Role of Information Systems in Empowering Innovation Networks\(^1\)

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**Executive Summary**

Open innovation networks, which involve a diverse set of partners, are vital for developing new products and services, especially for small and medium-sized enterprises (SMEs). Information systems play a significant role in empowering such networks throughout the entire open innovation process. The full article presents the case of an innovation network in the medical device industry, and identifies the key IS functionalities needed and provides guidelines for CIOs to facilitate innovating in networks.

**The Open Innovation Funnel**

The open innovation model is often depicted as a funnel with three phases—*co-shaping*, *co-performing* and *co-opting*.

Co-shaping entails identifying novel business opportunities, selecting and integrating partners and their resources, and collaboratively developing ideas and value propositions to satisfy emerging customer needs.

Co-performing involves adjusting the value chains of the firms in the innovation network to collaboratively develop products or services as part of an aligned innovation process. At the end of a successful new product development project, the new product or service may cause a firm to reconsider and maybe reinvent its business model. Through co-opting, firms can leverage learning and alignment with partners to reach and open new markets.

In the case described in the full article, the innovation network included the medical device manufacturer, manufacturers of subparts and providers of consulting, research and engineering services. The partners’ expertise was linked through knowledge maps and knowledge spaces for co-shaping. The IS support included an innovation procedure toolkit for co-performing, and integrating compliance structures for co-opting in

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the network. At the end of the project, these information systems formed a shared IS infrastructure for innovation networks.

A Shared IS Infrastructure for Innovation Networks

A key element if the IS infrastructure was the knowledge maps, which depicted the overall positioning of partners within the network and were implemented with the help of open source business process modeling software and made available on a shared collaborative work environment (CWE). The maps captured value chain structures, types of partners and the services or manufacturing capacities required for the new product to succeed. The CWE was a wiki-based workspace comprising workflow, deliverables and project management functionalities. As the project proceeded, the partners extended it by adopting particular practices and procedures as well as a diverse set of IS tools.

Another key IS functionality was the innovation procedure toolkit, which contained methodologies, or reference models, that described how to integrate multiple perspectives of a complex problem, how to identify gaps in the development such as missing expertise or knowledge, and how to explore viable next steps in a problematic situation. The methodologies were configured as application software (apps) installed on the CWE for use by the innovation network members.

Other IS functionalities included in the shared IS infrastructure were knowledge spaces (which integrate knowledge between partners) and social media (used to gain an overview of competition and market/technology options).

For each of the phases of the open innovation process, the IS infrastructure provided key functionalities that addressed the broad spectrum of challenges in innovation networks.

Guidelines for Managing the IS Infrastructure for an Innovation Network

Based on the medical device case, the full article provides nine guidelines for CIOs, grouped by the three phases of the open innovation process.

**Phase 1: Co-shaping the Innovation Network.** During Phase 1, the CIO needs to:

1. Implement shared tools to map the innovation network’s ecosystem
2. Promote the firm’s expertise as a service to network partners and set an example
3. Implement processes to ensure scale and scope economies in the innovation network.

**Phase 2: Co-performing in the Innovation Network.** During Phase 2, the CIO must manage alignment and partner integration by:

4. Implementing an IS-based joint project management approach
5. Implementing a joint innovation management approach
6. Using systematic methodologies to ensure project progression.

**Phase 3: Co-opting for the Innovation Network.** During Phase 3, the CIO needs to cooperate across partnering firms to arrange for an effective long-term implementation. Specific actions are to:

7. Implement processes to ensure compliance with regulations and documentation standards
8. Implement an agile approach for coordination
9. Implement a strategy for a shared IS infrastructure.

In conclusion, innovation networks are crucial for developing new products or services. The case described in the full article shows that a network of SMEs can build a shared IS infrastructure for innovating if they effectively harness the IS functionalities needed to support collaboration at each of the three major phases of the innovation process—co-shaping, co-performing and co-opting. CIOs, together with their counterparts in innovation network partners, need to establish a balanced portfolio of IS functionalities that lay the foundation for a shared IS infrastructure for innovating in networks. By building such an infrastructure, SMEs have the opportunity to tap an exceptional potential of sustained competitive advantage via an innovation network.