

Development of Software for Philanthropic Institutions in a Extension Service Project at Positivo University

Authors:

Maristela Regina Weinfurter Teixeira, Positivo University, maristela.weinfurter@up.edu.br

Marcelo Mikosz Gonçalves, Positivo University,marcelo@up.edu.br

Edson Pedro Ferlin, Positivo University,ferlin@up.edu.br

Abstract — *This article reports an experience of software development for Non-Governmental Organizations in the city of Curitiba, integrating the software engineering, database and operating systems courses within a university extension service project of the Positivo University. The University maintains extension services projects to improve the lives of citizens and in this particular project to offer to the students an opportunity to apply the knowledge acquired by students and promote the exercise of citizenship. The integration of theory and practice leads the students to a deeper reflection of the knowledge acquired and to experience everyday practical situations that inevitably occur in the future on your professional life as well the social responsibility involved in the process. As a result, in 2009, the junior students created software using concepts and techniques of software engineering to help the management of this philanthropic entity. The initiative was also supported by all freshman and sophomore students who brought used computers, installed the Linux operating system and configured the network. Currently the computers are installed in JOCUM, is helping the institution and to promote courses for the community of Vila Icaraí, empowering the disadvantaged youth in the periphery giving them a new possibility in future, promoting the digital inclusion. A very important aspect in this project is the exercise of citizenship and humanization in the engineer profession in an unequal society. Learning, motivation and social responsibility are the foundations of this multidisciplinary work that supports poor communities sponsored by the Positivo University.*

Index Terms — *Social Responsibility, Computer Engineering, Learning Process, Digital Inclusion, Methodology, Multidisciplinarity.*

INTRODUCTION

Positivo University, formerly know as UnicenP [1], through the years is improving the computer engineer program since its creation. Many efforts are now consolidated like the integration of theory and practice [2]. As well, the realization of multidisciplinary projects some experiences can be seen in [3] [4] and [5]. In early 2007, seeking something more than the usual multidisciplinary projects and practical activities that are being undertaken by courses of the junior year, we decided to add a social dimension to the projects. So the students designed developed and implemented solutions in software for philanthropic entities, which in most cases are deficient in computational systems. Thus, besides having a multidisciplinary nature, the interaction with these Entities resulted in a product approaching the student with the social reality of the country. The Brazilian Law of Directing and Basis of Education (LDB) in the second paragraph of first chapter stands: "The Education shall commit itself to the world of Work and social practice. This current work presents the results of the initiative developed in 2009 also inspired in the third pillar of the UNESCO task force on education for the twenty-first century. Most institutions master the two first pillars that are learning to know and learning to do. And at the same time, they increase the distance between people. This statement seems paradoxical, because we live in a connected world. But students are connected by virtual connections, doing virtual activities and living virtual lives. Most of time, they are far from the real world. They are capable to develop solutions from a formal specification (most of time refers to a real world problem). But sometimes they are not capable to interact in a old fashion way. So, the multidisciplinary project were proposed as extension service of Positivo University. This initiative was developed to fulfill the gap of Learning to live together. To do so, the projects created the necessity of Discovering other people by visiting Non-Governmental Organizations that take care of disadvantaged youth in the periphery of Curitiba to discover their problems, needs and together walk towards common goals.

THE PROPOSED CHALLENGE

The students of computer engineer program were divided in three teams. Each team was designed for a different institution. First team was responsible for the physiotherapy clinic at Positivo University. The students of physical

therapy supervised by teachers provide free service for community. This team was responsible to understand and develop a system to schedule the appointments of the clinic. The second one was designated to Acridas (that in Portuguese stands for Christian Social Work Association) the project proposed for the students were to develop a system to make a inventory of donation that include food, clothes, cleaning supplies and so on. And the last one at JOCUM (in Portuguese stands for Youth With A Mission's YWAM) a visite the entity find their needs and develop software solution for philanthropic entities, involving the requirement analysis, the design of custom software, the testing, the deployment, and the training of the employees of the entity.

The project involved students of the freshman and sophomore year of Computer Engineering Program of some disciplines, namely: Software Engineering, Database Systems and Operational Systems. It involved also in a non compulsory way, the freshman year students of the Computer Engineering Program through Algorithms and Programming course.

The main objective of the project was learning beyond of the course curriculum, providing a practical experience of development a management system using multidisciplinary approach. To do this, which course professor involved in the project, established schedule concerning to the activities and respective artifacts to be delivered and respective validation criteria.

It is important to point that the product developed didn't have any cost to the entities, both with regard to software produced, as well the hardware. The software was developed with free programs and tools. The computers and the hardware equipment were achieved through donation, shown in figure 1, in the Engineering Games described in [6].



FIGURE 1
COMPUTERS DONATED IN THE ENGINEERING GAME

Development Phases proposed

On first contact with the institutions teams were accompanied by a professor. After the initial visit, was passed to the students what are the methodology and artifacts that should be delivered to be evaluated academically. Later contacts were scheduled and managed by the students to Learning to live together.

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The project proposed for the students were a development of a management system for philanthropic entities, involving the requirement analysis, the design of custom software, the deployment, and the training of the employees of the entity.

On the table 1 is presented the development phases proposed to students. To facilitate the integration of the software products to be generated and the topics that we have to cover in disciplines the development phases proposed were organized in bimesters. These phases were based in [7].

Phases	Activities
First Bimester	Requirement phase using organizational semiotics (for general requirements) and UML Use Case Models.
Second Bimester	Software analysis, modeling (UML Class, sequence, collaboration, objects, activities and packages diagrams)
Thirth Bimester	Software codification and testing (usability tests, Black box and White Box)
Fourth Bimester	Deployment, Training and final adjustments

TABLE 1
DEVELOPMENT PHASES PROPOSED

RESULTS

In this section are presented some lessons learned with the development of this project. All the projects were concluded in time, the software were developed according to the specifications, the hardware equipment was donated to the institutions and the training courses were conclude with success.

The institutions demonstrated a real professional treatment with the students and collaborated significantly to the development of the project and to the professional development of our classmates. Generally, students had a very positive relationship with the institutions and managed very well the relationship between the development groups and the institution.



FIGURE 2
Students at YWAN

Actually this relationship was crucial to the development of the project, once students had to obtain a green signal of the institutions every time a software product was generated to continue the development. Classmates had to develop this interaction ability not only with clients, but also with the other members of the group.

We observed initially the difficulty to treat with the differences between the members of the group, although these differences were solved during the development. At the beginning we noted that students were a little bit afraid about the relationship with clients, at the end of project, this problem was solved. We noted that students were very responsible with the software products quality developed e also responsible to the dates established to conclude each stage of the development.

They incorporate the idea that their commitment was with their clients and not with the teacher, and this way of thinking was very good to the project development. The teacher was not the “bad guy” anymore he was saw by the students as a “mediator”. Actually, he was seen as a person who could help the group to achieve their goals. The results at YWAM exceeded expectations, because this team were so involved in Engineering Games that they manage the donation of eight computers. Linux and BR-office were installed and today YWAN offers free computer courses for the local community.



FIGURE 3
The delivery day at YWAM

FINAL CONSIDERATIONS

This is a pilot project that intends, guided by the results obtained, to be expanded in order to involve other disciplines, including hardware ones. In a posterior stage we it is our goal to establish an inter-courses project, enhancing even more the concern about social responsibility principles foment by Positivo University.

Beyond the aspects that can be listed instead this moment we can point out the enthusiasm of our classmates to be collaborating in a real way, helping other entities and people. Another aspect observed in initial meetings is that some students were not able to communicate in a satisfactory way with the other members of their development group and with clients. At the end of project this ability was enhanced and these students were integrated with the project.

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