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ORIGINAL PAPER

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PROCESS DOCUMENTATION: A MODEL FOR KNOWLEDGE MANAGEMENT IN ORGANIZATIONS

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ABSTRACT

Background: Continuous and interconnected processes are a chain of activities that turn the inputs of an organization to its outputs and help achieve partial and overall goals of the organization. These activities are carried out by two types of knowledge in the organization called explicit and implicit knowledge. Among these, implicit knowledge is the knowledge that controls a major part of the activities of an organization, controls these activities internally and will not be transferred to the process owners unless they are present during the organization's work. Therefore the goal of this study is identification of implicit knowledge and its integration with explicit knowledge in order to improve human resources management, physical resource management, information resource management, training of new employees and other activities of Isfahan University of Medical Science. **Methods:** The project for documentation of activities in department of health of Isfahan University of Medical Science was carried out in several stages. First the main processes and related sub processes were identified and categorized with the help of planning expert. The categorization was carried out from smaller processes to larger ones. In this stage the experts of each process wrote down all their daily activities and organized them into general categories based on logical and physical relations between different activities. Then each activity was assigned a specific code. The computer software was designed after understanding the different parts of the processes, including main and sub processes, and categorization, which will be explained in the following sections. **Results:** The findings of this study showed that documentation of activities can help expose implicit knowledge because all of inputs and outputs of a process along with the length, location, tools and different stages of the process, exchanged information, storage location of the information and information flow can be identified using proper documentation. **Conclusion:** A documentation program can create a complete identifier for every process of an organization and also acts as the main tool for establishment of information technology as the basis of the organization and helps achieve the goal of having electronic and information technology based organizations. In other words documentation is the starting step in creating an organizational architecture. Afterwards, in order to reach the desired goal of documentation, computer software containing all tools, methods, instructions and guidelines and implicit knowledge of the organization was designed. This software links all relevant knowledge to the main text of the documentation and identification of a process and provides the users with electronic versions of all documentations and helps use the explicit and implicit knowledge of the organization to facilitate the reengineering of the processes in the organization.

Key words: Documentation, Electronic organization, Knowledge management.

1. INTRODUCTION

Knowledge, especially experience based knowledge, is one of the key resources in any organization. The more people know, the better they will act. In today's world, not only knowledge is considered to be a form of capital but is often considered to be the most important capital of an organization. In an enlightened age that considers knowledge to be the most important resource, a different approach for handling the processes and employees of an organization is needed. Therefore like management of physical resources, knowledge management needs to be part of the standard policies of every organization (1). Knowledge

management as a management approach is quickly evolving and advancing and emphasizes on improving performance and organizational processes along with continued innovation. The need for knowledge management arises from this fact that knowledge is an important part in an organization's activities and in reaching sustainable competitive advantage. Also increases specialization increases the risk of losing knowledge and experience as a result of transferring or losing employees which again shows the importance of knowledge management (2). Knowledge management is an organized and systematic method for managing the knowledge within an organization

and using this knowledge in various activities in order to achieve the organization's goals. Knowledge management also aims to avoid repeating mistakes and to reach decisions based on the organization's previous knowledge (3).

On the other hand in an organization interconnected and continuous processes help create the desired outputs from the inputs and achieve partial and general goals of the organization. These processes use two type of knowledge present in any organization called explicit and implicit knowledge. Explicit knowledge has clear and written documentation and can be easily shared with others. This type of knowledge is logical and reasonable and can be found in guidelines, procedures, software, documentations, instructions, reports, design and goal of any organization. On the other hand implicit knowledge is where experiences, insights, tricks and skills of the employees show themselves and normally has no clear documentation and exclusive to certain employees (4, 5). This implicit knowledge has its roots in the corporate culture and is rarely shared or transferred. Therefore when the person having this knowledge leaves the organization for any reason, this knowledge will be lost and thus can't be considered a long-term knowledge. Implicit knowledge is rare, irreplaceable, inimitable and valuable if used to further the organization's goals. This type of knowledge is the result of certain elements of organizational learning because improves the available knowledge with experience and creates an atmosphere of learning in the organization (6).

Implicit knowledge is what controls a major part of an organization's activities which is exclusive to people and it is often witnessed that following a change in personal some of activates suffer from problems and delays which can then create major dysfunctions in the organization and create obvious and hidden costs. On the other hand humans have limited memory and therefore can fully preserve their experiences and knowledge by recording them. In order to gather, transfer and store the experiences of the employees and transferring this knowledge to other employees and creating harmonization, attunement, collaboration and a single vision in the organization, a system for documentation of the experiences of employees is necessary. Organizational documentation is a process, during which concepts and information are gathered, edited, categorized and stored and can lead to targeted, precise and orderly activities in an organization (7).

Documentation exchanging experiences can directly improve the activities of an organization and can also help create new knowledge (8). From knowledge management point of view, documentation helps in information retrieval, using innovative knowledge and experiences, creation of new knowledge and betterment of the organization (9, 10). Some of the advantages of documentation in an organization are having a historical, analytical and scientific record of achievements, processes, improvements and other organizational activities, enabling scientific and precise monitoring of strengths and weaknesses of the organization, creating the necessary tools for creating

Main process	Code
1- Supply and distribution of funds	TA
2- Accusation and distribution of equipment	TB
3- Supervision and planning	TC
4- Notifications and database	TD

Table 1. List of main processes and their codes

a systematic view and facilitating organizational learning. In other words, documentation creates a complete identification for every process and activity of the organization, acts as the main tool for establishment of information technology in the organization and facilitates the creation of electronic organizations (11). Therefore due to the importance of documentation in knowledge management, the goal of the current study is to present a framework and design a software for documentation of processes in department of health of Isfahan University of Medical Science in order to improve the efficiency of this department and facilitate organizational learning, faster and better decision making, creating room for development, improving organizational innovation, motivating the employees and improving the quality of the activities in this department.

2. MATERIAL AND METHOD

The project for documentation of activities in department of health of Isfahan University of Medical Science was carried out in several stages. First the main processes and related sub processes were identified and categorized with the help of planning expert. The categorization was carried out from smaller processes to larger ones. In this stage the experts of each process wrote down all their daily activities and organized them

Main process	Sup process	Code	
1- Supply and distribution of funds	1-1 request for allocation of funds	T1-1	
	1-2 determining the share of each eparchy	T1-2	
	2-1 Requesting a list of needed equipments from each eparchy	T2-1	
	2-2 Creating the list of needed equipment for each eparchy	T2-2	
	2-3 Issuing and validation of accusation request	T2-3	
	2-4 Accusation of equipment using tenders	T2-4	
2- Accusation and distribution of equipment	2-5 Sending the equipments to each eparchy	T2-5	
	2-6 Selecting different types of each equipment	T2-6	
	3- Supervision and planning	3-1 Supervising the accusations	T3-1
		3-2 Supervising the improvement of standards and equipments in each eparchy	T3-2
		3-3 Extracting the supervision checklist	T3-3
		3-4 Creating and sending supervision feedback	T3-4
3-5 Amendment of supervision checklist		T3-5	
3-6 Scoring (ranking) of each eparchy based on equipment and programs		T3-6	
3-7 Drawing a detailed plan		T3-7	
3-8 Tracking the acquired equipment until operation		T3-8	
3-9 Writing a performance report		T3-9	
4- Notifications and database	4-1 Updating the equipment database	T4-1	
	4-2 Gathering and recording the information of distributed equipments	T4-2	
	4-3 Developing a rough estimate for the cost of equipments and new units (divided by unit and service provided)	T4-3	
	4-4 Controlling the databases of each eparchy	T4-4	
	4-5 Creating a list of units ready for opening or lunch	T4-5	

Table 2. List of sub processes and their codes

Process identification	
Process name/code	Acquiring the permission for hiring health providers and creating the list of places in need of new employees
Person/persons in charge	Expert in charge of health providers
Process input	Acquiring the permission for hiring health providers from human resources or ministry of health
Process output	List of places in need of new employees
Process details	Each year (though not at any specific date) permission will be granted for employing a number of health providers. This permission is in the form of a letter from university's department of human resources to the department of health and finally to the expert in charge of health providers. After accruing permission, each eparchy will be contacted and the person in charge of health providers in the eparchy is asked to investigate the number of empty health provider positions with the help of the local human resource manager and determine their priority, then report the results using the proper form and within 15 days. After gathering the information from all eparchies, the expert in charge of health providers creates a list of empty positions based on priority and eparchy. Since the number of empty positions is always larger than the number of people mentioned in the hiring permission, the permissions for hiring new health providers need to be distributed between networks. In order to achieve this after completing the final list of empty positions the expert in charge of health providers sets a date for the admissions committee by coordinating with different committee members. The committee takes place in the determined data and investigates the list of empty positions by considering factors such as the population, number of current employees and number of satellite villages which is provided in the form titled "number of empty positions and retirement". Using this factors the hiring permissions are distributed to different eparchies and the final list of hiring positions is created. Then in order to assure that the positions are empty, the expert in charge of health providers investigates the positions that are reported to be empty. If the position is occupied, the expert tries to identify and solve the problem with the help of local human resource managers (or probably give the quota to another position).
Expectations	Gathering the list of empty positions during the deadline Formation of admissions committee with at least half plus one members Communication with university management and ensuring that the positions are empty Using information technology during the process
Customer/next process	BH1-2

Table 3. The identification of processes and other related processes

into general categories based on logical and physical relations between different activities. Then each activity was assigned a specific code. The computer software was designed after understanding the different parts of the processes, including main and sup processes, and categorization, which will be explained in the following sections.

Number	Title	Relationship	Information source	Information destination	Information sources or destination
1	Number of empty positions	Created	Eparchy expansion	Province expansion	
2	Name and locations of empty positions	Created	Eparchy expansion	Province expansion	
3	Number of hiring permissions	Created	Ministry of Health	Province expansion	
4	Eparchy population	Transferred from	Eparchy expansion	Province expansion	Annual population census
5	Number of employed health providers	Transferred from	Eparchy expansion	Province expansion	Statistic of employees
6	Number of satellite villages	Transferred from	Eparchy expansion	Province expansion	IHNS software report
7	List of hiring locations for health providers	Created – transferred to	Province expansion	Province expansion	Informing each eparchy

Table 4. Information flow in each process

3. RESEARCH FINDINGS

Based on findings, a list of main and sup processes of department of health of Isfahan University of Medical Science is presented in Tables 1 and 2.

In the second stage, identifications for each process were created. This was done by identifying the inputs and outputs, the owners, the details of the process and the type of supervision used in the process. In this stage, the expert of each process explained the details of the process and also answered questions such as who the process concerns? What type of activity happens during the process? When? Using what tools? For how long? Why and to what end?

Then in the supervision section a list of organizational supervision on each process was listed in order to be used in the supervision checklist. Finally the name of the next process or the customer of the process was mentioned. Next process or customer are processed or people that uses the output of the current process. Table 3 shows a sample of the identification gathered using the aforementioned method.

In the next stage, the process details were converted to PDF format and all documentations including guidelines, letters, instructions, and forms and excel files used during the process and all the tools were linked to the appropriate locations of the process detail.

In the next stage information flow chart of each process was created with the help of planning expert and project executive.

In the table 4 regarding the information flow of the process, three types of information is investigated and stored:

- Information used in the process,
- Information created by the process,
- Information transferred from this process to the next process.

The information are stored using the above table and can be used in the organization's information systems which facilitates system analysis in order to design and implement information systems. Information can have three relations to the process:

- Transferred from the process,
- Transferred to the process,
- Created by the process.

The first group is information created by other processes that are then used in the current process. The second group is the information created in previous processes and is transferred to other processes through this process. The third type is information created and stored during this process that can also be

transferred to other processes.

In table 4 column titled "Information sources or destination" shows which process has supplied the information or will receive the information.

In the next stage a picture flowchart of the processes was created. The special feature of these flowcharts was that the flowchart of a process didn't simply show the process itself including different stages of the process but also showed some parts of previous and next processes at the start and end of the flowchart to help understand the relation between processes.

Finally a process refinement checklist was created. This checklist was created based on the expectations of each process and posed some questions for each expectation to help managers evaluate and refine each process and spread this evaluation to all of the organization.

At the end of this study a pilot version of multimedia software was created. Current organization chart was used in different parts of the software. For example network expansion group is a group under the supervision of department of health that has three units:

- Expansion unit,
- Health provider training unit,
- Statistic and computer unit.

Each unit has different programs based on its duties and each program has different processes. This structure was the basis of the software design in which first groups and technical units of the organization are shown. Then the sub units of each group and processes and sup processes are displayed. Then description or process identification, process evaluation checklist, process information flow and process flowchart is shown for each process. By entering process description section, the process identification will be displayed based on the previously mentioned format. In the text of process description, underlined sections are parts of the process that introduce tools or documentations used during the process. These documentations and tools are linked to the description as pictures, PDF files, excel files and other formats. Therefore the reader can click on each underlined section and gains access to the documentations. This helps the user to gain knowledge regarding the process and also helps in training new employees and helps improve their knowledge regarding organizational structure.

4. DISCUSSION AND CONCLUSION

As can be seen by reading the process descriptions and other tables, one can understand some examples of knowledge in the organization. For example the fact that only the ministry of health can give permission for hiring new health providers and in order to hire new health providers one needs to know about the empty positions or knowing what type of information is cycled in the processes, which process create the information and which process uses the information are some examples of organizational knowledge. These facts and many others are among the implicit knowledge of the organization. This information is hidden in the minds of experienced employees and with their retirement and if there is no method for transferring this information to the successors, all this knowledge will be lost. Then the successor of any position needs to spend time and energy to again acquire this knowledge which can lead to waste of organization resources, troubles in the work flow, client dissatisfaction, lowering organization efficiency and other

problems. Therefore by documentation of all current activities of the organization, monitoring each process, defining information flow and information used in different processes and attaching the documentations and tools of each process to the process description (like what has been done here) one can gather a large portion of the implicit knowledge of the organization and turn it into explicit knowledge. Then this explicit knowledge can be transferred to clients, other organization, successor of each position and other interested parties. This advantage along with the advantages caused by reducing cost of operations including training new employees and increase of the efficiency can create satisfaction in the organization and in the clients.

Another value of this system is facilitating the implementation of electronic systems in the organization's daily operations and digitalizing the operations. The reason is that the first step in creating an organizational architecture that can be used for digitalizing the organizations is to know the organizational processes and procedures and then identifying processes that currently use electronic means. Other advantages of this system include facilitating learning in the employees, better and faster decision making, improving development capabilities, creating organizational innovation and motivating the employees.

CONFLICT OF INTEREST: NONE DECLARED.

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