

On the Nature, Origins and Outcomes of Over Featuring in the New Product Development Process

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Abstract

Developing new products and services beyond what is required by the needs of users, market demand and the resources of companies ranks among the top 10 risks leading to new product development (NPD) failures. This study defines and refers to this multifaceted phenomenon as 'Over Featuring' (OVF) to group different forms of excessive product development, from scope creep to overspecification and feature creep. The classification and theoretical development of the various forms of OVF is proposed, also origins and adverse outcomes, such as feature fatigue, are explored. Stage-Gate and Agile approaches are discussed in the light of the OVF phenomenon.

Keywords: New product development; product design; product features; requirement engineering; project management

1. Introduction

A long time ago, Horace said ‘*Est modus in rebus*’¹. Today, the search to win over increasing competition and need to gain a competitive edge in the market in timely fashion require companies to produce a continuous inflow of new-to-the-world products, new services and an ever-evolving product portfolio (Christensen & Bower, 1996; Marzi et al., 2021; Wouters et al., 2011).

However, the critical task of creating a competitive position by developing something new lies in the effective management of the uncertainty and fuzziness that are inherent to the innovation process (Christensen & Bower, 1996; Yu et al., 2010). Uncertainty comes from both exogenous and endogenous sources and plays a crucial role in the success of the innovation and new product development (NPD) processes. Exogenous sources include shifting customer preferences, competitors’ strategic moves and nascent technological trajectories, while endogenous ones are, for example, developers’ creative responses to discoveries during the project or the co-evolution of technical solutions in the interacting product components (Antioco et al., 2008; Burke, 2013; Gross et al., 2015; Wouters et al., 2011). As a result, managers, project managers, engineers, and developers have to make decisions with scarce information, high ambiguity and a vague overview of market needs that could favour the emergence of several unexpected states of NPD projects (Antioco et al., 2008; Burke, 2013; Coman & Ronen, 2010). At the same time, the increasing need for product distinctiveness, continuous technological developments and rapid changes in customers’ preferences are pushing companies to develop products with more and more alluring characteristics, able to seduce consumers by offering performances and features beyond what the latter need (Antioco et al., 2008; Coman & Ronen, 2010; Thompson et al., 2005; Wouters et al., 2011).

Starting from these premises, the present study defines and classifies as ‘Over Featuring’ (OVF) a set of tendencies that can harm the success of an NPD process, spanning the fields of innovation management, research and development (R&D) management, engineering and design (Bianchi et al., 2019; Shmueli & Ronen, 2017). The term OVF comprehends a number of different conditions which can happen anywhere along the NPD process, during its ontogenesis, when a product or service is developed beyond what is needed by the users, market or plans as well as what is feasible within the company’s resources. The outcome of OVF is a pathological condition of the NPD process manifested through a variety of adverse outcomes on product usability and quality and project performance (Bianchi et al., 2019; Bjarnason et al., 2012; Coman & Ronen, 2010; Shmueli & Ronen, 2017).

The magnitude of risk associated with OVF is so pervasive that even the National Aeronautics and Space Administration (NASA) listed the inclusion of excessive features among the top 10 risks of failure for development projects (Landis et al., 1992, pp. 98–128). Several sound examples of the effects of OVF on NPD projects are available in everyday experience. Mercedes-Benz developed, delivered and later removed around 600 non-essential features from its cars as they were the direct cause of several malfunctions to electronic parts, lack of usability, increased need for after-sale support and complaints from customers (Rust et al., 2006). BMW series 7 included the iDrive system,

¹ The Latin expression of the Roman poet Horace (65 BC–8 BC) calls for wise moderation and a sense of measure to avoid any type of excess. Specifically, Horace warns us to take care not to run into too much or too little and to adopt the equilibrium required by the situation (Harrison, 2007). Horace’s complete sentence is *Est modus in rebus sunt certi denique fines, quos ultra citraque nequit consistere rectum*, which can be translated as ‘There is an optimal condition in all things with precise boundaries beyond which one cannot find the right thing’. The sentence can be found in Horace, Satire (1, 1, 106–107), 35 BC. Western mythology offers several other pedagogical tales on this topic, such as Aesop’s fable *The Fox and the Grapes* (Gross et al., 2015), or the myth of Icarus (Coman & Ronen, 2010).

which proposed about 700 capabilities requiring multifunction displays and multi-step operations. The complexity of the iDrive system forced BMW to include an instruction manual, which was thought necessary whenever a valet parker took the car (Rust et al., 2006). From 2010, Apple included in its product the Retina display to attract new customers and showcase a distinguishing feature, claiming that Retina has more resolution than the human eye can perceive (Edwards, 2010). Although the Retina has driven innovation in the entire display industry, a resolution beyond what is perceivable by human eyes brought several inconveniences, from the higher costs and complexity of the devices' architecture to the tangible battery and consequent decreased battery life (Edwards, 2010; Liu & Yu, 2017).

Hence, OVF can manifest in different forms and at different levels, through deliberate decisions or unconscious behaviours at different organisational strata. OVF has different facets, from the steady increase of the project's scope (scope creep) to the continuous inflow of additional features when the product is still in development (overdesign and feature creep), often contradicting the ethos of the KISS principle, and more broadly, the Occam's razor (Griffin & Somermeyer, 2008). The consequences of OVF are numerous and frequently become a steep price to pay. Project delays, budget overruns and user difficulty with excessively featured products, namely feature fatigue, are common outcomes in OVF-affected NPD projects (Rust et al., 2006; Stock, 2011; Thompson et al., 2005; Verkijika, 2021).

However, despite the magnitude of the OVF phenomenon, it has received little attention, especially outside the software development domain (Shmueli & Ronen, 2017), and recent literature has only highlighted the relevance of OVF to physical products and services (Cesaretto et al., 2021; De Giovanni, 2019; Jain, 2019; Liu & Yu, 2017).

Consequently, the nature, origins and outcomes of OVF remain understudied and have not been appropriately recognised and encompassed in the NPD literature (de Vasconcelos Gomes et al., 2021; Gyimah et al., 2019). An analysis of the available studies showed that the body of knowledge related to OVF is poorly theoretically developed, and terminological confusion is widespread.

Therefore, there are consistent theoretical and empirical gaps that need to be addressed and brought to the attention of scholars, managers and practitioners through the following research questions: (1) What are the different forms of OVF, and how do they evolve during the course of the NPD process? (2) What are the antecedents and outcomes of OVF? (3) Where and when does OVF manifest during the NPD process, in light of the two main NPD management approaches, namely Stage-Gate and Agile?

To address these gaps, the present paper analyses and unpacks the OVF literature by focusing on its antecedents and effects, reconnecting these with the latest available studies on the NPD realm, proposing a theoretical model capable to clarify the phenomenon of OVF comprehensively. In doing so, this study first presents an integrative and inclusive overview of the literature which can elucidate the interconnections, evolution and effects of the various forms of OVF (Cronin & George, 2020). Grounded on the results emerging from the review, a conceptual development of OVF is then proposed, allowing the exploration of the interconnection among the various facets of OVF and serving as a springboard for future development of the topic (Corley & Gioia, 2011).

The results which emerged from the present analysis highlighted the existence of different forms of OVF at different stages of the NPD process, while a large variety of outcomes and antecedents of

OVF has been identified and classified. Moreover, the present study sheds light on the growing phenomenon of OVF by offering a comprehensive taxonomy of it which clusters the different terms currently in use across different fields. The exploration of OVF has been approached with a clinical-like lens by highlighting its different facets and considering them all in a single, general model that shows the pathological state of the NPD process resulting from OVF.

It has been widely recognised that the management of the NPD process and its uncertainty have long posed problems for scholars and practitioners in regard to the difficulty of forecasting user need and market demand during the NPD process, especially when the time span from idea to market launch is lengthy (Antioco et al., 2008; Bianchi et al., 2020; Salvato & Laplume, 2020). The NPD process has been managed via Stage-Gate or Agile processes, which are based on two opposite tenets: either control uncertainty or welcome it (Bianchi et al., 2020). In this regard, the problem of OVF often escapes the boundaries set by the Stage-Gate or Agile method, creeping silently through the various phases of the development process. Thus, the present study lastly proposes an analysis of when and where OVF could manifest in the two common NPD process management approaches.

In the following section, the methods for the study are presented. The third section proposes the taxonomy and reclassification of OVF, while the fourth analyses the pathological structure of OVF, its antecedents and its outcomes. Section four also proposes an integration of OVF in the Stage-Gate and Agile frameworks for NPD. Finally, the conclusions and limitations are presented, along with an agenda for further development of the field.

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Further Reading

Marzi, G. (2022). *Uncertainty-driven Innovation. Managing the New Product Development Processes in an Unpredictable Environment*. Springer Nature, London. ISBN 978-3-030-99533-1

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