

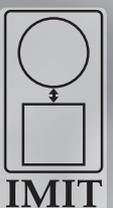
MANAGEMENT

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Open innovation in technology development

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Open innovation in technology development

– how an integrated set of project management practices can help companies to collaborate better with market- and science-based partners in technology development

In increasingly open innovation processes, many companies find that adopting a set of integrated project management practices for project coordination and control is crucial for technology development outcomes. This article reports on how project management practices can be adapted to market-based and science-based collaboration respectively.

av Fábio Gama, David Rönnberg Sjödin and Johan Frishammar

Technology development is a particular type of exploratory project which serve as a foundation for subsequent new product development. Technology development projects may include basic research, fundamental research and technology platform initiatives, and are indeed critical for technology-oriented companies. For example, many Swedish manufacturing companies are currently exploring inter-organizational technology development in areas such as automated machines, nano-materials or electric propulsion together with other companies, or with universities or research institutes, trying to create future value to enable the next generation innovations for their customers.

” *Leading companies are increasingly modifying and adapting their existing project management practices to diminish misunderstandings and promote joint problem solving among partners* ”

Most companies have limited resources and competences to pursue technology developments on a pure internal basis so inter-firm collaboration or collaboration with universities or research institutes is a potential solution. The open innovation concept has at its very core that technology development activities can and should be conducted in partnerships across companies boundaries. We refer to such projects as open technology development projects. However, these projects seldom run smoothly. Different

project management styles among partners might collide which leads to misunderstandings, conflicts and hampered benefits of development.

To account for these problems, leading companies are increasingly modifying and adapting their existing project management practices to diminish misunderstandings and promote joint problem solving among partners. This implies that they are revising their coordination and control practices to build an integrated set of practices to streamline the involvement of market-based (e.g. customers and suppliers) and science-based partners (e.g. universities and research institutes). However, many companies still lack an in-depth understanding of how their project management practices can be adjusted to manage open technology projects with different partner types. This article reports insights from a study of three leading Swedish manufacturing companies, and how they adopted project management practices to better manage different partner types in technology development (See figure 1).

Practices for improving management of market-based partnerships in technology development

Market-based partnerships with customers and suppliers is regarded as a rich source of knowledge. While customers may contribute first-hand information on technology trends and market needs, suppliers may provide expertise on the latest technologies available. Although such partnerships represents a valuable source to access new knowledge, mismanaged coordination and inappropriate control frequently lead to conflicts and misunderstandings. To deal with these problems, we identified the following practices:

Synchronized coordination practices involves activities dedicated to align routines and tasks between a focal company and external business partners. It enables companies to synchronize their different processes and thus prevent causes of partnership failure, such as divergent development processes. Synchronization

of coordination practices can be established in three ways. First, by using process comparison at the project scoping stage through kick-off workshops. Second, via joint stages synchronization (e.g., shared milestones and Gantt charts). And third, by implementing common terminologies at the early stages of the technology development. Better synchronized coordination practices can help companies reduce transaction costs by encouraging discussion and thereby mitigate re-works during later stages of open technology development.

Aligned control practices is about up-front and organized meetings during the project-scoping phase. Initiated by a project manager, it intends to assess project's performance through predefined criteria mutually agreed among by the business partners involved (e.g., deadlines and targets for technology readiness levels). Aligned, control practices help companies mitigate problems that occur during open technology development. For example, companies can implement a "gate zero" before a formal collaboration with customers and suppliers take off. During the "gate zero" meeting, project managers from both sides are able to create, refine and adjust project scope and set joint goals. In addition, companies can agree in advance upon partner representation in steering committees, which helps evaluate the project from each partner's perspective and which therefore reduce problems of disagreements at later stages. An additional benefit is that e.g. a buyer can better understand the supplier's perspective and expectation during the project review meetings. In sum, aligned control practice reduce risks and confusion in open technology development projects.

Practices for improving management of science-based partnerships in technology development

Universities and research institutes are may offer access to still unpublished knowledge, enabling companies to quickly build on the latest research findings, in addition to a broad scientific knowledge base. Although these partners are important sources of novelty, science-based partners have incentives very different from com-

mercial companies. Researchers at universities are typically driven by novelty and discovery in its own right, and oriented towards publishing their work. Such differences may create conflict which needs to be managed. Our case study identified the following appropriate practices:

Adaptable coordination practices refers to the adoption of flexible procedures to accommodate partners' differences into company practices. When companies collaborate with science-based partners in open technology development projects, they may assume flexible and more informal routines for sharing progress. For example, rather than adopting strictly formal coordination procedures such as up-front review check points, companies may really

”By implementing adaptable coordination practices companies can reduce the impacts of cultural differences and therefore increases the chances of collaboration success”

on more relaxed modes. This may imply less interaction at the early stages and then more interaction later on. Moreover, companies may create a higher-level activity plan to coordinate the joint activities. While a traditional coordination plan typically require systematic arrangement of predefined activities based on meticulous schedules and schemes, companies benefit from assuming more informal reports. In summary, by implementing adaptable coordination practices companies can reduce the impacts of cultural differences and therefore increases the chances of collaboration success.

Parallel control practices are characterized by interrelated project evaluations between companies and scientific partners. During

	Project management practices	Activities
 <p>Market-based partner</p>	<ul style="list-style-type: none"> • Synchronized coordination practices 	<ul style="list-style-type: none"> • Adoption of process comparison in the project scoping stage • Joint stages synchronization by activities mapping • Implementation of common terminologies
	<ul style="list-style-type: none"> • Aligned control practices 	<ul style="list-style-type: none"> • Conducting joint review meetings with the project management group • Implementation of gate zero before formal collaboration • Adoption of partners representation in the steering committee
 <p>Science-based partner</p>	<ul style="list-style-type: none"> • Adaptable coordination practices 	<ul style="list-style-type: none"> • Include scientific performance indicators in evaluation criteria • Adopt dual evaluation structure for respective partner
	<ul style="list-style-type: none"> • Parallel control practices 	<ul style="list-style-type: none"> • Assume flexible and informal routines for sharing progress • Adoption of less detailed activity plan

Figure 1. An integrated set of project management practices to manage business- and science-based partners in open innovation

project evaluations, companies and scientific-based partners can examine the deliverables by similar criteria using dual evaluation structures. For example, whereas companies consider quantitative and qualitative criteria based on business strategy fit, probability of technical success, and commercial success, science-based partners can adopt knowledge creation or quality and quantity of publications. To connect both sets of criteria, companies can include scientific performance indicators in the evaluation criteria (as key performance indicators in the project checklist). By assuming parallel control practices, companies can ensure that open technology projects will be guided by interconnected goals which will facilitate the synchronizations between activities.

Conclusion

Open technology development have enabled companies to de-commoditize product offerings by creating disruptive technologies in alliance with customers, suppliers, universities and research institutes. But to operationalize this collaboration in practice, and reap the benefits of it, companies have to revise their project management based on an integrated set of practices. If control and coordination practices are not properly adjusted, conflict or tension between partners might emerge and hamper open technology development outcomes. Companies attempting to improve the ways they manage open technology development should revise their project management practices and in particular adapt these to the type of partner they collaborate with.

To sum up, our study provides the following key advice for managers:

Managers seeking to start open technology development projects with partners need to pay special attention to project management practices already at the earliest stages to avoid conflict and misunderstandings.

There is no "one-type-fits-all" management practice appropriate for all types of partners in open technology development. Managers thus need to move away from the idea of a universal/standard practice and adapt practices of coordination and control to each partner's characteristic (market-based vs. science-based).

While project management practices for market-based partners require synchronization and alignment of practices among partners, science-based collaboration require flexible and adaptable practices taking into account different working styles. ●

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For more reading connected to this topic please see

Gama, F., Rönnerberg Sjödin, D. and Frishammar, J. (2017) 'Managing interorganizational technology development: project management practices for market- and science-based partnerships' *Creativity and Innovation Management* (in press).

Gama, F., Rönnerberg Sjödin, D. & Frishammar, J. (2015). *Managing Open Technology Development: Adapting Stage-Gate Processes to Partner Types* (ed.). Paper presented at CINet Conference 2015.

Grönlund, J. Rönnerberg Sjödin, D. Frishammar, J. (2010) 'Open Innovation and the Stage-Gate Process: A Revised Model for New Product Development', *California Management Review*, 52(3), 106-131.

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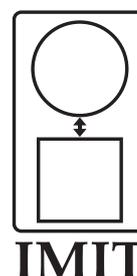
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