How Schlumberger Achieved Networked Information Leadership by Transitioning to a Product-Platform Software Architecture

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Executive Summary

To sustain its competitive position as the leader in providing information solutions to the oil and gas industry, Schlumberger transitioned to a cutting-edge product-platform software architecture by embedding a leading geological modeling software product—Petrel—within Ocean, its collaborative open software platform. The purpose was to open up Petrel through the layered Ocean platform to broaden the company’s information innovation network with a view to maximizing customer satisfaction. To achieve this, four challenges had to be overcome: (1) fostering global innovation and knowledge sourcing; (2) securing core knowledge while ensuring platform robustness; (3) regulating the contributors’ network; and (4) ensuring an adequate quantity of high-quality contributions. We have identified the seven practices Schlumberger followed to address these four challenges. These are summarized below and described in detail in the full report.

Seven Practices for Overcoming the Four Challenges

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<th>Practices</th>
<th>1. Fostering innovation and knowledge sourcing</th>
<th>2. Securing core knowledge while ensuring platform robustness</th>
<th>3. Regulating the contributors’ network</th>
<th>4. Ensuring an adequate quantity of high-quality contributions</th>
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<td>1. Identify a modular software product that can be overlaid with a scalable software platform</td>
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<td>2. Create a product-platform software architecture by integrating the identified software product and platform</td>
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<td>3. Extend the platform knowledge ecosystem by fostering partnerships and alliances</td>
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<td>4. Enhance the architecture functionalities by incorporating diverse internal and external products and platforms</td>
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<td>5. Establish governance processes for ensuring quality and timeliness of architecture functionalities</td>
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<td>6. Orchestrate solution development and distribution through unconventional channel partners</td>
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<td>7. Coordinate sustained growth through communication to diverse target audiences at multiple events</td>
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1. **Identify a Modular Software Product that can be Overlaid with a Scalable Software Platform.** Petrel was primarily a siloed reservoir modeling application while Ocean was a powerful platform that could support and foster innovation through collaboration across Schlumberger business units. However, despite their strong potentials, both Petrel and Ocean were individually limited in their functionalities and reach.

2. **Create a Product-Platform Software Architecture by Integrating the Identified Software Product and Platform.** To provide enhanced capabilities and functionalities, Schlumberger integrated Petrel with the Ocean platform so that, together, they can help scale up Schlumberger’s innovation capabilities. Soon after the Ocean platform was overlaid on the existing Petrel functionalities, Schlumberger started adding new domains to Petrel to meet growing user requirements. This was possible only because such a scalable extension was planned during the initial design phase.

3. **Extend the Platform Knowledge Ecosystem by Fostering Partnerships and Alliances.** The innovative Ocean-Petrel software platform was opened up to the internal and external ecosystem of contributors and users—within Schlumberger, the oil and gas industry, software developers and academia. Schlumberger’s knowledge sourcing thus became open and global.

4. **Enhance the Architecture Functionalities by Incorporating Diverse Internal and External Products and Platforms.** This practice emphasizes the importance of integrating, maintaining and expanding the systems and platform network. The platform design enables others to produce plugins that integrate with Petrel data accessed through a communication protocol.

5. **Establish Governance Processes for Ensuring Quality and Timeliness of Architecture Functionalities.** To ensure adequate quality of the plugins made available through the Ocean store, Schlumberger specifies a series of acceptance tests for both internal and external contributors. Plugin developers commit to upgrading their products to match new releases of Petrel.

6. **Orchestrate Solution Development and Distribution Through Unconventional Channel Partners.** In addition to conventional channel partners and selling plugins through its own Ocean store, Schlumberger actively involved academia as channel partners. Though academic institutions cannot sell their products through the Ocean store, their expertise can be leveraged in marketing the products.

7. **Coordinate Sustained Growth Through Communication to Diverse Target Audiences at Multiple Events.** The five main communication channels and events through which Schlumberger sustains growth of its ecosystem are: the Ocean website, user group meetings, Ocean plugin academic competitions, local industry events and participation in international oil and gas industry events.

**Three Principles**

Synthesizing the seven practices followed by Schlumberger, we have derived three principles that can be used to inform similar future implementations:

1. **Develop Your Most Competitive Products on Extensible Platforms**
2. **Nurture Resource Sourcing by Opening the Platform**
3. **Foster Control with Collaborative Growth**

The seven practices used by Schlumberger and the three key principles we have distilled from them can be used as the departure point for companies either transitioning from independent software product and software platform architectures to an integrated product-platform architecture or aspiring to be product-platform software architecture leaders for facilitating open innovation.

In conclusion, the full article describes how Schlumberger reformulated its information and software innovation strategy by opening up its product-platform software architecture to a new set of internal and external contributors. This open information innovation strategy dynamically evolved with the software strategy as Schlumberger transitioned from a closed software product—Petrel—to an open collaboration system enabled by overlaying Petrel with the Ocean software platform. The combination of Petrel and Ocean created a modular and scalable software platform, or an integrated product-platform software architecture, which provided Schlumberger with a competitive edge in the oil and gas industry. Through a carefully planned software evolution strategy intertwined with an open innovation philosophy, Schlumberger was able to expand the flexible functionalities of Petrel and provide them to a wide range of contributors from the industry and academia through the Ocean platform.