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Product platforms: influencing factors and effects

Abul Hasnat Md Zakir Uddin

Junior Professorship in Innovation Management and Entrepreneurship
zakir.uddin@tu-dresden.de

Abstract: The product platform strategy is well known for its several positive effects. However, these effects differ under different market situations. Several product platform projects related decisions can influence these effects. This research work will show how these effects are influenced by decisions under different market situations, findings will help academics in enriching product platform theories and, it will help managers to take proper decisions to enhance the possibility of product platform project success.

Introduction

In several industries, companies are facing increasing pressure in terms of shorter product life cycles, cost competition and diversified demands in the market. In response, they are considering strategies like product platforms. In the literature, successful product platform stories are presented for companies like Black & Decker power tools and Hewlett-Packard Deskjet printers [ML97], and Intel Microprocessors [CG02]. Product platforms have a longer usage time span than single derivative products. During this time, the market situation also changes and companies need to adjust to this change. So, product platforms need to adjust to this evolving situation, and platform development project decisions can help them in this context. On the other hand, companies decide to invest in product platforms due to the different effects like developing several variants faster and cheaper etc. [RU98]. However, at different market situations these effects also change. So analysing platform effects in different market situation, and finding impacts of platform project related decisions on them can help improving platform project management and their success.

Research problem and research question

Different aspects of product platforms like optimization for product platforms, multiple market segments etc. are covered in several works. Effects of product platforms are mentioned by several authors sporadically. But how these effects differs in different market situations and how product platform project decisions influence them is

not considered. So there is a clear gap in literature about the relationship between product platform decision, platform effects and market situations. A survey based research can help to explain this relationship and can significantly contribute to product platform theories as well as help managers to take decisions in different market situations. So, the main research question is: What is the relationship between market situation and product platform effects, and how can decisions help achieving desired effects in different market situations. The main question can be broken down into following sub questions: What are the effects of product platforms expected by industries? How are the effects interdependent on each other? What are the potential market factors that have an impact on the product platform definition (i.e. external factors)? How do expected effects of product platform projects depend on specific market situations? How is the influence of different decisions on specific effects in certain market situations? What are the possible negative effects in product platform projects? How can these effects be minimized with managerial decisions?

Literature review

Product platforms are defined in various ways, ranging from collections of the common elements implemented across a range of products [Mc95] and a common structure from which a stream of derivative products can be efficiently developed and produced [ML97] to an even broader definition as a collection of assets (i.e. components, processes, knowledge, people and relationships) that are shared by a set of products [RU98]. In this research product platforms are considered as the collection of modules or parts that are common to a number of products, and this commonality is developed intentionally to attain certain effects.

The effects of platform-based products are determined by the specific platform definition of a company, which takes various aspects into consideration, like external factors, decisions, etc. [HHV03; HY11]. The ultimate target of product platform effects is to increase profits and market share and, these effects are also interdependent [HU12]. The potential *effects* can be summarized under two headings: cost advantage and competitive advantages. Major cost reduction effects of product platforms include reducing production costs, reducing development costs, and reducing sales, marketing and service costs [Me97; RU98; Sa98; BEC09]. Effects of product platforms like covering multiple market segments, covering global market, reducing product time to market, reducing customer lead time, increasing quality and decreasing product investment costs help to increase competitive [Me97; RU98; Sa98; BEC09; MR00; Ch12]. However, there are also potential negative effects (risks) like

(architectural) innovation risk, platform obsolescence risk, investment risk and risks of too less distinctiveness of products ([ML97; HHV03; HH05]. Proactive measure can help mitigating risks in product platform development [HU13].

The effects of developing platform-based product families are dependent on the situation [HHV03]. Several organizational *factors* have influence on product platform project outcomes: managerial and architectural decision involvement of senior management, multifunctional platform team, cooperation among different units and knowledge sharing [ML97; RU98; MR00; HHV03]. Ye et al. have identified in general five categories of factors which have impacts on the commonality and variety trade-off: (i) market, (ii) government/industry regulations and/or standards, (iii) product characteristics, (iv) life-cycle processes, and (v) organizational capabilities [Ye09]. On the otherhand, Martin and Ishii listed external factors which have an influence on the product platform performance like customer requirements, reduced prices and, regulations and standards [MI02]. Customer needs or preferences, price reduction or competitive price and regulations are other external factors that have influence on platform development decisions [HHV03; Sa98; ML97].

As we mentioned earlier, the *decision* is one of the key factors in projects which have impact on throughout the product platform life. So, taking an appropriate decision in a specific situations is crucial. Decisions like possible product variants or components sharing are mentioned by [KU01]. The decisions in product platform projects can be summarized under target market definition, product family definition, product generations planning, market entry strategy, commonality strategy etc. [HY11].

Product platforms can also be considered as resources. Using resource based view and competency, Harland, Uddin & Laudien extend the idea of resource management and show how the product platform can be considered as an advanced resource which can be bundled with other resources to build capability and to gain competitive advantage [HUL13].

State of the Research

Through literature research the research gap was identified and later on research criteria (effects, factors and decisions) was explored. A content analysis approach was considered during exploration of the criteria. Three papers were prepared and presented in three international conferences focusing on effects, risks and resource based view of product platforms. Feedbacks from the conferences are taken into consideration and articles for journals are now in progress. Already a theoretical

framework for the effects is developed showing how the effects are dependent on each other and how they can bring competitive advantage.

The developed framework of effects helped to reduce the number of effects from 27 to a manageable number of 7 effects. Now a hypothesis based model is developed showing the relationship between effects, decisions and market situations. Development of the constructs as well as the questionnaire is in progress now. Next, a survey is planned to collect data from industries. Industry types are also selected based on findings of the literature research: Transportation equipment manufacturer, Machinery manufacturer and computer and electronic product manufacturer [HU12]. The survey is planned at project level and the participants will be R&D Manager, Product manager, Research engineer or nominated person involved in platform development project. Gathered data will be analysed with suitable statistical methods.

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A.H.M. Zakir Uddin, M.Sc. is a research assistant and PhD candidate at the International Institute Zittau (IHI Zittau) of the Technische Universität Dresden. He holds a master's degree in technology and innovation management from the Brandenburg University of Technology (BTU Cottbus, Germany). His research focusses on the evaluation of product platforms with respect to their effects and possible influencing factors.

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