

Making Open Innovation Ecosystems Work: Case Studies in Healthcare

By Donald E. Wynn, Jr., Renée M. E. Pratt, and Randy V. Bradley

In recent years, government agencies have been faced with the following challenge: finding innovative approaches to deliver technological solutions to agency operations while at the same time, dealing with declining tax revenues and calls for more efficient utilization of public resources. In the private sector, there has been a steady flow of technological advances being developed among organizations and individuals.

Open Innovation

One attempt to address this challenge is the idea of open innovation. For our purposes, open innovation is about getting external ideas into an organization to improve its ability to develop new products and services. Open innovation is also a way to take internal innovations to market through external channels. These two approaches can be used by government agencies that are interested in improving and increasing the value of their innovation processes; a vital area of emphasis in recent years.

This definition highlights the two approaches by which agencies can benefit by adopting open innovation practices:

Approach One: By adopting or using innovations that were developed externally, agencies can capitalize on industry best practices. Because these resources already exist, there is often less incentive to spend time and funding on conducting basic research and development internally within the organization.

Approach Two: By allowing their intellectual property (IP) that is developed internally to be released to the external markets, an agency can gain legitimacy, additional support options, and complementary products and services. In addition, releasing an innovation may attract additional ideas and components to the agency contributed by external parties. These contributions can be included in subsequent innovative projects.

Management Challenges to Open Innovation

Open innovation introduces three managerial challenges: 1) an agency must be able to motivate administrators and line employees to contribute intellectual property that is developed internally to those outside their organization; 2) the agency must be able to identify and access promising ideas developed outside the organization that can benefit its internal processes; and 3) an agency must develop the capability to incorporate these external ideas, along with internal resources, to improve its innovation processes.

This report discusses a particular type of healthcare information technology—an electronic health records system (EHR)—that is an open-source software platform. Open-source software has been described as a particular manifestation of open innovation, based on two elements of the open source model:

- collaborative development of the technology (i.e., a software platform) and
- shared rights for everyone to use the technology.

Typically, open-source software projects generate revenues through the sale of complementary products and services, such as additional licensing fees for commercial support options. However, this is typically not an option for government agencies pursuing an open-source model, because the products are developed using public funding (making it illegal to sell them back to the public). However, despite not being able to generate revenues directly, agencies can derive significant benefits by establishing the technology as a de facto standard. The agency would achieve this by:

- releasing the technology for public use,
- attracting improvements and additional products from external adopters of the technology,

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- generating mindshare and goodwill within the industry market surrounding the technology, and
- increasing the support options for the technology that are available to external adopters and the agency.

Open innovation allows the agency to solve a number of important issues related to the value of its innovative practices, but perhaps the most crucial issue is how to attract and motivate external participants to help with its innovation practices. To address this issue, we first introduce the concept of a technological ecosystem.

Open Innovation within a Technological Ecosystem

To illustrate how open innovation can work, the authors employ the concept of the technological ecosystem to demonstrate that fostering innovations cannot be done alone. The authors define an ecosystem as:

“The set of individuals and organizations operating within a given market space in order to provide a complete value proposition to the end customers, who are also part of the ecosystem.”

Based on our research, successful technological ecosystems can be managed by paying attention to five key elements of an organizational ecosystem:

1. Resources—the contribution made and exchanged among the participants of an ecosystem
2. Participants—the characteristics of the participants
3. Relationships—the relationships and interaction among the participants
4. Organization—of the ecosystem as a whole
5. External environment—in which the ecosystem operates

By managing these elements effectively within an ecosystem, the participants can realize an increased level of

functionality and enhance operations that, in turn, enable them to achieve a sustainable level of value creation.

Achieving Open Innovation with Technological Ecosystems

In this report, we discuss the means by which a government agency can capitalize on open innovation via an open-source software-based technology ecosystem. Although we discuss a specific form of ecosystem in open-source software, we stress that it is a manifestation of open innovation in general and as such, similar issues and practices are applicable across a wide range of alternative open innovation programs. Based on our research, government agencies can capitalize on the available benefits in one of two ways, depending on whether or not they have existing technologies around which to base an ecosystem.

For government agencies with previously developed technologies or systems that are effective for their internal needs, one strategy for capitalizing on the existing technologies would be to create an ecosystem of external participants around the technology in an effort to capture the innovation that exists elsewhere. This requires attracting and retaining a wide range of potential participants and making the technology available to them in order to encourage and appropriate the resultant innovation. This strategy is exemplified by the U.S. Department of Veterans’ Affairs’ attempt to sponsor a new ecosystem around its existing VistA software.

An alternative strategy is to join an existing ecosystem. This strategy is appropriate for agencies seeking to develop new technological innovations from scratch, and will allow such agencies to utilize the resources available within the existing ecosystem in combination with their own resources.

Making Open Innovation Ecosystems Work: Case Studies in Healthcare

The report presents two case studies from the healthcare sector that describe how technology ecosystems work and can effectively stimulate the development and dissemination of innovation.

- U.S. Department of Veterans Affairs (VA) built a new ecosystem around its VistA electronic health records software in order to better facilitate the flow of innovation practices and processes between the VA and external agencies and private firms.
- State of West Virginia selected a variant of the VistA software for deployment in its hospital system, saving a significant amount of money while introducing a number of new features and functionality for the seven medical facilities.

Each case study has been evaluated based on the five key elements of an organizational ecosystem outlined earlier.

Best Practices to Capitalize on Open Innovation

Based on our study of the two ecosystems, we've identified 10 best practices for organizations seeking to capture significant return on investment from sponsoring innovation through technology ecosystems. We have delineated these practices according to the framework for evaluating and managing ecosystem elements described earlier: resources, partnership characteristics, relationships among members, ecosystem organization, and the external environment.

Resources

1. Define Clear Goals and Objectives for Open Innovation

Agencies participate in open innovation in order to introduce external ideas and solutions into their internal innovation projects and/or to enable the commercialization of internally generated innovations in the external marketplace. Prior to participation, agencies need to know which goal to pursue in order to maintain an adequate level of focus and make decisions accordingly. For instance, the VA was focused on both objectives in order to maximize the ultimate value of the VistA software, both within the agency and in the healthcare industry in general.

2. Manage and Monitor Resource Flows Across Agency Boundaries

By definition, open innovation requires the sharing of information and other resources in both directions across the borders of an organization. An agency should not only appropriate resources from other parts of the ecosystem as inputs to their internal processes, but also contribute resources to other members of the ecosystem. In addition, the agency needs to identify and monitor the resources it is receiving from the ecosystem. What ideas, information, and

relevant knowledge have been brought from the ecosystem into the agency's internal innovation processes? Similarly, how has the agency's costs of innovation, product development, and support changed?

3. Manage Intellectual Property Rights

In many cases, the agency will possess patents, software licenses, and other IP rights on the basis of its past innovation results, which it can use as leverage in the outside market. Government agencies are often incapable of utilizing their IP in the marketplace to generate revenue or other direct monetary gain. However, IP plays a significant role in open innovation projects. It is important for agencies to strike a balance between retaining and releasing its IP to maximize the benefits of its open innovation and its overall organizational effectiveness.

Participant Characteristics

4. Seek and Encourage Diversity Among Ecosystem Participants

One of the best indicators of a growing, resilient ecosystem is an increase in the diversity of participants. While it is important for an ecosystem to have a large number of participants, it is equally important for it to attract and retain members of many different types to avoid homogeneous "groupthink."

Relationships Among Members

5. Establish Effective Positioning within the Ecosystem

Once the goals and objectives for participation are set, an agency must be careful to build and maintain relationships that will enable it to achieve its desired outcomes. For instance, for an agency or other entity (such as either the VA or the state of West Virginia) to access specific software development expertise, it will need to ensure that it can establish effective working relationships with vendors that possess this expertise.

6. Be an Active Team Player

In addition to establishing the correct relationships, a participant must be a good citizen of the ecosystem in order for other participants to value their contributions and thus, enable them to fully take advantage of any benefits that may be available. This includes a number of attributes and actions an agency can take, such as by being an active contributor to avoid any accusations of "free riding." It is important for a participant to be committed enough to contribute a significant amount of resources toward the ecosystem, as appropriate.

Ecosystem Organization

7. Establish and Observe Effective Governance and Leadership

The type of governance model that is established sets the tone for the cooperation and coordination among members of an ecosystem, while leadership establishes its vision and purpose. As such, it is crucial that these be established to enable participants to work together toward a shared outcome, while also enabling them to achieve their individual objectives. Governance and leadership work best in open source and open innovation when they are established in a shared manner, with each participant having a say in both the ecosystem's rules of conduct and the overall purpose.

8. Encourage Openness and Transparency

Similar to the establishment of effective governance and leadership, an agency should be willing to pursue openness when establishing an open-innovation program. This openness can be encouraged in many different ways. Participants should share their goals and objectives freely with other members without harboring hidden agendas that may lead to distrust if exposed or observed by others. The more open and transparent a firm can become with respect to its existing processes, the more likely other members will contribute external ideas that can increase the value of the overall innovation ecosystem.

External Environment

9. Minimize Friction and Bureaucracy

An organization must learn to eliminate any close-minded attitudes toward “not invented here” that employees may have regarding the quality or usability of externally developed ideas. Another source of friction in public agencies and other large organizations is the existence of countless rules and regulations that must be followed to precision, despite any complexity or ambiguity inherent in them. In order to capitalize on creativity and innovation, an agency must learn to work through or around these issues to enable external participants to work with the agency effectively and quickly. Without this flexibility, innovation is strongly discouraged and in the worst cases, impossible.

10. Continuously Monitor External Conditions

Changes in regulatory policies, political climates, and industry conditions are inevitable. Monitoring the external environment for such jolts is therefore important in order for members to assess the resulting changes and adjust their

participation accordingly. These changes also may necessitate changes in the governance and leadership of the ecosystem as a whole. It is crucial to keep a watchful eye beyond the ecosystem to be prepared for anything that may affect future contributions, coordination efforts, and results.

Conclusion

Although this report is based on a study of two open-source software ecosystems, it is important to recognize that open source is a manifestation of open innovation in general. As such, similar issues and practices are applicable across a wide range of alternative open-innovation programs. In addition, similar results can be found in other industries.

For example, the state of Georgia effectively sponsored an ecosystem surrounding an in-house developed open-source, software-based, integrated library management application. In addition, several universities (public and private) have joined forces to develop the SAKAI learning management system platform with new members joining each year. In both of these cases, we still find many of the recommendations that we describe above to be applicable in industries other than healthcare.

Agencies must be able to act in bold and proactive ways to be able to execute open innovation successfully. ■

TO LEARN MORE

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The report can be obtained:

- In .pdf (Acrobat) format at the Center website, www.businessofgovernment.org
- By e-mailing the Center at businessofgovernment@us.ibm.com
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