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PAMATRIX: A METHOD TO ASSESS PLATFORMS IN PRODUCT DEVELOPING COMPANIES

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Abstract

Platforms in the context of product developing companies are used to fulfil a number of different goals. In some cases they have proven to be beneficial, while in other instances they have proven not to be. To understand how well a platform is performing, it has to be assessed in its existing industry-, market-, and company internal context. Furthermore, the platform has to be assessed in line with how much it contributes to the company's specific competitive advantage strategy (CAS).

The purpose of the paper is to propose a method that does this, i.e. assesses a company's platforms in reference to the industry-, market-, and company intrinsic context, as well as in reference to the company's chosen CAS. Furthermore, an important objective is to keep the method easy to use, and base it on explicit or tacit data that already exist in the company. A basic assumption is that companies have a great deal of valuable data that isn't utilized; it has to be documented and presented in a way that converts it to useful information.

The method – which we call the Platform Assessment Matrix (PAMatrix) – consists of a matrix that analyzes the platforms of a company from different viewpoints. By using the method, stakeholders can more easily derive to general strategic action plans for each individual platform.

The method is still in creation, and a number of iterations are still needed. The basis is however in place and a number of industry case studies in the pipeline. .

1 Introduction

Over the last decades, the use of platforms in product developing companies has proliferated, coinciding with an increased level of competition, more demanding customers, and a shorter lifespan of products. A platform facilitates a company's effort to effectively and efficiently deliver a variety of attractive goods to the market. In many cases they have been successful [Sanderson and Uzumeri'97], while in others they have not been worth the effort [Hauser'01].

The problem with such findings is that they apply to specific platforms in specific contexts and cannot be extrapolated to any given situation; an effective platform in one context might be ineffective in another context. Platforms have different *goals* (e.g. to facilitate cost leadership, improve reliability, or to create a standard), and cause a number of different side effects. This raises the question of how we can assess the performance of a platform in a specific context and scope.

We find that there is a great need for a pragmatic and simple method, which holistically and objectively evaluates the performance of platforms in their specific context. Today when managers and other stakeholder make decisions regarding platforms (e.g. regarding their use, maintenance, design, and out phasing), they have to count on intuition, multi-tasking ability, and successful cognitive juggling of numerous factors.

2 Theoretical background

The authors define a platform in the context of a product developing company as *a set of core assets that are reused to achieve a competitive advantage.* This definition has been derived by finding the lowest common denominator of a series of definitions from relevant literature [Kristjansson, et al.'04]. Our working definition of a platform strategy is *a company's elaborate and systematic plan of action to manage a group of platforms, both individually, as well as group-wise.* [Kristjansson and Hildre'04b].

A number of methods exist to construct platforms from scratch (see e.g. [Siddique'00] and [Gonzalez-Zugasti and Otto'00]), few however aim to rate the performance of already existing platforms. [Meyer and Lehnerd'97] have defined the *effectiveness* and *efficiency* of product platforms by looking at platform engineering cost, derivative product engineering cost, net sales of a derivative product, and development costs of a derivative product, and [Gonzalez-Zugasti, et al.'01] attempt to value platforms by using options. These methods are undoubtedly appropriate for specific contexts and scopes, but arguably not appropriate for our broader definition of the term platform. [Kristjansson and Hildre'04a] propose using the following framework to evaluate platforms with the attention to create action plans (Figure 1).

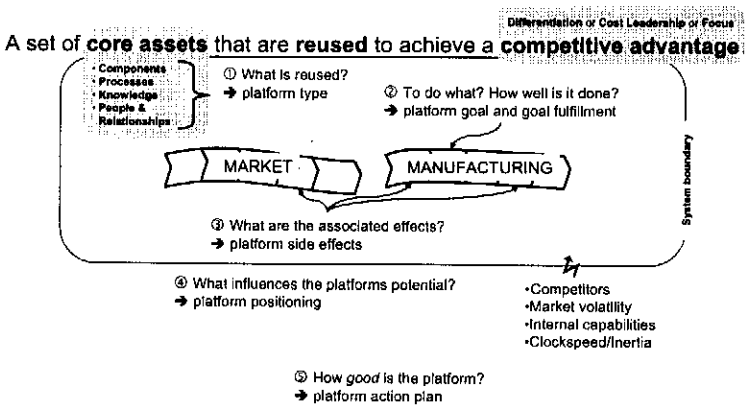

Figure 1. A framework to evaluate platforms with the goal to decide on individual action plans

3 Research aim and methodology

The primary aim of the paper is to propose a discussion-based evaluation method for platforms. The method should serve as a support tool for stakeholders to quickly comprehend the nature of the diverse platforms used in a company, and so make better decisions upon explicit strategic action plans for each individual platform. It should use qualitative information already available within the company – both explicit as well as tacit – to create awareness of the "as is" status of platforms, as well as the company's need and potential to change them. Furthermore, it should be relatively easy to use so increase the likelihood of actual utilization.

In this paper we only aim to describe from a pedagogical standpoint how the method works.

We base our research on previous work that describes a framework for platform evaluation [Kristjansson and Hildre'04a] and a study of factors influencing platform strategy [Kristjansson and Hildre'04b].

4 The Platform Assessment Matrix (PAMatrix)

The method builds on a sequence of steps; first systematically registering the company's platforms, then assessing each platform in reference to a set of specific "factors", and finally summing up and deciding upon specific action plans.

In Figure 1 we see an illustration of the PAMatrix. Horizontally we line up the company's platforms, while vertically a number of factors are listed that either influence or are influenced by the platforms. The factors are divided into "as is" – i.e. factors that describe the current *performance* of the platform – and "positioning" – i.e. the potential to improve/maintain the current value of the platform. For each step graphical representations are used to facilitate the comprehension of the collected data. After each step, a strategic action plan is recommended.

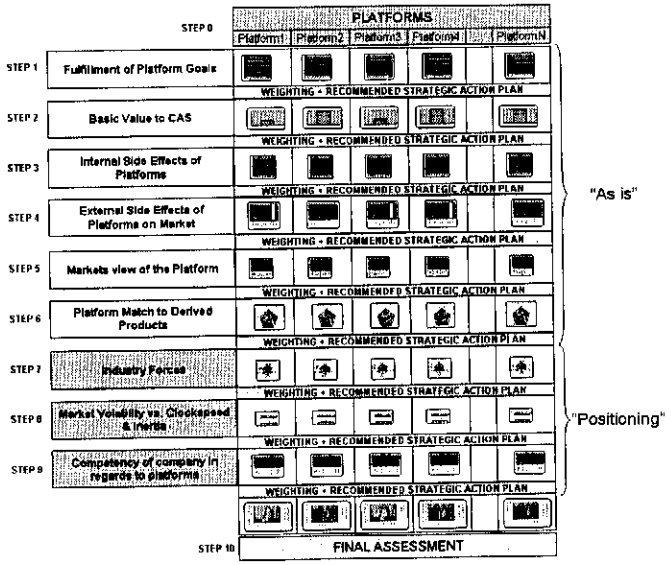

Figure 2. An overview of the PAMatrix method.

The factors are assessed qualitatively by stakeholders most often from within the company.

In this section we describe step by step how the method should be used. In steps 1 to 6, we look at forces that describe the "as is" situation of each platform while in steps 7 to 9, we examine each platforms "positioning." With that we refer to how easy it is for the company to improve/maintain the platforms value proposition.

4.1 Grading and weighting

In the grading process, a number of different scales are used, designed to capture the values of each step in an appropriate way for the given context. In general, rating scales are used to judge properties of objects without reference to other similar objects [Cooper and Schindler'03]. In Table 1, the grading scales used in the PAMatrix are displayed. Common to all steps is that they are ended by recommending a strategic action plan, rated with an APS scale. In addition, the importance of each step for a particular platform is weighted. In this way a platform might perform poorly in regards to a specific factor/step, but at the same time the factor/step might be rated as being of low importance. The rating scale RS-B is used for registering the weighting (Table 1).

Table 1. Grading scales used in the PAMatrix

Rating Scale A (RS-A)	-9	Great negative effect	
	-3	Medium negative effect	
	-1	Low negative effect	
	0	No effect	
	1	Low positive effect	
	3	Medium positive effect	
	9	Great positive effect	
Rating Scale B (RS-B)	0	None (or does not apply)	
	1	Low	
	3	Medium	
	9	High	
Rating Scale C (RS-C)	0	High	
	1	Medium	
	3	Low	
	9	None (or does not apply)	
Rating Scale D (RS-D)	1	Low	
	3	Medium	
	9	High	

Inertia Rating Scale (IRS)	F	Fitament
	T	Time To Market
	K	Know How
	S	Standard
Maturity Level Scale (MLS)	E	Embryonic
	G	Growth
	M	Maturity
	A	Aging
KANO Scale (KMS)	T	Threshold
	P	Performance
	E	Excitement
Action Proposal Scale (APS)	0	Status Quo
	1	Incremental Change
	2	Drastic Change
	3	New / Split
	4	Eliminate / Merge

We will now explain each step of the method. In Figure 3 we can see an example of steps 0 to 5 and in Figure 4 an example of steps 6 to 10.

4.2 Step 0: Identification of the company's platforms

Step 0 of the method is to identify the platforms used in a company. To help with this step, we find that platforms can be categorized into being component-, process-, knowledge-, or people & relationships platforms (derived from [Robertson and Ulrich'98]). We suggest going through a company's products, and for each one, identifying the component-, process-, knowledge-, or people & relationships platforms. The identified platforms are then lined up horizontally into the PAMatrix. See Figure 3 for an example.

4.3 Steps 1 to 6: Assessing the "as is" status of the platforms

4.3.1 Step 1: The fulfilment of the platforms goal

Every platform has one or more goals, be it to create economies of scale or to shorten product development time. In the PAMatrix we register for each platform what the *main goal* is by using Porter's three generic strategies as a framework. For each strategy we assess the

expected impact as well as the actual impact the platforms have. The grading scales used are RS-A, RS-B, and APS. See Figure 3 for an example.

4.3.2 Step 2: Basic value to the competitive advantage strategy (CAS)

Porter defines three generic strategies that a company can follow to achieve a competitive advantage: differentiation, cost leadership, or focus [Porter'85]. A company should have only one general strategy to follow. Depending on the chosen strategy, the company has to align its platforms accordingly. This however does not mean that platforms not supporting the general strategy should be discarded – the company must however be aware of the impact the platform has.
In step 2 of the process, the basic value of the platform for the competitive advantage strategy is assessed. The grading scales used are RS-A, RS-B, and APS. See Figure 3 for an example of this step.

4.3.3 Step 3: Internal side effects of platform

The PAMatrix also captures the internal side effects that a platform has on the company. A platform might have positive main effects but negative side effects, diminishing the overall benefits. In the Figure 3 we see how the side effect of a platform are graded depending on the effect it has on the value chain of a company; on the *firm infrastructure*, the *human resources management*, *technology development*, *procurement*, *inbound logistics*, *operations*, *outbound logistics*, *sales & marketing*, and finally *service* (adapted from [Porter'85]).
The grading scales used are RS-A, RS-B, and APS.

4.3.4 Step 4: External side effects of the platforms on the market

Depending on its type, and the context which it is in, a platform deviates in its susceptibility to be reused over price-, industry, and product family segments. The factors used are the threat of unwanted *cannibalization*, *demand loss*, and *image loss* for the three different scenarios, where the platform is a) reused *over a price range*, b) reused *over product families*, and c) reused *over industries*.
In the Figure 3 we show how the external side effects of a platform are registered in the PAMatrix. The grading scales used are RS-B, and APS.

4.3.5 Step 5: Markets view of the platforms

The objective of a platform is to create internal advantages for the company, and also to provide the buyer with a value proposition. The buyer might or might not be aware of the platform. If he is aware of the platform, he will perceive it according to how well it fulfils certain functions (here functions can also mean identity or/and quality). He will also get (hopefully) some satisfaction from the platform. In Figure 3 we see how the PAMatrix captures the market views for each platform.
The factors used to analyze the markets view of the platform are *Customer Satisfaction*, *Platform Function Implementation*, *Customer Involvement*, *Awareness to the Customer*, and *Value for Customer*. Furthermore, we register whether the function that the platform fulfils is a threshold-, performance-, or excitement function, i.e. according to the Kano Model (see e.g. [Kristjansson and Hildre'04b,Ullman'97] for further information). The grading scales used are KMS and RS-B, and APS. See Figure 3 for an example.

4.3.6 Step 6: Platform match to derived products

Platforms are in many cases originally designed for a certain product in mind, and therefore fit well its target functionality, quality, cost, volume, and identity. When however the

platform is used for other products, the match might not be optimal. In Figure 4 we can see how the PAMatrix registers these matches.
The company's products are listed up on the vertical axis and the platforms match graded in terms of functionality, quality, cost, volume, and identity. The rating scales used are RS-A, RS-B, and APS.

4.4 Steps 7 to 9: Assessing the "positioning" of the platforms

4.4.1 Step 7: Industry forces

The company exists in a certain industrial context. In the PAMatrix, we assess how the platform complies with the given industry situation. In Figure 4 we can see an example of how the *Industry Forces Factors* for each of the company's platforms are captured in the PAMatrix.
There are six factors considered, always in relevance to the specific platform. These factors are *Rivalry Rate, Barriers to Entry, Bargaining Power of Buyers, Bargaining Power of Suppliers, Substitution Threat,* and *Disruptive Technology Threat.* In essence we use Porter's Five Forces Model [Porter'85], in addition to Christensen's theory of disruptive technologies [Christensen'97] to capture the industry forces which affect the platforms. It is important to notice that we apply the analysis on each individual platform, and not on the product in whole.
For each factor a grading is given according to how strong the forces are. The grading scales used are RS-B, RS-C, and APS. If e.g. the *Bargaining Power of Buyers* is strong in reference to a particular platform, the grading would be set as 9.
The graph facilitates the comprehension of the results; high scores indicate a tough industry situation for the platform.

4.4.2 Step 8: Market volatility vs. clockspeed & inertia

Platforms have different clockspeeds and inertia, which should be aligned to – among other things – the volatility of the market. In Figure 3 we see how the relationship between market volatility and clockspeed & inertia is captured in the PAMatrix.
The factors looked at are the *clockspeed* and *inertia* of the platform, as well as the *market volatility level* and *maturity level* of the particular platform. In addition, the matrix captures the main reason for the inertia. Furthermore, to create a reference point, the main competitor's clockspeed and inertia in terms of his comparable platform (if it exists) is registered.
The grading scales used are RS-B, RS-D, IRS, MLP, ASP, and the clockspeed is measured in the maximum amount of years that a company will use it (starting from first usage).

4.4.3 Step 9: Platform competency

Companies have a number of platforms that they use to support their overall competitive advantage strategy. Depending on the platform, a company's ability to improve it varies. The company's competency to improve the platform, along with the time and cost needed to do so is assessed. In Figure 4 we see an example of how this step is executed. The grading scales used are RS-B, RS-D, and APS.

4.5 Step 10: Summing up

Finally the scores from all factors are summed up along with their weightings. An overall evaluation is undertaken of *how well the platform supports the competitive advantage strategy (CAS)*, the overall need to change the platform, the overall potential to do so, and the overall importance to do so. Based on the findings, a final recommendation is given towards a strategic action plan. The grading scales used are RS-B and APS.

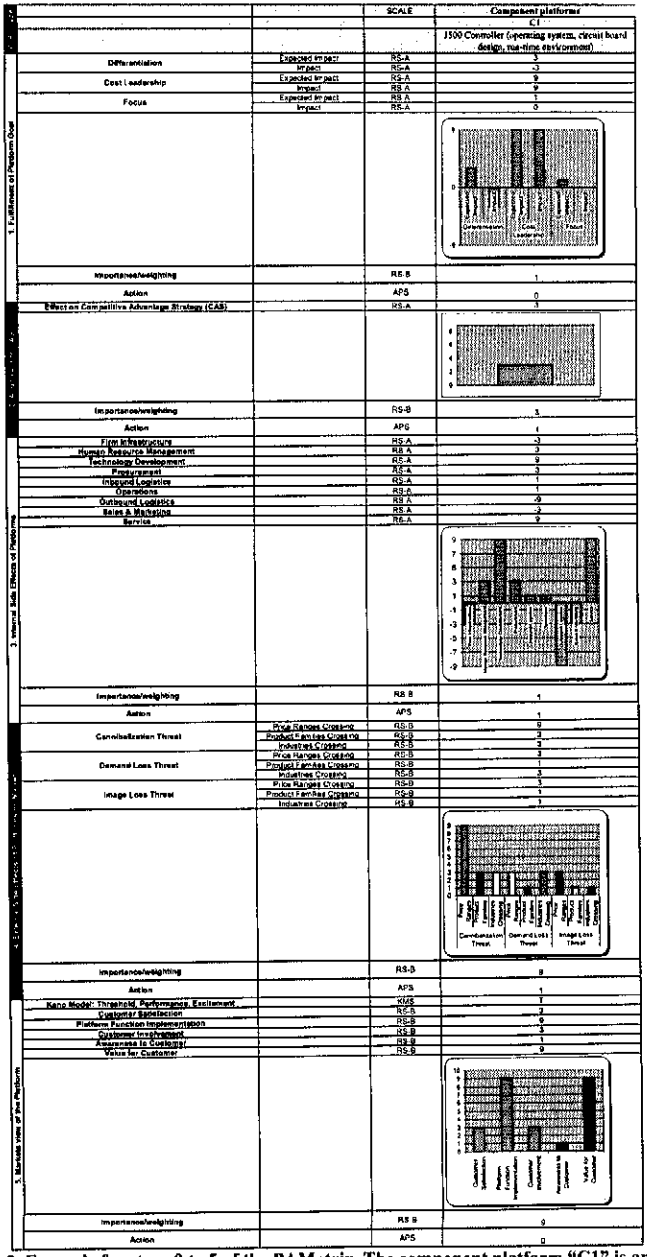

Figure 3. Example for steps 0 to 5 of the PAMatrix. The component platform "C1" is analyzed.

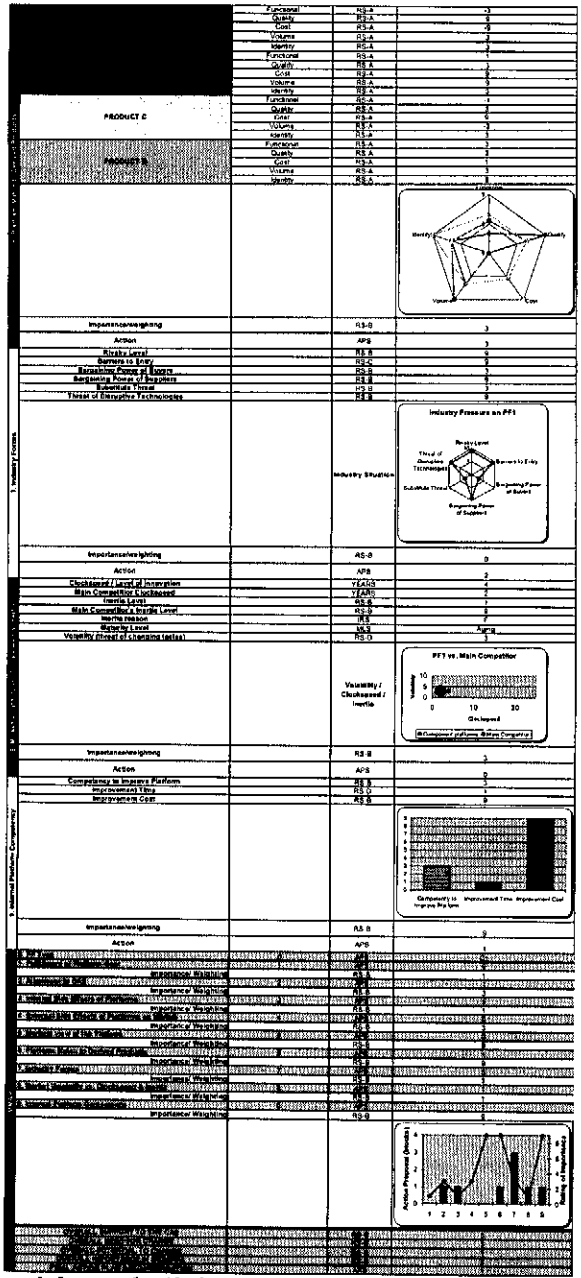

Figure 4. Example for steps 6 to 10 of the PAMatrix. The component platform "C1" is analyzed.

5 Interpreting PAMatrix

By displaying together a group of platform critical measures, matching them together, and assessing their effect, a relatively strong indicator of platform performance is made possible. The intermediary step-wise action plans facilitate the creation of an overall strategic action plan by breaking down into smaller "pictures" the status for each platform.
Furthermore, due to the classification of platforms, benchmarking is made possible, facilitating the transport of knowledge within the field of platform strategy.
In praxis, the PAMatrix should be used as a discussion-based tool to 1) make the platforms apparent and create common understanding, 2) facilitate a meaningful discussion of the platform's current situation as well as need and potential to change, and 3) derive a strategic action plan based on discussion's and expert opinion.

6 Conclusions and further research

For managers and other stakeholders, the ability to comprehend a large amount of complex information in a relatively short amount of time is of key importance. A company has a number of platforms that are in effect the core foundation of value creation. The industry needs a method to assess the platforms in a standard way, to be able to make better strategic decisions regarding what action plans for each individual platform. This is the main purpose of the PAMatrix method. In essence it has primarily 5 functions:

1) Capture and create a common understanding of a company's diverse platforms
2) Assess a multitude of factors that affect or are affected by these platforms
3) Grade how well the platforms align with the competitive advantage strategy
4) Facilitate an understanding of how the individual platforms should be improved
5) Create an arena for stakeholders to discuss-, create a common understanding of -, and make decisions regarding a company's platforms

The PAMatrix should preferably be displayed in a way that enables all stakeholders to simultaneously view it – e.g. by using a projected or printed graphic representation. Stakeholders should use the depiction as a discussion tool, and be able to cognitively bond findings, modify values, and enter remarks.
An important aspect of the method is that it should not be elusive, but at the same time not so detail oriented that the overview is lost. It is a strategic decision support tool, using the tacit and explicit data and information captured within the company.

The PAMatrix method is still in development. It is an attempt to approach the request of the industry to be able to assess *what* and to which *extent* a company should reuse its core assets. The method is not meant to be a foolproof guide to managing platforms; it will not provide any direct suggestions, but rather should serve as a mapping technique to comprehend a vast amount of information in a systematic way, and so serve as a decision support tool for stakeholders. The basic assumption is made that the company already has a large amount of information regarding the reuse of core assets; it is simply a matter of systematically gathering the information together in a cognitively ergonomic way.
The method has not been validated yet, but a number of case studies in diverse industries are in the pipeline to do this. It will be tested in workshop forums, where a number of cross functional experts will give their qualitative assessment on their company's platforms. We believe that for the purpose of creating a better overview of a company's reuse of assets, it is very useful, and certainly better than using 2-3 simple indicators, cognitively *locked* in the minds of a small group of stakeholder.

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