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Effective knowledge management

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Abstract
Introduction: since the existence of organization, organizational knowledge has been managed more informally than formal ways, done through a knowledge supporting culture, by trusting and managing the employees. The objective of this research article is to explore the knowledge effectiveness capabilities in large organizations and their impact on knowledge effectiveness. Knowledge management capabilities are explored with respect to infrastructure, structure, storage, dissemination, and application. KM effectiveness is defined in terms of improved communication, enhanced collaboration, improved employee skills, better decision making, and improved productivity.

Keywords: knowledge management, knowledge effectiveness, SPEED performance, Performance gurus

Introduction: Summary
Knowledge has a very strong human element. Hence, researchers have identified two classes of knowledge: soft (tacit) and hard (explicit) Hard knowledge can be codified, and documented. Soft knowledge cannot be externalized. As a result, effective KM in large, geographically dispersed organizations, should not only include central repository of documents, but also managing the human element as well. To address the human element, researchers defined "communities of practice (CoP)" where co-located individuals share their knowledge typically through face-to-face communication. Similarly, "network of practice (NoP)" concept expanded the CoP to cover knowledge sharing among individuals who are not co-located. The relationships in NoP are not as strong as that in CoP. Further, communication in NoP is typically not face-to-face, and could take place in electronic medium. Another aspect of knowledge sharing in a loosely coupled network is to realize the network effects.
Reed's and Metcalf's laws state that the value of a network increases at a much higher rate than the number of users increase: exponential and quadratic, respectively. There is a recent study that claims that the value of a network increases less gradually. To realize the network effects, though, the communication medium has to be peer-to-peer and not centralized Because with centralized communication model, benefits of network effect diminishes significantly.
Having provide a high-level overview of KM, we defined the problem. A small group of performance engineer were provided expertise to a small group of fields and sales engineer. As more field and sales engineer are interested in and requested performance expertise, it became evident that this model would not scale. As a result a new virtual company was started and invented all field and sales engineer who are interested in performance related topics. This area called speed.
SPEED address both hard and soft elements of knowledge. All performance related data are published in a central database where all members can access. Email exchanges among members are stored in web board format so that members can search on previous topics. Performance engineering holds annual conferences to update field and sales engineers with up-to-date information. Between conferences, they provide Internet-based seminars and webcasts to provide latest developments. Even though all emails are stored centrally, communication among members is never centralized. Peer-to-peer communication is always available, and in fact is encouraged. Members have a very strong motivation to join SPEED virtual community. SPEED membership is an important recognition for field and sales engineers as they have to be nominated by their management, and have to prove their competence by passing a certification (entrance) exam. Escalation process of SPEED makes it easy to scale out to serve thousands of field and service engineers. SPEED is considered a big success story since it leverages expertise of a small number of engineers to a much bigger audience. It further provides a virtous cycle in that members provide feedback to performance engineering with their hands-on field experience. Looking at SPEED through KM perspective, we can identify reasons for its huge success. First it addressed both the soft and hard aspects of knowledge. Second, it created a Network of Practice, where people with similar backgrounds and interests shared their experiences. Further, SPEED leveraged the network effect. As more members participated, the value of the network for everyone has increased. Lastly, the communication model was not centralized. Members were encouraged to communicate among themselves. SPEED was originally established for the only product line of the company. Since then, the company released or acquired more product lines. Based on the success of the model, the company has established parallel SPEED structures for other product lines. It is hoped that the knowledge management model of SPEED would prove to be successful with these product lines as well.

Knowledge
DATA⟶Information⟶Knowledge
Knowledge is an intangible resource that exists within the mind of the individual.
Know-how: Knowing how to do something

-Able to solve forward problem (cause → effect)
-as well as the inverse problem (effect → cause)

Management
Traditional management definition:
-plan
-organise
-lead
Yet, another definition- Effective use of resources to achieve goals

Knowledge Management (Km)
-Knowledge is an important resource of organizations.
-In today's economy, effective management of knowledge is imperative
-Time = money
In many industries cost of employee time is a significant cost item.

Duality of Knowledge
Soft knowledge vs. hard knowledge
-Softer aspects of knowledge are those that cannot be externalized
-Harder aspect are those that can be articulated, captured and stored.
- These are also known as tracit vs. explicit knowledge.

Sources and Type of Knowledge
Soft (tracit) knowledge:
-People - subject matter experts
-Organizational relationship
-Culture, beliefs, background and values
-Past experiences

Hard (explicit) knowledge
Some are structured, and well documented
-Documented (reports, presentation, etc)
-Email exchange
-Employee resumes and profiles

Other are unstructured
-Whiteboard drawings/notes
-Halfway/ water cooler small talks

Km Problem
-Managing knowledge includes not only managing documents but also managing peoples (soft/tracit knowledge)
-KM is not just putting all hard knowledge in a central repository and not an IT problem
-When organization face a problem, they need to search for the right "knowledge" in all sources

- Especially difficult to get to tracit knowledge
- How to find out whether the organization has the knowledge?
- Who has the knowledge? How to access the relevant knowledge?

Databases
May be a solution for some cases… but
-Difficult to maintain up to date
-Has to be easy to update/use
-Rewards/recognition for contributors
-Interaction among participant is difficult

Performance group develops tool for gurus to use
-know – how transfer through expert systems and simulations

Conclusion
Most importantly, cannot codify tacit knowledge – missing human element and interaction
Centralized communication reduces network effect.

Community of Practice and Network of Practice
Community of practice
- Groups of people informally bound together by shared expertise and passion for a joint enterprise
-Usually refers to face to face interactions along with strong relationship among co-located individuals

Network of practice
-Expands community of practice to include "network" type relationships that are not necessarily strong
-It also includes distributed and electronic networks

Network Effects
-REED's law: A network's value increasing exponentially with the size of users
-Metcalfe's law: A network's value is proportional to square of its uses
-Briscoe, *et al*. corrects this into n.log (n) where n is the number of members

Problem Circa
Single product line: Symmetrix
- High-end, enterprise storage array
A small engineering performance group (15-20 people)
-Measured system performance,
-Product performance reports,
-Amassed a huge system performance knowledge
Thousands of field and sales people dependent on the performance group for
-Pre sales: customer engagement
-Post sale: performance troubleshooting
Pre and post sales engineers did not communicate well
Field and sales organization grew at high rate, and expected support
The small engineering group could not scale to
-Support the field
-Share information and experience with such a large group

The Solution
Best expressed by the Chinese proverb:
"Give a men a fish and he will eat for a day.
Teach him how to fish and he will eat for a lifetime"

Better manage the performance knowledge
-Train the field
-Provide idea
-Transfer information
-Transfer know-how
-Provides tool
-Get feedback

However, it is impractical to reach everyone on the field
Speed: Symmetrix Performance Engineering Evaluation Database Started as a database, but then grew into full knowledge management system and community

Speed Performance Community
Created a community of performance experts
Member of the community are called "Performance Gurus"

The gurus are
-Pre or post sales engineers
-Nominated by their manager
-Not compensated for their participation and extra work required in speed
-Certified after taking an exam

The gurus are selected carefully to give full geographical coverage
-At least one each major cities
-At least one in each country

The Performance Gurus
The gurus form a buffer between performance group and the rest of the field
The gurus are well recognized in their local field office
Problem are escalated in hierarchical fashion
-When someone has a problem, they contact their local gurus and seek help
-If local gurus cannot find answer, the problem is escalated to performance engineering.
Performance group strictly enforces proper escalation channels

Speed Performance Guru Covenant
To be successful and practical, SPEED requires participate to abide by a covenant:
-Actively help people in their local office
-Be active in guru email list and message board
-Be willing to learn continuously from board published by performance engineering
-Provide feedback to engineering on system performance, customer expectations
-Evaluate and use tools provided by the performance group
-Maintain confidentiality of performance data – share only with other based on a need-to-know basis

Benefit of Speed to Performance Gurus
Access to performance data and reports
-Continuously updated by performance group
Access to the peer community
-Exchange customer experience
Access to engineering through performance group
-Gurus have a chance to receive fellowship and work in engineering on a specific problem
Recognition as go to performance person in their local offers
Pre and post sales engineering actively communicate
Membership is valuable and prestigious
-Nominated by their manager
-requires certification

Benefit of Speed to Performance Group
Performance gurus become first line of defence
-The group is not bogged down with simple, or known problems
-Only complex problems are escalated
Performance know-how is scaled
-Customers use and deploy products and competitive products
-Fields personnel uses internal tool developed to support field
Performance group learns about customer expectations from new products or new IT trends

Speed as Knowledge Management Solution
Employ employees with special interest in performance
SPEED gathers them under one roof
Simple problem are handled and solved locally
More complex issues are either solved
-Within speed community
-With help from performance group
Reports and performance data maintained in central database
-Indexed based on topic
-Keyword searchable

Speed as Knowledge Management Solution
Email exchange among performance gurus are retained in the Web Board
-Possible to do keyword search on past topics
Strong communication
-When new reports are published, email notifications sent to all members
-Quarterly newsletter
-Bits N bytes and case studies: short noted on specific topics prepared by gurus published in SPEED
-Engineering frequently polls the gurus to get their feedback on contemporary issue and trends in the field
Before posting for a new problem, gurus are required to search
-past web board topics
-SPEED reports to see if the problem is solved/addressed before
Performance group trains regularly with every major release of hardware and software
-Training sessions are recorded and published as wec cast Speed website

Speed has been a big success
Currently there are 800+ symmetrix performance gurus
Other organizations appreciate the value: sales and customer support organizations
-Fund many speed training meetings
-Nominate members of their organization to spend time with SPEED

Gurus appreciate the value
-Willing to prepare for, and take a certification exam
-Training meetings fill-up very quickly
Parallel "speed" stacks are established for other product lines
-Clariion (mid-range)
-Celerra (NAS)

Room for Improvement
Speed is not perfect
-Participation from gurus is not high – there are many who do not actively participate discussion groups
-IT infrastructure needs updating
-Cannot ensure and enforce that entire community digests the information and use them the right way
-Dependent on gurus motivation
Performance group has been working to improve it continuously

Lessons Learned

Important components – people

-field personnel

- Participate from diverse geographies
- Capable – nominated by their management, and passed certification

-Performance engineering personnel

- Willing to teach and transfer knowledge/experience
- Responsive to field queries
- Prepare performance reports and tools that are relevant to field

-SPEED community administrator

- Handles membership issue
- Directs work-flow of reports and other publications
- Organizes periodic training sessions and web casts
- Interfaces with IT department

Important components – Insfrastructure

-IT infrastructure

- Website: reports, web casts and web board
- Automated certification exam
- Web board and email distribution list
- Multiple access levels (engineering only, SPEED only, public etc.)

Process and procedures

- Confidentiality of data/reports and tools
- Escalation
- Communication

The knowledge and experience within the performance group is leveraged to support whole field by

-Training a larger group

-Trusting field with performance data

Win-win outcome

-Field personnel is empowered with performance knowledge

-performance engineering scale and reaches much bigger audience

References

1. Briscoe B, Odlyzko A, Tilly B. "Metcalfe's law is wrong", IEEE Spectrum, pp. 26-31.
2. Brown JS, Duguid P. The social life of information, Boston, MA: Harvard Business School Press, 2000.
3. DeSouza KC. "Facilitating tacit knowledge exchange", Communications of the ACMV, 2003, 46(6).
4. Gilder G. "Metcalfs law and legacy", Forbes ASAP, September 13, 1993.
5. Hildreth PJ, Kimble C. "The duality of knowledge", Information Research. 2002; 8(1):142.
6. Lave J, Wenger E. Situated learning: Legitimate peripheral participation, Cambridge University Press, 1991.
7. Polanyi M. The tacit dimension. First published Doubleday & Co, 1966. Reprinted Peter Smith, Gloucester, Mass, 1983.
8. Reed D. "The law ofthe pack", HarvardBus. Rev, 2001, 2-3.
9. Sharratt M, Usoro A. "Understanding knowledge-sharing in online communities of practice", The Electronic Journal of Knowledge AMI anagement. 2003; 1(2):187-196. available online at www.ejkm.com
10. Sveiby KE. The new organizational wealth, Berret-Koehler, San Francisco, 1997.
11. Teigland R. "Knowledge networking: Structure and performance in networks of practice", Ph.D. Thesis, Stockholm: Stockholm School of Economics, 2003.
12. Tiwana A. "Affinity to infinity in peer-to-peer knowledge platforms", Communications oftheACM, May, 2003, 46(5).
13. Wenger E, Snyder WM, "Communities of practice: The organisational frontier", Harvard Business Review, 2000, 139-145.