

Exploiting the collective knowledge generated in project-based R&D

Many organisations have moved to project-based research and development over the past 20 years to speed up the delivery of results. But what happens to the information, and especially the knowledge that is generated during such projects? What tools are available to enable the exploitation of project knowledge? And how can companies retain project knowledge and ensure it is available for future projects?

The project: a complex idea and organisation

A project is a complex system, often made up of several dozen phases, which can also interact with other projects. A major project might run for many years, and at its height could employ up to three project managers and 15 researchers. If many projects run in parallel, several dozen people could be working together.

This sort of complex system usually faces many serious issues during its lifespan. In the energy sector over the past 15 years these have included shorter deadlines due to deregulation, and a rise in demand for economic studies, both of which have led to increasing demand for research.

Project management in R&D

Within R&D centres, project-based organisation has caused a fundamental change in management processes. These organisations now run within a matrix and function around project managers and researchers, working with program managers. The program managers, in turn, work with a management committee that includes other program managers, cross-disciplinary competence centres, new customer and supplier relationships and an evolving management and operational process.

This project-based logic has its limits. Project-based management implies deadlines. Project leaders and researchers end up spending 95% of their time dealing with immediate issues, such as customer meetings, financial reporting and staff management, to the detriment of creating new knowledge. Most projects are allocated little time to deepen their knowledge because they have deadlines to meet. Experts, who are supposed to work partly on fundamental tasks and partly on the project, end up working in one of two ways: either integrated into a project, where they spend less than 5 % of their time deepening their insights; or working relatively independently, and often outside the project, on developing an area of expertise.

The result of generating knowledge through a series of projects is a paradox: it gets more difficult to solve problems because of the pressure on human resources and the presence of intermediate deliverables that create deadline emergencies. Companies also have to deal with an increasingly transitory research workforce, who may work on one project but not the next, and may even be hired away by clients for the knowledge they developed during the project.

Project management, by its nature, focuses on 'deliverables' and sometimes neglects the exploitation of existing knowledge or the development of new knowledge. And the approach doesn't have an answer to the question: what happens to the knowledge acquired during the project, once the project is over?

This issue troubles project leaders and recurs regularly in feedback from workgroups such as EIRMA's special interest group on knowledge management (SIG-III), and in discussions by its members. Applying project-management techniques to R&D undermines an organisation's ability to profit from the experience that it accumulates during its projects.

What's particularly troublesome in project-based R&D is that so much of the knowledge that is created is collective knowledge, a combination of information, insights and expertise that is wrapped up in individuals, groups of individuals and the relationships between them. Collective knowledge is powerful, since it is inherently shared and regularly tested as individuals interact. But it is as difficult to maintain as it is to maintain the same group of researchers on a project, and profoundly difficult to separate from that group of people.

Exploiting project knowledge

There are several approaches to information management in such contexts, based on tools, communities of practice, organisational structures or a combination of all three.

The technological approach uses software tools to attempt to capture both information and knowledge. These tools can be expensive and rarely take into account the context into which they are introduced, which often results in failure and can sometimes undermine a company. They promote the capture and sharing of information but often neglect the collective and relational dimension of knowledge.

The combined quality and process approach usually applies in organisations that have rigid quality systems, procedures and goals that describe the whole company process. This approach usually demands too many deliverables, reducing the researchers' freedom to work.

A social approach based on 'communities of practice' puts information at the centre of a network of human relationships. This tends to make it easier for individuals to exchange and exploit knowledge and best practices. Such approaches often emerge from human resources policy and the organisation's circumstances, such as having multiple, widely dispersed R&D sites.

The integrated approach to knowledge management tries to bring together aspects of all of these, and adds leadership by experts in the project field.

Teams within CRIGEN tend to prefer combinations of the first three approaches, in different mixes depending on the context in which they function. The composite approach to knowledge management relies on a recognition of the role that experts can play improving relations between people and organisations within their domain of expertise. Such leadership tends to strengthen the project's collective intelligence.

From exploitation to the creation of new knowledge

Knowledge can quickly become obsolete and so the key issue is not to exploit knowledge but to create new knowledge. Knowledge is not only a rare resource to exploit at all costs, to hoard and to reuse later: knowledge needs constant updating.

The key issue is to create new knowledge

How does one create and update this knowledge? The answer is to use the expertise, embedded in people and in the relationships between people, as an active memory of the project that captures the past successes and failures, approaches and decisions that brought the project to its current status.

Conclusion

Companies that do project-based R&D are very interested in how they can capture and exploit the knowledge that is generated during their projects. The way this is done is a delicate issue because it depends on the project's stakeholders, size and duration.

To ensure that project knowledge is successfully captured, retained and refreshed it is necessary to rise above the debate between individually gathered tacit knowledge and collective explicit knowledge and the idea that knowledge only has to become explicit to start a new spiral of knowledge creation. One must think instead of a network of actors organised into communities of practice that incorporate and convey knowledge.

Innovation can only derive from knowledge sharing, hence the difficulty of importing it, or transferring it internally, without the people who developed it being available to share or interpret it for new users. This is why it is important that people working on projects and in professional practice have access to an external network that provides a community of practice: they need to talk to experts to animate the knowledge they can get from static sources.

Coupling such communities with leadership from experts can reconcile the dynamics of project management, with its ever-pressing deadlines, with the desire to preserve and refresh project knowledge.

I think projects should not be too focused on a customer's deliverables to the detriment of capturing and preserving the project knowledge. And I am convinced that human organisation, especially communities of practice led by experts, is the key to knowledge management within a project-based organisation.

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Links

EIRMA's special interest group on knowledge management (SIG-III)

<http://www.eirma.org/f3/forumdisplay.php?f=17>

The evolving role of knowledge management in R&D organisations

<http://www.eirma.org/eiq/018/pages/eiq-2009-018-0010.html>