Create communities of practices to improve organizational performance

The technology-intensive case of Rolls-Royce

Is it possible to purposefully create a community that increases organizational performance in a technology-intensive organization? In large companies, technical knowledge is dispersed over individual specialists, business units and locations. For that reason, knowledge sharing and mutual learning among organization members is important for the short-term effectiveness and long term survival of any organization. This study of communities of practices (CoPs) at Rolls-Royce shows that CoPs are a valuable structure for technology and knowledge management, although never fully under managerial control.

Communities of Practices (CoP)

Knowledge sharing has been interpreted as a social process that takes place in communities, which have become known as ''communities of practices'' (CoPs). CoPs are defined as ''groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.'' They are considered a potential knowledge management tool.

Although theoretical work exists, few studies have been carried out on the effectiveness of CoPs. To address this gap, a research project to evaluate four CoPs, created within Rolls-Royce, was undertaken. The study confirms that it is possible to set up CoPs that enhance knowledge sharing and organizational performance. It also shows that the benefits gained from CoPs differ.

As knowledge is embedded in practice, learning can only occur through the engagement in practice. Novices learn through the increasing participation to a profession. Learning is therefore as much about becoming the member of a community as it is about the acquisition of knowledge.

Every CoP can be characterized by three structural elements:

1. *knowledge domain* – it creates a common ground and a sense of identity;
2. *community* – it provides a social context in which learning, creating and sharing of knowledge takes place; and
3. *practice* – a set of frameworks, ideas, styles, language, etc.

In addition to these three structural elements, a CoP is balanced between four pairs of dimensions:

1. *participation and reification* – also called the ''negotiation of meaning'';
2. *local and global* – interaction with members of the community but also with elements outside of the group;

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3. *identification and negotiation* – creates different forms of memberships and gives people ownership of meaning; and
4. *design and emergence* – the constant negotiation of meaning implies that CoPs cannot be designed, but, rather, a response to design.

They can only emerge from the interaction of the community members.

Two levels in the contribution of CoPs to an organization can be discerned:

1. the level of activities within the CoPs; and
2. the outcomes of the CoPs.

Cases and research method

This study focuses on four CoPs within the Manufacturing Engineering Group of Rolls-Royce.

Each CoP was centered on a specific manufacturing capability:

- Joining and welding;
- Measurement and inspection;
- Milling, drilling and turning; and
- Tooling and fixturing.

All members of a CoP were involved with the CoP's knowledge domain.

Setting up CoPs

Specific CoP space was allocated on the company's e-mail server for communication and information storage. A bulletin board was set up, functioning through the e-mail system, which all employees could read but only CoP members could post to.

To measure their performance, CoPs were the objects of both summative and formative evaluations. The summative evaluation focused on activity and outcome measures while the formative evaluation was qualitative in nature, in order to develop understanding of the dynamics of each of the cases.

Number of monthly postings and formal meetings were recorded as part of the summative evaluation. A measure of the knowledge sharing, internally and externally, was also included.

The outcomes of community activities were measured by four constructs:

1. numbers of new processes;
2. new products;
3. new procedures adopted; and
4. number of authorised lessons learned.

The qualitative data for the formative evaluation were gathered through interviews with CoP members and observation of meetings.

Performance of the CoPs

Results showed that each of the four CoPs enhanced knowledge sharing among technologists. It transpired that, thanks to the CoPs, members could get into contact with the appropriate individuals within the organization. CoPs removed organizational barriers, provided easy communication and increased trust.

Members concluded that activities within their CoPs had increased their performance. CoPs played an important role in the adoption of new products, procedures, and process improvements.

> **"Since learning is a process of negotiation and meaning, it takes time for a CoP to come into existence."**

The study of CoPs over time showed that there was no association between time and outcomes, nor between activity level and outcomes. This implies a higher level of activity within a CoP does not necessarily imply a bigger contribution to the practices of its members.

Explaining performance differences

In the case of Rolls-Royce, the community of Joining and welding is seen as the positive example of a CoP, whereas Tooling and fixturing is discussed as a community that has not yet provided many benefits.

The summative evaluation presented Joining and welding as the best performing CoP. The existing history between the members of this CoP made it easier for members to share knowledge and develop trust. The CoP produced a number of new procedures that has allowed the improvement of the welding capability within the company.

A balance between the four pairs of dimensions was also observed within the CoP. For instance, discussing the future developments of the technology, both inside and outside Rolls-Royce, led to opportunities for identification and negotiation.

The summative evaluation also revealed that activity level correlated with time. It takes time to raise the level of the participation in a CoP and it takes time for the CoP to produce reifications.

Tooling and fixturing, however, had a lower level of development of CoP structural elements than Joining and welding. This is partly explained by the fact that the CoP started later.

The lagging level of outcomes of Tooling and texturing was predominantly due to a skewed local/global dimension. Tooling and fixturing paid relatively little attention to local problems that members were experiencing. There was also an imbalance between participation and reification towards participation. The results were that Tooling and fixturing was very active with a global outlook, but producing a small amount of reifications.

In conclusion, CoPs at Rolls-Royce provided clear benefits to the technologists making up these communities. The knowledge that was shared through the CoPs enabled to implement process improvements and to adopt new procedures and new products.

Comments

Keywords:
Knowledge management, Knowledge sharing, Communities

This case study is a description of a project to set up Communities of Practices in a technology-intensive environment such as Rolls-Royce. It clearly shows the mechanisms and implications of CoPs and compares the different outcomes between CoPs in an attempt to understand the components of their success.

Reference

Meeuwesen, B. and Berends, H. (2007), ''Creating communities of practices to manage technological knowledge: an evaluation study at Rolls-Royce'', *European Journal of Innovation Management*, Vol. 10 No. 3, pp. 333-47, ISSN 1460-1060.