FEDERAL UNIVERSITY OF PAMPA

Lucas Alexandre Fell

Extensionly - A tool for supporting the management of extracurricular projects and programs: Frontend

Alegrete
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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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Term Paper presented and approved on .... of .....
Committee members:

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<sigla da instituição>

Prof. <titulação> Nome Professor
<sigla da instituição>

This work is dedicated to all software engineering empiricists who,
at some point, felt like giving up
and throwing everything up in the air,
but still made it to the end.

ACKNOWLEDGEMENTS

I would like to thank my family, Isabel, Marco and Maitê for their unbounded love and support. I wouldn't be here without their help throughout the years and the education they were able to provide me. For that, I will be always grateful.

I am also thankful for the knowledge and education I received from each of my professors during my time at the University. This work wouldn't be possible without them. College has been a challenge since the start, especially during the COVID pandemic, but thanks only to their patience and effort in teaching, that was I able to reach this far in the course.

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My friend and roommate throughout the college years, Igor, for the bond we created through college that I'm sure will last for many years to come. Also, thanks for all the discussions and knowledge sharing we've had during each discipline of the course. It would've been much, much harder to come this far without his help.

"The most beautiful experience we can have is the mysterious.
It is the fundamental emotion that stands at the cradle of true art and true science."
(Albert Einstein)

RESUMO

Em 2023, o processo de curricularização de novas Ações de Extensão será implantado obrigatoriamente pelas universidades. Apesar disso, essa gestão dos Programas e Projetos de Extensão continuaria sendo realizada manualmente pelo coordenador ou colaboradores da UNIPAMPA. Essa é a motivação principal por trás da Extensionly. Desenvolver uma solução que contemple todos os processos envolvidos no ciclo de vida das atividades extensionistas. Para isso, um protocolo foi formulado e executado para a realização de um mapeamento sistemático na literatura cinza, de acordo com as diretrizes da Engenharia de Software, com o objetivo de encontrar ferramentas similares. Os resultados foram classificados e, a partir de sua análise, foi feita uma extração de requisitos e necessidades iniciais da aplicação. Posteriormente, foi feita a confecção de um survey segundo definições e diretrizes encontradas na literatura. Direcionado à comunidade acadêmica da UNIPAMPA, teve como objetivo classificar, escala de importância, os requisitos previamente coletados com a revisão na literatura cinza. Os resultados foram analisados e, a partir deles, iniciou-se o desenvolvimento da solução proposta, uma aplicação web que suprirá as necessidades do público-alvo e reduzirá o esforço manual atualmente colocado nos processos de extensão.

Palavras-chave: Ferramenta. Survey. Literatura Cinza. Frontend. Extensão. Universidade.

ABSTRACT

In 2023, the process of curricularization of new outreach activities will be obligatorily implemented by universities in Brazil. Despite this, this management of outreach programs and projects would continue to be carried out manually by the coordinator or collaborators of UNIPAMPA. This is the main motivation behind Extensionly. Develop a solution that includes all the processes involved in the life cycle of outreach activities. For this, a protocol was formulated and executed to carry out a systematic mapping in the gray literature, according to the guidelines of Software Engineering, in order to find similar tools. The results were classified and, from their analysis, an extraction of requirements and initial needs of the application was made. Subsequently, a survey was carried out according to definitions and guidelines found in the literature. Directed to the academic community of UNIPAMPA, it aimed to classify, on a scale of importance, the requirements previously collected by reviewing the gray literature. The results were analyzed and, from them, the development of the proposed solution began, a web application that will meet the needs of the target audience and will reduce the manual effort currently placed in the outreach activities processes.

Key-words: Tool. Survey. Gray Literature. Frontend. Outreach Activities. University.

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LIST OF ABBREVIATIONS AND ACRONYMS

IT Information Technology

MVP Minimum Viable Product

OCA Outreach Curriculum Activity

PROEXT Dean of Extension and Culture

UNIPAMPA Federal University of Pampa

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1 INTRODUCTION

This work is part of a collaborative effort by two students from the Software Engineering course. Since the complexity and size of the problem were bigger than what the academy is used to seeing on term papers, the work was split among both authors. This decision was supported and previously agreed upon by their supervisor.

The effort was separated as follows: While this paper encompasses all of the front-end system requirements, such as analytics, multiple languages, component styling, design of the pages with the user interface and user experience, the counterpart focuses heavily on the back-end system requirements. Both projects are separate implementations and live in different version control repositories, and both have their own specific devops pipelines and deployments.

The Federal University of Pampa offers several opportunities for students to participate in environments external to the university. According to the 317th CONSUNI Resolution from April 29th, 2021, an outreach activity can be described as the following: An action that integrates the curricular matrix and the organization of research, constituting an interdisciplinary, political, educational, cultural, scientific and technological process. It also promotes the transforming interaction between UNIPAMPA and society, through the production and application of knowledge, in permanent articulation with teaching and research (UNIPAMPA, 2021b).

There are 4 different modalities for outreach activities (UNIPAMPA, 2021b): (i) Program: a set of actions that are oriented towards a common objective, with a medium to long term duration; (ii) Project: usually linked to a Program, it has a specific objective and a fixed term; (iii) Course: training activity, with short duration, and; (iv) Event: an action with an artistic, cultural and scientific character, with a well-defined duration.

An example is the JEDI Program, which aims to solve local problems and stimulate capacity building and training in Information Technology (IT) with the involvement of the community (academic and external) together with public or private companies (BERNARDINO, 2021).

To register a new Outreach Curriculum Activity, it is first necessary to identify whether it is a Specific or Linked OCA - whether it is linked to an Undergraduate Curriculum Component or not (UNIPAMPA, 2021b). The OCA insertion process is carried out at the Dean of Extension and Culture (PROEXT) of Unipampa (UNIPAMPA, 2021b). Once registered, the course committee will need to appoint one or more professors as outreach supervisors (UNIPAMPA, 2021b).

Among the supervisor's responsibilities are: the evaluation of the formative nature of the action carried out by the student, the validation of the use of Specific OCAs and also the construction and dissemination of a biannual report containing the extension activities carried out in the course.

After contacting the supervisor, showing interest in an OCA, it is the student's responsibility to request the use and validation of the hours spent in the activity with the Academic Secretary of the course (UNIPAMPA, 2021b). And the professor is responsible for selecting and enrolling each student interested in the OCA, until there are open slots.

1.1 Motivation

It's not a mystery that time is of utmost importance on the academic environment. It is an invaluable resource, and as such, must be dealt with with great care. Thinking about time is what drives this project forward, as currently, there is no solution to take care of all the requirements of creating and managing outreach activities in UNIPAMPA.

In 2023, due to Res. Nº317 (UNIPAMPA, 2021b), the process of curricularization of new Outreach Curriculum Activity will be obligatorily implemented by universities in Brazil. However, all management would be carried out manually by the coordinator or collaborators of the Outreach Programs and Projects. With that in mind, a number of issues were identified with this manual approach that would be easily resolved by introducing a tool to support the process.

This means that everything - from developing a project, submitting and having it approved, sending emails and creating registration forms to open it for the students to join and later on receive their participation certificate - has to be manually done by the professors and coordinators. From the student's perspective, there is a possibility that one or more of the offers will go unnoticed amid the large amount of emails received daily from the university. The whole process is unoptimized, and takes a great amount of time and effort to be concluded.

So in order to create a more efficient and welcoming environment for the outreach activities in the university, the idea of a system to support the needs of this whole process was conceived.

Also due to the institutional action "Unipampa Cidadã" - which aims to dedicate a portion of the hours currently invested in outreach activities in projects and areas of great social relevance - it is expected that the enrollment rate of new students in higher education will increase (UNIPAMPA, 2021a), which consequently highlights even more the importance of automating manual processes at the university.

1.2 Objectives

According to what has been presented, this Course Conclusion Work has the general objective of developing the front-end part of a tool in which all the current management of OCAs will be carefully observed and reproduced, in order to reduce the effort of the professors and supervisors with the manual steps of the process.

In order to achieve the general objective, the following specific objectives were defined:

- Systematically review grey literature works and products in order to find similar solutions, collecting the first batch of requirements.
- Elaborate a survey, according to (KASUNIC, 2005), in order to discover new system requirements and in order to better understand the target users' needs.
- Analyze the results and refine the elicited requirements to create tangible tasks and an implementation roadmap.
- Study current market technologies, programming languages and frameworks to build a stack which delivers a great user experience and is creates a codebase that is easily maintained.
- Create a working Minimum Viable Product (MVP) of the system which implements at first the most critical collected and refined requirements.

1.3 Contribution

The main contribution of this study is the implementation of an MVP, in the form of a web application, to support and automate the whole process of Outreach Curriculum Activities in the university. Due to the complexity of this proposal, as previously mentioned, the effort was split amongst two papers. This focuses on the development of a web app, with all its related challenges, but it doesn't encompasses the backend services in detail.

As for the artifacts generated to support the research, such as the gray literature systematic review and the survey, all of them were done in conjunction by both authors and are not related specifically to a single work.

1.4 Organization

This document is organized according the following chapters:

- **Chapter 2: Methodology**: Describes how the study was planned and the approaches used to conduct it.
- **Chapter 3: Background**: Important information and details of concepts related to the study, e.g. outreach activities in Brazil and in the Federal University of Pampa, federal laws and similar tools.
- **Chapter 4: Gray Literature**: How the protocol was structured, results, discovered tools, preliminary requirements.

- **Chapter 5: Survey**: How it was structured, results, validation of refined requirements with the target audience.
- **Chapter 6: Extensionly**: Revolves around implementation details, created artifacts, technologies used, the software engineering process, DevOps practices and the incorporation of analytics.

2 METHODOLOGY

Table 1 – Níveis de investigação.

Nível de Investigação	**Insumos**	**Sistemas de Investigação**	**Produtos**
Meta-nível	Filosofia da Ciência	Epistemologia	Paradigma
Nível do objeto	Paradigmas do metanível e evidências do nível inferior	Ciência	Teorias e modelos
Nível inferior	Modelos e métodos do nível do objeto e problemas do nível inferior	Prática	Solução de problemas

Source: van Gigch e Pipino (1986)

3 BACKGROUND

4 GRAY LITERATURE

5 SURVEY

6 EXTENSIONLY

7 PRELIMINARY CONSIDERATIONS

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

Bom trabalho!

BIBLIOGRAPHY

BERNARDINO, M. **Chamada Interna do Programa JEDI Nº1/2021**. 2021. Universidade Federal do Pampa. Disponível em: <https://web.archive.org/web/20220706153648/https://eventos.unipampa.edu.br/programajedi/2021/08/05/ola-mundo/>. Cited in page 23.

KASUNIC, M. **Designing an effective survey**. [S.l.], 2005. Cited in page 25.

UNIPAMPA. **Instrução Normativa Nº 18. Normativas do Programa Institucional "UNIPAMPA Cidadã"**. 2021. Disponível em: <https://web.archive.org/web/20220706155520/https://sites.unipampa.edu.br/proext/files/2021/08/sei_unipampa-0585474-instrucao-normativa-gr-unipampa-cidada.pdf>. Cited in page 24.

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**. 2021. Disponível em: <https://web.archive.org/web/20220706154002/https://sites.unipampa.edu.br/proext/files/2021/05/res-317_2021-politica-de-extensao.pdf>. Cited 2 times on pages 23 e 24.

van GIGCH, J. P.; PIPINO, L. L. In search for a paradigm for the discipline of information systems. **Future Computing Systems**, v. 1, n. 1, p. 71–97, 1986. Cited in page 27.

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