

THE TERM PLATFORM IN THE CONTEXT OF A PRODUCT DEVELOPING COMPANY

A. H. Kristjansson, T. Jensen. and H. P. Hildre

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1. Introduction

The term platform means different things in different circumstances; an oil platform, a platform in a railway station, a platform as a declaration of principles in politics – all these ways of using the term are frequently practiced and have a relatively clear meaning. Within the context of a product developing company however, the term is more vague – used in different contexts and scopes – and often causes misunderstanding and confusion. Due to the vagueness of the terminology, it has proven difficult to evaluate and benchmark different platforms.

In this paper, we present a sample of the use of the term *platform* in the context of product development – mainly focusing on the term *product platform*. Furthermore – in this context – we suggest a definition of the term so that *all* platforms can be objectively characterized.

2. The use of the term platform in product developing companies

A range of different platform terms are used in the context of product developing companies; *product platform*, *technology platform*, *brand platform*, *global platform*, *modular platform*, *process platform*, *customer platform*, *integral platform*, *scalable platform*, and *high-tech platform* are all commonly used terms to describe different types of platforms. Unfortunately, there are also a number of different definitions for the *same type* of platform. Furthermore, the general term *platform* means different things to different people, i.e. there is a general lack of precision in its usage.

According to [Moore et al. 1999]¹ a *platform* is a *foundation for a range of individual product variation*, i.e., *something that is developed once and used in multiple applications*. [Ericsson & Erixon 1999]² similarly find that a *platform* refers to a *common base* from which a number of predefined models can be built. [Gonzalez-Zugasti et al. 2001]³ include *interfaces* into the concept and define a *platform* as *the set of elements and interfaces that are common to a family of products*. These definitions are very similar to definitions of *product platforms*, as we will later see⁴.

Moving on to the term *product platform*, we find differing meanings in the literature depending on the scope and context of its use; it can refer to the sharing of *functions*, the reuse of a *physical frame* that is constant over time, a collection of *modules which can change* over time, or even in some cases it might be a *strategic tool*. Let us look at definitions of product platforms from some of the leaders within engineering design- and marketing research.

¹ Work within the field of business and marketing

² Work within the field of engineering

³ *ibid*

⁴ Although not specified it is likely that the authors use the term *platform* synonymously to the term *product platform*.

In its most simplistic form, a product platform refers merely to the sharing of physical components over a range of products. [Meyer & Lehnerd 1997]⁵ define a product platform as a set of common components, modules, or parts (especially the underlying core technology) from which a stream of derivative products can be efficiently created and launched. [Sawhney 1998]⁶ finds that a product platform is set of subsystems and *interfaces* that form a common structure from which a stream of derivative products can be efficiently developed and produced. This is very similar to [Gonzalez-Zugasti et al. 2001] definition of a *platform* mentioned earlier.

Adding the term *design* to the concept, [Meyer & Utterback 1993]⁷ and later [Nayak et al. 2000]⁸ argue that a product platform encompasses the design as well as the components which are shared by a set of products. Similarly, [de Weck et al. 2003]⁹ find that a product platform is a set of *design variables or components* that is commonly shared across the product family.

A different perspective is seen from those who find that the reuse of *technology* is the main factor of a product platform. [Maier & Fadel 2001]¹⁰ define a product platform as *the technology that all the members of the product family have in common* and upon which different product variants are designed (or “instantiated”) by individually adding technology to the platform. Similarly [McGrath 2001]¹¹ and [Siddique et al. 1998]¹² argue that *a product platform is the lowest common denominator of relevant technology in a set of products or a product line*¹³.

[Robertson & Ulrich 1998]¹⁴ include all of the above into their definition of a product platform – finding that it is *the collection of assets that are shared by a set of products*. These assets can be divided into four categories, consisting of components, processes, knowledge, and people and relationships.

[McGrath 2001] furthermore finds that a product platform is *a collection of common elements, particularly the underlying technology elements, implemented across a range of products*. At the same time he emphasizes that a product platform is *primarily a definition for planning, decision making, and strategic thinking*; it is the set of *architectural rules and technology elements* that enable multiple product offerings and defines the *basic value proposition, competitive differentiation, capabilities, cost structure, and life cycle of these offerings*. Here it is clear that the platform encloses the core competency of the organization; that *certain something* that gives the organization a competitive advantage.

Significantly different is the definition from [Farrell & Simpson 2001]¹⁵ of a product platform, as it is not a steady, unchangeable foundation or basis, but rather a *design architectural* concept that can change¹⁶. They argue that the product platform provides the basis for the product family, which is derived through the addition, *substitution, or exclusion* of one or more modules from the platform or by scaling the platform in one or more dimensions.

[Sudjianto & Otto 2001]¹⁷ move from viewing a product platform as mainly being *a collection of physical assets* to being *a set of shared functionality across multiple products*. In the case of the use of

⁵ Meyer works within management

⁶ Works within management of electronic commerce and technology

⁷ Utterback works within management and innovation

⁸ Work within the field of engineering

⁹ ibid

¹⁰ ibid

¹¹ Works within strategic management

¹² Work within the field of engineering

¹³ It is important to notice however, that in many cases concepts such as *technology* and *design* mean different things to different people.

¹⁴ Work within the field of information- & product development

¹⁵ Work within the field of engineering

¹⁶ As an example in the automotive industry a platform can include interchangeable modules [Muffatto 1999]. The chassis may even have different lengths as long as the same stamping dies are used.

¹⁷ Work within the field of engineering

multiple brands, *a product platform is a set of functions shared across multiple products each within a different brand*. It is clear in this case that the definition has a different character, as there is no certainty of reuse of components although we reuse functions¹⁸. Furthermore, they define a brand platform as *the set of shared brand signatures and modules* over a range of products. Here a brand signature is a function or aesthetic element made common to a brand's offerings, to maintain brand identity.

From what we have read, we see a gradual increase in *scope* in the *product platform* definition – from including only physical components and modules, to including technology, human resources, design, and functionality.

According to [McGrath 2001] *technology platforms* are managed differently from product platforms in that product platforms are a market-facing construct, and, although developed collaboratively with R&D, they are managed by a business unit. Technology platforms are in a sense, a core competency for technology-based companies. They do not lend themselves to the building block modules and interface structure of product platforms – whereas the key technical issues for a product platform revolve around the design of *the element integration and the architecture* – for technology platforms, they are more complex; they include road-mapping of relevant product platform elements and predictable, on-schedule technology delivery. Finally make-buy decisions are different for a product platform as they are made at the element level, while for a technology platform, make/buy and licensing decisions are made at the technology, patent, and portfolio level.

[Ulrich & Eppinger 2000]¹⁹ find that a platform product is built around a pre-existing technological subsystem (a technology platform). As an example, the tape transport mechanism in the Sony Walkman, the Apple Macintosh operating system, and the instant film used in Polaroid cameras. A technology platform has already demonstrated its usefulness in the marketplace in meeting customer needs. Furthermore, they find that platform products are very similar to technology-push products in that the team begins the development effort with an assumption that the product concept will embody a particular technology. [Gawer & Cusumano 2002]²⁰ find that a high-tech platform is an evolving system made of interdependent pieces that can each be innovated²¹.

The concept of *platform thinking* is defined by [Sawhney 1998] as the process of *identifying and exploiting the shared logic and structure in a firm's activities and offerings* to achieve leveraged growth and variety. It can be applied to the firm's products, brands, target markets, geographical markets, and business processes. He finds that each of these dimensions is a vector for growth and variety creation, and together these dimensions enable firms to achieve leveraged high variety. He describes five types of platforms to facilitate the analysis of the firm's activities and offerings, i.e. a *product platform*, a *global platform*²², a *customer platform*²³, a *process platform*²⁴, and finally a *brand platform*²⁵.

We see that there exist numerous types of platforms within the context of a product developing companies. Furthermore, a definition of the same *type* of platform can vary considerably as the example of a *product platform* in Table 1 shows. Finally, we observe that in some cases greater precision is needed in what is meant by the term platform.

¹⁸ Even if we assume a one-to-one matching between the physical components and the functional elements – i.e. what e.g. [Ulrich 1995] refers to as modular architecture – we cannot assume the reuse of components.

¹⁹ Work within the field of product development

²⁰ Work within the field of management

²¹ In this case a platform can be thought of as a standard

²² Consisting of a core offering that is common across global markets and customized elements that enable speedy and cost-effective localization of the firm's offerings to country-specific conditions and customer preferences

²³ The *beachhead* that the firm chooses as its point of entry into a new market can be conceptualized as the firm's *customer platform*

²⁴ E.g. manufacturing processes, design work-steps, assembly procedures, and logistics handling procedures

²⁵ Platform thinking applied to brand management allows a firm to exploit synergies among brands, to minimize overlap among brand identities, and to achieve coherence and clarity of positioning across the product family

Table 1. A summary of the product platform definitions displayed in the paper

		Strategic thinking tool	Planning tool	Decision making tool	Reuse of knowledge	Reuse of functionality	Reuse of design/ design variables	Reuse of architectural rules	Reuse of people and relationships	Reuse of processes	Reuse of a product foundation/ basis	Reuse of technology/ technology elements	Reuse of interfaces	Reuse of modules/ subsystem	Reuse of components/ elements	Reuse of single monolithic part
1	[Meyer & Lehnerd 1997]													X	X	
2	[Moore et al. 1999]										X					
3	[Ericsson & Erixon 1999]										X					
4	[Gonzalez-Zugasti et al. 2001] ²⁶												X		X	
5	[Sawhney 1998]													X		
6	[Meyer & Utterback 1993]						X								X	
7	[Nayak et al. 2000]						X								X	
8	[de Weck et al. 2003]						X									
9	[Maier & Fadel 2001]										X					
10	[Gonzalez-Zugasti & Otto 2000]													X ²⁷		X ²⁸
11	[Robertson & Ulrich 1998]				X				X	X					X	
12	[McGrath 2001]	X	X	X				X			X				X	
13	[Sudjianto & Otto 2001]					X										
14	[Farrell & Simpson 2001]													X		

3. A definition of the term platform in the context of product development

How can we define a platform in the context of a product developing company in a way that captures the core meaning of all different types of platforms? We argue that this is only possible if we set the scope of the term in a way that it is compatible with an *accepted* body of definitions as the lowest common denominator. Based on our findings we define a *platform* as²⁹:

a collection of core assets that are reused to achieve a competitive advantage

Here *assets* is adapted from [Robertson & Ulrich 1998] and defined as **components** (e.g. part designs of a product, the CAD tools needed to make them, the circuit designs, software, and product function), **processes** (e.g. the equipment used to make components or to assemble components into products, and the design of the associated production process and supply chain, and material), **knowledge** (e.g. design know-how, material know-how, technology applications and limitations, production techniques, mathematical models, and testing methods), and finally **people and relationships** (e.g. teams, relationships among team members, relationships between the team and the larger organization, relationship with a network of suppliers, and alliances). The term *core* indicates that the company believes that the asset enables a competitive advantage for the company; in most cases core assets are proprietary, engineered by the members of the organization; the expertise of use of specific material, the concept of differentiating the final product after first phase quality control, the secret multi-step process of manufacturing a SiC semiconductor wafer, or for that matter the secret mixture of the Coca Cola syrup, are all examples of an organizations reuse of core assets.

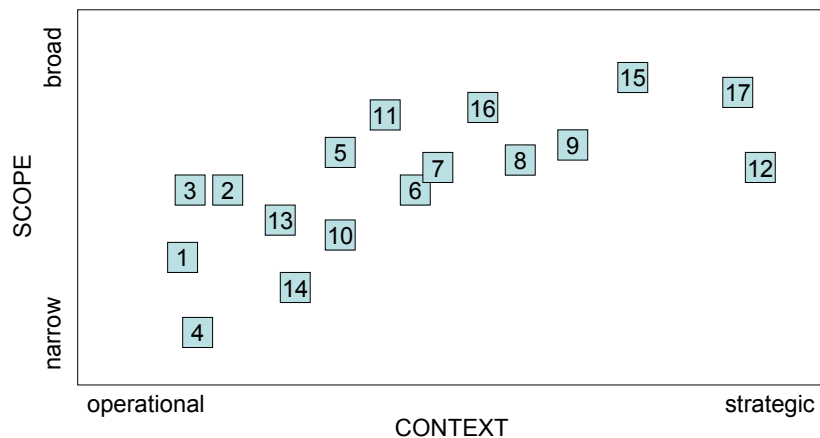
The platform definitions discussed in this paper are summed up in figure 1. We find that although a number of similarities exist we see that there are large deviances both in scope as well as context.

²⁶ We assume that their use of the term *platform* is synonymous with the term *product platform*

²⁷ Modular platform

²⁸ Integral platform

²⁹ The definition is influenced by [McGrath 2001], [Sawhney 1998], and [Robertson & Ulrich 1998]



#	AUTHOR(S)
1	[Meyer & Lehnerd 1997]
2	[Moore et al. 1999]
3	[Ericsson & Erixon 1999]
4	[Gonzalez-Zugasti et al. 2001]
5	[Sawhney 1998] ³⁰
6	[Meyer & Utterback 1993]
7	[Nayak et al. 2000]
8	[de Weck et al. 2003]
9	[Maier & Fadel 2001]
10	[Gonzalez-Zugasti & Otto 2000]
11	[Robertson & Ulrich 1998]
12	[McGrath 2001]
13	[Sudjianto & Otto 2001]
14	[Farrell & Simpson 2001]
15	[Gawer & Cusumano 2002]
16	[Ulrich & Eppinger 2000]
17	[Sawhney 1998] ³¹

Figure 1. The platform concepts vary in scope and context³²

4. Conclusion and further research

In the overview of the *platform* concept, we have not attempted to list all definitions of platforms, but rather analyzed the context and scope of a representative sample of literature. We argue that 1) there exist a number of different types of platforms, 2) within the same type of platform, there often exist ambiguous nuances, and 3) the term *platform* is understood differently by different people, i.e. there is a lack of precision in the use of the term.

Based on the findings we propose that if one wants to objectively evaluate and benchmark platforms, one has to first define the platform term in a way, which includes platforms in all scopes and contexts³³. This we do by defining a platform as *a collection of assets that are reused to achieve a competitive advantage*. Although this is a broad definition, it serves as the *lowest common denominator* for the platform concepts we have presented in this paper.

Further research has been carried out to identify a set of *viewpoints* that can be used to objectively characterize platforms³⁴ in product developing companies. Future research aims to verify the feasibility of using these viewpoints as well as understanding their dynamics in terms of platform strategy. Finally – building on this research – a methodology to assess the performance of platforms is in the making.

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³⁰ Definition of product platform

³¹ Concept of platform thinking

³² The concepts are not accurately placed in the figure, but rather qualitatively according to the views of the authors.

³³ Within the context of a product developing company

³⁴ A set of such viewpoints is suggested in the paper "PLATFORM CHARACTERIZATION: a method to view the reuse of core assets in product developing companies" by A. Kristjansson and H.-P. Hildre. Published at the 7th Workshop on Product Structuring – Product Platform Development, Chalmers University Of Technology, Göteborg, March 24-25, 2004

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Arnar H. Kristjansson

Norwegian University of Science and Technology, Department of Engineering Design and Materials

Richard Birkelandsv. 2b, Gløshaugen, Trondheim, Norway

Telephone: +47 7359 0933, Telefax: +47 7359 4129

E-mail: arnar.kristjansson@immtek.ntnu.no