nas contas já são os definitivos.

- Use a opção no menu **Elementos** para inserir os contextos da tabela a seguir:

Declaração de contexto						
Nome	Instituição	Eixo	Dimensão	Schem a	Início	Término
C1	2927408EX	EstagiosReceita Orcamentaria	PrevisaoAtualizada	siconfi. tesouro .gov.br	2020-01-01	2020-02-29
C2	2927408EX	EstagiosReceita Orcamentaria	ReceitasRealizadasAte OBimestre	siconfi. tesouro .gov.br	2020-01-01	2020-02-29
C3	2927408EX	EstagiosReceita Orcamentaria	SaldoReceita	siconfi. tesouro .gov.br	2020-01-01	2020-02-29

Nota: 2927408EX = Prefeitura Municipal de Salvador - BA

- Use a opção no menu **Elementos** para inserir a unidade da tabela a seguir:

Declaração de unidade	
Nome	Código ISO
U1	BRL





C. Use a opção no menu **Elementos** para inserir as contas da tabela a seguir:

Declaração de conta				
Tag	Valor	Decimais	Unidade	Contexto
ReceitasExcetoIntraOrcamentarias	50765748	2	U1	C1
ReceitasExcetoIntraOrcamentarias	5072777	2	U1	C2
ReceitasExcetoIntraOrcamentarias	45692971	2	U1	C3

D. Use a opção no menu **Elementos** para inserir a nota explicativa da tabela a seguir:

Declaração de elemento não numérico		
Tag	Referencia de contexto	Conteúdo
Notas explicativas	C1	Fonte:Siconfi, Unidade Responsável: Prefeitura Municipal de Salvador - BA, Data de emissão 2020-02-02

E. Salve o relatório para gerar o arquivo de instância XBRL.

### Terceira tarefa - Validar o documento de instância XBRL

- Use a opção no menu de **Validação da instância** para tentar validar o arquivo de instância.
- Se a validação não for bem-sucedida, compare os dados que você inseriu, através do painel da árvore do documento, com os dados apresentados nas tabelas da última tarefa. Edite os dados introduzidos de forma diferente e tente validar novamente.
- Em caso de sucesso, basta sair da interface do OFR e enviar o arquivo do seu relatório para o pesquisador em [antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com)
- Agora que você completou sua experiência com o OFR, acesse o link [bit.ly/ofrpostestspt](https://bit.ly/ofrpostestspt) e responda ao questionário pós-teste.



#### Referencias:

BRASIL. MINISTÉRIO DA ECONOMIA. Guia de Implementação da Taxonomia Siconfi: [rreo: relatório resumido da execução orçamentária] [rgf: relatório de gestão fiscal] [dca: declaração de contas anuais]. Brasília - Df: Siconfi, 2020. 16 p.

SILVA, Paulo Caetano da. EXPLORANDO LINGUAGENS DE MARCAÇÃO PARA REPRESENTAÇÃO DE RELATÓRIOS DE INFORMAÇÕES FINANCEIRAS. 2003. 154 f. Dissertação (Mestrado) - Curso de Redes de Computadores, Área de Concentração em Tecnologias Web e Aplicações Distribuídas, Universidade Salvador, Salvador, 2003.

TESOURO NACIONAL. **Apresentação**. Available at: <<https://siconfi.tesouro.gov.br/siconfi/pages/public/conteudo/conteudo.jsf?id=21>>. Accessed at: 17 Jun. 2020. a.

TESOURO NACIONAL. **Taxonomia Siconfi**. Available at: <<https://siconfi.tesouro.gov.br/siconfi/pages/public/conteudo/conteudo.jsf?id=584>>. Accessed at: 17 Jun. 2020. b.

XBRL INTERNATIONAL. An introduction to XBRL: The basics of XBRL for business and accounting professionals. Available at: <<https://www.xbrl.org/the-standard/what/anintroduction-to-xbrl/>>. Accessed at: 17 Jun. 2020.



## Ficha de actividad de evaluación de usabilidad / UX de OFR

**Antônio Ricardo d'Araujo Amâncio Oliveira**

**Tradução: Paulo Caetano da Silva**

**Salvador-Ba**

**2021-02-07**



## Resumen

Este documento contiene instrucciones para que los voluntarios utilicen el programa Open Financial Reporting para redactar una versión corta de un informe financiero XBRL de la taxonomía Siconfi, mientras participan en la evaluación de usabilidad / Ux. El resto de este documento está estructurado de la siguiente manera: la sección 1 proporciona una introducción a XBRL; la sección 2 presenta una introducción a los informes financieros XBRL de Siconfi; la sección 3 contiene instrucciones para probar el programa; la sección de Referencias presenta los trabajos que apoyaron la elaboración de este documento. **Si está familiarizado con los conceptos introductorios, pase a la sección 3.**



## 1. Introducción a XBRL

XBRL es un lenguaje desarrollado con el propósito de crear informes financieros de acuerdo con la especificación XML1.0. XBRL proporciona una forma estandarizada de hacer que los datos financieros estén disponibles en un formato legible por máquina (por ejemplo, computadoras). Por lo tanto, los reguladores, empresas, gobiernos, proveedores de datos, analistas, inversores y contables pueden utilizar los documentos XBRL para muchos propósitos diferentes. Sin embargo, su uso requiere formación, estudio y experiencia para comprender y manipular datos en XBRL. “XBRL es compatible con una amplia variedad de programas de proveedores grandes y pequeños, lo que permite que una amplia gama de partes interesadas trabajen según el estándar” (XBRL INTERNATIONAL, 2020a).

Las taxonomías definen la estructura de los documentos XBRL. Son un conjunto de elementos de esquema XML (archivos con extensión .xsd) y atributos que actúan como una biblioteca de estados financieros que pueden componer un informe. Las taxonomías consisten en reglas estructurales, etiquetas, relaciones matemáticas, orden de presentación y características de otros elementos (SILVA, 2003). También existen documentos denominados bases de enlaces (linkbases) que definen la relación o jerarquía entre los elementos de una taxonomía.

Los contextos, las unidades y las cuentas son elementos típicos de un documento XBRL. Según Brasil (2020), los contextos son una forma coherente de interpretar datos de documentos de instancia XBRL. Identifican la entidad que está reportando la información, el período y brindan otra información. Las unidades son una forma de definir la unidad de medida de todos los datos numéricos de un informe. Una cuenta es información reportada (datos) que tiene un valor y se refiere a una unidad y contexto. Las notas explicativas son elementos opcionales en estos documentos.



## 2. Introducción a los informes Siconfi

Brasil se encuentra entre los países que realizan proyectos de financiación electrónica. En 2014, la Secretaría del Tesoro Nacional (STN), la entidad gubernamental central para la planificación, coordinación y control financiero, presentó el Sistema de Información Contable y Tributaria del Sector Público Brasileño (Siconfi), una herramienta basada en XBRL para recibir información fiscal, contable y financiera. (TESORO NACIONAL, 2020a).

La taxonomía Siconfi abarca "declaraciones contables y fiscales estandarizadas, como el Informe Resumen de Ejecución Presupuestaria (RREO), el Informe de Gestión Fiscal (RGF) y el Estado de Cuentas Anuales (DCA)" (TREASURO NACIONAL, 2020b). Cada informe Siconfi tiene un punto de entrada asociado. Es un archivo de esquema XML que identifica todos los recursos y elementos necesarios para representar un informe específico. Esto incluye todos los archivos de taxonomía relacionados con el informe en construcción. Por lo tanto, cada documento de instancia tiene una referencia a un archivo de punto de entrada.

La taxonomía de Siconfi es dimensional, por lo que el modelo de datos organizacionales sigue una estructura de hipercubo (Figura 2.1). En este escenario, una dimensión es una forma de interpretar los datos (por ejemplo, información de la cuenta) y los ejes son grupos de dimensiones para interpretar los datos. Por lo tanto, la información de la cuenta se puede acoplar a uno o más ejes y dimensiones. Los contextos de la taxonomía de Siconfi deben proporcionar información sobre la dimensión a la que se refieren los datos, la entidad que informa la información y el período.

En un informe de Siconfi, toda la información numérica de la cuenta debe tener una referencia de unidad de acuerdo con el código estándar ISO 4217. Sin embargo, STN solo funciona con la etiqueta "BRL", que es el código ISO 4217 para la moneda brasileña. La información de la cuenta debe tener un valor, un indicador de precisión (número de decimales utilizados para representar el valor), una referencia a una unidad y una referencia a un contexto. STN solo funciona con dos decimales, por lo que cualquier otro número de decimales genera inconsistencias. Siconfi también permite la adición de notas explicativas sobre los contextos de cada informe.

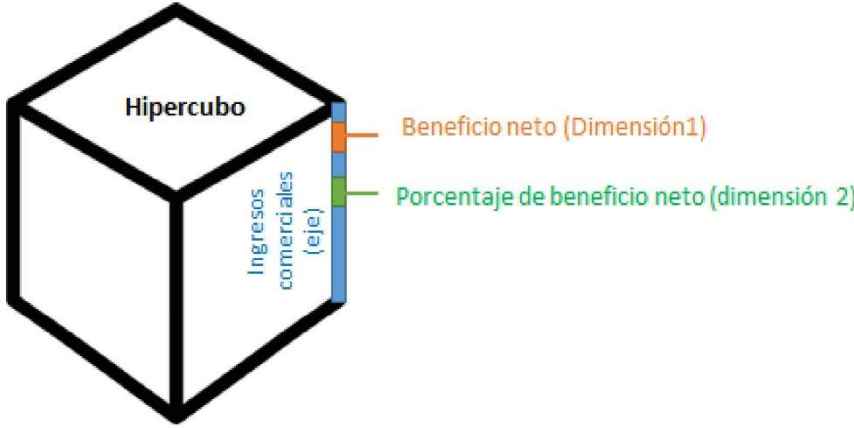


Figura 2.1 – Ejemplo de estructura de hipercono.



### 3. Prueba del programa Open Financial Reporting (OFR)

#### Procedimientos de configuración

1 - Descargue el archivo .zip del software Open Financial Reporting en [bit.ly/ofrhc](https://bit.ly/ofrhc)

2 Descomprima el archivo descargado. Si no sabe cómo descomprimir un archivo, aquí hay un enlace a un tutorial:

Windows <https://www.youtube.com/watch?v=5Wm4PwF8DqY>

Linux [https://www.youtube.com/watch?v=pya5truC\\_\\_E](https://www.youtube.com/watch?v=pya5truC__E)

Mac <https://www.youtube.com/watch?v=PGp1daVIBcs>

3 - Si no tiene Java 8 o posterior instalado, descárguelo en <https://www.java.com/es/download/manual.jsp> e instálelo antes de iniciar los procedimientos. Este enlace también contiene instrucciones para descargar e instalar Java.

#### Procedimientos de evaluación

Ahora tiene todo lo que necesita para comenzar a crear informes financieros XBRL. En la carpeta extraída "OpenFinancialReporting", puede encontrar tres elementos: una carpeta "doc", una carpeta "lib" y el programa OFR. La carpeta "lib" contiene archivos auxiliares que el programa necesita para funcionar correctamente. La carpeta "doc" contiene la documentación de soporte del programa. Si desea capacitación, puede pedirle al evaluador que la enseñe o ver el video antes de comenzar su experiencia. Sin embargo, no es necesario que reciba capacitación. Aquí hay un enlace al video de capacitación del programa: [bit.ly/ofrtvpty](https://bit.ly/ofrtvpty).

El propósito de esta evaluación es identificar si la OFR puede ayudar a los usuarios a redactar informes financieros XBRL, independientemente de su nivel de conocimiento sobre XBRL. Si el programa no le ayuda en esta tarea, la evaluación debe proporcionar información al equipo de desarrollo para que el programa cumpla mejor con su objetivo. Si el OFR logra su propósito, la prueba de evaluación debe proporcionar información al equipo de desarrollo para optimizar los recursos y la interfaz del programa. Entonces, la OFR es el objeto bajo análisis, **no usted**.





Si no puede completar las siguientes tareas, **significa solo un problema de diseño o implementación** en el programa.

#### Primera tarea - Crear un documento de instancia XBRL vacío

- A. Acceda al enlace [bit.ly/ofrpretestpt](http://bit.ly/ofrpretestpt) y complete el cuestionario previo a la prueba.
- B. Abra la carpeta OpenFinalcialReporting y abra OFR.
- C. Seleccione el idioma apropiado para su experiencia en el programa.
- D. Seleccione la plantilla de informe **siconfi-rreo-consorciospublicos\_2019-12-31**.
- E. Cree un nuevo informe.

#### Segunda tarea - Inserte datos en el documento de instancia XBRL

Los problemas de clasificación de cuentas están fuera de los objetivos de la OFR. Cada proveedor de taxonomía también debe proporcionar información sobre cómo clasificar la información contable primaria entre los elementos del informe. Entonces, los valores que ingresarás en las cuentas ya son los definitivos.

- A. Utilice la opción en el menú **Elementos** para ingresar los contextos en la siguiente tabla:

Enunciado de contexto						
Nombre	Institución	Eje	Dimensión	Schema	Inicio	Fin
C1	2927408 EX	EstagiosReceita Orcamentaria	PrevisaoAtualizada	siconfi. tesouro .gov. br	2020-01-01	2020-02-29
C2	2927408 EX	EstagiosReceita Orcamentaria	ReceitasRealizadas AteOBimestre	siconfi. tesouro. gov. br	2020-01-01	2020-02-29
C3	2927408 EX	EstagiosReceita Orcamentaria	SaldoReceita	siconfi. tesouro. gov. br	2020-01-01	2020-02-29

Nota: 2927408EX = Prefeitura Municipal de Salvador - BA

- B. Utilice la opción del menú **Elementos** para insertar la unidad de la siguiente tabla:

Declaración de la unidad	
Nombre	Código ISO
U1	BRL



C. Utilice la opción en el menú **Elementos** para ingresar las cuentas en la siguiente tabla:

Estado de cuenta				
Tag	Valor	Decimales	Unidad	Contexto
ReceitasExcetoIntraOrcamentarias	50765748	2	U1	C1
ReceitasExcetoIntraOrcamentarias	5072777	2	U1	C2
ReceitasExcetoIntraOrcamentarias	45692971	2	U1	C3

D. Utilice la opción del menú **Elementos** para insertar la nota explicativa en la siguiente tabla:

Declaración de elemento no numerico		
Tag	Referencia de contexto	Contenido
Notas explicativas	C1	Fonte:Siconfi, Unidade Responsável: Prefeitura Municipal de Salvador - BA, Data de emissão 2020-02-02

E. Guarde el informe para generar el archivo de instancia XBRL.

### Tercera tarea - Validar el documento de instancia XBRL

- Utilice la opción en el menú de **Validación de instancia** para intentar validar el archivo de instancia.
- Si la validación no es exitosa, compare los datos que ingresó, a través del panel del árbol del documento, con los datos presentados en las tablas de la última tarea. Edite los datos ingresados de manera diferente e intente validar nuevamente.
- En caso de éxito, simplemente salga de la interfaz OFR y envíe el archivo de su informe al investigador a [antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com)
- Ahora que ha completado su experiencia OFR, vaya a [bit.ly/ofrpostestspt](https://bit.ly/ofrpostestspt) y complete el cuestionario posterior a la prueba.



#### Referencias:

BRASIL. MINISTÉRIO DA ECONOMIA. Guia de Implementação da Taxonomia Siconfi: [rreo: relatório resumido da execução orçamentária] [rgf: relatório de gestão fiscal] [dca: declaração de contas anuais]. Brasília - Df: Siconfi, 2020. 16 p.

SILVA, Paulo Caetano da. EXPLORANDO LINGUAGENS DE MARCAÇÃO PARA REPRESENTAÇÃO DE RELATÓRIOS DE INFORMAÇÕES FINANCEIRAS. 2003. 154 f. Dissertação (Mestrado) - Curso de Redes de Computadores, Área de Concentração em Tecnologias Web e Aplicações Distribuídas, Universidade Salvador, Salvador, 2003.

TESOURO NACIONAL. **Apresentação**. Available at: <<https://siconfi.tesouro.gov.br/siconfi/pages/public/conteudo/conteudo.jsf?id=21>>. Accessed at: 17 Jun. 2020. a.

TESOURO NACIONAL. **Taxonomia Siconfi**. Available at: <<https://siconfi.tesouro.gov.br/siconfi/pages/public/conteudo/conteudo.jsf?id=584>>. Accessed at: 17 Jun. 2020. b.

XBRL INTERNATIONAL. An introduction to XBRL: The basics of XBRL for business and accounting professionals. Available at: <<https://www.xbrl.org/the-standard/what/anintroduction-to-xbrl/>>. Accessed at: 17 Jun. 2020.

## Pre-test questionnaire - Formative and conclusive evaluations

### OFR pre-test questionnaire

Please take a few minutes to answer the following questions to help us better understand your background. We use this information only to provide background and usage context in which to interpret the input and feedback you'll give us in your session today.

All the information provided will not have any other purpose than the aforementioned ones. The questionnaire also assures one's anonymity, privacy, and ethical rights. All data gathered will not be handled, posted online, or shared under any circumstances. All videotapes and any form or data that allows identifying you will be completely deleted on 03/31/2021.

Thank you for helping us out!

\*Obligatory field

\*Obrigatório

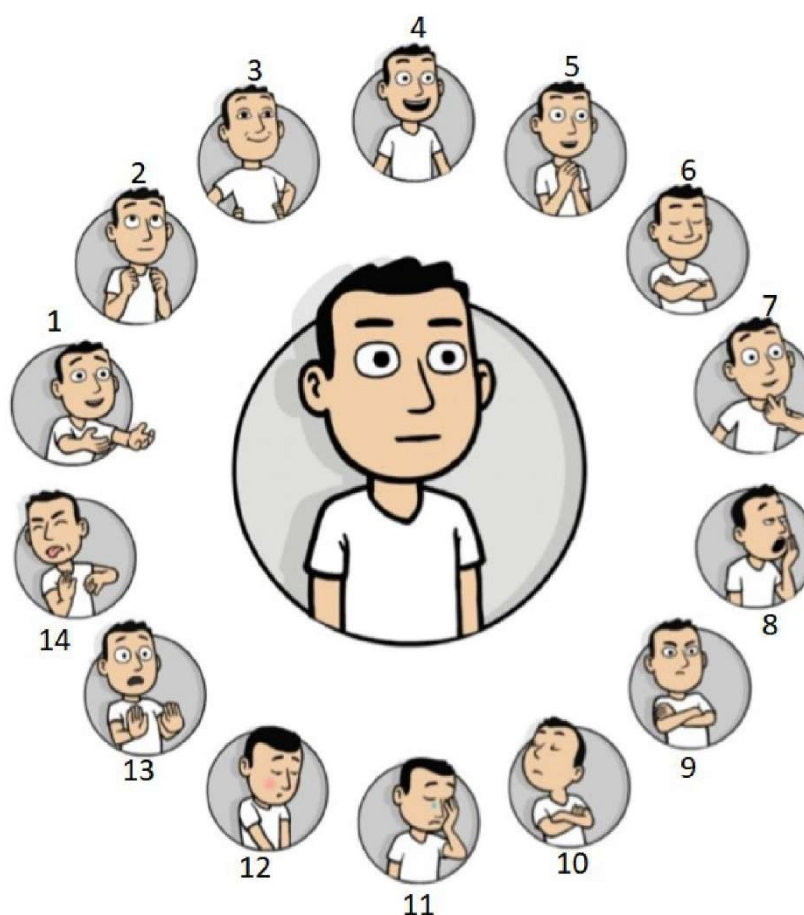
What is your volunteer ID code? \*

Sua resposta



PrEmo is a non-verbal self-report instrument that measures distinct (pleasant and unpleasant) emotions in a non-verbal manner that is validated cross-culturally. Instead of relying on the use of words, respondents can report their emotions with the use of expressive cartoon. In the following figure, every cartoon has an emotion tag number from 1 to 14. The intensity scale for every emotion ranges from 1 (that means you did not feel this emotion) to 5 (that means you did feel this emotion very intensely). Use the cartoons below to tell us how do you expect to feel while performing activities with the OFR. \*

Image adapted from CAICEDO, D. G.; DESMET, P. M. Designing the new prEmo—An empirical research on how to improve the emotion measuring tool. Delf University of Technology, Delf, 2009.



2

3

4

	1 - I do not expect to feel the emotion				5 - I do expect to feel the emotion intensely
Emotion 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotion 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotion 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotion 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotion 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotion 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotion 7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotion 8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotion 9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotion 10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotion 11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotion 12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotion 13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emotion 14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Enviar



## Questionário pré-teste

Por favor, considere usar alguns minutos para responder às questões a seguir. Elas nos auxiliarão a compreender melhor seu contexto. Nós usamos estas informações apenas para inferir em que contexto de uso devemos interpretar os dados que obtivermos durante sua sessão hoje.

Toda informação fornecida NÃO terá outro fim além dos já citados. O questionário certifica anonimato, privacidade e direitos éticos dos respondentes. Todos os dados coletados NÃO serão distribuídos, publicados online ou compartilhados sob quaisquer circunstâncias. Todos os vídeos, formulários, e dados que permitam identificação dos respondentes e participantes serão completamente destruídos em 31 de março de 2021.

Obrigado pela sua colaboração!

\*Campo obrigatório

\*Obrigatório

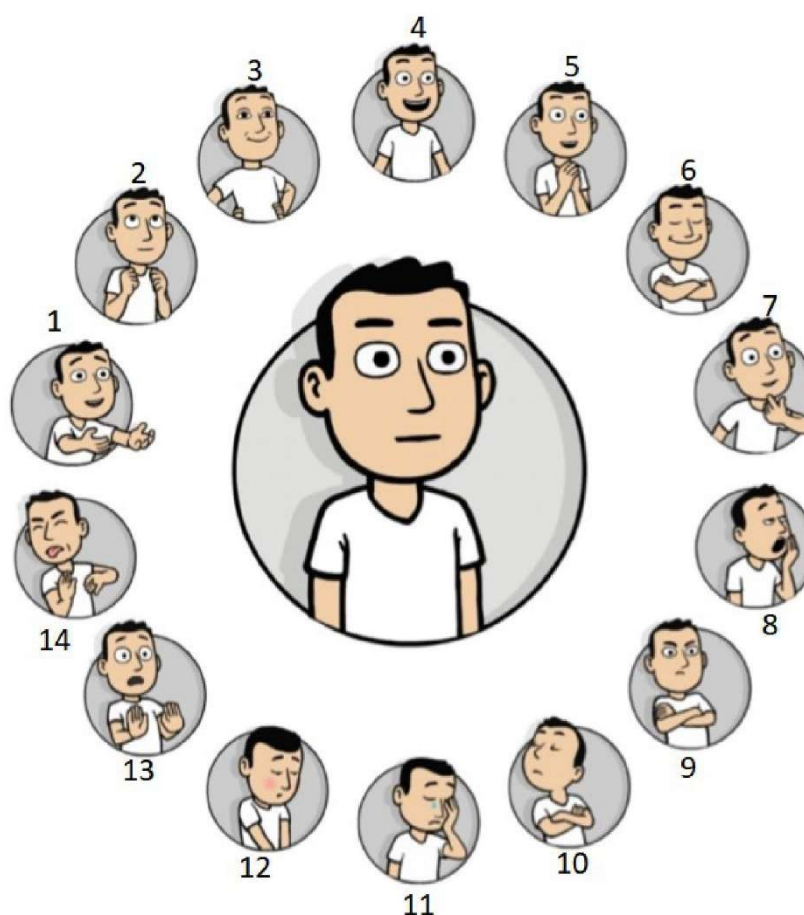
Qual o seu código de identificação de voluntário? \*

Sua resposta



PrEmo é um instrumento de auto-relato que mede diferentes emoções (agradáveis e desagradáveis) de uma forma não verbal que é válida mesmo entre culturas diferentes. Ao invés de se basear no uso de palavras, os respondentes podem reportar suas emoções com o uso de um desenho expressivo. Na figura a seguir, cada desenho representa uma emoção com um número de 1 a 14. A escala de intensidade vai de 1 (você não sentiu esta emoção) a 5 (você sentiu esta emoção intensamente). Use os desenhos abaixo para nos dizer como você espera se sentir enquanto interage com o OFR. \*

Imagem adaptada de CAICEDO, D. G.; DESMET, P. M. Designing the new prEmo—An empirical research on how to improve the emotion measuring tool. Delf University of Technology, Delf, 2009.



2

3

4



	1 - Eu não espero sentir esta emoção.				5 - Eu espero sentir esta emoção intensamente.
Emoção 1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emoção 2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emoção 3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emoção 4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emoção 5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emoção 6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emoção 7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emoção 8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emoção 9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emoção 10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emoção 11	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emoção 12	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emoção 13	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emoção 14	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



## Post-test questionnaire – Formative and conclusive evaluations

### OFR post-test evaluation questionnaire

Now you have had an experience with the OFR software, so we need your feedback:

1. To improve OFR's Human-Computer Interaction features, turning it into a tool that better meets users' needs to elaborate XBRL financial reports.
2. To investigate the impact of HCI features in the task efficiency of elaborate on XBRL financial reports.

All the information provided will not have any other purpose than the aforementioned ones. The questionnaire also assures one's anonymity, privacy, and ethical rights. All data gathered will not be handled, posted online, or shared under any circumstances. All videotapes and any form or data that allows identifying you will be completely deleted on 03/31/2021.

Thank you for helping us out!

\*Obligatory field.

\*Obrigatório

What is your volunteer ID code? \*

Sua resposta

#### SUS evaluation questionnaire

The SUS consists of a questionnaire with ten items, which the answers have five different values ranging from "Strongly disagree" to "Strongly agree" that measures usability and learnability dimensions.

I think that I would like to use this software frequently. \*

1    2    3    4    5

STRONGLY DISAGREE

STRONGLY AGREE



I found the software unnecessarily complex. \*

1    2    3    4    5

STRONGLY DISAGREE                  STRONGLY AGREE

I thought the software was easy to use. \*

1    2    3    4    5

STRONGLY DISAGREE                  STRONGLY AGREE

I think that I would need the support of a technical person to be able to use this software. \*

1    2    3    4    5

STRONGLY DISAGREE                  STRONGLY AGREE

I found the various functions in this software were well integrated. \*

1    2    3    4    5

STRONGLY DISAGREE                  STRONGLY AGREE



I thought there was too much inconsistency in this software. \*

1 2 3 4 5

STRONGLY DISAGREE      STRONGLY AGREE

I would imagine that most people would learn to use this software very quickly. \*

1 2 3 4 5

STRONGLY DISAGREE      STRONGLY AGREE

I found the software very cumbersome to use. \*

1 2 3 4 5

STRONGLY DISAGREE      STRONGLY AGREE

I felt very confident using the software. \*

1 2 3 4 5

STRONGLY DISAGREE      STRONGLY AGREE



I needed to learn a lot of things before I could get going with this software. \*

1    2    3    4    5

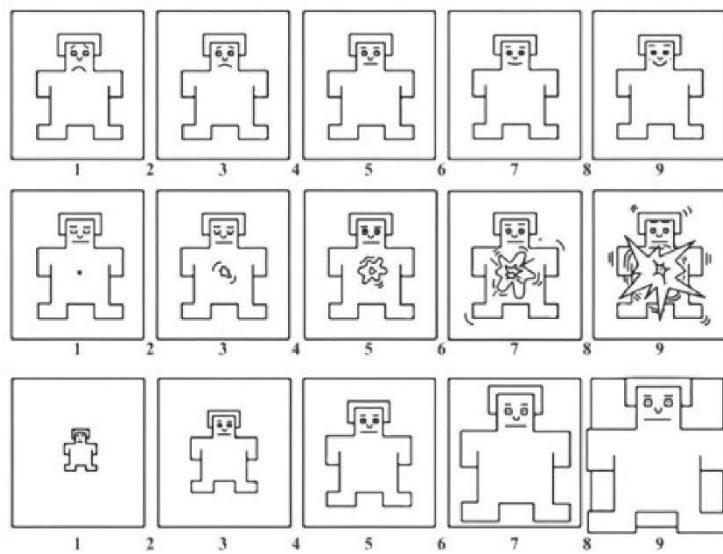
STRONGLY DISAGREE                  STRONGLY AGREE

### UX evaluation questionnaire

ISO9241 standard defines User eXperience (UX) as the “user’s perceptions and responses that result from the use and/or anticipated use of a system, product, or service”. The following questions will regard the OFR’s UX.



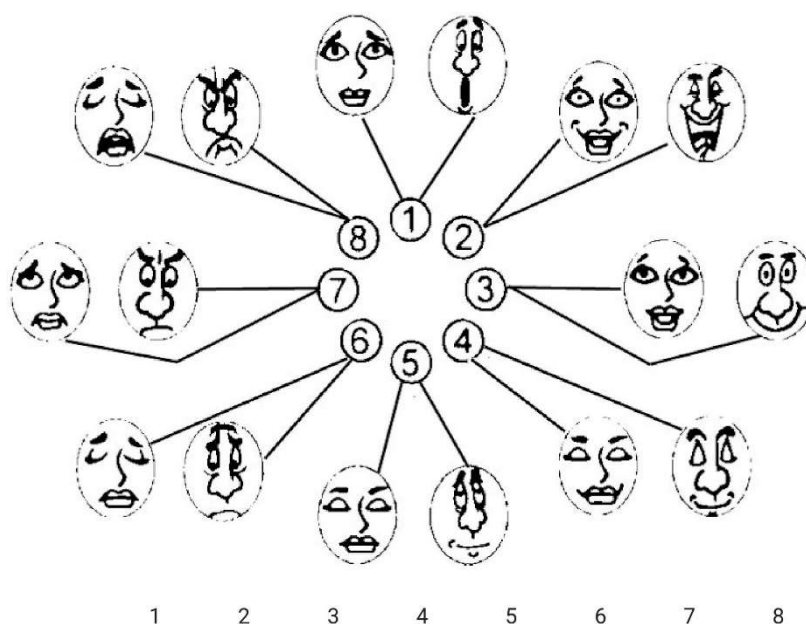
Self-Assessment Manikin (SAM) is a tri-dimensional User eXperience (UX) capture that is based on a psychological model. It represents user emotions' dimension and intensity through full body dummies with different expressions. The three dimention covered by SAM technique are; 1) bliss (dummies with happy and unhappy faces); 2) excitement (it associates the explosion picture size with the user's interest during the activity); and 3) dominance (it associates user's context control to the dummies size). Use the SAM pictures below to express how did it feel to compose an XBRL financial report with the OFR. \*



	1	2	3	4	5	6	7	8	9
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Emocards are a tool for users to express their emotions without words after an experience. It consists of 16 cartoon faces (a half male and the other half female) that express eight emotions that vary in two dimensions: pleasantness and arousal. Each pair of faces relates to one specific emotion. The figure below depicts all the Emocards. So, choose the one that best matches how did it feel to compose an XBRL financial report with the OFR. \*



Your  
choice

1   2   3   4   5   6   7   8

If there is anything you want to tell us but, it was not covered in the questionnaire, feel free to inform it in the space below.

Sua resposta



**Final considerations**

Thank you so much for helping us out with our research. Your feedback was pretty valuable to us! We wish you a good day and good luck in the prize draw.

Página 1 de 1

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## Questionário de avaliação pós-teste

Agora que você já teve uma experiência com o programa OFR, precisamos de seu feedback:

1. Para melhorar os recursos de Interação Humano-Computador do OFR, tornando-o uma ferramenta que melhor atenda às necessidades dos usuários de elaborar relatórios financeiros XBRL.
2. para investigar o impacto dos recursos de IHC na eficiência da tarefa de elaboração de relatórios financeiros XBRL.

Toda informação fornecida NÃO terá outro fim além dos já citados. O questionário certifica anonimato, privacidade e direitos éticos dos respondentes. Todos os dados coletados NÃO serão distribuídos, publicados online ou compartilhados sob quaisquer circunstâncias. Todos os vídeos, formulários, e dados que permitam identificação dos respondentes e participantes serão completamente destruídos em 31 de março de 2021.

Obrigado pela sua colaboração!

\*Campo obrigatório

\*Obrigatório

Qual o seu código de identificação de voluntário? \*

Sua resposta

### Questionário de avaliação SUS

O SUS consiste num questionário de dez itens cujas respostas tem cinco diferentes níveis de intensidade (de "Discordo Completamente" a "Concordo Completamente"). Ele mede as dimensões de usabilidade e facilidade de aprendizagem do OFR.



Eu acho que gostaria de usar esse programa com frequência. \*

1 2 3 4 5

Discordo Completamente      Concordo Completamente

Eu acho o programa desnecessariamente complexo. \*

1 2 3 4 5

Discordo Completamente      Concordo Completamente

Eu achei o programa fácil de usar. \*

1 2 3 4 5

Discordo Completamente      Concordo Completamente

Eu acho que precisaria de ajuda de uma pessoa com conhecimentos técnicos para usar o programa. \*

1 2 3 4 5

Discordo Completamente      Concordo Completamente



Eu acho que as várias funções do programa estão muito bem integradas. \*

1 2 3 4 5

Discordo Completamente      Concordo Completamente

Eu acho que o programa apresenta muita inconsistência. \*

1 2 3 4 5

Discordo Completamente      Concordo Completamente

Eu imagino que as pessoas aprenderão como usar esse programa rapidamente. \*

1 2 3 4 5

Discordo Completamente      Concordo Completamente

Eu achei o programa atrapalhado de usar. \*

1 2 3 4 5

Discordo Completamente      Concordo Completamente



Eu me senti confiante ao usar o programa. \*

1 2 3 4 5

Discordo Completamente      Concordo Completamente

Eu precisei aprender várias coisas novas antes de conseguir usar o programa. \*

1 2 3 4 5

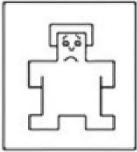
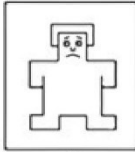
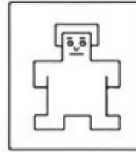
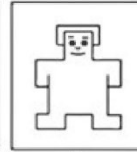
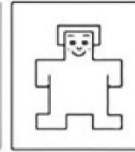

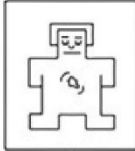
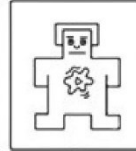
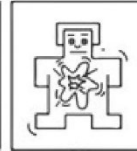
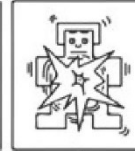
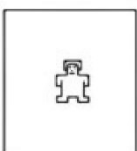
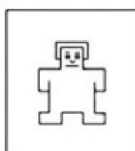
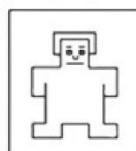
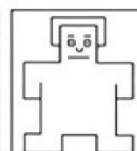
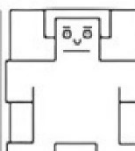
Discordo Completamente      Concordo Completamente

#### Questionário de avaliação de UX

A norma ISO9241 define User eXperience (UX) como a "percepção e respostas do usuário, que são resultado do uso e/ou antecipação de uso de um sistema, produto, ou serviço". As questões a seguir são referentes à UX do OFR.



Self-Assessment Manikin (SAM) é uma técnica tridimensional de captura de User eXperience (UX) baseada em um modelo psicológico. Ela usa imagens de bonecos de corpo inteiro com expressões para representar o nível de intensidade de cada dimensão. As dimensões adotadas são; 1) prazer (de expressões faciais felizes a infelizes); 2) excitação (relaciona o tamanho da explosão da imagem com o grau de interesse pela atividade); e 3) dominância (relaciona o controle de contexto do usuário ao tamanho da imagem). Utilize as imagens da técnica SAM abaixo, para expressar como você se sentiu enquanto compunha um relatório financeiro XBRL com o OFR. \*

									
1	2	3	4	5	6	7	8	9	
									
1	2	3	4	5	6	7	8	9	
									
1	2	3	4	5	6	7	8	9	
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Emocards são uma ferramenta para que os usuários possam expressar suas emoções, sem o uso de palavras, após uma experiência. Eles consistem em dezesseis desenhos de faces (oito femininas e oito masculinas) que expressam oito emoções que, por sua vez, variam em duas dimensões: prazer e excitação. Cada par de faces está relacionado a uma emoção específica. A figura abaixo exibe todos os Emocards. Use-a para escolher a que melhor representa como você se sentiu enquanto compunha um relatório financeiro XBRL com o OFR. \*

The diagram shows 16 Emocards arranged in a circle around 8 numbered nodes (1-8). Each node is connected to two faces (one male, one female). The faces are arranged in pairs around each node, with lines connecting them to the central node. The faces are arranged in a circular pattern around the central nodes, with lines connecting them to the central nodes.

	1	2	3	4	5	6	7	8
Sua escolha	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Existe alguma coisa que você queira nos dizer mas, não mencionamos no questionário?

Sua resposta

**Considerações finais**

Muito obrigado por nos ajudar com nossa pesquisa! Seu feedback foi muito importante para nós! Te desejamos um bom dia e boa sorte no sorteio!

Página 1 de 1

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### The recruiting criteria sheet

Participant Characteristics for the OFR Usability and UX Formative Tests	Number needed
Total participants:	12
Dry-run	1
Pilot	1
Regular	5
Backup	5
User Group Profile: Professionals with a bachelor's or higher college degree, from 31 to 60 years old, that do not struggle to use computers, that perform financial-reporting related tasks for two or more years, regardless of their XBRL knowledge degree.	
Participant Characteristics	Number obtained
Highest college degree attained:	
Bachelor's degree	2
Postgraduate	1
Master's degree	1
Doctoral degree (P.h.D.)	0
Post Doctoral	1
Professional Degree (M.D.)	0
Gender:	
Male	5
Female	0
Age:	
31-40	2
41-50	1
51-60	2
Experience with XBRL	
Novice	1
Adv. Beginner	0
Competent	0
Proficient	3
Expert	1
Accounting knowledge	
Novice	0
Adv. Beginner	1
Competent	1
Proficient	0
Expert	3



Time performing financial-reporting related tasks	
Less than 2 years	0
From 2 to 5 years	2
From 6 to 10 years	0
From 11 to 20 years	2
More than 20 years	1
Occupation	
2 Professor	
2 System analyst	
1 Accountant	
*Note: There were no backup volunteers.	

Participant Characteristics for the OFR Usability and UX Conclusive Tests	Number needed
Total participants:	12
Dry-run	1
Pilot	1
Regular	5
Backup	5
User Group Profile: Professionals with a bachelor's or higher college degree, from 31 to 60 years old, that do not struggle to use computers, that perform financial-reporting related tasks for two or more years, regardless of their XBRL knowledge degree.	
Participant Characteristics	Number obtained
Highest college degree attained:	
Bachelor's degree	3
Postgraduate	2
Master's degree	0
Doctoral degree (P.h.D.)	0
Professional Degree (M.D.)	0
Gender:	
Male	3
Female	2
Age:	
31-40	1
41-50	3
51-60	1
Experience with XBRL	

Novice	5
Adv. Beginner	0
Competent	0
Proficient	0
Expert	0
<b>Accounting knowledge</b>	
Novice	0
Adv. Beginner	0
Competent	0
Proficient	0
Expert	5
<b>Time performing financial-reporting related tasks</b>	
Less than 2 years	0
From 2 to 5 years	0
From 6 to 10 years	1
From 11 to 20 years	2
More than 20 years	2
<b>Occupation</b>	
5 Accountant	
*Note: There were no backup volunteers.	

## The recruiting brochures

### DO NOT miss this opportunity to contribute to scientific research and GET A PRIZE, if you are lucky enough.

The OFR Development team is recruiting volunteers for usability and User eXperience evaluations.

01 Access the link  
**bit.ly/ofrvform**

02 Schedule your section  
Fill up the online form and our development team will get in touch ASAP.

03 Join the prize draw  
After you participated in our study you will receive your lucky number to join the prize draw.

Programa de Pós Graduação em Sistemas de Computação

UNIFACS

#### Conciliating XBRL financial reporting and Human-Computer Interaction



Can HCI Design help out creating XBRL financial reports?

### Que tal contribuir para o desenvolvimento de uma pesquisa científica e ainda concorrer a um prêmio?

A equipe de desenvolvimento do OFR está recrutando voluntários para avaliações de usabilidade e UX.

01 Acesse o link  
**bit.ly/ofrvformpt**

02 Agende sua seção  
Preencha o formulário online e a nossa equipe entrará em contato o mais breve possível.

03 Concorra a um prêmio  
Após a sua participação no nosso estudo, você receberá o seu número da sorte para participar do sorteio.

Programa de Pós Graduação em Sistemas de Computação

UNIFACS

#### Conciliating XBRL financial reporting and Human-Computer Interaction



O Design de IHC pode ajudar a criar relatórios financeiros XBRL?

## The sign-up form

### Volunteer recruiting form

Applying an online quiz to several volunteers from Brazil and around the World, the results showed some HCI (Human-Computer Interaction) design-related demands in the XBRL (eXtensible Business Reporting Language) financial reporting area and highlighted the XBRL knowledge issue the European Securities and Markets Authority (2015) report identified.

There are many third-part Closed source software for composing XBRL financial reports. Despite the number of XBRL applications available, the basic demands of HCI design still go on.

Although most specialists do not face difficulties in using financial reporting tools, XBRL expertise is not always able to mitigate the complexity and problems of the available platforms.

The alternatives for the ones that can't afford to pay a Closed source software license typically embrace: taking professionals out of their role to compose XBRL financial reports and wasting time dealing with the mistakes or inconsistencies committed.

We propose the Open Brazilian Financial Reports (OBFR), which will be a third-part free and Open source software, developed under HCI design guidelines, to prevent such a waste of time and resources. An HCI design project is focused and centered on the potential final users, whose feedback information are the main guidelines for developing and implementing the software tools and interface. So, we will be thankful if you can cooperate with us.

The aforementioned solution is part of a UNIFACS System and Computing Master degree Program's project. Its development will apply the Human-Computer Interface design techniques to ease the task of composing an XBRL financial report by putting aside its complexity.

All volunteers will have to download and run the OFR on their computer to use it in the sections. During each evaluation section, the researcher will explain the conduction procedures, share the supportive materials, and solve videoconference platform-related issues.

Then, the volunteers will answer a pre-test questionnaire before sharing their computer screen and starting the training and the test activities.

After the observation and data gathering procedures, the volunteers will answer a post-test questionnaire, which also embraces usability and user experience evaluations. The total section-time estimated will be 90 minutes (30 minutes of training and 60 minutes of activities).



Every volunteer that shows up will receive an email with a voucher for the prize draw that will take place at the end of each research cycle. At the end of the section, all of them will have to answer the email to ensure they wanted to join the prize draw.

Before ending the section, the researcher will also ask the participants about referrals for future studies and will adopt the voucher number as the users' identification code in the description of the results.

All the information provided will not have any other purpose than the aforementioned ones. The questionnaire also assures one's anonymity, privacy, and ethical rights. All data gathered will not be handled, posted online, or shared under any circumstances. All videotapes and any form or data that allows identifying you will be completely deleted on 03/31/2021.

Thank you for helping us out!

\*Obligatory field.

\*Obrigatório



You have agreed to participate in a usability/UX study that will evaluate the OFR. By participating in this study, you will help the research team to improve the OFR in future redesigns. A researcher will observe you and record information about how you work with the OFR. We will also ask you to fill out questionnaires about your experience and answer follow-up questions. We will record your comments and actions using written notes and video cameras. The researchers will use the data from your study session, including videotapes, solely to evaluate the OFR and share the results of these evaluations with the UNIFACS community. By signing this form, you give your permission for the UNIFACS research team to use: your recorded voice, your verbal statements, and the videotape of your session (you do not have to share your webcam content). Your name, email, or videotapes will not be used during any presentation of the results of this study. All data gathered during your session will not be handled, posted online, or shared under any circumstances. All questionnaires also assure one's anonymity, privacy, and ethical rights. All videotapes and any form or data that allows identifying you will be completely depleted on 03/31/2021. All the information provided will not have any other purpose than to investigate the impact of HCI features in the task efficiency of elaborate on XBRL financial reports. You will receive a lucky number for joining a prize (A tablet HOW HT-705 XS) draw for your participation. However, accepting it does not constitute employment by UNIFACS, the research team, or the study sponsor. If you need a break at any time, please inform the study facilitator immediately. If you have questions about how the session will proceed, you may ask them at any time. You may withdraw from your study session at any time. If you agree with these terms, please indicate your agreement in the checkboxes below. \*

I agree.

I disagree.



Nickname (It does not have to be your actual nickname. It is just a way to prevent the researcher and the evaluator to address you through your numerical volunteer code during the video conferences). \*

Sua resposta

E-mail: \*

Sua resposta

Available test date (MM/DD/YYYY): \*

DD MM AAAA

/ /

Time available for testing (24h format): \*

Horário

:

What is your time zone? \*

Sua resposta



Which of the following ranges best describes your age? \*

- I'm 18-30 years old.
- I'm 31-40 years old.
- I'm 41-50 years old.
- I'm 51-60 years old.
- I'm 61-70 years old.
- I would rather do not answer it.

What is the highest college degree you have completed? \*

- High school graduate
- Professional certificate (career school)
- Associate degree (academic program)
- Bachelor's degree
- Master's degree
- Doctoral degree (P.h.D.)
- Professional Degree (M.D.)

What is your occupation? \*

Sua resposta





What is your job title? \*

Sua resposta

How long have you been performing financial-reporting related tasks? \*

- Less than 2 years
- From 2 to 5 years
- From 6 to 10 years
- From 11 to 20 years
- More than 20 years
- I have not been performing financial-reporting related tasks

On a scale of 1-5, how would you rate your knowledge about computers. \*

- |         |                       |                       |                       |                       |                       |        |
|---------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------|
|         | 1                     | 2                     | 3                     | 4                     | 5                     |        |
| AMATEUR | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | EXPERT |

On a scale of 1-5, how would you rate your knowledge about Accounting. \*

- |         |                       |                       |                       |                       |                       |        |
|---------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------|
|         | 1                     | 2                     | 3                     | 4                     | 5                     |        |
| AMATEUR | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | EXPERT |



On a scale of 1-5, how would you rate your knowledge about XBRL? \*

1      2      3      4      5

AMATEUR                        EXPERT

Have you ever used any XBRL financial report software? \*

- Yes
- No

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## Formulário de recrutamento de voluntários

Aplicando um questionário online a vários voluntários do Brasil e de outras localidades ao redor do mundo, os resultados revelaram que existem algumas demandas relacionadas ao Design de IHC (Interação Humano-Computador) na área de relatórios financeiros XBRL (eXtensible Business Reporting Language) e também destacaram o problema relacionado à questão do conhecimento sobre XBRL identificado no relatório da European Securities and Markets Authority (2015).

Existem muitos programas e soluções de código fechado para composição de relatórios financeiros XBRL. No entanto, apesar do número de aplicações disponíveis voltadas ao XBRL, demandas básicas relacionadas ao Design de IHC ainda persistem.

Mesmo especialistas em XBRL enfrentam dificuldades para usar tais ferramentas disponíveis para gerar relatórios financeiros. Ou seja, expertise em XBRL nem sempre permite mitigar a complexidade e os problemas das plataformas disponíveis.

Outro problema com as aplicações XBRL disponíveis é o custo de suas licenças de uso, que muitas vezes as tornam proibitivas ou inviáveis para algumas empresas e instituições governamentais do Brasil, por exemplo.

As alternativas para aqueles que não tem condições de arcar com uma licença de uso de um programa de código fechado tipicamente compreendem: desvio funcionais de profissionais para elaborar os relatórios financeiros XBRL e desperdício de tempo e recursos lidando com erros ou inconsistências cometidos.

Nós estamos propondo o Open Financial Reports (OFR), que será um programa de código aberto e gratuito, desenvolvido à luz das premissas do Design de IHC, para mitigar os problemas supracitados. Um projeto de Design de IHC é focado e centrado nos potenciais usuários finais, cujo informações e feedback fornecidos constituem-se nas principais diretrizes para o desenvolvimento e implementação das ferramentas e interface do programa. Desta forma, somos muito gratos se você puder colaborar conosco.

A referida solução é parte de um projeto do programa de mestrado em Sistemas e Computação da UNIFACS. Seu desenvolvimento aplicará técnicas de Design de IHC para facilitar a tarefa de elaborar um relatório financeiro XBRL por meio da abstração das complexidades da tecnologia.

Todos os voluntários terão de baixar e executar o OFR em seus computadores e usá-lo durante as seções de avaliação. Durante cada uma delas, o pesquisador



explicará os procedimentos que serão conduzidos, compartilhará os materiais de suporte e resolverá problemas relacionados à plataforma de videoconferência.

Então, os voluntários irão responder o questionário pré-teste antes de compartilharem as telas dos seus computadores, iniciarem o treinamento e começarem as atividades referentes ao teste.

Após os procedimentos de observação e coleta de dados, os voluntários irão responder ao questionário pós teste que também contempla avaliações de usabilidade e UX (user experience). O tempo total estimado para a sessão é de 90 minutos (30 minutos de treinamento e 60 minutos de atividades).

Todos os voluntários que comparecerem às secções receberão um e-mail com um voucher para o sorteio de um prêmio, que ocorrerá no final do ciclo de pesquisa. Ao final de suas respectivas secções, todos os voluntários terão de responder o e-mail enviado para confirmar seu desejo de participar do sorteio.

Antes do término das secções, o pesquisador solicitará, aos voluntários, indicações para futuros estudos e adotará o número do voucher como código de identificação do usuário para efeito de descrição dos resultados obtidos.

Toda informação fornecida NÃO terá outro fim além dos já citados. Os questionários certificam anonimato, privacidade e direitos éticos dos respondentes. Todos os dados coletados NÃO serão distribuídos, publicados online ou compartilhados sob quaisquer circunstâncias. Todos os vídeos, formulários, e dados que permitam identificação dos respondentes e participantes serão completamente destruídos em 31 de março de 2021.

Obrigado pela sua colaboração!

\*Campo obrigatório.

\*Obrigatório



Você concordou em participar de um estudo de usabilidade/UX que avalia o OFR. Ao participar deste estudo, você irá ajudar à equipe de desenvolvimento do OFR à aprimorar o OFR em futuros redesigns. Um pesquisador irá te observar e registrar informações sobre como você utiliza o OFR. Também solicitaremos que você preencha formulários ou questionários a cerca de sua experiência com o programa e faremos perguntas sobre este mesmo assunto. Nós iremos registrar seus comentários e ações por meio de gravação de vídeo e anotações. O pesquisador irá usar os dados e vídeos obtidos em sua sessão exclusivamente para avaliar o OFR e compartilhar os resultados da avaliação com a comunidade da UNIFACS. A preencher este formulário, você autoriza a equipe de pesquisa da UNIFACS à usar: a gravação de áudio de sua voz, suas declarações verbais e os registros em vídeo de sua sessão de avaliação (você não é obrigado(a) à compartilhar imagem de sua webcam). Seu nome, e-mail ou registros em vídeos NÃO serão usados na apresentação de quaisquer resultados deste estudo. Toda informação fornecida NÃO terá outro fim além dos já citados. Os questionários certificam anonimato, privacidade e direitos éticos dos respondentes. Todos os dados coletados NÃO serão distribuídos, publicados online ou compartilhados sob quaisquer circunstâncias. Todos os vídeos, formulários, e dados que permitam identificação dos respondentes e participantes serão completamente destruídos em 31 de março de 2021. Toda informação fornecida não terá outro uso além de investigar o impacto dos recursos de IHC na eficiência da tarefa de elaborar relatórios financeiros XBRL. Vovê irá receber um numero da sorte, para concorrer a um prêmio (Um tablet HOW HT-705 XS), por sua participação; no entanto, sua aceitação deste incentivo não constitui vínculo empregatício com a UNFACS, a equipe de pesquisa, ou com a instituição de financiamento da pesquisa. Se você precisar de uma pausa durante a sessão, por favor informar imediatamente ao facilitador do estudo. Se você tem alguma dúvida sobre como as secções de avaliação irão funcionar, você também pode perguntá-las a qualquer momento. Você pode desistir da sessão de avaliação em qualquer momento. Se você concorda com estes termos, por favor indique sua aceitação marcando as caixas abaixo. \*

Eu concordo.

Eu discordo.



Apelido (Não precisa ser seu verdadeiro apelido. Este campo é apenas uma forma de evitar que o pesquisador se refira à você através de código numérico, durante as videoconferências). \*

Sua resposta

E-mail: \*

Sua resposta

Data disponível para o teste: \*

DD MM AAAA

/ /

Horário disponível para o teste: \*

Horário

:



Em qual das faixas etárias a seguir podemos classificar sua idade? \*

- 18-30 anos.
- 31-40 anos.
- 41-50 anos.
- 51-60 anos.
- 61-70 anos.
- Prefiro não informar.

Qual o seu maior grau acadêmico completo? \*

- Nível médio
- Nível técnico
- Graduação
- Pós-graduação
- Mestrado
- Doutorado
- Pós-doutorado
- Livre docente

Qual a sua profissão? \*

Sua resposta



Qual seu cargo em seu trabalho? \*

Sua resposta

Há quanto tempo você tem realizado tarefas relacionadas a relatórios financeiros? \*

- Menos de 2 anos
- De 2 a 5 anos
- De 6 a 10 anos
- De 11 a 20 anos
- Mais de 20 anos
- Eu não tenho realizado tarefas relacionadas a relatórios financeiros

Em uma escala de 1-5, como você avalia seu conhecimento sobre computadores? \*

- |       |                       |                       |                       |                       |                       |              |
|-------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------------|
|       | 1                     | 2                     | 3                     | 4                     | 5                     |              |
| Leigo | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Profissional |

Em uma escala de 1-5, como você avalia seu conhecimento sobre contabilidade? \*

- |       |                       |                       |                       |                       |                       |              |
|-------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------------|
|       | 1                     | 2                     | 3                     | 4                     | 5                     |              |
| Leigo | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Profissional |





Em uma escala de 1-5, como você avalia seu conhecimento sobre XBRL?

\*

1      2      3      4      5

Leigo                                    Profissional

Você já usou algum programa para confeccionar relatórios financeiros XBRL? \*

Sim

Não

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## The event reminding message

Hello, dear [participant name]:

Thank you very much for agreeing to participate in the Open Financial Reporting (OFR) development research. As scheduled in the signup form, your evaluation session will be at <https://demo.bigbluebutton.org/gl/ant-pj5-jfb> on [date and time]. Your access code is 295663. If you have never used the Bigbluebutton video conferencing platform here is a link where you will find quick instructions on how to use it: <https://bigbluebutton.org/html5/>

Because we are scheduling very few people for this study, it is extremely important that you keep your appointment with us. If for any reason you cannot make it, or you find you will be unavoidably late, please contact Antônio Oliveira, at +55 71 997003104 as soon as you know. Please do not send anyone else in your place.

If you do not have Java 8 or later installed, please download it at <https://www.java.com/en/download/manual.jsp> and install it before your session. That link also has instructions for downloading and installing Java. If you have trouble with it, the researcher may help you out during the meeting.

You will use the OFR software for instantiating XBRL financial reports and performing a few tasks. You will also answer a few questionnaires. Then, the evaluation staff will:

- ask you a few follow-up questions to clarify their observations to ensure they thoroughly understand your actions with the OFR;
- obtain any additional feedback you feel is important.

After your session, you will receive a code for participating in the prize draw as our thanks for your participation. We will need the address to which you would like us to send the tablet HOW HT-705 XS. The winner will receive the prize via SEDEX, a couple of days after the draw.

I'd like to remind you that, with your permission, we will videotape your session, and that these tapes will be used by the project team within the company for analysis purposes only; all personal information, including your identity, will remain company confidential. If you have any questions, please feel free to call us at +55 71 997003104 or email us at [antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com).

Regards,

OFR development team.

### **The invitational email**

Hello, dear [participant name]:

Thank you very much for answering the Volunteer recruiting form. I would like to invite you to participate in our study. As you scheduled earlier, your evaluation session will be at <https://demo.bigbluebutton.org/gl/ant-pj5-jfb> on [date and time].

Your access code is 295663, and your volunteer ID code is [numer code]. You will receive an event reminding email the day before you scheduled your section with more detailed information about the study. If you have never used the Bigbluebutton video conferencing platform, here is a link where you will find quick instructions on how to use it: <https://bigbluebutton.org/html5/>

If you do not have Java 8 or later installed, please download it at <https://www.java.com/en/download/manual.jsp> and install it before your section. That link also has instructions for downloading and installing Java. If you have trouble with it, the researcher may help you out during the meeting.

I would like to remind you that your session will be videotaped, but that these tapes will be used by the project team within the company for analysis purposes only; all information, including your identity, will remain confidential. Before starting your experience with the OFR, you might receive directions about the software's basic features. The total section-time estimated will be 90 minutes (30 minutes for training and 60 for activities).

Every volunteer that shows up will receive an email with a “lucky number” for the prize draw that will take place at the end of each evaluation phase. At the end of the section, all of them will have to answer the email to ensure they wanted to join the prize draw. Your “lucky number” will be your volunteer identification code in the description of the results.

Before ending the section, the researcher will also ask the participants about referrals for future studies. All the information provided will not have any other purpose than the aforementioned ones. The questionnaire also assures one's anonymity, privacy, and ethical rights. All data gathered will not be handled, posted online, or shared under any circumstances. All data that allows identifying you will be completely deleted on 03/31/2021.

If you have any questions, please feel free to call us at +55 71 997003104 or email us at antonioricardo1993@gmail.com. We are counting on your participation. Thank you for helping us out!

Regards,

OFR development team.

### **The rescheduling email**

Hello, dear [participant name]:

Thank you very much for answering the recruiting form. I would like to invite you to participate in our study. However, we are afraid we do not have an evaluator available the time you requested. Could you, please, inform another date and time when you will be available to perform the tests?

If you do not have Java 8 or later installed, please download it at <https://www.java.com/en/download/manual.jsp> and install it before your section. That

link also has instructions for downloading and installing Java. If you have trouble with it, the researcher may help you out during the meeting.

Every volunteer that shows up will receive an email with a “lucky number” for the prize draw that will take place at the end of each evaluation phase. At the end of the section, all of them will have to answer the email to ensure they wanted to join the prize draw. Your “lucky number” will be your volunteer identification code in the description of the results.

All data gathered will not be handled, posted online, or shared under any circumstances. All data that allows identifying you will be completely deleted on 03/31/2021. If you have any questions, please feel free to call us at +55 71 997003104 or email us at [antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com). We are counting on your participation. Thank you for helping us out!

Regards,

OFR development team.

### **The excuse email**

Hello, dear [participant name]:

Thank you very much for answering the Volunteer recruiting form. I'm afraid it will not be possible to invite you to participate in our study because we already have enough people with your profile right now.

Thank you for your initiative to help us. We would like to know if we can count on you for future studies. If you have any questions, please feel free to call us at +55 71 997003104 or email us at [antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com).

Regards,

OFR development team.

**The email with the prize draw code and thank note**

Dear [participant name],

The OFR development team would like to thank you for participating in our usability/UX evaluations. You provided us with valuable feedback, which we will use to make recommendations for improving the OFR.

If you know of someone else who may be interested in participating in a usability study, please email us at [antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com) to let us know the name of the person you are referring, and how we may contact your referral.

Here is your lucky number [code] for the prize draw that will take place at [date]. Thanks again for your time and interest in our study.

Regards,

OFR development team.

**The receipt form**

Hello, dear [participant name]:

Thank you for participating in the OFR usability/UX evaluation. Please acknowledge that you have received from the researcher the tablet HOW HT-705 XS for your participation by responding to this e-mail. Note that your acceptance of this incentive does not constitute employment by UNIFACS, the researcher, or the financier institution. Thanks again for your participation!

Regards,

OFR development team.

## The event reminding message in Portuguese

Olá, prezado(a) [participant name]:

Muito obrigado por concordar em participar da pesquisa de desenvolvimento do Open Financial Reporting (OFR). Conforme agendado no formulário de inscrição, sua sessão de avaliação será em <https://demo.bigbluebutton.org/gl/ant-pj5-jfb> em [data e hora]. Seu código de acesso é 295663. Se você nunca usou a plataforma de videoconferência Bigbluebutton, aqui está um link onde você encontrará instruções rápidas sobre como usá-la: <https://bigbluebutton.org/html5/>

Como estamos contactando poucas pessoas para este estudo, é extremamente importante que você mantenha seu compromisso conosco. Se por algum motivo você não puder comparecer ou se chegar atrasado, entre em contato com Antônio Oliveira, pelo telefone +55 71 997003104, assim que puder. Por favor, não mande ninguém em seu lugar.

Se você não tiver o Java 8 ou posterior instalado, baixe-o em <https://www.java.com/pt-BR/download/manual.jsp> e instale-o antes de sua sessão. Esse link também contém instruções para baixar e instalar o Java. Se você tiver problemas com isso, o pesquisador pode ajudá-lo durante a reunião.

Você usará o software OFR para criar relatórios financeiros XBRL e executar algumas tarefas. Você também responderá a alguns questionários. Então, a equipe de avaliação irá:

- fazer algumas perguntas de acompanhamento para esclarecer suas observações e garantir que entendam completamente suas interações com o OFR;
- obter qualquer feedback adicional que considere importante.

Após a sessão, você receberá um código para participar do sorteio como agradecimento pela sua participação. Precisaremos do endereço para o qual você deseja que enviemos o tablet HOW HT-705 XS. O vencedor receberá o prêmio via SEDEX, alguns dias após o sorteio.

Gostaria de lembrar que, com sua permissão, iremos gravar sua sessão em vídeo (na qual você **não** é obrigado(a) compartilhar sua webcam), e que esses arquivos serão usados pela equipe do projeto, dentro da empresa, apenas para fins de análise; todas as informações pessoais, incluindo sua identidade, permanecerão confidenciais. Em caso de dúvidas, por favor, ligue para +55 71 997003104 ou envie um e-mail para antonioricardo1993@gmail.com.

Atenciosamente,

Equipe de desenvolvimento do OFR.

### **The invitational email in Portuguese**

Olá, prezado(a) [participant name]:

Muito obrigado por responder ao formulário de recrutamento de voluntários. Gostaria de convidá-lo(a) a participar de nosso estudo. Conforme você agendou anteriormente, sua sessão de avaliação será em <https://demo.bigbluebutton.org/gl/ant-pj5-jfb> em [data e hora].

Seu código de acesso é 295663 e seu código ID de voluntário é [código numérico]. Você receberá um e-mail de lembrete do evento um dia antes do agendado para sua sessão com informações mais detalhadas sobre o estudo. Se você nunca usou a plataforma de videoconferência Bigbluebutton, aqui está um link onde você encontrará instruções rápidas sobre como usá-la: <https://bigbluebutton.org/html5/>

Se você não tiver o Java 8 ou posterior instalado, baixe-o em <https://www.java.com/pt-BR/download/manual.jsp> e instale-o antes de sua sessão. Esse link também contém instruções para baixar e instalar o Java. Se você tiver problemas com isso, o pesquisador pode ajudá-lo durante a reunião.

Gostaria de lembrar que sua sessão será gravada em vídeo (na qual você **não** é obrigado(a) compartilhar sua webcam), mas esses arquivos serão utilizados pela equipe do projeto, dentro da empresa, apenas para fins de análise; todas as



informações, incluindo sua identidade, permanecerão confidenciais. Antes de começar sua experiência com o OFR, você pode receber instruções sobre os recursos básicos do programa. O tempo total estimado da sessão será de 90 minutos (30 de treinamento e 60 de atividades).

Cada voluntário que comparecer receberá um e-mail com um “número da sorte” para o sorteio que ocorrerá ao final de cada ciclo de pesquisa. Ao final da sessão, todos terão que responder ao e-mail para garantir que desejam participar do sorteio. O “número da sorte” será seu código de identificação de voluntário na descrição dos resultados.

Antes de encerrar a sessão, o pesquisador também pedirá aos participantes referências de outras pessoas para estudos futuros. Todas as informações fornecidas não terão outra finalidade senão as mencionadas. O questionário também garante o anonimato, a privacidade e os direitos éticos. Todos os dados coletados não serão transferidos, publicados online ou compartilhados em nenhuma circunstância. Todos os dados que permitem identificá-lo(a) serão totalmente apagados em 31/03/2021.

Em caso de dúvidas, por favor, ligue para +55 71 997003104 ou envie um e-mail para [antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com). Contamos com a sua participação. Obrigado por nos ajudar!

Atenciosamente,

Equipe de desenvolvimento do OFR.

### **The rescheduling email in Portuguese**

Olá, prezado(a) [participant name]:

Muito obrigado por responder ao formulário de recrutamento de voluntários. Gostaria de convidá-lo(a) a participar de nosso estudo. No entanto, não temos um membro

com disponibilidade compatível com a sua. Você poderia nos informar outro dia e horário em que esteja disponível para participar do estudo?

Se você não tiver o Java 8 ou posterior instalado, baixe-o em <https://www.java.com/pt-BR/download/manual.jsp> e instale-o antes de sua sessão. Esse link também contém instruções para baixar e instalar o Java. Se você tiver problemas com isso, o pesquisador pode ajudá-lo durante a reunião.

Cada voluntário que comparecer receberá um e-mail com um “número da sorte” para o sorteio que ocorrerá ao final de cada ciclo de pesquisa. Ao final da sessão, todos terão que responder ao e-mail para garantir que desejam participar do sorteio. O “número da sorte” será seu código de identificação de voluntário na descrição dos resultados.

Todos os dados coletados não serão transferidos, publicados online ou compartilhados em nenhuma circunstância. Todos os dados que permitem identificá-lo(a) serão totalmente apagados em 31/03/2021.

Em caso de dúvidas, por favor, ligue para +55 71 997003104 ou envie um e-mail para [antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com). Contamos com a sua participação. Obrigado por nos ajudar!

Atenciosamente,

Equipe de desenvolvimento do OFR.

### **The excuse email in Portuguese**

Olá, prezado(a) [participant name]:

Agradeço por responder ao formulário de recrutamento de voluntários. Infelizmente, não será possível convidá-lo para participar de nosso estudo porque já temos pessoas suficientes com o seu perfil no momento.

Obrigado por sua iniciativa em nos ajudar. Gostaríamos de saber se podemos contar com você para estudos futuros. Em caso de dúvidas, por favor, ligue para +55 71 997003104 ou envie um e-mail para [antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com).

Atenciosamente,

Equipe de desenvolvimento do OFR.

### **The email with the prize draw code and thank note in Portuguese**

Prezado(a) [participant name],

A equipe de desenvolvimento do OFR gostaria de agradecer a você por participar de nossas avaliações de Usabilidade/UX. Você nos forneceu um feedback valioso, que usaremos para melhorar o OFR.

Se você conhece alguém que possa estar interessado em participar de um estudo de usabilidade, envie um email para [antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com), para nos informar o nome da pessoa que você está indicando e como podemos entrar em contato com o seu indicado(a).

Aqui está o seu número da sorte [código] para o sorteio que acontecerá em [data]. Obrigado novamente pelo seu tempo e interesse em nosso estudo.

Atenciosamente,

Equipe de desenvolvimento do OFR.

### **The receipt form in Portuguese**

Olá, prezado(a) [participant name]:

Agradeço por participar da avaliação de Usabilidade/UX do OFR. Por favor, confirme que você recebeu do pesquisador o tablet HOW HT-705 XS, pela sua participação, respondendo a este e-mail. Observe que a sua aceitação desse incentivo não constitui vínculo empregatício ante a UNIFACS, o pesquisador ou a instituição financiadora.

Atenciosamente,

Equipe de desenvolvimento do OFR.

### **The event reminding message in Spanish**

Hola [nombre del participante]:

Muchas gracias por aceptar participar en la investigación de desarrollo de Open Financial Reporting (OFR), software para la creación de informes basado en tecnología XBRL,. Según lo programado en el formulario de registro, su sesión de evaluación será en <https://demo.bigbluebutton.org/gl/ant-pj5-jfb> el [fecha y hora]. Su código de acceso es 295663. Si nunca ha utilizado la plataforma de videoconferencia Bigbluebutton, aquí hay un enlace donde encontrará instrucciones rápidas sobre cómo utilizarlo: <https://bigbluebutton.org/html5/>

Como nos estamos comunicando con pocas personas para este estudio, es extremadamente importante que mantenga su compromiso con nosotros. Si por alguna razón no puede asistir o llega tarde, comuníquese con Antônio Oliveira al +55 71 997003104 ([antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com)) tan pronto como pueda. Por favor, no envíe a nadie en su lugar.

Si no tiene Java 8 o posterior instalado, descárguelo en <https://www.java.com/es/download/manual.jsp> e instálelo antes de su sección. Este enlace también contiene instrucciones para descargar e instalar Java. Si tiene problemas con esto, el investigador puede ayudarlo durante la reunión.

- Utilizará el software OFR para crear informes financieros XBRL y realizar algunas tareas. También responderá a algunos cuestionarios. Luego, el equipo de evaluación:
- Hacer algunas preguntas de seguimiento para aclarar sus observaciones y asegurarse de que comprende completamente sus interacciones con la OFR;
- Obtener cualquier comentario adicional que considere importante.

Después de la sesión, recibirá un código para participar en el sorteo como agradecimiento por su participación. Necesitaremos la dirección a la que desea que le enviemos la tableta HOW HT-705 XS. El ganador recibirá el premio a través de SEDEX, unos días después del sorteo.

Me gustaría recordarle que, con su permiso, grabaremos su sesión de video (en la que no está obligado a compartir su cámara web), y que estos archivos serán utilizados por el equipo del proyecto, dentro de la empresa, con fines de análisis. solo; toda la información personal, incluida su identidad, seguirá siendo confidencial. Si tiene alguna pregunta, llame al +55 71 997003104 o envíe un correo electrónico a [antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com).

Atentamente,

Equipo de desarrollo de OFR.

### **The invitational email in Spanish**

Hola [nombre del participante]:

Muchas gracias por responder al formulario de reclutamiento de voluntarios. Me gustaría invitarlos a participar en nuestro estudio. Como programó anteriormente, su sesión de evaluación será en <https://demo.bigbluebutton.org/gl/ant-pj5-jfb> el [fecha y hora].

Su código de acceso es 295663 y su código de identificación de voluntario es [código numérico]. Recibirá un recordatorio por correo electrónico del evento el día antes de su sesión programada con información más detallada sobre el estudio. Si nunca ha utilizado la plataforma de videoconferencia Bigbluebutton, aquí hay un enlace donde encontrará instrucciones rápidas sobre cómo usarlo: <https://bigbluebutton.org/html5/>.

Si no tiene Java 8 o posterior instalado, descárguelo en <https://www.java.com/es/download/manual.jsp> e instálelo antes de su sección. Este enlace también contiene instrucciones para descargar e instalar Java. Si tiene problemas con esto, el investigador puede ayudarlo durante la reunión.

Me gustaría recordarle que su sesión se grabará en video (en el que no es necesario que comparta su cámara web), pero estos archivos serán utilizados por el equipo del proyecto, dentro de la empresa, solo con fines de análisis; toda la información, incluida su identidad, será confidencial. Antes de comenzar su experiencia OFR, puede recibir instrucciones sobre las características básicas del programa. El tiempo total estimado para el tramo será de 60 minutos.

Cada voluntario que asista recibirá un correo electrónico con un “número de la suerte” para el sorteo que se realizará al final de cada ciclo de encuestas. Al final de la sección, todos deberán responder al correo electrónico para asegurarse de que quieren participar en el sorteo. El "número de la suerte" será su código de identificación de voluntario en la descripción de los resultados.

Antes de cerrar la sección, el investigador también pedirá a los participantes referencias de otros para estudios futuros. Toda la información proporcionada no tendrá otro fin que el mencionado. El cuestionario también garantiza el anonimato, la privacidad y los derechos éticos. Todos los datos recopilados no serán transferidos, publicados en línea o compartidos bajo ninguna circunstancia. Todos los datos que le permitan ser identificado serán eliminados por completo el 31/03/2021.

Si tiene alguna duda o pregunta, llame al +55 71 997003104 o envíe un correo electrónico a [antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com). Contamos con su participación.  
¡Gracias por ayudarnos!

Atentamente,

Equipo de desarrollo de OFR

## The rescheduling email in Spanish

Hola [nombre del participante]:

Muchas gracias por responder al formulario de reclutamiento de voluntarios. Me gustaría invitarlo a participar en nuestro estudio. Sin embargo, no tenemos un miembro con disponibilidad compatible con la suya.

¿Podría decirnos otro día y hora en que estará disponible para participar en el estudio? Si no tiene Java 8 o posterior instalado, descárguelo en <https://www.java.com/es/download/manual.jsp> e instálelo antes de su sección. Este enlace también contiene instrucciones para descargar e instalar Java. Si tiene problemas con esto, el investigador puede ayudarlo durante la reunión.

Cada voluntario que asista recibirá un correo electrónico con un “número de la suerte” para el sorteo que se realizará al final de cada ciclo de encuestas. Al final de la sección, todos deberán responder al correo electrónico para asegurarse de que quieren participar en el sorteo. El “número de la suerte” será su código de identificación de voluntario en la descripción de los resultados.

Todos los datos recopilados no serán transferidos, publicados en línea o compartidos bajo ninguna circunstancia. Todos los datos que le permitan ser identificado serán eliminados por completo el 31/03/2021.

Si tiene alguna pregunta, llame al +55 71 997003104 o envíe un correo electrónico a [antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com). Contamos con su participación. ¡Gracias por ayudarnos!

Atentamente,

Equipo de desarrollo de OFR.

### **The excuse email in Spanish**

Hola [nombre del participante]:

Gracias por responder al formulario de reclutamiento de voluntarios. Desafortunadamente, no será posible invitarlo a participar en nuestro estudio porque ya tenemos suficientes personas con su perfil en este momento.

Gracias por su iniciativa para ayudarnos. Nos gustaría saber si podemos contar con usted para futuros estudios. Si tiene alguna pregunta, llame al +55 71 997003104 o envíe un correo electrónico a [antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com).

Atentamente,

Equipo de desarrollo de OFR.

### **The email with the prize draw code and thank note in Spanish**

Estimado [nombre del participante]:

El equipo de desarrollo de OFR desea agradecerle por participar en nuestras evaluaciones de Usabilidad / UX. Nos ha proporcionado comentarios valiosos, que utilizaremos para mejorar OFR.

Si conoce a alguien que pueda estar interesado en participar en este estudio de usabilidad, envíe un correo electrónico a [antonioricardo1993@gmail.com](mailto:antonioricardo1993@gmail.com), para decirnos el nombre de la persona a la que está refiriendo y cómo podemos comunicarnos con su nominado.

Aquí está su número de la suerte [código] para el sorteo que tendrá lugar el [fecha]. Gracias nuevamente por su tiempo e interés en nuestro estudio.



Atentamente,

Equipo de desarrollo de OFR.

**The receipt form in Spanish**

Hola [nombre del participante]:

Gracias por participar en la evaluación de usabilidad / UX de OFR. Confirme que recibió la tableta HOW HT-705 XS del investigador, por su participación, respondiendo a este correo electrónico. Tenga en cuenta que su aceptación de este incentivo no constituye una relación laboral con UNIFACS, el investigador o la institución financiadora.

Atentamente,

Equipo de desarrollo de OFR.

## **APPENDIX D - DOCUMENTS**

The following subtopics show all the documents generated during the OFR development process.

### **OFR's Use-Case Specification Document**

XBRL – Open Financial Reporting software	
Use-Case Specification: Create XBRL Instances	Version 2.0.1

## **XBRL – Open Financial Reporting software Use-Case Specification: Create XBRL Instances**

**Version 2.0.1**

### **Revision History**

<b>Date</b>	<b>Version</b>	<b>Description</b>	<b>Author</b>
31/07/2012	1.0.0	First version	Paulo Caetano
08/12/2020	2.0.0	Update for OFR features	António Oliveira
27/01/2021	2.0.1	Fixing minor details in the use-cases	António Oliveira

XBRL – Open Financial Reporting software	
Use-Case Specification: Create XBRL Instances	Version 2.0.1

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XBRL – Open Financial Reporting software	
Use-Case Specification: Create XBRL Instances	Version 2.0.1

## Use-Case Specification: Create XBRL Instances

### 1. Introduction

#### 1.1 Description

This use-case regards the processes of creating, editing, and deleting XBRL instance documents according to a financial reporting taxonomy. It also encompasses supportive functions for each aforementioned process. Figure 1 depicts the use-case diagram for enabling XBRL instance document creation.

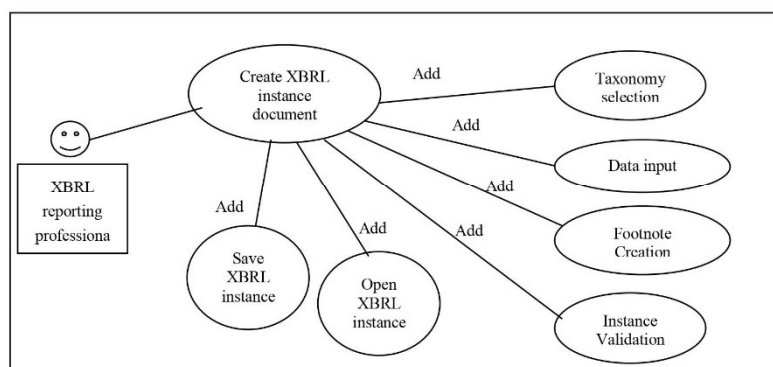


Figura 1 – Use-case diagram.

#### 1.2 Definitions, Acronyms and Abbreviations

XBRL – eXtensible Business Reporting Language

#### 1.3 References

Título	Versão	Data	Onde pode ser obtido
XBRL Specification 2.1	2.1	25/01/12	<a href="http://www.xbrl.org/SpecRecommendations">http://www.xbrl.org/SpecRecommendations</a>
XML Specification – rules for language tagging	1.0	06/10/00	( <a href="http://www.w3.org/TR/2000/REC-xml-20001006#scc-lang-tag">http://www.w3.org/TR/2000/REC-xml-20001006#scc-lang-tag</a> )

### 2. Pre-conditions

It is necessary to have a taxonomy file available, such as Siconfi's financial reporting taxonomy, to enable XBRL document instantiation and validation.

### 3. Actors

Actor	Description	Type [U = user; H = external hardware; S = system]
/XBRL reporting professional/	The user who has access to create Siconfi-based XBRL instances.	[U]

XBRL – Open Financial Reporting software	
Use-Case Specification: Create XBRL Instances	Version 2.0.1

#### 4. Use-Case Detailing

In this section, mandatory tasks or interactions are marked by the use of the verb “shall”. Optional tasks or interactions are marked by the use of the verb “may”.

Use-Case:	<i>XBRL instance document creation</i>		Nº: 01
<b>General Description</b>			
It initiates the XBRL instance document creation software and shows the user the main screen, through which the user shall create an empty XBRL instance document and perform actions to fill it up.			
<b>Actors</b>			
User profile: XBRL reporting professional.			
<b>Pre-conditions</b>			
Inexistent.			
<b>Regular event course</b>			
<b>The actors' action</b>		<b>The system's response</b>	
1. The actor shall initialize the system.		1. The system shall exhibit the empty main screen with the top menu bar, and it waits for the user to put an action in the course (Figure 1-1).	
<b>Alternative event course</b>			
3. The actor may close the window.		3. The system ends.	
4. In the top menu bar, the actor may click a "Language" menu and select one among the available languages to display the software components.		4. The system shall update the main screen and the top menu bar with the translated labels. Then, it waits for the user to put an action in the course.	
5. In the top menu bar, the actor may click a "Help" menu and select the option "About".		5. The system shall exhibit a new window informing the user how he/she can get the software user's guide for further information about how to use it.	
<b>Interface requirements</b>			
Inexistent.			
<b>Postcondition</b>			
Inexistent.			
<b>Notes</b>			
Inexistent.			

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Use-Case:	Taxonomy selection	Nº: 02
<b>General Description</b>		
It allows the user to select a Taxonomy file to load. This file is the base for creating the XBRL instance document.		
<b>Actors</b>		
User profile: XBRL reporting professional.		
<b>Pre-conditions</b>		
The system successfully went through UC-01, showing the screen from Figure 1-1.		
<b>Regular event course</b>		
<b>The actors' action</b>	<b>The system's response</b>	
1. The actor shall click on the Select Taxonomy button on the main screen (Figure 1-1).	1. The software shall open a file location selection window through which the user provides the taxonomy file path.	
2. The actor shall select the taxonomy the system will have to load, and click on a load button.	2. The software shall load the taxonomy files and the linkbase files as well as update the options available through the remaining menus.	
3. The user shall click a button to select a report model.	3. The software shall exhibit the options available in a new list and wait for the user to select an option or to cancel the action. The system shall update the fields within the options menus (Figures 1-3 to 1-5) from the main screen (Figure 1-1) regarding the selected Presentation linkbase and waits for the user to evoke the Use-case number 03 (Data input).	
<b>Alternative event course</b>		
The actor cancels the operation, and the system waits for the next interaction.		
<b>Interface requirements</b>		
Inexistent.		
<b>Postcondition</b>		
The software updates the fields within the options menus (Figures 1-3 to 1-5) from the main screen (Figure 1-1) regarding the loaded taxonomy files.		
<b>Notes</b>		
Inexistent.		

XBRL – Open Financial Reporting software	
Use-Case Specification: Create XBRL Instances	Version 2.0.1

Use-Case:	Data input	Nº: 03
<b>General Description</b>		
It allows users to insert the elements, financial statements, and all information that shall be in the financial report, except for footnotes (Use-case 04).		
<b>Actors</b>		
User profile: XBRL reporting professional.		
<b>Pre-conditions</b>		
The actor has already performed the Use-case 02, so the system has loaded all necessary features to enable inserting data in the empty XBRL instance document.		
<b>Regular event course</b>		
<b>The actors' action</b>	<b>The system's response</b>	
1. The actor shall click on an element management menu on the main screen.	1. The system shall exhibit the element management menu with three options for the actor to choose the next action course: Insert, Edit, and Delete.	
2. The actor shall click on an insert element button.	2. The system shall show the element insertion screen (Figure 1-3) with the list of available elements.	
3. The actor shall select an element.	3. The system shall make available the fields to input values for each attribute of the chosen element.	
4. The actor shall input the data and click the add button.	4. The system shall add the element data to the XBRL instance file and display the new element in the document information window in the proper place.	
<b>Alternative event course</b>		
5. Alternatively, the actor may click the option edit.	5. The system shall exhibit a new window (Figure 1-4) with lists of the XBRL instance document existing elements and wait the actor to select one and enter the new data about that element.	
5.1 The actor shall select an element, fill up the new data through the dialog box and click the edit button.	5.1 The system shall update the chosen element data and wait for the actor to take another action course.	
6. Alternatively, the user may click the option delete.	6. The system shall exhibit a new window (Figure 1-5) with lists of the XBRL instance document existing elements.	
6.1 The actor shall select an element and click the delete button.	6.1 The system shall delete the chosen element from the XBRL instance document, from the document information panel, and wait for the actor to take another action course.	
<b>Interface requirements</b>		
Inexistent.		
<b>Postcondition</b>		
The system updates the XBRL instance document and the document information panel according to the actions the actor performed.		
<b>Notes</b>		
Inexistent.		



XBRL – Open Financial Reporting software	
Use-Case Specification: Create XBRL Instances	Version 2.0.1

Use-Case:	Footnote creation		Nº: 04
<b>General Description</b>			
It allows actors to create a footnote related to any element from the XBRL instance document.			
<b>Actors</b>			
User profile: XBRL reporting professional.			
<b>Pre-conditions</b>			
The actor has already performed the Use-case 03.			
<b>Regular event course</b>			
<b>The actors' action</b>		<b>The system's response</b>	
1. The user shall select an element from the instance document information panel, then go to a menu and click the option to add a footnote.		1. The software shall exhibit the footnote insertion window with two fields for the user to fill up. The first one shall allow the user to inform the footnote' ISO 693 language code in compliance with the XML rules ( <a href="http://www.w3.org/TR/2000/REC-xml-20001006#sec-lang-tag">http://www.w3.org/TR/2000/REC-xml-20001006#sec-lang-tag</a> ). The second one shall allow the user to enter the footnote text.	
2. The user inputs the information and shall click on an insertion confirmation button.		2. Then, the software shall generate the footnote element with all its subelements, and updates the document information panel.	
<b>Alternative event course</b>			
4. Alternatively, the actor may click the option edit.		4. The software shall exhibit a window with the list of existing footnotes, and request the actor to enter the new data.	
3.1 The actor shall select a footnote, fill up the new data through the dialog box and click on an edition confirmation button.		4.1 The application shall replace the selected footnote with the new one and wait for other user action.	
5 Alternatively, the actor may click the option delete.		4. The software shall exhibit a window with the list of existing footnotes.	
5.1 The actor shall select a footnote and click an exclusion confirmation button.		6.1 The software shall delete the selected footnote and wait for other action.	
Inexistent.			
<b>Interface requirements</b>			
Inexistent.			
<b>Postcondition</b>			
The system updates the XBRL instance document and the document information panel according to the actions the actor performed.			
<b>Notes</b>			
Inexistent.			

XBRL – Open Financial Reporting software	
Use-Case Specification: Create XBRL Instances	Version 2.0.1

Use-Case:	<i>XBRL instance validation</i>	Nº: 05
<b>General Description</b>		
It validates the XBRL instance document through the Formula link.		
<b>Actors</b>		
User profile: XBRL reporting professional.		
<b>Pre-conditions</b>		
The actor has already performed the Use-case 03.		
<b>Regular event course</b>		
<b>The actors' action</b>	<b>The system's response</b>	
1. The actor shall click on an instance validation button under a menu on the main screen.	1. The system validates the XBRL instance document through the Formula link and presents a report informing whether there are inconsistencies or not with the instantiated data.	
<b>Alternative event course</b>		
Inexistent.		
<b>Interface requirements</b>		
Inexistent.		
<b>Postcondition</b>		
Inexistent.		
<b>Notes</b>		
Inexistent.		

XBRL – Open Financial Reporting software	
Use-Case Specification: Create XBRL Instances	Version 2.0.1

Use-Case:	Open XBRL instance document	Nº: 06
<b>General Description</b>		
It loads an existing XBRL instance document on the main screen, through which the user shall edit the XBRL instance document and perform actions to fill it up.		
<b>Actors</b>		
User profile: XBRL reporting professional.		
<b>Pre-conditions</b>		
The actor has already performed the Use-case 02, so the system has loaded all necessary features to enable inserting data in the loaded XBRL instance document.		
<b>Regular event course</b>		
<b>The actors' action</b>	<b>The system's response</b>	
1. The actor shall click on a open button under a menu in the main screen.	1. The system shows the file selection screen (Figure 1-10) with the available options. Then, it waits for the actor to take the following action.	
2. The actor shall inform the location path, and select the file the system will have to load. Then, the actor shall click on a load button	2. The system shall load the file with the corresponding elements, data, and footnotes. Then, it updates the document information panel in the main screen. The system shall update the fields within the options menus (Figures 1-3 to 1-5) from the main screen (Figure 1-1) regarding the selected imported document and waits for the user to take another action.	
<b>Alternative event course.</b>		
The actor closes the window, and the system waits for the next interaction.		
<b>Interface requirements</b>		
Inexistent.		
<b>Postcondition</b>		
Inexistent.		
<b>Notes</b>		
Inexistent.		

XBRL – Open Financial Reporting software	
Use-Case Specification: Create XBRL Instances	Version 2.0.1

Use-Case:	Save XBRL instance document	Nº: 07
<b>General Description</b>		
It saves the XBRL instance document into a file.		
<b>Actors</b>		
User profile: XBRL reporting professional.		
<b>Pre-conditions</b>		
The actor has already performed the Use-case 03.		
<b>Regular event course</b>		
<b>The actors' action</b>	<b>The system's response</b>	
1. The actor shall click on a save button in the main screen.	1. The system shows the file saving screen (Figure 1-9) and requests the actor to inform the desired path, and the file name.	
2. The actor shall inform the location path, the file name, and click on a save button.	3. The system saves the XBRL instance document into a file, and it waits for the next interaction.	
<b>Alternative event course.</b>		
The actor closes the window, and the system waits for the next interaction.		
<b>Interface requirements</b>		
Inexistent.		
<b>Postcondition</b>		
The software generates an XBRL file in the chosen location path.		
<b>Notes</b>		
Inexistent.		

## 5. Special Requirements

Inexistent.

XBRL – Open Financial Reporting software	
Use-Case Specification: Create XBRL Instances	Version 2.0.1

## 6. Messages for users

Código	Descrição da Mensagem
M_Error01	Please, make sure to fill up all the required fields before adding an element.
M_Error02	Please, make sure to add a context and a unit before adding financial statements.
M_Error03	Please, make sure to insert a valid institutional code.
M_Error04	Please, make sure to insert a valid period.
M_Error05	Please, make sure to insert a valid context name.
M_Error06	Please, make sure to add a context before adding explanatory notes.
M_Error07	Please, also make sure you are not incurring one of the following situations: 1 - You tried to add an element without marking the appropriate Element type Checkbox. 2 - You forgot to properly fill up any field.
M_Error08	Please, make sure to add a context and a financial statement before trying to delete a financial statement.
M_Error09	Please, make sure to add a context before trying to delete one.
M_Error10	Please, make sure to add a unit before trying to delete one.
M_Error11	Please, make sure to add an explanatory note before trying to delete one.
M_Error12	It was not possible to locate the desired element. Please, review your data input and try again.
M_Error13	Please, make sure to fill up all the required fields before editing an element.
M_Error14	Please, make sure to add a context and a financial statement before trying to edit a financial statement.
M_Error15	Please, make sure to add a context and a unit before editing financial statements.
M_Error16	Please, make sure to insert a valid institutional code.
M_Error17	Please, make sure to insert a valid period.
M_Error18	Please, make sure to insert a valid context name.
M_Error19	Please, make sure to add a context before trying to edit one.
M_Error20	Please, make sure to add a unit before trying to edit one.
M_Error21	Please, make sure to add an explanatory note before trying to edit one.
M_Error22	Please, make sure to add a context before editing explanatory notes.
M_Error23	Please, also make sure you are not incurring one of the following situations: 1 - You tried to edit an element without marking the appropriate Element type Checkbox. 2 - You forgot to properly fill up any field.
M_Error24	Please, load a taxonomy before trying to create an instance report, adding elements, or adding footnotes.
M_Error25	Please, add elements to the XBRL instance document before trying to add footnotes.
M_Error26	The instance document could not be validated. There are inconsistencies regarding the following elements: [list of elements]
M_Error27	The file load process failed. Please try it again.
M_Error28	The Value field and the Decimals field only accepts integer numbers. Please, make sure you did not type something else in those fields.
M_Error29	The Institution's code field must be a valid Siconfi's code. The End date must always be ulterior to the Start date. Please, make sure you did not type something invalid in those fields.
M_Error30	Please, remove the report's inconsistencies before trying to validate it.
M_Suc01	Element successfully added.
M_Suc02	Element successfully edited.
M_Suc03	Element successfully deleted.
M_Suc04	Footnote successfully added.
M_Suc05	Footnote successfully edited.
M_Suc06	Footnote successfully deleted.
M_Suc07	Instance file successfully validated.
M_Suc08	Taxonomy files successfully loaded.
M_Suc09	Instance document successfully loaded.

XBRL – Open Financial Reporting software	
Use-Case Specification: Create XBRL Instances	Version 2.0.1

M_Suc10	Instance file successfully generated.
M_Suc11	There are no problems regarding the accounts' context declaration.
M_Suc12	There are no problems regarding the accounts' unit declaration.
M_Suc13	There are no problems regarding the accounts' axis declaration.
M_Suc14	There are no problems regarding the non-numeric elements.
M_Suc15	There are no problems regarding the accounts' precision.
M_Suc16	Report model successfully loaded.
M_Fault00	The following accounts are missing a valid context declaration:
M_Fault01	The following accounts are missing a valid unit declaration:
M_Fault02	The following accounts are missing a valid axis declaration:
M_Fault03	Non-numeric elements regarding the context list below need a valid context references:
M_Conf00	Do you wish to save the current report before quitting?
M_Conf01	Do you wish to save the current report before loading the new report model?
M_Help	OFR prototype VX. Thanks for using the Open Financial Reporting Software! If you got any trouble, access the link to the software's documentation: <a href="http://bit.ly/XXXXXXX">bit.ly/XXXXXXX</a>

XBRL – Open Financial Reporting software	
Use-Case Specification: Create XBRL Instances	Version 2.0.1

## 7. User Interfaces

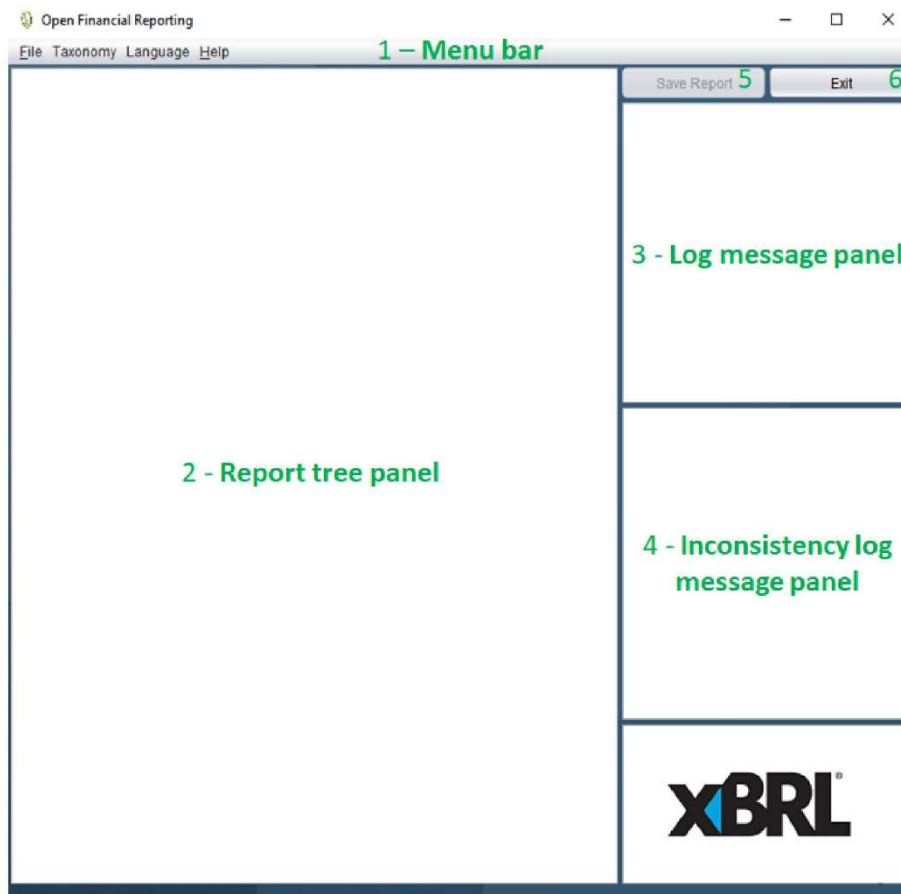


Figure 1- 1 – Main Screen



Figure 1-2 – Taxonomy selection screen

XBRL – Open Financial Reporting software	
Use-Case Specification: Create XBRL Instances	Version 2.0.1

Figure 1-3 – Element Management screen – Insert Option

Figure 1-4 – Element Management screen – Edit Option



XBRL – Open Financial Reporting software	
Use-Case Specification: Create XBRL Instances	Version 2.0.1

Figure 1- 5 – Element Management screen – Delete Option



Figure 1- 6 – Footnote Management screen – Insert Option



Figure 1- 7 – Footnote Management screen – Edit Option



Figure 1- 8 – Footnote Management screen – Delete Option

XBRL – Open Financial Reporting software	
Use-Case Specification: Create XBRL Instances	Version 2.0.1

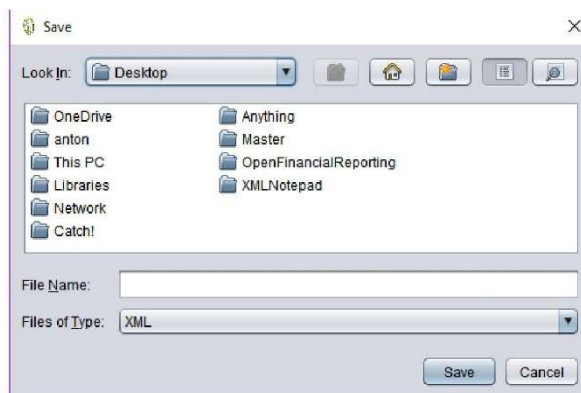


Figura 1-9 – Save XBRL Instance File

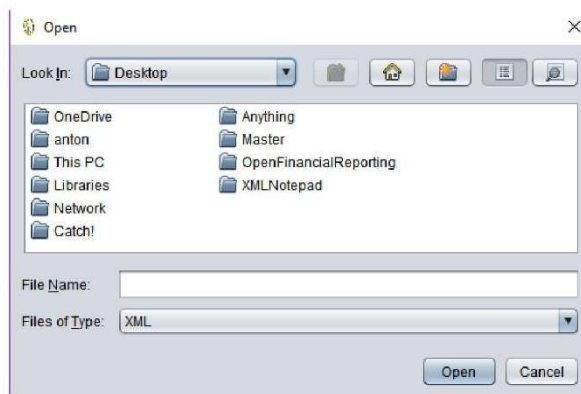


Figura 1-10 – Open XBRL Instance File

## 8. Notes

- Inexistent.

OFR's first User guide document



# OFR – User guide

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PAULO CAETANO DA SILVA

JAN-2021



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# Introduction

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## Introduction

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This document contains the basic guidelines for interacting with the Open Financial Reporting (OFR). It will be a third-part free and Open source software developed under HCI design practices to prevent the waste of time and resources of composing an XBRL financial report.

An HCI design project is focused and centered on the potential final users, whose feedback information are the main guidelines for developing and implementing the software tools and interface.

The aforementioned solution is part of a UNIFACS System and Computing Master degree Program's project. Its development will apply the Human-Computer Interface design techniques to ease the task of composing an XBRL financial report by putting aside its complexity.

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# The software interface

THE MENU BAR

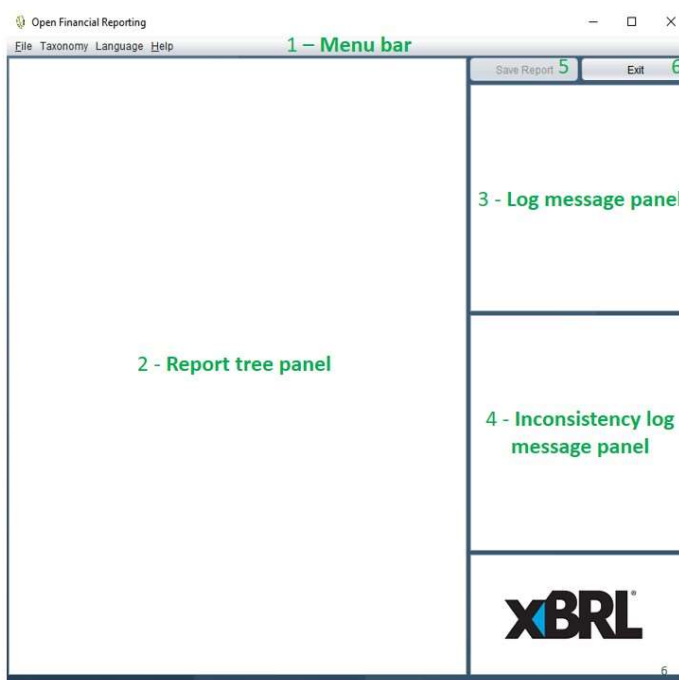
THE REPORT TREE PANEL

THE LOG MESSAGE PANEL

THE INCONSISTENCY LOG MESSAGE PANEL

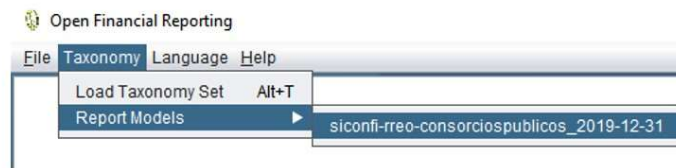
## The software interface

As depicted, OFR's interface consists of a top menu bar (item 1), a report tree panel (item 2), a log message panel (item 3), a inconsistency log message panel (item 4), a "Save Report" button (item 5), and an "Exit" button (item 6). Initially, the menu bar contains four main menus: File, Taxonomy, Language, and Help. The button becomes available after the user opens a report or start a new one. Clicking on it triggers the same set of events that the "Save" option in the "File" menu. Clicking on item 6 triggers the same set of events that the "Exit" option in the "File" menu.



## The menu bar

Within every menu, the available keyboard shortcuts for each subitem are displayed at their side. The "Taxonomy" menu has two subitems: "Load Taxonomy Set" and "Report Models". The former should open a file chooser window for the user to import a taxonomy set before creating, loading, or composing the instance report. However, the development team is testing a specific XBRL financial report, so all the taxonomy rules were already incorporated in the software source code. That is why hovering the cursor over the later option only displays report models related to the incorporated taxonomy set.



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## The menu bar

The user will not have to download, locate, and import the taxonomy files for this report. The former subitem still has no functionality attached to it. After clicking the report model option, the "New Report" and the "Open" subitems from the "File" menu become available.



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## The menu bar

After clicking the report model option, if the user has a report under edition, the OFR will prompt the user with a message that asks if he/she would like to save the current report before shifting report models.



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## The menu bar

It is also because of the "background taxonomy" that the software only deals with instances regarding the implemented taxonomy set. In this way, whenever the OFR saves an XBRL file, it will strictly follow the Presentation link rules (so, there is no need for validating the instance file through that linkbase). It also implies that whenever the OFR opens an XBRL file, it must be according to that taxonomy.

The "Help" menu has one subitem: About. Clicking on it will display a message window with a brief note about the software and a URL for downloading this document.



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## The menu bar

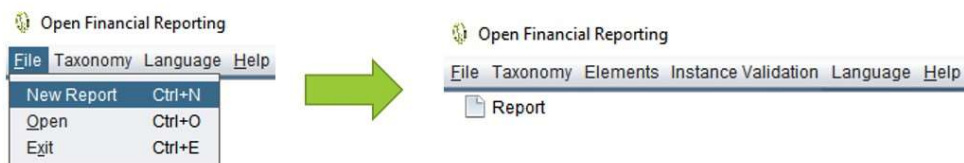
Initially, the File menu has one subitem: Exit. The "Exit" option closes the program losing all not previously saved progress. If the user has a report under edition, the OFR will prompt the user with a message that asks if he/she would like to save the current report before quitting. It has the same outcome of clicking the "Exit" button (item 6) in the software interface.



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## The menu bar

After loading a report model, the "New Report" and the "Open" subitems become available. The option New Report generates a new empty XBRL instance (a financial report in XBRL language) and enables a new subitem: "Save". After clicking on "New Report", the menus for the element managers and instance validation will also become available.

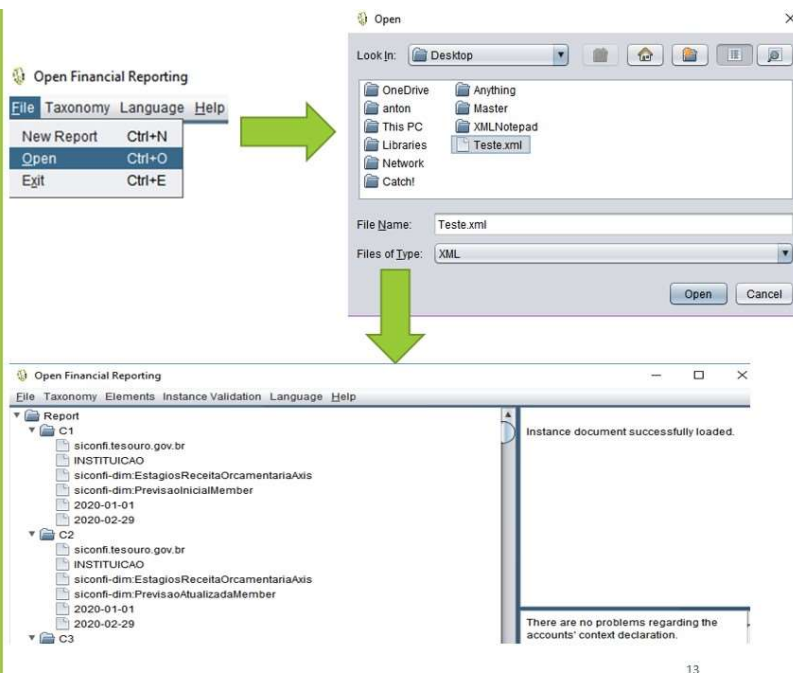


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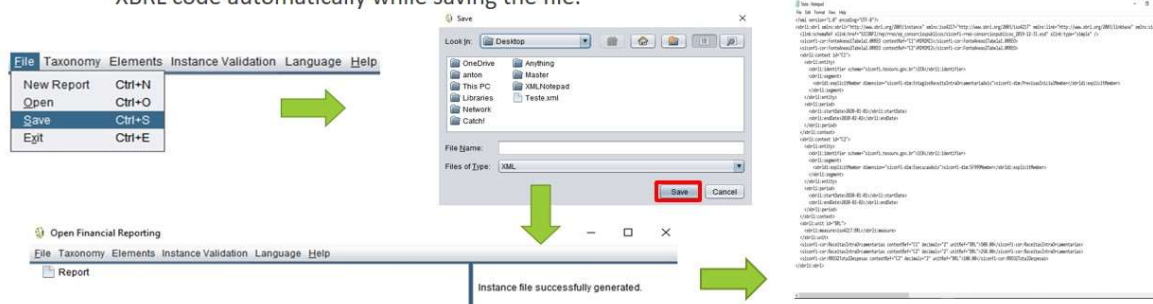
## The menu bar

As depicted, the option "Open" pops up a file chooser window for the user to navigate, select and load an XML file containing an XBRL financial report. After clicking this option, the software enables the "Save" subitem, the menus for the element managers, and instance validation. It also loads the report tree (item 2 area), shows a message (item 3 area) whether the opening process was successful or not, and generates warnings regarding inconsistencies found in the loaded report, in the item 4 area.



## The menu bar

Once the user has created a new report or opened an existing one, the option "Save" becomes available under the File menu. Clicking on it will open a file chooser window for the user to name the report file and save it wherever the folder is convenient. When the process ends, the software exhibits a message informing the file is successfully saved. The OFR generates all the XBRL code automatically while saving the file.



## The menu bar

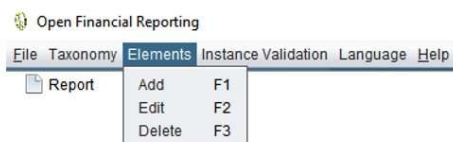
As depicted, the "Language" menu has three subitems: English, Spanish, and Portuguese. Clicking on any of them will instantly translate the whole software to the corresponding language. It is important to highlight that it only affects the software menus, windows, and options. The report elements will always display in their native language deployed to define the taxonomy set.



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## The menu bar

The menu "Elements" becomes available after the user load or create a new financial report. It has three subitems: Add, Edit, and Delete. Each of them invokes a corresponding element manager that allows the user to create, edit, and remove elements from the financial report. The section Managing elements describes all managers in better detail.

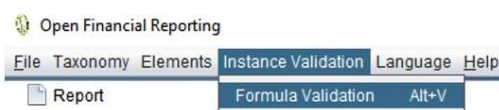


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## The menu bar

The "Instance validation" menu has one subitem: Formula Validation. It is common for XBRL instances to undergo validation through one or more linkbases. The validation process prevents inconsistencies in the instance file.

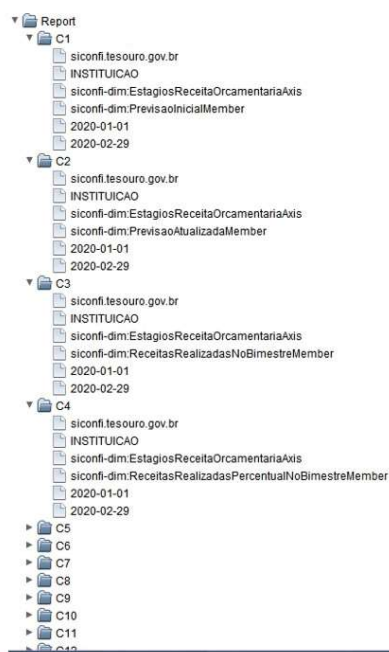
For example, a link base formula validation prevents the instance report from having financial statements that do not match the mathematical relations between them. This prototype implemented a reduced set of rules once it does not prevent the instance creation task. Even though it is an important feature, a further version of this software will fully implement this functionality.



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## The report tree panel

XBRL instance files have a hierarchical structure commonly represented through trees. The OFR provides the user a report tree panel that displays the XBRL document hierarchical structure while it is under construction. The panel displays the elements according to the order defined in the Presentation link base on the taxonomy set. It must allow the user to keep track of all the elements within the report under construction.



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## The log message panel

The OFR provides the user a log message panel that displays the software messages according to the users' interactions. The panel displays the messages in chronological order. It must allow the user to keep track of all the operations regarding the report construction. Messages regarding element's management display through specific message windows.

Instance document successfully loaded.

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## The inconsistency log message panel

The OFR provides the user a inconsistency log message panel. It displays the software messages according to the inconsistencies found in the elements within the report under edition. The messages update whenever the user edits the report or loads a new instance file. It must allow the user to keep track of all the elements with inconsistencies during the report construction.

There are no problems regarding the accounts' context declaration.

There are no problems regarding the accounts' unit declaration.

There are no problems regarding the accounts' axis declaration.

There are no problems regarding the non-numeric elements.

There are no problems regarding the accounts' precision.

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# Managing elements

INSERTING AN ELEMENT

EDITING AN ELEMENT

DELETING AN ELEMENT

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## Inserting an element

Clicking the item Add under the Elements menu will load the element insertion manager window. This way, a user can insert financial statements, contexts, units, and explanatory notes in a financial report.

The element insertion follows the rules below:

- 1 - Contexts and Units do not depend on preexisting elements so, the user can add them freely.
- 2 - Explanatory notes rely on previously added contexts so, it is not possible to add one without having already added a context.
- 3 - Financial statements rely on previously added contexts and units so, it is not possible to add one without having already added a context and a unit.

**Element insertion manager**

Type:  Account  
 Account tag:

Value:   
 Decimals:   
 Unit:   
 Context:

Type:  Non numeric  
 Non numeric element tag:   
 Context:   
 Description:

Type:  Context  
 Context name:   
 Institution's code:   
 Context axis:   
 Start date:   
 End date:   
 Schema:   
 Context dimension:   
 YYYY-MM-DD:   
 YYYY-MM-DD:   
 Secondary Context Axis:   
 Secondary Context Dimension:

Type:  Unit  
 Unit name:   
 ISO code:

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## Inserting an element

Whenever the user selects the element type by checking the available checkboxes, it disables all the items that are not related to the chosen element. However, all the remaining ones are mandatory to add that element.

Some disabled combo boxes and text fields might display some content because the software does not delete the user's progress if he/she stops the operation through the "Cancel" button. The software shall display error messages through new windows any time the user tries to add an inconsistent element by clicking the "Add" button.

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## Editing an element

Clicking the item Edit under the Elements menu will load the element edition manager window. This way, a user can edit financial statements, contexts, units, and explanatory notes in a financial report.

The element edition follows the rules below:

- 1 - Contexts and Units do not depend on preexisting elements so, the user can edit them freely.
- 2 - Explanatory notes rely on previously added contexts so, it is not possible to edit one without having already added a context.
- 3 - Financial statements rely on previously added contexts and units so, it is not possible to edit one without having already added a context and a unit.
- 4 - The user must add elements before trying to edit them.

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## Editing an element

Whenever the user selects the element type by checking the available checkboxes, it disables all the items that are not related to the chosen element. However, all the remaining ones are mandatory to edit that element.

Some disabled combo boxes and text fields might display some content because the software does not delete the user's progress if he/she stops the operation through the "Cancel" button. The software shall display error messages through new windows any time the user tries to inconsistently add data to an element when clicking the "Edit" button.

## Editing an element

Every element area in the edition manager window consists of two zones: the selection zone (signalized in blue) and the editing zone (the remaining area).

In the selection zone, the user has to choose the items that identify the element he/she wants to edit.

When the user performs a valid selection, the software auto-fills the editing area items with the current element characteristics so they can undergo edition.

All the alterations will only override the existing data after the user clicks the "Update" button.

The screenshot shows the 'Element edition manager' window. The 'Current account tag' section is active, with the 'Type' dropdown set to 'Current account tag'. The 'Account tag' field is empty. The 'Value', 'Decimals', 'Unit', and 'Context' fields are also empty. The 'Current element' section is visible below, with 'Non numeric element tag' selected. The 'Current context name' section is also visible, with 'Context name' and 'Institution's code' fields empty, and 'Context axis' set to 'EstagiosReceitaOrcamentaria'.

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The screenshot shows the 'Element edition manager' window. The 'Current account tag' section is active, with the 'Type' dropdown set to 'Current account tag'. The 'Account tag' field is empty. The 'Value', 'Decimals', 'Unit', and 'Context' fields are also empty. The 'Current element' section is visible below, with 'Non numeric element tag' selected. The 'Current context name' section is also visible, with 'Context name' and 'Institution's code' fields empty, and 'Context axis' set to 'EstagiosReceitaOrcamentaria'. Blue boxes highlight the selection zones for the 'Current account tag', 'Current element', and 'Current context name' sections.

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## Deleting an element

Clicking the item Delete under the Elements menu will load the element exclusion manager window. This way, a user can remove financial statements, contexts, units, and explanatory notes from a financial report.

The element deletion follows the rules below:

- 1 - Contexts and Units do not depend on preexisting elements so, the user can delete them freely, as long as they are not attached to other elements.
- 2 - Explanatory notes rely on previously added contexts so, it is not possible to delete one without identifying its context reference.
- 3 - Financial statements rely on previously added contexts and units so, it is not possible to delete one without identifying its context and unit references.
- 4 - The user must add elements before trying to delete them.

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## Deleting an element

Whenever the user selects the element type by checking the available checkboxes, it disables all the items that are not related to the chosen element.

Some disabled combo boxes and text fields might display some content because the software does not deplete the user's progress if he/she stops the operation through the "Cancel" button. The software shall display error messages through new windows any time the user tries to inconsistently delete an element by clicking the "Delete" button.

All the selection fields within an element area are mandatory to identify and remove that element. When the user performs a valid selection, the software auto-fills the element area items with the current element characteristics. All the alterations will only override the existing data after the user clicks the "Delete" button.

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# Messages list

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## Messages list

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- M\_Error00 This report only supports one active unit at a time.
- M\_Error01 Please, make sure to fill up all the required fields before adding an element.
- M\_Error02 Please, make sure to add a context and a unit before adding financial statements.
- M\_Error03 Please, make sure to insert a valid institutional code.
- M\_Error04 Please, make sure to insert a valid period.
- M\_Error05 Please, make sure to insert a valid context name.
- M\_Error06 Please, make sure to add a context before adding explanatory notes.
- M\_Error07 Please, also make sure you are not incurring one of the following situations: 1 - You tried to add an element without marking the appropriate Element type Checkbox. 2 - You forgot to properly fill up any field.
- M\_Error08 Please, make sure to add a context and a financial statement before trying to delete a financial statement.
- M\_Error09 Please, make sure to add a context before trying to delete one.
- M\_Error10 Please, make sure to add a unit before trying to delete one.
- M\_Error11 Please, make sure to add an explanatory note before trying to delete one.
- M\_Error12 It was not possible to locate the desired element. Please, review your data input and try again.

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## Messages list

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- M\_Error13 Please, make sure to fill up all the required fields before editing an element.
- M\_Error14 Please, make sure to add a context and a financial statement before trying to edit a financial statement.
- M\_Error15 Please, make sure to add a context and a unit before editing financial statements.
- M\_Error16 Please, make sure to insert a valid institutional code.
- M\_Error17 Please, make sure to insert a valid period.
- M\_Error18 Please, make sure to insert a valid context name.
- M\_Error19 Please, make sure to add a context before trying to edit one.
- M\_Error20 Please, make sure to add a unit before trying to edit one.
- M\_Error21 Please, make sure to add an explanatory note before trying to edit one.
- M\_Error22 Please, make sure to add a context before editing explanatory notes.
- M\_Error23 Please, also make sure you are not incurring one of the following situations: 1 - You tried to edit an element without marking the appropriate Element type Checkbox. 2 - You forgot to properly fill up any field.

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## Messages list

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- M\_Error24 Please, load a taxonomy before trying to create an instance report, adding elements, or adding footnotes.
- M\_Error25 Please, add elements to the XBRL instance document before trying to add footnotes.
- M\_Error26 The instance document could not be validated. There are inconsistencies regarding the following elements: [list of elements]
- M\_Error27 The file load process failed. Please try it again.
- M\_Error28 The Value field and the Decimals field only accepts integer numbers. Please, make sure you did not type something else in those fields.
- M\_Error29 The Institution's code field must be a valid Siconfi's code. The End date must always be ulterior to the Start date. Please, make sure you did not type something invalid in those fields.
- M\_Suc01 Element successfully added.
- M\_Suc02 Element successfully edited.
- M\_Suc03 Element successfully deleted.
- M\_Suc09 Instance document successfully loaded.
- M\_Suc10 Instance file successfully generated.

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## Messages list

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- M\_Suc07 Instance file successfully validated.
- M\_Suc11 There are no problems regarding the accounts' context declaration.
- M\_Suc12 There are no problems regarding the accounts' unit declaration.
- M\_Suc13 There are no problems regarding the accounts' axis declaration.
- M\_Suc14 There are no problems regarding the non-numeric elements.
- M\_Suc15 There are no problems regarding the accounts' precision.
- M\_Fault00 The following accounts are missing a valid context declaration: [list of elements]
- M\_Fault01 The following accounts are missing a valid unit declaration: [list of elements]
- M\_Fault02 The following accounts are missing a valid axis declaration: [list of elements]
- M\_Fault03 Non-numeric elements regarding the context list below need a valid context references: [list of elements]
- M\_Fault04 Siconfi's reports use only two decimals to express account values. Please check such inconsistencies regarding the following accounts: [list of elements]

## Messages list

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- M\_Conf00 Do you wish to save the current report before quitting?
- M\_Conf01 Do you wish to save the current report before loading the new report model?
- M\_Help OFR prototype VX. Thanks for using the Open Financial Reporting Software! If you got any trouble, access the link to the software's documentation: [bit.ly/XXXXXX](http://bit.ly/XXXXXX)



# OFR – Guia do usuário

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PAULO CAETANO DA SILVA

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### Introdução

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- Deletando um elemento

#### Lista de mensagens



# Introdução

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## Introdução

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Este documento contém as instruções básicas para interagir com o Open Financial Reporting (OFR). O referido programa será gratuito, de código aberto, e desenvolvido sob as práticas de design de IHC para evitar o desperdício de tempo e recursos de compor um relatório financeiro XBRL.

Um projeto de design de IHC é focado e centrado nos potenciais usuários finais, cujas informações de feedback são as principais diretrizes para o desenvolvimento e implementação da interface e das ferramentas do programa.

A referida solução é parte de um projeto do programa de mestrado em Sistemas e Computação da UNIFACS. Seu desenvolvimento aplicará técnicas de design de Interface Humano-Computador para facilitar a tarefa de compor um relatório financeiro XBRL por meio da abstração de sua complexidade.

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# A interface do programa

A BARRA DE MENUS

O PAINEL DA ÁRVORE DO RELATÓRIO

O PAINEL DE MENSAGENS

O PAINEL DE MENSAGENS DE INCONSISTÊNCIA

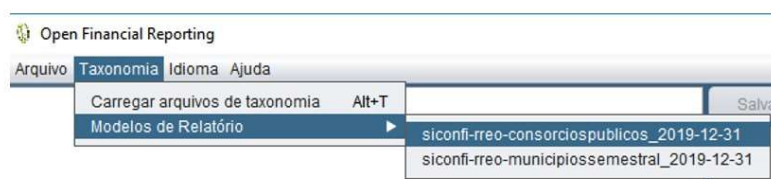
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## A interface do programa

Conforme a imagem, a interface do OFR consiste em: uma barra de menus (item 1), um painel da árvore do relatório (item 2), um painel de mensagens (item 3), um painel de mensagens de inconsistência, um botão "Salvar Relatório" (item 5), e um botão Sair (item 6). Inicialmente a barra de menus contém quatro itens principais: *File*, *Taxonomy*, *Language*, e *Help*. O item 5 se torna acessível depois que o usuário abre um relatório ou começa um novo. Clicar no item 5 é equivalente a clicar na opção "Salvar" do menu "Arquivo". Clicar no item 6 é equivalente a clicar na opção "Sair" do menu "Arquivo".

## A barra de menus

Dentro de cada menu, os atalhos disponíveis no teclado para cada subitem aparecem ao lado de cada um deles. O menu “Taxonomia” tem dois subitem: “Carregar arquivos de taxonomia” e “Modelos de Relatório”. O primeiro deveria abrir uma janela de seleção de arquivos para o usuário importar a taxonomia desejada, antes de criar, carregar ou compor um relatório de instância. No entanto, a equipe de desenvolvimento está testando um relatório financeiro XBRL específico. Deste modo, todas as regras da taxonomia já foram incorporadas ao código do programa. Por isso, passar o mouse sobre o segundo subitem exhibe apenas modelos de relatório relacionados à taxonomia incorporada.



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## A barra de menus

O usuário não terá de baixar, localizar, e importar os arquivos da taxonomia para este relatório. Assim, o primeiro subitem não tem nenhuma função programada. Depois de selecionar um modelo de relatório, as opções “Novo relatório” e “Abrir” são disponibilizadas no menu “Arquivo”.



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## A barra de menus

Após clicar na opção de modelos de relatório, se o usuário possuir algum relatório sob edição, o OFR irá exibir uma mensagem ao usuário, perguntando se ele(a) deseja salvar o relatório atual antes de trocar de modelo.



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## A barra de menus

Por causa da taxonomia incorporada, o programa apenas lida com instâncias referentes a esta taxonomia. Desta forma, toda vez que o OFR salvar um arquivo, ele obedece às regras do Presentation Link da taxonomia incorporada (por isso, não há necessidade de validar a instância neste linkbase). Analogamente, toda vez que o OFR abrir um arquivo XBRL, o programa interpreta o arquivo como sendo uma instância da taxonomia acoplada.

O item "Ajuda" tem um subitem: "Sobre". Ao clicar sobre ele, o programa exibe uma nota breve sobre seu versionamento e fornece uma URL para baixar a documentação de suporte.

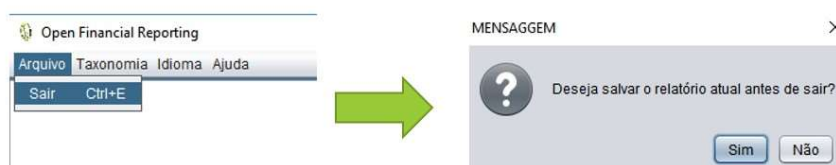


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## A barra de menus

Inicialmente, o item “Arquivo” possui um subitem: “Sair”. A opção “Sair” fecha o programa perdendo todo o progresso não salvo. Se o usuário tem um relatório sob edição, o OFR irá exibir uma janela que pergunta ao usuário se ele(a) deseja salvar o relatório atual antes de sair. Esta opção tem o mesmo resultado que clicar no botão “Sair” (item 6) na interface do programa.



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## A barra de menus

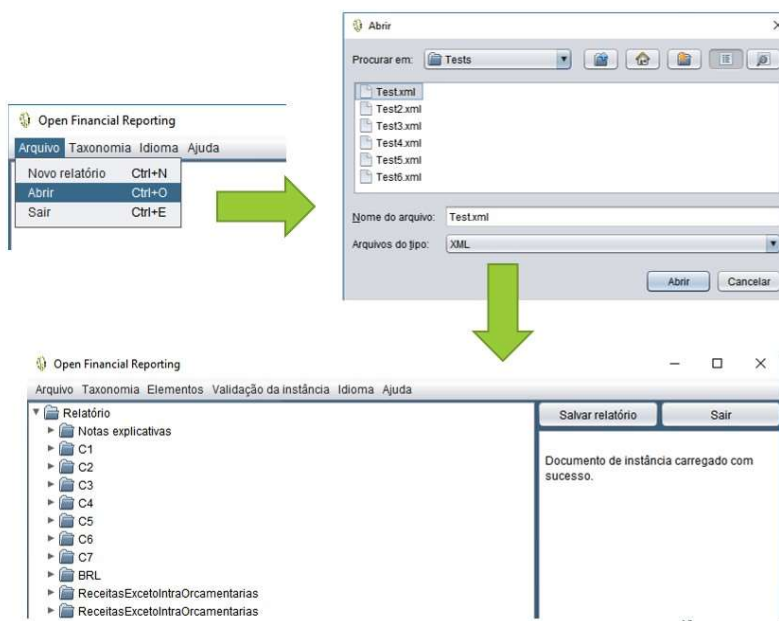
Após carregar o modelo do relatório, os subitens “Novo relatório” e “Abrir” se tornam disponíveis. O subitem “Novo relatório” gera um novo documento de instância XBRL vazio (um relatório financeiro na linguagem XBRL) e habilita um novo subitem: “Salvar”. Após clicar na opção “Novo relatório”, os menus de gerenciamento de elementos e validação de instância ficam disponíveis.



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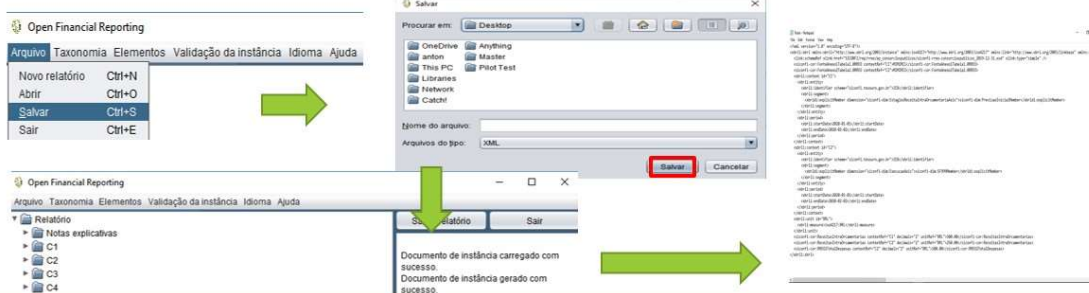
## A barra de menus

Conforme ilustrado, a opção “Abrir” exibe uma janela de seleção de arquivos para que o usuário possa navegar, selecionar e carregar um arquivo XML contendo um relatório financeiro XBRL. Após clicar nesta opção, o programa habilita o subitem “Salvar” e os menus para gerenciamento de elementos e validação de instância. Esta ação também atualiza o painel da árvore do relatório (item 2), informa, no painel de mensagem (item 3), se a abertura do documento foi bem sucedida ou não, e gera avisos referentes às inconsistências presentes no relatório carregado no item 4 da interface.



## A barra de menus

Uma vez que o usuário tenha criado ou aberto um relatório, a opção “Salvar” fica disponível no menu “Arquivo”. Ao clicar nela, o programa exibirá uma janela de seleção de arquivo para que o usuário nomeie o arquivo do relatório e o guarde numa pasta que considerar conveniente. Quando o processo termina, o programa exibe uma mensagem informando que o arquivo foi salvo com sucesso. O OFR gera todo código XBRL automaticamente enquanto salva o arquivo.



## A barra de menus

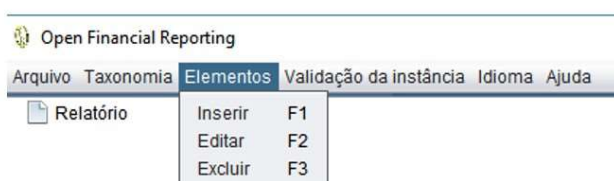
Conforme ilustrado, o menu "Language" tem três subitens: Inglês, Espanhol, e Português. Ao clicar em qualquer um deles o programa será automaticamente traduzido para o idioma correspondente. É importante salientar que isto afeta apenas os menus e janelas do programa. Os elementos do relatório sempre serão exibidos na linguagem usada na taxonomia implementada.



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## A barra de menus

O menu "Elementos" fica disponível após o usuário abrir ou criar um novo relatório. Ele tem três subitens: Inserir, Editar e Excluir. Cada um deles invoca um gerenciador de elementos correspondente, que permite ao usuário criar, editar e remover elementos do relatório financeiro. A seção "Gerenciando elementos" descreve os gerenciadores em maior detalhe.

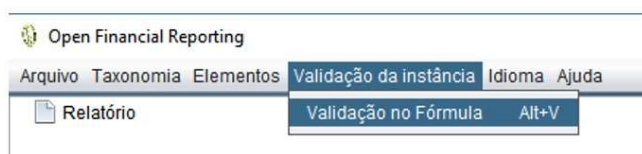


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## A barra de menus

O menu “Validação da instância” possui um subitem: Validação no Fórmula. É comum que documentos de instância XBRL sejam submetidos a validações junto a um ou mais *linkbases*. O processo de validação previne que os arquivos apresentem inconsistências.

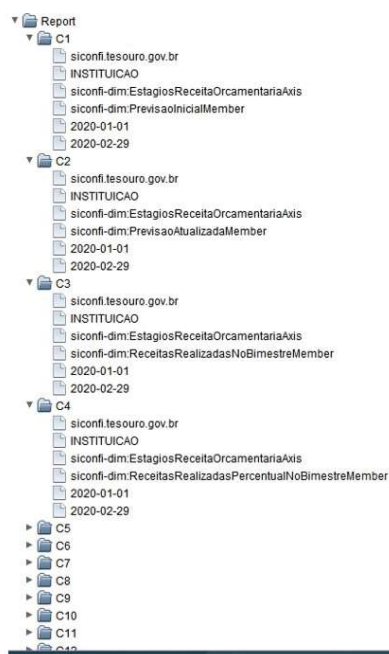
Por exemplo, uma validação no *linkbase formula* evita que o relatório possua declarações de contas que não obedeçam às relações matemáticas entre elas. Este protótipo implementou um conjunto de regras reduzido, uma vez que isso não impossibilita a criação de instâncias. Mesmo sendo um recurso importante, uma versão ulterior do programa implementará esta funcionalidade em sua completude.



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## O painel da árvore do relatório

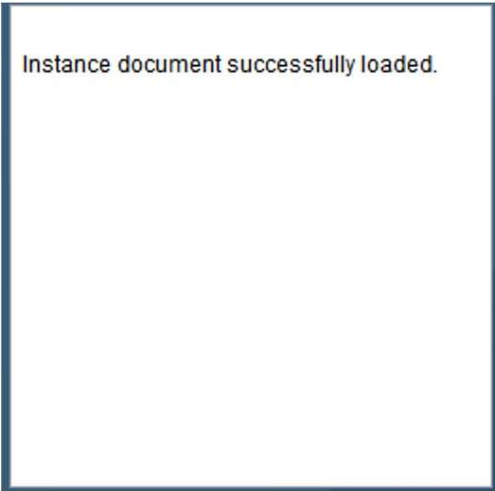
Arquivos de instância XBRL possuem uma estrutura hierárquica, comumente representada por meio de árvores. O OFR provê o painel da árvore do relatório como um recurso que exibe a estrutura hierárquica do documento XBRL, enquanto ele está em construção. O painel exibe os elementos de acordo com a ordem definida no *Presentation linkbase* da taxonomia. Sua função é permitir ao usuário verificar todos os elementos existentes no relatório em construção.



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## O painel de mensagens

O OFR provê um painel de mensagens que exibe as comunicações do programa de acordo com as ações realizadas pelo usuário. As mensagens são exibidas em ordem cronológica. Este painel deve permitir ao usuário verificar todas as operações realizadas referentes à construção do relatório. Mensagens relacionadas aos gerenciadores de elementos são exibidas em janelas de mensagens específicas.

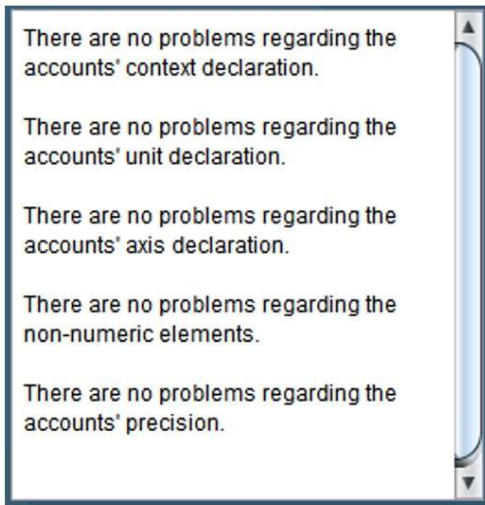


Instance document successfully loaded.

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## O painel de mensagens de inconsistência

O OFR provê o painel de mensagens de inconsistência. Ele exibe mensagens do programa de acordo com as inconsistências encontradas nos elementos do relatório sob edição. As mensagens são atualizadas toda vez que o usuário edita o relatório ou abre um arquivo de instância. Ele permite ao usuário verificar todos os elementos com inconsistências durante a construção do relatório.



There are no problems regarding the accounts' context declaration.

There are no problems regarding the accounts' unit declaration.

There are no problems regarding the accounts' axis declaration.

There are no problems regarding the non-numeric elements.

There are no problems regarding the accounts' precision.

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# Gerenciando elementos

INSERINDO UM ELEMENTO

EDITANDO UM ELEMENTO

DELETANDO UM ELEMENTO

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## Inserindo um elemento

Ao clicar na opção "Inserir" no menu "Elementos", o programa exibirá a janela do gerenciador de inserção de elementos. Por meio dela, o usuário pode inserir declarações financeiras, contextos, unidades e notas explicativas no relatório financeiro.

A inserção de elementos segue as seguintes regras:

1 - Contextos e unidades não dependem de elementos pré-existentes. O usuário pode adicioná-los livremente.

**Gerenciador de inserção de elementos**

Tipo:  Conta Tag da conta

Valor:  Decimais:  Unidade:  Contexto:

Tipo:  Não numérico Tag do elemento não numérico

Contexto:  Descrição:

Tipo:  Contexto Nome do contexto:  Código da Instituição:  Eixo do contexto:

Início:  Término:  Schema:  Dimensão do contexto:

AAAA-MM-DD:  AAAA-MM-DD:  Dimensão secundária do contexto:

Tipo:  Unidade Nome da unidade:  Código ISO:

Cancelair Adicionar

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## Inserindo um elemento

2 - Notas explicativas dependem de contextos previamente adicionados.

Não é possível adicionar notas explicativas sem ter declarado um contexto.

3 - Declarações de contas dependem de um contexto e uma unidade previamente adicionados. Não é possível inserir declarações financeiras sem ter declarado um contexto e uma unidade.

## Inserindo um elemento

Toda vez que o usuário seleciona o tipo de elemento, por meio de uma das checkboxes, todos os itens não relacionados ao elemento escolhido são desabilitados. No entanto, todos os campos restantes são obrigatórios para poder adicionar o elemento.

Alguns dos itens desabilitados podem exibir algum conteúdo, pois o programa não perde o progresso do usuário caso a operação seja interrompida por meio do botão "Cancelar". Toda vez que o usuário tentar adicionar um elemento inconsistente o programa exibirá mensagens de erros, por meio de novas janelas, quando ele(a) clicar no botão "Adicionar".

**Gerenciador de inserção de elementos**

Tipo  Conta Tag da conta

Valor Decimais Unidade Contexto

Tipo  Não numérico Tag do elemento não numérico  
Notas explicativas

Contexto Descrição

Tipo  Contexto Nome do contexto Código da Instituição Eixo do contexto  
EstagiosReceitaOrcamentaria

Início Término Schema Dimensão do contexto  
Previsaoinicial

AAAA-MM-DD AAAAA-MM-DD

Eixo secundário do contexto Dimensão secundária do contexto

Tipo  Unidade Nome da unidade Código ISO  
ADP

Cancelar Adicionar

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**Gerenciador de inserção de elementos**

Tipo  Conta Tag da conta

Valor Decimais Unidade Contexto

Tipo  Não numérico Tag do elemento não numérico  
Notas explicativas

Contexto Descrição

Tipo  Contexto Nome do contexto Código da Instituição Eixo do contexto  
EstagiosReceitaOrcamentaria

Início Término Schema Dimensão do contexto  
Previsaoinicial

AAAA-MM-DD AAAAA-MM-DD

Eixo secundário do contexto Dimensão secundária do contexto

Tipo  Unidade Nome da unidade Código ISO  
ADP

Cancelar Adicionar

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## Editando um elemento

Ao clicar na opção "Editar" no menu "Elementos", o programa exibirá a janela do gerenciador de edição de elementos. Por meio dela, o usuário pode editar declarações financeiras, contextos, unidades e notas explicativas no relatório financeiro.

A edição de elementos segue as seguintes regras:

1 - Contextos e unidades não dependem de elementos pré-existent. O usuário pode editá-los livremente.

## Editando um elemento

2 - Notas explicativas dependem de contextos previamente adicionados.

Não é possível editar notas explicativas sem ter declarado um contexto.

3 - Declarações de contas dependem de um contexto e uma unidade previamente adicionados. Não é possível editar declarações financeiras sem ter declarado um contexto e uma unidade.

4 - O usuário deve adicionar elementos antes de tentar editá-los.

**Gerenciador de edição de elementos**

Tipo  Conta Tag atual da conta [EstagiosReceltaOrcamentaria] Contexto atual da conta [Previsaolnicial]

Area de edição Tag da conta [EstagiosReceltaOrcamentaria]

Valor [ ] Decimais [0] Unidade [ADP] Contexto [Previsaolnicial]

---

Tipo [ ] Não numérico Elemento atual [ ] Contexto atual [ ]

Area de edição [Notas explicativas] Tag do elemento não numérico [ ]

Contexto [ ] Descrição [ ]

---

Tipo [ ] Contexto Contexto atual [ ]

Area de edição [ ] Nome do contexto [ ] Código da Instituição [ ] Eixo do contexto [EstagiosReceltaOrcamentaria]

Início [ ] Término [ ] Schema [siconfl.tesouro.go...] Dimensão do contexto [Previsaolnicial]

AAAA-MM-DD [ ] AAAAA-MM-DD [ ]

Eixo secundário do contexto [ ] Dimensão secundária do contexto [ ]

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Tipo [ ] Unidade atual [ ] [Atualizar]

[ ] Unidade Unidade [ ] Código ISO [ADP] [Cancelar]

Area de edição [ ]

25

**Gerenciador de edição de elementos**

Tipo  Conta Tag atual da conta [EstagiosReceltaOrcamentaria] Contexto atual da conta [Previsaolnicial]

Area de edição Tag da conta [EstagiosReceltaOrcamentaria]

Valor [ ] Decimais [0] Unidade [ADP] Contexto [Previsaolnicial]

---

Tipo [ ] Não numérico Elemento atual [ ] Contexto atual [ ]

Area de edição [Notas explicativas] Tag do elemento não numérico [ ]

Contexto [ ] Descrição [ ]

---

Tipo [ ] Contexto Contexto atual [ ]

Area de edição [ ] Nome do contexto [ ] Código da Instituição [ ] Eixo do contexto [EstagiosReceltaOrcamentaria]

Início [ ] Término [ ] Schema [siconfl.tesouro.go...] Dimensão do contexto [Previsaolnicial]

AAAA-MM-DD [ ] AAAAA-MM-DD [ ]

Eixo secundário do contexto [ ] Dimensão secundária do contexto [ ]

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Tipo [ ] Unidade atual [ ] [Atualizar]

[ ] Unidade Unidade [ ] Código ISO [ADP] [Cancelar]

Area de edição [ ]

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## Editando um elemento

Toda vez que o usuário seleciona o tipo de elemento, por meio de uma das checkboxes, todos os itens não relacionados ao elemento escolhido são desabilitados. No entanto, todos os campos restantes são obrigatórios para poder editar o elemento.

Alguns dos itens desabilitados podem exibir algum conteúdo, pois o programa não perde o progresso do usuário caso a operação seja interrompida por meio do botão "Cancelar". Toda vez que o usuário tentar inserir informações inconsistentes num elemento o programa exibirá mensagens de erros, por meio de novas janelas, quando ele(a) clicar no botão "Atualizar".

## Editando um elemento

Na janela do gerenciador de edição de elementos, a área destinada a cada tipo de elemento é dividida em duas zonas: zona de seleção (área sinalizada em azul) e zona de edição (área restante).

Na zona de seleção o usuário deve selecionar os itens que identificam o elemento que ele(a) deseja editar.

Quando o usuário faz uma seleção válida, o programa completa, automaticamente, os demais campos da zona de edição com as características atuais do elemento selecionado para edição.

Todas as alterações realizadas só sobrescreverão as informações existentes após o usuário clicar no botão "Atualizar".

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## Deletando um elemento

Ao clicar na opção “Excluir” no menu “Elementos”, o programa exibirá a janela do gerenciador de exclusão de elementos. Por meio dela, o usuário pode remover declarações financeiras, contextos, unidades e notas explicativas do relatório financeiro.

A remoção de elementos segue as seguintes regras:

1 - Contextos e unidades não dependem de elementos pré-existent, então o usuário pode deletá-los livremente, desde que não estejam atrelados a outros elementos.

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## Deletando um elemento

2 - Notas explicativas dependem de contextos previamente adicionados. Não é possível deletar notas explicativas sem identificar seu contexto de referência.

3 - Declarações de contas dependem de um contexto e uma unidade previamente adicionados. Não é possível deletar declarações financeiras sem identificar suas referências de contexto e unidade.

4 - O usuário deve adicionar elementos antes de tentar deletá-los.

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## Deletando um elemento

Toda vez que o usuário seleciona o tipo de elemento, por meio de uma das checkboxes, todos os itens não relacionados ao elemento escolhido são desabilitados. No entanto, todos os campos restantes são obrigatórios para poder identificar e remover o elemento.

Alguns dos itens desabilitados podem exibir algum conteúdo, pois o programa não perde o progresso do usuário caso a operação seja interrompida por meio do botão "Cancelar". Toda vez que o usuário tentar deletar elementos de formas inconsistentes o programa exibirá mensagens de erros, por meio de novas janelas, quando ele(a) clicar no botão "Remover".

Gerenciador de exclusão de elementos

Tipo  Conta Tag da conta

Valor Decimais Unidade Contexto

Tipo Elemento não numérico selecionado  Não numérico

Contexto Descrição

Tipo	Nome	Código da Instituição	Eixo do contexto
<input type="checkbox"/> Contexto			
Início	Término	Schema	Dimensão do contexto
AAAA-MM-DD	AAAA-MM-DD		
Eixo secundário do contexto			Dimensão secundária do contexto

Tipo Nome da unidade Código ISO

Unidade BRL BRL

Cancelar Remover

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## Deletando um elemento

Todos os campos de seleção dentro de uma área de tipo de elemento são obrigatórios para identificar e remover o elemento. Quando o usuário realiza uma seleção válida, o programa preenche todos os campos da área do elemento automaticamente com as características do elemento selecionado. Todas as alterações realizadas só sobrescreverão as informações existentes após o usuário clicar no botão "Remover".

Gerenciador de exclusão de elementos

Tipo  Conta Tag da conta

Valor Decimais Unidade Contexto

Tipo Elemento não numérico selecionado  Não numérico

Contexto Descrição

Tipo	Nome	Código da Instituição	Eixo do contexto
<input type="checkbox"/> Contexto			
Início	Término	Schema	Dimensão do contexto
AAAA-MM-DD	AAAA-MM-DD		
Eixo secundário do contexto			Dimensão secundária do contexto

Tipo Nome da unidade Código ISO

Unidade BRL BRL

Cancelar Remover

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# Lista de mensagens

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## Lista de mensagens

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M\_Error00 Este relatório suporta apenas uma unidade ativa por vez.

M\_Error01 Por favor, certifique-se de ter preenchido todos os campos requeridos antes de adicionar um elemento.

M\_Error02 Por favor, certifique-se de adicionar um contexto e uma unidade antes de adicionar um fato.

M\_Error03 Por favor, certifique-se de inserir um código institucional válido.

M\_Error04 Por favor, certifique-se de inserir um período válido.

M\_Error05 Por favor, certifique-se de inserir um nome de contexto válido.

M\_Error06 Por favor, certifique-se de inserir um contexto antes de adicionar uma nota explicativa.

M\_Error07 Por favor, também certifique-se de que nenhuma das seguintes situações está ocorrendo: 1 - Você tentou adicionar um elemento sem marcar a checkbox apropriada ao tipo de elemento. 2 - Você preencheu algum campo inadequadamente.

M\_Error08 Por favor, certifique-se de adicionar um contexto e um fato antes de tentar deletar uma conta.

M\_Error09 Por favor, certifique-se de adicionar um contexto antes de tentar deletar um.

M\_Error10 Por favor, certifique-se de adicionar uma unidade antes de tentar deletar uma.

M\_Error11 Por favor, certifique-se de adicionar uma nota explicativa antes de tentar deletar uma.

M\_Error12 Não foi possível remover o elemento desejado. Por favor, revise os dados fornecidos e tente novamente.

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## Lista de mensagens

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- M\_Error13 Por favor, certifique-se de ter preenchido todos os campos requeridos antes de editar um elemento.
- M\_Error14 Por favor, certifique-se de adicionar um contexto e um fato antes de editar um fato.
- M\_Error15 Por favor, certifique-se de adicionar um contexto e uma unidade antes de editar um fato.
- M\_Error16 Por favor, certifique-se de inserir um código institucional válido.
- M\_Error17 Por favor, certifique-se de inserir um período válido.
- M\_Error18 Por favor, certifique-se de inserir um nome de contexto válido.
- M\_Error19 Por favor, certifique-se de adicionar um contexto antes de tentar editar um..
- M\_Error20 Por favor, certifique-se de adicionar uma unidade antes de tentar editar uma.
- M\_Error21 Por favor, certifique-se de adicionar uma nota explicativa antes de tentar editar uma.
- M\_Error22 Por favor, certifique-se de inserir um contexto antes de editar uma nota explicativa.
- M\_Error23 Por favor, também certifique-se de que nenhuma das seguintes situações está ocorrendo: 1 - Você tentou editar um elemento sem marcar a checkbox apropriada ao tipo de elemento. 2 - Você preencheu algum campo inadequadamente.

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## Lista de mensagens

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- M\_Error24 O elemento ainda está ligado a outros elementos do relatório.
- M\_Error26 O arquivo de instância não pôde ser validado. Existem inconsistências envolvendo os seguintes elementos: [lista de elementos]
- M\_Error27 O processo de carga do arquivo falhou. Por favor, tente novamente.
- M\_Error28 Os campos Valor e Decimais aceitam apenas números inteiros. Por favor, certifique-se de não ter digitado algo mais nesses campos.
- M\_Error29 O campo Código da instituição deve ser válido de acordo com a relação de códigos do Siconfi. O término do período deve ser sempre superior ao seu início. Por favor, certifique-se de não ter digitado algo inválido nesses campos.
- M\_Suc01 Elemento adicionado com sucesso.
- M\_Suc02 Elemento editado com sucesso.
- M\_Suc03 Elemento removido com sucesso.
- M\_Suc09 Documento de instância carregado com sucesso.
- M\_Suc10 Documento de instância gerado com sucesso.

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## Lista de mensagens

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- M\_Suc07 Arquivo de instancia validado com sucesso.
- M\_Suc11 Não existem problemas relacionados à declaração de contextos das contas.
- M\_Suc12 Não existem problemas relacionados à declaração de unidades das contas.
- M\_Suc13 Não existem problemas relacionados à declaração de eixos das contas.
- M\_Suc14 Não existem problemas relacionados aos elementos não numéricos.
- M\_Suc15 Não existem problemas relacionados à precisão das contas.
- M\_Fault00 As contas a seguir estão sem declaração de contexto válido: [lista de elementos]
- M\_Fault01 As contas a seguir estão sem declaração de unidade válida: [lista de elementos]
- M\_Fault02 As contas a seguir estão sem declaração de eixo válido: [lista de elementos]
- M\_Fault03 Elementos não numéricos relacionados aos contextos a seguir precisam de uma declaração de referência de contexto válida: [lista de elementos]
- M\_Fault04 Os relatórios do Siconfi usam apenas dois decimais para expressar os valores das contas. Verifique tais inconsistências relacionadas às seguintes contas: [lista de elementos]

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## Lista de mensagens

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- M\_Conf00 Deseja salvar o relatório atual antes de sair?
- M\_Conf01 Deseja salvar o relatório atual antes de carregar o novo modelo de relatório?
- M\_Help OFR protótipo V0. Obrigado por usar o programa Open Financial Reporting! Se você está com algum problema, acesse o link da documentação do programa: XXX.XXX.XXX

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## OFR's second User guide document



# OFR – User guide

ANTÔNIO RICARDO D'ARAÚJO AMÂNCIO OLIVEIRA

PAULO CAETANO DA SILVA

JAN-2021



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### Introduction

#### The software interface

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#### Messages list



# Introduction

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## Introduction

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This document contains the basic guidelines for interacting with the Open Financial Reporting (OFR). It will be a third-part free and Open source software developed under HCI design practices to prevent the waste of time and resources of composing an XBRL financial report.

An HCI design project is focused and centered on the potential final users, whose feedback information are the main guidelines for developing and implementing the software tools and interface.

The aforementioned solution is part of a UNIFACS System and Computing Master degree Program's project. Its development will apply the Human-Computer Interface design techniques to ease the task of composing an XBRL financial report by putting aside its complexity.

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# The software interface

THE MENU BAR

THE REPORT TREE PANEL

THE LOG MESSAGE PANEL

THE INCONSISTENCY LOG MESSAGE PANEL

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## The software interface

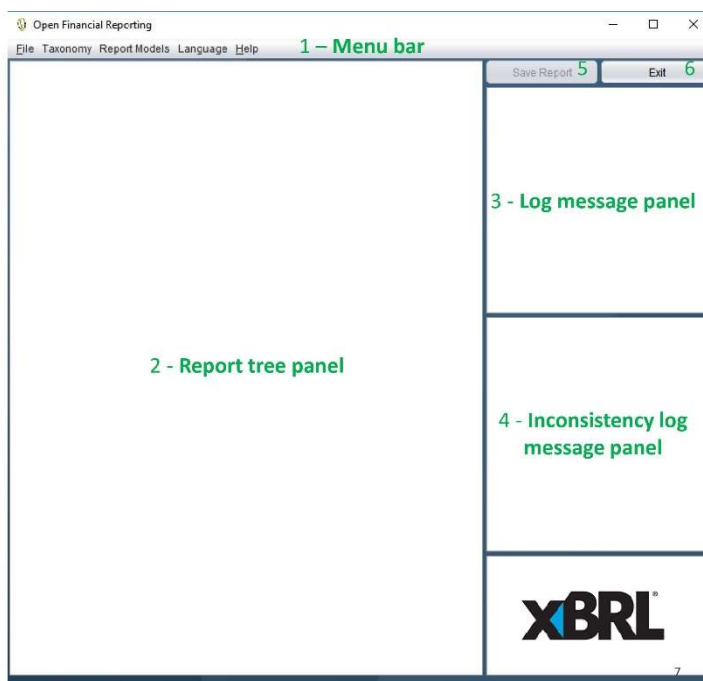
As depicted, OFR's interface consists of:

- A top menu bar (item 1),
- A report tree panel (item 2),
- A log message panel (item 3),
- A inconsistency log message panel (item 4),
- A "Save Report" button (item 5),
- An "Exit" button (item 6).

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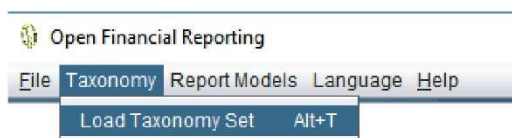
## The software interface

Initially, the menu bar contains five main menus: File, Taxonomy, Report Models, Language, and Help. The Save Report button becomes available after the user opens a report or starts a new one. Clicking on it triggers the same set of events that the "Save" option in the "File" menu. Clicking on item 6 triggers the same set of events that the "Exit" option in the "File" menu.



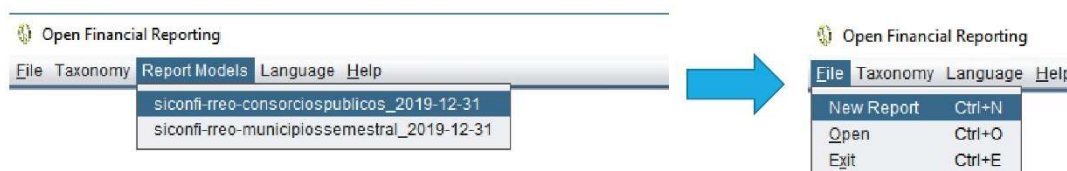
## The menu bar

Within every menu, the available keyboard shortcuts for each subitem are displayed at their side. The "Taxonomy" menu has one subitem: "Load Taxonomy Set". It should open a file chooser window for the user to import a taxonomy set before creating, loading, or composing the instance report. However, the development team is testing a specific XBRL financial report, so all the taxonomy rules were already incorporated in the software source code. The subitem still has no functionality attached to it.



## The menu bar

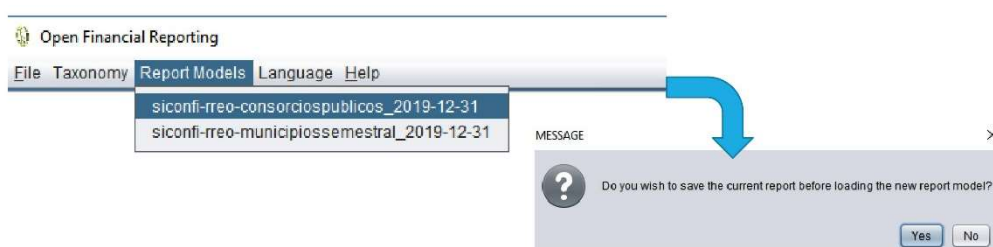
As all the taxonomy rules were already in the software source code, the menu Report Models is available on the starting screen. Clicking on it only displays report models related to the incorporated taxonomy set. After clicking the report model option, the "New Report" and the "Open" subitems from the "File" menu become available.



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## The menu bar

After clicking the report model option, if the user has a report under edition, the OFR will prompt the user with a message that asks if he/she would like to save the current report before shifting report models.

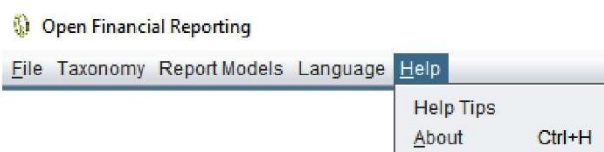


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## The menu bar

It is also because of the "background taxonomy" that the software only deals with instances regarding the implemented taxonomy set. In this way, whenever the OFR saves an XBRL file, it will strictly follow the Presentation link rules (so, there is no need for validating the instance file through that linkbase). It also implies that whenever the OFR opens an XBRL file, it must be according to that taxonomy.

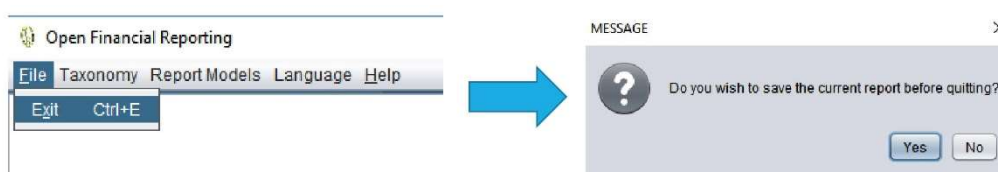
The "Help" menu has two subitems: Help Tips and About. Clicking on "About" will display a message window with a brief note about the software and a URL for downloading this document. Clicking on "Help Tips" will display a message window with a tip about what the user should do next.



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## The menu bar

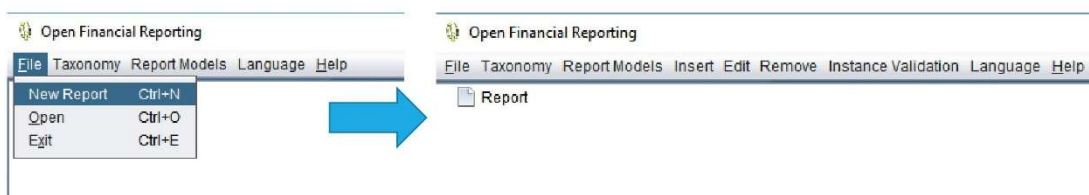
Initially, the File menu has one subitem: Exit. The "Exit" option closes the program losing all not previously saved progress. If the user has a report under edition, the OFR will prompt the user with a message that asks if he/she would like to save the current report before quitting. It has the same outcome of clicking the "Exit" button (item 6) in the software interface.



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## The menu bar

After loading a report model, the "New Report" and the "Open" subitems become available. The option New Report generates a new empty XBRL instance (a financial report in XBRL language) and enables a new subitem: "Save". After clicking on "New Report", the menus for the element managers and instance validation will also become available.



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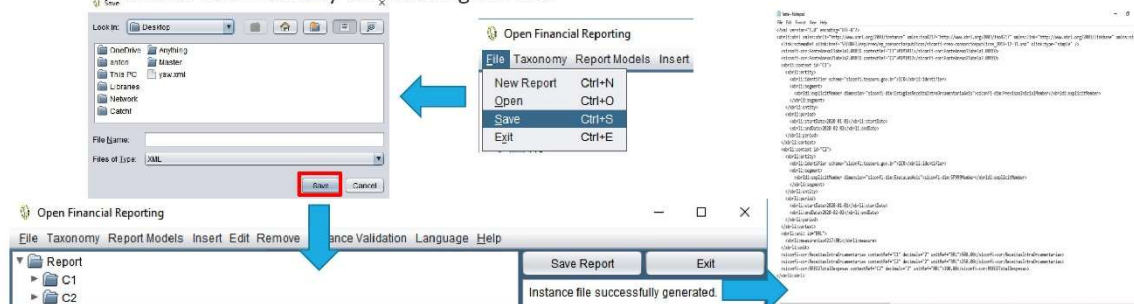
### The menu bar

As depicted, the option "Open" pops up a file chooser window for the user to navigate, select and load an XML file containing an XBRL financial report. After clicking this option, the software enables the "Save" subitem, the menus for the element managers, and instance validation. It also loads the report tree (item 2 area), shows a message (item 3 area) whether the opening process was successful or not, and generates warnings regarding inconsistencies found in the loaded report, in the item 4 area.

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## The menu bar

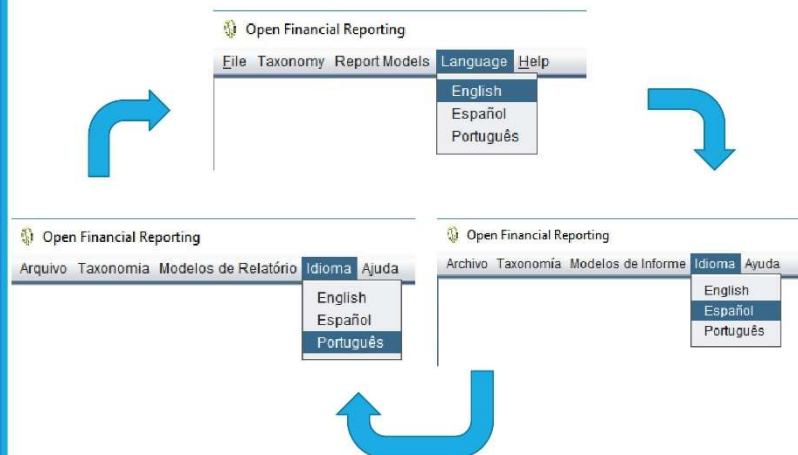
Once the user has created a new report or opened an existing one, the option "Save" becomes available under the File menu. Clicking on it will open a file chooser window for the user to name the report file and save it wherever the folder is convenient. When the process ends, the software exhibits a message informing the file is successfully saved. The OFR generates all the XBRL code automatically while saving the file.



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## The menu bar

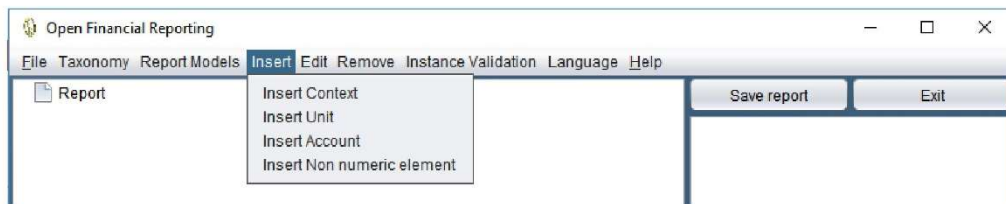
As depicted, the "Language" menu has three subitems: English, Spanish, and Portuguese. Clicking on any of them will instantly translate the whole software to the corresponding language. It is important to highlight that it only affects the software menus, messages, windows, and options. The report elements will always display in their native language deployed to define the taxonomy set.



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## The menu bar

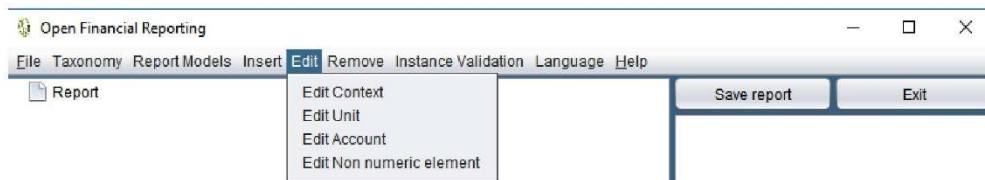
The menu "Insert" becomes available after the user load or create a new financial report. It has four subitems: Insert Context, Insert Unit, Insert Account, and Insert Non Numeric element. Each of them invokes the element insertion manager window that allows the user to create the corresponding element in the financial report. The section Managing elements describes all managers in better detail.



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## The menu bar

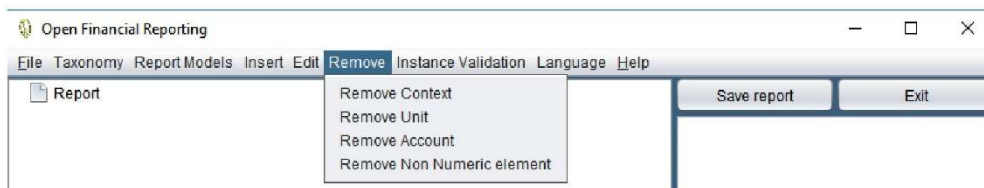
The menu "Edit" becomes available after the user load or create a new financial report. It has four subitems: Edit Context, Edit Unit, Edit Account, and Edit Non Numeric element. Each of them invokes the element edition manager window that allows the user to edit the corresponding element from the financial report. The section Managing elements describes all managers in better detail.



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## The menu bar

The menu "Remove" becomes available after the user load or create a new financial report. It has four subitems: Remove Context, Remove Unit, Remove Account, and Remove Non Numeric element. Each of them invokes the element edition manager window that allows the user to Remove the corresponding element from the financial report. The section Managing elements describes all managers in better detail.



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## The menu bar

The "Instance validation" menu has one subitem: Formula Validation. It is common for XBRL instances to undergo validation through one or more linkbases. The validation process prevents inconsistencies in the instance file.

For example, a link base formula validation prevents the instance report from having financial statements that do not match the mathematical relations between them. This prototype implemented a reduced set of rules once it does not prevent the instance creation task. Even though it is an important feature, a further version of this software will fully implement this functionality.

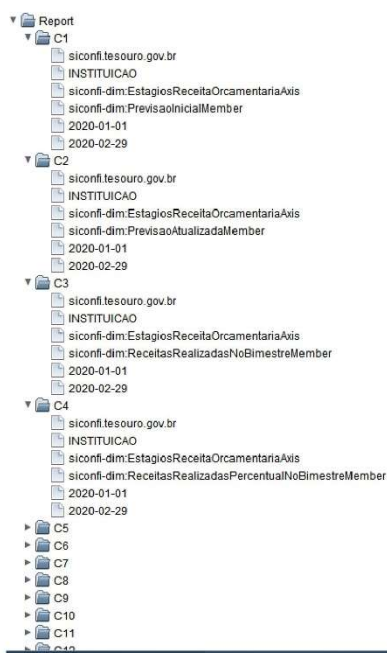


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## The report tree panel

XBRL instance files have a hierarchical structure commonly represented through trees. The OFR provides the user a report tree panel that displays the XBRL document hierarchical structure while it is under construction. The panel displays the elements according to the order defined in the Presentation link base on the taxonomy set. It must allow the user to keep track of all the elements within the report under construction.



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## The log message panel

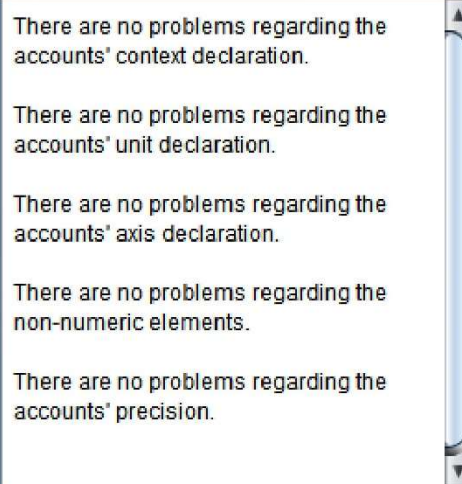
The OFR provides the user a log message panel that displays the software messages according to the users' interactions. The panel displays the messages in chronological order. It must allow the user to keep track of all the operations regarding the report construction. Messages regarding element's management display through specific message windows.

Instance document successfully loaded.

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## The inconsistency log message panel

The OFR provides the user a inconsistency log message panel. It displays the software messages according to the inconsistencies found in the elements within the report under edition. The messages update whenever the user edits the report or loads a new instance file. It must allow the user to keep track of all the elements with inconsistencies during the report construction.



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# Managing elements

INSERTING AN ELEMENT  
 EDITING AN ELEMENT  
 DELETING AN ELEMENT

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## Inserting an element

Clicking the item Insert Context under the Insert menu will load the element insertion manager window. It shows up prepared for a context insertion. All available fields are mandatory for the user to insert a valid context in the financial report.

The screenshot shows the 'Element insertion manager' dialog box with the 'Context' type selected. The fields are filled with the following values:

- Type:  Context
- Context name: [Empty text box]
- Institution's code: [Empty text box]
- Context axis: EstagiosReceitaOrcamentaria
- Start date: 2020-01-01
- End date: 2020-01-31
- Schema: siconfi.tesouro.gov.br
- Context dimension: Previsaoinicial
- Secondary Context Axis: [Empty dropdown]
- Secondary Context Dimension: [Empty dropdown]
- Type:  Unit
- Unit name: [Empty text box]
- ISO code: ADP
- Type:  Account
- Account tag: [Empty dropdown]
- Value: [Empty text box]
- Decimals: [Empty text box]
- Unit: [Empty dropdown]
- Context: [Empty dropdown]
- Type:  Non numeric
- Non numeric element tag: Notas explicativas
- Context: [Empty dropdown]
- Description: [Empty text box]

Buttons: Cancel, Add

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## Inserting an element

Clicking the item Insert Unit under the Insert menu will load the element insertion manager window. It shows up prepared for a unit insertion. All available fields are mandatory for the user to insert a valid unit in the financial report.

The screenshot shows the 'Element insertion manager' dialog box with the 'Unit' type selected. The fields are filled with the following values:

- Type:  Unit
- Context name: [Empty text box]
- Institution's code: [Empty text box]
- Context axis: EstagiosReceitaOrcamentaria
- Start date: 2020-01-01
- End date: 2020-01-31
- Schema: siconfi.tesouro.gov.br
- Context dimension: Previsaoinicial
- Secondary Context Axis: [Empty dropdown]
- Secondary Context Dimension: [Empty dropdown]
- Type:  Account
- Account tag: [Empty dropdown]
- Value: [Empty text box]
- Decimals: [Empty text box]
- Unit: [Empty dropdown]
- Context: [Empty dropdown]
- Type:  Non numeric
- Non numeric element tag: Notas explicativas
- Context: [Empty dropdown]
- Description: [Empty text box]

Buttons: Cancel, Add

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## Inserting an element

Clicking the item Insert Account under the Insert menu will load the element insertion manager window. It shows up prepared for an account insertion. All available fields are mandatory for the user to insert a valid account in the financial report.

The screenshot shows the 'Element insertion manager' window with the following fields and values:

- Type:**  Context,  Account
- Context name:** [Empty]
- Institution's code:** [Empty]
- Context axis:** EstagiosReceitaOrcamentaria
- Start date:** 2020-01-01
- End date:** 2020-01-31
- Schema:** siconfi.tesouro.gov.br
- Context dimension:** Previsaolnicial
- Secondary Context Axis:** [Empty]
- Secondary Context Dimension:** [Empty]
- Unit name:** [Empty]
- ISO code:** ADP
- Account tag:** [Empty]
- Value:** [Empty]
- Decimals:** [Empty]
- Unit:** [Empty]
- Context:** [Empty]
- Non numeric element tag:**  Non numeric,  Account
- Non numeric element tag value:** Notas explicativas
- Description:** [Empty]

Buttons: Cancel, Add

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## Inserting an element

Clicking the item Insert Non Numeric element under the Insert menu will load the element insertion manager window. It shows up prepared for a non numeric element insertion. All available fields are mandatory for the user to insert a valid non numeric element in the financial report.

The screenshot shows the 'Element insertion manager' window with the following fields and values:

- Type:**  Context,  Account,  Non numeric
- Context name:** [Empty]
- Institution's code:** [Empty]
- Context axis:** EstagiosReceitaOrcamentaria
- Start date:** 2020-01-01
- End date:** 2020-01-31
- Schema:** siconfi.tesouro.gov.br
- Context dimension:** Previsaolnicial
- Secondary Context Axis:** [Empty]
- Secondary Context Dimension:** [Empty]
- Unit name:** [Empty]
- ISO code:** ADP
- Account tag:** [Empty]
- Value:** [Empty]
- Decimals:** [Empty]
- Unit:** [Empty]
- Context:** [Empty]
- Non numeric element tag:**  Non numeric,  Account
- Non numeric element tag value:** Notas explicativas
- Description:** [Empty]

Buttons: Cancel, Add

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## Inserting an element

The user can also switch the element he/she is trying to insert by unchecking the element type checkbox and clicking on the desired one. This way, a user can insert financial statements, contexts, units, and explanatory notes in a financial report.

The screenshot shows the 'Element insertion manager' dialog box. The 'Context' type is selected, and the 'Unit' type is disabled. The 'Context' type is selected, and the 'Unit' type is disabled.

Fields and values shown:

- Type:  Context
- Context name: [Empty]
- Institution's code: [Empty]
- Context axis: EstagiosReceitaOrcamentaria
- Start date: 2020-01-01
- End date: 2020-01-31
- Schema: siconfi.tesouro.gov.br
- Context dimension: Previsaoinicial
- Secondary Context Axis: [Empty]
- Secondary Context Dimension: [Empty]
- Type:  Unit
- Unit name: [Empty]
- ISO code: ADP
- Type:  Account
- Account tag: [Empty]
- Value: [Empty]
- Decimals: [Empty]
- Unit: [Empty]
- Context: [Empty]
- Type:  Non numeric
- Non numeric element tag: Notas explicativas
- Context: [Empty]
- Description: [Empty]

Buttons: Cancel, Add

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## Inserting an element

Whenever the user selects the element type by checking the available checkboxes, it disables all the items that are not related to the chosen element. However, all the remaining ones are mandatory to add that element.

Some disabled combo boxes and text fields might display some content because the software does not deplete the user's progress if he/she stops the operation through the "Cancel" button. The software shall display error messages through new windows any time the user tries to add an inconsistent element by clicking the "Add" button.

The screenshot shows the 'Element insertion manager' dialog box. The 'Context' type is selected, and the 'Unit' type is disabled. The 'Context' type is selected, and the 'Unit' type is disabled.

Fields and values shown:

- Type:  Context
- Context name: [Empty]
- Institution's code: [Empty]
- Context axis: EstagiosReceitaOrcamentaria
- Start date: 2020-01-01
- End date: 2020-01-31
- Schema: siconfi.tesouro.gov.br
- Context dimension: Previsaoinicial
- Secondary Context Axis: [Empty]
- Secondary Context Dimension: [Empty]
- Type:  Unit
- Unit name: [Empty]
- ISO code: ADP
- Type:  Account
- Account tag: [Empty]
- Value: [Empty]
- Decimals: [Empty]
- Unit: [Empty]
- Context: [Empty]
- Type:  Non numeric
- Non numeric element tag: Notas explicativas
- Context: [Empty]
- Description: [Empty]

Buttons: Cancel, Add

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## Inserting an element

The element insertion follows the rules below:

- 1 - Contexts and Units do not depend on preexisting elements so, the user can add them freely.
- 2 - Explanatory notes rely on previously added contexts so, it is not possible to add one without having already added a context.
- 3 - Financial statements rely on previously added contexts and units so, it is not possible to add one without having already added a context and a unit.

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## Editing an element

Clicking the item Edit Context under the Edit menu will load the element edition manager window. It shows up prepared for a context edition.

The element area consists of two zones: the selection zone (signalized in blue) and the editing zone (the remaining area).

In the selection zone, the user has to choose the items that identify the element he/she wants to edit.

When the user performs a valid selection, the software auto-fills the editing area items with the current element characteristics so they can undergo edition.

All the alterations will only override the existing data after the user clicks the "Update" button.

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## Editing an element

Clicking the item Edit Unit under the Edit menu will load the element edition manager window. It shows up prepared for a unit edition.

The element area consists of two zones: the selection zone (signalized in blue) and the editing zone (the remaining area).

In the selection zone, the user has to choose the items that identify the element he/she wants to edit.

When the user performs a valid selection, the software auto-fills the editing area items with the current element characteristics so they can undergo edition.

All the alterations will only override the existing data after the user clicks the "Update" button.

The screenshot shows the 'Element edition manager' window. The 'Unit' checkbox is checked. The 'Selected unit name' dropdown is highlighted with a blue box. Other fields include 'Context name', 'Institution's code', 'Context axis', 'Edition area', 'Start date', 'End date', 'Schema', 'Context dimension', 'YYYY-MM-DD', 'Secondary Context Axis', 'Secondary Context Dimension', 'Unit name', 'ISO code', 'Account tag', 'Selected account tag', 'Selected context', 'Value', 'Decimals', 'Unit', 'Context', 'Selected element', 'Non numeric element tag', 'Edition area', 'Context', and 'Description'.

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## Editing an element

Clicking the item Edit Account under the Edit menu will load the element edition manager window. It shows up prepared for an account edition.

The element area consists of two zones: the selection zone (signalized in blue) and the editing zone (the remaining area).

In the selection zone, the user has to choose the items that identify the element he/she wants to edit.

When the user performs a valid selection, the software auto-fills the editing area items with the current element characteristics so they can undergo edition.

All the alterations will only override the existing data after the user clicks the "Update" button.

The screenshot shows the 'Element edition manager' window. The 'Account' checkbox is checked. The 'Selected account tag' dropdown is highlighted with a blue box. Other fields include 'Context name', 'Institution's code', 'Context axis', 'Edition area', 'Start date', 'End date', 'Schema', 'Context dimension', 'YYYY-MM-DD', 'Secondary Context Axis', 'Secondary Context Dimension', 'Unit name', 'ISO code', 'Account tag', 'Selected account tag', 'Selected context', 'Value', 'Decimals', 'Unit', 'Context', 'Selected element', 'Non numeric element tag', 'Edition area', 'Context', and 'Description'.

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## Editing an element

Clicking the item Edit Non Numeric element under the Edit menu will load the element edition manager window. It shows up prepared for a non numeric element edition.

The element area consists of two zones: the selection zone (signalized in blue) and the editing zone (the remaining area).

In the selection zone, the user has to choose the items that identify the element he/she wants to edit.

When the user performs a valid selection, the software auto-fills the editing area items with the current element characteristics so they can undergo edition.

All the alterations will only override the existing data after the user clicks the "Update" button.

The screenshot shows the 'Element edition manager' window with the following fields and values:

- Type:** Selected context name (dropdown)
- Context**
- Context name, Institution's code, Context axis
- Edition area: EstagiosReceitaOrcamentaria
- Start date: 2020-01-01, End date: 2020-01-31, Schema: siconfi.tesouro.go..., Context dimension: Previsaoinicial
- YYYY-MM-DD, YYYY-MM-DD
- Secondary Context Axis, Secondary Context Dimension
- Type:** Selected unit name (dropdown)
- Unit**
- Unit name, ISO code: ADP
- Edition area
- Type:** Selected account tag (dropdown), Selected context (dropdown)
- Account**
- Account tag
- Edition area
- Value, Decimals, Unit, Context
- Type:** Selected element (dropdown, highlighted in blue), Context
- Non numeric**
- Non numeric element tag
- Edition area: Notas explicativas
- Context: Description
- Buttons: Update, Cancel

35

## Editing an element

The user can also switch the element he/she is trying to edit by unchecking the element type checkbox and clicking on the desired one. This way, a user can edit financial statements, contexts, units, and explanatory notes in a financial report.

The screenshot shows the 'Element edition manager' window with the following fields and values:

- Type:** Selected context name (dropdown)
- Context**
- Context name, Institution's code, Context axis
- Edition area: EstagiosReceitaOrcamentaria
- Start date: 2020-01-01, End date: 2020-01-31, Schema: siconfi.tesouro.go..., Context dimension: Previsaoinicial
- YYYY-MM-DD, YYYY-MM-DD
- Secondary Context Axis, Secondary Context Dimension
- Type:** Selected unit name (dropdown)
- Unit**
- Unit name, ISO code: ADP
- Edition area
- Type:** Selected account tag (dropdown), Selected context (dropdown)
- Account**
- Account tag
- Edition area
- Value, Decimals, Unit, Context
- Type:** Selected element (dropdown)
- Non numeric**
- Non numeric element tag
- Edition area: Notas explicativas
- Context: Description
- Buttons: Update, Cancel

36



## Editing an element

Whenever the user selects the element type by checking the available checkboxes, it disables all the items that are not related to the chosen element. However, all the remaining ones are mandatory to edit that element.

Some disabled combo boxes and text fields might display some content because the software does not delete the user's progress if he/she stops the operation through the "Cancel" button. The software shall display error messages through new windows any time the user tries to inconsistently add data to an element when clicking the "Edit" button.

## Editing an element

The element edition follows the rules below:

- 1 - Contexts and Units do not depend on preexisting elements so, the user can edit them freely.
- 2 - Explanatory notes rely on previously added contexts so, it is not possible to edit one without having already added a context.
- 3 - Financial statements rely on previously added contexts and units so, it is not possible to edit one without having already added a context and a unit.
- 4 - The user must add elements before trying to edit them.

The screenshot shows the 'Element edition manager' dialog box. It has several sections for editing different types of elements. The 'Context' section is active, with the 'Context' checkbox checked. The 'Unit' section is inactive, with the 'Unit' checkbox unchecked. The 'Account' section is inactive, with the 'Account' checkbox unchecked. The 'Non numeric' section is inactive, with the 'Non numeric' checkbox unchecked. The 'Update' button is visible at the bottom right.

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The screenshot shows the 'Element edition manager' dialog box. In this view, the 'Context' checkbox is unchecked, and the 'Unit' checkbox is checked. The 'Account' checkbox is still unchecked. The 'Non numeric' checkbox is now checked. The 'Update' button is visible at the bottom right.

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## Deleting an element

Clicking the item Remove Context under the Remove menu will load the element exclusion manager window. It shows up prepared for a context exclusion. All the selection fields within an element area are mandatory to identify and remove that element. When the user performs a valid selection, the software auto-fills the element area items with the current element characteristics. All the alterations will only override the existing data after the user clicks the "Delete" button.

The screenshot shows the 'Element exclusion manager' window with the 'Context' type selected. The form includes fields for Name, Institution's code, Context axis, Start date, End date, Schema, Context dimension, Secondary Context Axis, and Secondary Context Dimension. Below these are sections for Unit, Account, and Non numeric elements, each with their respective selection fields and a Description field. 'Cancel' and 'Delete' buttons are at the bottom right.

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## Deleting an element

Clicking the item Remove Unit under the Remove menu will load the element exclusion manager window. It shows up prepared for a unit exclusion. All the selection fields within an element area are mandatory to identify and remove that element. When the user performs a valid selection, the software auto-fills the element area items with the current element characteristics. All the alterations will only override the existing data after the user clicks the "Delete" button.

The screenshot shows the 'Element exclusion manager' window with the 'Unit' type selected. The form structure is identical to the previous one, but the 'Unit' checkbox is checked and the 'Unit name' field is active. The 'Context' checkbox is unchecked.

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## Deleting an element

Clicking the item Remove Account under the Remove menu will load the element exclusion manager window. It shows up prepared for an account exclusion. All the selection fields within an element area are mandatory to identify and remove that element. When the user performs a valid selection, the software auto-fills the element area items with the current element characteristics. All the alterations will only override the existing data after the user clicks the "Delete" button.

The screenshot shows the 'Element exclusion manager' window. The 'Type' dropdown is set to 'Account'. The 'Context' dropdown is set to 'Context'. The 'Start date' and 'End date' fields are empty, with 'Schema' and 'Context dimension' labels below them. The 'Secondary Context Axis' and 'Secondary Context Dimension' fields are also empty. The 'Unit name' field is empty, and the 'ISO code' field is empty. The 'Account tag' dropdown is set to 'Account'. The 'Value' field is empty, and the 'Decimals', 'Unit', and 'Context' fields are empty. The 'Selected non numeric element' dropdown is set to 'Non numeric'. The 'Description' field is empty. The 'Cancel' and 'Delete' buttons are at the bottom right.

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## Deleting an element

Clicking the item Remove Non numeric element under the Remove menu will load the element exclusion manager window. It shows up prepared for a non numeric element exclusion. All the selection fields within an element area are mandatory to identify and remove that element. When the user performs a valid selection, the software auto-fills the element area items with the current element characteristics. All the alterations will only override the existing data after the user clicks the "Delete" button.

The screenshot shows the 'Element exclusion manager' window. The 'Type' dropdown is set to 'Non numeric'. The 'Context' dropdown is set to 'Context'. The 'Start date' and 'End date' fields are empty, with 'Schema' and 'Context dimension' labels below them. The 'Secondary Context Axis' and 'Secondary Context Dimension' fields are also empty. The 'Unit name' field is empty, and the 'ISO code' field is empty. The 'Account tag' dropdown is set to 'Non numeric'. The 'Value' field is empty, and the 'Decimals', 'Unit', and 'Context' fields are empty. The 'Selected non numeric element' dropdown is set to 'Non numeric'. The 'Description' field is empty. The 'Cancel' and 'Delete' buttons are at the bottom right.

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## Deleting an element

The user can also switch the element he/she is trying to remove by unchecking the element type checkbox and clicking on the desired one. This way, a user can delete financial statements, contexts, units, and explanatory notes in a financial report.

**Element exclusion manager**

Type:  **Context** [dropdown]

Name: [text field] Institution's code: [text field] Context axis: [text field]

Start date: [text field] End date: [text field] Schema: [text field] Context dimension: [text field]

YYYY-MM-DD: [text field] YYYY-MM-DD: [text field]

Secondary Context Axis: [text field] Secondary Context Dimension: [text field]

---

Type:  **Unit** [dropdown]

Unit name: [text field] ISO code: [text field]

---

Type:  **Account** [dropdown]

Account tag: [text field]

Value: [text field] Decimals: [text field] Unit: [text field] Context: [dropdown]

---

Type:  **Non numeric** [dropdown]

Selected non numeric element: [text field]

Context: [text field] Description: [text field]

[Cancel] [Delete]

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## Deleting an element

Whenever the user selects the element type by checking the available checkboxes, it disables all the items that are not related to the chosen element.

Some disabled combo boxes and text fields might display some content because the software does not deplete the user's progress if he/she stops the operation through the "Cancel" button. The software shall display error messages through new windows any time the user tries to inconsistently delete an element by clicking the "Delete" button.

All the selection fields within an element area are mandatory to identify and remove that element. When the user performs a valid selection, the software auto-fills the element area items with the current element characteristics. All the alterations will only override the existing data after the user clicks the "Delete" button.

**Element exclusion manager**

Type:  **Context** [dropdown]

Name: [text field] Institution's code: [text field] Context axis: [text field]

Start date: [text field] End date: [text field] Schema: [text field] Context dimension: [text field]

YYYY-MM-DD: [text field] YYYY-MM-DD: [text field]

Secondary Context Axis: [text field] Secondary Context Dimension: [text field]

---

Type:  **Unit** [dropdown]

Unit name: [text field] ISO code: [text field]

---

Type:  **Account** [dropdown]

Account tag: [text field]

Value: [text field] Decimals: [text field] Unit: [text field] Context: [dropdown]

---

Type:  **Non numeric** [dropdown]

Selected non numeric element: [text field]

Context: [text field] Description: [text field]

[Cancel] [Delete]

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## Deleting an element

The element deletion follows the rules below:

- 1 - Contexts and Units do not depend on preexisting elements so, the user can delete them freely, as long as they are not attached to other elements.
- 2 - Explanatory notes rely on previously added contexts so, it is not possible to delete one without identifying its context reference.
- 3 - Financial statements rely on previously added contexts and units so, it is not possible to delete one without identifying its context and unit references.
- 4 - The user must add elements before trying to delete them.

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## Messages list

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## Messages list

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- M\_Error01 Please, make sure to fill up all the required fields before adding an element.
- M\_Error02 Please, make sure to add a context and a unit before adding financial statements.
- M\_Error03 Please, make sure to insert a valid institutional code.
- M\_Error04 Please, make sure to insert a valid period.
- M\_Error05 Please, make sure to insert a valid context name.
- M\_Error06 Please, make sure to add a context before adding explanatory notes.
- M\_Error07 Please, also make sure you are not incurring one of the following situations:
  - 1 - You tried to add an element without marking the appropriate Element type Checkbox.
  - 2 - You forgot to properly fill up any field.
- M\_Error08 Please, make sure to add a context and a financial statement before trying to delete a financial statement.
- M\_Error09 Please, make sure to add a context before trying to delete one.
- M\_Error10 Please, make sure to add a unit before trying to delete one.
- M\_Error11 Please, make sure to add an explanatory note before trying to delete one.

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## Messages list

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- M\_Error12 It was not possible to locate the desired element. Please, review your data input and try again.
- M\_Error13 Please, make sure to fill up all the required fields before editing an element.
- M\_Error14 Please, make sure to add a context and a financial statement before trying to edit a financial statement.
- M\_Error15 Please, make sure to add a context and a unit before editing financial statements.
- M\_Error16 Please, make sure to insert a valid institutional code.
- M\_Error17 Please, make sure to insert a valid period.
- M\_Error18 Please, make sure to insert a valid context name.
- M\_Error19 Please, make sure to add a context before trying to edit one.
- M\_Error20 Please, make sure to add a unit before trying to edit one.
- M\_Error21 Please, make sure to add an explanatory note before trying to edit one.
- M\_Error22 Please, make sure to add a context before editing explanatory notes.

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## Messages list

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M\_Error23 Please, also make sure you are not incurring one of the following situations:

- 1 - You tried to edit an element without marking the appropriate Element type Checkbox.
- 2 - You forgot to properly fill up any field.

M\_Error24 Please, load a taxonomy before trying to create an instance report, adding elements, or adding footnotes.

M\_Error25 Please, add elements to the XBRL instance document before trying to add footnotes.

M\_Error26 The instance document could not be validated. There are inconsistencies regarding the following elements: [list of elements]

M\_Error27 The file load process failed. Please try it again.

M\_Error28 The Value field and the Decimals field only accepts integer numbers. Please, make sure you did not type something else in those fields.

M\_Error29 The Institution's code field must be a valid Siconfi's code. The End date must always be ulterior to the Start date. Please, make sure you did not type something invalid in those fields.

M\_Error30 Please, remove the report's inconsistencies before trying to validate it.

M\_Suc01 Element successfully added.

M\_Suc02 Element successfully edited.

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## Messages list

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M\_Suc03 Element successfully deleted.

M\_Suc04 Footnote successfully added.

M\_Suc05 Footnote successfully edited.

M\_Suc06 Footnote successfully deleted.

M\_Suc07 Instance file successfully validated.

M\_Suc08 Taxonomy files successfully loaded.

M\_Suc09 Instance document successfully loaded.

M\_Suc10 Instance file successfully generated.

M\_Suc11 There are no problems regarding the accounts' context declaration.

M\_Suc12 There are no problems regarding the accounts' unit declaration.

M\_Suc13 There are no problems regarding the accounts' axis declaration.

M\_Suc14 There are no problems regarding the non-numeric elements.

M\_Suc15 There are no problems regarding the accounts' precision.

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## Messages list

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M\_Suc16 Report model successfully loaded.

M\_Fault00 The following accounts are missing a valid context declaration:

M\_Fault01 The following accounts are missing a valid unit declaration:

M\_Fault02 The following accounts are missing a valid axis declaration:

M\_Fault03 Non-numeric elements regarding the context list below need a valid context references:

M\_Conf00 Do you wish to save the current report before quitting?

M\_Conf01 Do you wish to save the current report before loading the new report model?

M\_Help OFR prototype VX.

Thanks for using the Open Financial Reporting Software!

If you got any trouble, access the link to the software's documentation:  
[bit.ly/XXXXXX](http://bit.ly/XXXXXX)

M\_Tip00 First, go to the Report Models menu and choose one among the available options.

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## Messages list

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M\_Tip01 To create a new report, go to the File menu and choose the option New Report.

M\_Tip02 Your report is empty! Go to the Insert menu, choose the option Insert Context, and insert your data through the opened window.

M\_Tip03 Try inserting a new context! Go to the Insert menu, choose the option Insert Context, and insert your data through the opened window.

M\_Tip04 Try inserting a new Unit! Go to the Insert menu, choose the option Insert Unit, and insert your data through the opened window.

M\_Tip05 Try inserting a new Account! Go to the Insert menu, choose the option Insert Account, and insert your data through the opened window.

M\_Tip06 Try inserting a new Non Numeric element! Go to the Insert menu, choose the option Insert Non Numeric element, and insert your data through the opened window.

M\_Tip07 You can edit elements through the options under the Edit menu whenever the report validation is unsuccessful. You can also deal with inconsistent elements in that way. You can also delete elements through the options under the Remove menu.

M\_Tip08 In the Element Edition Manager window, use the blue boxes to choose the element you want to edit. Then the OFR will fill up the remaining boxes with the information of that element for you to edit.

M\_Tip09 In the Element Exclusion Manager window, use the blue boxes to choose the element you want to remove.

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# OFR – Guia do usuário

ANTÔNIO RICARDO D'ARAÚJO AMÂNCIO OLIVEIRA  
PAULO CAETANO DA SILVA  
JAN-2021



## Sumário

### Introdução

#### A interface do programa

- A barra de menus
- O painel da árvore do relatório
- O painel de mensagens
- O painel de mensagens de inconsistência

#### Gerenciando elementos

- Inserindo um elemento
- Editando um elemento
- Deletando um elemento

#### Lista de mensagens



# Introdução

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## Introdução

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Este documento contém as instruções básicas para interagir com o Open Financial Reporting (OFR). O referido programa será gratuito, de código aberto, e desenvolvido sob as práticas de design de IHC para evitar o desperdício de tempo e recursos de compor um relatório financeiro XBRL.

Um projeto de design de IHC é focado e centrado nos potenciais usuários finais, cujas informações de feedback são as principais diretrizes para o desenvolvimento e implementação da interface e das ferramentas do programa.

A referida solução é parte de um projeto do programa de mestrado em Sistemas e Computação da UNIFACS. Seu desenvolvimento aplicará técnicas de design de Interface Humano-Computador para facilitar a tarefa de compor um relatório financeiro XBRL por meio da abstração de sua complexidade.

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# A interface do programa

A BARRA DE MENUS

O PAINEL DA ÁRVORE DO RELATÓRIO

O PAINEL DE MENSAGENS

O PAINEL DE MENSAGENS DE INCONSISTÊNCIA

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## A interface do programa

Conforme a imagem, a interface do OFR consiste em:

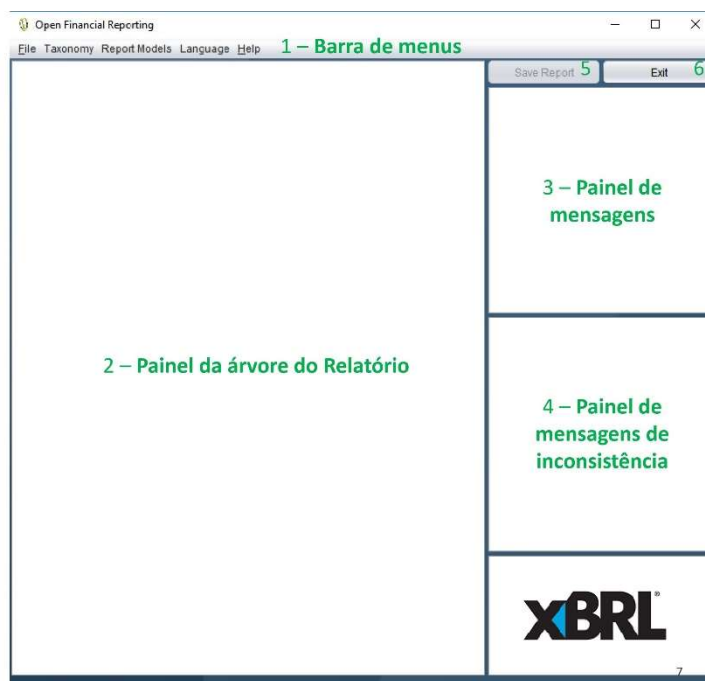
- Uma barra de menus (item 1),
- Um painel da árvore do relatório (item 2),
- Um painel de mensagens (item 3),
- Um painel de mensagens de inconsistência (item 4),
- Um botão "Salvar Relatório" (item 5),
- Um botão Sair (item 6).

## A interface do programa

Inicialmente a barra de menus contém cinco itens principais: *File*, *Taxonomy*, *Report Models*, *Language*, e *Help*.

O item 5 se torna acessível depois que o usuário abre um relatório ou começa um novo. Clicar no item 5 é equivalente a clicar na opção “Salvar” do menu “Arquivo”.

Clicar no item 6 é equivalente a clicar na opção “Sair” do menu “Arquivo”.



## A barra de menus

Dentro de cada menu, os atalhos disponíveis no teclado para cada subitem aparecem ao lado de cada um deles. O menu “Taxonomia” tem um subitem: “Carregar arquivos de taxonomia”. Ele deveria abrir uma janela de seleção de arquivos para o usuário importar a taxonomia desejada, antes de criar, carregar ou compor um relatório de instância. No entanto, a equipe de desenvolvimento está testando um relatório financeiro XBRL específico. Deste modo, todas as regras da taxonomia já foram incorporadas ao código do programa. Atualmente, não existe nenhuma função acoplada a este item.



## A barra de menus

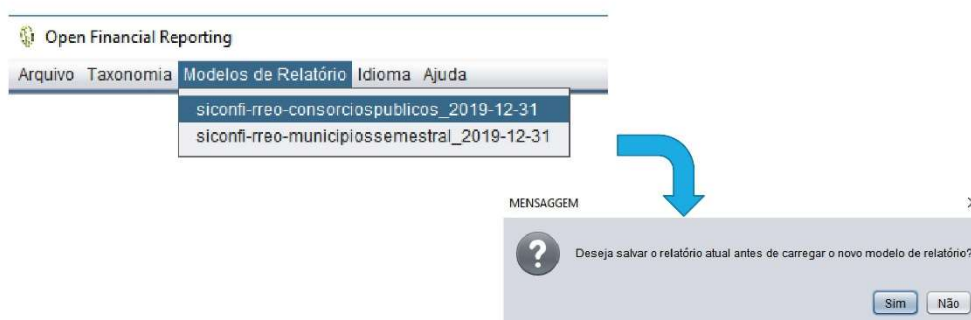
Uma vez que todas as regras da taxonomia já estão no código do programa, o menu “Modelos de Relatório” está disponível na tela inicial. Ao clicar sobre ele, o program exibe apenas modelos de relatório relacionados à taxonomia incorporada. Depois de selecionar um modelo de relatório, as opções “Novo relatório” e “Abrir” são disponibilizadas no menu “Arquivo”.



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## A barra de menus

Após clicar na opção de modelos de relatório, se o usuário possuir algum relatório sob edição, o OFR irá exibir uma mensagem ao usuário, perguntando se ele(a) deseja salvar o relatório atual antes de trocar de modelo.

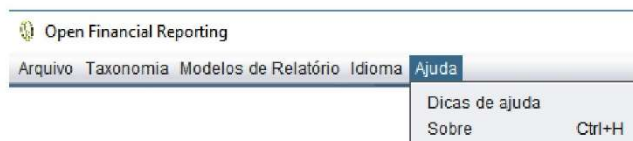


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## A barra de menus

Por causa da taxonomia incorporada, o programa apenas lida com instâncias referentes a esta taxonomia. Desta forma, toda vez que o OFR salvar um arquivo, ele obedece às regras do Presentation Link da taxonomia incorporada (por isso, não há necessidade de validar a instância neste linkbase). Analogamente, toda vez que o OFR abrir um arquivo XBRL, o programa interpreta o arquivo como sendo uma instância da taxonomia acoplada.

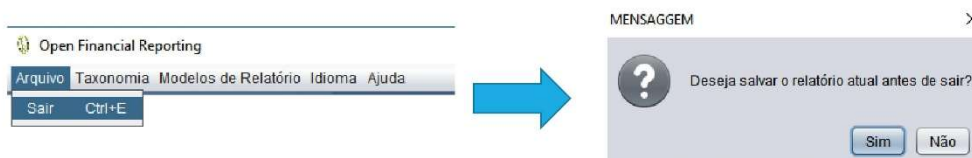
O item “Ajuda” tem dois subitens: “Dicas de Ajuda” e “Sobre”. Ao clicar em “Sobre”, o programa exibe uma nota breve sobre seu versionamento e fornece uma URL para baixar a documentação de suporte. Clicar em “Dicas de ajuda” exibirá uma janela de mensagem com uma dica sobre o que o usuário pode fazer a seguir.



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## A barra de menus

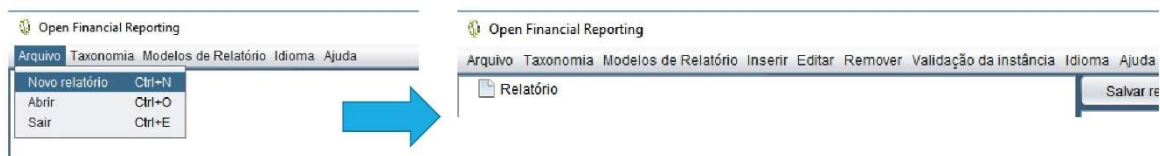
Inicialmente, o item “Arquivo” possui um subitem: “Sair”. A opção “Sair” fecha o programa perdendo todo o progresso não salvo. Se o usuário tem um relatório sob edição, o OFR irá exibir uma janela que pergunta ao usuário se ele(a) deseja salvar o relatório atual antes de sair. Esta opção tem o mesmo resultado que clicar no botão “Sair” (item 6) na interface do programa.



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## A barra de menus

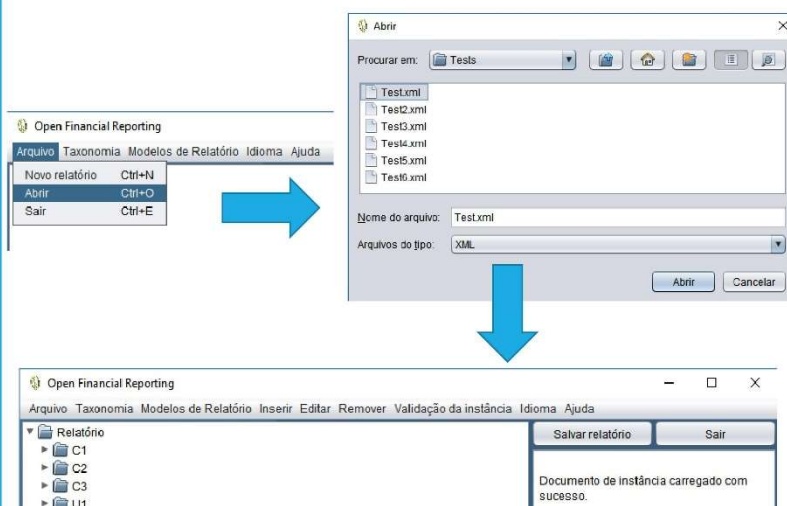
Após carregar o modelo do relatório, os subitens “Novo relatório” e “Abrir” se tornam disponíveis. O subitem “Novo relatório” gera um novo documento de instância XBRL vazio ( um relatório financeiro na linguagem XBRL) e habilita um novo subitem: “Salvar”. Após clicar na opção “Novo relatório”, os menus de gerenciamento de elementos e validação de instância ficam disponíveis.



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## A barra de menus

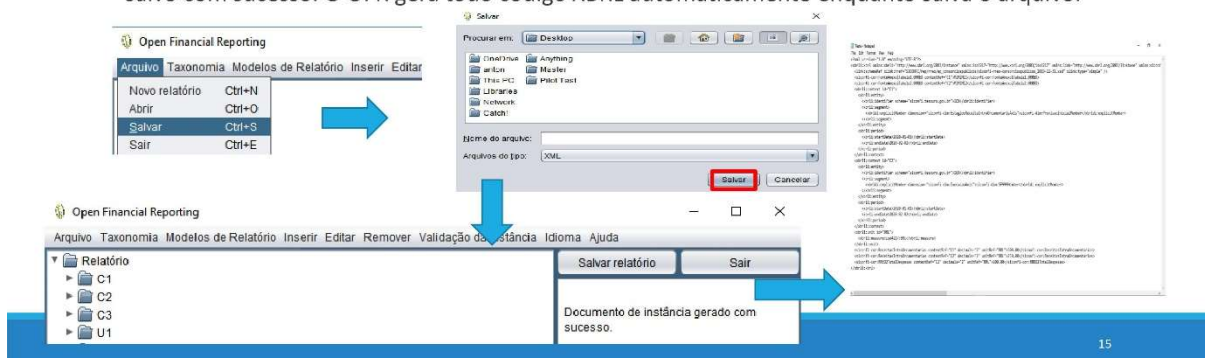
Conforme ilustrado, a opção “Abrir” exibe uma janela de seleção de arquivos para que o usuário possa navegar, selecionar e carregar um arquivo XML contendo um relatório financeiro XBRL. Após clicar nesta opção, o programa habilita o subitem “Salvar” e os menus para gerenciamento de elementos e validação de instância. Esta ação também atualiza o painel da árvore do relatório (item 2), informa, no painel de mensagem (item 3), se a abertura do documento foi bem sucedida ou não, e gera avisos referentes às inconsistências presentes no relatório carregado no item 4 da interface.



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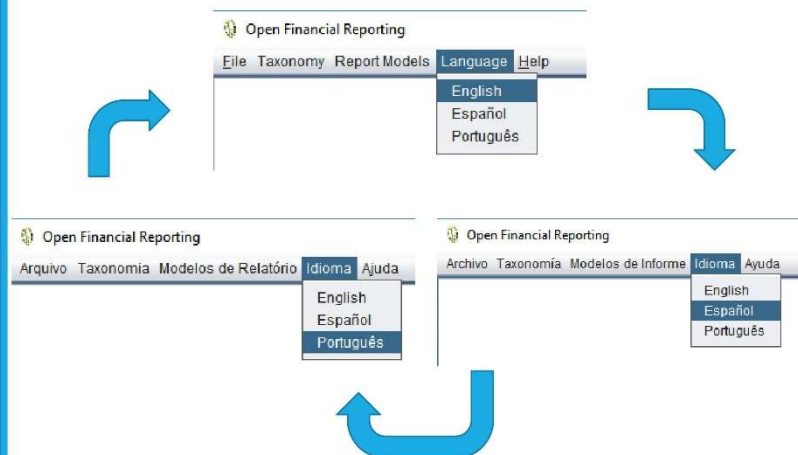
## A barra de menus

Uma vez que o usuário tenha criado ou aberto um relatório, a opção “Salvar” fica disponível no menu “Arquivo”. Ao clicar nela, o programa exibirá uma janela de seleção de arquivo para que o usuário nomeie o arquivo do relatório e o guarde numa pasta que considerar conveniente. Quando o processo termina, o programa exibe uma mensagem informando que o arquivo foi salvo com sucesso. O OFR gera todo código XBRL automaticamente enquanto salva o arquivo.



## A barra de menus

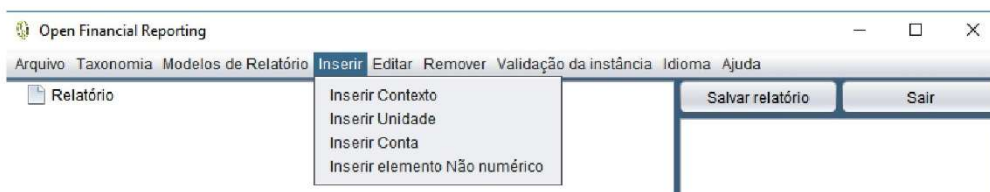
Conforme ilustrado, o menu "Language" tem três subitens: Inglês, Espanhol, e Português. Ao clicar em qualquer um deles o programa será automaticamente traduzido para o idioma correspondente. É importante salientar que isto afeta apenas os menus e janelas do programa. Os elementos do relatório sempre serão exibidos na linguagem usada na taxonomia implementada.





## A barra de menus

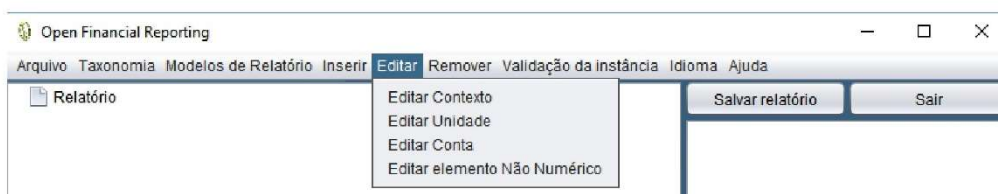
O menu “Inserir” fica disponível após o usuário abrir ou criar um novo relatório. Ele tem quatro subitens: Inserir Contexto, Inserir Unidade, Inserir Conta, e Inserir elemento Não Numérico. Cada um deles invoca o gerenciador de inserção de elementos que permite ao usuário criar elementos do relatório financeiro. A secção “Gerenciando elementos” descreve os gerenciadores em maior detalhe.



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## A barra de menus

O menu “Editar” fica disponível após o usuário abrir ou criar um novo relatório. Ele tem quatro subitens: Editar Contexto, Editar Unidade, Editar Conta, e Editar elemento Não Numérico. Cada um deles invoca o gerenciador de edição de elementos que permite ao usuário editar elementos do relatório financeiro. A secção “Gerenciando elementos” descreve os gerenciadores em maior detalhe.



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## A barra de menus

O menu “Remover” fica disponível após o usuário abrir ou criar um novo relatório. Ele tem quatro subitens: Remover Contexto, Remover Unidade, Remover Conta, e Remover elemento Não Numérico. Cada um deles invoca o gerenciador de exclusão de elementos que permite ao usuário remover elementos do relatório financeiro. A secção “Gerenciando elementos” descreve os gerenciadores em maior detalhe.

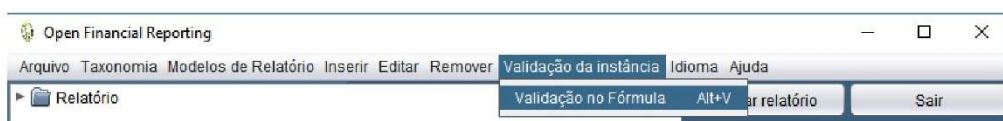


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## A barra de menus

O menu “Validação da instância” possui um subitem: Validação no Fórmula. É comum que documentos de instância XBRL sejam submetidos a validações junto a um ou mais *linkbases*. O processo de validação previne que os arquivos apresentem inconsistências.

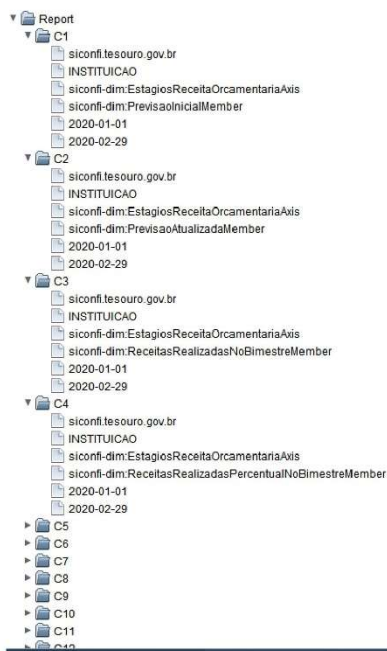
Por exemplo, uma validação no *linkbase formula* evita que o relatório possua declarações de contas que não obedeçam às relações matemáticas entre elas. Este protótipo implementou um conjunto de regras reduzido, uma vez que isso não impossibilita a criação de instâncias. Mesmo sendo um recurso importante, uma versão ulterior do programa implementará esta funcionalidade em sua completude.



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## O painel da árvore do relatório

Arquivos de instância XBRL possuem uma estrutura hierárquica, comumente representada por meio de árvores. O OFR provê o painel da árvore do relatório como um recurso que exibe a estrutura hierárquica do documento XBRL, enquanto ele está em construção. O painel exibe os elementos de acordo com a ordem definida no *Presentation linkbase* da taxonomia. Sua função é permitir ao usuário verificar todos os elementos existentes no relatório em construção.



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## O painel de mensagens

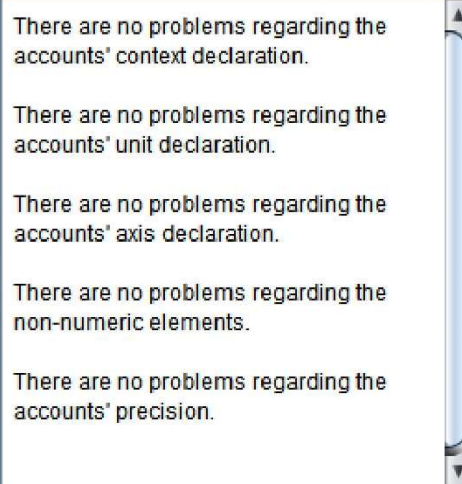
O OFR provê um painel de mensagens que exibe as comunicações do programa de acordo com as ações realizadas pelo usuário. As mensagens são exibidas em ordem cronológica. Este painel deve permitir ao usuário verificar todas as operações realizadas referentes à construção do relatório. Mensagens relacionadas aos gerenciadores de elementos são exibidas em janelas de mensagens específicas.

Instance document successfully loaded.

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## O painel de mensagens de inconsistência

O OFR provê o painel de mensagens de inconsistência. Ele exibe mensagens do programa de acordo com as inconsistências encontradas nos elementos do relatório sob edição. As mensagens são atualizadas toda vez que o usuário edita o relatório ou abre um arquivo de instância. Ele permite ao usuário verificar todos os elementos com inconsistências durante a construção do relatório.



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# Gerenciando elementos

INSERINDO UM ELEMENTO  
 EDITANDO UM ELEMENTO  
 DELETANDO UM ELEMENTO

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## Inserindo um elemento

Ao clicar na opção “Inserir Contexto” no menu “Inserir”, o programa exibirá a janela do gerenciador de inserção de elementos. A janela será exibida e preparada para a inserção de um contexto. Todos os campos disponíveis são obrigatórios para a inserção de um contexto válido no relatório financeiro.

The screenshot shows the 'Gerenciador de inserção de elementos' window with the 'Contexto' tab selected. The form contains the following fields:

- Tipo:**  Contexto
- Nome do contexto:** [Empty text box]
- Código da Instituição:** [Empty text box]
- Eixo do contexto:** EstagiosReceitaOrcamentaria
- Início:** 2020-01-01
- Término:** 2020-01-31
- Schema:** siconfi.tesouro.gov.br
- Dimensão do contexto:** Previsaoinicial
- AAAA-MM-DD:** AAAA-MM-DD
- Eixo secundário do contexto:** [Empty dropdown]
- Dimensão secundária do contexto:** [Empty dropdown]
- Tipo:**  Unidade
- Nome da unidade:** [Empty text box]
- Código ISO:** ADP
- Tipo:**  Conta
- Tag da conta:** [Empty dropdown]
- Valor:** [Empty text box]
- Decimais:** [Empty text box]
- Unidade:** [Empty dropdown]
- Contexto:** [Empty dropdown]
- Tipo:**  Não numérico
- Tag do elemento não numérico:** Notas explicativas
- Contexto:** [Empty dropdown]
- Descrição:** [Empty text box]

Buttons: Cancelar, Adicionar

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## Inserindo um elemento

Ao clicar na opção “Inserir Unidade” no menu “Inserir”, o programa exibirá a janela do gerenciador de inserção de elementos. A janela será exibida e preparada para a inserção de uma unidade. Todos os campos disponíveis são obrigatórios para a inserção de uma unidade válida no relatório financeiro.

The screenshot shows the 'Gerenciador de inserção de elementos' window with the 'Unidade' tab selected. The form contains the following fields:

- Tipo:**  Contexto
- Nome do contexto:** [Empty text box]
- Código da Instituição:** [Empty text box]
- Eixo do contexto:** EstagiosReceitaOrcamentaria
- Início:** 2020-01-01
- Término:** 2020-01-31
- Schema:** siconfi.tesouro.gov.br
- Dimensão do contexto:** Previsaoinicial
- AAAA-MM-DD:** AAAA-MM-DD
- Eixo secundário do contexto:** [Empty dropdown]
- Dimensão secundária do contexto:** [Empty dropdown]
- Tipo:**  Unidade
- Nome da unidade:** [Empty text box]
- Código ISO:** ADP
- Tipo:**  Conta
- Tag da conta:** [Empty dropdown]
- Valor:** [Empty text box]
- Decimais:** [Empty text box]
- Unidade:** [Empty dropdown]
- Contexto:** [Empty dropdown]
- Tipo:**  Não numérico
- Tag do elemento não numérico:** Notas explicativas
- Contexto:** [Empty dropdown]
- Descrição:** [Empty text box]

Buttons: Cancelar, Adicionar

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## Inserindo um elemento

Ao clicar na opção “Inserir Conta” no menu “Inserir”, o programa exibirá a janela do gerenciador de inserção de elementos. A janela será exibida e preparada para a inserção de uma conta. Todos os campos disponíveis são obrigatórios para a inserção de uma conta válida no relatório financeiro.

The screenshot shows the 'Gerenciador de inserção de elementos' window. The 'Tipo' section has the 'Conta' checkbox checked. The 'Nome do contexto' field is empty. The 'Código da Instituição' field contains 'siconfi.tesouro.gov.br'. The 'Eixo do contexto' dropdown is set to 'EstagiosReceitaOrcamentaria'. The 'Início' field is '2020-01-01' and the 'Término' field is '2020-01-31'. The 'Schema' dropdown is 'siconfi.tesouro.gov.br' and the 'Dimensão do contexto' dropdown is 'Previsaolnicial'. The 'AAAA-MM-DD' and 'AAAA-MM-DD' fields are empty. The 'Eixo secundário do contexto' and 'Dimensão secundária do contexto' fields are empty. The 'Tipo' section has the 'Unidade' checkbox unchecked. The 'Nome da unidade' field is empty and the 'Código ISO' dropdown is 'ADP'. The 'Tipo' section has the 'Conta' checkbox checked. The 'Tag da conta' dropdown is empty. The 'Valor' field is empty, the 'Decimais' field is empty, the 'Unidade' dropdown is empty, and the 'Contexto' dropdown is empty. The 'Tipo' section has the 'Não numérico' checkbox unchecked. The 'Tag do elemento não numérico' dropdown is 'Notas explicativas'. The 'Contexto' dropdown is empty. The 'Descrição' field is empty. The 'Cancelar' and 'Adicionar' buttons are at the bottom right.

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## Inserindo um elemento

Ao clicar na opção “Inserir elemento Não Numérico” no menu “Inserir”, o programa exibirá a janela do gerenciador de inserção de elementos. A janela será exibida e preparada para a inserção de um elemento não numérico. Todos os campos disponíveis são obrigatórios para a inserção de um elemento não numérico válido no relatório financeiro.

The screenshot shows the 'Gerenciador de inserção de elementos' window. The 'Tipo' section has the 'Contexto' checkbox unchecked. The 'Nome do contexto' field is empty. The 'Código da Instituição' field contains 'siconfi.tesouro.gov.br'. The 'Eixo do contexto' dropdown is set to 'EstagiosReceitaOrcamentaria'. The 'Início' field is '2020-01-01' and the 'Término' field is '2020-01-31'. The 'Schema' dropdown is 'siconfi.tesouro.gov.br' and the 'Dimensão do contexto' dropdown is 'Previsaolnicial'. The 'AAAA-MM-DD' and 'AAAA-MM-DD' fields are empty. The 'Eixo secundário do contexto' and 'Dimensão secundária do contexto' fields are empty. The 'Tipo' section has the 'Unidade' checkbox unchecked. The 'Nome da unidade' field is empty and the 'Código ISO' dropdown is 'ADP'. The 'Tipo' section has the 'Conta' checkbox unchecked. The 'Tag da conta' dropdown is empty. The 'Valor' field is empty, the 'Decimais' field is empty, the 'Unidade' dropdown is empty, and the 'Contexto' dropdown is empty. The 'Tipo' section has the 'Não numérico' checkbox checked. The 'Tag do elemento não numérico' dropdown is 'Notas explicativas'. The 'Contexto' dropdown is empty. The 'Descrição' field is empty. The 'Cancelar' and 'Adicionar' buttons are at the bottom right.

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## Inserindo um elemento

O usuário também pode trocar o tipo de elemento que está tentando inserir desmarcando checkbox do tipo de elemento desejado. Dessa forma, um usuário pode inserir contas, contextos, unidades e notas explicativas em um relatório financeiro.

Gerenciador de inserção de elementos

Tipo:  Contexto

Nome do contexto:

Código da Instituição:

Eixo do contexto: EstagiosReceitaOrçamentaria

Início: 2020-01-01

Término: 2020-01-31

Schema: siconfi.tesouro.gov.br

Dimensão do contexto: Previsaoinicial

AAAA-MM-DD: AAAA-MM-DD

Eixo secundário do contexto:

Dimensão secundária do contexto:

Tipo:  Unidade

Nome da unidade:

Código ISO: ADP

Tipo:  Conta

Tag da conta:

Valor:

Decimais:

Unidade:

Contexto:

Tipo:  Não numérico

Tag do elemento não numérico: Notas explicativas

Contexto:

Descrição:

Cancelar Adicionar

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## Inserindo um elemento

Toda vez que o usuário seleciona o tipo de elemento, por meio de uma das checkboxes, todos os itens não relacionados ao elemento escolhido são desabilitados. No entanto, todos os campos restantes são obrigatórios para poder adicionar o elemento.

Alguns dos itens desabilitados podem exibir algum conteúdo, pois o programa não perde o progresso do usuário caso a operação seja interrompida por meio do botão "Cancelar". Toda vez que o usuário tentar adicionar um elemento inconsistente o programa exibirá mensagens de erros, por meio de novas janelas, quando ele(a) clicar no botão "Adicionar".

Gerenciador de inserção de elementos

Tipo:  Contexto

Nome do contexto:

Código da Instituição:

Eixo do contexto: EstagiosReceitaOrçamentaria

Início: 2020-01-01

Término: 2020-01-31

Schema: siconfi.tesouro.gov.br

Dimensão do contexto: Previsaoinicial

AAAA-MM-DD: AAAA-MM-DD

Eixo secundário do contexto:

Dimensão secundária do contexto:

Tipo:  Unidade

Nome da unidade:

Código ISO: ADP

Tipo:  Conta

Tag da conta:

Valor:

Decimais:

Unidade:

Contexto:

Tipo:  Não numérico

Tag do elemento não numérico: Notas explicativas

Contexto:

Descrição:

Cancelar Adicionar

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## Inserindo um elemento

A inserção de elementos segue as seguintes regras:

1 - Contextos e unidades não dependem de elementos pré-existentes. O usuário pode adicioná-los livremente.

2 - Notas explicativas dependem de contextos previamente adicionados. Não é possível adicionar notas explicativas sem ter declarado um contexto.

3 - Declarações de contas dependem de um contexto e uma unidade previamente adicionados. Não é possível inserir declarações financeiras sem ter declarado um contexto e uma unidade.

A janela 'Gerenciador de inserção de elementos' apresenta os seguintes campos e controles:

- Tipo:**  Contexto
- Nome do contexto:** Campo de texto.
- Código da Instituição:** Campo de texto.
- Eixo do contexto:** Menu suspenso com 'EstagiosRecetaOrcamentaria' selecionado.
- Início:** Campo de data com máscara '2020-01-01'.
- Término:** Campo de data com máscara '2020-01-31'.
- Schema:** Menu suspenso com 'siconfi.tesouro.gov.br' selecionado.
- Dimensão do contexto:** Menu suspenso com 'Previsaoinicial' selecionado.
- AAAA-MM-DD:** Campos de data para início e término.
- Eixo secundário do contexto:** Menu suspenso.
- Dimensão secundária do contexto:** Menu suspenso.
- Tipo:**  Unidade
- Nome da unidade:** Campo de texto.
- Código ISO:** Menu suspenso com 'ADP' selecionado.
- Tipo:**  Conta
- Tag da conta:** Menu suspenso.
- Valor:** Campo de texto.
- Decimais:** Campo de texto.
- Unidade:** Menu suspenso.
- Contexto:** Menu suspenso.
- Tipo:**  Não numérico
- Tag do elemento não numérico:** Menu suspenso com 'Notas explicativas' selecionado.
- Contexto:** Menu suspenso.
- Descrição:** Campo de texto.
- Botões:** 'Cancelar' e 'Adicionar'.

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## Editando um elemento

Ao clicar na opção "Editar Contexto" no menu "Editar", o programa exibirá a janela do gerenciador de edição de elementos. A janela será exibida e preparada para a edição de um contexto.

A área destinada a cada tipo de elemento é dividida em duas zonas: zona de seleção (área sinalizada em azul) e zona de edição (área restante).

Na zona de seleção o usuário deve selecionar os itens que identificam o elemento que ele(a) deseja editar.

A janela 'Gerenciador de edição de elementos' apresenta os seguintes campos e controles:

- Tipo:** Menu suspenso com 'Contexto selecionado' selecionado e destacado em azul.
- Contexto:**  Contexto
- Nome do contexto:** Campo de texto.
- Código da Instituição:** Campo de texto.
- Eixo do contexto:** Menu suspenso com 'EstagiosRecetaOrcamentaria' selecionado.
- Área de edição:** Campo de texto.
- Início:** Campo de data com máscara '2020-01-01'.
- Término:** Campo de data com máscara '2020-01-31'.
- Schema:** Menu suspenso com 'siconfi.tesouro.go...' selecionado.
- Dimensão do contexto:** Menu suspenso com 'Previsaoinicial' selecionado.
- AAAA-MM-DD:** Campos de data para início e término.
- Eixo secundário do contexto:** Menu suspenso.
- Dimensão secundária do contexto:** Menu suspenso.
- Tipo:**  Unidade
- Unidade selecionada:** Menu suspenso.
- Unidade:** Campo de texto.
- Código ISO:** Menu suspenso com 'ADP' selecionado.
- Área de edição:** Campo de texto.
- Tipo:**  Conta
- Tag da conta selecionada:** Menu suspenso.
- Contexto selecionado:** Menu suspenso.
- Área de edição:** Campo de texto.
- Tag da conta:** Menu suspenso.
- Valor:** Campo de texto.
- Decimais:** Campo de texto.
- Unidade:** Menu suspenso.
- Contexto:** Menu suspenso.
- Tipo:**  Não numérico
- Elemento selecionado:** Menu suspenso.
- Contexto:** Menu suspenso.
- Área de edição:** Campo de texto com 'Notas explicativas'.
- Botão:** 'Atualizar'.
- Contexto:** Menu suspenso.
- Descrição:** Campo de texto.
- Botão:** 'Cancelar'.

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## Editando um elemento

Quando o usuário faz uma seleção válida, o programa completa, automaticamente, os demais campos da zona de edição com as características atuais do elemento selecionado para edição.

Todas as alterações realizadas só sobrescreverão as informações existentes após o usuário clicar no botão "Atualizar".

Gerenciador de edição de elementos

Tipo: Contexto selecionado

Contexto

Nome do contexto: [ ] Código da Instituição: [ ] Eixo do contexto: EstagiosReceltaOrcamentaria

Area de edição: [ ]

Início: 2020-01-01 Término: 2020-01-31 Schema: siconfi.tesouro.go... Dimensão do contexto: Previsaoinicial

AAAA-MM-DD AAAAA-MM-DD

Eixo secundário do contexto: [ ] Dimensão secundária do contexto: [ ]

Tipo: [ ] Unidade selecionada: [ ]

Unidade

Unidade: [ ] Código ISO: ADP

Area de edição: [ ]

Tipo: [ ] Tag da conta selecionada: [ ] Contexto selecionado: [ ]

Conta

Tag da conta: [ ]

Area de edição: [ ]

Valor: [ ] Decimais: [ ] Unidade: [ ] Contexto: [ ]

Tipo: [ ] Elemento selecionado: [ ] Contexto: [ ]

Não numérico

Tag do elemento não numérico: [ ]

Area de edição: Notas explicativas

Contexto: Descrição: [ ]

Atualizar

Cancelar

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## Editando um elemento

Ao clicar na opção "Editar Unidade" no menu "Editar", o programa exibirá a janela do gerenciador de edição de elementos. A janela será exibida e preparada para a edição de uma unidade.

A área destinada a cada tipo de elemento é dividida em duas zonas: zona de seleção (área sinalizada em azul) e zona de edição (área restante).

Na zona de seleção o usuário deve selecionar os itens que identificam o elemento que ele(a) deseja editar.

Gerenciador de edição de elementos

Tipo: Contexto selecionado

Contexto

Nome do contexto: [ ] Código da Instituição: [ ] Eixo do contexto: EstagiosReceltaOrcamentaria

Area de edição: [ ]

Início: 2020-01-01 Término: 2020-01-31 Schema: siconfi.tesouro.go... Dimensão do contexto: Previsaoinicial

AAAA-MM-DD AAAAA-MM-DD

Eixo secundário do contexto: [ ] Dimensão secundária do contexto: [ ]

Tipo: [ ] Unidade selecionada: [ ]

Unidade

Unidade: [ ] Código ISO: ADP

Area de edição: [ ]

Tipo: [ ] Tag da conta selecionada: [ ] Contexto selecionado: [ ]

Conta

Tag da conta: [ ]

Area de edição: [ ]

Valor: [ ] Decimais: [ ] Unidade: [ ] Contexto: [ ]

Tipo: [ ] Elemento selecionado: [ ] Contexto: [ ]

Não numérico

Tag do elemento não numérico: [ ]

Area de edição: Notas explicativas

Contexto: Descrição: [ ]

Atualizar

Cancelar

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## Editando um elemento

Quando o usuário faz uma seleção válida, o programa completa, automaticamente, os demais campos da zona de edição com as características atuais do elemento selecionado para edição.

Todas as alterações realizadas só sobrescreverão as informações existentes após o usuário clicar no botão "Atualizar".

The screenshot shows the 'Gerenciador de edição de elementos' window. The 'Contexto' section is active, with the 'Contexto' checkbox checked. Below it, the 'Unidade' checkbox is also checked. The 'Atualizar' button is visible at the bottom right of the window.

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## Editando um elemento

Ao clicar na opção "Editar Conta" no menu "Editar", o programa exibirá a janela do gerenciador de edição de elementos. A janela será exibida e preparada para a edição de uma conta.

A área destinada a cada tipo de elemento é dividida em duas zonas: zona de seleção (área sinalizada em azul) e zona de edição (área restante).

Na zona de seleção o usuário deve selecionar os itens que identificam o elemento que ele(a) deseja editar.

The screenshot shows the 'Gerenciador de edição de elementos' window. The 'Conta' checkbox is checked. The 'Tag da conta selecionada' and 'Contexto selecionado' fields are highlighted with a blue box, indicating the selection zone.

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## Editando um elemento

Quando o usuário faz uma seleção válida, o programa completa, automaticamente, os demais campos da zona de edição com as características atuais do elemento selecionado para edição.

Todas as alterações realizadas só sobrescreverão as informações existentes após o usuário clicar no botão "Atualizar".

Gerenciador de edição de elementos

Tipo: Contexto selecionado

Contexto Nome do contexto Código da Instituição Eixo do contexto

Area de edição: EstagiosReceitaOrcamentaria

Início: 2020-01-01 Término: 2020-01-31 Schema: siconfi.tesouro.go... Dimensão do contexto: Previsaoinicial

AAAA-MM-DD: AAAAA-MM-DD

Eixo secundário do contexto: Dimensão secundária do contexto

Tipo: Unidade selecionada

Unidade Unidade Código ISO

Area de edição: ADP

Tipo:  Conta Tag da conta selecionada Contexto selecionado

Area de edição: Tag da conta

Valor: Decimais Unidade Contexto

Tipo: Elemento selecionado Contexto

Não numérico Tag do elemento não numérico

Area de edição: Notas explicativas

Contexto: Descrição

Atualizar

Cancelar

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## Editando um elemento

Ao clicar na opção "Editar elemento Não Numérico" no menu "Editar", o programa exibirá a janela do gerenciador de edição de elementos. A janela será exibida e preparada para a edição de um elemento Não Numérico.

A área destinada a cada tipo de elemento é dividida em duas zonas: zona de seleção (área sinalizada em azul) e zona de edição (área restante).

Na zona de seleção o usuário deve selecionar os itens que identificam o elemento que ele(a) deseja editar.

Gerenciador de edição de elementos

Tipo: Contexto selecionado

Contexto Nome do contexto Código da Instituição Eixo do contexto

Area de edição: EstagiosReceitaOrcamentaria

Início: 2020-01-01 Término: 2020-01-31 Schema: siconfi.tesouro.go... Dimensão do contexto: Previsaoinicial

AAAA-MM-DD: AAAAA-MM-DD

Eixo secundário do contexto: Dimensão secundária do contexto

Tipo: Unidade selecionada

Unidade Unidade Código ISO

Area de edição: ADP

Tipo:  Conta Tag da conta selecionada Contexto selecionado

Area de edição: Tag da conta

Valor: Decimais Unidade Contexto

Tipo: Elemento selecionado Contexto

Não numérico Tag do elemento não numérico

Area de edição: Notas explicativas

Contexto: Descrição

Atualizar

Cancelar

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## Editando um elemento

Quando o usuário faz uma seleção válida, o programa completa, automaticamente, os demais campos da zona de edição com as características atuais do elemento selecionado para edição.

Todas as alterações realizadas só sobrescreverão as informações existentes após o usuário clicar no botão "Atualizar".

Gerenciador de edição de elementos

Tipo: Contexto selecionado

Contexto

Nome do contexto: [ ] Código da Instituição: [ ] Eixo do contexto: EstagiosReceitaOrcamentaria

Área de edição: [ ]

Início: 2020-01-01 Término: 2020-01-31 Schema: siconfi.tesouro.go... Dimensão do contexto: PrevisaInicial

AAAA-MM-DD: [ ] AAAAA-MM-DD: [ ]

Eixo secundário do contexto: [ ] Dimensão secundária do contexto: [ ]

Tipo: [ ] Unidade selecionada: [ ]

Unidade

Unidade: [ ] Código ISO: ADP

Área de edição: [ ]

Tipo: [ ] Tag da conta selecionada: [ ] Contexto selecionado: [ ]

Conta

Área de edição: Tag da conta: [ ]

Valor: [ ] Decimais: [ ] Unidade: [ ] Contexto: [ ]

Tipo: [ ] Elemento selecionado: [ ] Contexto: [ ]

Não numérico

Tag do elemento não numérico: [ ]

Área de edição: Notas explicativas [ ] Atualizar

Contexto: Descrição: [ ] Cancelar

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## Editando um elemento

O usuário também pode trocar tipo de elemento que está tentando editar desmarcando checkbox do tipo de elemento desejado. Dessa forma, um usuário pode editar contas, contextos, unidades e notas explicativas em um relatório financeiro.

Gerenciador de edição de elementos

Tipo: Contexto selecionado

Contexto

Nome do contexto: [ ] Código da Instituição: [ ] Eixo do contexto: EstagiosReceitaOrcamentaria

Área de edição: [ ]

Início: 2020-01-01 Término: 2020-01-31 Schema: siconfi.tesouro.go... Dimensão do contexto: PrevisaInicial

AAAA-MM-DD: [ ] AAAAA-MM-DD: [ ]

Eixo secundário do contexto: [ ] Dimensão secundária do contexto: [ ]

Tipo: [ ] Unidade selecionada: [ ]

Unidade

Unidade: [ ] Código ISO: ADP

Área de edição: [ ]

Tipo: [ ] Tag da conta selecionada: [ ] Contexto selecionado: [ ]

Conta

Área de edição: Tag da conta: [ ]

Valor: [ ] Decimais: [ ] Unidade: [ ] Contexto: [ ]

Tipo: [ ] Elemento selecionado: [ ] Contexto: [ ]

Não numérico

Tag do elemento não numérico: [ ]

Área de edição: Notas explicativas [ ] Atualizar

Contexto: Descrição: [ ] Cancelar

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## Editando um elemento

Toda vez que o usuário seleciona o tipo de elemento, por meio de uma das checkboxes, todos os itens não relacionados ao elemento escolhido são desabilitados. No entanto, todos os campos restantes são obrigatórios para poder editar o elemento.

Alguns dos itens desabilitados podem exibir algum conteúdo, pois o programa não perde o progresso do usuário caso a operação seja interrompida por meio do botão "Cancelar". Toda vez que o usuário tentar inserir informações inconsistentes num elemento o programa exibirá mensagens de erros, por meio de novas janelas, quando ele(a) clicar no botão "Atualizar".

## Editando um elemento

A edição de elementos segue as seguintes regras:

- 1 - Contextos e unidades não dependem de elementos pré-existentes. O usuário pode editá-los livremente.
- 2 - Notas explicativas dependem de contextos previamente adicionados. Não é possível editar notas explicativas sem ter declarado um contexto.
- 3 - Declarações de contas dependem de um contexto e uma unidade previamente adicionados. Não é possível editar declarações financeiras sem ter declarado um contexto e uma unidade.
- 4 - O usuário deve adicionar elementos antes de tentar editá-los.

**Gerenciador de edição de elementos**

Tipo: Contexto selecionado

**Contexto** Nome do contexto: [ ] Código da Instituição: [ ] Eixo do contexto: EstagiosReceitaOrcamentaria

Area de edição: [ ]

Início: 2020-01-01 Término: 2020-01-31 Schema: siconfi.tesouro.go... Dimensão do contexto: Previsaoinicial

AAAA-MM-DD AAAAA-MM-DD

Eixo secundário do contexto: [ ] Dimensão secundária do contexto: [ ]

Tipo: Unidade selecionada

**Unidade** Unidade: [ ] Código ISO: ADP

Area de edição: [ ]

Tipo: Tag da conta selecionada Contexto selecionado

**Conta** Tag da conta: [ ]

Area de edição: [ ]

Valor: [ ] Decimais: [ ] Unidade: [ ] Contexto: [ ]

Tipo: Elemento selecionado Contexto

**Não numérico** Tag do elemento não numérico: [ ]

Area de edição: Notas explicativas [ ] [Atualizar]

Contexto: Descrição [ ] [Cancelar]

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**Gerenciador de edição de elementos**

Tipo: Contexto selecionado

**Contexto** Nome do contexto: [ ] Código da Instituição: [ ] Eixo do contexto: EstagiosReceitaOrcamentaria

Area de edição: [ ]

Início: 2020-01-01 Término: 2020-01-31 Schema: siconfi.tesouro.go... Dimensão do contexto: Previsaoinicial

AAAA-MM-DD AAAAA-MM-DD

Eixo secundário do contexto: [ ] Dimensão secundária do contexto: [ ]

Tipo: Unidade selecionada

**Unidade** Unidade: [ ] Código ISO: ADP

Area de edição: [ ]

Tipo: Tag da conta selecionada Contexto selecionado

**Conta** Tag da conta: [ ]

Area de edição: [ ]

Valor: [ ] Decimais: [ ] Unidade: [ ] Contexto: [ ]

Tipo: Elemento selecionado Contexto

**Não numérico** Tag do elemento não numérico: [ ]

Area de edição: Notas explicativas [ ] [Atualizar]

Contexto: Descrição [ ] [Cancelar]

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## Deletando um elemento

Ao clicar na opção "Remover contexto" no menu "Remover", o programa exibirá a janela do gerenciador de exclusão de elementos. A janela será exibida e preparada para a remoção de um contexto. Todos os campos de seleção dentro de uma área de tipo de elemento são obrigatórios para identificar e remover o elemento. Quando o usuário realiza uma seleção válida, o programa preenche todos os campos da área do elemento automaticamente com as características do elemento selecionado. Todas as alterações realizadas só sobrescreverão as informações existentes após o usuário clicar no botão "Remover".

The screenshot shows the 'Gerenciador de exclusão de elementos' window. The 'Contexto' checkbox is checked. The form fields are as follows:

Tipo	Nome	Código da Instituição	Eixo do contexto
<input checked="" type="checkbox"/> Contexto	[dropdown]		
Início	Término	Schema	Dimensão do contexto
AAAA-MM-DD	AAAA-MM-DD		
Eixo secundário do contexto			Dimensão secundária do contexto
Tipo	Nome da unidade	Código ISO	
<input type="checkbox"/> Unidade	[dropdown]		
Tipo	Tag da conta		
<input type="checkbox"/> Conta	[dropdown]		
Valor	Decimais	Unidade	Contexto
			[dropdown]
Tipo	Elemento não numérico selecionado		
<input type="checkbox"/> Não numérico	[dropdown]		
Contexto	Descrição		

Buttons: Cancelar, Remover

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## Deletando um elemento

Ao clicar na opção "Remover Unidade" no menu "Remover", o programa exibirá a janela do gerenciador de exclusão de elementos. A janela será exibida e preparada para a remoção de uma unidade. Todos os campos de seleção dentro de uma área de tipo de elemento são obrigatórios para identificar e remover o elemento. Quando o usuário realiza uma seleção válida, o programa preenche todos os campos da área do elemento automaticamente com as características do elemento selecionado. Todas as alterações realizadas só sobrescreverão as informações existentes após o usuário clicar no botão "Remover".

The screenshot shows the 'Gerenciador de exclusão de elementos' window. The 'Unidade' checkbox is checked. The form fields are as follows:

Tipo	Nome	Código da Instituição	Eixo do contexto
<input type="checkbox"/> Contexto	[dropdown]		
Início	Término	Schema	Dimensão do contexto
AAAA-MM-DD	AAAA-MM-DD		
Eixo secundário do contexto			Dimensão secundária do contexto
Tipo	Nome da unidade	Código ISO	
<input checked="" type="checkbox"/> Unidade	[dropdown]		
Tipo	Tag da conta		
<input type="checkbox"/> Conta	[dropdown]		
Valor	Decimais	Unidade	Contexto
			[dropdown]
Tipo	Elemento não numérico selecionado		
<input type="checkbox"/> Não numérico	[dropdown]		
Contexto	Descrição		

Buttons: Cancelar, Remover

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## Deletando um elemento

Ao clicar na opção "Remover Conta" no menu "Remover", o programa exibirá a janela do gerenciador de exclusão de elementos. A janela será exibida e preparada para a remoção de uma conta. Todos os campos de seleção dentro de uma área de tipo de elemento são obrigatórios para identificar e remover o elemento. Quando o usuário realiza uma seleção válida, o programa preenche todos os campos da área do elemento automaticamente com as características do elemento selecionado. Todas as alterações realizadas só sobrescreverão as informações existentes após o usuário clicar no botão "Remover".

The screenshot shows the 'Gerenciador de exclusão de elementos' window. The 'Tipo' field is set to 'Conta' (checked). The 'Contexto' field is empty. The 'Nome da unidade' field is empty. The 'Tag da conta' field is empty. The 'Valor' field is empty. The 'Decimais' field is empty. The 'Unidade' field is empty. The 'Contexto' field is empty. The 'Elemento não numérico selecionado' field is empty. The 'Descrição' field is empty. The 'Cancelar' and 'Remover' buttons are visible at the bottom right.

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## Deletando um elemento

Ao clicar na opção "Remover elemento Não Numérico" no menu "Remover", o programa exibirá a janela do gerenciador de exclusão de elementos. A janela será exibida e preparada para a remoção de um elemento Não Numérico. Todos os campos de seleção dentro de uma área de tipo de elemento são obrigatórios para identificar e remover o elemento. Quando o usuário realiza uma seleção válida, o programa preenche todos os campos da área do elemento automaticamente com as características do elemento selecionado. Todas as alterações realizadas só sobrescreverão as informações existentes após o usuário clicar no botão "Remover".

The screenshot shows the 'Gerenciador de exclusão de elementos' window. The 'Tipo' field is set to 'Não numérico' (checked). The 'Contexto' field is empty. The 'Nome da unidade' field is empty. The 'Tag da conta' field is empty. The 'Valor' field is empty. The 'Decimais' field is empty. The 'Unidade' field is empty. The 'Contexto' field is empty. The 'Elemento não numérico selecionado' field is empty. The 'Descrição' field is empty. The 'Cancelar' and 'Remover' buttons are visible at the bottom right.

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## Deletando um elemento

O usuário também pode trocar tipo de elemento que está tentando remover desmarcando checkbox do tipo de elemento e clicando na checkbox do tipo de elemento desejado. Dessa forma, um usuário pode remover contas, contextos, unidades e notas explicativas em um relatório financeiro.

## Deletando um elemento

Toda vez que o usuário seleciona o tipo de elemento, por meio de uma das checkboxes, todos os itens não relacionados ao elemento escolhido são desabilitados. No entanto, todos os campos restantes são obrigatórios para poder identificar e remover o elemento.

Alguns dos itens desabilitados podem exibir algum conteúdo, pois o programa não perde o progresso do usuário caso a operação seja interrompida por meio do botão "Cancelar". Toda vez que o usuário tentar deletar elementos de formas inconsistentes o programa exibirá mensagens de erros, por meio de novas janelas, quando ele(a) clicar no botão "Remover".

**Gerenciador de exclusão de elementos**

Tipo Nome Código da Instituição Eixo do contexto

Contexto

Início Término Schema Dimensão do contexto

AAAA-MM-DD AAAA-MM-DD

Eixo secundário do contexto Dimensão secundária do contexto

---

Tipo Nome da unidade Código ISO

Unidade

Tipo Tag da conta

Conta

Valor Decimais Unidade Contexto

---

Tipo Elemento não numérico selecionado

Não numérico

Contexto Descrição

Cancelar Remover

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**Gerenciador de exclusão de elementos**

Tipo Nome Código da Instituição Eixo do contexto

Contexto

Início Término Schema Dimensão do contexto

AAAA-MM-DD AAAA-MM-DD

Eixo secundário do contexto Dimensão secundária do contexto

---

Tipo Nome da unidade Código ISO

Unidade

Tipo Tag da conta

Conta

Valor Decimais Unidade Contexto

---

Tipo Elemento não numérico selecionado

Não numérico

Contexto Descrição

Cancelar Remover

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## Deletando um elemento

A remoção de elementos segue as seguintes regras:

- 1 - Contextos e unidades não dependem de elementos pré-existentes, então o usuário pode deletá-los livremente, desde que não estejam atrelados a outros elementos.
- 2 - Notas explicativas dependem de contextos previamente adicionados. Não é possível deletar notas explicativas sem identificar seu contexto de referência.
- 3 - Declarações de contas dependem de um contexto e uma unidade previamente adicionados. Não é possível deletar declarações financeiras sem identificar suas referências de contexto e unidade.
- 4 - O usuário deve adicionar elementos antes de tentar deletá-los.

**Gerenciador de exclusão de elementos**

Tipo	Nome	Código da Instituição	Eixo do contexto
<input type="checkbox"/> Contexto	<input type="text"/>		
Início	Término	Schema	Dimensão do contexto
AAAA-MM-DD	AAAA-MM-DD		
Eixo secundário do contexto			Dimensão secundária do contexto

---

Tipo	Nome da unidade	Código ISO
<input type="checkbox"/> Unidade	<input type="text"/>	

---

Tipo	Tag da conta
<input type="checkbox"/> Conta	<input type="text"/>

---

Valor	Decimais	Unidade	Contexto
<input type="text"/>			<input type="text"/>

---

Tipo	Elemento não numérico selecionado
<input type="checkbox"/> Não numérico	<input type="text"/>

---

Contexto	Descrição
	<input type="text"/>

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## Lista de mensagens

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## Lista de mensagens

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- M\_Error00 Este relatório suporta apenas uma unidade ativa por vez.
- M\_Error01 Por favor, certifique-se de ter preenchido todos os campos requeridos antes de adicionar um elemento.
- M\_Error02 Por favor, certifique-se de adicionar um contexto e uma unidade antes de adicionar um fato.
- M\_Error03 Por favor, certifique-se de inserir um código institucional válido.
- M\_Error04 Por favor, certifique-se de inserir um período válido.
- M\_Error05 Por favor, certifique-se de inserir um nome de contexto válido.
- M\_Error06 Por favor, certifique-se de inserir um contexto antes de adicionar uma nota explicativa.
- M\_Error07 Por favor, também certifique-se de que nenhuma das seguintes situações está ocorrendo: 1 - Você tentou adicionar um elemento sem marcar a checkbox apropriada ao tipo de elemento. 2 - Você preencheu algum campo inadequadamente.
- M\_Error08 Por favor, certifique-se de adicionar um contexto e um fato antes de tentar deletar uma conta.
- M\_Error09 Por favor, certifique-se de adicionar um contexto antes de tentar deletar um.
- M\_Error10 Por favor, certifique-se de adicionar uma unidade antes de tentar deletar uma.
- M\_Error11 Por favor, certifique-se de adicionar uma nota explicativa antes de tentar deletar uma.
- M\_Error12 Não foi possível remover o elemento desejado. Por favor, revise os dados fornecidos e tente novamente.

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## Lista de mensagens

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- M\_Error13 Por favor, certifique-se de ter preenchido todos os campos requeridos antes de editar um elemento.
- M\_Error14 Por favor, certifique-se de adicionar um contexto e um fato antes de editar um fato.
- M\_Error15 Por favor, certifique-se de adicionar um contexto e uma unidade antes de editar um fato.
- M\_Error16 Por favor, certifique-se de inserir um código institucional válido.
- M\_Error17 Por favor, certifique-se de inserir um período válido.
- M\_Error18 Por favor, certifique-se de inserir um nome de contexto válido.
- M\_Error19 Por favor, certifique-se de adicionar um contexto antes de tentar editar um..
- M\_Error20 Por favor, certifique-se de adicionar uma unidade antes de tentar editar uma.
- M\_Error21 Por favor, certifique-se de adicionar uma nota explicativa antes de tentar editar uma.
- M\_Error22 Por favor, certifique-se de inserir um contexto antes de editar uma nota explicativa.
- M\_Error23 Por favor, também certifique-se de que nenhuma das seguintes situações está ocorrendo: 1 - Você tentou editar um elemento sem marcar a checkbox apropriada ao tipo de elemento. 2 - Você preencheu algum campo inadequadamente.

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## Lista de mensagens

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M\_Error24 O elemento ainda está ligado a outros elementos do relatório.

M\_Error26 O arquivo de instância não pôde ser validado. Existem inconsistências envolvendo os seguintes elementos: [lista de elementos]

M\_Error27 O processo de carga do arquivo falhou. Por favor, tente novamente.

M\_Error28 Os campos Valor e Decimais aceitam apenas números inteiros. Por favor, certifique-se de não ter digitado algo mais nesses campos.

M\_Error29 O campo Código da instituição deve ser válido de acordo com a relação de códigos do Siconfi. O término do período deve ser sempre superior ao seu início. Por favor, certifique-se de não ter digitado algo inválido nesses campos.

M\_Suc01 Elemento adicionado com sucesso.

M\_Suc02 Elemento editado com sucesso.

M\_Suc03 Elemento removido com sucesso.

M\_Suc09 Documento de instância carregado com sucesso.

M\_Suc10 Documento de instância gerado com sucesso.

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## Lista de mensagens

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M\_Suc07 Arquivo de instancia validado com sucesso.

M\_Suc11 Não existem problemas relacionados à declaração de contextos das contas.

M\_Suc12 Não existem problemas relacionados à declaração de unidades das contas.

M\_Suc13 Não existem problemas relacionados à declaração de eixos das contas.

M\_Suc14 Não existem problemas relacionados aos elementos não numéricos.

M\_Suc15 Não existem problemas relacionados à precisão das contas.

M\_Fault00 As contas a seguir estão sem declaração de contexto válido: [lista de elementos]

M\_Fault01 As contas a seguir estão sem declaração de unidade válida: [lista de elementos]

M\_Fault02 As contas a seguir estão sem declaração de eixo válido: [lista de elementos]

M\_Fault03 Elementos não numéricos relacionados aos contextos a seguir precisam de uma declaração de referência de contexto válida: [lista de elementos]

M\_Fault04 Os relatórios do Siconfi usam apenas dois decimais para expressar os valores das contas. Verifique tais inconsistências relacionadas às seguintes contas: [lista de elementos]

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## Lista de mensagens

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M\_Conf00 Deseja salvar o relatório atual antes de sair?

M\_Conf01 Deseja salvar o relatório atual antes de carregar o novo modelo de relatório?

M\_Help OFR protótipo V0. Obrigado por usar o programa Open Financial Reporting! Se você está com algum problema, acesse o link da documentação do programa: XXX.XXX.XXX