Sustaining and Developing Disciplinary Expertise in Project-Based Organizations: Balanced and Integrated Solutions

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■ ABSTRACT

This study explores how firms that rely on co-located, interdisciplinary project teams develop and sustain disciplinary expertise. It identifies different types of organizational solutions used by project-based firms, and describes how such enterprises sustain and develop disciplinary expertise in the long run.

■ THE PROBLEM

R&D firms rely extensively on interdisciplinary project teams. A chief reason, among others, is that such organizations require integrated, combined knowledge from various domains to maintain the pace of innovation.

Although such types of organizing are considered to be superior when it comes to integrating knowledge in an effective way, they do not come without disadvantages. A major challenge for such firms is handling the tension that accrues from the different characteristics and needs of the product- or output-oriented temporary organization (i.e. the project) versus the permanent organization. One challenge, in particular, is finding ways to develop and sustain the required disciplinary expertise throughout the life of the project and beyond. This challenge, which has been identified in both research and practice, centers on the organization’s attempts to develop, elaborate and thereby sustain disciplinary expertise within a firm’s core knowledge domains over time.

■ THE STUDY

This research is undertaken in three project-based firms involved in advanced product development, integrating knowledge from different engineering areas to solve complex problems. Three case studies were conducted that included extended interviews with managers, image-processing specialists and other domain experts in the three companies specializing in software, sensor systems and medical IT engineering, respectively.

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KEY WORDS
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Project organization
The three case studies show the relevance of developing and sustaining disciplinary expertise, a topic that engages general managers, project managers and individual team members.

In all cases, the trend toward organizing for increased interdisciplinary problem-solving is clear, and the efforts to do so are highly influenced by principles of agile project management and Scrum methodologies. Both structural and activity-based solutions patterns were identified.

**Structural Solutions**

The most prominent structural solution is the establishment of expert units. These units include disciplinary experts who are supposed to focus more on a particular disciplinary knowledge domain and less on interdisciplinary teamwork.

The expert units contribute to the maintenance and development of a particular disciplinary expertise by keeping up to date with recent developments within their knowledge domain, and supporting the interdisciplinary and co-located teams with specific disciplinary expertise when needed.

Two distinct forms of structural solutions have been recognized. The first, called “Disciplinary Leadership”, uses the experts and expert units to enhance disciplinary leadership. It is more effective when highly skilled disciplinary specialists are involved to whom time is allocated for individual study and competence development. The main benefits of disciplinary leadership are:

- Provides expert support to the interdisciplinary teams and to disciplinary peers
- Enhances strategic knowledge development within the main disciplines
- Recognizes the contributions of skilled co-workers
- Motivates subject matter experts to sustain and further develop their disciplinary expertise
- Creates career opportunities

The second solution, “Disciplinary Community”, uses the expert units to establish a community among disciplinary peers. The community’s main mission is to guard a strategically important disciplinary domain. The main benefits of this approach are:

- Provides disciplinary expertise to the teams
- Enhances knowledge sharing among disciplinary peers
- Fosters knowledge development within certain strategically important disciplines
- Recognizes certain disciplinary domains as holding strategically important expertise

**Activity-Based Solutions**

The second group of solutions identified in the cases includes a variety of activities, some of them rather informal or ad hoc in nature and others more formalized. Some took place within the organization while others took place outside the company borders. These activities can be divided into five main groups:

The first group involves collaboration among disciplinary peers at work:

- Competence networks with disciplinary focus sounding boards
- Cross-team testing and other joint testing activities
- Informal disciplinary group meetings
- Communities of practice with focus on products or tools
- Visiting/receiving peers at other R&D units
- Inspecting one another’s code

“FINDINGS AND PRACTICAL IMPLICATIONS

“The most prominent structural solution is the establishment of expert units. These units include disciplinary experts who are supposed to focus more on a particular disciplinary knowledge domain and less on interdisciplinary teamwork.”

“The second group of solutions… includes a variety of activities, some of them rather informal or ad hoc in nature and others more formalized. Some took place within the organization while others took place outside the company borders.”
The second group includes activities that relate to participating in organized learning arenas:

- Courses
- Conferences
- Internal wiki pages
- Research seminars

The third group involves activities related to external networking, including:

- Web-based communities and internet forums
- Professional networks
- Personal networks/friends

The fourth group contains individual activities that the disciplinary experts carry out on their own such as individual studies, hobby projects, and “experimental Fridays/Week—work with your own ideas”.

The fifth group consists of activities outside their own organization, including visits with customers.

**FINAL REMARKS**

Managers interested in finding a solution to the question of how to develop and sustain disciplinary expertise must strive for solutions that achieve horizontal integration, which implies supporting knowledge, knowing, and contextualizing simultaneously\(^1\).

The empirical findings suggest that solutions vertically integrated into everyday work practices, product development processes, and strategic goals and road maps have more potential viability in the long run. Hence, managers must strive for vertical integration of the solutions.

**FULL CITATION**


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\(^1\) *Knowledge* consists of that which an individual cognitively comprehends, for example, information, theories, methodologies broadly considered to have passed some test of validity and being institutionally backed up.

*Knowing* is the practical use of the knowledge.

*Contextualizing* implies the adaptation of knowledge and knowing to the situation, industry, clients, and stakeholders.