

KNOWLEDGE MANAGEMENT TOOLS IN THE DIGITAL ERA

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Abstract

With the advent of the digital era, communication became easier around the world, slowly closing the distance gaps and allowing to know more about any event worldwide faster than ever, thus creating the knowledge society we live in right now. Whenever something relevant happens somewhere in the world, the information travels instantly throughout the globe and humanity know more than ever before, but this does not come without weak points, there is hardly any control on the information being disseminated and the quality of it. So while we may consider the society as a knowledge society as a whole, the definition would be closer to an information society, there are a lot of data available but most is bogus or unverified information and only a little qualifies as actual knowledge. This is especially true when we talk about internet and the multiple sources of information it contains, what may start as true knowledge, for example a scientific finding or a unbiased report, it can quickly be misinterpreted and misrepresented and spread throughout the web, thus causing the opposite effect of creating knowledge. Now more than ever we need to create a way to identify and classify information in order to create a knowledge network and filter the useless information out.

Keywords: Knowledge management, information society, project-management.

1. INTRODUCTION

The Oxford dictionary defines knowledge as facts, information, and skills acquired through experience or education; the theoretical or practical understanding of a subject, while information are the facts provided or learned about something or someone. (Oxford Dictionary, 2016). Dwelling on more contemporary authors who analyze further the distinctions between the terminology we can talk about three key terms, data, information and knowledge, because the simple definition offered by the Oxford Dictionary is representative of how most people perceive those terms, as such information is treated as facts, while it should be treated as data, an individual may have a lot of information about a certain topic, but that information can be wrong or plain simple false, thus no matter how much information one can have about something, it will never evolve to knowledge if said information is not correct or useful.

For this analysis, we'll take the following classification: data being raw facts or simple observations about the state of the world; information is data in some context and knowledge is information with guidance for action that is knowing how to act given the information (Courteney, 2001).

This article will be divided as follows, in the first section Knowledge Management will be defined, as well as some of the more common methodologies used to achieve the knowledge management goals. In the second section, a brief review of the most commonly used knowledge management tools will be presented. Lastly in the third section a critique and recommendation on where to lead the future of the knowledge management, using the available technologies to its fullest, will be discussed.

2. ABOUT KNOWLEDGE MANAGEMENT

The idea of knowledge management, albeit not a new one, hasn't really found a widespread state of adoption between the organizations, even though most companies want to make believe that they use knowledge management, most just stay in the data storage phase and don't go beyond that due to the implications of implementing a knowledge management system inside their corporations. But what is knowledge management?

The two types of knowledge commonly acknowledged are tacit and explicit knowledge, first presented by Nonaka and Takeuchi (considered by most as the fathers of the knowledge management term), a number of studies have been done about the two types of knowledge and how to better make them work.

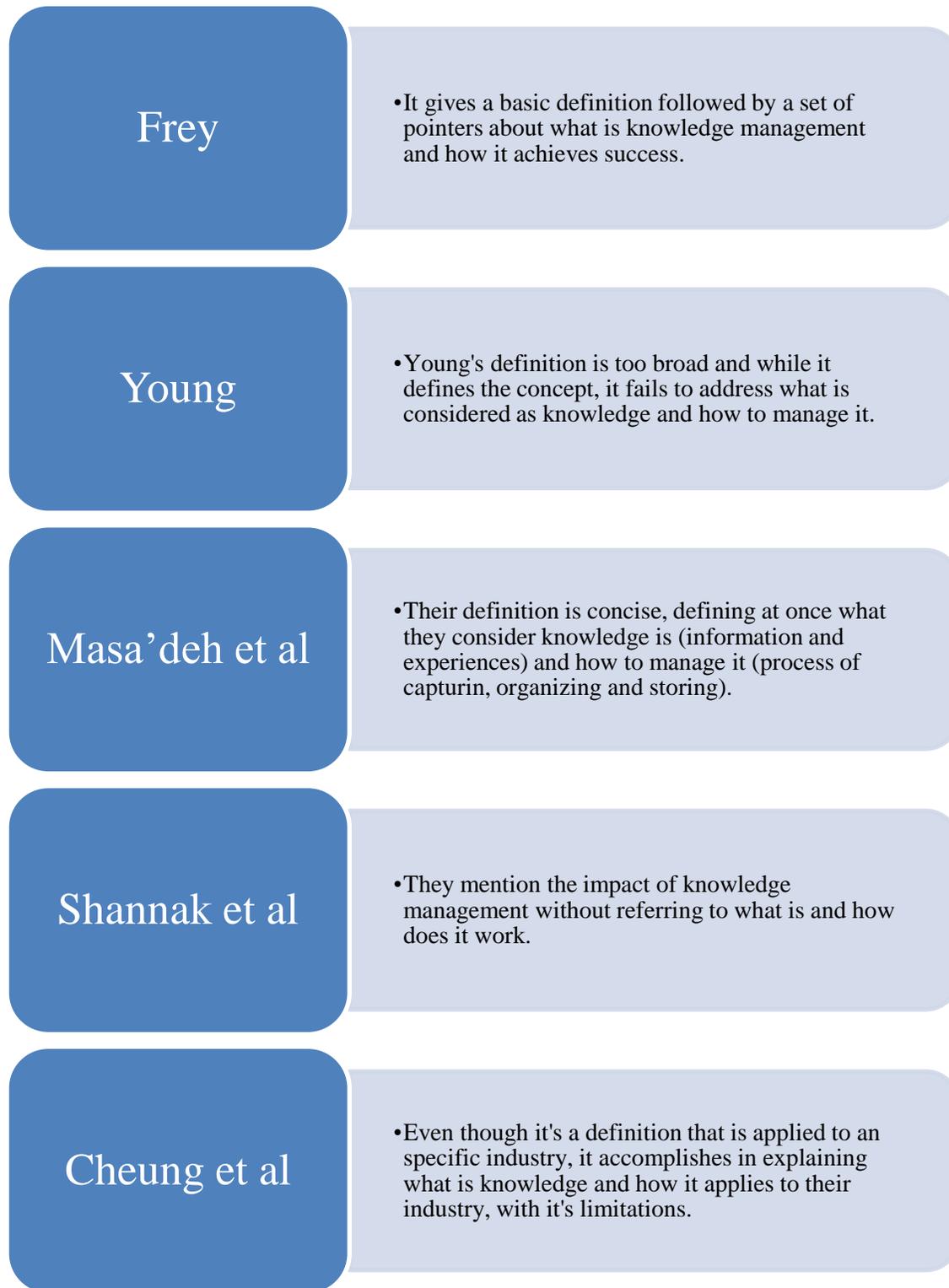
Knowledge Management can be defined in many ways and even though each definition share similarities with each other, there are some distinctions to be made, so as a way to better integrate those definitions into one that can work for this article, we'll go through the main ones describing their strong and weak points.

In its beginning knowledge management was beacons as a really important factor for companies to make smart choices about how and when to come up with new acknowledges and utilize it in its activities (Frey, 2001). "Knowledge management deals with any intentional set of practices and processes designed to optimize the use of knowledge, in other words, to increase allocative efficiency in the area of knowledge production, distribution and use" (Young, 2013, p. 3). Knowledge management is also defined as "the process of capturing, organizing, and storing information and experiences of workers and groups within an organization and making it available to others (Masa'deh et al., 2016).

When the concept took off and started to prove its usefulness, the part that played in the operations and practice was discovered to generate significant results in the regulatory area and that it could be a component to enrich and enhance productivity (Shannak et al., 2012). Frey follows up his first definition with a more detailed one so we can find knowledge management defined as a set of organized activities, that find the best combination between each other, and that link information and intellectual resources, it does so by accessing the raw data and complexity of the operations, including all of the underlying information and the knowledge implicit inside the human mind, and turning it into something that can be stored and shared with others, to then apply the best to turn it into a competitive ability for the organization (Frey, 2001, p.39).

Finally Cheung et al (2008) have a particular viewpoint considering knowledge management from the perspective of the customer service management, which is usually represented in the form of a pyramid with three layers, the first layer being the data assimilation and public information services, the second layer, consulting services and the third layer the knowledge and service managers.

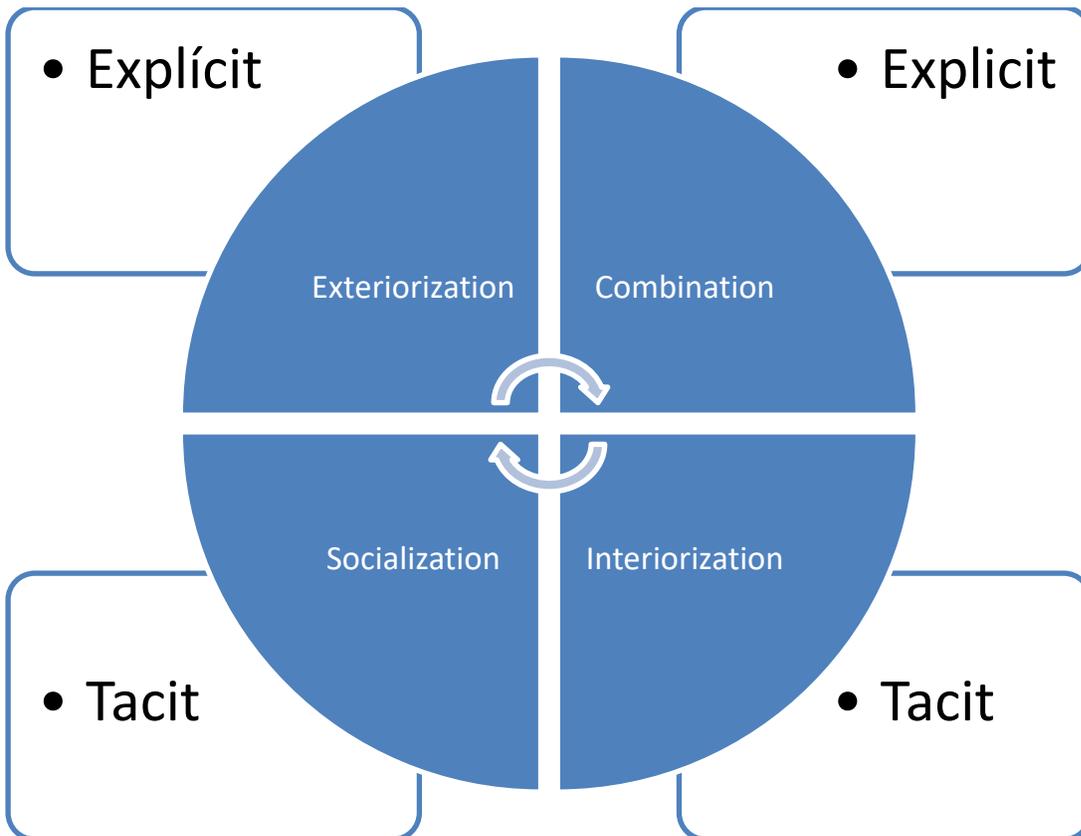
Figure 1 Knowledge management definitions comparison



Source: Own creation

Knowledge management shouldn't be discussed without mentioning the model created by Nonaka, who is considered by many as the creator of the knowledge management term. The model shows the process of generation, accumulation and integration of knowledge in the organizations as a circular cause-effect process, which is accumulative and continually interactive between the epistemological variables and the ontological levels of knowledge.

Figure 2 Knowledge matrix according to Nonaka



Source: Nonaka, I., Toyama, R. and Konno, N. (2000). 'SECI, Ba, and leadership: a unified model of dynamic knowledge creation'. Long Range Planning,

This model of knowledge and the idea of knowledge management as a whole was a breakthrough when presented due to the novelty of the idea it presented, that organizations had not only the information that was explicitly written and expressed in their manuals, guides, documents, and other formal means of distributing information, but that they had a far more useful and underrated type of asset, that was the tacit knowledge, that was part of every organization whether they knew it or not and that had everything to do with another asset that was not usually accounted for, the human capital.

By assuming that each employee in an organization was generating and accumulating knowledge that was potentially useful for the organization but that said knowledge was not being accounted for, thus incurring in the probability of knowledge loss, since that knowledge that was being created could be forgotten or simply taken away with the individual or group of individuals whom generated it.

The second most cited author in terms of knowledge management, Thomas Davenport, in 1998 elaborated an interesting report named “Successful Knowledge Management Projects” (Davenport et al, 1998), in this report, they investigated different companies in order to learn how they were developing knowledge management projects and to what degree of success they could accomplish it, thus aiming to distinguish the elements that made a knowledge management project successful, and concluding that “...when a business faces competitors that perform well on those other dimensions, the difference between success and failure may well turn on how effectively it manages its knowledge.” (Davenport et al, 1998, p.56). At the time knowledge management seemed to be the final solution to many organizations problems, the corner stone of new and improved ways to manage organizations and redefine what it meant human capital and their impact to the firm, not just as valuable workforce or valuable assets, but as assets that would constantly generate more value to the firm in the form of knowledge. 17 years later, in 2015 Davenport published an article in The Wall Street Journal titled: “Whatever Happened to Knowledge Management?” (Davenport, 2015) in which he claims that interest in knowledge management as a term has dwindled in past years and is not the panacea people once thought, Davenport cites many factors that affected this falling of grace, mainly the lack of interest by the members of the organization and the lack of understanding about what could the knowledge management bring to the table, so it was seen as an unnecessary expense, rather than a way to help the organization on the long term.

Nevertheless, knowledge management is useful and it will continue to play a pivotal role on successful organizations, whether they realize that they are doing activities that correspond to managing knowledge or not. The risk is that since organizations are not actively managing knowledge, there will be knowledge that will be irremediably lost, which will suppose the loss of a possible asset to the organization. Luckily there are a number of systems and methods that while their main objective is not the active management of knowledge, (project management software comes to mind) they do allow to gather, store and use knowledge from members of the organization.

3. TOOLS FOR KNOWLEDGE MANAGEMENT: METHODOLOGY AND DEVELOPMENT

Knowledge is an intangible asset, as such it does not hold a physical form and has to be captured and stored in an appropriate form or it will be lost for good. Capturing knowledge is not a new concern, before the invention of writing, techniques were transmitted master to disciple, stories and other vital information were learned and transmitted by wise men, and so on. Each ancient civilization we have a recollection of, had a way to capture knowledge, whether it was by writing or engraving, or a mixture, the need to preserve knowledge has existed since the beginning of civilization, and those cultures that didn't feel the need to capture their knowledge, we will probably never know about them, because their knowledge became extinct.

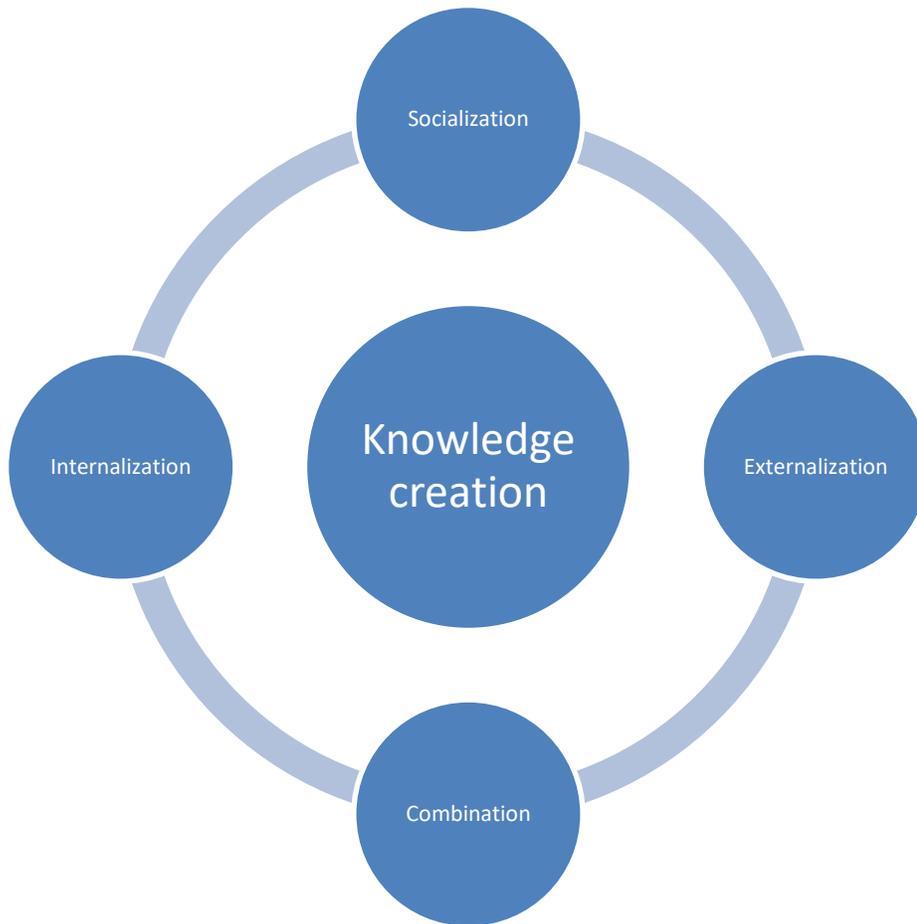
In modern times, organizations saw the advantages of storing information early on, but it was not knowledge management since the information being stored was necessary but it didn't necessarily generate solutions or contributed to the development of new knowledge. It wasn't until organizations began to document, store, apply and improve procedures and processes that a start of knowledge management can be gazed upon.

The most commonly used knowledge management tool is the information repositories, it may change the name, depending on the organization but the basic principle remains, it's a data base that stores all of the formal documents of the organization that could be needed by the personnel in any given time, documents like policies, procedures, processes, guidelines, manuals, and so on. While it is a good way to store and retrieve information, it lacks the capability to interact, only a handful of people can edit and more importantly, it can be cumbersome to use, leading to a lack of use.

There are of course knowledge management methodologies, usually a mixture of interviews, shadowing processes, data recompilation that ends in the creation of a tool or a process, the downside being that is not dynamic and it can end up being stored in a repository or not being as useful as expected. Fortunately, the advent of the internet and the mobile communications has allowed the creation of new tools that can be used for managing knowledge.

The tools discussed in this article won't be necessarily focused for knowledge management, but rather for project management, but the potential is there to capture information and generate knowledge. One of the earliest examples of a project management software is MS Project from Microsoft, but it has some severe limitations as far as promoting the creation of knowledge goes. For this article, a review of five software will be made, the focus will be in the features considered as essential for knowledge creation and/or management, based on the knowledge creation process proposed by Nonaka and Takeuchi (1995), which considers the four phases mentioned in the model presented on the first section, but for the purposes of this article, the knowledge creation was put in the middle, as the result of the four continuous phases.

Figure 3 knowledge creation continuous process

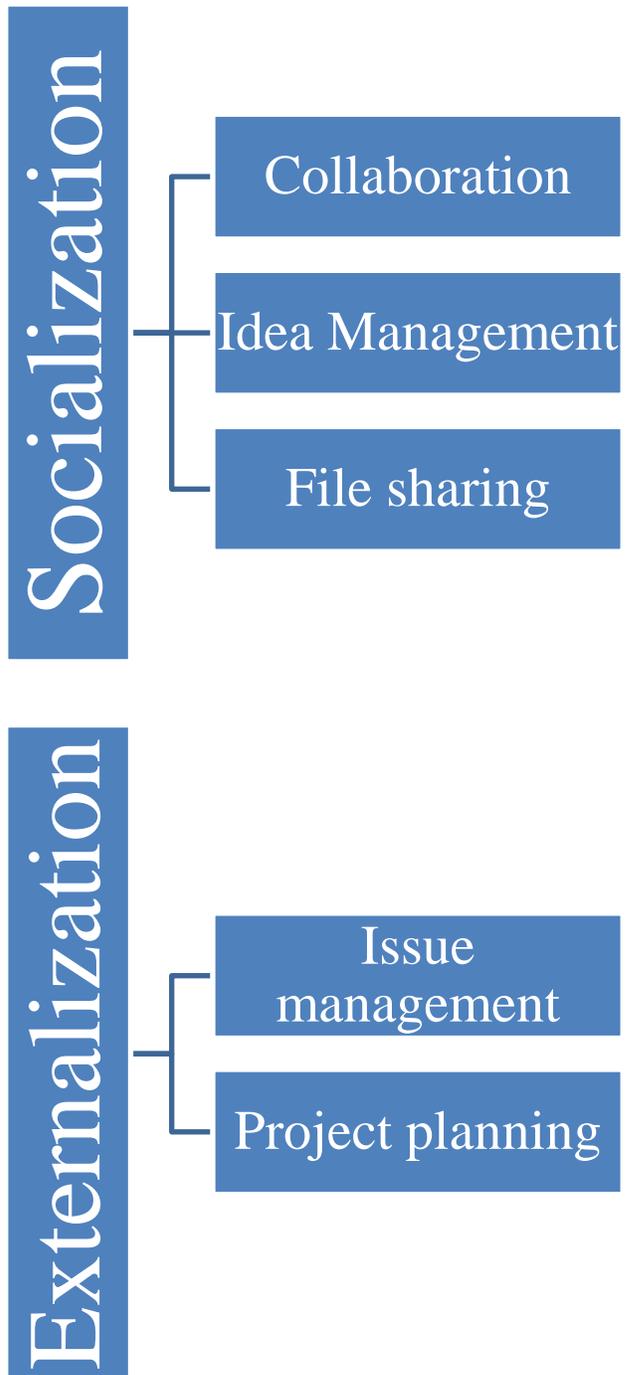


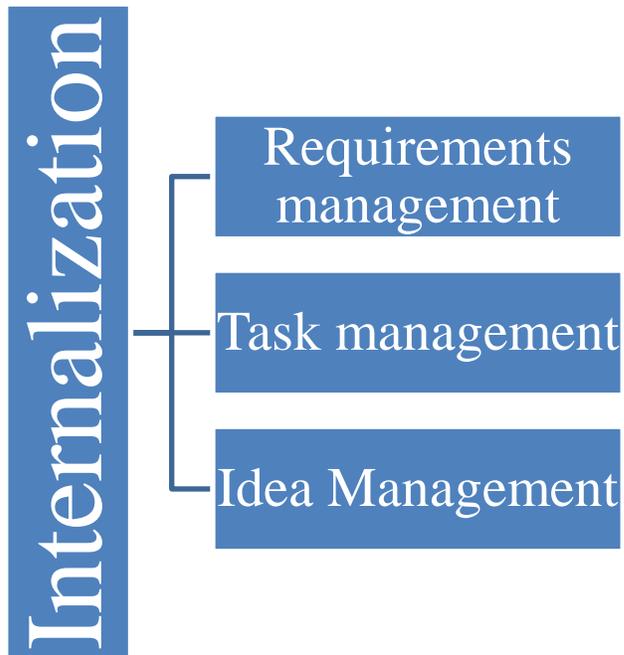
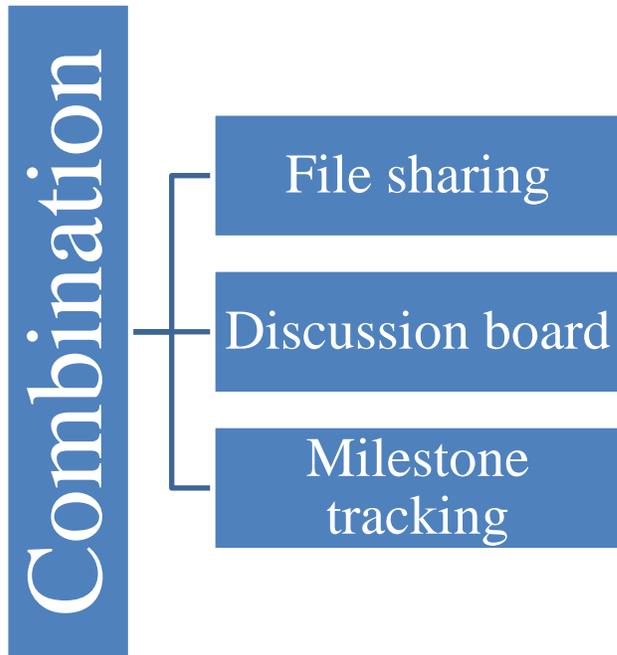
Source: Own creation

In the diagram, the focus is in the processes and not in the type of knowledge (whether tacit or explicit), that is because in terms of the knowledge creation through the help of project management software, the distinction between tacit and explicit knowledge can get a little diffused so it's simpler to just focus on the processes instead.

As the next step, the activities required for each process will be defined, this is key as it will be the stepping stone to define if the project management software can indeed be used to generate and manage knowledge.

Figure 4 Project management activities by process





Source: Own creation

As a way to test this idea, the 5-software selected were: Microsoft's MS Project, Trello, Slack, Asana and Basecamp. A brief comparison chart is presented just as an illustrative figure, before digging into the analysis.

Table 1 Project management software features

Software	Distribution	Features
MS Project	Windows app with cross platform accessibility	Budget management Collaboration Milestone tracking
Asana	Web and mobile app	Task management Discussion board
Trello	Web and mobile app	Budget management Collaboration File sharing Idea management Issue management Project planning Task management Resource management
Basecamp	Web and mobile app	Collaboration tools File sharing Milestone tracking Task management Project planning
Slack	Computer and mobile app	Collaboration File sharing Messaging

Source: Own creation

While in theory all of the project management software serve the same function, they do so in different styles and with different tools, one of them, for example, is a very robust messaging software that takes advantage of a full integration with other software in order to manage a project, on the opposite side MS project is great to manage a task but with a very formal environment, it fails to promote the exchange of ideas and the creation of new knowledge, is more of an information management and distribution software. So, where can we find the right environment to create knowledge? A mixed approach turns out to be better, a not so formal software that allows messaging, access to files, discussion board, brainstorming while at the same time keeping track of activities, in this way the information is formally shared, while tacit knowledge is being written in the discussion boards so every formal file gets some feedback and is internalized by the team members, thus creating the knowledge management cycle inside the software.,

4. DISCUSSION, BRIEF CASE PRESENTATION AND FINAL THOUGHTS

Knowledge management as a concept is not dead, but it has been left out of the argument for some time now, organizations are still managing knowledge even if it's not explicitly stated as such. The future for knowledge management lies in the use of other concepts, such as project management, in order to stay relevant and to achieve the goals of preserving and using knowledge.

One of the main reasons knowledge management has failed to stick inside the organizations has to do with how people react to the idea of giving away information, that is the personal mistrust about what will happen once the organization knows what the employee knows and what that can mean to their careers. There's a reason why since ancient times, some professions required just some apprentices and were jealous of their techniques, which is also the reason why some techniques and a lot of knowledge has been lost forever.

That's not to say that it cannot be done, it just means that a more subtle approach is required, in such a way that people won't feel threatened and won't withhold vital information for the sake of preserving their usefulness inside the organization, that's why collaborative tools play a huge role in preserving the essence of knowledge in the digital era.

Some of the tools discussed in the previous section, allow for the free and spontaneous collaboration inside a project while creating a repository of data that can be accessed later and used as previous knowledge that can result in a new solution for a different problem than the one the original project solved. The flexibility of being an online tool, and in most cases having a mobile app, allow for an out of the box thinking methodology since an individual can contribute whenever an idea comes to mind, without the need of waiting for a formal meeting nor feeling the pressure that comes with discussing ideas in a more regulated environment. This effectively becomes an automated knowledge conversion spiral that allows tacit individual knowledge to become explicit social knowledge, thus effectively being shared with the organization.

Another advantage of the collaborative tools is that it encourages the free discussion of ideas and the exchange of information, which in turn is distributed and discussed, these processes coincide with the Nonaka's dynamic model of creating knowledge, specifically with the tacit to tacit and tacit to explicit sections of the model, so more than a tool for collaboration or managing projects, if well executed, these tools can become tools for managing knowledge, the proposed cycle with the knowledge creation in the middle of the dynamic model serves to exemplify how knowledge can be constantly created in the right environment.

Of course, a tool is just a tool and its execution depends on the skill of the one using it, so unless the team leader is aware of the capabilities of the collaborative tools and takes advantage of the potential for it to manage knowledge, the possibilities will remain at that, a possibility that will not be fulfilled. An in-depth awareness with the process of managing knowledge becomes vital for the people in charge of managing the collaborative tools, a more balanced tool was suggested as a way to promote collaboration, rather than one of the more formal approaches like MS Project.

An interesting example of this, is a project that was conducted by an international consulting firm for a client in Queretaro, Mexico in 2012, for this particular project two teams, led by different project managers, were created, each team was tasked with the same activities for 5 weeks, for different sectors of the organization, and by the end of that time they would join the results for each team and create a single report that would serve for the final phase of the project, there were

guidelines as what to do, but no specific tools to manage the information or how to achieve the results, so each team acted according to the team manager's vision. The first team worked with a simplified version of a MS Project, but the team manager centralized all of the information without getting into the ground work, so through the day he was responsible to fill out the reports with the information periodically informed by the team. The second team used a more informal project tool, in which each team member could fill out the data and it was being constantly delivered to a shared folder, the disadvantage was, that there was not integration with the MS Project tool so the team manager had to transfer all the data at the end of the day, which in itself wasn't time consuming, but it added a half hour of work, which was perceived as a setback. By the end of the five weeks, both team managers started merging information only to find out a set of discrepancies that grew larger. When the need to go back and double check the physical location of the discrepancies arose, the first team had no trail to go back to, their main file, was their only file so if the data was wrong in the report, there was no way to check it other than going back and reviewing where exactly had the information failed. Since all of the information had been centralized with no input from the team members, they had no way to say where the report had failed. On the other hand, the second team could easily pinpoint the discrepancies and review against another source, where there was some wrong data, the person responsible of said data could be pinpointed and that person could go and review where was the mistake. In the end, for the first team a delay over a week was caused due to the centralization of the information and the poor use of the knowledge management tools.

In the digital era we live in, there seems to be a continuous flux of information, but for the most part that information does not equals to knowledge, a lot of useless data gets thrown around and the same can be said for the more conventional tools used for capturing knowledge. One of the main disadvantages of the information repositories, has to do with the waste of time that involves digging across the pool of information in order to find something that can be useful and applicable to the problem or situation in hand, so rather than searching for something that may not be there, people in organizations tend to forego the repositories and search for a new solution, missing the whole point of having an information repository in the first place and failing to achieve the transformation of the information into knowledge.

A collaborative tool has the advantage of not only storing information, but also transmitting it, getting feedback, having said information expanded or corrected, applied and transforming in true usable knowledge that will serve as an asset for the organization without people felling threatened. The present work is an introduction for further research into how the organizations are managing projects and if the knowledge management tools are actually being used, as it was shown, on the example above, simply providing tools to the employees is not enough, as more data is being gathered through interviews, is becoming increasingly clear that there is a gap between what a tool should be used for and what is actually used for.

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