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ScienceDirect
International Journal of Project Management 27 (2009) 166–174
International Journal of Project Management
www.elsevier.com/locate/ijproman

Crossing innovation and product projects management: A comparative analysis in the automotive industry

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Received 2 September 2008; accepted 4 September 2008

Abstract

Projectification and platform approaches have been two main transformation trends implemented by industrial firms during the 1990s. For those firms, innovation management no longer deals with introducing radically and totally new products, but rather with applying innovative features within a regular stream of products and platforms. This paper proposes an analytical framework that can address the resulting interplay between innovative features and new products. This framework relies on the concept of *innovation life-cycle management* (ILCM). The paper presents the early results from the comparison of five case studies from three OEMs.

Keywords: Organizational learning; New product projects portfolio; Innovation management; Automotive industry; Comparative analysis

1. Introduction

Projectification and platform approaches have been two main transformation trends for industrial firms in the 1990s and at the beginning of the 2000s. For those firms, innovation management no longer deals with introducing radically and totally new products, but more likely with applying innovative features within a stream of new products and platforms. This implies management of the interplay between the maturation of innovative features and the regular stream of development projects based on existing competencies.

This paper proposes an analytical framework for a systematic comparison on innovation-product interplay management, and presents several early results based on data collected in the automotive industry. This sector provides an interesting empirical opportunity to study this question, since it faces a dramatic increase in the pace of launch both of new products and of innovative features.

We first present the empirical drivers of this research, set up the research question, regarding the important literature on project-led organisation and learning. We then settle the theoretical framework and methodology for analyzing the innovation/product interplay. In the third part we present five case studies, resulting from data collected in European and Asian carmakers. We finally present several lessons learnt from the comparison of these five cases.

2. Motivation of the research: the new challenge for product and innovation projects interplay

2.1. The current strategic context: renewing products more frequently while adding more radical innovative features

For the last 20 years, OEMs and suppliers have dramatically increased the pace of new products launches (Fig. 1). At the same time, OEMs launch more innovative features more often (Fig. 2). As a direct consequence, automotive companies face an emerging challenge: to increase the frequency, reliability, radical nature and profitability of the innovations developed in research and advanced engineering, and at the sale time to maintain their ability to develop

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0263-7863/$34.00
doi:10.1016/j.ijproman.2008.09.004

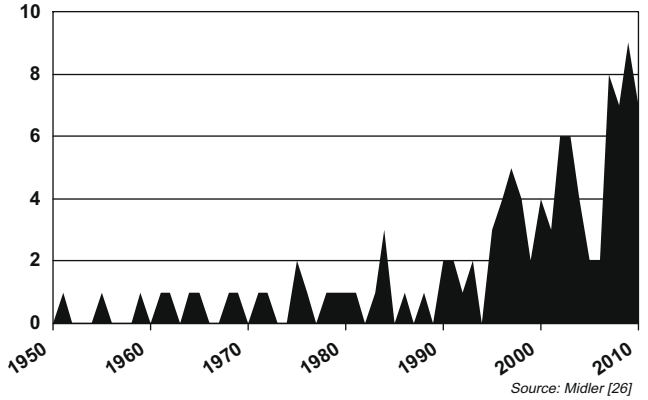

Fig. 1. Number of vehicle launched each year by Renault. (See above-mentioned references for further information.)

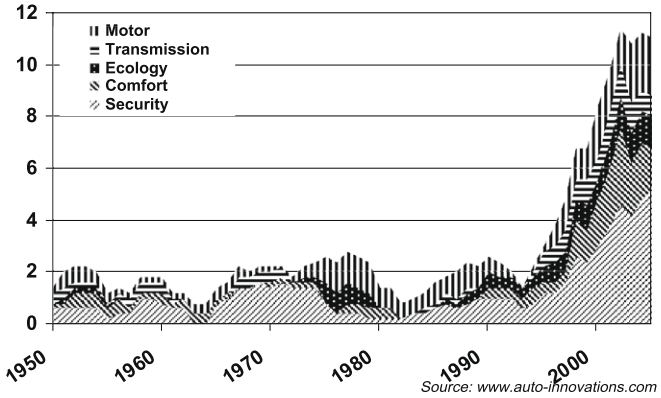

Fig. 2. Number of innovative features launched each year by automotive companies. Number of innovations from 1950.

more vehicles than ever in a context of very tight constraints on quality, cost and lead time.

Such a strategic challenge called for deep transition in car manufacturers product design processes in the last two decades.

2.2. The empowerment and routinization of product development activities in the 1990s

During the 1980s, the increasing competitive pressure put emphasis on the ability of industrial firms to improve quality level, reduce cost, time-to market (so called QCT indicators) of new products, and last but not least, to manage the increasing complexity of products. Many industries addressed this shift: automotive, medical devices, consumer goods, and electronics. Pioneer research defined concepts and organizational frameworks for effective "projectification" of product development processes: heavyweight project management teams, concurrent engineering and early supplier involvement [11,24,25,31]. Industrial firms implemented these frames and methodologies during the 1990s.

Nevertheless, this overwhelming success rapidly showed its bad side: the "fat-design" problem. The focus on the QCT performance of a single product tended to favour one-shot solutions, developed specifically for one project, disregarding the firm global performance. To fight against this problem companies implemented platform strategies which relied on sharing components and subsystems among different products through a global part sourcing [9,18].

Given the increasing pressure on development performance, it became more difficult for firms to take risks in the context of development routines [1]. This led to "front-load" all the potential problems to the pre-project phase (the so called "fuzzy front-end" of the project). As a consequence, the pre-project phase more and more consisted both as a product definition process [28,30] but also as a risk-elimination process aimed at reducing the problem-solving effort of the development phase [7,8,14,29].

In the early 2000s, automotive firms were well armed to develop rapidly new products, and to have a global strategy for managing the diversity implied by this evolution. As a consequence, the gap among automotive OEMs around the world in product development performance has been narrowing in the 1990s [12].

2.3. Innovation management in the projectified firm

Although projectified organizations instituted core capabilities maximizing QCT indicators, these core capabilities tended to turn into core rigidities that modelled potential products through a stable architecture and existing competencies [19]. These organizations became reluctant to apply innovative features that were disruptive towards this organizational structure [13,15]. Such results confirmed the results found out in the construction industry [3,20].

Le Masson et al. [17] developed a general formalism to explore innovation reasoning, combining knowledge creation and concept development. Ben Mahmoud-Jouini and Midler [4] proposed a framework for exploring the interplay between product projects and learning processes within the design system of the firm, which articulates the product project management, the competencies creation process and the strategy formulation process. Learning processes imply pre-project research explorations and maturation, within project activities and from projects [5] by cross project comparison, formalisation and capitalisation processes [2].

Iansiti's work [16] improved our understanding of the linkage between technological knowledge activities and product development activities. He showed that development projects that "create a match between technological options and application context" perform better than others. In other words, knowledge creation carried out by research activities should be oriented towards the future contexts of application. Iansiti's work highlighted the technology integration process within a new product, but remained focused on technical improvement, disregarding deeper reshuffling of the product hierarchy. Furthermore,