Knowledge Identification for Personnel Allocation to Research Projects: A Proposal Methodology

Alonso Perez-Soltero*      Javier Grijalva-Garcia      Mario Barcelo-Valenzuela
Universidad de Sonora, Industrial Engineering Department, Rosales and Blvd. Encinas
C.P. 83000 Hermosillo, Sonora, Mexico
* E-mail of the corresponding author: aperez@industrial.uson.mx

Abstract
Today, knowledge has been acknowledged as an important source of competitive advantage and value creation for organizations. The leveraging of individual knowledge in an organization is important to improve its competitiveness and internal processes. The proposal presented in this work is oriented to organizations that develop research projects and need employees with the skills and competencies necessary for their development. This is difficult because the people in charge of personnel allocation to research projects do not always have the sufficient knowledge for doing an efficient allocation. The objective of this article is proposing a methodology that allows the identification of key knowledge of the employees that can be available for the people in charge of personnel allocation to research projects. A first conceptual approach, based on literature review and the comparison with other similar works, allows proposing a methodology focused in five key phases. This proposal will allow the organizations to identify, capture and disseminate key employees’ knowledge to make it available when it is needed.

Keywords: Knowledge Management, Knowledge Identification, Key Knowledge, Human Resource Management, Personnel Allocation

1. Introduction
Today, knowledge has been acknowledged as an important source of competitive advantage and value creation for the organization and like an indispensable ingredient for the development of dynamic competencies, generally, like a determinant factor for organizations with global ambitions (Farzin et al., 2014). Between several resources available in the organization, knowledge is the most valuable resource because it encompasses the best practices, routines, learned lessons, problem solution methods and creative processes that are usually difficult to imitate (Renzel, 2008).

Because it is useless to have this knowledge, without having it unidentified, this document presents an early proposal of a methodology for knowledge identification that will benefit the process of personnel allocation in organizations. Such methodology has the objective to identify the key knowledge that the employees possess and putting it at its disposal, being the main beneficiaries the people in charge of personnel allocation to research projects.

The document is established in the following way: first, it is defined the conceptual framework related to knowledge management and its general concepts; after that, the problem description is explained based on the literature review and the cases that have been found; subsequent to this, there is presented the proposed methodology for the solution of the problem; discussions and expected results are explained for finally ending with the conclusions. All this is presented below.

2. Conceptual Framework
In this section are presented the definitions of the concepts of knowledge management (KM), knowledge identification, knowledge management in human resource management and personnel allocation process.

2.1 Knowledge Management
KM is the creation and subsequent administration of an environment, which provides tools for the creation, sharing, organization, and use of knowledge for the benefit of the organization and its clients (Kebede, 2010). Macias & Aguilera (2012) determine that KM is the set of practices related to the generations, identification, capture, dissemination and application of relevant knowledge for the organization.

Chen & Huang (2012) consider that KM is an important fact, because it is what allows organization to manage correctly its knowledge for creating long-term competitive advantages, and, with its implementation, provides the organization the dynamic capacities to promote the quality and quantity of knowledge. At the same time, the organizations that effectively manage and moderate the knowledge and experience that is embedded in the minds of individuals are capable of creating a competitive advantage of superior and greater value (Chen & Huang, 2009). Although, the interaction inside the organization for the sharing and creation of knowledge have been a key concern to the top management that it requires defined processes of KM, and its respective methodologies, to efficiently manage knowledge (Oztemel et al., 2011).
As Kim et al. (2012) mention, the purpose of KM is maximizing the utilization of organizational knowledge and winning a competitive advantage over its competitors. León et al. (2006) assure that KM has been a new focus that it is based on the recognition and utilization of the most important asset of the organizations: the human resources, their knowledge and its disposition to disseminate this knowledge. But Perez-Montoro (2004) details that a critical operation from which its execution depends on big part the success of a KM program is the identification of knowledge.

2.2 Knowledge Identification

Knowledge identification is one of the key phases of KM, however, not all authors study this theme because they consider it evident. It's important to know that without a previous analysis of the state of organizational knowledge and the environment, the process is no efficient enough (Perez-Soltero et al., 2013). It has to be highlighted that only by discovering what knowledge the organization posses, it is possible to find ways to storage and disseminate knowledge.

Inside and organization, knowledge must always be at the disposition of all the employees working in it, in order to use it in the best way they can. Because of this, Wakefield (2005) describe that the identification of employees with relevant knowledge help improve the transference of this knowledge, because they know who knows what.

Before the investment of the development of new capacities, the organizations must know what knowledge and experience exists inside and outside their own walls, and more importantly, who posses this knowledge (Probst, 1999). Members of organizations posses knowledge, skills, experience and intuition; but the organization only control a minimum part of it, and is because of this that is necessary to implement strategies that allow employees to explicit their knowledge, that it is transformed into information and that can be available for the organization (Leon et al., 2006).

Focusing on the tools used for knowledge elicitation, the process by which the knowledge is identified and capture (Shadbolt & Smart, 2015), that will allow to use specialized tools to identify and capture the knowledge embedded in the employees’ mind. There are tools for knowledge elicitation such as structured interviews that their main objective is to obtain information about how is that an activity or a task are developed and how a particular decision is made (Shadbolt & Smart, 2015). Vásquez-Bravo et al. (2014) mention that the design and formulation of the questions of a structured interview must be coherent with the tasks and processes that have been identified in the organization and that are those that want to be explored. They also mention that this it he most efficient tool for capturing knowledge because it converts tacit knowledge into explicit knowledge by the interaction between people.

The observation method is one that can be used as well, that consists in the recording (video or audio) of an expert developing a task and then observing what he/she has done. This allows to discover and explore which are the actual demands of the job, what strategies workers have developed, how is the work flow and the aspects of communication and coordination (Crandall et al., 2006).

Other of the methods of knowledge elicitation that can be used is limited information task. This technique was first presented by Hoffman, (1987) and Shadbolt and Smart (2015) resume the idea and mention that this method works at providing the employee with few or scarce information about a particular problem to be solved, so that the employee must ask for specific information that may be needed to solve the problem. The information that is asked for, together with the order it is asked, provides the people doing the study a visualization of the strategy of the employee to solve a problem.

By far, using these methods, the knowledge that resides in an organization can be identified and captured, but it is important to know where this knowledge must be stored and where it can be found for future use. In the study made by Newk-Fon Hey Tow et al. (2012), it demonstrate that the first place where companies look the existing knowledge of the organization, specially the individual knowledge, is in Human Resource area system record. This is why is important to have efficient Human Resource practices at first place, because as Özbağ et al. (2013) mention, the human resources of an organization cannot be imitated by competitors because the knowledge they posses is tacit and cannot be easily codified.

2.3 Human Resource Management and Knowledge Management.

Human Resource Management (HRM) practices are the main means by which the organization can influence and mold the skills, aptitudes and behaviors of the individuals for making their job and achieve organizational objectives (Chen & Huang, 2009). These authors mention that knowledge is embedded to human capital and organizations cannot easily transfer knowledge between individuals. The literature of HRM has put special focus on the research of HRM practices in the development of human capital that influence directly on the performance of the organization (Buller & McEvoy, 2012). Becker (1964) describes human capital as the knowledge, skills and aptitudes from individuals in the human resources of the organization. Buller & McEvoy (2012) base their work hypothesis in that the specific human capital of the organization has direct effects over
the behavior of employees and, at last, in the performance of the organization. Wang, Chiang & Tung (2012) describe that for avoiding the dependence on the human capital of one employee, the organization must use formal training, teamwork and standardized documents, for transforming gradually the skills of employees in public information over their daily operations.

Har et al. (2010) describe that knowledge is recognized as one of the key elements that must be applied to daily activities of employees and even if knowledge is seen as an strategic asset for the success of the organization, a efficient management of individual knowledge can be a powerful tool for facilitating the transformation of this knowledge to competitive advantages.

The study of Wang & Wang (2012) recreated a model where it can be demonstrated the relation between the transfer of knowledge, innovation and organizational performance. They mentions that the principles of innovation tend to depend on the knowledge, skills, and experiences of the employees of the organization. In their results, they discover that identifying employees’ knowledge helps improve the innovations rhythms. Also Wisniewska & Wisniewski (2012) present a study where they determine the key roles of HRM for developing KM. Between these key roles it can be found: help an organization articulate the purpose of KM, create a proper environment of using and developing knowledge in an organization, build employees skills, competencies and careers mainly through education, training and development responsibilities and promote innovation and creativity of workers.

2.3 Personnel Allocation Process

A great quantity of process in organizations are based in activities that are developed by the human resources, that if they are skilled and well trained, are the primary source of competitive advantages for the organizations (Kuchar & Martinovic, 2013). The key problem of this is that the human resources have to be managed in an efficient way to develop its ultimate potential.

Between the different processes that HRM develops it can be found the allocation of personnel to activities of the organization or projects that the organization has. The allocation process is defined as: given n tasks and m resources, the problem is to determine the assignment of each task to each resource, optimizing its functions and satisfying the requirements of the activity (Rodriguez, 2006).

From the perspective of personnel allocation to research projects, after analyzing the activities of the project, the knowledge and skills of the employees must be identified (Wang & Tian, 2012). In this case, the norm INTE-ISO 10006 (2003), which focuses on the rules for the management of quality projects, contains a section for the human resource allocation to organizational projects. In this norm section we can mention some rules such as:

- It must be defined the competencies necessary in terms of education, formation, skills and experience of the employees that will work in the projects.
- In the selection of personnel for the project it must be paid special attention to the requisites of competencies of key employees.
- The project manager must participate on the selection of personnel that will occupy a job in the project that are considered as key for its development.
- It should be sufficient time for the hiring of competent personnel in the case that the organization does not count with it, and that it is key for the development of the project.

At the end, Villela et al. (2005) describe that there has to be a representation of the organizational structure with the required competencies for each activity, with which will create an identification culture and the dissemination of existing knowledge.

3. Problem Description

There has been sufficient literature that focuses on the problem of personnel allocation in organizations. For example, Grunow & Günther (2004) determines that, in many occasions, the personnel allocation is developed in a manual form and besides is based in prove and error, which consumes time and is not viable when the allocation must be developed in a short margin of time or when there has to be a reallocation of personnel. Based on this, Ampuero et al. (2009) mention that the personnel allocation to research projects without the necessary competencies and problems between the members of the team, are detected as the two main principal problems associated wit human factors that affect the success of projects. Besides, Santos et al. (2014) mention that because of the dynamic and complex context in which it takes place, it is not a simple task to perform personnel allocation. Nevertheless, they describe that it is known that managers usually use rules of thumb, intuition and gut to make decisions, but today this behavior is no longer suitable in such important decisions, because of the high cost of reallocating personnel and the delay of the project.

Even more, based on the literature research, most of published articles about personnel allocation focuses on the mathematical model or an information system that makes the allocation in an automatic form, but they do not mention the previous actions to be made for these systems to be implemented.
Besides the above for the personnel allocation to research projects, some organizations base their decision in the personal relationship between the people in charge of this process and the employees, either for their physical proximity or they social relationship. The main problem is that a reallocation must be done because, in most cases, there is no place where people in charge of personnel allocation can find the knowledge for an efficient allocation. Also, even if the process is automated, there has to be a predefined identification of knowledge that is the principal input of these systems. Even though, because the Human Resource area do not have an adequate management of individual knowledge, the people in charge of personnel allocation for research projects cannot identify the employees with the adequate profile. By having this inadequate management the organization loses time in finding the employees with the right knowledge for the projects development. In the same way, the employees’ records are not actualized and this makes that they do not reflect the individual knowledge of the organization.

4. Proposal for Problem Solution
In the literature exist methodologies for the identification of organizational knowledge. Among some methodologies we can found those proposed by Ganasan & Dominic P (2011), Henczel (2000), Liebowitz et al. (2000), Drus & Shariff (2011), Nieves et al. (2009), Artiles & Visbal (2013) and Perez-Soltero et al. (2013), to name a few. But of these mentioned, only the last two focuses only on the identification of knowledge based on the human resource, whether he remaining focuses on the identification of organizational knowledge. Each of these methodologies helps identify the knowledge that resides in employees’ head. Even though, these methodologies have a few constraints in the basis of knowledge elicitation. For example, all these methodologies only utilizes structured interview for knowledge elicitation. Also, focusing on the dissemination of knowledge, only one of these methodologies takes this in consideration. But, even if it takes into consideration, the last phase does not consider a recommendation phase where there can be actions for the use and maintenance of the dissemination tool.

The methodology of Knowledge Identification for Personnel Allocation Process (KIPAP), as seen in figure 1, is the proposed methodology for solving the problem and consists of 5 phases. In phase 1, Knowledge Detection, there is considered to be an organizational diagnostic. This is the evaluation of certain characteristics that can be evaluated for knowing if this methodology is applicable to the organization. Once the diagnostic is done and the methodology is applicable to the organization, there is the detection of key knowledge, where the people in charge of personnel allocation are asked for the key knowledge that has to be identified for them to do a correct allocation. After the detection of key knowledge is over, a mediating reunion must be done to let the employees know the benefits of the methodology and what is going to be done, this with the purpose of having the support of the employees for the realization of the methodology.

**Figure 1. KIPAP Methodology**

Phase 2, Tools’ Development, is focused on the development of the tool or set of tools that will be utilized during the methodology. But before that, the recompilation planning must be done, this with the purpose of knowing the beginning and the end of the application of the tool. Subsequent, the limitations must be known for avoiding the detection of irrelevant knowledge. If the planning and limitations are well structured, the development of the tool or set of tools for knowledge elicitation can initiate. There can be used knowledge
elicitation techniques, such as structured interviews, observation and limited information task, but others can be
used depending on the organization where the methodology is applied. Also there might be documentation in the
human resource area that might be helpful for determining, for example, the level of certain language. These
types of tools aside from the defined knowledge elicitation techniques will be defined by each organization
during the implementation of the methodology.

Phase 3, Tools’ Application, consists mainly in the process of knowledge elicitation applying the set of
tools developed in phase 2. The application of these tools must be done considering the recompilation planning.
Once the application is finished, the analysis of this knowledge and its representation is the next step. There are
numerous of knowledge representation tools such as knowledge maps, skill matrix and social network analysis,
for mention some. This depends on the easiest way that the organization can understand the knowledge that has
been identified.

Phase 4, Knowledge Dissemination, enables the organization to have the knowledge at its disposal
by the implementation and evaluation of a knowledge dissemination tool. There has to be a way for the
knowledge that has been identified to be at the disposition of the people in charge of personnel allocation. This
will enable the utilization of this knowledge not only for the allocation process, but also by the employees
themselves for the searching of experts that can help them in their daily activities. Tools such as portals, wikis,
expert yellow pages, intranets and databases can be used. As well, this depends on the ability of the organization
for maintaining the tools implemented and that has the required technological and financial resources.

At the end, phase 5, Usage Recommendations, have the utilization actions for the correct use of the
methodology and the dissemination tool itself, this with the purpose of using the tool at its full potential. Also,
phase 5 have the recommendations once the methodology and a new allocation has been finished, were it can be
found 2 options. Option 1 opts for an efficient personnel allocation process, where the knowledge required by the
projects is fulfilled by the knowledge inside the organization. Option 2 is more complicated, because it deals
with the problem that the required knowledge is not inside the organization, causing this 2 considerations:
Consideration 1 is the cost of training the employees in the missing knowledge and the cost of changing the
status of the project to standby. Consideration 2 is the cost of hiring external knowledge for the completion of
the project. The organization, in the case of option 2, must choose the consideration that has the minimum cost
or the consideration that fits the organization at that time.

5. Discussions and Expected Results
As discussed in the section 4, there are some constraints in the reviewed methodologies. The knowledge
elicitation techniques that these methodologies uses are commonly structured interview, instead of the one
proposed here, that will utilize a combination of these techniques to have a deeper elicitation. Also, it is proposed
a last phase for usage recommendations and action plans that will facilitate the people in charge of personnel
allocation to use and actualize the dissemination tool that is where the knowledge identified reside. Also,
focusing on people, there has to be a reunion for presenting the purpose of knowledge identification and the
techniques that will be used, this with the objective of obtaining the support of the employees, one thing that
other methodologies does not take into account.

Making bases on what is mentioned above, this proposal of a methodology of knowledge identification
will provide the people in organizations in charge of personnel allocation the sufficient individual knowledge to
develop and efficient allocation process.

The development of this methodology for the identification of key knowledge of the human resource in
an organization, will allow knowing the knowledge that the organization posses, minimize the search time of
employees for research projects and favor the utilization of the existent knowledge by the members of the
organization. This will avoid the facing with the two major problems of personnel allocation: the reallocation of
employees due to the lack of the correct employee’s profile to assign to a project, and the lack of communication
due to the poor relationships that the team members may have. Also, the people in charge of personnel allocation
will face the two considerations that are mentioned in phase 5, giving the necessary analysis to know when it is
better to hire new personnel or to train the ones that are already inside the organization, and will allow the
organization to know the knowledge that it actually has and make plans so that it can increase. This brings to
discussion the elaboration of capacitation plans for the employees that allow the creation of new knowledge that
benefits the competitive advantages of the organization and also avoiding the hiring of new and specialized
personnel.

In the same way, the correct management of the employees’ records will benefit the discovering of
knowledge, skills and competencies that these posses. It will allow that the records can be actualized constantly
for avoiding the identification of obsolete knowledge for the organization. The information in the records can be
used for the search of specialized personnel and selecting them for the research projects of the organization and
for developing action plan for incrementing the existing knowledge. Also, employees of other departments can
be taken into account for the development of a project, task that never happens because of the lack of the
identification of knowledge.

6. Conclusions
In the actual times, the organizations have perceived that in this new market, is not the organization that produces the most the one that is over the rest of them, but is the one that has more knowledge over the rest and that is used for making efficient processes and quality products. In the same way, the organization have observed that for the implementation of KM, they first need to know the knowledge that they actually have and that in most cases, it resides in the head of the employees.

As it was mentioned above, knowledge is embedded to the employees of the organization and this makes that in most cases, if it is not well identified, it is not well used and in a long term, lost. Is for this reason that the organizations have to focus part of their activities to identifying the knowledge of their employees for is efficient utilization.

It is expected that with the development and implementation of this methodology, the organizations know how to identify the existent knowledge inside them and that this knowledge helps making a better personnel allocation to research projects and, in a long term, develop research teams that are specialized in certain projects. In future research, an evaluation is being done for its implementation and obtained results. Additionally, for information systems that make the allocation in an automatic form, but do not mention the previous actions to be made for these systems to be implemented, this methodology could be the first step for the implementation of those systems for personnel allocation.

References


The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage: http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/ All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digitial Library, NewJour, Google Scholar