APS1012

Framework to Manage Technological Innovation in Large Complex Ecosystems (LCE):

Case Study on Development of Portable Nuclear Energy

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2. Executive Summary

This document proposes a framework by which to evaluate the conditions for innovation in large-scale, complex, emerging technology cases.

The intent is to provide a tool that enable individuals or organizations finding themselves or considering whether to involve themselves in such situations to:

- Gauge whether the current conditions of a project have the qualities to achieve innovation and success;
- Identify situational aspects that need mitigation in order to achieve a greater potential for innovativeness; and/or
- Learn ways to help mitigate situational aspects that impede innovation.

The framework presented is a combination of several, pre-existing evaluation methods that scores and profiles cases by a total of 13 factors on three different levels: the project context, the network undertaking (or likely undertaking) the project, and the nature of problem technology itself.

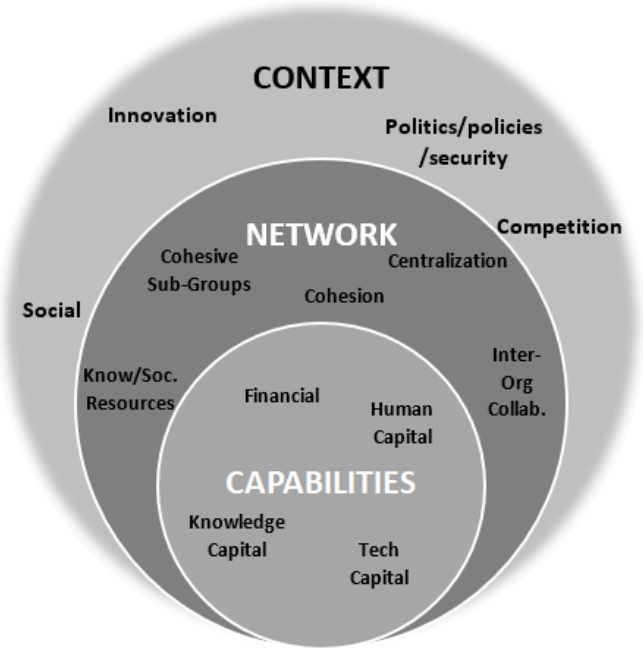

Figure 1: Summary of Large Complex Ecosystem Framework.

Currently, there still exists limitations to the framework development and its application such as:

- Limitation of scope for context analysis of each case due to the nature of the brief nature of the framework. The context will be unique to each technology and market;
- Often, users of the framework will have very limited access to network information on open sources;
- The framework training case study, Project Pele, is not yet a completed project. A retroactive analysis after completion would be useful to test the framework and confirm mid-point assessment; and
- More case studies to “train the framework” should be used.

To demonstrate the framework’s application, it is used to evaluate the case of the Pele Project, an American government-led initiative to develop portable nuclear energy. The project’s innovative qualities and frictions are identified, scored and discussed. Subsequently, specific recommendations for future action to (1) policy makers, (2) governmental program managers, and (3) contracted project leaders are made to mitigate the case’s identified frictions to innovation. These included:

- Establishing a dedicated, protected communication and information sharing system with an intuitive user interface and simple processes. This would enable a balance between the free flow of ideas and trust, and the protection of sensitive or classified information;
- Leveraging the power of policy to streamline innovation and remove barriers to capital growth by incorporating language which promotes knowledge and technology sharing through cross-sector partnerships; and
- Creating a campaign that would augment public support and private sector assistance by raising awareness of the US's nuclear technology advancement.