AN EVALUATION OF IDEAL FEATURES IN PROJECT MANAGEMENT SOFTWARE TOOLS

UMA AVALIAÇÃO DE CARACTERÍSTICAS IDEAIS EM FERRAMENTAS DE GERENCIAMENTO DE PROJETO DE SOFTWARE

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ABSTRACT

While Universities and colleges have remained as the place where scholars and professors gather, in practical terms much has changed since their inception in the manner studies are done and organized. Today they face new challenges in applying their academic research. As culture and technology evolve, many of the ways in which the institution organizes itself are growing stale and inefficient. One of the issues that have arisen is found in the communication between research members, a strong determinant of the final quality of the studies and finds. According to many scientific studies, the relationship between mentor and student is the main element to attain successful research. However, due to lack of time and resources that can manage these activities, it has become common for students to report problems related to guidance and orientation. The field of Project Management has arisen as an attempt to curb some of those issues in academia and in the development and completion of many other endeavors found throughout Business environments in many industries. In this paper, we identified the modern needs and requisites of college studies via an extensive look into standards and practices found and recorded in books such as Project Management Body of Knowledge, this study being split into five different phases which involve analysis, discourses, setting definitions and assessments. By using and keeping the practices of those published contents in mind, we analysed four of the current and popular frameworks already in place related to Project Management and found a set of features they lack, by collecting all requirements an ideal tool needs we propose a solution through a similar but improved contemporary software tool which fits all required criteria.

Keywords: Software Engineering. Software Requirements. Project Management.

RESUMO

Enquanto universidades e faculdades continuam sendo o local onde escrivães e professores se reúnem, em termos práticos muito foi mudado desde suas origens na maneira em que estudos são realizados e organizados. Hoje eles encaram novos desafios em aplicar sua pesquisa acadêmica. Conforme cultura e tecnologia evoluem, muitos dos métodos nos quais as instituições se organizam se tornam mais ineficientes e defasados. Um dos problemas

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que há surgido é encontrado na comunicação entre membros de pesquisa, um forte determinador na qualidade dos estudos e seus resultados. De acordo com vários estudos científicos, a relação entre orientador e estudante é o elemento principal para se atingir uma pesquisa de sucesso. Entretanto, devido a falta de tempo e recursos que podem gerenciar essas atividades, se tornou comum estudantes denunciarem problemas relacionados a orientação. O campo científico de Gerenciamento de Projeto surgiu como uma tentativa de eliminar alguns desses problemas na academia e no desenvolvimento e finalização de projetos encontrados em ambientes de Gerenciamento de Negócios de várias indústrias. Neste artigo, identificamos as necessidades modernas e requisitos de estudos universitários via uma observação extensiva de padrões e práticas encontrados e descrevidos em livros como *Project Management Body of Knowledge*, esse estudo foi dividido em cinco fases diferentes que envolvem análise, discussão, definição de termos e avaliação. Usando e mantendo as práticas desses conteúdos já publicados, analisamos quatro dos ambientes atuais e populares já existentes relacionados a Gerência de Projetos e encontramos uma coletânea de funções que lhes faltam, ao coletar todos os requisitos que uma ferramenta ideal necessita propomos uma solução através de uma ferramenta de *software* similar, mas aprimorada e que se encontra dentro de todos os critérios.

Palavras chaves: Engenharia de Software. Requisitos de Software. Gerenciamento de projetos.

Introduction

Universities have been around for nearly a millennium, ever since the University of Bologna in the 11th Century. These institutions are not only hubs of teaching and knowledge but also centers for cutting edge research. Scientific research and study, in general terms, is considered to be one of the great human pursuits. Through the ages humanity has explored new depths and sought after a way to put an end to the darkness of ignorance. In present times a greal deal of Research and Development is found inside private companies and universities.

At universities, researches are usually conducted as part of the post-graduate curriculum. Higher end institutions can afford to provide with students and advisors the most cutting edge equipment to aid them in their pursuit, yet it does not solve a more personal and pressing issue: faulty communication.

Post-graduate finds are composed of three phases: Planning, Execution and Publishing. During this process the Advisor-student relationship is tightly involved and is one of the most direct influences on the overall quality of the conducted study. This relationship has faced challenges and has become strained over time thanks to a change in culture and technology, but we can take advantage of this fact through a suggestion of new ideas and tools to increase efficiency and enabling a smoother interaction between both parties.

Common complaints have been a lack of time and support from the advisor's part,

random and inconsistent meetings, inability to efficiently share updates and progress reports and an overall lack of contact between both parties. Either the student is left to fend off on their own, or the advisor is kept completely in the dark about what his student is doing.

One of the main attempts to mitigate all such problems is through the field of Project Management, such is a mostly conceptual framework to which systems and relationships can be built upon. Project Management Institute, Inc. (PMI) defines Project Management as "the application of knowledge, skills, tools and techniques to a broad range of activities in order to meet the requirements of a particular project.", this institute has consolidated its research within the PMBOK (Project Management Body of Knowledge).

This newfound area is not exclusively related to IT, rather it employs general techniques to favor all industries. However, in a society increasingly integrated with computing systems, solutions are offered in the form of software deployment, manipulated through desktops or web browsers. Yet they are not sufficient in covering all needs and problems found in a common project.

Through this paper we will identify major issues found in modern Project Management and its proposed online solutions, as a means of raising awareness of what must be done to mitigate them and how to do it. With this we hope to encounter the ways to reach ideal Project conditions and intensify current efficiency.

1 Method

For the purposes of this paper, we need to initiate data gathering on the pertinent subjects to Research, Project Management and its related tools. Collection will be done via online channels and through Knowledge Compendiums such as PMBOK (Project Management Body of Knowledge).

Following that, existing solutions will be tested, the focus will be software, the tools themselves mostly contained as web apps. The data will be processed and organized throughout this document in the following order:

1. Analysis of the field and identification of Requisites.
2. Definitions and Processes used in Project Management.
3. Tools currently used and Project Manager roles.

4. Discourse on Requirements Engineering.
5. Four Project Manager aid tools are compared to the raised requirements.

Project Management is found on the aforementioned PMBOK, this book was written in 1996 and is parts of efforts from PMI (Project Management Institute) to provide assistance and standards for the development and conclusion of projects. The book documents the best practices for the field.

Requirements Engineering is a subset of Software Engineering, which is both a field in Management and also the title of a book by Ian Sommerville. We will be utilizing his work as basis for collection of requirements on Project Management Tools.

Requirements comprise an important part of Software development as all software is built based on them. Thus, the requirements are documented descriptions of what the system should accomplish, what functions it will have, the services it can offer and the restrictions it will have.

As Ian Sommerville writes in Software Engineering: "Software must deliver the desired functionality and performance to the user and must be Maintained, Reliable and Usable."; Requirements Engineering includes the collection of all data of Resources to be used in the project to Documentation, the process involves four steps:

1. Identification;
2. Analysis and negotiation;
3. Specification and documentation;
4. Validation.

For testing, four platforms were chosen. These programs were taken on either their Trial runs or Free version, and tested for a few days each on a dummy project. They were tested for compliance with ideal Project Management conditions, using processes found in Software Engineering:

1. Labguru
2. ROCA
3. Asana
4. Wrike

2 The Scientific Process

Scientific method is defined as a set of norms, rules and processes for the production of knowledge with the rigor of science. In short, a method used to prove or research a particular subject. We can say that its origin comes from Discourse on the Method by René Descartes, who constructed it from the analysis of works by several authors.

Simply put, the proposed method that ended up being known as "Mechanism", "Reductionism", or "Cartesian Model" has as its main basis the concept that everything can be divided into smaller parts, and these can be studied individually for understanding of the whole.

The great breakthrough that this kind of thought has caused is undeniable. We can see examples in Engineering, Medicine and even in more abstract subjects such as History or Geography. In order to build a building one does not use a single engineer, but many individually responsible for their parts such as wiring, lighting and materials.

In the present times the scientific process is without of doubt the greatest medium for study and development in any sector of human knowledge. Also indispensable in the evaluation of the trainees, students can prove not only practical knowledge, but also their preparedness for becoming professionals.

2.1 The Mentor's Role

The counselor, also known as mentor or advisor, oversees and conducts research with his student. Their primary goal is to support and assist the student, who is developing the studies himself. To this end, the supervisor must follow a model prepared to enthuse, involve and increase the participation of the student or mentee in their formation.

The advisor may also designate and monitor a series of activities as part of his supportive role such as readings, targeted studies, research internships and courses or disciplines that contribute to aggregating or complementing the Knowledge of the specific area of interest.

The advisor should also seek stability between dependence and independence within the orientation of their students, avoiding excessive dependency or independence. Eventually, many students end up becoming mentors due to their participation and experience.

2.2 The Student's or Mentee's Role

The student, who develops the project and receives orientation, has many important roles in the research. Given that they are the ones who will engage in writing, collecting data, testing and applying results, there's a vital element that they must possess: to have commitment to research.

It is up to the student to meet the deadlines stipulated by the supervisor, follow the proposed methods, review material that has been provided, engage in testing and finding solutions to their exposed problem and respect the advisor's opinion on the path to which the work should follow.

While it may seem like this role is mostly of an order follower, it is important to highlight that it is the most active one, as well as the fact the student is the one which ultimately decides on the theme, which tests to use, and the overall final look and organization of the findings. The professor or mentor is there to provide support, and assist them in completing the project.

2.3 An ideal advisor and its relationship with students.

Over the years any given student is always more inclined towards a particular subject or field, whether by taste, indication, labor market or many other reasonings, everyone has their preferences. Undertaking on any sort of research is an excellent, if not the best way for a student to get to know and work in their chosen area.

Another important factor in this decision is the supervisor, a professional that the student has as a reference in the field. Research shows that the Student chooses the counselor based primarily on personal charisma, while the supervisor chooses his oriented based on his notes, Knowledge and skills.

In this type of work it should be clear the role of each member in this relationship, Being that the blunt of the active work itself must be done by the person(s) being given orientation, yet always along with the Advisor's supervision. The counselor should always set aside time to communicate, discuss and solve issues with their students, whether they are related to the project or even questions about the field in which the project fits into.

The supervisor should first stipulate the method that the project shall be developed

on (Field reports, field surveys, practical projects, etc.), followed by deadlines that must be carried out. The counselor should know how to relate to his or her team, understand their insecurities and desires, challenge them and always search for knowledge.

An active, proactive student with an incompetent advisor may even be able to complete his chosen research, a lazy, procrastinating student with a good advisor can be inspired to build an excellent finished project, but nothing good will come out of a bad student working with a bad advisor.

2.4 Challenges within the advisor-student relationship.

Although the guiding itself and its functions are well defined, they are not always followed according to context. There are challenges that arise during research, such as the relationship between the supervisor and their student. A poorly organized, perhaps even toxic relationship may harm the research as a whole.

In most cases, the initial relationship, that is, the choice of the subject to be Researched, is autocratic on the part of the advisor. In this way, in this subjugated position, the student may feel overwhelmed and may, during the course of the research avoid expressing their opinions, debating ideas, making decisions.

Another challenge that occurs in the relationship between counselor and counselor are the meetings. Those encounters are meant for the active student to solve doubts that arise during the project and also feel confident that they are developing their finds properly. Asystematic, inconsistent meetings interfere, since the Mentor can not steer their mentee in the correct direction if they are not aware of the progress being made in the research.

Similarly, the counselor should be committed to the findings and deadlines set in the schedule. Being on time corroborates with research and the relationship with the supervisor, showing commitment and responsibility.

3 Project Management

In project management, a project may be defined as a temporary effort to create an exclusive service, product or result (PMBoK, 2014).

A project is divided into steps and has its parts defined by the team or person who manages it, but must always have a term. This term is reached when the project objectives

are reached or become impossible to achieve, or can be terminated when it loses its functionality (the needs for it to cease to exist) or its support (if the project depends on it) is cut off.

Even while being temporary, the "product" generated by the project is usually made to be enduring. This "product" generated may still have even greater consequences than them. We can mention for example the Star Seven, where only 6 units were manufactured, but the language used for its creation (Java) not only lasts until today, as it is the most used in the world.

Projects can generate improvements to existing products, new products, new materials, methods or simply new ways of thinking about something, so each project is unique in its location, people involved, impacts generated, reasons for creation, etc. By being unique, projects can generate uncertainties about the final "product", so they must be extensively studied, and their possible outcomes, individually.

3.2 Definition of Project Management

After the project is established, a general organization must be held for compliance and finalization. In order to achieve this goal we have Project Management, which will use various resources and apply skills, tools, techniques among others.

This Management is commonly delegated to professionals with specialization in this type of task called "Project Manager". The Manager must make use of the tools that have been made available to him, keeping in mind the budget and other restrictions imposed as well as the details and scope of the project,

Ensuring that the project is completed efficiently and without too many complications. Management will integrate the established management process systems, the 47 processes contained in the system are grouped into 5 groups:

- Initiation;
- Planning;
- Execution;
- Monitoring;
- Closing;

During the course of the project, the responsible person should analyze its scale and determine the resources that should be made available, according to what is necessary to reach the objectives and goals.

After that, the possible approaches are covered and the professionals who will be involved

Concerns about the project. Collected data the manager creates a communication system that aims at maximizing the exchange of information in order to achieve project goals and also balances all constraints such as the budget and the associated risks, the manager must mitigate Any errors to minimize their negative impacts.

Project Management can therefore be defined as the construction and finalization of goals and objectives, taking into account the scope of the project and associated constraints and using organizational patterns such as project groups. In favor of consummation of a project.

3.3 Quality tools and techniques

To be successful a project, or product, needs, in addition to creativity, be innovative and have a good planning, have quality. Although the idea is that quality is measurable through comparison with another product or service, the quality of a project can be defined in terms of who evaluates it. As an example, if in the development of a project a certain activity is not performed to guarantee its quality, or, for some reason, it was not executed as it should, at the end of the project the inherent characteristics of the project will not be fully satisfied in order to Evaluation.

3.3.1 The seven basic quality tools

To maintain a quality of the project (product) the hard work must be special to solve the problems related to a quality that can arise without the development of the project development.

To eliminate this roadblock, such as seven quality tools, cause-and-effect diagram, flowchart, selection sheet, histogram, Pareto diagram, control chart and scatter diagram - are to solve these problems.

3.4 SWOT

SWOT (Strengths, Weaknesses, Opportunities and Threats) is a method of analysis that defines all the positives and negatives of a project. It is important to be identified for more efficient risk management.

3.4.1 Assessment of probability and impact of risks

Once the project risks have been defined through several different processes and tools, the probability of negative events occurring and their impact on project stability should be evaluated.

4 Requirements Engineering

Software development begins with hiring by the client, which will expose all the functions it demands in his software. In that the User Requirements are generated, a Prototype is built and shown for consumer analysis where all feasible characteristics are contained within.

Many systems today are developed without prior planning, or without a precise and effective collection of requirements resulting in incomplete and inconsistent systems that will certainly affect its quality. Faced with these facts, Requirements Engineering is a technique used to minimize the divergence and mistakes made in defining the objective of the user.

After estimates are found for the project, it is pointed out which software and hardware tools will be used in the execution of the project. This activity, called Requirements Engineering specify everything that includes the internal part of development. With the Complete prototype analysis initiates which decides what resources will be used in creating software. Therefore, requirements engineering is efficient in collecting information for the goal of the system or project.

Requirements comprise an important part of developing Software because the final product will be based on them. Thus, requirements are documented descriptions of what the system should accomplish, what functions it will have, the services it can offer and the restrictions it will have.

According to Ian Sommerville, "Software must deliver the requested functionality and performance to the user and must be Maintained, reliable and usable." What is feasible in software can be determined in different times depending on your project.

Requirements Engineering includes the collection of all data that Resources to be used in the project to Documentation, the process involves four steps:

- Identification;
- Analysis and negotiation;
- Specification and documentation;
- Validation.

There are, to increase the accuracy of collection of these requirements, certain Guidelines, which are steps that must be taken to better written Requirements. These guidelines include, firstly, System and User Requirements, separating Functional requirements from Non-Functional Requirements, in addition to understanding them. After performing these distinctions and getting to know each one of them, it is necessary to perform an elicitation of these requirements to later model the usage-case diagram.

4.1 Functional vs Non-Functional Requisites

The requirements document should provide the user with a description of what the system should do in a very abstract and organized way, differentiating between functional requirements and nonfunctional requirements. The purpose of differentiating and organizing the requirements is to detail to the customer what the system will accomplish, and the constraints that the system will have.

In a more formal way, what the system will perform, what functions it will provide, how the behavior in relation to the inputs, that is, what the user can do with the system, is called functional requirements. However, the part of the system restrictions, response time, protection, reliability, security, usability, that is, requirements that are not related to the system functionalities (target platform, amount of memory used, type of interface desired) are called requirements Not functional.

The main difference between functional requirements and nonfunctional requirements is criticality. While in functional requirements a requirement is not implemented will not imply inefficiency in the system, non-functional requirements will imply a loss that could render the system inoperative.

An example of this catastrophic situation is when the interface is made in a non-intuitive way, or the lack of training to the users, which can cause input failures that can stop the system. Also in non-functional requirements, these can be classified into

subgroups: product requirements, organizational requirements and external requirements.

4.2 Requirements Identification

After defining the requirements that the software will have, and separating them between functional requirements and nonfunctional requirements, it is necessary to formalize them, that is, to create a document describing the requirements in a way that the system user will understand.

Therefore, minimum or no use of technical terms should be employed, as well as using as many diagrams as possible, easy to understand tables, as this document will serve to add details to user requirements, thus describing the behavior of the System and its functional constraints.

It should also be noted the raised system requirements, which can be written using formal language without technical expressions. There are also other ways of describing the system requirements, as these can not be ambiguous or described very succinctly. These, in turn, aim to explain the system requirements in a different way. Although not widely used, they still facilitate the understanding of some users.

In order to minimize ambiguities and highlight important points of requirements, there follows a finite number of steps called requirements specification guidelines which are, in short:

- Create a format that will be used to describe the requirements definitions and adhere to it by default;
- Separate mandatory and desirable requirements using a consistent language (SOMMERVILLE, 2011);
- Use bold, italic formatting to highlight key parts of requirements;
- Avoid technical terms.

4.3 Elicitation and Analysis

The main part of the software / project is the stakeholders. Being a term widely used in project management, among other areas, stakeholders are the stakeholders in the software / project (the word etymology is exactly this). The project manager, investors, client and the company that is the developer of the project can be understood first and

foremost by interested parties. However, the definition of "interested parties" goes beyond the developer's, manager and client, being also the end users of the project, if it is a product or software, suppliers, competitors, among others.

Stakeholders are important because they influence directly or indirectly in the project / software and, therefore, if there is a failure to identify them, there may be a mistake in the information and the objective of the project / software will not be fulfilled, besides being part of the Elicitation and analysis of the requirements collected.

Elicitation and analysis is the part of the project management in which the manager meets with the stakeholders to collect information about the system in order to provide the correct and complete understanding of the system requirements. Eliciting, that is, obtaining information about the system is a long-lasting process

And difficult because many users have difficulty explaining what they do, or even not having an accurate concept of the system. However, there are some techniques to contribute to the discovery and collection of requirements, in order to minimize the risks of obtaining incoherent and erroneous information, among which we can mention: ethnography, interviews, questionnaires, brainstorming, use cases. The latter is effective because of its ability to discover and record functional requirements in the system.

After eliciting and documenting the requirements, the analysis is performed in order to identify problems, inconsistencies and non-completeness of the requirements, so that later, it can carry out a new elicitation until the requirements are well defined and ready to serve The prototyping and development of the system.

4.4 Requirements Identification

The cost and rework to correct problems encountered in elicitation and analysis is very high, which would result in noncompliance with the deadline stipulated in the project schedule and errors in its development. Taking into account this cost, the validation of the requirements performs the verification of the requirements elicited, overlapping, in this way, the analysis of them.

This verification consists of the identification of errors, consistency, precision, and contextualization of the requirements in the requirements document so that it is well defined. Verifications include: verifying the validity, consistency, precision, revision, and prototyping. After the checks, it is important and essential that the requirements be tested, so if there is a problem, the requirements should be reconsidered.

4.5 Managing Requirements

Before the requirements changes, be they system or user, the project manager must be prepared to have a position on what should be done and how it will be done. Although few types of projects, or systems, have a nearly constant change in their requirements, it is important to manage them efficiently so that they are applied correctly, without compromising performance and quality.

Changes can come from changes in the corporate operating system, organizational budgets can conflict with end-user requirements, and can thus influence requirements, which can be added to support the user, among others.

Requirements management is the process in which the project manager must understand and control the changes that will occur during the development of the project, or system. It should, among other activities, assess the impact this change will have, whether it will have any additional cost in relation to the initial cost of the project, how it will affect the project schedule, and so on.

For this, the management of requirements must be carried out based on planning. This should be the first step to be taken to manage the requirements, identifying them, what process needs to be done for change management, what tools the requirements management will support, and the policy to be adopted for Track requirements and changes. This step, once completed, will serve as the basis for managing requirements changes

4.6 Use-case diagrams

Often the collection of requirements becomes complicated because the customer does not have knowledge about exactly what they want. Although there are tools to facilitate this collection, many of these may not be very explanatory, making it difficult for the client to understand the system's functionalities.

The use-case diagram facilitates visualization of the operation, definitions, constraints and execution processes that the system will have in an intuitive-visual way through diagrams, where users will be called actors, and system functionalities are called case Of use, and the interactions of the actors with the system are called communications. An example of a use case diagram can be seen in figure 1.

Figure 1: Use case diagram - hospital system
Source*: <http://www.devmedia.com.br/o-que-e-uml-e-diagramas-de-caso-de-uso-introducao-pratica-a-uml/23408>*

5 Assessment of Currently Available Tools

To aid the progress of the projects, there is specialized software, however, the need for deficiency in relation to the management of academic and business projects. Through an analysis of existing programs, a set of requirements were found that make up an ideal software for this purpose.

Success will bring prosperity and space for increasingly ambitious large-scale projects. One area is vitally important and there is an entire industry with software to support this management.

For success, all information is provided with an intent to mitigate risk, store and control information. An organized project with high chances of success, we will be several programs and systems with the objective of finalizing and supporting progress.

There is also a discussion and comment system, where team members, is what is the version control of the project is arranged so that when an update is created, such as changes within no protocol. The search management

Projects, using six criterias. The following Table sets out Suggested Features, as well as the Evaluation Criteria of the systems that support project management:

Suggested Features:

1. Record of lessons learned

2. Document storage
3. Planning / Budget Control
4. Planning / Quality Assurance
5. Version Control
6. Communication among stakeholders
7. Diagram Builder

Evaluation Criteria:

1. Functionality
2. Reliability
3. Usability
4. Efficiency
5. Simple Maintenance
6. Portability

Functionality:

The program or system must perform the functions that have been presented to the user correctly.

Reliability:

Characterized by the need to be available to any platform, like having cloud (software based on Internet use) or multiple operational systems support and at any time, with infrequent to no downtime of servers.

Usability:

The system must have a user interface that is simple and usable for any type of employee of various functions in the project.

Efficiency:

Efficiency is driven by greater resource utilization with the smallest time and effort possible. One of the main reasons why Support software exists for the increasing complexity of projects.

Simple Maintenance:

In case of errors or problems, the user should present themselves with simple fixes and remain stable during use.

5.1 Labguru

Labguru centralizes all the development without any project in a single and simple access, making the work more profitable and intuitive, besides offering the option of use inside and outside the workplace despite a paid system broadly related to the Research of This Laboratory Software has essential tools such as: list of members that make up a project team, timeline with predefined deadlines, activity log, resource management, workflow mapping, etc. And research tools for laboratory research, such as an inventory of important data related to a specific item, and to share results with other laboratories. The result is stored, there is no project, it will be incorporated as soon as possible.

An interface provides clear and concise information that tells how tasks were performed among project members. You can also view progress through the program interface and after an analysis to determine the total progress containment system is not focused on all types of searches.

It is equipped with a large capacity to store modules, a server to handle them and an organized system with a user preference, as well as public information about a search, such as worksheets and examples. It can record relevant meta-information such as cataloging and mapping of search materials, inventory tracking, and list management.

He checks if there are any similar projects and images and if any he informs the members of the team who will decide the project.

5.2 ROCA

ROCA - *Repositório de Outras Coleções Abertas*

The role of ROCA is to save, gather and provide access to TCCs (Course Completion Works) managed by UTFPR students (*Pato Branco, Campo Mourão, Cornélio Procópio, etc.*) acting as a type of library for future graduates. ROCA also acts with the storage, management and dispersion of audio-visual production and image recordings (iconographic), results of internal or external work to the Institution distributed and analyzed by the Management Committee.

In view of the implementation and customization of RIUT (Repository Of the Federal Technological University of Paraná), it became clear the need of managing other content produced by the Institution and that they needed to be stored in another repository. This tool is created with the direct intention of assisting students and the learning institution to store and access research carried out from within.

Therefore, the ROCA foundation previewed in the Information Policy of UTFPR Institutional Repository, building an institutional demand of storing and making available for TCCs (Course Completion Work) some audiovisual production, image (iconographic), and other collections evaluated by the pending and analysis of the Management Committee, as it generates the Institutional Repository Information Policy Of UTFPR.

With the intention of increasing the quantity of the repository and guaranteeing the preservation of the documents, it was decided that there will be no initial auto filings, and the responsibility for inserting the works in the ROCA remains with the libraries. In order to institutionalize and standardize the methods to be adopted, a Normative Adjacent 01/2011 - PROGRAD / PROPPG was included, which originates the form of presenting documents to the library for inclusion and availability.

5.3 Asana

Asana is ideal for companies that need to be more scope of projects, aiming to provide assistance to Private Companies. The interface provides clear and concise information that informs the Responsibilities and Tasks that were carried out among the project members. It is also possible to visualize the progress through the program interface, and after an analysis to determine the total progress made to date.

Project participants have the availability of Communication that guarantees a fluid work, since the transmission of data through instant messaging is more efficient than meeting or email interaction. It is also possible to use what was communicated to create

new tasks.

Project Info Control filters messages that have been sent through the smart inbox tool and determines which are the most important and relevant to the current project in relation to the amount of progress made.

The user can choose which type of step and task to be tracked, whether it be bugs, the development of new features or the evaluation of new people interested in participating in the project. The project manager, or another program user, has at their disposal systems that can be created and held accountable to the manager himself or another person assigned to such task.

There are also ways to create different "Sections" for a better and more organized distribution of the subject and purpose of certain Goals and Tasks. Ten access files can be stored and associated with any task or conversation, such as computer hard drives or Cloud Storage Systems like Dropbox.

5.4 Wrike

Wrike's help in the reality of work, creating a new kind of management paradigm, increasing speed and efficiency between the beginning and end of the project, accelerating delivery.

With an intrapersonal communication function that can bring important information for discussion between project members or the client that can serve information of paramount importance without end of work and request for progress report, it is also possible to communicate with team members and He divides the projects in an organized way, reducing the main search on different tasks and media among team members.

The number of attachable elements, such as number of members and other project management programs that can not be compared, are limited, however, you can keep backup and project records in an email account, Attach files that have no project, request and provide delivery data, individual contributions, and progress report. It has a great portability with Word, Excel, Google Drive, etc. It can be used on almost all platforms.

6 Results

The use of backup software is extremely important competitive in the market.

Increased efficiency in introducing cloud storage, modification and communication systems ensures the system's reliability and reliability due to its presence on any device with internet access.

The main focus of most systems tested was the storage of communication and data, with the goal of bringing together online storage, including various integrations with pre-existing systems such as Google Drive or Dropbox.

Efficiency and Usability increase thanks to these internet-dependent products, but reliability and simple maintenance are threatened by outsourcing, which are beyond the scope of the system used. If an error occurs, for example, the Dropbox, compromising the project. Within other systems, functionality is compromised due to the lack of an eclectic management system. Some have the specific focus, such as Labguru on Biological Projects and ROCA in Undergraduate Programs, and feature some of the suggested resources.

The portability also varies depending on the use of the applications, without presenting Off-line modes, the internet is essential. With the six (6) evaluation criteria applied in four popular support systems, the advantages and disadvantages of the use were exposed, as well as the needs and failures of the current systems to fulfill the task of producing an ideal support system.

6.1 Prototype

Based on the data gathered in this paper, we will utilize of Project Management and Software Engineering methods to draw a prototype containing the Requirements and Suggested Features. First nonfunctional and functional requirements will be raised below, preceded by a prototype of features the ideal tool will possess.

Functional Requirements:

PMT-FRX	**Functional Requirements**
PMT-FR1	Keeps a record of lessons learned and notes.
PMT-FR2	Cloud and Local Document storage.
PMT-FR3	Planning aides for Budget and QA.

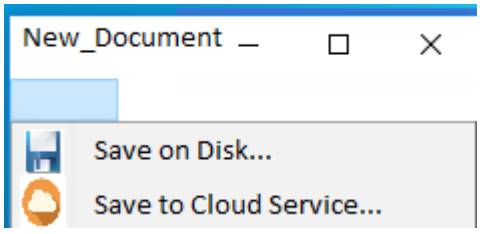
PMT-FR4	Versioning control, online and offline.
PMT-FR5	Maintains communication protocols among stakeholders and team members.
PMT-FR6	Builds Diagrams.

Nonfunctional Requirements:

PMT-NFRX	**Nonfunctional Requirements**
PMT-NFR1	Must have a Reliable uptime of at least 99%
PMT-NFR2	Must be usable by any type of user, with only quick training required.
PMT-NFR3	Must be light on resources for portability to mobile platforms or use on older hardware.
PMT-NFR4	Simple Maintenance in case of failure for efficient recovery and maintaining high uptime.

Note Taking is essential for project management, some products like Evernote perform this specific task exclusively, increasing fragmentation between the tools. Image Source: <http://imgarcade.com/evernote.html>

2. Document storage



Maintaining a record of your progress both locally and online are important for access and recovery. Image Source: <https://opensource-usability.blogspot.com.br/2015/08/the-save-icon-needs-update.html> and <http://imgarcade.com/cloud-icon.html>

3. Planning / Budget Control

Budgets are usually managed on separate applications, but a good PM tool would ideally present the user with everything they need consistently. Source: <http://www.leavedebtbehind.com/reviews/online-tools-software/use-budgeting-tools-to-keep-your-finances-on-the-right-track/>

4. Planning / Quality Assurance

QA is present on all industries, this ubiquitous concept requires assistance with online tools and integration with messaging. Image Source: <http://help.livehelpnow.net/article/1/9718/emailticket-workflow>

5. Version Control

Versioning may be achieved via integration of existing professional tools like git. Image Source: <http://www.hongkiat.com/blog/version-control-git-vs-code/>

6. Communication among stakeholders

Communication and messaging Features were found on nearly all tested tools, they are important and would be implemented on an ideal tool as well.

7. Diagram Builder

Diagrams and Graphs are helpful to display data in an easy to understand manner, mind maps as well, both are used to help the user to learn better and faster and are supported by some document collaboration tools such as Nuclino. These graphs may be user or auto generated. Image Source: <https://www.nuclino.com/product>

7 Conclusions

Humanity as a species has progressed today thanks to being adaptable to changing times and building tools to assist on their journey and interaction with the world around them. As progress happens, usual methods or tools may fall out of favor over time. In this paper we have explored in detail exactly how modernity has strained the relationship between mentor and mentee. Entire industries like project management and fields like software engineering were founded in efforts to keep up, however a single, multi-purpose tool to fit all needs is yet to be produced. Functions today, while modern, are fragmented in various different and specific tools, which is neither efficient nor helpful for project managers and those who work with him. The prototype displayed in this paper is a "fits-all" approach to suit academic and business needs, built on software engineering methods for project management purposes.

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