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Absorptive capacity and innovative performance in an open innovation network: a case study of Symbian going open

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1. Background

'*Open Innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively*' (Chesbrough, 2006).

Absorptive capacity (ACAP) is very important for understanding why some firms can better create and appropriate value from in-sourcing technology developed outside the boundaries of the firm than others. However, the bulk of the academic literature in ACAP tends to focus on individual firms in industries like biotechnology, construction and manufacturing. There has been little research on the role and importance of ACAP in an open industry platform. Therefore, in light of growing prominence of open industry platforms and great progress in ACAP literature over the past decade, this study set out to understand the role of ACAP in the innovative performance of an open industry platform.

1. Aims and Objectives

In order to achieve this aim, the study addressed the following two research questions:

1. Why do industry platforms go open? What are the key drivers, both external and internal, for a platform to be open-source?
2. How do absorptive capacities (ACAP) of firms, involved in developing and supporting this open-platform, moderate the platform's innovative performance?

Thus, the objective of this project was two pronged. Firstly, the project aimed to undertake explanatory research to analyse the motivating factors for a platform to be open-sourced. Secondly, the project aimed to use existing conceptual frameworks relating to the effect of ACAP on innovative performance to develop and test the following hypothesis: The innovative performance of the open platform is positively moderated by four key drivers of ACAP: (1) Organisational structure and processes; (2) Firm members' mental models; (3) Incentives and compensation practices; and (4) Power relationships. The research explored these aspects of an open industry platform through a case study of Symbian Foundation, a not-for-profit organisation governing and supporting the Symbian mobile platform and Nokia, a major contributing member company to the Symbian platform.

2. Qualitative analysis

2.1 Key drivers for opening up the platform

Before Nokia acquired the 52 per cent of Symbian it did not already own and decided to make the platform open source by forming the Symbian Foundation, the business model of Symbian Software Limited was to license its OS to the Original Equipment Manufacturers (OEM) for a royalty of approximately 5 US$, depending on their volumes. Symbian was the

market leader with a share of 60% of smart phone operating systems. Symbian was playing the role of a supplier in the mobile industry value chain. This customer-supplier relationship was fundamentally changed with the announcement of open-sourcing Symbian OS. Following are some of the key reasons given by the leading team members of the Foundation who were an integral part in the decision making process to open-up Symbian.

Commoditisation of the OS layer: Mobile operating systems were becoming a commodity, with the OEMs looking to differentiate either using hardware or their back-end services like maps, music etc. However, Symbian projected a sharp decline in volume in 2010 due to the availability of other royalty-free operating systems which were feature rich and mature. This meant that Symbian Software Limited's business model would be fundamentally broken in three years time. Opening up the operating system sooner rather than later would enable the platform to maintain its dominant position when the market tipped towards royalty-free mobile operating systems.

Cost structure: There was a significant duplication of effort for the OEM's to support different platforms. Hence it was unsustainable in the long run and the OEMs clearly had to stop competing at the operating system level and consider consolidating it to reduce costs.

Fragmentation of the user interface: Historically, Symbian OS supported three different user interfaces (UIs) – S60, UIQ and MOAP(S), which was confusing for the market place. If Symbian Foundation consolidated its leadership position in the smartphone mobile OS space by uniting these fragmented user interface systems to create one open mobile software platform, it would gravitate application developers, handset manufacturers and network operators towards the platform, as it allowed them strong opportunities for meaningful differentiation, speedy product development, good quality output, and significant revenues.

Competitive landscape and rapid shift within the value chain: By releasing the iPhone, Apple raised the bar from a technical perspective. Linux had become a real threat to Symbian's business with a number of Linux initiatives like Limo gaining serious momentum. Hence Symbian's competitive landscape had started to change rapidly during the year prior to its acquisition, with new entrants and old competitors increasing their influence. Google also entered this space through Android, an open mobile OS which was distributed to its Open Handset Alliance members royalty-free. Though Symbian held a healthy leadership position in the smartphone OS space, the future was beginning to look less secure.

Service orientation of Nokia: With the commoditisation of the operating system, Nokia was beginning to increasingly focus on the back-end service part of its business which included

location based services, maps, music and applications sold through its Ovi store. Hence it would appropriate the value created through the acquisition and open-sourcing of Symbian by monetising the services it offers to its customers developed on the platform. Enabling external actors to work with the Symbian platform may drive adoption and expand the demand for Nokia's core activity – developing and selling mobile devices.

Thriving ecosystem and third party innovation: If one needs a thriving ecosystem around a platform, it would be wise to operate in an open business model. This critical factor, in addition to the other factors discussed above, was a key driving factor for opening up the Symbian platform. Doing so also meant moving away from the not-invented-here philosophy.

2.2 ACAP of Symbian Foundation

This section of the qualitative analysis presents a qualitative argument in supporting the hypothesis with the help of data from the 17 interviews conducted at the Symbian Foundation. For this purpose, this section qualitatively discusses how the innovative performance of the open platform is positively moderated by the following four key drivers of ACAP:

2.2.1 Firm members' mental models

(a) Recognising value of external contribution: The values and cognitive and capability bounds on search and expectation of the vast majority of the Symbian Foundation employees were aligned towards fairly recognising the value of external knowledge and contributions in the most appropriate manner. This was clearly evident in the way they worked.

(b) Knowledge base: The ex-Symbian Software Ltd, from where a considerable number of employees had transitioned into the Foundation, had a good history of collaborating with its licensees like Nokia and Sony Ericsson to integrate some of their contributions, especially in the UI layer, back into the platform. This feedback effect would positively feed into the Foundation's future success.

(c) Interfaces and linkages: Historically, Symbian Software Ltd liaised with Universities, primarily to develop mindshare amidst the student population in order to develop the right skills needed to develop Symbian, which was a scarce skill set in the job market. It did not have a strong commitment to collaborate and create new IP for the platform. However, with the formation of the Symbian Foundation, the emphasis seemed to have shifted towards fostering adoption of the platform in research institutes in order to facilitate innovation on the platform.

2.2.2 Organisational structure and processes

(a) Organisational structures: Because many of the package owners are fairly new to the role, the effectiveness of relationships between themselves and the broader external community is largely untested. This remains a crucial success factor for knowledge assimilation and the innovative performance of the platform.

(b) Systems and processes for knowledge processing: Symbian Foundation employees used a wide variety of channels to share knowledge and communicate both internally and externally. They embraced Web 2.0 based channels like wikis, blogs and twitter. Alfresco, an open-source content management software was actively used to share knowledge within the Foundation. Also, a relatively new developer website was beginning to gain traction as a knowledge sharing channel with the wider external community. Overall, these were hugely enabling assimilation of knowledge from within the organisation as well as external sources.

2.2.3 Incentives and compensation practices:

The incentives of the Foundation employees are well aligned with absorbing contributions from outside. Some soft incentives for package owners include visibility and recognition in the open-source community and career progression. Over a period of time, these soft incentives will naturally self select package owners who have the right skill set to succeed in this collaborative work environment. However, at present, they are nominated by member companies.

2.2.4 Power relationships:

In the case of Symbian Foundation, the power dynamics amongst the board members and between them and the community members, if unmediated, could prove to be a huge barrier for the Foundation's absorptive capacity. With the formation of the Foundation, this funding model has changed. Members of the community pay 1500 US$ per year as a membership fee. But the current number of members does little to finance the operating expenses of the Foundation, which is to the tune of 20-30 million US$ with a 200 strong workforce. Hence the Foundation heavily relies on the members of the board – Nokia, Samsung and Sony-Ericsson – for its funding. Naturally, these OEM's have a lot of say in what the Foundation does. This doesn't auger well for an open-source community.

3. Quantitative analysis

Using a survey, Nokia employees' ability to absorb knowledge from external sources and their perceptions of the future innovative performance of the Symbian platform was measured. Using over 100 responses, the key drivers of ACAP of the platform developers at Nokia were studied. The drivers were (1) Organisational structure and processes; (2) Firm members' mental models; (3) Incentives and compensation practices; and (4) Power

relationships. These constructs were then used to test the hypothesis that these drivers of ACAP positively moderated the innovative performance of the platform.

Reliability: Factor analysis provided support for the hypothesised model. Reliability testing was done for the first three constructs: organisational structures and processes; firm members' mental models; and future innovative performance. The constructs 'incentives and compensation' and 'power relationships' were measured through responses to yes/no questions and hence reliability measurement wasn't needed. The analysis showed that all three constructs are reliable.

Regression analysis: Regression analysis was performed to test the hypothesis that the four independent variables positively moderate future innovative performance of the platform. Analysis revealed that there is a strong relationship only between two variables, with high levels of organisational structures and processes associated with higher levels of future innovative performance. It is important to note that high levels of organisational structures and processes means that the structures and process in the firm are more conducive for transfer and absorption of new knowledge from external sources.

Further analysis also gave relative contribution of each independent variable. Organisational structures and processes variable made the strongest unique contribution in explaining future innovative performance. Power relationship variable made the next strong unique contribution. The beta values for Firm members' mental models and Incentives and Compensations variables were slightly less, indicating that they made less of a contribution to the model. However, these two independent variables did not have a significant impact on future innovative performance (Sig > 0.10).

4. Conclusions and recommendations

It was evident from the interviews that the Symbian Foundation clearly has a diverse set of people and many of them are able to recognise the value of contribution from external sources. The Foundation also seems to have the right balance of depth and diversity in knowledge base for acquiring new knowledge from outside. Symbian Foundation needs to have a strong commitment to collaborate and foster adoption of the platform in research institutes and create new IP for the platform. There are encouraging signs of new initiatives towards achieving this.

The effectiveness of relationships between the package owners and the broader external community is largely untested. This remains a crucial success factor for knowledge assimilation and the innovative performance of the platform and hence careful attention

needs to be given to the incentives for package owners. Incentives, both financial and 'soft', need to have a strong external focus in order for the platform to succeed.

The power dynamics amongst the board members and between them and the community members, if unmediated, could prove to be a huge barrier for the Foundation's absorptive capacity. The platform governance through the various councils needs to be transparent and the council members should act as a voice of the community.

The Foundation currently doesn't have a channel through which individual developers can contribute to the platform. This channel could bring in valuable new knowledge and IP. Moreover, a key challenge that remains is to propagate this open collaborative approach of working to the contributing community members. This is amplified by the fact that open-source is a relatively new concept in the telecommunications industry. It would take time and effort for the contributing companies to embrace openness.

Key policy as well as managerial implications emerged from the quantitative analysis of survey data collected from Nokia employees contributing to the platform. Members companies such as Nokia that contribute to the Symbian community need to support the development of human resources by focusing on organisational structure and also facilitating systems and processes that enable knowledge sharing between employees and the broader community. Furthermore, both financial and 'soft' incentives need to be in place to encourage employees to collaborate with external developers and assimilate knowledge from external sources. Doing so will improve the future innovative performance of the platform.

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