EXPLOITING THE POWER OF PRODUCT PLATFORMS FOR THE MEDIA INDUSTRY

a conceptual framework for digital goods and its customization for content syndicators

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Abstract: The concept of product platforms has already been successfully applied in various industries such as automobile and software. Advantages reach from cost savings due to the re-use of product components to the simplified individualization of products. In the media industry, the application of product platforms promises ample benefits due to the industry-specific first copy cost effect and the move towards production and distribution of digital goods. However, product platforms for the media industry have so far not been widely discussed. The paper on hand proposes a framework for the platform-based production and distribution of digital goods, which is customizable for different media business models. The heart of the platform is a repository, storing content modules and content meta data. Further, we distinguish different components for the input and output of content and the platform management, which can be assembled according to the requirements of an individual business model. This assembly is exemplarily shown by a customization of the framework for a content syndicator.

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1. INTRODUCTION

The media industry has been evolving rapidly in the recent past. Advances in information and communication technologies create new opportunities for the production and distribution of media products. At the same time, recipients become more demanding and expect ever new and individualized offerings. However, the creation of media products is a sophisticated process, which so far has not yet been highly elaborated in media related research. In other industries, product platforms have proven to be a successful concept for the cost effective, fast and individual production of different products. So are automobiles assembled of a well defined set of components and software is made of different modules on the basis of specified communication interfaces. Building on the idea of product modularization, product platforms enable and reinforce the re-use of product components like car chassis in the automobile industry and software modules in the software industry.

Due to the first copy cost effect, the re-use of content modules on the basis of platforms can bring about substantial cost savings for the media industry and opens up a new field of research. In the paper on hand, we transfer the concept of product platforms to the media industry and propose a conceptual framework for the platform based production of media products. Thereby, we build upon first works of Meyer and Lehnerd [MeLe97]. We first give an introduction to the concept of product platforms in general and focus on the specificities in the production and modularization of media products in chapter two. After deriving requirements for product platforms in the media industry in chapter three, we develop a framework for the platform-based production of media products, which on the one hand supports the re-use of content modules and on the other hand is easily customizable to the needs of different media business models. In chapter four, we test the framework by customizing it for a specific and currently often discussed media business model, the content syndicator.

2. BASIC CONSIDERATIONS

In the following we discuss the principles and the state-of-the-art of product platforms. Then we introduce a concept for the modularization of media content which can form the basis for product platforms in media companies.

2.1 Product platforms

Platform concepts focus on the similarities of products and processes, and do no longer consider products and technologies of a company as independent from each other [Sawh98, pp. 54]. Theory distinguishes product platforms, brand platforms, processing platforms, global platforms and customer platforms as five different types of platforms [Sawh98, pp. 56]. Most widely discussed are product platforms which support the planning and realization of complex products and production concepts and can be compared to a construction kit that enables a company to create differentiated offerings based on modularized products. Products are manufactured by combining the modules on the basis of product architectures. Accordingly, Meyer and Lehnerd define a product platform as a "set of subsystems and interfaces that form a common structure from which a stream of derivative products can be efficiently developed and produced." [MeLe97, p. 39]

Using multi-purpose modules in multiple products is possible through a sweeping unification of different product architectures in a company, resulting in a significant advantage of efficiency compared to monolithic approaches in both product innovation and production. In monolithic approaches, products are developed and produced as a single unit and not as modules. The exact extent of the efficiency advantage depends on the modules' multiple usability and is greatest when it is possible to reproduce modules very cheaply or almost for free; for example software modules. The individual products of a product platform sum up to a product family as they depend on the same technologies and belong to the same group of products.

Platform concepts are, in theory and practice, most commonly associated to the automotive industry. With the help of platforms, the automobile companies were able to increase their product variety, to shorten developing times for new models and to reduce developing and production costs at the same time. However, platform strategies were successfully employed in other branches, too. Sanderson and Uzimi tell us, that the success of the Sony walkman is due to a platform strategy [SaUz95]. Wheelright and Clark name Honda, IBM and Procter & Gamble as success stories [WhCl92, p. 73]. Meyer and Mugge give more examples of different industries like Black

& Decker, Gillette, HP, Sun, Cisco and EMC [MeMu01]. Platforms can also be successfully employed for services, for example in the assurance industry as shown by Meyer and DeTore [MeDe01]. Sundren worked out a detailed description of successful platform projects in different sectors [Sund99, p. 42]. Reduction of development and production costs, enhancement of product variety and a simplified extension and individualization of products are often named as strengths of product platforms.

A first approach towards using product platforms for information products can be found in Meyer and Zack and Meyer and Lehnerd [MeZa96, pp. 46; MeLe97, pp. 209]. The product platforms for information products introduced in these works are part of an architecture for information products and consist of a repository in which contents and structures are saved. The repository in this model assists in the manufacturing process of information products. In their work, the authors outline the concept of product platforms on a basic level. The framework to be introduced in this paper picks up these approaches, substantiates and develops them. The concept furthermore provides a starting point for the construction of a product platform prototype for media companies.

In most cases, product platforms use the principle of modularization, an idea as old as the idea of division of labor. Tasks or problems are no longer treated as monolithic devices but are fractionized in sub-tasks or sub-problems, which possess clear-cut limited functions and interfaces, and can be looked at and worked with independently and can be combined with each other. The individual parts are called units or modules, the underlying principle is called modularization (process-related view), or modularity (condition-related view). Product platforms transfer these principles to products and create product architectures based on modules that are designed independently but still function as an integrated whole. However, the procedure is only beneficial if the partition is precise, unambiguous and complete. For this purpose the procedure is divided into visible design rules and hidden design parameters [BaCl97, p.86]. The visible design rules include all aspects that affect subsequent design decisions and therefore it is useful to establish all of them in an early stage of the design process and to communicate them to those involved. The visible design rules are split into the three categories: architecture, interfaces and standards. The architecture specifies the modules of a system and their functions while the interfaces describe in detail how the modules interact, including how they fit together, connect and communicate. The standards describe how the conformity of a module can be tested and how their performance can be measured. The hidden design parameters contain the decisions that do not affect the design beyond the local module. Hence modules can even be changed, chosen or

substituted at a late stage in the design process without the necessity to communicate to anyone beyond the module design team.

2.2 Modularization of media products: modules and construction plans

A starting point for the modularization of media content is the media value chain, which, in three generic stages, describes the production, bundling and distribution of media contents [ScHe02, p. 9]. A form of modularized products already seems to exist when we relate these stages to the stages of modularization: media contents are first produced and then bundled to products to be distributed. Therefore, regarding media products, we can already talk about modularized products, which admittedly have a low degree of modularization because the products on the step of production are usually already marketable. This could, for example, be single TV shows which are distributed in a bundled form for economic as well as technical reason together with other products, for example a whole TV program. Therefore, a modularized production, taking a view from the bundling perspective, already exists. Modularization in the production stage, which will be discussed from the view of modularization in the following, is traditionally very low, mainly because of technical restrictions. In this context we will talk about monolithic content production. The main effort on the production step is clearly the creation of new original content, the so called “first copies”, which are bundled and distributed on the succeeding steps and whose production costs are called “first copy costs” [ShVa99, pp. 20]. New technical means, such as the digitalization as a basis of media independent data management, low-priced storage and duplication of content, allow a modularized production of the former monolithically produced content. Consequently, the first copy and therewith the first copy costs split into two components, according to the two steps of modularization. Original content modules (for example text modules of a book, which are not marketable on their own) are generated during stage one and bundled during stage two to create original content products (see figure 1).

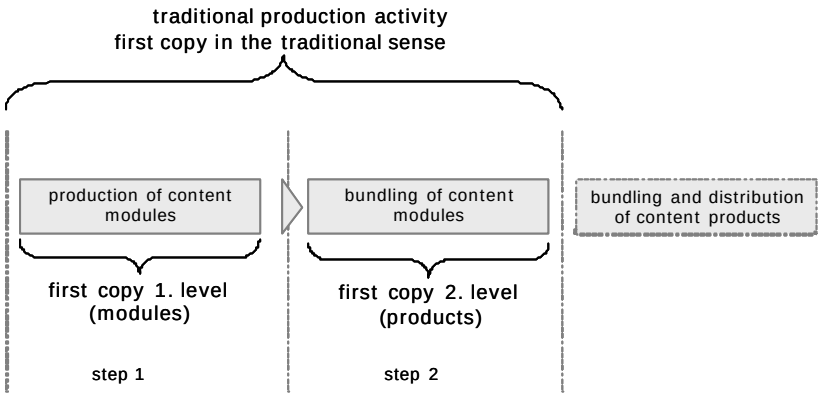

Figure 1: production and bundling of content products on two stages

We can split the creation of first copies into two steps. While the activity of producing the "first" first copy is the same as in the production of original content (for example writing a text), the activity to produce the "second" first copy is a bundling activity. Compared to monolithic content production, there is a higher degree of modularization. While in monolithic content production the major effort lies in the production of original content, in the modularized production of content the effort is shifted towards the bundling of content modules and the effort for production of original content is reduced. A higher re-use of modules accompanies a rising degree of modularization. The effects on the first copy costs are obvious. Minimizing costs to a level significantly below the cost of monolithic content production can be attained by an ideal proportioning of efforts on both steps of the content production.

In the following discussion of the content platform, the term 'module' will be used with respect to media content being stored and processed by the platform. Moreover, it is illustrated how these modules can be bundled to products and how "construction plans" have to be designed for this purpose.

In other industries, modules are built by decomposing products into their individual parts. This decomposition can take place in different steps by deconstructing every part as often as possible. As a result, hierarchies develop between the modules on these different steps. Due to this procedure, modularization of products ends with screws and nuts for manufacturing goods or with single bits for digital goods. In this case, modularization of digital media contents could be extended to single bits. However, from an economic point of view such an extensive modularization is not reasonable. Therefore, the modularization of media products should not be based on a technical perspective; it should take place with respect to the human

perception of content. The particular size of single modules, such as a single audio stream, can be determined according to the economic value of the module. This value results on the one hand from the difference between additional costs of producing an original module (which can be saved by re-use) and the costs of finding a re-usable module in a database, and on the other hand, by the value customers assign to the module. For the technical representation of content, the markup language XML would be appropriate as it distinguishes between content, semantics and layout of media contents (see figure 2).

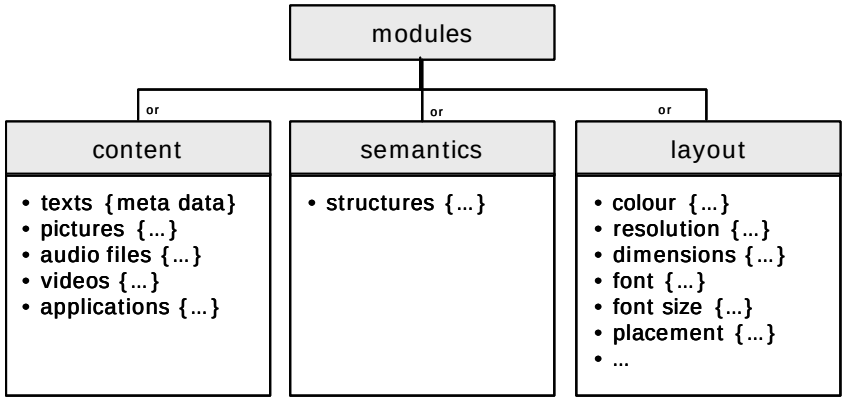

Figure 2: modules of media content

Following this approach, media content like texts, pictures, audio/video files and applications are content modules and classified using meta data. For consumption, the content modules have to be bound to a semantic module and a layout module. The semantic module describes the structure of the content and can be compared to a grammar. A semantic module, for example, describes that a specific content consists of a headline, an abstract, a body text and a number of graphics. These descriptions are stored in semantic modules, which in turn consist of meta data. To display the content, a layout is needed, which, with the help of layout modules, describes features like the font, font size, resolution or placement of a headline. Different layout modules results from different layout guidelines for different structures.

This principle of modularization cannot only be used for textual content but also for pictures, videos and audio content. For instance, a film could be structured according to a semantic module into trailer, intro, different

chapters, credits and making of. The corresponding episodes are saved as independent, modular film sequences and are presented according to layout modules. As such, it is possible to realize – for example – different resolutions or picture qualities for different customer target groups or for different technical means of presentation (e.g. a TV- vs. a cell phone version).

Each of these modules is exactly described by meta data. The meta data could comprise names or descriptions of people and objects on a photograph, the date of the shooting, the name of the photographer and the copyright of the picture. Copyright information is particularly important meta data for media companies because it enables the company to track the holder of a specific copyright and whether a module is free to be published or not.

According to the procedure described earlier, modularized media products consist of content-, layout- and semantic modules. We further want to discuss how these single modules can be assembled to a marketable content product. The assembly is based on construction plans, which determine the modules contained by the product, the way these modules are linked and the methods to be used for editing the product and the modules (see figure 3).

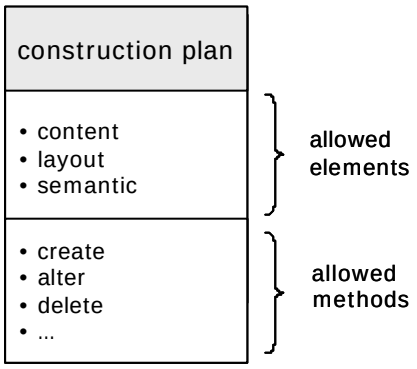

Figure 3: construction plans

The concept of construction plans resembles object-oriented software development and follows the class-principle, which contains the data used as well as the methods used to edit the data. Further, hierarchies can exist among different construction plans, similar to class-hierarchies in object-oriented software development. Construction plans on a higher hierarchy level define the spectrum of modules and methods, which can be used in construction plans on a lower level. For example, the construction plan of a

product line defines the modules and methods that can be used in the construction plans of products in this product line. The construction plan of the product in turn defines the methods and modules that can be used to produce an issue of this media product (e.g. an issue of a newspaper). The construction plan of an issue finally contains all elements and methods that are used in this issue. Therefore, it is reasonable to name the construction plan of an issue "logic first copy". The construction plan of an issue again can be compared to an object (or instance) of the product class. Later on, the "physical first copy" is assembled on the basis of the construction plan for the issue. The physical first copy in turn serves as a master copy for copies of the media content.

3. PRODUCT PLATFORMS IN MEDIA COMPANIES

In the following, requirements for a product platform in media companies are analyzed, and, based on the results, a framework for the specific development of product platforms in media companies is introduced.

3.1 Requirements for product platforms in media companies

The media industry is made up of several sectors with different companies using different media and running different business models. Because of these differences, it is not possible to develop just one product platform that fits all companies. Instead, it is useful to compose a framework, which allows the design of customized product platforms, aligned to the specifics of each media company. To allow the design of individual platforms, the framework needs a modular design with independent system components that can easily be combined using standardized interfaces.

As discussed in the former section, not only the product platform should have a modular designed, also the media content stored and processed by the platform needs to be organized in a modular way to benefit from all advantages of modularization. Hence, the product platform needs to support the modularization of media content based on the concepts introduced before.

Besides the storage of media content, product platforms should also offer functions to support other activities. We will discuss some of these activities starting from the media value chain with its three steps: production, bundling and distribution. The framework for product platforms in media companies has to offer individually applicable system components that support these activities, even if some companies do not cover all value activities in their business model and do not need all of the system components. By analyzing the different value chain activities it is possible to identify more detailed activities, which are contained in the value chain activities but which should be offered independently by the framework (see figure 4).

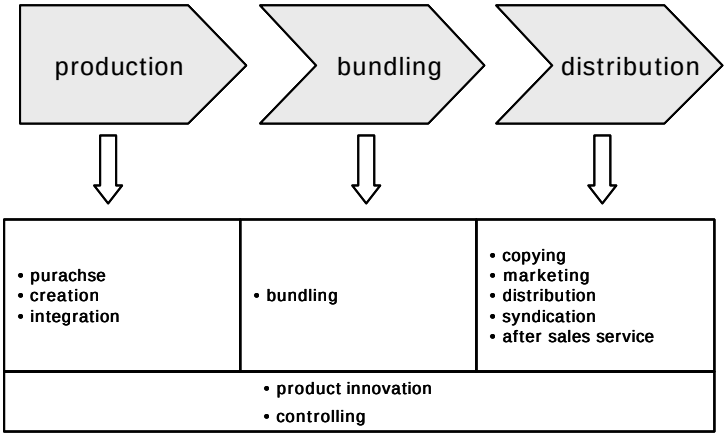

Figure 4: functions of product platforms

The first activity of the value chain can be divided into purchase, creation and integration of media content depending on the business models of different media companies. Some companies just create their own media content, others only purchase media content from producers or syndicators. Some integrate media content from outside the company, e.g. media content from customers for other customers, and again others use several ways to produce media content. Because of these differences in the business models, the framework should offer independent components which support each function and which can be chosen independently.

The second value activity represents the process of bundling separate content modules to products. For modularized media content as described before, we can differentiate between bundling single modules to larger units (e.g. combining pictures and texts with the help of construction plans to articles) and bundling these larger units to complete products (e.g. different articles to a whole newspaper). The media content produced and bundled within the first and second activity is stored in the repository of the product platform. In the case of modularized media products, content-, semantic - and layout modules as well as the construction plans have to be stored separately from each other.

The third value chain activity covers all activities linked to the output of media content. These are activities of copying, marketing, distributing and syndicating media content as well as after sales services. Each of these activities has to be represented by a distinct system component within the framework. In this framework, the system component for copying media content supports the production of a first-copy and the duplication of this first-copy. Further, marketing-, distribution- and syndication components

support the delivery of the media content to customers. Finally, the component for after sales services assists activities after the delivery of content, such as updates.

In addition to these activities, there are activities that belong to or influence all steps of the value chain. Product innovation, for instance, influences all activities, because the process of product innovation determines the construction plans of product groups, product lines, or products and also whether modules acquired from other firms or created within the company or whether the products will be syndicated or not. Hence, product innovation not just affects one activity, it influences all activities. As a further activity relevant for the whole value chain, a controlling function collects data about all processes and units and generates information to manage all processes and units. According to the specific needs of media companies, product platforms should also support these functions by providing independent system components.

Finally, further components are needed to manage the product platform itself. With the help of these management components, system components can be integrated into the platform, updated, changed or removed. In addition, management components support the administration of users and workflows.

3.2 A framework for product platforms in media companies

To enable the design of individual product platforms aligned with the specific needs of a media company, a framework to develop product platforms is discussed in this chapter. This framework is composed of independent system components, which can be combined and which interact using standardized interfaces. Within this framework, it is distinguished between the product platform in the narrow sense, which solely represents the repository of the platform, and the product platform in the broader sense, which – besides the repository – comprises additional system components for further functions.

3.2.1 Product platform in the narrow sense

The product platforms in the narrow sense consist of the content repository, which includes the content-, layout-, and semantic modules of a company and the construction plans of product groups, product lines, products etc. The repository itself is divided into a multimedia database and a XML database. While the first stores different content modules, the second

holds layout- and semantic modules as well as the meta data describing content modules in the multimedia database.

The product platform in the narrow sense only provides the storage of media content modules. To extend the functionalities of the product platform, different system components have to be integrated using standardized interfaces. By integrating system components, the product platform can be individually adjusted and designed, according to the needs of a specific media company.

3.2.2 Product platforms in the broader sense

The product platform in the broader sense is designed according to the principles of component based software development and comprises the product platform in narrow sense and different integrated system components to expand the functionalities. The various system components can be categorized into three groups, which resemble the various value chain activities of a company (see figure 5). The first group of components supports the input of media content into the platform. The second group supports the output of media content while the third group provides components for the platform management. In the following the different components are further discussed.

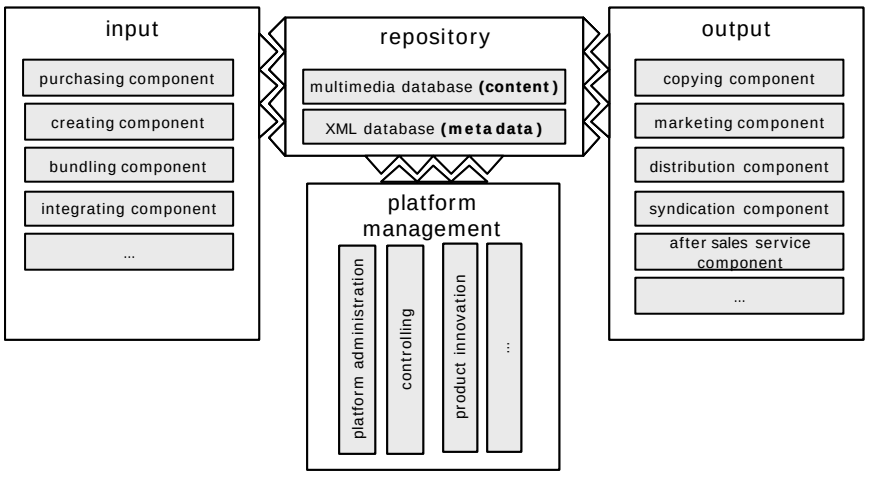

Figure 5: framework for product platforms in media companies

Each group consists of several standard components, which can be combined according to the needs and the business model of a company. One

of the input components is the purchasing component, which supports the process of buying media content from producers or content syndicators and which includes several functionalities, e.g. a billing system, a retrieval system and a system to generate relevant meta data for the purchased media content. The next component supports the creation of new content by the company and provides editing functionality for different media, systems to split content into modules as well as content mining systems. A further component enables the bundling of various modules with the help of construction plans. Thereby, the bundling does not need to take place manually by editors, but can be an automated process, based on personalized product configurations. These, in turn, could be generated manually by the customers or automatically by collaborative filtering systems. Another component to input media content could support the integration of media content from outside the company. This media content may be advertising content from advertising customers or media content such as comments produced by consumers.

The group of output-components also provides various functionalities. The copying component allows the physical production of the first-copy, linking the construction plan of an issue to a medium. This component also supports the duplication of this first-copy. The marketing component supports the advertisement for and the sale of the product. Functionalities for analyzing customer target groups or producing the advertisements can be integrated in this component. The distribution of products to the consumers is supported by a distribution component, enabling the customization of the products (e.g. to fit the customers' technical equipment). The B2B-distribution of products to other companies can be supported by a specific syndication component, which is customized to the particular features of these deals. Another component may support the after sales services, including content updates after the sales process.

The third group of components aids the management of the product platform. Thereby, they support the administration of the platform and the management of the overall activities. To administer the platform, these components offer functionalities to plan and design the platform as well as to integrate, update, change and remove components. The components also deliver functionalities for user- and workflow administration. The second part of this group supports the overall activities of the company, such as product innovation or controlling. The component for product innovation offers, among others, functionalities to design construction plans for product groups, product lines and single products. It also supports market testing of new products.

The different groups can be extended by new components, which may be customized for a specific company if the functionality of the standard components is insufficient.

4. AN EXAMPLE FOR CUSTOMIZING THE FRAMEWORK: THE CONTENT SYNDICATOR

4.1 Content Syndication

Content Syndication describes the sale of the same good to many customers [Werb00] and has been practiced by the media industry since the first moving pictures were marketed at the beginning of the 20th century. The term syndicate, in general, refers to a marketing cartel where several producers jointly market their products in order to keep market prices at a high level. In the media industry, the meaning has slightly changed. Content Syndication primarily addresses the case where one content producer sells its products to several publishers in order to recoup production costs and maximize revenues. Often, the content has already been published by the producer himself and is then licensed to other publishers who then distribute the content to their audience in a second cycle.

Content Syndication per definition is a B2B business and involves at least three actors. The content originator produces the content or holds copyrights which he sells to a content publisher. The content publisher eventually distributes the content to consumers. The syndication process can be supported by an intermediary, the content syndicator, who facilitates the transaction between content originators and the publishers. Thus, there are two options for syndicating content between originators and publishers who can either transact directly with one another or make use of the syndicator (see figure 6).

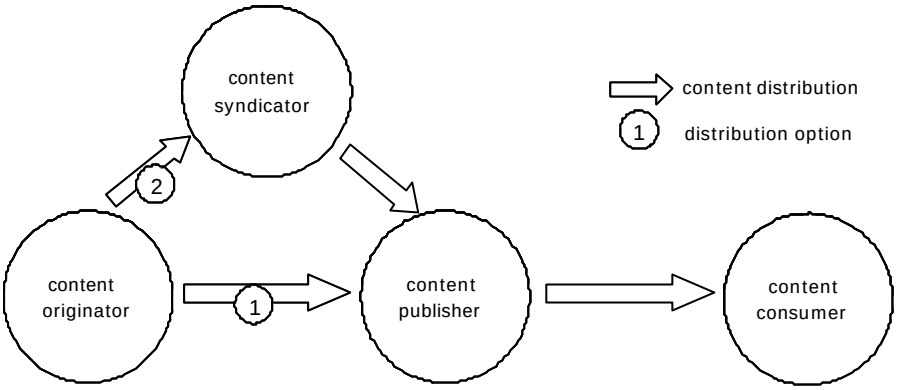

Figure 6: actors in the content syndication process

The decision on whether to employ the syndicator or not shall not be discussed here. We assume that originators and publishers do not interact directly and choose option (2) in the syndication process. In the following, we will take a closer look at the model of the content syndicator and the application of the product platform framework for this type of business. We assume that the content syndicator is a "pure" syndicator and neither produces parts of the content himself nor distributes content to consumers .

4.2 Customizing the framework for a content syndicator

In its intermediary position between content originators and publishers, the content syndicator can either act as a merchant who buys and sells media content or as a broker who just provides originators and publishers with relevant information on possible transaction partners. Based on this information, originators and publishers exchange the content independently from the syndicator. By describing the architecture of the platform for both types of the syndicator, we distinguish between the necessary platform components and the required structure of the content repository for both the broker and the merchant type of the syndicator.

4.2.1 Content Syndicator as a merchant

A content syndicator as a merchant physically acquires media content and syndicates it to different publishers. Thus, the platform needs to contain the content purchasing component on the input- and the syndication component on the output-side. Furthermore, the bundling component can be employed in order to generate new content bundles from the content in

stock. Besides, the content merchant needs the components for platform administration and -controlling. Depending on the type of content to be syndicated, the platform can also contain a distribution component. This could be necessary if dynamic content or applications are syndicated, which require a specific technical capability of the content server . Thus, the syndicator might provide this server ability and thereby partly cover the distribution step while the publisher markets the content to the consumers.

The content repository for this type of content syndicator needs to support the classification and storage of the acquired content. Therefore, it needs to store metadata as well as the content itself and consists of a multimedia database in combination with an XML-metadatabase as described in 3.2. The platform management specifically needs components for the platform administration and controlling. Supportive functions like product innovation are not relevant for the content syndic ator.

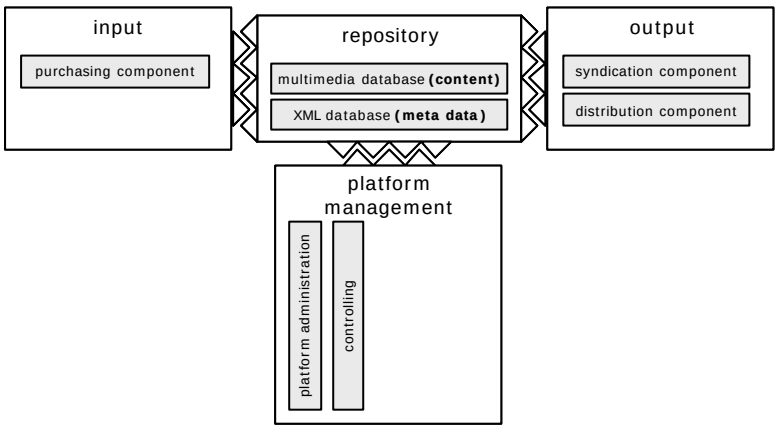

Figure 7: framework for a content syndicator as a merchant

4.2.2 Content Syndicator as a broker

Being a broker, the content syndicator does not physically acquire content but provides publishers with meta information about the originators content. Thus, the content platform does not need a purchasing component for the content, but has to acquire and store meta data provided by content originators. Further, no syndication or distribution component is needed, but the content syndicator has to provide an interface for publishers to access the meta data. As for the platform management, no different components are

needed than in the merchant case. However, the controlling component can be less functional since not the content flow itself but only the meta data needs to be controlled.

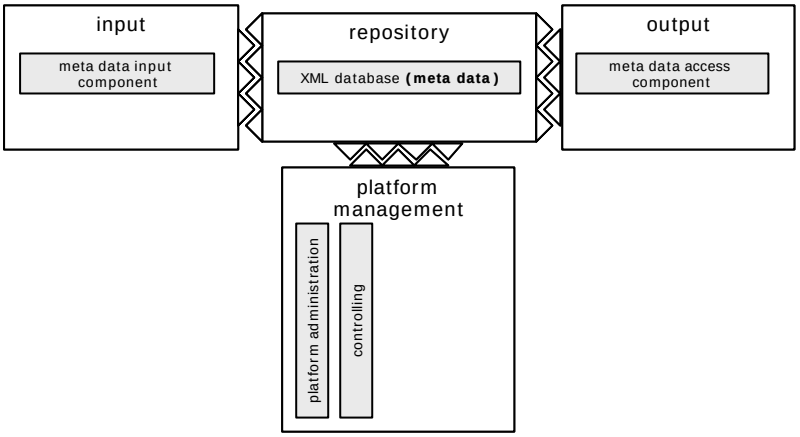

Figure 8: framework for a content syndicator as a broker

This example of applying the content platform for the content syndicator shows that it can easily be adapted to specific business environments and single components can be included or left out without much effort.

5. SUMMARY AND OUTLOOK

Starting point of the paper was the question, how product platforms as a very successful concept in various industries can be applied in the media industry. We have discussed the modularization of products as the basic concept of product platforms with respect to media content and have extended the first copy approach by a distinction of content modules and content products. This allows the definition of a platform for media content and shows that product platforms unfold a huge potential in the media industry due to the reinforced re-use of content modules. The proposed platform framework covers a content repository for storing content modules and meta data as well as supportive components for content input, output and the platform management. Due to the many different types of media companies to be supported, the proposal puts emphasis on the flexible configuration of the platform depending on the functions needed by specific media business models. As an example for the application of the platform we have customized the framework for a content syndicator and have distinguished two specific types of this business model. While each customized version of the platform framework for a specific media business model represents a platform for the production and distribution of media content, the platform framework itself can be considered a meta platform for the definition of specific platforms.

Further research is needed on the detailed definition of platform components and the XML-based representation of content semantics and layouts in the repository (e.g. Document Type Definitions for different layouts). Furthermore, the demand for an easy configuration of the platform requires interfaces between the repository and the supportive components to be well considered in order to allow smooth access. After these refinements, a prototypical implementation should deliver a proof of concept of the proposed framework and pave the way for its application in a real world environment.

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