An Approach Of Domain Knowledge Based Team Structure In Software Engineering

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Abstract.

Knowledge management is the collection of different strategies and techniques used in organization for create, represent, and utilize knowledge's. We give some idea for efficient utilization of knowledge in organization by different team member of different domain.

In this paper we experiment that how knowledge shared between different groups of team working on different domain. The different techniques we follow by investigate the organization needs for sharing knowledge's. There are two types of techniques, one for collect contact details of particular team member who expert on particular domain from database for direct communication with expert, another technique for sharing knowledge from repository about different problem occur during development by team members.

Keywords: knowledge management (KM), knowledge management systems (KMS), knowledge sharing.

1 Introduction

Knowledge management defines methodologies to identify, evaluating, retrieving and sharing all types of information related to experience of employees and knowledge used within organization. These information are databases, documents, coding, strategies, procedure. The main aim of organizations is to utilize knowledge's in efficient way to achieve the success of organization. Knowledge's are codified and documented knowledge like patents, databases, manuals, white papers etc is called "explicit knowledge". The knowledge called "tacit knowledge" which is embedded in the minds of people. The tacit knowledge is intuitive, contextual, past memories and difficult to codify, document and communicate.

2. Basic Terminology

a. What is KM

Several industries has its own knowledge assets and use KM practices. Knowledge of KM in industry or any institution serves in the way that the customer, employees, people can hire it. The main factor is how the information uses or reuses by company or the institution that is generated by interactions with their customers, employees and other stake holders.

KM uses some types of knowledge which resides in an organization or institution. So Employees or researchers learn these types of knowledge from doing an organization's work, this type of knowledge is totally different from book knowledge or from lists of regulations or databases of customer information which use in organization. Examples of knowledge like: An organization learning process by introducing new product or service, reducing material costs on capital projects, decreasing the project time in developing a product or service.

b. Knowledge-based assets

All information is not valuable. Therefore, individual Organizations decide what information qualifies as intellectual and knowledge-based assets. The intellectual and knowledge based assets are two categories: explicit or tacit. Explicit knowledge is documented, archived and codified knowledge, often with the help of IT. The concept of tacit knowledge is knowledge embedded in people's mind. There are so many difficulties with tacit knowledge are how to recognize, generate, share and manage this knowledge.

c . The Need for KM

KM techniques are the important issue for most of the organization or institution. The people working in organization or institution share their valuable experiences or knowledge's for success of organization in competitive market.

d. Knowledge creation

Knowledge creation is the activities that translate tacit knowledge which is embedded in human mind into explicit knowledge. The explicit knowledge is documented knowledge. So created knowledge is the documented knowledge which is used by organization for development.

e. Knowledge sharing

Knowledge sharing is the process where people communicate with each other and exchange their valuable experiences for reduce their knowledge gap. So different people share their knowledge's for learning and gathering information .People also communicate with each other for exchange their thoughts.

f. IT for K.M.

There is different existing technology for Connecting with all people. The technologies are e-mail or intranet systems and Intranet systems, in Intranets user have the community to store and share their documents.
The information provide to the user through knowledge Centers. The knowledge Centers provides searching facility and create query etc. This type of Knowledge centers offered online training courses.

g. Different type of Team Structure in Software Engineering

I. Ego-less Programming Team

All members are responsible for complete their work. Team members are covering all areas of work so that no one person or group concentrates any one specific area of work. So decision is making through consensus. Fig 1 represents Ego-Less programming team
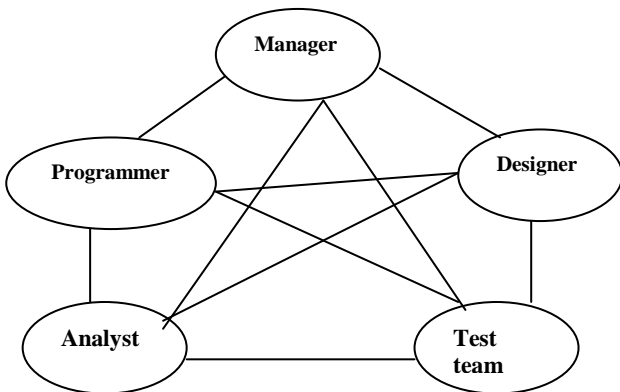

Fig 1: Ego-Less Programming Team

II. Democratic Team

Decision make through consensus.
Leadership change periodically from one person to other who have shown best team leadership capability. The democratic team encourages high productivity and morale. Fig 2 Democratic team members
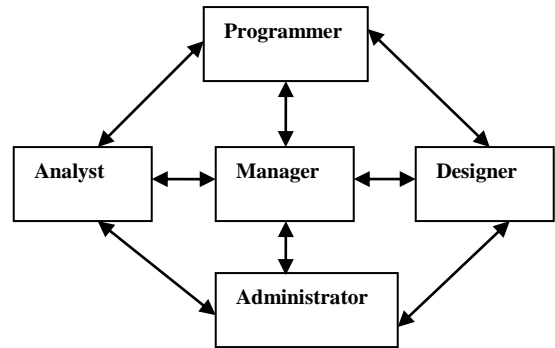

Fig 2: Democratic Team Members

III. Hierarchical Team

Management appoint a person as team leader to lead the project team. Communication of decision between different members passes to downward from top to bottom.
This method is frequently used by large company. Advantage is that best technical people are work into management .So best technician's replaces poor manager. Fig 3 Hierarchical team member
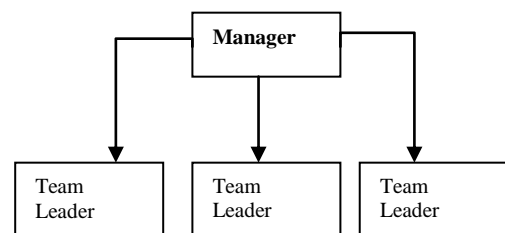

Fig 3: Hierarchical Team Member

IV. Chief programmer Team

The chief programmer makes all decision. Other team members support chief programmer decision .Chief programmer engages outstanding senior engineers. They are train juniors. Fig 4 represents Chief Programmer team
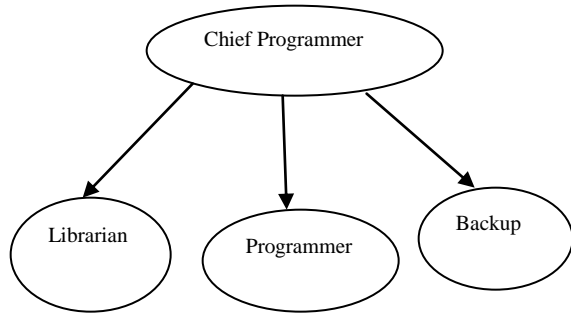
Fig 4: Chief programmer Team

V. Ideal Team

Ideal Team is open structured team. Team merges all collaborative features and hierarchical decision making. So all roles of the team are well specified and allocated. The roles are rotated within team member. . Fig 5 represents ideal team member.
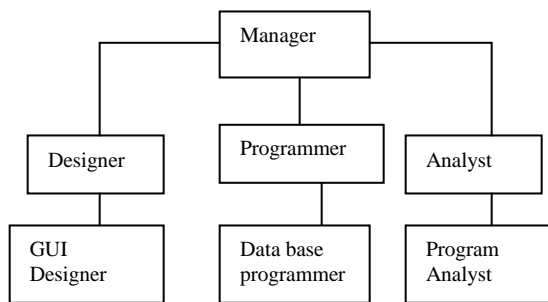
Fig 5: Ideal Team Members

Software organizations are working with different Knowledge domains. Knowledge domain are specific area of knowledge, like java, C++, .Net etc on the other hand oracle, Ms Access, sqlserver.

The employees are work on one or more different domain.
 At the time of project development, developing team is taking the people from different domain knowledge for development. For example software project developed by group of people of java domain and oracle domain. For this software project,

people of java domain should well know about the knowledge of oracle domain and vice-versa.
But there is a problem to collect knowledge that is from where or to whom one domain's people gather the knowledge about other domain. This is our particular research area.

3. Proposed idea

For large and medium team member if the knowledge needs to be share within same team member, there is also database with contact details of same team members. This contact information directly shared by any team member within same domain. Anyone can collect contact of other from database of *contact details*. So any team member directly contact with the expert to solve their problem. So communication between member with contact for sharing knowledge are processed by video chatting, video conferencing or directly communicate with mobile or telephone. Team members also share their knowledge's from a common database of *knowledge about problems* shared by same team members. Team members can store their problem and make query for solution in the database of *knowledge about problems*. So All different type of Problems, Query stored in database solved by any members of a team and they can store their solution to the database. Then solution of problems stored in the database is viewed to the member who make request for solving the problem in the database. Fig 6 represent sharing knowledge within individuals group.
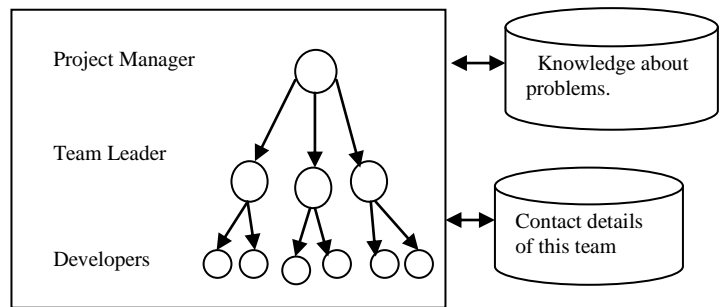
Fig 6: Sharing Knowledge of Individual Group

If knowledge sharing process is failed within same team member Then all individual team member are assembled as different group for share their knowledge's. If the knowledge needs to be share within different group of team working on different domain, there is a database with contact details of group of team members of different domain. This contact information directly shared by any team member within different group. So any team members of one group directly contact with the experts of another group to solve their problems. So communication between members of different group with contact for sharing knowledge are processed by

video chatting, video conferencing or directly communicate with mobile or telephone .There is a common sharing data base where any team members can store there problem which is viewed to the all members of different group of team working on different domain. So experts working on any group can solve the any type of problem stored in database by team member of any other groups. Fig 7 represent knowledge sharing between different group of team member.
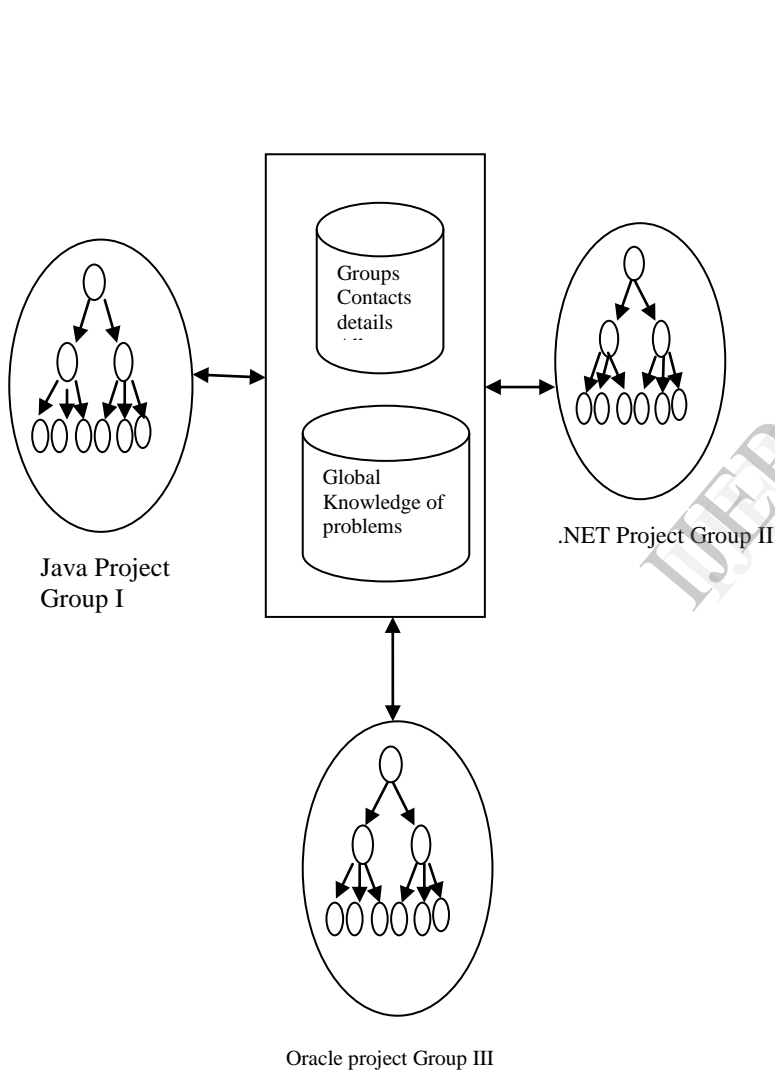
particular team member store their problems in their organization distributed knowledge database which is shared by different computer server in different location of an organization. So any team member of an organization can see the problems of other team member's work on different location from their shared distributed data base. Fig 3 represent sharing knowledge's by different team member in different location within an organization. Fig 8 represents knowledge sharing between distributed groups of team work on different location.

Fig 7: Sharing Knowledge of Different Group

Fig 8: Sharing Knowledge of Different Group of Distributed Team

If the group of virtual team work on same domain are not reside in same location of an organization Then another technique for sharing knowledge's is storing problems in distributed knowledge data base reside in different location of an organization server computer. In this techniques

4. Result & Discussion

1. X software company starting development of a .NET Project Group I. Mr. Das working on coding development

team in .NET Project Group have a problem to write code for database connection. He store his problem in knowledge problems data base in the following way

Name: Mr. Das
Contact no: xxxxxxxxxx
Problem: How to connect data base with any data base server from C# .NET.

Mr. Roy who working on same team have very strong experience in writing code for data base connection in C#.NET. Mr. Roy see the above information from Knowledge problems data base and give solution in the following way

Problem Solved by: Mr. Roy
Contact no: xxxxxxxxxx
E-mail id:xxxx@xxx.xx
Solution: 1 Open connection code: xxxxxxx
            2. Execute Query code: xxxxxxx
            3 Close connection code: xxxxx
This above information store into the Knowledge problem data base by Mr. Roy that is retrieve by Mr. Das.
If the above process is failed Then Mr. Das search contact no of experts from contact details data base.

Mr. Das retrieve E-mail Id of Mr. Roy who expert on C#.NET data base connection.
Then Mr. Das contact with Mr. Roy through video chatting.
Mr. Das verbal Chat Message:
My Name: Mr. Das
Contact no: xxxxxxxxxx
Problem: How to connect data base with any data base server from C# .NET.

Solution by Mr. Roy is that

Mr. Roy chat message:
My Contact no: xxxxxxxxxx
My E-mail id:xxxx@xxx.xx
Solution: 1 Open connection code: xxxxxxx
            2. Execute Query code: xxxxxxx
            3 Close connection code: xxxxx

2. If Mr. Das is not getting any solution from above processes then he go for Sharing knowledge from different group of team and share knowledge in same way.

3. If the above process failed then goes for sharing knowledge from Virtual team Mr. Das working on .NET project Group II of software company X in Kolkata branch have a problem for data base connection.
Then Mr Das store their problem in their distributed knowledge data base reside in Kolkata branch computer server like that

Name: Mr. Das
Contact no: xxxxxxxxxx
Working at: Kolkata
Problem: How to connect data base with any data base server from C# .NET.

Mr. Roy who working on .NET project Group III in Mumbai branch of same company have very strong experience in writing code for data base connection in C#.NET .Mr. Roy see the above information from Knowledge problems distributed data base from Kolkata branch. and give solution in the following way

Problem Solved by: Mr. Roy
Working At: Mumbai
Contact no: xxxxxxxxxx
E-mail id:xxxx@xxx.xx
Solution: 1 Open connection code: xxxxxxx
            2. Execute Query code: xxxxxxx
            3 Close connection code: xxxxx
This above information store into the Knowledge problem distributed data base by Mr. Roy in Mumbai branch computer server that is retrieve by Mr. Das from Kolkata branch computer server.
If the above process is failed Mr. Das directly communicate with contact details in same way as

Mr. Das retrieve E-mail Id of Mr. Roy who expert on C#.NET data base connection.
Then Mr. Das contact with Mr. Roy through video chatting.
Mr. Das verbal Chat Message:
My Name: Mr. Das
Working at: Kolkata
Contact no: xxxxxxxxxx
Problem: How to connect data base with any data base server from C# .NET.

Solution by Mr. Roy is that

Mr. Roy chat message:
My Contact no: xxxxxxxxxx
Working at: Mumbai
My E-mail id:xxxx@xxx.xx
Solution: 1 Open connection code: xxxxxxx
            2. Execute Query code: xxxxxxx
            3 Close connection code: xxxxx

5. CONCLUSION

We are investigate on some software companies KM practices and gather all related information insight into their KM practices. After investigate We see that KMS is used by

software companies   to improve productivity, reduce defects, facilitate reuse of software components, and share lessons learnt in execution of projects. So companies want to implement the capability of KMS for improve their performance.

In this paper we describe new ideas of knowledge's helpful for the organization to increase performance. These proposed ideas help to share knowledge's from any group of teams within organization and also from distributed teams working on different location. So knowledge globally shares from any location by any team members.

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