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GLOBAL PRODUCT STRUCTURE MATRIX: AN INTEGRATED COMPONENT OF A VARIABLE PROCESS MODEL FOR GLOBAL PLATFORMS

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ABSTRACT
This research is targeted at manufacturers of special purpose machinery and custom-made products, who operate multi-nationally. Globalization pressures lead these companies to develop platform-based products. In the style of the automotive industry, many of these companies started to develop their product families based on global product platforms. The difficult task is to cover all kinds of local standards, laws, and regulations within the platform. Supplementary strong variations in the purchasing power of customers, education of work forces, and availability of technology or mere fashions in local markets are further hindering the platform development.
This paper describes two elements of a new variable platform process for global product development. The goal is to guarantee variant management already during the development of a global product family and improve global collaboration. The *Global Product Structure Matrix* is the platform process' backbone and helps to determine the optimal product variety and at the same time improves the integration and collaboration of R&D and market representatives. But the real *"spirit"* of the process is the *Component Box* platform model. Its novel structure offers the robustness for component re-use and flexibility for local differentiation. Even more important it facilitates the collaborative product development in the globally distributed development network by remaining "visible" throughout the entire process.

Keywords: Product platforms, Global product development, Variant management, Product structure, Simultaneous engineering

1 INTRODUCTION

1.1 Motivation
Since more than a decade the automotive industry and many multi-national companies of the consumer goods industry are successfully applying global platform and modularization strategies [1]. Some of the most prominent drivers behind such platform strategies are the overall reduction of (technical) complexity, achieving economy of scale, increase reliability & quality and achieving shorter time to market by re-using standard components [2-4]. But what remains unmentioned in literature is the difficult task of planning and developing a global platform. How do you cover all kinds of local standards, laws, and regulations within the global product platform? In reality strong variations in purchasing power of the customer, education of work forces, import duties and availability of technology or mere fashions in the different local markets are antagonizing the platform development. Especially manufacturers of special purpose machinery and custom-made products struggle to overcome these typical obstacles. Market volume and lot sizes are small compared to the consumer goods or to the automotive industry. Often, global sourcing strategies seem not profitable, since high import duties exist or the products are simply too big and bulky to be transported economically. Also the international harmonization of codes and standards is a slow and tedious process. Thus, the global product platform exists only for a short while, during the conceptual design phase.
The motive for this research came from Schindler Elevators Ltd. It has over 40'000 employees in 130 countries with worldwide more than 1'000 branch offices. Schindler has introduced platform-based

product development in 2002. The need for further research specifically targeted at companies of the capital-intensive goods industry arose from Schindler's experiences during the development of its first global product family, which has been successfully launched in 2005.

As a product executor at Schindler once explained: *"Platform-based product development is tough for companies, where the gains of component re-use along the entire product life cycle and value chain are not clear "*. Experiences show that during the localization and industrialization of a global product into a local market many problems occur. These are very difficult to anticipate during the planning and conceptual design phase. Often, unplanned variants and redesigns become necessary.

Furthermore, Schindler seeks to develop its global platforms by making optimal use of its global innovation network. Thus, an approach is needed to optimally support the simultaneous development in the globally dispersed and cross-functional development team. People having the following competences need to be represented in the team:

- In-depth understanding of the market
- System know-how and elevator engineering
- Manufacturing & logistics know-how
- Understanding and practical experience of the company's overall processes

The objective is to define a generic methodology for the development of global product platforms that:

1. Has the purpose to actively plan and manage variants during the planning and development phase of a global platform.
2. Makes optimal use of a company's globally dispersed innovation network.

1.2 Contributions and outline of this paper

This paper proposes a variable process model for the development of global platforms in an integrated and globally dispersed R&D network. This research is strongly driven by practice. The process and methods are currently applied at Schindler Elevators Ltd. during the development of a global product family. All terminology is adapted to the vocabulary used by product executors at Schindler. The paper is structured as follows. Section 2 of this paper offers an overview of related work.

The requirements for the platform process and the corresponding product model are elaborated in Section 3. Based on it Section 4 describes the core method of the process; the *Global Product Structure Matrix (GPSM)* to support the global requirements engineering, optimal variety planning, and module definition. The importance of the proposed platform model and methods is then discussed in Section 5 by highlighting the benefits and drawbacks of their implementation at Schindler.

2 RELATED WORK

The state of art in product family and platform design has been recently summarized and broadly reviewed by Simpson, Siddique, and Jiao [5]. This shows that the topic is still prevailing and on the top priority lists of industry executives.

2.1 Global product development (GPD)

It seems that after more than a decade of hearing the buzzword "globalization" the borderless economy and global marketplace have become a reality [6]. Today products are being developed in globally distributed engineering environments with the help of powerful IT and communication tools [7, 8]. This trend could further increase the interest in product family and platform design. Researchers such as Ishii and Yang [9], Eppinger [10], and Mikkola [11] see product platform design and modularization as a pre-requisite for global product development network consisting of captive, partner, and external suppliers' resources. The existing GPD research generally focuses on the strategic management level and discusses the problem from an organizational, core competencies, and know-how & skills perspective. The operationalization is often not described. This research regards the actual product that needs to be developed as the "missing link" in order to develop operational guidelines for successful global product development.

2.2 Missing global dimension in related work

In their recent work concerning flexible product platforms Weck and Suh [12] focus on those components that are no real carryovers and are not really new, but often need a substantial redesign (i.e. they call them carryover-modified) which leads to tooling and equipment changes in manufacturing. They suggest a systematic design process which treats such elements as "flexible elements" and assigns them to an expanded product platform. Companies of the capital-intensive goods industry face very similar problems (see Section 1.1) during the localization and industrialization phase of a global product design into the different regional markets. It is exactly this fuzzy area of how to deal with such "carryover-modified" components that causes a lot of problems. Missing solutions to this problem lead to ambiguity. Product executors loose the motivation to develop global platforms.

Therefore it is essential that such a systematic platform design process, as proposed by Weck and Suh [12] can be easily applied by product executors and gets by without complex analysis. Future research should consider real-life terms and conditions, such as the persistent shortage of time, money, and resources and therefore should be targeted at the operational management level.

Malmqvist [13] offers a classification of matrix-based product development methods and discusses them. He states that such methods are popular to develop complex products, since they facilitate the analysis of relations in complex systems. He differentiates between product modeling design structure matrices, which exist as inter-domain matrices (i.e. represents relations between elements of the same type), but also as intra-domain matrices, which allow to compare different types of elements in the rows and columns. Commonly used and well known methods are Quality Function Deployment (QFD), Desing Structure Matrix (DSM), and Modular Function Deployment (MFD). Nevertheless a matrix-based method that specifically supports platform design of a global dimension is still missing.

2.3 Not targeted at product executors

Rathnow [14] and others [15, 16] have highlighted the problems related to uncontrolled generation of product variants that results in the increase of the overall technical complexity of a company. Their recommended solutions remain at a strategic management level or are targeted at a product's market phase. Thus product family and platform planning is a tool for active and early variant management in the product planning and creation phase.

Previous work usually is addressing product family and platform design at the example of the automotive or consumer goods industry [2, 4, 17, 18] or is targeted at the market phase of a product [19]. No related work could be found that is addressing the problem from the perspective of the capital-intensive goods industry [20] during the planning and conceptual design phase.

Martin and Ishii [21] propose the Design for Variety (DFV) method and demonstrate the method on a water cooler. Even though some generic methods exist [22], also for the capital-intensive goods industry, they might be too complex and mathematical to be applied by product executors.

No clear instructions and guidelines for the operational level exist on how to design and develop a global platform-based product family [15, 16, 23]. Also no general methodology could be found to support the development of a global product platform in a multi-site R&D network. Maier and Fadel [24], and Simpson [22] all argue that a generic methodology for product family development and component/module re-use is needed to help engineering decision making on operational level.

3 VARIABLE PLATFORM PROCESS

3.1 Prerequisites and prearrangements

In order to follow a global product development approach, this research assumes that companies possess three basic characteristics as follows:

- The strategic management follows a clear platform strategy (derived and regularly revised with the help of a platform planning process similar to the one described by Robertson and Ulrich [17]).
- These companies act according to a highly structured product creation process similar to the engineering design process according to Pahl & Beitz [25].
- These companies develop products using a systems engineering approach. Meaning market and user requirements are collected and transformed into system requirements. The system requirements are mapped into technical system and component requirements [26]. This research further defines systems engineering as the discipline of developing a complex system (i.e. product) by decomposing the originally complex task into sub-systems and components development tasks. Thus, the different components can be developed simultaneously by cross-functional teams [10].

Requirements for a variable platform process

The development of a global platform usually bases on an existing product family and aims to optimise the future value chain. The best sub-systems of the existing platforms are carried over or improved. New technologies are integrated to reach new levels of price and performance [4]. Thus, the global development task can be regarded as a multi-dimensional (optimization) problem with dimensions as follows:

- ***1st dimension*** – Market View: The scope of the market offering, supply, and services (i.e. market and customer requirements) needs to be determined.
- ***2nd dimension*** – Technical View: The necessary technical variability of the components
- ***3rd dimension*** – Global Execution: The consideration of all regional markets (i.e. regional market and code requirements) enhance the number of variants of the global platform
- ***4th dimension*** – Value Creation Chain: In order to prevent difficulties during the localization and industrialization phase of the global platform into regional markets, the value chain and business processes of each market region need to be considered. Its characteristics and specifics need to be covered by a "flexible" global platform to prevent what Weck and Suh [12] named the "carryover-modified" problem.

The variable platform process needs to fulfill the requirements off the 4 dimensions. Moreover a platform model, containing the following elements, is required:

- Guarantee a common understanding of the platform with a clear definition of the concept.
- Offer the necessary flexibility to deal with the many "carryover-modified" parts [12] by comprising a practical and pragmatic platform definition.
- Offer a structure that incorporates the product family's architectures. This structure should be visible along the entire platform process and be reflected in all its methods.
- Clear definition of the worldwide applicable core components, the locally diverse peripherals and the standard interfaces of each product family.

Thus, the platform model needs to foster global communication and collaboration by offering a high degree of recognition throughout the platform development process.

In the following sections the authors focus on problems related to the 3rd dimension. Solutions on how to deal with the 4th dimensions are discussed in [27]. In order to comprehend the discussed topic, the *Component Box* as representation of the platform model needs to be introduced.

3.2 Component box containing the global product structure

The *Component Box* visualizes and clarifies the goals of global platform-based product families. It was developed by analyzing the impacts of the localization and industrialization process on the product structure of Schindler's first launched global product family.

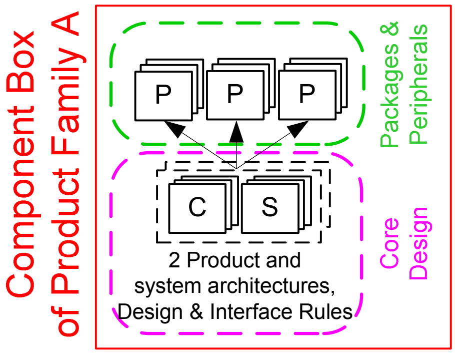

Figure 1. Component box with commonality (C), scaling (S), and "loose" (P) modules.

The *Component Box* comprises elevator components (with pre-defined interfaces) classified as commonality (C), scaling (S), or packages & peripherals (P) modules. This is a direct modification of the three design strategies proposed by Maier and Fadel [10] adapted to Schindler's needs. Within the box one can differentiate between:

- **Core Design:** This is Schindler's "actual" global platform (i.e. the expression 'core design' was created during the development of the first program), which makes use of commonality (C) and scaling (S) modules (e.g. a guide rail or a guide rail bracket are common units re-used in all products of the same family, whereas a mechanical drive or a cabin are size ranges which can vary). Within one product family the *Core Design* components are globally applicable. In the same time many *Core Design* components can be re-used across different product families belonging to different market and performance segments. *Core Design* components are mandatory components of the elevator's product architecture and determine a fully functional elevator.

- **Packages & Peripherals:** This part consists of elevator components which are "loose" modules (that might be grouped to packages) and used in different market regions for differentiation and code compliance reasons (e.g. decoration panels for the cabin, mechanically actuated push-buttons for US code compliance, etc.). Components making use of new technologies or special styling components (due to changing market dynamics) are also attributed to this part at first. Their transfer to the *Core Design* is periodically reviewed during harmonization cycles. But generally the *Packages & Peripherals* components are often optional and have no impact on the key functions of an elevator.
- **Set of rules:** The set of rules includes the product family's architecture, its system layouts (e.g. machine room less or mini-machine room elevator etc.), interface specification, design, and configuration rules. These rules are key parts of the global platform and essential in building the order processes. The possible product structures (i.e. BOM) are defined and need to have a life cycle outlasting the product life cycles that can be configured based on it. Therefore the set of rules belongs to the *Core Design* and is globally valid. Furthermore, the emotional profile and design language of the respective product family are part of the *Core Design*.

3.3 Schindler's platform process

Figure 2 gives an overview of Schindler's platform process and emphasizes the importance of concurrent engineering. The tasks of *Market* and *Process* functions will not be discussed in detail, though (key process steps discussed are marked with bold frames or in red). The focus lies on the newly proposed methods Global Product Structure Matrix (GPSM) and *Component Box*.

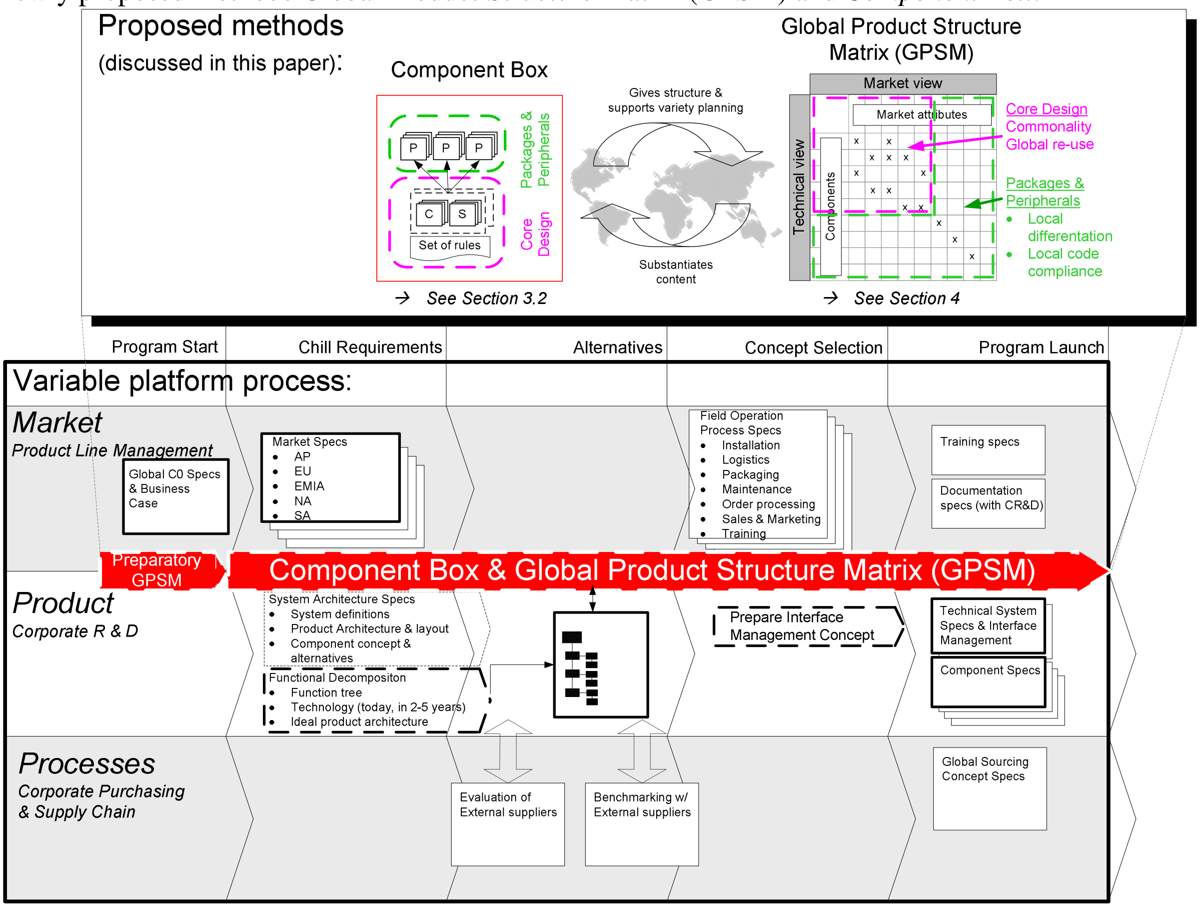

Figure 2: Overview of Schindler's platform process.

4 THE GLOBAL PRODCUT STRUCTURE MATRIX (GPSM)

4.1 The K-Matrix method

The Global Product Structure Matrix (GPSM) is based on the idea of the K-Matrix method [28]. The K-matrix is an intra-domain matrix method comparing the functional and the component (technical) domain. The main difference to the well known QFD (quality function deployment) is the focus on the variety of the components in the platform instead of a ponderation of the single components depending on the customer wishes. So the K-matrix does not support the development of the right product for the market but represents all existing variants of the components. Thus the method helps to systematically visualize elements in order to minimize the component variety by the satisfaction of all customer requirements. In the K-Matrix two different views on the product can be compared and brought into correlation. These are as follows:

- The ***market (or functional) view***: On the x-axis consisting of market attributes (MA) and their specifications (e.g. MA: elevator duty load specifications: 600 kg, 675 kg, 750 kg, etc…). The market attributes are not necessarily customer requirements, often they are customer requirements transformed into a technical language (cf. functional requirements).
- The ***technical view*** (i.e. close to the product): On the y-axis the product's components and modules including all existing variants are listed (e.g. An elevator's mechanical drive MDR XY in all necessary execution variants, that are needed to cover the requested duty loads). The level of detail can vary and depends on the purpose. The optimized technical view will later result in and help to determine the *Component Box*, out of which all products belonging to a certain product family can be configured.
- The technical view needs to be based on an underlying generic structure, which is the functional structure of the product. This functional structure was a necessary precondition to achieve a common understanding in the multi-functional and globally distributed team. Further it helped to establish a standardized product structure for the matrix.

4.2 The Global Product Structure Matrix

In order to develop the *Component Box* for a global product family, the K-Matrix method needed to be improved. Considering the global dimension (see also 3.1.1) two adaptations were necessary:

- 4 additional rows were inserted in the market view. The rows represent the main market regions in which a market attribute (incl. codes & standards) is requested (see Figure 4).
- 4 columns in order to specify in which main market region a component/variant is used (see Figure 4).

The benefits of the ***Global Product Structure Matrix*** are as follows:

- It helps to gain a good overview over the targeted global market segments.
- Commonalities between the existing continental product lines can be identified.
- It helps estimating the feasibility of a global platform and highlights its sensitive areas.

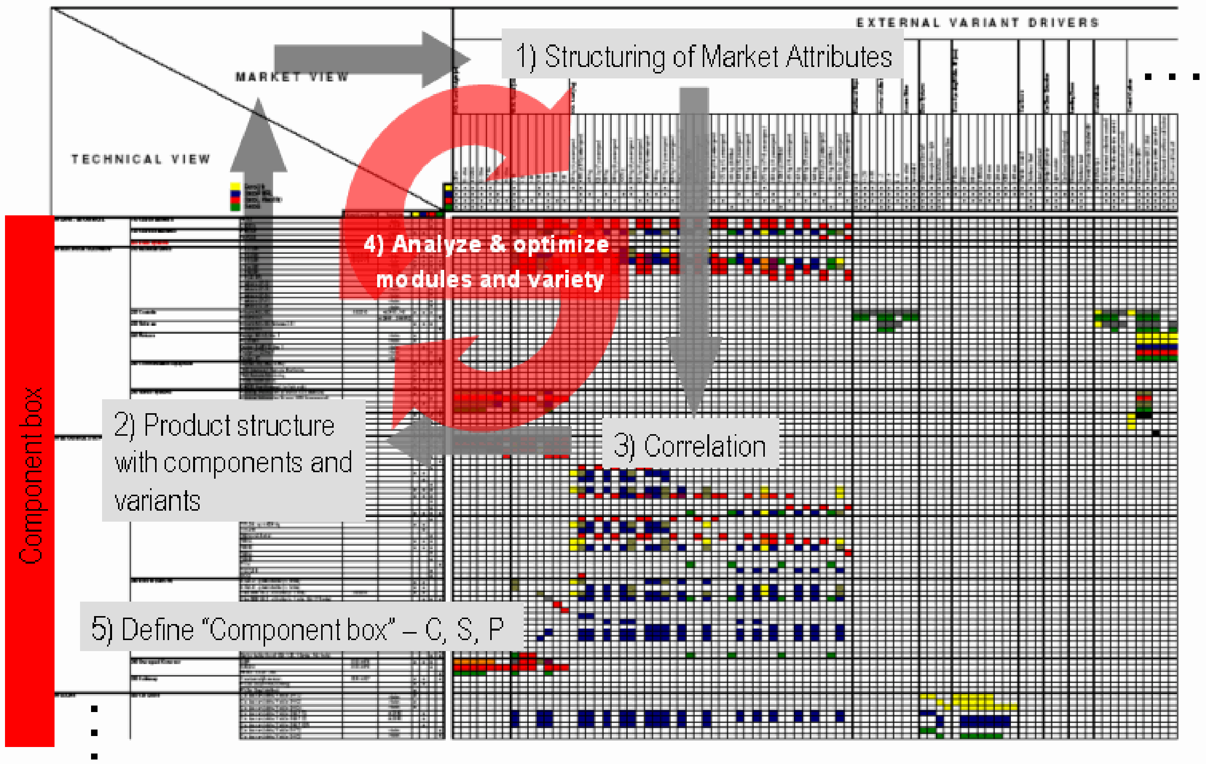

Figure 3. Section from a Global Product Structure Matrix.

Evaluation of the preparatory Global Product Structure Matrix

In a preparatory phase of the development the existing regional product lines have been analyzed with the Global Product Structure Matrix. The analysis has been performed by applying a perspective, which seeks to achieve an optimal global variant management. The analysis works as follows:

- ***Where used (components):*** If components/variants are nowadays already used in multiple product lines and market regions then they should become global *Core Design* components (see Figure 4). For example: Today the gearless machine GLM 1 is used in the mid segment and in the market regions Europe, Asia Pacific, and North America (this is due to the its brake system that meets global code standards).
- ***Where requested (market attributes):*** If today exactly the same market attributes are already requested in several market regions, then in the future they should be satisfied with a global *Core Design* component (see Figure 4).
- ***Slightly Different Market Attributes Specifications – Harmonization Potential:*** If slightly different market attribute specifications correlate to different regional component variants (e.g. duty load 525kg in Latin America and 550kg in Asia Pacific) then it needs to be discussed if the technical solution in order to satisfy these specifications can be achieved with one and the same component (this is certainly possible for elevator machines, but becomes more tricky with the elevator cabin, where the code specifies the ratio between duty load and cabin dimensions).
- ***Many Correlations from Market Attributes to one Component:*** Such components often are key elevator components and belong into the Core Design. They usually unite a lot of specific elevator know-how (e.g. elevator controller).
- ***No Correlation from Component to Market Attribute:*** Components with no direct correlation to a market attribute should be included in the Core Design. If many execution variants of such components exist in different market regions, then they should be consolidated into one global Core Design component. These components are likely to be below the line of visibility.
- ***No Correlation Market Attribute to Component:*** It is likely that this market attribute has not been requested for many years. Therefore it should be cancelled from the market view and the market representatives have to take it off the product order sheets and sales brochures.

The benefits of the GPSM are summarized as follows:

- Potential for standardization and harmonization with the future global platform (i.e. Core

Design components) is visualized.

- During the analysis: Market attributes and their specifications which offer no potential for optimization are identified and can be classified as regional market attributes. They allow a first estimation on the number and kind of local Packages & Peripherals modules needed.

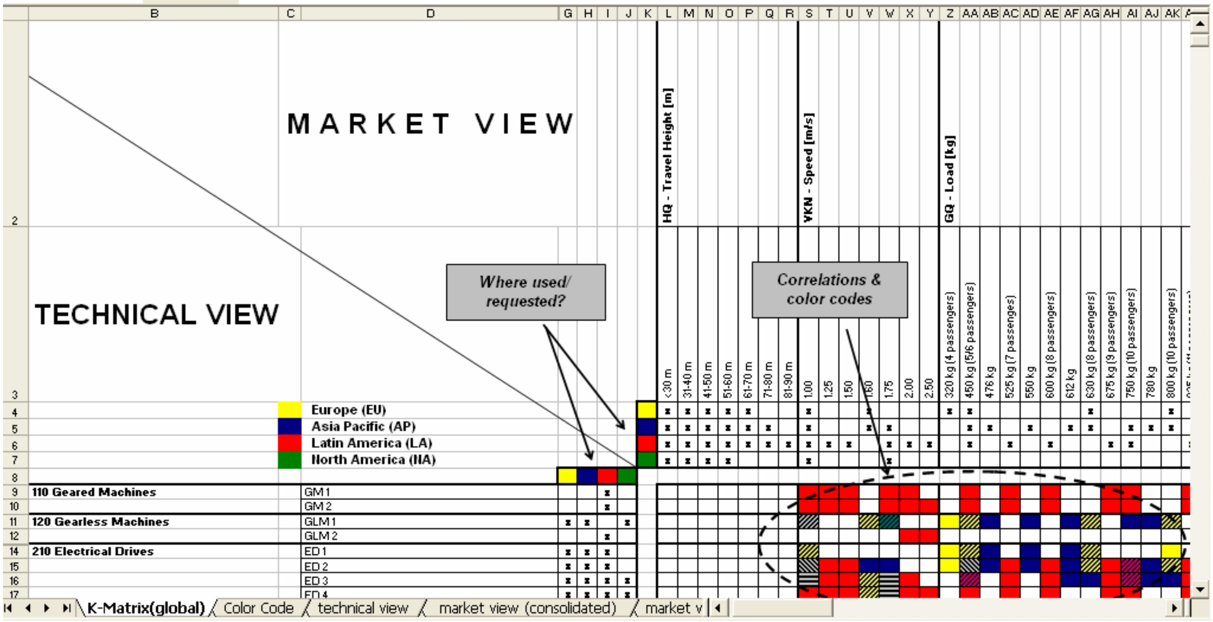

Figure 4. Section from the preparatory Global Product Structure Matrix analyzing product lines to be replaced.

Additionally the consolidated information in the matrix can be further processed by establishing *Variant Portfolios*. The goal of these portfolios is to evaluate the quality of today's product structure in relation to the variant diversity. It is beyond the scope of this paper to discuss all possible portfolios. Exemplary the market focus portfolio shall be briefly discussed (see Figure 5).

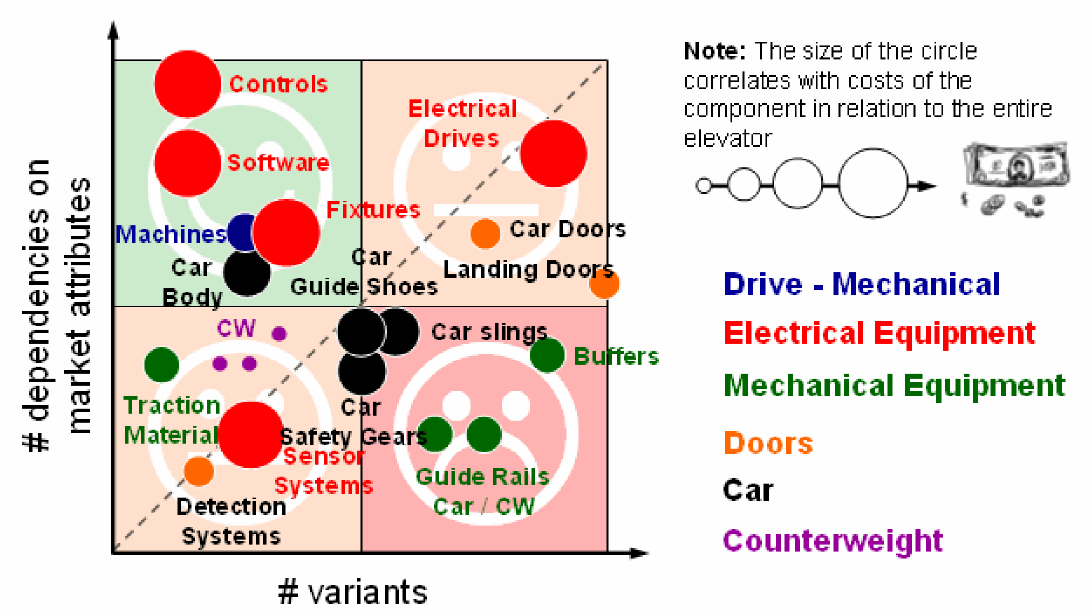

Figure 5. The market focus portfolio analysis maps the elevator components into a portfolio depending on their dependencies on market attributes and existing variants.

This portfolio analyzes the component variant diversity of a global platform concept. The existing number of variants of a certain elevator component is mapped with the number of market attributes the component depends on. Components, which depend on many market attributes need to be critically

considered. The *market focus – portfolio* is divided into four quadrants. With the perspective and goal to achieve an optimal variant management, the top left quadrant needs to be aspired.
Components depending on a lot of market attributes should be allowed to have a "beneficial" variant diversity. Because often it is not possible to develop a "universal component" that covers a wide range of market attributes and still is economical and cost competitive. On the other hand components that are hardly influenced by any market attribute need to be standardized. Examples are as follows:

- The mechanical drive (i.e. machine) in the top left quadrant depends on a lot of market attributes (e.g. on travel height, speed, load, etc…). It is beneficial to design this component as a size range (S) component belonging to the Core Design. An optimal variety can be achieved by an accurate planning of the size range. Alternative technical concepts need to be analyzed by mapping them to the market and performance requirements which are clustered according to market forecasts.
- Mechanical shaft equipment such as the buffers in the pit, the guide rails, and the guide rails mountings depend only on a few market attributes. Therefore it is easily possible to standardize these components. The components are candidates for commonality (C) parts belonging to the Core Design.

The various possibilities of matrix analysis performed on the old products give an early indication on possibilities for global *Core Design* components and the local *Packages & Peripherals* components. The analysis allowed the development team to learn a lot about the different local conditions. Its results gave important indications and revealed the sensitive areas of the global development task ahead.

Global Product Structure Matrix as a development and requirements engineering tool

After the program was launched the GPSM was then used to actively plan the necessary product variety and develop the *Component Box* of the new global product family. Thus, the method has become an attending tool for the global development team along the product development process. Summarized the main characteristics of the new GPSM method are as follows:

- ***Systems and requirements engineering tool:*** The global product line management team (i.e. representing the market side) and the project management team within R&D use the matrix to globally collect and structure the customer and market requirements. They are then structured and summarized for iterative reviews with the regional market representatives. Simultaneously the development team within R&D is deriving the system requirements and starts working on the system architecture specifications. Thus, conceptual design phase can start early. By the time the market requirements are finally accepted, the program development has already gained momentum. First layout and technical feasibility analysis, concept evaluations, etc. have already been approached.
- ***Module definition tool:*** As soon as the market view has been revised and structured, the GPSM is used as a correlation tool of market attributes to components. This then helps to define the necessary modules and component variants. Hence, the product variety can be determined (i.e. the *Component Box* is taking shape).
- ***Communication and management tool:*** The GPSM is a worldwide communication and management tool that helps to drive the system development ahead. This is supported by generating different views of the matrix (i.e. Schindler uses Excel® and its filter functionality) in order to guarantee the overview over the huge data. Possible views are as follows:
    - ***Where used – view:*** Depending on one or several market regions, the requirements can be selected and compared.
    - ***Type – view:*** All customers selectable attributes, technical system specifications, order processing relevant attributes, etc. can be selected and viewed separately..
    - ***By responsibility – view:*** For different persons involved in the project, different information is relevant. Therefore information can be viewed by responsibility.
    - ***Timeline – view:*** The time or project phase of when a certain attribute was first requested and when it was taken off can be tracked depending on the different stages of a project.

One of the main outputs of the GPSM is a first draft of the *Component Box*, which implies a first suggestion of global *Core Design* components and of the local *Packages & Peripherals* components.

5 BENEFITS AND DRAWBACKS

Generally the *Component Box* and GPSM method brought structure into the global product development. The complex task was visualized and the engineering, marketing, manufacturing & supply-chain functions were brought together. The usefulness and benefits of the proposed concepts are as follows:

1) Pro-active variant management in the planning & development phase

For Schindler already the hard work and process that led to setting up the matrices was highly instructive and useful. All product and market-related data of four continental product lines (which are about to be replaced) was carried together and finally available. The matrices were repeatedly discussed in the multi-functional team (as described in Section 4.2). GPSM visualized standardization and harmonization potential and areas, where local differentiation is needed. All of a sudden the product executors realized that there already is a lot of global standardization potential. The multi-functional team built up awareness such as follows:

- ***The global platform virtually already exists:*** Some newer components are already used globally (which was not always apparent). Other local components cover very similar market and performance requirements. If the market and performance requirements are globally harmonized, a global component can be introduced.
- ***Local codes and standards are not an insurmountable problem:*** If addressed early ideal solutions to overcome local codes and standard requirements can be found and often lie in a modular component design.
- ***From system to component level analysis:*** The team realized that the *Component Box* and its rules need to be applied first on elevator system level. Then, in a second iteration, they need to be applied for each component on component level. This means instead of over hastily creating a local component variant, the team needs to analyze whether it makes sense to develop a modular component by applying the *Component Box* rules on component level. Also components can have a *Core Design* and *Packages & Peripherals* part.

Schindler achieved more than satisfying results with its standardization efforts. The variety of rather **mechanical components** such as elevator machine, cabin, cabin doors, landing doors, etc. could be **reduced by 50 to 75%** on average. **Components containing electronic and/or software**, such as the frequency converter, elevator controller, safety systems, etc. could be **reduced by ca. 50%** on average. Even with typical local differentiation components such as the user interfaces (i.e. car and landing operating panel) substantial improvements could be achieved (60%). Today Schindler elevators have one global design language with slight adaptations to local tastes.
Drawback: The GPSM only covers 3 dimensions of the problem (see Section 3.1). The more dynamic 4th dimension of difficulties occurring during the localization and industrialization of a global platform related to varying regional business processes and product life cycle requirements is not yet considered.

2) Faster time to market

The *Component Box* and the GPSM trigger many processes which would normally start much later. It is possible to early derive a magnitude of information from the GPSM (and also have this information available!); such as the product structure (i.e. BOM) and the interface management concept. Since the market requirements and their history, and how they correlate to the components is documented the order processes and configuration model can be built. Simultaneous engineering and integrated product and process development is fostered and improved.
Drawback: The GPSM combined with the *Component Box* help to make the complex task of developing a global platform manageable. Nevertheless it is important to resist the temptation to "try to cover all at once". Sequences of broad and global analysis need to be followed by sequences with regional focuses (on target markets) in order to drive the development project ahead.

6 CLOSING REMARKS AND SUGGESTIONS FOR FUTURE WORK

Faster and global product development continues to be a major goal for many companies. This paper describes two aspects of a variable process model, which can help to improve this issue. Other elements of the variable process model are discussed in a second paper [27].

6.1 Summary

For the time being the initial goals of guaranteeing variant management and improving global collaboration have been satisfactorily achieved. The *Component Box* platform model with its simple structure manages to comprise both goals. It visualizes the global platform, communicates the global product architecture, and therefore aligns the globally dispersed development team. The global product development network can be deployed in an effective and efficient manner. The method and concepts proposed in this paper can be adapted to other companies of the capital-intensive goods industry.

6.2 Future work

The *Component Box*'s potential is not yet fully recognized. Future research should try to enhance this platform model. Possible and promising trends could lie in the following areas:

- *Value chain and product life cycle:* A future method should anticipate and consider difficulties related to the regionally varying business processes and product life cycle requirements, which can cause unplanned variants during the localization and industrialization phase.
- *Deployment of global innovation network:* Based on the output of the GPSM a method needs to be developed which supports decisions making on how to best globally distribute the workload among the global development team consisting of captive and external partner resources.

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