

FEDERAL UNIVERSITY OF PAMPA

Igor Dalepiane da Costa

**Extensionly - A tool for supporting the
management of outreach projects and
programs in the university: Backend**

Alegrete
2022

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Term Paper presented in Software Engineering Graduation Course in the Federal University of Pampa as a partial requirement for obtaining the title of Software Engineering Bachelor

Supervisor: Prof. PhD. Maicon Bernardino da Silveira

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I dedicate this work to my family and to God,
who have always been my greatest strengths.

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First and foremost, I would like to thank my family Eliane, Jair and Mateus, who always helped me in all my obstacles and above all taught me the values, love and religiosity that I carry with me to this day. I also thank all the family members who gave me strength and support to keep me on the road.

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Thank you for everything and God bless you all!

“Everybody should learn to program a computer,
because it teaches you how to think.”

Steve Jobs

RESUMO

Devido às diretrizes impostas pela Resolução Nº 7 de 2018 do Conselho Nacional de Educação (CNE) (MEC, 2018), a curricularização da extensão se tornará obrigatória no ano de 2023. Tendo em vista que o processo de criação e manutenção de um programa ou projeto de extensão é demasiado demoroso e adicionado com a obrigatoriedade eminente, o objetivo deste trabalho é implementar uma ferramenta que ofereça suporte ao processo como um todo, permitindo desde a criação até a emissão de certificados para os participantes. Para isto ser possível, realizou-se primeiramente uma revisão sistemática na literatura cinza, em busca de ferramentas semelhantes, sendo extraído funcionalidades e aspectos mais pertinentes entre estas. Posteriormente, utilizando a lista alcançada, foi executado um levantamento (*survey*) com os possíveis usuários finais da comunidade acadêmica da UNIPAMPA, com objetivo de classificar por ordem de importância as funcionalidades, além disso, permitindo com que os participantes fornecessem sugestões relacionadas as mesmas, ou até mesmo sugerindo novas. Os resultados foram analisados e iniciou-se a produção da solução proposta, uma ferramenta baseada na Web que auxiliará no esforço manual requerido nos processos relacionados a atividades de extensão. O desenvolvimento foi realizado por dois alunos de graduação, dividindo a carga em frontend e backend, este trabalho se concentra na área do backend.

Palavras-chave: Ferramenta. Survey. Literatura Cinza. Backend. Extensão. Atividade Extensionista. Comunidade. Universidade.

ABSTRACT

Due to the guidelines imposed by Resolution No. 7 of 2018 of the National Education Council (CNE) (MEC, 2018), the curricularization of the extension will become mandatory in 2023. Given that the process of creation and maintenance of an extension program or project is too time-consuming and added to the imminent obligation, the objective of this work is to implement a tool that supports the process as a whole, allowing from the creation to the issuance of certificates for the participants. For this to be possible, a systematic review was first carried out in the gray literature, in search of similar tools, extracting the most relevant features and aspects among them. Subsequently, using the list reached, a survey was carried out with the possible end users of the academic community of UNIPAMPA, with the objective of classifying the functionalities in order of importance, in addition, allowing the participants to provide suggestions related to them, or even suggesting new ones. The results were analyzed and the production of the proposed solution began, a web tool that will assist in the manual effort required in the processes related to extension activities. The development was carried out by two undergraduate students, dividing the load into front-end and back-end, this work focuses on the back-end area.

Key-words: Tool. Survey. Grey Literature. Backend. Outreach. Community. University.

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LIST OF ABBREVIATIONS AND ACRONYMS

ATE Administrative Technician in Education

CAEX Outreach Actions Control

CLE Local Outreach Committee

CONSUNI University Council

CSE Superior Outreach Committee

FOREXT National Forum for Extension and Community Action of Universities and
Community Higher Education Institutions

FORPROEX Forum of Pro-Rectors for Outreach of Brazilian Public Universities

HEI Higher Education Institution

ICES Higher Education Community Institution

IDP Institutional Development Plan

MEC Ministry of Education

MoSCoW Must have, Should have, Could have and Will not have

MVP Minimum Viable Product

NGO Non-Governmental Organization

OA Outreach Activity

OCA Outreach Curriculum Activity

ProExt University Outreach Program

PROEXT Dean of Outreach and Culture

SAP Academic Project System

SGCE Electronic Certificate Management System

SIGAA Integrated Academic Activities Management System

SIPPEE Information System for Research, Teaching and Outreach Projects

TP Term Paper

UNIPAMPA Federal University of Pampa

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1 INTRODUCTION

Federal University of Pampa currently offers three categories of extra activities, teaching, research and outreach. Teaching activities consist of student learning in general, they can be courses, lectures, monitoring activities, among others. Research activities are constituted by everything that is related to research itself, among them are scientific initiations, Term Papers (TPs), publication of papers in events, and so on. Finally, we have the Outreach Projects and Programs, which are the focus of this work, and according to the 2019 Institutional Development Plan (IDP), “Outreach assumes the role of promoting a dialogic relationship with the external community, for the democratization of access to academic knowledge as well as for the feedback of university practices based on this dynamic” (UNIPAMPA, 2019).

To explain what outreach is within an academic environment, Resolution No. 332 of 2021 will be used (UNIPAMPA, 2021d), which clarifies Outreach Activity (OA) as an action that encourages research and development, increasing the bond between the community and Higher Education Institution (HEI). OAs must have the participation of the external community and promote a balance between practical and theoretical activities. To classify these outreach activities, four terms are defined, namely: (1) Projects, “set of actions articulated around a common theme and objectives”; (2) Programs, “set of articulated projects, which may include more than one type of action (project, courses, events)”; (3) Courses, “training activities”; (4) Events, “activities of an artistic or scientific nature”. Therefore, it is necessary for some bodies to be responsible for managing these activities, also defined by Resolution 104, they are: (1) Dean of Outreach and Culture (PROEXT); (2) Superior Outreach Committee (CSE); (3) Local Outreach Committee (CLE).

The curricularization of the outreach described in Resolution No. 7 of 2018 (MEC, 2018), explains that OAs must have their proposal, development and conclusion, duly recorded, documented and analyzed, so that it is possible to organize work plans, methodologies, instruments and knowledge generated. Also ordering that educational institutions should include in their IDP, at least 10% (ten percent) of the total course load focused on OAs, in addition to all related terms, with a deadline of up to three years from the date of its approval. In view of this demand, Federal University of Pampa created University Council (CONSUNI) Resolution No. 317 of April 29, 2021, (UNIPAMPA, 2021c), which implements all the guidelines presented by the Ministry of Education (MEC).

To control all this, a complete software is indispensable, and that is easy to use, with which users are comfortable to use and can complete their tasks using it. Currently, Federal University of Pampa only has a system called Academic Project System (SAP), which serves only for registration outreach projects, submit proposals to the public notices offered and manage the scholarship holders of the awarded notices, but does not support other processes. Because of this, it ends up making the bureaucracy concentrate outside the system, making this process boring and time-consuming, teachers often even give up

doing it, opting for other less bureaucratic activities.

Related to this matter, Normative Instruction No. 18 (UNIPAMPA, 2021a) was released a short time ago, which stipulates the norms of the Institutional Program “UNIPAMPA Cidadã”. Which is an outreach program that should be composed of citizenship and solidarity actions, such as clothing campaign, food collection, support for asylums, etc., being mandatory to offer them. When effective, in all undergraduate courses, a minimum workload of 60 and a maximum of 120 must be allocated.

1.1 Motivation

The process of curricularization of outreach proposed by Resolution N^o 317 (UNIPAMPA, 2021c), will become mandatory in 2023, given the effort that will be required to manually complete demands such as registration, control, issuance of certificates and entry of participants, implicit in an Outreach Curriculum Activity (OCA), it was proposed to create a support tool in the management of these projects and outreach programs, thus managing to reduce bureaucracy and speed up the process.

The community periodically contacts the university to request some type of solidarity action, with this demand, OAs are generated, which can be carried out by students managed by a coordinator or even within a subject of their courses. But this communication is not the most intuitive, not having a system to manage them, it leads to the only option of having to do it through calls or even in person, this is very discouraging for the community. In view of this, one of the motivations for the development of the tool is to strengthen this link between academic communication and external communication, allowing new demands to be created in the tool itself.

Regarding the dissemination of OAs, nowadays emails are sent to students informing them about new opportunities, but usually students inboxes receives a lot of emails on a daily basis, leading to the lack of interest in reading all of them. For this reason, with a tool that concentrated all the information, opportunities and news related to the outreach. Hence, the students would no longer need to venture into their sea of emails when they need to look for a new activity, they would just resort to the tool where everything is already organized and ready to use.

Another motivator that encouraged the development of this tool is that from the review in the grey literature that was conducted, no tools were found that completely solved the problems related to these processes. Some tools had features and details that others did not and vice versa, but together they would build a complete tool.

1.2 Objectives

In view of what has been presented, the research aim of the theme of this term paper is the development of the *back-end* of a tool that will serve as support in the

management of outreach programs and projects, reproducing and assisting in all processes related to this demand, from its creation to the generation of certificates when it is finalized. The aim is to reduce the effort and time spent by those involved in these manual steps of the process. In addition to allowing a new communication channel to be built between the academic community and the external community, allowing suggestions for demands for OAs directly in the tool.

Therefore, the Table 1 presents the synthesis of the research aims and objectives, as well as the subject, the study, the research question (problem) and the solution hypothesis.

Table 1 – Synthesis of the Research Aim and Research Objectives.

Topic	Description
Subject	Management of outreach programs and projects.
Study	Tool for Support in management of outreach programs and projects.
Research Question	How can a tool to support the management of outreach programs and projects of UNIPAMPA can optimize the management of proposition, registration, dissemination and accountability processes of outreach actions?
Research Hypothesis	With a tool to support the management of outreach programs and projects, it's possible to have a reduction on the effort needed to create an outreach activity and an increase in the engagement of volunteer outreach participants.
Research Aim	Develop the <i>back-end</i> of the tool to support the management of outreach programs and projects of UNIPAMPA
Research Objectives	Report results and execution methods of the following processes: (i) Research: Analyze similar tools, state the processes that will be made available by the tool, conduct surveys with the organizers and participants of OAs, understand the limitations of current processes. (ii) Planning: Elicitate functional and non functional requirements, identify stakeholders, define architecture, technologies and tools. (iii) Development: Develop the features raised, build and run test cases. (iv) Deployment: Perform experiments with possible end users, collect feedback and implement appropriate improvements and corrections.

Source: Author.

1.3 Contribution

The proposal for this tool is designed for the participation of two students, Igor Dalepiane da Costa and Lucas Alexandre Fell, because its complexity is high, justifying this double development.

For this, the division was made between the development of *back-end* and *front-end*, the first being developed by the proponent of this work and the second by the other student. For better visualization, a feature model was developed with the exact division of the tasks that will be performed by each of the students, represented in Figure 1. Contributions of this work:

- Research among university professors on the real need for this instrument to organize the OCAs processes;
- Development of the *back-end* of the system, encompassing all the processes that will be made available by the tool, explained in Figure 10.

1.4 Organization

This document is organized according to the following:

- **Chapter 2: Methodology:** Details of the methodology adopted during the search, along with its classification and research schedule.
- **Chapter 3: Background:** Details of main concepts related to this work, such as, resolutions and OAs.
- **Chapter 4: Grey Literature:** This chapter presents in more detail the review performed in the grey literature to find similar tools.
- **Chapter 5: Survey:** Provides details about the survey performed, its protocol and results.
- **Chapter 6: Extension:** Provides details of the design and implementation of the proposed tool.
- **Chapter 7: Conclusions:** This chapter presents the partial conclusions about this study.

2 METHODOLOGY

In this chapter, we present the methodology, techniques and procedures that were used in the course of this study. Starting with Section 2.1, where we present the context of the research. In Section 2.2, the search will be classified using terms and definitions presented by Prodanov e Freitas (2013). Then in Section 2.3, it is presented how this study was conducted, along with the research design, the research schedule, with deadlines and time spaces is in Section 2.4.

2.1 Introduction

In order for the objectives of a study to be successfully achieved, scientific research is considered very important for its contributions. According to (PINGPING; YULAN, 2013), the purpose of a research is to explore the present situation and development of the world, under the previously set goals and unknown knowledge plans.

There are several ways in which scientific research can be conducted and it is assigned to researchers to define which one to use, aiming at the greatest relevance in their results. It is very important that they are chosen as the basis for the development of research, authors and successful studies, because as Dampier e Wilson (2000) says, the advances made previously and the known truths, serve as a basis for the advances of the scientific method.

2.2 Research Classification

The classification of this research was given according to the definitions made by Prodanov e Freitas (2013), in Figure 1 the classification of the research is separated by four groups, each with its respective categories, are the groups: (i) According to the **Approach**; (ii) According to the **Nature**; (iii) According to the **Objectives**; (iv) According to the **Procedures**. In Figure 1 the rectangles filled with blue color represent those that apply to this research.

Starting with the point of view of nature, this fits into **Applied Research**, as it seeks to apply new knowledge generated in objective problems, involving truths, interests and local demands. Bringing to the reality of this work, the knowledge generated refers to all the data collected related to outreach in the course of the study, and the objective problem is the bureaucracy involved in OAs.

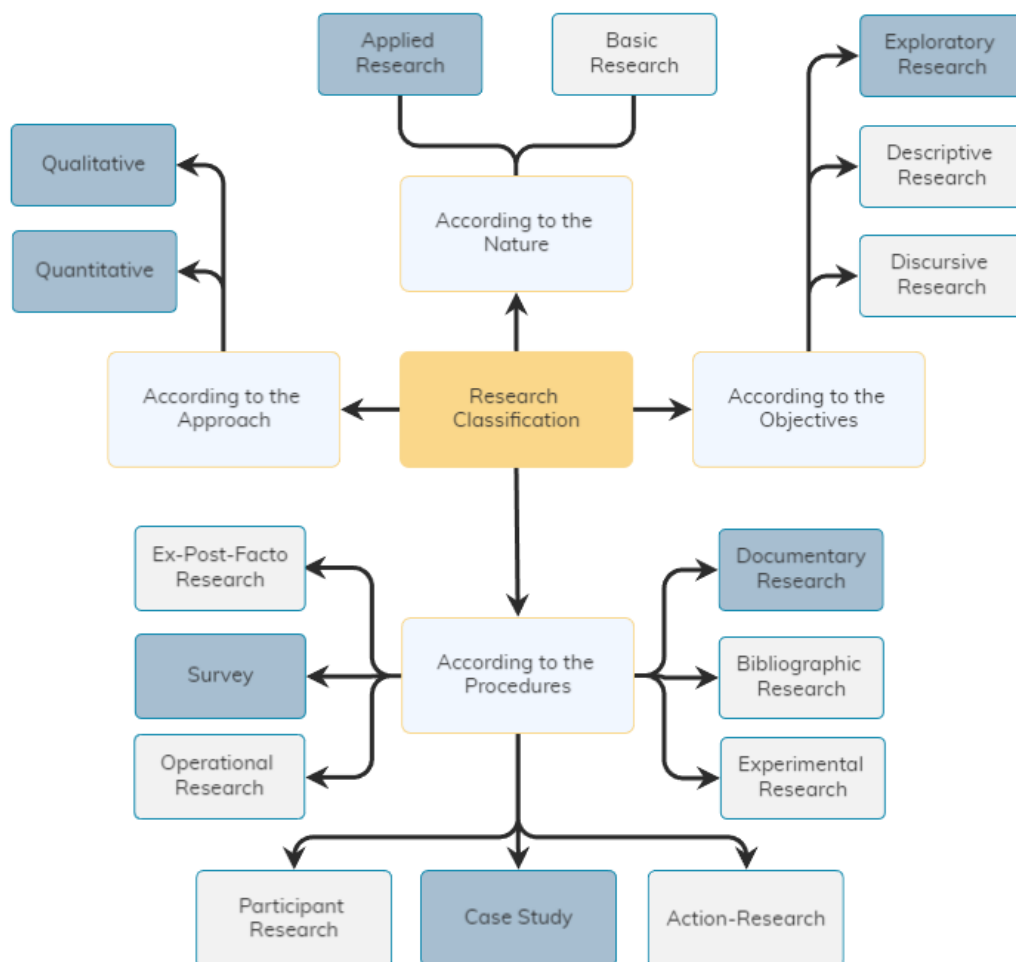
In view of the objectives, this is classified as **Exploratory Research** because to achieve the defined objectives, research in the grey literature and questionnaires with people related to the subject were performed. Thus, using what already exists as a basis, we seek to build a new improved solution.

In relation to technical procedures, **Case Study** is applied, as it seeks to collect information from individuals, tools, processes, related to the main theme using **Qualitative**

methods, to be able to place the results and graphs and analyze them, and **Quantitative**, allowing a deeper understanding of what was answered. The **Survey** classification also applies, as this is one of the ways of collecting information used by researchers. Before the survey execution with the participants, a pilot test was conducted to validate organization, completeness, coherence and other points of the questionnaire, more of this will be discussed in Chapter 5.

Finally, the study is also classified as **Documentary Research**, for using as a knowledge base, materials that have not yet received an analytical treatment, such as internet search results, the subject of grey literature will be better explained in ??.

Figure 1 – Research Classification



Source: Adapted from (PRODANOV; FREITAS, 2013).

2.3 Research Design

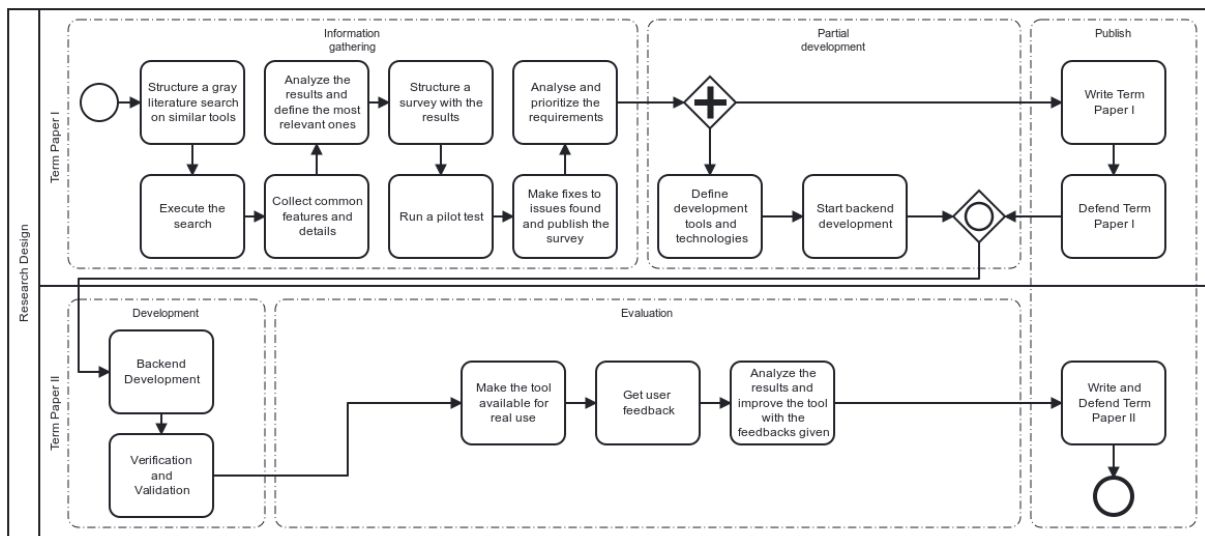
In Figure 2 is represented the flowchart followed in the course of this research, the activities placed in it are divided into five phases: (1) Information gathering; (2) Partial development; (3) Development; (4) Evaluation; (5) Publish.

The first phase, **Information Gathering**, is focused on organizing research structures, questionnaires, prioritization of information, and learning about the research topic. Mainly aimed at producing two important artifacts of the research, the review in the grey literature and the survey with possible end users.

Moving on to the second phase, **Partial Development**, where it was decided among those involved in the project, that it would not be feasible to implement the entire tool at this first moment, so only some more important functionalities and that would already be sufficient for a Minimum Viable Product (MVP) (LENARDUZZI; TAIBI, 2016), would be developed. Within the **Publish** phase, the two TPs will be written and defended, occurring in parallel to the development of the tool, mostly happening in the **Development** phase.

After there is a stable version of the tool, where users can use it, it will be available for real use, allowing UNIPAMPA's outreach activities to be registered and opening vacancies for participant or volunteer registrations, with this in the phase of **Evaluation**, feedbacks will be collected, analyzed the results and improvements in the tool will be made.

Figure 2 – Research Design



Source: Author.

2.4 Research Schedule

To facilitate the visualization of how the activities took place over time. Table 2 presents the entire schedule of what was planned from the collection of information to the defense of Term Paper II.

Table 2 – Research Schedule

Activities	2021/2	2022/1					2022/2				
	Nov - Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Plan and execute systematic review in the grey literature											
Plan and execute survey with target users											
Analyze results from previous steps and map requirements											
Plan and start tool development											
Write Term Paper I											
Defend Term Paper I											
Continue the development of the tool											
Execute a real use case on the tool											
Write Term Paper II											
Defend Term Paper II											

Source: Author.

2.5 Chapter Summary

In this chapter we have presented the meaning of methodology, and how it can be classified within a scientific scope, along with what terms apply to this TP. In addition, the research design was presented containing the steps taken by the author, as well as those that will be given.

3 BACKGROUND

This chapter discusses subjects that complement the objective of this work, helping to understand the policies and resolutions involved. In Section 3.1 the national outreach activity policy will be presented, which is valid for all of Brazil on the objectives that university outreach has in relation to the academic and external community. Then in Section 3.2 the vision of how Unipampa has adapted to receive these new rules. After that, in Section 3.2.1 the difference between outreach programs and projects will be presented, followed by a more detailed explanation about the “Unipampa Cidadã” project in Section 3.2.3. The Section 3.3 highlights some tools related to the subject of the work, their commonalities and a high-level description. Finally in Section 3.4 a general summary of the chapter is presented.

3.1 National Outreach Policy

It is well-known that university outreach is an area of great importance for the academic and external community, also being a tool for connecting professors, students and the population, having a great impact on the formation of a student. To strengthen the objectives that university extension has within this universe, the Forum of Pro-Rectors for Outreach of Brazilian Public Universities (FORPROEX), updated the old version of the National Outreach Policy document, published in 1999, with current situations and challenges found in recent years. The new version of the document, (FORPROEX, 2012), within its objectives, has as an example the following:

- Achieve the recognition of university outreach activities as an essential tool for the public university;
- Ensure that the outreach activity is the solution to any type of social problem faced by the country;
- Defend the funding of outreach programs and projects so that they can continue to function;
- Promote environmental and sustainable awareness in outreach projects in Brazil;
- Promote solidarity both nationally and internationally, covering the area of impact of outreach actions.

Serving as a basis for universities, the document “Referentials for the construction of a National Outreach Policy in Higher Education Community Institutions (ICES)” (FOREXT, 2013), discusses a little about the doubt of classifying an academic activity as outreach or not, but leaving as a fact the following sentence “If the theoretical dimension of university outreach tends towards greater rigidity - in the sense that it needs to keep

principles, resume references, dialogue with other institutional documents – the practical dimension allows for greater flexibility, giving rise to a considerable diversity of actions”. This document also highlights the importance of integrating extension with research and teaching, with discussions of a social nature and the effects of the results on society.

In the aforementioned document, nine types of possible OAs are discussed in depth, each with its peculiarities, dividing them into direct outreach actions and actions that allow the integration between outreach and teaching or outreach and research.

3.1.1 Outreach Activity Curricularization in Higher Education

Entering the scope of higher education, Resolution No. 7, of December 18, 2018 (SUPERIOR, 2018) was created, where it established guidelines, principles, foundations and procedures for university outreach in Brazilian higher education. In this way, it was regulated that the OAs will be made available in the form of curricular components for the courses.

In this document, it is also determined that OAs must make up at least 10% (ten percent) of the entire workload of undergraduate courses, being characterized as an interventionist activity that directly involves the external community and is related to student training.

Another important point raised is related to the self-assessment of outreach activities, in order to constantly improve it. This evaluation should include the identification of the relevance of the use of OAs in curricular accreditation, the contribution to the fulfillment of the objectives of the IDP and the Pedagogical Projects of the Courses and, finally, the presentation of the results achieved in relation to the participating public.

All OAs must also be registered according to the rules mentioned in the same resolution (SUPERIOR, 2018), and must contain the planning of their internal activities, strategies for self-assessment, proposal, development and conclusion, these must be duly registered and analyzed in order to be able to organize your work plans.

Finally, the aforementioned resolution determines that “Higher education institutions will have a period of up to 3 (three) years, counting from the date of their approval, to implement the provisions of these Guidelines.”

3.2 Outreach Activity Curricularization in Federal University of Pampa

In UNIPAMPA’s view, like all other Higher Education Institution, must have a resolution aimed at standardizing OAs in general, presenting what they are, their target audience, objectives, etc. In view of this, UNIPAMPA, in CONSUNI/UNIPAMPA Resolution No. 332 of 2021, (UNIPAMPA, 2021d), determines the types of extension activities, already mentioned in Chapter 1, its managing bodies, executing team, possible related processes, and some rules such as the minimum duration of 8 (eight) hours, taking

into account the period of organization, execution and preparation of the final report.

For some time now, UNIPAMPA has been implementing some outreach projects within its curriculum, for example in the Software Engineering course where, within the Problem Solving subject, students meet in groups, similar to development teams and project management, where they are assigned to work on real demand for someone in the external community. This activity provides the student with a very rewarding experience, for the opportunity to talk, interact and contribute directly with a customer who needs help in solving a problem.

The main objectives in the insertion of outreach activities in undergraduate courses, which UNIPAMPA highlights in its Resolution No. 317 of 2021, (UNIPAMPA, 2021c) are the following:

- Help students develop their critical, citizen, interdisciplinary and responsible education;
- Improve teaching in undergraduate courses as a whole and strengthen the inseparability between teaching, research and outreach;
- Strengthen UNIPAMPA's social commitment;
- Stimulate constructive discussions in all sectors of UNIPAMPA;
- Promote actions that strengthen UNIPAMPA's ethical principles and social commitment in all areas;
- Encourage the academic community to be more present in human, academic, social, cultural, and economic development.

3.2.1 Outreach Programs and Projects

To explain what outreach projects and programs are, the definitions of FOREXT (2013) will be used, which says that they are activities regulated internally by the institution that articulates events involving teaching and research, always involving the external community. With them, students can take attitudes and decisions directly about the community in which they live, contributing to its evolution and progress. In addition to helping the external community, National Forum for Extension and Community Action of Universities and Community Higher Education Institutions (FOREXT) says that the programs and projects do not seek to create a bond of dependence with the university, so it is necessary to solve the problem with the most efficiency and quality possible.

Because the two terms are similar, some confusion can arise, so VIERO (2012) highlights the difference between the two, citing the definitions made by University Outreach Program (ProExt):

It is important to point out that ProExt provides for two sets of university outreach actions: outreach projects, defined as “a set of continuous procedural actions, of an educational, social, cultural or technological nature, with a specific objective and a determined period”; and outreach program, as “an articulated set of projects and other outreach actions, preferably of a multidisciplinary nature and integrated with research and teaching activities (VIERO, 2012).

Within the UNIPAMPA Alegrete campus there are some current projects and programs, examples of which are with their respective coordinators: (1) **Ciência a Cavalos: University and Basic Education Hand in Hand for Strengthening Education**, Prof^o Marco Antonio Durlo Tier; (2) **IT consultancy for Agribusiness Companies**, Prof^o Elder de Macedo Rodrigues; (3) **Empresa Júnior: Multi Advisory and Solutions in Junior Engineering - MASE Junior**, Prof^o José Gabriel Vieira Neto; (4) **Espaço Maker - Criative Learning**, TAE Vitor Almada; (5) **Programa UniHacker.Club**, Prof^o Diego Luiz Kreutz; (6) **UNIPATAS Alegrete: Protection, Sterilization and Adoption**, TAE Camila da Costa Lacerda Tolio Richardt; (7) **Programa C**, Prof^a Aline Vieira de Mello; (8) **Programa JEDI**, Prof^o Maicon Bernardino da Silveira.

3.2.2 Processes for New Proposals for Outreach Programs and Projects

In order to register a new outreach program or project and generate certificates at the end, there are some rules defined by UNIPAMPA (2021d), which must be performed beforehand. With these documents in hand, UNIPAMPA standardized some process flow schemes, so that all proponents are aware of what happens after the proposal is made.

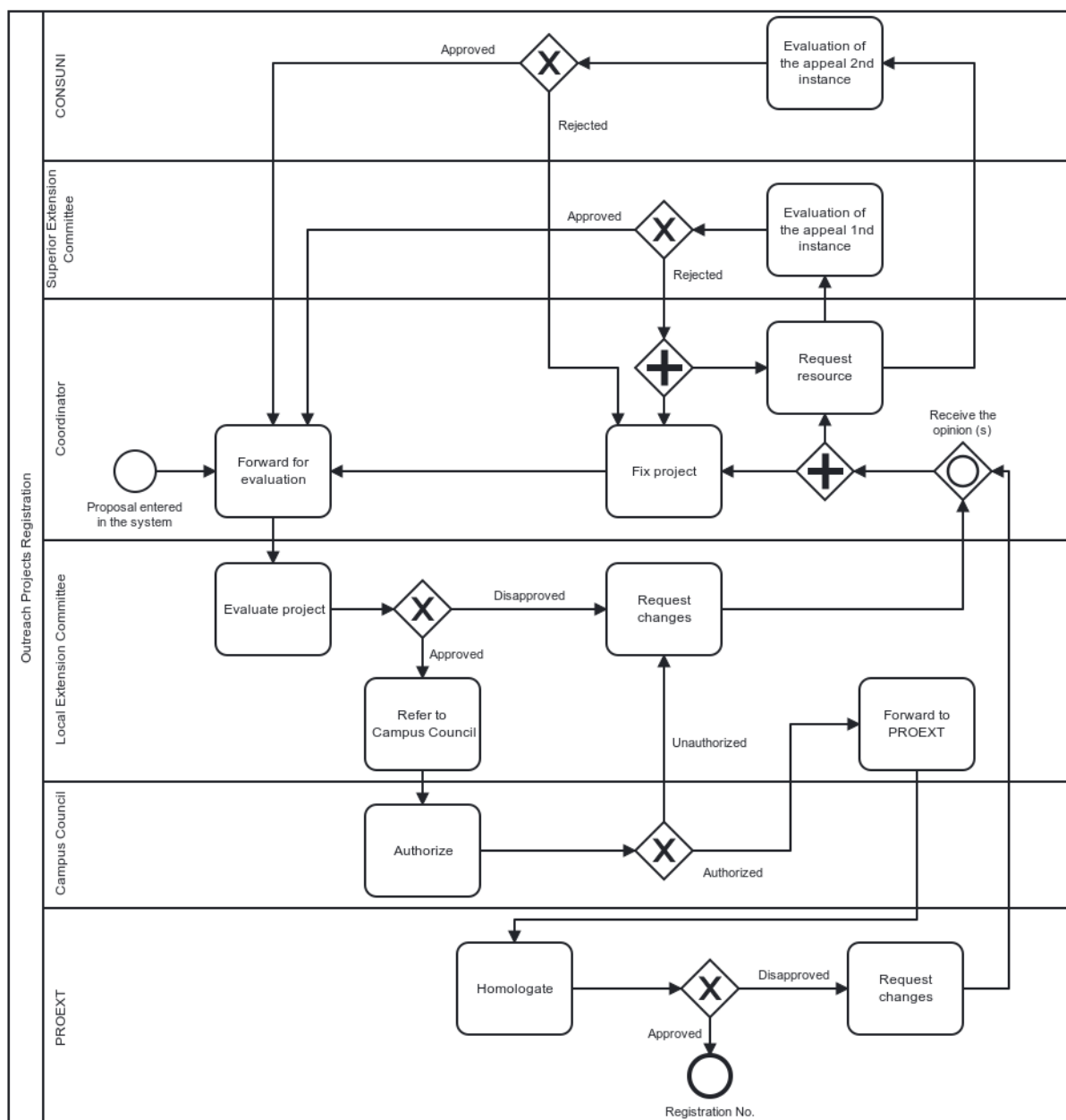
In Figure 3, the registration flow of a new outreach project is presented, in which it is possible to see that the proposal goes through several steps of corrections and evaluations, being sent to several actors throughout the process.

In the Figure 4, the steps related to the approval and generation of certificates are represented, starting with the proponent of the activity having the attendance list and the spreadsheet with information for the generation of certificates. Then, a final report is built and inserted in the Information System for Research, Teaching and Outreach Projects (SIPPEE) system, it is evaluated and approved, reaching again at PROEXT which, with the spreadsheet sent, sends its data to the Electronic Certificate Management System (SGCE) system, receiving the certificates and sending them to participants' emails.

3.2.3 “Unipampa Cidadã” Program

UNIPAMPA through Normative Instruction No. 18 (UNIPAMPA, 2021a), using Resolution No.317 (UNIPAMPA, 2021c), established that the outreach project called “Unipampa Cidadã” must be offered by all courses, consisting of citizenship and solidarity activities and with the objective of training graduates aware of their social responsibility, stimulating and increasing integration with the local community.

Figure 3 – Outreach Projects Registration



Source: Adapted from (UNIPAMPA, 2022).

After the implementation of the project in the institution's courses, it must be carried out by all students, the course offered for the project must have a minimum of 60 and a maximum of 120 hours. Community actions must be carried out in public institutions, Non-Governmental Organizations (NGOs) and organizations or associations of organized civil society. The course extension supervisor is responsible for carrying out the project evaluation, planning, monitoring, validation and he will be responsible for approving the beginning of the activities.

The project also makes available in Normative Instruction Nº 18, a form template for filling in data when the activities are completed, allowing the student to reflect on the impact of the project under their view, pointing out what they learned during the execution. Finally, the supervisor can make observations about the student and indicate whether he or she passed or failed.

3.3 Similar Outreach Support Tools

In conjunction with Chapter 4 that will present the review conducted in the grey literature, some tools were researched to acquire information on how the market is in relation to outreach in universities. With the results it was possible to raise functionalities, details and common points among the tools.

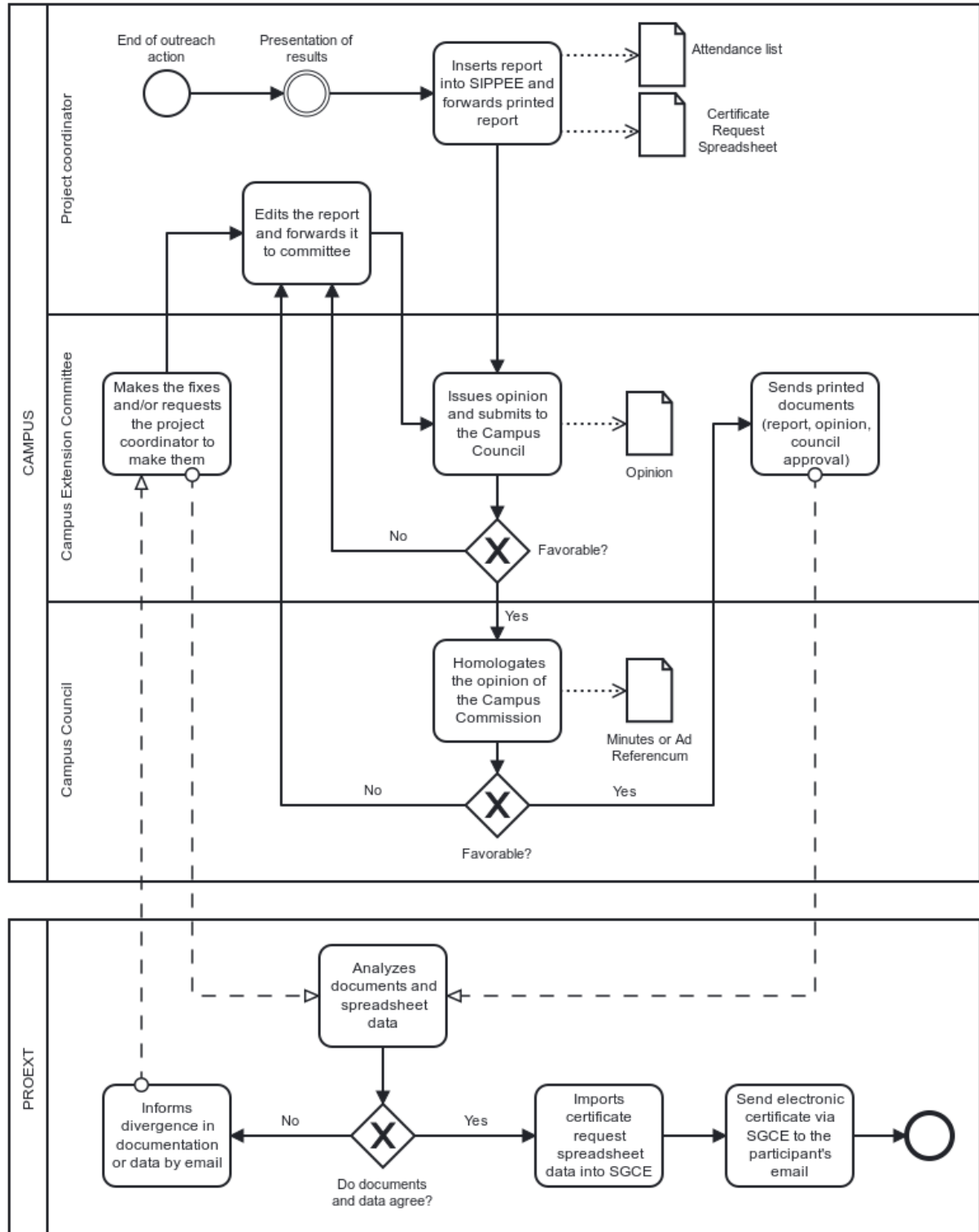
At first, the authors sought to make a systematic review of the white literature, but the results found would not be completely satisfactory, since the manual exploration by various tools related to the topic would bring more content to be classified and discussed among those involved in the research.

During the execution of the review, the tool that returned the most results and was always present in the research was Integrated Academic Activities Management System (SIGAA), which is the most used by several institutions, being very complete, containing parts in its system aimed at most processes involving an institution. Another one that presented interesting results was Outreach Actions Control (CAEX), which presented several unique features, being only it that presented them, with this it was possible to extract ideas of great importance for the construction of a complete tool.

3.4 Chapter Summary

In this chapter, guidelines of various resolutions and regulations related to extension were presented, both in the country as a whole and in UNIPAMPA. It was also discussed the similarities and differences between the terms outreach program and project, presenting the most relevant processes involved in its life span. As a more recent example of an extension program, “Unipampa Cidadã” had part of its objectives and guidelines presented, finally, a little discussion about the grey literature review carried out by the participants of this research was discussed, so in the next chapter, criteria will be more in-depth, methodology, results, research questions, among other information relevant to grey literature.

Figure 4 – Issuance of certificates



Source: Adapted from (UNIPAMPA, 2022).

4 GREY LITERATURE

Before beginning to develop the solution itself, it would be extremely beneficial to conduct a systematic review of the grey literature to map and assess existing tools and solutions that already address the issue of managing outreach activities in the context of HEIs. This research will ultimately result in a software product. Two authors did the review. Although the two term papers were prepared independently, as was already indicated, the artifacts produced to support the study were produced jointly.

The systematic review of the grey literature is described in this chapter. Additionally, data gathered during the study that is pertinent to the creation of the target product will be presented. In addition to a thorough examination and comparison of the chosen tools, the protocol established to conduct the evaluation will be covered, citing details such research questions, inclusion and exclusion criteria, extracted data, and search strings.

In this manner, the chapter is structured: Introduced in the Section 4.1 are words and ideas utilized in the study. The technique outlined by the authors will be presented in Section 4.2. The methods used in the study and the information gathered to address the research questions will be explained in the section on reporting Section 4.3, while the section on validity Section 4.4 highlights risks to the study's validity. The systematic review is concluded by Section 4.5.

4.1 Background

The following definition of grey literature comes from ??):

<grey literature> is produced at all levels of government, academia, business, and industry in print and electronic formats, but is not controlled by commercial publishers, or that is, where publication is not the main activity of the producing body.

The quality of software described as a “black box” is one in which the internal workings of the system are unknown; its use solely concentrates on the outputs produced in response to chosen inputs and execution conditions Nidhra e Dondeti (2012).

This phrase was used in relation to the Google search engine, where it is unknown exactly what occurs internally other than the fact that occasionally, despite the identical search word, the results differ just little.

4.2 Planning

Due to the limited amount of formal works published on the issue of outreach activities management, the authors determined that a systematic review of the grey literature would be more interesting and valuable to the study than one in the white literature.

4.2.1 Reasons for Carrying out the Review

The following were the key justifications given by the authors to include a review of grey literature in their study: (i) More tools than formal articles in search results; (ii) Very few results were obtained when the search terms were applied to white literature; (iii) There are a number of tools and solutions without published articles; (iv) The authors are looking for tools in order to gather inspiration and useful design ideas for the creation of the intended product.

The questions and their responses that were used to make the choice to conduct the review of the grey literature can be found in the Table 3. Additionally, the following objectives were specified for carrying out the review:

(i) Find free tools that help academic management in some way; (ii) Look for features in tools already in existence and (iii) Validate concepts for the features and information that will be used in the solution.

Table 3 – Questions for Inclusion of Grey Literature

Question	Answer
Is the subject “complex” and insoluble considering only the formal literature?	No
Is there a lack of volume or quality of evidence, or lack of consensus on outcome measurement in the formal literature?	Yes
Is contextual information important to the subject under study?	Yes
Is the objective to validate or corroborate scientific results with practical experiences?	No
Is the aim to challenge assumptions or falsify results of practice using academic research or vice versa?	No
Would a synthesis of insights and evidence from the industrial and academic-community be useful to one or even both communities?	Yes
Is there a large volume of professional sources that indicate high professional interest in a topic?	Yes

Source: Adapted from ??).

4.2.2 Research Questions

The research questions that the authors have identified for the systematic review are listed in the Table 4.

Table 4 – Research Questions

ID	Question
RQ 1.	What tools currently exist that perform academic management?
RQ 1.1.	Which ones have related functionality or support outreach activities?
RQ 1.2.	What are the features offered by these tools?
RQ 1.3.	What are the most common features between this type of tool?
RQ 1.4.	What data do the tools use in relation to activities, participant registration and user registration?

Source: Author.

The search terms were developed by modifying the approach utilized in (GODIN et al., 2015). The first step was to establish search phrases using words like **extensão** (outreach), **programa** (program), **projeto** (project), **gerenciamento** (management) and **atividade** (activity).

Additionally, because the search engine’s site filter was initially employed and the scope of the project was restricted to outreach initiatives at Brazilian universities, only websites with the specified “.edu.br” ending would be displayed. Later on, it was discovered that it would have been wiser to remove the filter because some private universities do not use the .edu domain extension.

In the end, the authors generated ten search strings, seven of which combined the terms “**extensão (programa | projeto)**”, which were deemed to be the most pertinent terms. There were 100 entries per string and a limit of only using the first ten pages of the search engine’s results meant that there were a total of 1000 records.

After the initial search, the keyword SIGAA was eliminated because it is a resource used by many public universities called Vieira e Machado (2013), which clogged the results with virtually the same record and would have concealed other alternatives. In Table 5, the defined strings are displayed.

Table 5 – Search Strings

No.	Search String
1	sistema gestão acadêmicas (atividades projetos) site:.edu.br
2	(sistema ferramenta) gestão acadêmicas (atividades projetos) extensão site:.edu.br -SIGAA
3	(ferramenta aplicação) extensão (programa projeto) (gestão gerenciamento) -SIGAA
4	(app aplicativo) extensão (programa projeto) (administração gerência) -SIGAA
5	ferramenta extensão (programa projeto) (gestão gerência) -SIGAA
6	(ferramenta aplicação app aplicativo) extensão (programa projeto) gestão -SIGAA
7	software extensão (programa projeto) (gerência gestão controle) -SIGAA
8	(software ferramenta aplicação) extensão atividade -SIGAA
9	sistema extensão (projeto programa atividade) gestão -SIGAA
10	acadêmica extensão (projeto programa atividade) -SIGAA

Source: Author.

The Google search engine was used to conduct the actual search for the strings.

4.2.3 Inclusion Criteria

The inclusion criteria were developed over the course of two stages. The authors implemented a filter in the first stage to distinguish tools from catalogs due to the significant number of institutional sites that were simply catalogs of outreach initiatives. The outcome must meet at least three of the following standards in order to be considered: (a) User login; (b) Registration of activities; (c) Activity listing; (d) Possibility of signing up for outreach activities.

Step 2 was implemented once the results had been filtered using the aforementioned criteria. It had stricter definitions of what was required to be included. They are listed in Table 6 as follows:

Table 6 – Inclusion Criteria

ID	Inclusion Criteria
IC 1.	The tool or website supports the management of outreach activities.
IC 2.	The tool or website has a stable version.
IC 3.	If it is a tool, it must have documentation.

Source: Author.

4.2.4 Exclusion Criteria

Exclusion criteria were also established, and any result that met even one of these was automatically disqualified from further consideration. Six criteria were initially created by the authors, but following alignments with the adviser, it was determined that two of them were superfluous. The remaining factors, which affected the results, are shown in Table 7.

Table 7 – Exclusion Criteria

ID	Exclusion Criteria
EC 1.	If it is a tool, it does not have a source code download or an online page.
EC 2.	The tool or the website has not received updates for more than 10 years.
EC 3.	The tool or website is for the exclusive use of the organization, that is, closed to the external public.
EC 4.	The tool or website is paid and does not provide a trial version or all outreach activities are paid.

Source: Author.

4.2.5 Quality Criteria

Five quality criteria that are focused on traits deemed relevant within a tool and how it differs from the others were created to evaluate the quality of the tools that passed the inclusion and exclusion criteria. The scale used in the article by Iung et al. (2020) was modified to quantify the scores for each criterion and is as follows: (i) **Yes**: 1.0; (ii) **Partially**: 0.5; (iii) **No**: 0. The defined criteria are shown in Table 8.

4.2.6 Data Extraction Strategy

After the final list of tools is chosen, a manual data extraction is done in order to respond to the research questions that have been established Table 4. In the beginning, we look for all the OA functionalities the program has, creating a data matrix. There is

Table 8 – Quality Criteria

ID	Quality Criteria	Score		
		Yes (1)	Partial (0.5)	No (0)
QC 1.	Does the tool use a relevant amount of data related to outreach activities?	The tool uses ≥ 20	10 - 19	10 pieces of information
QC 2.	Does the tool have unique features among the selected tools?	The tool has 1	1	No unique features
QC 3.	Does the tool have a relevant amount of features among those collected?	The tool has ≥ 14	9-13	8 features in common with other tools
QC 4.	Does the tool have specialized support?	Yes	Partially	No
QC 5.	Has the tool been maintained frequently?	The last update was in 2022	2021-2019	2018 and before

Source: Author.

a list of all the various capabilities that were discovered within the findings. The matrix is discussed in more detail in the ?? below.

Afterwards, a new manual extraction was carried out while highlighting the first four most pertinent properties that were shared by all of the studied tools. Now with the intention of discovering every feature these solutions possessed. It is much simpler to handle comparable issues that will ultimately arise when constructing the goal product if this data is refined and tabulated.

4.3 Reporting

With the goal of starting and terminating on days that were close together, the search and record mapping were conducted between February 17 and February 20, 2022, decreasing one of the dangers to validity.

4.3.1 Research

Both authors contributed equally to the overall workload. In this manner, each person examined five of the ten pages using the search term, yielding fifty results per search string and 500 results per author. The first set of results, as displayed in Table 9, consisted of 169.

There were 56 results left after applying the first step of the inclusion criterion. The findings were then further decreased once the verification with the second step of the inclusion and exclusion criteria was completed, with 19 tools failing **IC 1.**, 8 tools failing **IC 2.**, and 24 tools being rejected for failing **IC 3.** Regarding the exclusion criterion, only one tool was eliminated by **ECs 1. and 2.**, as well. However, 14 tools failed **EC 3.**, and the same number failed **EC 4.** As can be seen in Figure 5, there were only 12

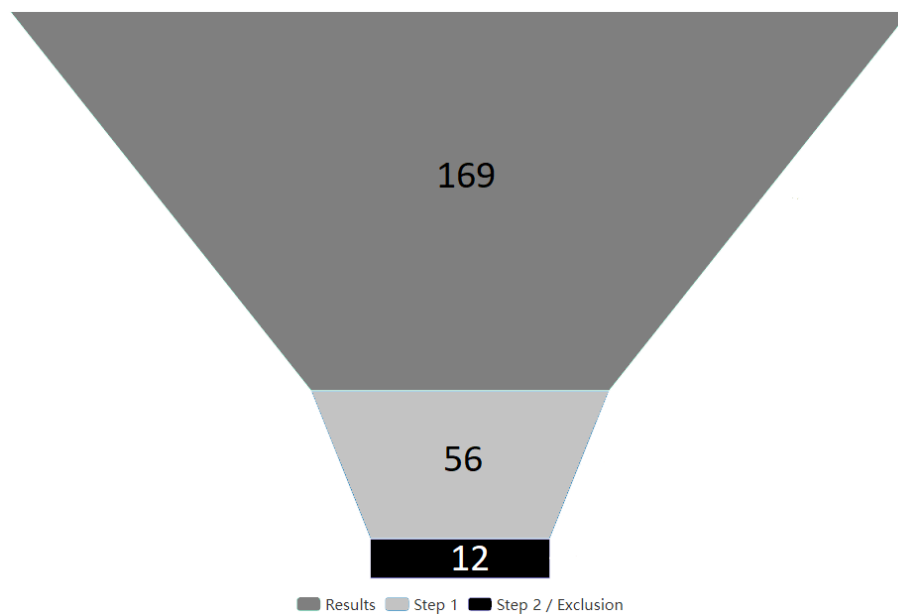
tools and websites left to be examined.

Table 9 – Search Results

No.	Search String	Evaluated Results	Potential New Tools	Total
1	sistema gestão acadêmicas (atividades projetos) site:.edu.br	100 out of ~1.250.000	4	4
2	(sistema ferramenta) gestão acadêmicas (atividades projetos) extensão site:.edu.br -SIGAA	100 out of ~182.000	11	15
3	(ferramenta aplicação) extensão (programa projeto) (gestão gerenciamento) -SIGAA	100 out of ~15.600.000	9	24
4	(app aplicativo) extensão (programa projeto) (administração gerência) -SIGAA	100 out of ~7.140.000	13	37
5	ferramenta extensão (programa projeto) (gestão gerência) -SIGAA	100 out of ~11.000.000	27	64
6	(ferramenta aplicação app aplicativo) extensão (programa projeto) gestão -SIGAA	100 out of ~22.500.000	15	79
7	software extensão (programa projeto) (gerência gestão controle) -SIGAA	100 out of ~8.300.000	24	103
8	(software ferramenta aplicação) extensão atividade -SIGAA	100 out of ~30.900.000	10	113
9	sistema extensão (projeto programa atividade) gestão -SIGAA	100 out of ~26.400.000	30	143
10	acadêmica extensão (projeto programa atividade) -SIGAA	100 out of ~17.000.000	26	169

Source: Author.

Figure 5 – Results x Criteria



Source: Author.

4.3.2 Data Extraction

This section explains how the two data extractions from the discovered tools were carried out: one for the feature matrix and the other to collect more details on the key features shared by the tools.

4.3.2.1 Feature Matrix

It was important to develop a functions matrix among the filtered results after the research was completed in order to apply the quality standards. The authors were able to determine which features were present in the examined tools the most frequently in this method. There were determined to be 37 traits in total, some of which repeated more frequently than others. The matrix can be seen in Figure 6.

Lighter gray highlights were utilized to draw attention to the characteristics that were shared by all of the examined tools and websites so that they could be used as criteria in the subsequent stage of data extraction.

4.3.2.2 More Information from Important Features

The goal of the second data extraction was to determine which data was utilized to (i) Listing of outreach activities; (ii) Detailed page of an activity; (iii) Enrollment of a participant into an activity; (iv) Registration of users external to the institution.

It was challenging to unify the analysis because each tool has its own format and attribute naming, thus the original names were retained. To prevent confusion, tools that lacked the chosen features have been highlighted in grey rather than having the cells left blank. Because it was nearly impossible to try to follow a pattern for all the tools, the extracted findings are written informally. The extracted data can be seen in ??.

4.3.3 Tool Classification

The extracted and tabulated data allowed for the classification of the tools based on the previously established quality standards. The scoring range for a tool is from 0 (zero) to 5 (five). The final results are shown in the table Table 10.

With this classification, it is clear that the CAEX tool and SIGAA received the highest ratings, which was exactly what was anticipated. First, SIGAA is one of the academic management tools that institutions in the nation utilize the most, and CAEX is the tool that offered the most distinctive features. As a result, they were two instruments that had a lot of promise and were very helpful in gathering data to create the goal product.

Figure 6 – Feature Matrix

		Tools											
		Cachalote	CAEX	Einstein	ENS	Santa Marcelina	SGE	SIEX	SIG	SIGAA	Suap	UNINASSAU	UNINTER
Features	System login	X	X	X	X	X	X		X	X	X	X	X
	Outreach activity listing	X	X	X	X	X	X	X	X	X	X	X	X
	Issuance of certificates	X	X						X	X		X	X
	Certificate validation	X	X				X		X	X	X		
	Application for activity evaluator	X									X		
	Event details page	X	X	X	X	X	X	X	X	X	X	X	X
	Event enrollment	X	X	X	X	X	X		X	X	X	X	X
	Detailed schedule	X					X		X	X	X		X
	Event query with filter		X	X	X		X	X	X	X		X	X
	Calendar view		X								X		
	External user registration	X	X	X	X	X	X		X	X		X	X
	Registration of interest in areas of knowledge		X	X									
	Discussion forums by event		X										
	Attendance recording - MGMT		X										
	Proposals for new events - MGMT		X										
	Task evaluation environment - MGMT	X	X										
	Transform proposals into events - MGMT		X										
	Manage submissions - MGMT		X										
	Enable certificates - MGMT		X										
	Fill in the final report - MGMT		X										
	Responsible teacher details		X	X	X					X			X
	List of events by teacher			X						X			
	Favorite events			X									
	Text event search	X		X		X	X	X	X	X			X
	Application of interest (when applications are not open)				X								
	Registration of event prerequisites				X								
	Enrollment form without login				X						X		
	Related events				X	X		X	X				
	Print enrollment status						X						
	Edit enrollment		X				X		X	X			
	Print event information							X					
	History of past versions of the event							X				X	
	Teacher's notes									X			
	Logged user event listing		X	X			X		X	X		X	X
	Logged user event history		X				X		X	X		X	X
	Help area (frequently asked questions, manuals)	X		X			X		X		X		X
	Testimonials from past participants				X								
	Sum of features	12	22	13	12	7	14	7	15	16	10	10	13

Source: Author.

4.3.4 Answering the Research Questions

The research questions are under the Table 4 and were introduced earlier in the study. For convenience's sake, each question is also explained below.

- **RQ 1.** What tools currently exist that perform academic management?

This is a question that also refers to some instruments that were eliminated during the use of inclusion and exclusion criteria. In this instance, 36 tools supporting academic management of various kinds were found, but only 12 of them meet the required requirements and are mentioned in the tool matrix in Figure 6.

- **RQ 1.1.** Which ones have related functionality or support outreach activities?

Figure 7 – Additional Information Extraction

		Features			
		Listing of outreach activities	Detailed page of an activity	Enrollment of a participant into an activity	Registration of users external to the institution
Tools	Cachalote	Image and title, duration, location, "Learn More" button.	Activity image, description, duration, location, contact phone, contact email, enrollment period and detailed schedule.	Description of the participant's disability, if any.	Name, username, email and password.
	CAEX	Title, duration, enrollment period and "Learn More" button.	Presentation of the activity, general objective, justification, beneficiary, "I want to register" button.	Step 1: Choose the activity; Step 2: Education, course, institution, scholarship holder?, funder, occupation, place of work; Step 3: Select which sub-activities you want to participate in; Step 4: Review completed information, confirm.	CPF, name, category, date of birth, sex, place of birth, nationality, marital status, password.
	Einstein	Image, category, title, "Learn More" button.	About, objectives and qualifications, student profile, program and methodology, faculty, FAQs, target audience, period, investment.	Select class, payment information.	Email
	ENS	Image, title, start date, "Learn More" button.	About, content, modality, validity, duration in hours, contact information, prerequisites, investment, faculty, testimonials from participants, related courses.	Step 1: Entry form, CPF, name, email, telephone; Step 2: Course, location, modality; Step 3: Personal data, CPF, name, email, telephone, gender, education level, address; Step 4: Review of information; Step 5: Payment if necessary; Step 6: Conclusion.	User-related data used in event registration
	Santa Marcelina	Image, title, brief description.	Link to application form, presentation, target audience, faculty, contact, related activities.	Desired activity, full name, email, date of birth, RG, CPF, telephone number, address, do you have a link with the institution?, how did you find out about the activity?	User-related data used in event registration
	SGE	Image, title, enrollment period, short description, "Learn More" button.	About, validity, certification, modality, transmission platform, target audience, faculty, schedule.	Select which event activities you want to participate in.	Name, nationality, CPF, gender, type of participant, telephone, institution, email, password.
	SIEX	Registration number, type (project, program...), title, unit, department, coordinator, status, functionality to print.	Description: Activity data, characterization (year it started, unit, linked program, extension line, knowledge area, keywords, thematic area). Full description: Presentation and justification, general objectives, specific objectives, methodology, evaluation method, website, internal or external target audience, characterization of the target audience. Plans: Activity plans, monitoring and guidance plan, evaluation process. Specific information: Physical infrastructure, link with teaching?, link with research?, estimated public. Additional information: Faculty (Position of participation, name, telephone, email, unit, department, period of work). Partner institutions: CNPJ, name, characterization, type. Scope: Name, state, county, zip code, details. Linked activities: Type, registration number, title, status. Results achieved: Specific results, general results. Productions: Type, title, date of publication/delivery of the product, identification/reference. History: Name of the activity along with the date it was performed, Print PDF Review Information.		
	SIG	Title, type, details, schedule, enrollment.	Activity data: Type, title, description, free?, total workload, total vacancies, scope, thematic area, knowledge area, classification, promoting unit, coordinator. Period: Start date/time, End date/time. Contacts: Phone, email, website, registration period.	Just subscribe button after being logged in.	Access data: Email. Personal data: Name, gender, date of birth, marital status, nationality. Documents: CPF, passport, RG, address. Professional data: Academic degree, training institution that obtained the highest degree, institution where you work. Contacts: Phone, cell phone.
	SIGAA	Year, title, type, department.	Title, year, no. of scholarships awarded, no. number of students involved, estimated audience, period, main area, CNPq area, proposing unit, units involved, type, cities where it will be held, spaces where it will be held, source of funding, workload, number of vacancies, person responsible for the action, email of the person responsible, url, summary, schedule, internal target audience, external target audience, team members (name, role, category (faculty, student)), photo list, enroll button.	Activity data: Title, coordinator, remaining vacancies, proposing unit, instructions, general information. Completed by the participant: Link (institution), file if necessary (file description).	Personal data: CPF, RG, name, date of birth, address, contact (phone, cell phone), authentication (email, password).
	Suap	Title, description, enrollment period	Title, presentation, workload, location, start of registration, end of registration, start, end.	Name, email, telephone, CPF, profile (student, external audience).	
	UNINASSAU	Title, category (lecture, personal development...).	Start date, end date, category, image, summary, location. Activities: Title, number of vacancies, deadline for registration, period, location, menu, schedule, bibliography.	Vacancies, workload, investment, discount, final value, completion period, user clicks "Finish".	CPF, name, email, address, cell phone, password.
	UNINTER	Image, title, price, add to cart button.	Date, description, realization, target audience, curriculum structure, certification criteria, faculty, sub-activities, how it works.	Add to cart and checkout.	Name, CPF, RG, date of birth, gender, email, cell phone, telephone, address.

Source: Author.

The following tools were found, as it was already demonstrated in the Figure 6, which describes the relationships between tools and main features: (1) Cachalote; (2) CAEX; (3) Einstein; (4) ENS; (5) Santa Marcelina; (6) SGE; (7) SIEX; (8) SIG; (9) SIGAA; (10) SUAP; (11) UNINASSAU and (12) UNINTER.

- **RQ 1.2.** What are the features offered by these tools?

The features matrix, which is present in Figure 6 and has a total of 37 features, contains a list of every feature that was discovered.

Table 10 – Quality Criteria Evaluation

		Quality Criteria										
		QC 1.		QC 2.		QC 3.		QC 4.		QC 5.		Final Results
		Ans.	Score	Ans.	Score	Ans.	Score	Ans.	Score	Ans.	Score	
Tools	Cachalote	9	0,0	No	0,0	12	0,5	Partially	0,5	2021	0,5	1,5
	CAEX	4	0,0	7	1,0	22	1,0	Yes	1,0	2022	1,0	4,0
	Einstein	12	0,5	1	0,5	13	0,5	Partially	0,5	2022	1,0	3,0
	ENS	11	0,5	3	1,0	12	0,5	Partially	0,5	2022	1,0	3,5
	Santa Marcelina	6	0,0	No	0,0	7	0,0	Partially	0,5	2022	1,0	1,5
	SGE	8	0,0	1	0,5	14	1,0	Yes	1,0	2016	0,0	2,5
	SIEX	53	1,0	1	0,5	7	0,0	Yes	1,0	2022	1,0	3,5
	SIG	18	0,5	No	0,0	15	1,0	Partially	0,5	2022	1,0	3,0
	SIGAA	28	1,0	1	0,5	16	1,0	Yes	1,0	2022	1,0	4,5
	Suap	8	0,0	No	0,0	10	0,5	Yes	1,0	2022	1,0	2,5
	UNINASSAU	14	0,5	No	0,0	10	0,5	Partially	0,5	2022	1,0	2,5
	UNINTER	9	0,0	No	0,0	13	0,5	Partially	0,5	2022	1,0	2,0

Source: Author.

- **RQ 1.3.** What are the most common features between this type of tool?

The most common functionalities in this type of tool are: (i) A login system; (ii) Listing of Outreach Activities; (iii) OA details page; (iv) OA enrollment and (v) Registration of external users. The ability to search for events by text is another feature that is present regularly but not as frequently as the other features; 8 of the tools were found to support this functionality.

- **RQ 1.4.** What data do the tools use in relation to activities, participant registration and user registration?

By analyzing the second data extraction presented in Section 4.3.2.2, the most common fields for OAs are: (a) Title; (b) Duration; (c) Enrollment period; (d) Contact information; (e) Description; (f) Target audience; (g) Faculty and (h) Schedule.

Regarding enrollment, the most common fields found are: (a) Participant's personal data; (b) Institutional affiliation; (c) Participant type and (d) Information about the participant's disability, if any.

When it comes to user registration, these tools mostly employ personal information, authentication information, and an address; however, some also request information about the institution, participant type, and professional data.

4.4 Validity

Some validity threats were found as the systematic review mapping process progressed. While the writers were able to lessen the majority of them, some still need to be addressed. They are as follows:

- When comparing the findings they both found throughout the study phase, the authors observed that the search results varied just little, between one or two different

records. Although it was a hazard that could be easily reduced, it couldn't be fully ruled out. In order to do the search in anonymous mode, the approach employed was to log out of the account currently logged into the browser. As a result, there were fewer divergences overall, however occasionally divergent outcomes did occur.

- Functionalities of the tools weren't checked with the creators. Unfortunately, the authors were unable to reach any universities to inquire about the management solution being employed.
- The authors aimed to conduct the search in as little time as feasible, beginning and finishing it in just three days, in order to reduce the divergence of findings. As the search engine is regarded as a "black box", making it challenging to predict the precise results that will emerge with each search string, the longer the delay, the greater the chance that risks to the study will be introduced.

4.5 Considerations

Finding tools that are similar to the intended outcome of the entire study was made possible by this thorough review of the grey literature. Before undertaking the review, no knowledge of the current status of the field or the most popular solutions employed by Brazilian HEI existed.

A wealth of useful data was gathered regarding the instruments used today. It was now much more obvious what Outreach Activities management and processes covered. This information will be useful when putting the objective product into use, which seeks to provide a comprehensive solution for OA management.

Furthermore, the review protocol's definitions of all the research questions could all be answered.

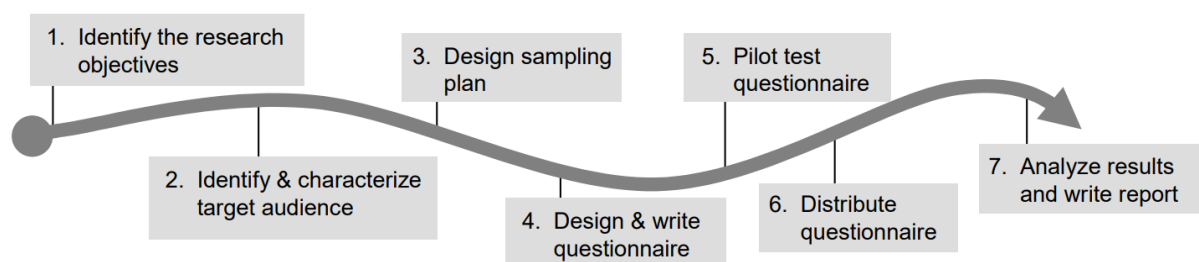
5 SURVEY

In this chapter, more detailed information is presented about the survey that was conducted. The survey was a collaborative effort between two authors, just like the grey literature systematic review discussed in the preceding chapter. Later, we'll go over each person's responsibilities. In Section 5.1, details about the adopted protocol, reference author, and task division among researchers are presented. The Section 5.2, reports threats to the validity of the study, and finally, in Section 5.3, all results achieved during execution are discussed.

5.1 Survey Protocol

According to Kasunic (2005), a survey is a method of gathering and analyzing data in which participants respond to pre-formulated questions or statements. The guidelines suggested by the author served as inspiration for the protocol that was developed for this study and is shown in Figure 8.

Figure 8 – Seven steps of the research process



Source: (KASUNIC, 2005).

The goal is to comprehend teacher and student needs with regard to outreach projects and activities, as will be stated later. The choice of *survey* as a data collection approach is due to the fact that the characteristics of a survey of this type allow us to generalize about the beliefs and opinions of many people by studying only a subset of them (KASUNIC, 2005). In this case, the ideal tool.

Due to the fact that this research was conducted by two students, efficiency and effectiveness were enhanced by dividing the workload. Table 11 shows the division of adopted activities, taking into account those that Kasunic (2005) has already defined.

5.1.1 Identify the Research Objectives

This first step's goal is to explain why conducting a survey is important and what can be accomplished by doing so. Taking into account the results generated by the review

Table 11 – Tasks Separation

Activity	Responsibility
Define and document research objectives	Lucas F.
Define and document research questions	Lucas F.
Define and document how research results will be used	Lucas F.
Define the appropriate target audience for the research	Igor C.
Determine the appropriate media to apply the research in	Igor C.
Recruit members of the target audience to participate in pilot test	Igor C.
Breakdown research questions into questionnaire topics	Lucas F.
Organize and sequence questions	Lucas F.
Review the questionnaire based on the pilot test	Igor C. and Lucas F.
Perform the pilot test	Igor C. and Lucas F.
Evaluate comments	Igor C. and Lucas F.
Perform final corrections before the distribution of the questionnaire	Lucas F.
Questionnaire ready for distribution	
Distribute questionnaires	Lucas F.
Monitor answers	Igor C. and Lucas F.
Send reminders	Igor C.
Questionnaire response deadline	
Perform analysis	Igor C. and Lucas F.
Write draft report	Igor C.
Revise draft	Igor C. and Lucas F.
Perform the final corrections	Igor C. and Lucas F.

in the gray literature, mentioned in Chapter 4, it was possible to elaborate questions in a way that the participant informs, in his view, the importance of a certain requirement raised. As a result, the goal of this survey is to prioritize them based on the views of potential end users.

In addition to being asked their opinions, participants were free to offer suggestions or improvements in relation to the needs of the tool, as one of the study's goals is to identify the needs of potential system users. Consequently, with a more solid foundation and a more clearly defined scope of activities, the solution development process will begin.

5.1.2 Identify and Characterize the Target Audience

At this stage, it is necessary to look at the possible respondent audiences and identify who will be the respondent audience and who the study population is. Therefore, the population is made up of all people within the academic community, so the coordinators of extension programs or projects, professors and students were chosen to represent the sample of this population, with preference given to participants who have experience with outreach activities. With this audience, it is possible to understand all tool users' perspectives, including those of activity creators and subscribers.

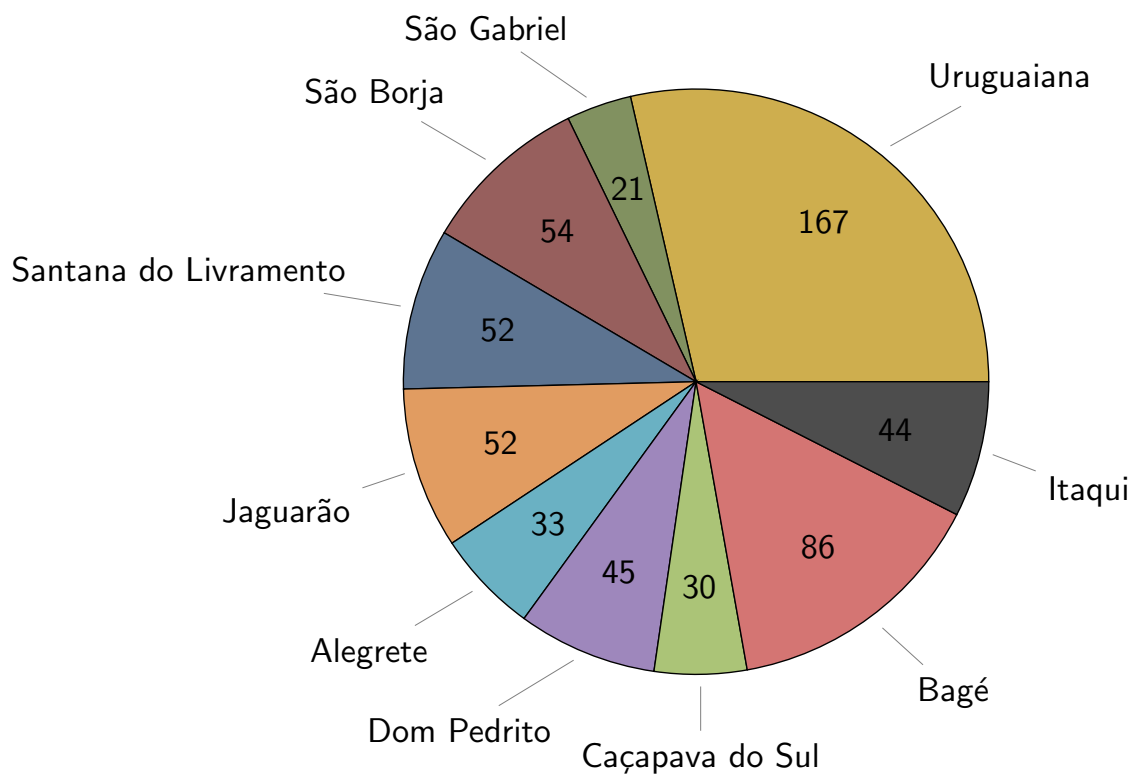
5.1.3 Design the Sampling Plan

According to Kasunic (2005), the objective of this phase is to determine the following topics:

- How individuals will be selected to participate in the survey;
- The required size of the sample.

Therefore, the first topic sought to cover as many UNIPAMPA campuses as possible by sending emails to its Academic Secretariats, directed to students and to lists of coordinators of programs and outreach projects, keeping the balance between teachers and students. As a result, it was anticipated that campuses like Uruguaiana and Bagé, which can be seen in the Figure 9 as being the campuses that performed outreach activities the most in 2021 (UNIPAMPA, 2021b), would contribute more respondents to the survey.

Figure 9 – Number of Projects Contemplated in the Internal Public Notices



Source: Adapted from (UNIPAMPA, 2021b)

Along with all of the quantitative responses, each respondent had the chance to discuss the questions in greater detail, allowing for qualitative feedback. This added significantly to the amount of work needed to conduct the analysis. The questionnaire received 123 responses in total.

The separation of the sample is an essential point for the best efficiency of the survey, being in accordance with the recommended practice 22 defined by Molléri, Petersen

e E. (2020), which says that the sample should be divided according to its characteristics and similarities. To contemplate it, the questionnaire respondents who declared themselves as Administrative Technician in Educations (ATEs) or professors were directed to one area of the questionnaire, and students to another, both areas with questions related to the profile claimed by the respondent.

5.1.4 Design and Write the Questionnaire

Kasunic (2005) emphasizes that for the structuring and writing of the questionnaire, the research objectives and the characteristics of the sample must be taken into account. According to the author, questionnaires that do not have well-defined objectives are more likely to have questions that only consume the respondent's time, he highlights this with a question Kasunic (2005, p.34) "How can you reach insightful conclusions if you do not know what you were looking for or planning to observe?", in this questionnaire the objective is well defined, focused on prioritizing requirements and gathering suggestions from potential end users as well described in Section 5.1.1. In the same way, the characteristics of the sample are important to write the questions in a way that everyone understands and not just thinking about the understanding of the researchers themselves. Linåker et al. (2015) notes that the results that will be obtained with the survey are directly related to the quality of the questionnaire used.

For Linåker et al. (2015) there are two types of questionnaires, self-administered and interviewer-administered questionnaire, according to its definitions, this fits the first type, as it is a web-based questionnaire, the researches don't have to monitor the respondents. This model allows for a wider range of respondents, but on the other hand tends to have a higher dropout rate, emphasizing the importance of good structuring.

The survey was designed using Google Forms because it offers a straightforward user interface and is a component of the Google Suite service, which is used by UNIPAMPA to support a number of different processes. Additionally, it is widely used and is known to the majority of the respondents.

The structure of the questionnaire that is contained in the ?? is given by the home page, the respondent's profile questions, requirements prioritization questions and finally functionality suggestions, these are described below in their respective sections.

5.1.4.1 The Welcome Screen

Following instructions from Kasunic (2005), the first page of the questionnaire contains important information for the participant such as:

- Research objective;
- Estimated duration of the questionnaire;

- Researchers' contact email addresses;
- Researchers involved;
- Voluntary, anonymous and confidential character of the research;
- Institution and organization involved.

5.1.4.2 Profile Questions

Questions related to acquiring information about the participant are important in the first phases of the questionnaire, as they motivate participants to continue answering it without confusing them with complex questions right at the beginning, (REA; PARKER, 2005). In addition to having a good classification of participants, it allows the analysis of these to be done in a more controlled and organized way, as mentioned by Martins (2021).

The data that was taken with the profile questions are listed below: (1) Is enrolled in UNIPAMPA; (2) Sex; (3) Age group; (4) Academic education; (5) Already participated in an OA; (6) Which roles the participant had in the OA; (7) His role in the academic community; (8) His campus and city; (9) The course the participant is taking.

5.1.4.3 Requisites Priorization Questions

In the questions related to the research objective, some directions described by Forza (2002) were used, they are:

Suggestion 1. Define the way questions are asked to collect the information on a specific concept;

Suggestion 2. For each question decide the scale on which the answers are placed;

Suggestion 3. Identify the appropriate respondent(s) to each question;

Suggestion 4. Put together the questions in questionnaires that facilitate and motivate the respondent(s) to respond.

In the case of **Suggestion 1**, in which it is suggested that the questions be written in such a way that the entire respondent sample can understand and formulate an answer. Since the questions in this questionnaire refer to software requirements, the user stories model was used, which makes it very clear who the actor is, what is desired with the given requirement and the reason for it. It was also determined that the questions would be classified as closed questions, which determine the possible responses of the respondent as described by Forza (2002). Thus, at the end of each page of the questionnaire there was also an open-ended question allowing the respondent to discuss possible suggestions for improvements or new requirements not yet elicited.

The **Suggestion 2** is the scale used in the questions, at first it was thought to use the Likert scale, but analyzing the situation and the format of the questions later it was decided to use the scale Must have, Should have, Could have and Will not have (MoSCoW), and the possible responses were adapted according to the MoSCoW technique. It was selected because it is specifically useful for prioritizing software requirements and is more closely related to requirements.

Then in **Suggestion 3**, it is suggested that the questionnaire directs the participants to the questions that they have the most ability to answer, bringing more constructive and relevant answers. In the questionnaire used, this division was performed using the profile questions commented on Section 5.1.4.2, with the participant being automatically directed to the corresponding section with their profile.

Finally, in **Suggestion 4** it is advised that all questions that have a common subject are arranged next to each other to facilitate cross-checks between the answers. To implement this suggestion, the requirements are organized into groups by system actors' roles, as follows: (1) OA proponent; (2) OA instructor; (3) OA participant; (4) Outreach programs and projects coordinator.

5.1.4.4 Feature Suggestions

A field was provided on the questionnaire's final page so that participants could offer researchers any suggestions for functionality, improvement, or other adjustments. With these answers it is possible to make a qualitative analysis and get new ideas for the development and completion of the final tool.

5.1.5 Pilot Questionnaire

After generating a stable version of the questionnaire, it is necessary to validate it, for which a pilot questionnaire was carried out. According to Kasunic (2005) the pilot test is a simulation of the real questionnaire carried out with a small number of members from the target audience. To carry out it, 7 (seven) people were arbitrarily invited, divided into: 4 (four) undergraduate students, 2 (two) professors from the UNIPAMPA Alegrete campus and 1 (one) ATE. The choice of pilot questionnaire respondents was made because it represents all the profiles expected in the target sample, and represents the proportion expected in the actual completion of the questionnaire.

Only one participant who was selected to take part in the pilot survey was unable to respond on time, and that participant was ATE. However, this did not actually present a problem because, as mentioned in Section 5.1.3 the survey is divided into two parts, in which ATEs and teachers answer the same.

With the execution of this pilot, it was possible to acquire several suggestions, corrections and important points for the final version of the questionnaire. As an illustra-

tion, it was suggested to ask for participants' ages in age groups because one participant didn't feel comfortable revealing his exact age.

5.1.6 Distribute the Questionnaire

The questionnaire was distributed to all the people who make up the sample of this research. To carry this out, all emails from coordinators with active outreach projects or programs from all UNIPAMPA campuses were gathered, and they were the first to respond to questionnaire. After 2 (two) days, emails were sent to all campus academic secretariats, requesting that it be passed on to all the students from all courses. In conclusion, the entire survey was open for responses for 18 (eighteen) days.

5.1.7 Analyze the Results and Write a Report

The quantitative results related to requirements prioritization must be collected and organized in graphs for better understanding and visualization of the data. This will allow you to have an ordered list of requirements that were considered most important to end users.

Regarding the qualitative answers, these will be analyzed on a case-by-case basis and, if the suggestion is relevant, they will be added to the final backlog of features or improvements.

5.2 Threats to Validity

In order for a survey to be successful, validity is a crucial factor that must be carefully considered and planned. Without the right precautions, the entire study may fail. Threats to the validity of the research can be avoided or reduced, according to Kasunic (2005), by adhering to a well-defined procedure and tailoring it to the research subject. The author lists two crucial categories of survey research validity: (1) Construct validity and (2) External validity.

The first point focuses on knowing exactly what needs to be measured or collected, as the author says "Are these questions providing enough information to answer my research objective?". The second validity is more concerned with the ability to generalize the obtained results to other people, places, or times.

5.2.1 Construct Validity

It was possible to gain important knowledge and insights from the results as soon as the first participants began sending in their responses. Having said that, the following items were noted as potential threats:

- Despite the fact that the questions were straightforward and made to be understood by all, those who are unfamiliar with the scale may find it confusing. The MoSCoW scale was modified and translated into Portuguese, but for those who are not accustomed to it, it may still be challenging to respond.
- Because the questions were written as user stories, it was simple for the participants to group the requirements according to their relevance. The threat posed by this way of describing the questions, could prevent the respondent from suggesting new functionalities because the "creative work" has already been done.
- Threats could also be viewed in the definitions' ambiguity and lack of clarity. Sometimes the participant was unable to respond because he did not understand what a OA was.

5.2.2 External Validity

There are some inherent risks to external validity by how the study's scope was established. Furthermore, it is not necessary or possible to completely neutralize this, as doing so would reduce the study's usefulness. The threats discovered are listed below:

- The study is limited to participants who are familiar with the academic environment and have preferably participated in an outreach activity at UNIPAMPA due to the defined scope.
- The scope could be expanded to other HEI without introducing significant risks, but the study would become less useful because this term paper describes a goal product aimed at UNIPAMPA.

5.3 Result Analysis

5.3.1 —

5.3.2 —

5.3.3 —

6 EXTENSIONONLY

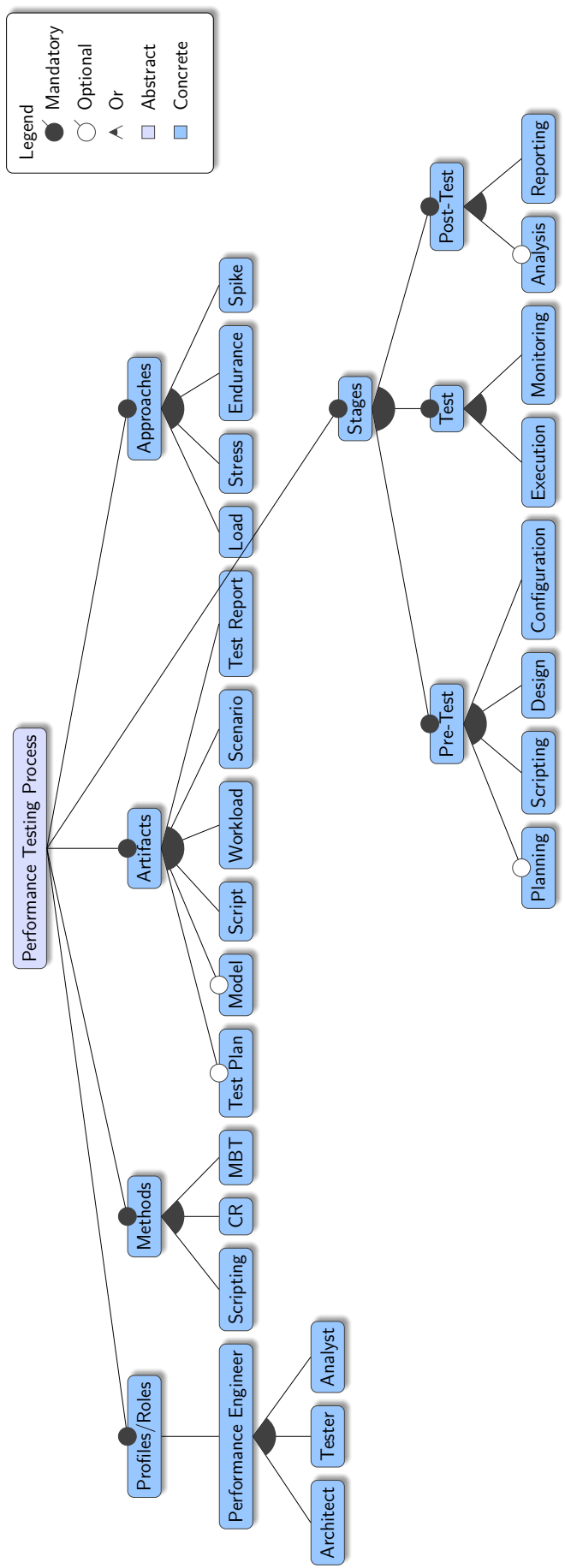
6.1 Requirement Engineering

6.1.1 Requirements Elicitation, Modeling and Analysis

6.1.2 User Stories

6.2 Features

Figure 10 – Taxonomy of performance testing tools represented by feature model.



Source: Author.

6.2.1 Roles

6.3 Development

6.3.1 Technology Stack

6.3.2 Programming Paradigm

6.3.3 Design Patterns

6.4 Software Architecture

6.4.1 DevOps

6.4.2 Pipeline

6.5 Testing

6.6 Software Artifacts

6.6.1 Domain Model

6.6.2 Component Diagram

6.6.3 Database Schema

7 PRELIMINARY CONCLUSIONS

7.1 Dummy

Em Trabalhos de Conclusão de Curso, use “*Considerações Finais*” e não “*Conclusão*”.

Bom trabalho!

REFERENCES

- DAMPIER, D.; WILSON, R. Teaching scientific method for real-time software engineering. **Thirteenth Conference on Software Engineering Education and Training**, 2000. Cited in page 29.
- FOREXT. Referenciais para a construção de uma política nacional de extensão nas ices. In: UNIVALI, E. (Ed.). **Extensão Nas Instituições Comunitárias De Ensino Superior**. [S.l.]: XX Encontro Nacional de Extensão e Ação Comunitária das Universidades e Instituições Comunitárias, 2013. p. 64. Disponível em: <http://www1.pucminas.br/imagedb/documento/DOC_DSC_NOME_ARQUI20150309182334.pdf>. Cited 2 times on pages 33, 35.
- FORPROEX. Política nacional de extensão universitária. Disponível em: <<https://www.ufmg.br/proex/renex/images/documentos/2012-07-13-Politica-Nacional-de-Extensao.pdf>>. 2012. Cited in page 33.
- FORZA, C. Survey research in operations management: a process-based perspective. **International Journal of Operations Production Management**, v. 22, p. 152–194, 2002. Cited in page 57.
- GODIN, K. et al. Applying systematic review search methods to the grey literature: a case study examining guidelines for school-based breakfast programs in canada. **Systematic reviews**, BioMed Central, v. 4, n. 1, p. 1–10, 2015. Cited in page 43.
- IUNG, A. et al. Systematic mapping study on domain-specific language development tools. **Empirical Software Engineering**, Springer, v. 25, n. 5, p. 4205–4249, 2020. Cited in page 44.
- KASUNIC, M. **Designing an effective survey**. [S.l.], 2005. Cited 5 times on pages 53, 54, 56, 58, 59.
- LENARDUZZI, V.; TAIBI, D. Mvp explained: A systematic mapping study on the definitions of minimal viable product. In: **42th Euromicro Conference on Software Engineering and Advanced Applications (SEAA)**. [S.l.: s.n.], 2016. p. 112–119. Cited in page 31.
- LINÅKER, J. et al. **Guidelines for Conducting Surveys in Software Engineering**. [S.l.], 2015. Cited in page 56.
- MARTINS, G. L. **Towards a Performance Testing Body of Knowledge (PTBOK)**. [S.l.], 2021. Cited in page 57.
- MEC. Resolução nº 7. estabelece as diretrizes para a extensão na educação superior brasileira. Disponível em: <http://portal.mec.gov.br/index.php?option=com_docman&view=download&alias=104251-rces007-18&category_slug=dezembro-2018-pdf&Itemid=30192>. 2018. Cited 3 times on pages 11, 13, 25.
- MOLLÉRI, J.; PETERSEN, K.; E., M. An empirically evaluated checklist for surveys in software engineering. **Information and Software Technology**, 2020. Cited in page 56.
- NIDHRA, S.; DONDETI, J. Black box and white box testing techniques-a literature review. **International Journal of Embedded Systems and Applications (IJESA)**, v. 2, n. 2, p. 29–50, 2012. Cited in page 41.

PINGPING, X.; YULAN, W. Study of scientific research quality monitoring system based on control theory. **2013 6th International Conference on Information Management, Innovation Management and Industrial Engineering**, 2013. Cited in page 29.

PRODANOV, C. C.; FREITAS, E. C. de. **Metodologia do trabalho científico: métodos e técnicas da pesquisa e do trabalho acadêmico-2ª Edição**. [S.l.]: Editora Feevale, 2013. Cited 2 times on pages 29, 30.

REA, L. M.; PARKER, R. A. **Designing and conducting survey research: a comprehensive guide**. 3. ed. [S.l.]: San Francisco: Jossey-Bass Publishers, 2005. Cited in page 57.

SUPERIOR, M. D. E. C. N. D. E. C. D. E. Resolução nº 7, de 18 de dezembro de 2018. estabelece as diretrizes para a extensão na educação superior brasileira e regimenta o disposto na meta 12.7 da lei nº 13.005/2014, que aprova o plano nacional de educação - pne 2014-2024 e dá outras providências. Disponível em: <http://portal.mec.gov.br/index.php?option=com_docman&view=download&alias=104251-rces007-18&category_slug=dezembro-2018-pdf&Itemid=30192>. 2018. Cited in page 34.

UNIPAMPA. Resolução nº 246 de 27 de junho de 2019. dispõe sobre o plano de desenvolvimento institucional da unipampa. Disponível em: <https://sites.unipampa.edu.br/consuni/files/2020/06/resolucao-246_2019-pdi-2019-2023.pdf>. 2019. Cited in page 25.

UNIPAMPA. Instrução normativa nº 18. normativas do programa institucional "unipampa cidadã". Disponível em: <https://sites.unipampa.edu.br/proext/files/2021/08/sei_unipampa-0585474-instrucao-normativa-gr-unipampa-cidada.pdf>. 2021. Cited 2 times on pages 26, 36.

UNIPAMPA. Prestação de contas de 2021. Disponível em: <https://web.archive.org/web/20220328201547/https://sites.unipampa.edu.br/proext/files/2022/03/prestacao_de_contas_2021.pdf>. 2021. Cited in page 55.

UNIPAMPA. Resolução consuni/unipampa nº317. regulamenta a inserção das atividades de extensão nos cursos de graduação, presencial e a distância, da universidade federal do pampa. Disponível em: <https://sites.unipampa.edu.br/proext/files/2021/05/res-317_2021-politica-de-extensao.pdf>. 2021. Cited 4 times on pages 25, 26, 35, 36.

UNIPAMPA. Resolução nº 332. revoga a resolução consuni/unipampa nº 104, de 27 de agosto de 2015 e institui as normas para atividades de extensão e cultura da universidade federal do pampa. Disponível em: <https://sites.unipampa.edu.br/proext/files/2021/12/sei_unipampa-0700488-resolucao-consuni.pdf>. 2021. Cited 3 times on pages 25, 34, 36.

UNIPAMPA. **Documentos Extensionistas**. 2022. <<https://sites.unipampa.edu.br/proext/documentos/documentos-e-fluxos/>>. Cited 2 times on pages 37, 39.

VIEIRA, M. das G.; MACHADO, F. F. Sistema integrado de gestão de atividades acadêmicas sigaa-módulo biblioteca: uma oportunidade de retomar a credibilidade da comunidade acadêmica com a efetivação da gestão do sistema de bibliotecas da

universidade federal da paraíba. **RDBCI: Revista Digital de Biblioteconomia e Ciência da Informação**, v. 11, n. 2, p. 159–175, 2013. Cited in page 43.

VIERO, T. V. Programa de extensão universitária: perspectivas emergentes na educação em ciências. **Dissertação de Mestrado (Programa de Pós-Graduação em Educação em Ciências: Química da Vida e Saúde)**, 2012. Cited 2 times on pages 35, 36.

Appendix

APPENDIX A – SURVEY QUESTIONNAIRE

Extensionly - Pesquisa de Interesse

Prezado(a) colaborador(a),

Somos alunos de graduação em Engenharia de Software da Universidade Federal do Pampa e temos como projeto de TCC uma ferramenta para facilitar a vida da comunidade acadêmica. Ela será focada na automação da gestão de atividades de extensão - eventos, minicursos, palestras, workshops... Processo que atualmente é realizado de maneira manual, tanto a parte da proposta de novas ações por docentes, quanto a parte de inscrição pelos participantes.

Com isso em mente, estamos conduzindo um estudo para entender as necessidades do nosso público-alvo. Gostaríamos de contar com a sua colaboração respondendo a este formulário, que dura em torno de 10-15 minutos.

Antes de continuar, é importante esclarecer as seguintes informações sobre a pesquisa:

- Sua participação no estudo é totalmente voluntária e, portanto, você não é obrigado a fornecer as informações e/ou colaborar com as atividades solicitadas pelos pesquisadores, podendo, a qualquer momento, desistir do mesmo.
- As respostas coletadas são de caráter anônimo e confidencial. O login é necessário somente para limitar as respostas em 1 por pessoa. Não coletamos nenhum dado pessoal.

Por fim, nos colocamos à disposição para quaisquer dúvidas através dos emails: lucasfell.aluno@unipampa.edu.br ou igorcosta.aluno@unipampa.edu.br

Professor Orientador: Maicon Bernardino da Silveira

***Obrigatório**





LESSE

Laboratory of Empirical Studies
in Software Engineering

1. Você concorda em continuar com a pesquisa? *

Marcar apenas uma oval.

☐ Sim

☐ Não

Identificação

Pedimos alguns dados anônimos para montarmos os perfis dos respondentes.

2. Você faz parte da unipampa? *

Marcar apenas uma oval.

☐ Sim *Pular para a pergunta 8*

☐ Não *Pular para a pergunta 27*

3. Sexo *

Marcar apenas uma oval.

☐ Masculino

☐ Feminino

☐ Outro: _____

4. Qual a sua idade? *

Marcar apenas uma oval.

- ☐ 14 anos ou menos
- ☐ 15 a 18
- ☐ 19 a 29
- ☐ 30 a 39
- ☐ 40 a 49
- ☐ 50+
- ☐ Prefiro não responder

5. Formação *

Marcar apenas uma oval.

- ☐ Ensino fundamental incompleto
- ☐ Ensino fundamental completo
- ☐ Ensino médio incompleto
- ☐ Ensino médio completo
- ☐ Superior incompleto
- ☐ Superior completo
- ☐ Pós-graduação
- ☐ Mestrado
- ☐ Doutorado
- ☐ Pós-Doutorado

6. Já participou de atividades extensionistas? *

Marcar apenas uma oval.

- ☐ Sim
- ☐ Não

7. Se sim, qual foi o seu papel na extensão? *

Selecione todos que se aplicam

Marque todas que se aplicam.

- ☐ Participante / Ouvinte de Atividade de Extensão
- ☐ Coordenador de Programa ou Projeto de Extensão
- ☐ Proponente de Programa ou Projeto de Extensão
- ☐ Instrutor (Curso) / Palestrante / Painelista / Voluntário de Atividade de Extensão
- ☐ Nunca participei de nenhuma de Atividade de Extensão

Identificação

Pedimos alguns dados anônimos para montarmos os perfis dos respondentes.

8. Qual é o seu papel na comunidade acadêmica? *

Marcar apenas uma oval.

- ☐ Discente *Pular para a pergunta 10*
- ☐ Docente *Pular para a pergunta 11*
- ☐ TAE *Pular para a pergunta 12*
- ☐ Outro: _____

9. Campus / Cidade:

Marcar apenas uma oval.

- ☐ Alegrete
- ☐ Bagé
- ☐ Caçapava
- ☐ Dom Pedrito
- ☐ Itaqui
- ☐ Jaguarão
- ☐ São Borja
- ☐ São Gabriel
- ☐ Santana do Livramento
- ☐ Uruguaiana
- ☐ Reitoria

Identificação -
Curso

Pedimos alguns dados anônimos para montarmos os perfis dos respondentes.

10. Curso: *

Marcar apenas uma oval.

- ☐ Administração
- ☐ Administração Pública
- ☐ Agronomia
- ☐ Aquicultura
- ☐ Biotecnologia
- ☐ Ciência da Computação
- ☐ Ciência e Tecnologia de Alimentos
- ☐ Ciências Biológicas
- ☐ Ciências da Natureza
- ☐ Ciências Econômicas
- ☐ Ciências Exatas
- ☐ Ciências Humanas
- ☐ Ciências Sociais - Ciência Política
- ☐ Comunicação Social - Publicidade e Propaganda
- ☐ Curso Superior de Tecnologia em Gestão Pública
- ☐ Direito
- ☐ Educação Física
- ☐ Enfermagem
- ☐ Engenharia Agrícola
- ☐ Engenharia Ambiental e Sanitária
- ☐ Engenharia Cartográfica e de Agrimensura
- ☐ Engenharia Civil
- ☐ Engenharia de Alimentos
- ☐ Engenharia de Aquicultura
- ☐ Engenharia de Computação
- ☐ Engenharia de Energia
- ☐ Engenharia de Produção
- ☐ Engenharia de Software
- ☐ Engenharia de Telecomunicações
- ☐ Engenharia Elétrica
- ☐ Engenharia Florestal
- ☐ Engenharia Mecânica

- ☐ Engenharia Química
- ☐ Farmácia
- ☐ Fisioterapia
- ☐ Fruticultura
- ☐ Física
- ☐ Geofísica
- ☐ Geografia
- ☐ Geologia
- ☐ Gestão Ambiental
- ☐ Gestão de Turismo
- ☐ História
- ☐ Interdisciplinar em Ciência e Tecnologia
- ☐ Jornalismo
- ☐ Letras - Espanhol e Literatura Hispânica
- ☐ Letras - Línguas Adicionais Inglês, Espanhol e Respectivas Literaturas
- ☐ Letras - Português e Espanhol
- ☐ Letras - Português e Literaturas de Língua Portuguesa
- ☐ Letras Português
- ☐ Matemática
- ☐ Medicina
- ☐ Medicina Veterinária
- ☐ Mineração
- ☐ Música
- ☐ Nutrição
- ☐ Pedagogia
- ☐ Produção e Política Cultural
- ☐ Química
- ☐ Relações Internacionais
- ☐ Relações Públicas
- ☐ Serviço Social
- ☐ Outro: _____

Identificação - Curso

Pedimos alguns dados anônimos para montarmos os perfis dos respondentes.

11. Curso: *

Marcar apenas uma oval.

- ☐ Administração
- ☐ Administração Pública
- ☐ Agronomia
- ☐ Aquicultura
- ☐ Biotecnologia
- ☐ Ciência da Computação
- ☐ Ciência e Tecnologia de Alimentos
- ☐ Ciências Biológicas
- ☐ Ciências da Natureza
- ☐ Ciências Econômicas
- ☐ Ciências Exatas
- ☐ Ciências Humanas
- ☐ Ciências Sociais - Ciência Política
- ☐ Comunicação Social - Publicidade e Propaganda
- ☐ Curso Superior de Tecnologia em Gestão Pública
- ☐ Direito
- ☐ Educação Física
- ☐ Enfermagem
- ☐ Engenharia Agrícola
- ☐ Engenharia Ambiental e Sanitária
- ☐ Engenharia Cartográfica e de Agrimensura
- ☐ Engenharia Civil
- ☐ Engenharia de Alimentos
- ☐ Engenharia de Aquicultura
- ☐ Engenharia de Computação
- ☐ Engenharia de Energia
- ☐ Engenharia de Produção
- ☐ Engenharia de Software
- ☐ Engenharia de Telecomunicações
- ☐ Engenharia Elétrica
- ☐ Engenharia Florestal
- ☐ Engenharia Mecânica

- ☐ Engenharia Química
- ☐ Farmácia
- ☐ Fisioterapia
- ☐ Fruticultura
- ☐ Física
- ☐ Geofísica
- ☐ Geografia
- ☐ Geologia
- ☐ Gestão Ambiental
- ☐ Gestão de Turismo
- ☐ História
- ☐ Interdisciplinar em Ciência e Tecnologia
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- ☐ Letras - Espanhol e Literatura Hispânica
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- ☐ Letras - Português e Espanhol
- ☐ Letras - Português e Literaturas de Língua Portuguesa
- ☐ Letras Português
- ☐ Matemática
- ☐ Medicina
- ☐ Medicina Veterinária
- ☐ Mineração
- ☐ Música
- ☐ Nutrição
- ☐ Pedagogia
- ☐ Produção e Política Cultural
- ☐ Química
- ☐ Relações Internacionais
- ☐ Relações Públicas
- ☐ Serviço Social
- ☐ Outro: _____

Extensionly

Pedimos que o respondente avalie a pergunta, encarando-a como um usuário do sistema. As perguntas estão organizadas na escala MoSCoW, utilizada com frequência na priorização de requisitos. Em inglês, seus 4 níveis são:

- 4 - Must have
- 3 - Should have
- 2 - Could have
- 1 - Wouldn't have

Adaptando ao português, classificamos da seguinte forma (lê-se: Em relação à afirmação descrita na pergunta, para mim essa funcionalidade é...):

- 4 - Indispensável
- 3 - Importante
- 2 - Desejável
- 1 - Irrelevante

Proponente de atividades de extensão

Aquele que idealiza uma atividade de extensão e monta uma proposta formal com o projeto do que foi pensado.

12. P1 - Eu como Proponente, gostaria de propor uma atividade de extensão, criando oportunidades de conhecimento para outras pessoas. *

Marcar apenas uma oval.

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

13. P2 - Eu como Proponente, gostaria de definir pré requisitos desejados para a matrícula na minha proposta de atividade de extensão, para que meus inscitos não venham despreparados. *

Marcar apenas uma oval.

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

14. P3 - Eu como Proponente, gostaria que meus dados fossem mostrados junto a *
página de detalhes da minha atividade de extensão, para que os participantes
tenham mais detalhes de quem a está ministrando.

Marcar apenas uma oval.

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

15. P4 - Eu como Proponente, gostaria de deixar observações na atividade de *
extensão, para pedir algum material especial para a realização da atividade ou
apenas deixar uma anotação minha para os participantes.

Marcar apenas uma oval.

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

16. Por favor deixe seu comentário (sugestão, melhoria ou crítica) sobre as
funcionalidades avaliadas:

Por favor, ao comentar, escreva o código da pergunta (P1, P2...). Obrigado!

Extensionly

4 - Indispensável
3 - Importante
2 - Desejável
1 - Irrelevante

17. P5 - Eu como Proponente, gostaria de preencher um relatório geral sobre como *
foi o decorrer da atividade de extensão realizada, para deixar registrado.

Marcar apenas uma oval.

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

18. P6 - Eu como Proponente, gostaria de cadastrar múltiplas edições de uma *
mesma atividade de extensão, para que novos participantes possam verificar
edições passadas.

Marcar apenas uma oval.

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

19. P7 - Eu como Proponente ou Instrutor, gostaria de entrar em contato com os *
participantes da atividade de extensão, para que seja facil passar informações
pertinentes à atividade.

Marcar apenas uma oval.

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

20. Em relação à pergunta anterior (P7), eu prefiro entrar em contato por meio de: *

Marque todas que se aplicam.

- ☐ Email
☐ WhatsApp

21. P8 - Eu como Proponente, gostaria de receber a avaliação dos participantes da minha atividade de extensão em formato de relatório/formulário detalhado, para que eu tenha ciência do que devo melhorar para a próxima edição. *

Marcar apenas uma oval.

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

22. Por favor deixe seu comentário (sugestão, melhoria ou crítica) sobre as funcionalidades avaliadas:

Por favor, ao comentar, escreva o código da pergunta (P5, P6...). Obrigado!

Extensionly

4 - Indispensável
3 - Importante
2 - Desejável
1 - Irrelevante

Instrutor de atividades de extensão

Aquele que passa o conteúdo no caso de workshops, realiza alguma palestra ou ensina algum curso. O agente que apresenta algo aos participantes.

23. I1 - Eu como Instrutor, gostaria de gerenciar as presenças dos participantes inscritos para que possa ser emitido os certificados para os presentes. *

Marcar apenas uma oval.

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

Coordenador de projetos ou programas de extensão
Aquele que revisa e aprova propostas de atividades de extensão.

24. C1 - Eu como Coordenador, gostaria de gerenciar as submissões de novas atividades de extensão realizadas, para que cada proposta passe por um processo de revisão antes de ser aceita. *

Marcar apenas uma oval.

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

25. C2 - Eu como Coordenador, gostaria de emitir certificados de participação com um determinado número de horas para todos os envolvidos, participantes, instrutores e coordenador, para que seja comprovado o envolvimento do indivíduo na atividade de extensão. *

Marcar apenas uma oval.

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

26. Por favor deixe seu comentário (sugestão, melhoria ou crítica) sobre as funcionalidades avaliadas:

Por favor, ao comentar, escreva o código da pergunta (I1, C1...). Obrigado!

Pular para a pergunta 47

Extensionly

Pedimos que o respondente avalie a pergunta, encarando-a como um usuário do sistema. As perguntas estão organizadas na escala MoSCoW, utilizada com frequência na priorização de requisitos. Em inglês, seus 4 níveis são:

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- 3 - Should have
- 2 - Could have
- 1 - Wouldn't have

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- 4 - Indispensável
- 3 - Importante
- 2 - Desejável
- 1 - Irrelevante

Participante

O usuário Participante ou Ouvinte é aquele que se inscreve em alguma atividade de extensão e se faz presente nas datas estabelecidas.

27. A1 - Eu como Participante, gostaria de me candidatar em atividades de extensão como eventos, cursos e palestras, para entrar na lista de espera e poder ser aceito na atividade. *

Marcar apenas uma oval.

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

28. A2 - Eu como Participante, gostaria de poder pesquisar por atividades de extensão, para que seja possível encontrar o que procuro com mais facilidade. *

Marcar apenas uma oval.

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

29. A3 - Eu como Participante, gostaria de cancelar ou editar as informações de uma inscrição realizada por mim, para ter mais liberdade caso mude de ideia. *

Marcar apenas uma oval.

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

30. Por favor deixe seu comentário (sugestão, melhoria ou crítica) sobre as funcionalidades avaliadas:

Por favor, ao comentar, escreva o código da pergunta (A1, A2...). Obrigado!

Extensionly

4 - Indispensável
3 - Importante
2 - Desejável
1 - Irrelevante

31. A4 - Eu como Participante, gostaria de ver as edições prévias das atividades de extensão, para que eu consiga ler as propostas passadas. *

Marcar apenas uma oval.

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

32. A5 - Eu como Participante, gostaria de visualizar o histórico de todas as atividades de extensão que participei, para que eu não precise manter o registro fora da ferramenta. *

Marcar apenas uma oval.

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

33. A6 - Eu como Participante, gostaria de contar com uma área de ajuda dentro do sistema, para me orientar com alguma dúvida ou problema que eu possa vir a enfrentar com a atividade em que me inscrevi. *

Marcar apenas uma oval.

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

34. A7 - Eu como Participante sem matrícula na faculdade, gostaria de me cadastrar no sistema, para participar de atividades de extensão que me interessem. *

Marcar apenas uma oval.

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

35. Por favor deixe seu comentário (sugestão, melhoria ou crítica) sobre as funcionalidades avaliadas:

Por favor, ao comentar, escreva o código da pergunta (A5, A6...). Obrigado!

Extensionly

4 - Indispensável
3 - Importante
2 - Desejável
1 - Irrelevante

36. A8 - Eu como Participante, gostaria de informar o meu interesse em áreas de conhecimento, para que eu veja atividades de extensão relacionadas as mesmas. *

Marcar apenas uma oval.

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

37. A9 - Eu como Participante, gostaria de favoritar atividades de extensão que eu julgar interessantes, para que eu tenha um fácil acesso a elas quando eu necessitar. *

Marcar apenas uma oval.

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

38. A10 - Eu como Participante, gostaria de demonstrar meu interesse em atividades de extensão indisponíveis, para que eu seja notificado quando abrir uma nova edição. *

Marcar apenas uma oval.

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

39. A11 - Eu como Participante, gostaria de realizar a inscrição em atividades de extensão sem fazer cadastro no sistema, para que minhas informações não sejam salvas. *

Marcar apenas uma oval.

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

40. Por favor deixe seu comentário (sugestão, melhoria ou crítica) sobre as funcionalidades avaliadas:

Por favor, ao comentar, escreva o código da pergunta (A9, A10...). Obrigado!

Extensionly

4 - Indispensável
3 - Importante
2 - Desejável
1 - Irrelevante

41. A12 - Eu como Participante, gostaria de compartilhar informações da atividade *
de extensão, para que eu consiga divulgar com mais facilidade para meus
amigos.

Marcar apenas uma oval.

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

42. A13 - Eu como Participante, gostaria de avaliar a atividade de extensão em que *
participei, para que outros participantes vejam a nota que eu atribuí.

Marcar apenas uma oval.

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

43. A14 - Eu como Participante, gostaria de ver as atividades de extensão em que *
estou inscrito na forma de um calendário, para que eu consiga me organizar
melhor.

Marcar apenas uma oval.

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

44. Sobre a pergunta anterior (A14), eu: *

Marque todas que se aplicam.

- ☐ Prefiro um calendário no site da própria ferramenta
☐ Prefiro exportar eventos para o meu app de agenda (Google Calendar ou iCloud
Calendar)

45. Por favor deixe seu comentário (sugestão, melhoria ou crítica) sobre as funcionalidades avaliadas:

Por favor, ao comentar, escreva o código da pergunta (A13, A14...). Obrigado!

Pular para a pergunta 46

Extensionly

-

Sugestões

Esta seção é reservada para você sugerir alguma funcionalidade (requisito) que não foi citada anteriormente, mas que você a considera importante para a completude do sistema.

46. Sugestões (como Participante):

Pular para a pergunta 48

Extensionly

-

Sugestões

Esta seção é reservada para você sugerir alguma funcionalidade (requisito) que não foi citada anteriormente, mas que você a considera importante para a completude do sistema.

47. Sugestões (como Coordenador, Instrutor ou Proponente):

Pular para a pergunta 48

Envio de
certificado de
participação

Se desejar o certificado de participação nesta pesquisa,
preencha todos os campos abaixo.

48. Seu e-mail:

49. Seu nome completo:

50. Sua matrícula:

Este conteúdo não foi criado nem aprovado pelo Google.

Google Formulários