Millennials Tank: un experimento para formar empresarios de ingeniería de software

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Resumen

En este artículo describimos una experiencia exitosa que desarrollamos para favorecer la propuesta de proyectos inspirados en un reality show bien conocido, para el cual parafraseamos Millennial Tank, donde los estudiantes desarrollaron diferentes empresas emergentes a partir de ideas, teniendo en cuenta las características de Los estudiantes del milenio.

PALABRAS CLAVE: INGENIERO DE SOFTWARE, ENTRENAMIENTO

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Abstract

In this article we describe a successful experience we developed to favour the proposal of projects inspired by a well known reality show, to which we have paraphrased Millennial Tank, where the students developed different start-ups starting from ideas, taking into account the characteristics of the millennial students.

KEYWORDS: SOFTWARE ENGINEERS, TRAINNING

Introduction

The training of Software engineers has always been a challenge. Permanent technological changes, but even more the realities of market changes are a barrier difficult to overcome if it does not have appropriate training.

In a conventional sense, it is clear that software engineering education must provide students with methods, techniques and tools for software development.

However, this is not enough. It is necessary that the student also address the problem of its use in projects that are subject to pressures and restrictions, relating them directly to the context of the profession and developing skills in a collaborative approach in search of solutions, or process. This aspect becomes more hard when trying with miellenials, as (Misirolli et. al 2017) point out at the the 1st International Workshop on Software Engineering Curricula for Millennials.

There is a certain consensus (Blank, 1997;) Dickinson, 1998; Harwell, 1997) (PBL) project-based learning is a suitable strategy for the paradigm of learning we are asking and, as how distinguishes John Larmer, there are different phases or stages through which students go, depending on the style of teaching.

While these distinguished authors have demonstrated the strength of their opinions, we have advanced a more overarching concept. Learn about technologies does not mean competence therein, is clear that it is important to promote the learning of technologies but guide students with notions of market competition is even more important, which led us to this experience that we want to convey in this article.

We've reorganized a course of software engineering, to pursue a vision that involves the concept of business. Business in the sense both comprenssion of its work insertion, but more deeply in its ability to generate individual or group projects.

What is intended as a general objective, is that at the end of their studies, the student must be able to carry out a process of software development or work satisfactorily in one, integrating new knowledge (organizing, processing and) prioritizing new or already known information), by identifying misconceptions, promoting personal and group development as a natural, continuous and incremental process. Thus, promoting the development of criteria and experiences that allow them to take and explain decisions satisfactory to ensure software quality, but without losing the vision of business.

As a basis, understanding and appreciating the implementation of best practices, but more fundamentally, to be able to develop your own business, providing them with knowledge that beyond the technical aspect in computer science, but also in business theory.

In this article we describe a successful experience we developed to promote the proposal of projects inspired by a well known reality show, which we have paraphrased Millennial Tank, where the students developed different start-ups starting from ideas, taking into account the characteristics of the millennial students.

Don't have already spread in the characteristics of millennials, is our conceptual basis that teachers must adapt to the characteristics of these students, whereas the world where they were developed.

What we want to convey is the methodology used, structured in different stages, on which this article is structured. The first stage describes the proposal of experience and the building of working groups; the second stage analyzes the interaction of the students when they think of the idea of their start-up; the third stage describes the first presentation to investors with the challenges faced; the fourth stage summarizes the work of students developing the product; ending in a final presentation

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stage, where becomes a vision retrospective of experience in which students have the opportunity to criticize teachers and is the crucial basis for the implementation of an agile method of teaching.

The plan

We believe that the generation of start-ups should be a key area of software engineering for youngsters to be transmitted. The problem is: how?. And here lies the essence of our experience.

Millennials are mainly characterized by their playful, from spirit of their child and adolescent training in electronic games. Thus, challenge students to generate start-ups in the manner of a competition seemed natural. It is obvious that necessary interaction in teams and working life that awaits them will present social needs, which will have to be prepared for changes, make presentations, accept criticism, defend positions and make decisions in team.

Thus, the idea was challenging that they form a team and propose a business idea, generating the challenge to integrate groups was the engine of the process. Process that does not usually give much attention, but it is essential. The result was amazing.

Generally, students tend to group themselves by affinity; However, the pressure to achieve the best start-up creates a competition by going to each group, appearing debates as what offer this person a group?, what this group offer me?, doing an analysis of which group was for each one personally, accepting the advantages and disadvantages of taking such a decision. After a week of personal and group discussions among students, with some speeches, the three groups started to compete for generating the best project complied.

Structuring the idea

The generation of a start-up, involves students generate an innovative idea (at least in the targeted market), that is workable and, in addition, is convincing. However, this is not enough without taking into account the concept of a *business plan*. To this end, the participation of an expert in business that explained the concept, told their experiences and proposed a useful tool to build and analyze business plan to grow joined: the canvas model.

The business model is canvas, created by Alexander Osterwalder. A canvas is formed by a series of elements that connect the different parts of the structure of a business plan, allowing to explain, graphical and easily, any business model. It is a useful tool and a most requested format, which served as a guide for students to raise their start-up. Having the necessary tools, groups continued with the choice of the theme for the subsequent presentation to "investors" invited by the Chair.

Each group created its ideas, but using different strategies: a group leader already had a strong project and the rest of the members decided to follow this idea, in other group members had some ideas and is supported in that seemed best to them , while the third group, which had no ideas yet, coordinated so that they are all members in a meeting in which held a brainstorming to analyze together the ideas, the pros and cons to decide on one.

The first presentation

The students performed the normal tasks of a presentation in order to convince investors that their idea had vision of the future, to achieve the objective.

Several issues came into play during the presentation of the groups facing investors, and again there was an original and different from the master class learning environment.

We were able to confirm was the initial hypothesis of research work of the Group and competitive behaviour. The project generated a concern that led to millennials to competition that surprisingly led to which we usually were accustomed, a vivid representation of the real world.

The groups were elusive to their strategies and tactics were known. Which led us to discuss teaching strategies and reaffirmed that a well organised commitment to change can be successful.

What we showed is that put in a healthy situation of controlled competition, they were taken to organize themselves and to compete with other rules laid down, basically, with respect. And that led them to having filed a project/idea individuals trained in group form, which makes us to win two fundamental aspects in engineering software, teamwork and business.

The groups began to behave like competing companies, holding that none of the three groups knew what the other was going to do or present. Before this situa-tion, to minimize conflicts, as it must be before any potential conflict that can occur in this type of competition, use the strategy meetings in bars trying to integrate ourselves into their areas of comfort in which they open up feelings and impressions that have on his career and the subject, but basically his life.

What we learned in this experience was to understand that what happens in his life, goes beyond what they care about career, complementing the contents of normal classrooms. In fact, this competitiveness is a typical behavior of millennials, confirming the business reality and reaffirming the objective of the course, learn how to compete and develop in group to obtain an objective focusing on the focus without harming anyone, while we deliver the role that competition is not wild, but is worthy, and there are no prejudices between anyone. This is a very important educational outcome that isn't necessary to harm anyone to obtain positive results, and this results in even more positive results of the course, that they understand that competion is legitimate and that the issue is the way in which it makes. That is, honestly and with dignity; but unfortunately do not get it in its entirety.

In principle, it is very interesting to analyze the groups dynamics. One group decided that all members were part of the presentation; although only spoke the leader and the leader of development. Another group did the same thing, only some members participated in the presentation, being 2 people spoke and showed the idea, while the rest only participated to any specific questions of the investors. Finally, the third group decided to have only 2 people who volunteered and showing the group the skills to engage successfully in the presentation. It is important to analyze these decisions and how were taken because allows the discovery of fundamental behavioral patterns which determine the group dynamics and that we were able to show convincingly in this experiment, after verify the results of the projects.

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That means how the experience led students to understand what mistakes made in the decisions that had been taken and what successes had also, both from our own experience to see other groups in action. As in reality, investors began to interrupt the presentations in order to understand the idea and be sure that their potential investment was worth, and then began to ask key questions as what is the business on this idea? There is a market for this product? What is the estimated budget? Their questions surprised presenters, not because they didn't have the answer, which could be the case in some groups, but because they realized is that his idea was not being understood, what led them to change the strategy and reformulate the presentation in real time.

Here is the point of how the course is raised, the analysis of the capability of managing surprising situations is essential for any software engineer and that students have the possibility of being able facing external investors or custumers in this situation derives in a crucial learning for a real context.

Advancing in the presentations, there was one group that could not fully convince investors, so it got the task of raising from the root which was the problem, as all continuous improvement process and accepting criticism necessary to complete such a task. However, the other two groups they aroused interest and emerged a new issue that bothered them, since they had not referred to it: what percentage would accept to give the interested investor?. Two groups were inclined to try to negotiate with investors, because negotiation is the fundamental part of any entrepreneurship; and another, due to the failure of leadership, decided to confront with investors. Always considering that it was a simulation, not a real case, although it had all the components of a real case.

Due to prior training, a group surprised arriving with a private investor, which we can not name for reasons of confidentiality, but who is helping to develop a project that shows another facet. The inverter provides data to test the quality of software that is trying to. The other two groups were in a situation of suddenly having to justify their ideas and somehow, realized what is entrepreneurship and company, despite having done a good job in his idea. This does not mean they were disqualified or delayed in the course, but that made the need for contact with the medium to be able to present a more solid project, and this result is the success of the course, all learned from everything.

We believe on the basis of surveys that students understood the importance of that part of the software development includes knowing how much their work is worth and what are they willing to accept the same.

Product development

Committed to investors, and a formal presentation of the development time needed, now groups were in another typical situation in the work environment that awaits them.

They quickly had to restructure the roles, define the Backlog, Sprint, set priorities and make decisions. A new phase, a new learning underway, involving them to work in an organized manner, recognizing the roles and hierarchies within the group, learning to delegate responsibilities,

need to get with the times posed, and knowing accepting constructive criticism both colleagues and the teacher who remained present assuming a role that the students themselves called "Old Scrum Master".

To help groups with the Organization and development of a quality product, has appointed two students who were not in any group to assume the role of Quality Assurance (QA), making monitoring of various projects and taking metrics through a (JIRA) project management tool, to make recommendations for improving the process, based on the practices recommended by the Capability Maturity Model Integration (CMMI).

In this way students designed and developed the product, adapted to development times, using not only the technologies that knew, but those who had to learn and master in a short time, according to the problems that they were presenting and adopting the necessary changes so that his product complies with the specifications of the business. In other words, they carried out a process of orderly agile software development.

Table 1 summarizes the performance of the three groups of enterprising students, which were identified with the names: Dogo, Boxer, and Caniches. Names of dog races surged from a joke with the students.

Final presentation

Finalizing the subject came the day of the presentation of the finished product. Despite the fact that not all groups were able to draw the attention of investors, all presented their product finished before the rest of the class.

Now the challenge was to show that they had managed to achieve its objectives, what it took to defend the product before the doubts and criticisms of the rest, commenting also form that developed the product and the resolution of difficulties encountered during that development, making a self-criticism to the end.

Finally, the course ended with a group of students who not only had to use and test everything what he learned in the career, but they also had to investigate what the career not had given them, from technicalities as the decision and the use of the technologies suitable for the project, as also not so technical, but important, learn to develop a business plan, establish schedules and respect them, teamwork, know their place in the group and choose at the same time in the same place, and something that never they had thought, uphold the work they do and know how to estimate a price for it.

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Groups	Presentation to investors	Group dynamics	Results
Dogo	Presentation made by a subgroup, where each spoke in a coordinated manner, been a clear and dynamic exposure.	The group is coordinated for the development of the product, with roles well defined and executed.	They excited, presenting to a call for ideas for entrepreneurs.
Boxer	Presentation made by a subgroup, where, while several spoke, was focused on one of the members of the group representing them.	The group is coordinated for the development of the product, with roles well defined and executed.	They got the interest of a company for the category of your idea-proyecto.
Caniches	All in the front, spoke to two of them. The silence of the rest gave a bad impression.	The Group was based on confidence in a leader. This failed to properly coordinate the group.	They finished the project with many difficulties.

Table 1 - Summary of performance of the three groups of enterprising students.

Conclusion

As result the course achieved through a fun proposal and at the same time professional, engage and motivate students in a whole process of software development, looking at virtually all aspects, following the best practices recommended by the CMMI, simulating a normal context of working life that awaits them, generating group and inter-group links, encouraging professionalism and responsibility in their work, and using potentials that had not exploited or developed yet. It should be noted also that one of the groups, on its own initiative, presented its product to a contest of ideas with funding to the winner, although they did not won, they added an extra experience for them and it showed a change in the attitude of the students, now better trained to deal with the changing reality that awaits them and cited them an expert in business as: *«failure is the opportunity to begin again more intelligently». (Henry Ford).*

We believe that there is no greater satisfaction for a teacher that be intercepted in hallways, and even in the street, of that students come to greet him and thank for its growth in professional development. The first two authors live that fact frequently. But it›s also satisfying to describe this experience based on the text that the other two authors generated telling their experience in the project. This article gives a way of trying to provide an innovative style of training and relationship with the students that we hope will be useful for the improvement of the process, that is, the CMMI in action for the agile education.

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