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TOWARDS A FRAMEWORK FOR BUSINESS MODEL DESIGN OF SCIENTIFIC JOURNALS WITH WEB 2.0 PRINCIPLES

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Abstract

The traditional business model of scientific journals is challenged by the Open Access movement and the Web-2.0 culture which opens up online-publishing to everybody. This paper seeks to contribute to the design and understanding of innovative business models for scientific publishing. As a first step, a morphological matrix will be presented that allows for systematic development and analysis of design options. The matrix combines five selected Web 2.0 characteristics, based on O'Reilly's Web 2.0 principles and patterns, with nine building blocks of business models, based on a widely used business model canvas. This framework is used to derive and describe two exemplary business model scenarios for scientific journals which incorporate various Web 2.0 principles. Assumptions about the impact of these 2.0 design patterns on scientific journal markets and for Open Access are made and briefly discussed. In further research, the framework may be improved and can be used to analyze and categorize existing internet-based models for scientific publishing, to design diverse innovative business models, and to craft research designs for measuring the impact of individual or combined 2.0-principles on desired outcome variables.

Keywords: Web 2.0, Web 2.0 Principles, Design Patterns, Web Squared, Business Model Design, Business Model Innovation, Open Access, Scientific Journals, Scientific Publishing, Morphological Matrix

1 INTRODUCTION

The print media industry is one of the most important branches within the current media landscape but the Internet is gaining more and more acceptance by customers. With innovative Internet-based business models, companies have been adding new values to the reader and advertising market as well as new value propositions to new customer segments over multi-sided Web-platforms.

The impact of Web 2.0 regarding business models for newspapers, the field of research is already widely discussed. In comparison the research of Web 2.0 concerning scientific publishing and appropriate business models is a relatively new one. Within this market the field of Scientific, Technical & Medical Publishing (STM) represents a distinct segment. Like the entire print industry, the STM market is also in the middle of a crisis. Firstly, a few of the largest publishing houses such as Elsevier, Wiley or Veritas occupy a market-dominating position. In 2002 the four leading publishing houses covered 49.3% of the STM-market (Worlock, 2004). It is estimated that the ten largest publisher houses generated revenues of 23.7 billion USD in 2008. This represents a growth of 8.4% compared to 2007 and a market share of 57% (BIIA, 2009). Secondly, the vast majority of all scientific publications are published by print journals. The revenues from print business are primarily generated through subscriptions, with steadily rising subscription fees. The Association of Research Libraries reported for the years 1986 to 2003 an increase in prices of 215%. The moderate decline in demand of only 5.1% indicates not only a very inelastic price elasticity of demand (0.02) but also a niche market with hard-substitutable products (Morgan Stanley, 2002). The analysis of the European market for the years 2005 to 2009 shows that prices increased by an average of 33%. Publisher representatives justify their higher prices with a higher number of published articles as well as the offer of new services, especially over their Web-platforms.

From a historical perspective, the trend of increasing prices has been the central driver for the enormous growth of the industry. Especially libraries and a new form of competition, caused by so-called not-for-profit publishers respectively Open Access Publishing (OAP) as a new business model, set the traditional market model under great pressure and calls the traditional business models into question. Therefore, Internet-based business models may revolutionize the scientific publishing in the future. Although organizations such as SPARC or OASIS, which encourage and support academics and publishers to publish their research works in the form of OAP, the industry analysis by Morgan Stanley (2002) concluded that the sector is not likely to change so quickly. This assessment is supported by the limited definition for Open Access by Suber (2007): "OA is a kind of access, not a kind of business model, license, or content". Both the industry analysis as well as the definition by Suber (2007) underestimate the enormous potential for a change of paradigm caused by Web 2.0, its principles as well as today's Internet users. The basis for OAP was formed in 2001 by the Budapest Open Access Initiative (BOAI). It catches up the old tradition to make research results and knowledge freely available and applies this consistently to the Internet, as a new low-cost distribution channel (BOAI, 2002).

Within this paper the authors illustrate how Web 2.0 principles may impact the innovation of scientific journals and their business models. Therefore, first five principles of Web 2.0 will be introduced and current business model theory discussed. On the basis of different approaches to categorize business models the authors will choose a practicable one to develop a framework for the design and analysis of web-based business models. The authors model a generic Internet-based business model for a traditional subscription-based journal and discuss the traditional as well as the disruptive Internet-based business model within the market for scientific publishing and examine how Web 2.0 affects the two generic Internet-based business models. The role of Web 2.0 principles in the Internet-based business models will be illustrated and finally the findings will be summarized. The authors also provide a critical reflection as well as some questions about further research.

2 A MORPHOLOGICAL MATRIX AS FRAMEWORK FOR BUSINESS MODEL DESIGN AND ANALYSIS

2.1 Web 2.0-Principles

Principles of Web 2.0 and underlying patterns have been variously discussed in literature but a generally accepted definition is still missing (Kilian, Hass & Walsh, 2008; Stevens, 2006). Researches of the various definitions show that we can distinguish two perspectives. From a technical view Web 2.0 refers to an incremental innovation (Stanoevska-Slabeva, 2008). Otherwise a user-oriented perspective exposes that the ultimate innovation can be seen in a social or indeed philosophical component (Meckel, 2006). The principles of Web 2.0 within this paper are primarily based on the work of O'Reilly (2005) respectively Musser & O'Reilly (2007) as well as their relevance in literature. With special reference to O'Reilly & Battelle (2009), "*Web Squared*", the next step in the evolution of Web 2.0, we will distinguish five principles of Web 2.0.

2.1.1 *The Web as Perpetual Beta Platform*

Running software over the internet was already discussed before the new millennium. But appropriate business models failed (Wartala, 2006). Web 2.0 has taken up the concept again with so-called Rich Internet Applications (RIAs) (Kuhn, 2007). The focus of developers as well as users shifts from the desktop to the so-called webtop (Wainwright, 2007). There are two trends that are pushing this progress. First of all, more and more open standards like HTTP, TCP/IP or XML are created which encourage the evolution as well as the diffusion of innovation. Secondly, static websites will be replaced by dynamic ones (Musser & O'Reilly, 2007). Further factors include the adoption of AJAX frameworks, and more efficient access technologies for processing, presentation and transmission of large amounts of data. In addition to data, servers also distribute centralized services. This enables a continuous development of applications and services common known as *perpetual beta* (MacCormack, Verganti & Iansiti, 2001; Kuhn, 2007).

2.1.2 *Harnessing Collective Intelligence*

Collective intelligence can be defined as "a share or group intelligence that emerges from the collaboration and competition of many individuals" (MIT Center of Collective Intelligence, 2008). Each individual user generates value. As a catalyst network effects enable the increase of this individual value. The knowledge of the community increases with each additional member. After exceeding the critical mass a collective is able to correct their own mistakes (Musser & O'Reilly, 2007). As a result, so-called folksonomies arise, based on the concept of social tagging and social bookmarking. This bottom-up approach corresponds to the counter draft of a conventional taxonomy in the Web. The advantage is the high degree of self-organization associated with the high currency and the very large flexibility. Information objects can be assigned to different keywords. For example, a map of Switzerland can be found both under the tag "map of Switzerland" or "map CH". At this point it should be noted that such meta-information is difficult to obtain because there are no hierarchical links between these individual objects. A logical and structured search within a folksonomy is therefore currently not possible (Behme & Ziegler, 2006).

2.1.3 *The Web of Data*

Data are essential key resources of Web-platforms. Large Internet-companies like Google, eBay or Facebook have in common that they share data and functionalities by providing APIs for public access to their data and services. If data represent key resources, then the management of this data has to be a core competence of successful Internet-companies. To achieve competitive advantages, such databases have to be inimitable by the competition (O'Reilly, 2005; Musser & O'Reilly, 2007). User-generated content is a key approach to build up appropriate databases coupled with low costs of production. The best known example is Wikipedia.org. Other examples are YouTube or Social Networking Site (SNS)

like Facebook or LinkedIn. The rapid progress of the adoption of these platforms highlights the tremendous impact of network effects and shows that in critical-mass systems competitive advantages can be developed very quickly by lock-in effects as well as inimitable data. But with user-generated content platform operators are also faced with several dilemma situations such as copyright violation and other ethical-legal problems.

2.1.4 *The Participatory and Social Web*

This principle is based on other principles with special reference to the users, their relationships and interactions with each other. Networks consist of actors and their relations with each other and are defined as the set of appropriate connections. The social behaviour is based on the characteristics of these connections. Knowledge networks not only play a central role in today's organization theory, but are also becoming increasingly important for two reasons. *First*, boundaries between products and services are disappearing. *Second*, this market-driven surplus in supply is also noticeable within companies. SNS enable the systematic development of relations across the Web. These relations can be private or commercial (Bächle, 2006). They are based on the two functions of sharing and networking but with strong focus on personalization (Singh, 2006).

2.1.5 *The Ubiquitous Web*

With the convergence of Web 2.0 and mobile media access, Smartphones and Tablets are taking the lead. On this paradigm both linked and complete new business models for the interaction with users as well as for the distribution of content and services have been emerging. This development is well known as mobile Web 2.0 and comprises mobile extensions of existing platforms but also standalone mobile applications and services. Nowadays, the possession of a mobile phone has become a matter of course, if not even a social duty (Giordano & Hummel, 2005). According to Olsen (2011) 65% of the 18-29 year olds have accessed the internet with mobile- or smartphones and 30% of the US population uses currently such devices. It is expected that by 2012 about 50% of the US population will use smartphones. This shows the tremendous potential for mobile Web 2.0 and appropriate successful business models. The reasons for the use of mobile media services can be grouped into two main categories (BLM, 2009):

- *Save Time*: The use of content and (location-based) services every time and everywhere without booting up a computer.
- *Kill Time*: Mobile infotainment and entertainment for bridging travel and waiting time by the consumption of TV, videos, music and games.

2.2 **Internet-based Business Models**

The term business model has widely been discussed in literature but often used incorrectly and only in rare cases defined by the authors (Rappa 2005; Alt & Zimmermann, 2001). Particularly, on the basis of Web 2.0 we find ourselves in an early scientific stage regarding Internet-based business models (Wirtz & Ullrich, 2008; Dubosson-Torbay et al., 2002).

The intellectual origins found in the 90's with the emergence of business process optimization. The driving forces were methods for modelling information systems. It was assumed that a company's value chain is composed of main processes which can be refined by process chains and supported by information and communication technologies. Due to the concise description of the essence of an entire company, business models close the gap between catchphrases of the early E-Business and the detailed IT-intensive business process models (Schwickert, 2004). Slywotzky (1996) describes business models as "business design". A business model allows compressed statements about the flow of resources, the actors involved and their value-adding tasks and roles. The business model, however, is not for the analysis of single fragmented areas, but for the holistic assessment with regard to all relevant areas of a company (Strauss & Schoder, 2002). The definition of Timmers (1998) is widespread in literature and often used by other researchers as grounding to develop their own business models. Rappa (2005) defines a business model in its most basic sense as the method of

doing business especially how a company makes money. Wirtz (2006) characterizes a business model as the reflection of a company's output system. Slywotzky's comprehensive description can be broken down to a few basic elements. Thus, a business model determines the output as the value proposition (what?), the market and customers (who?) and the internal as well as external activities (how?). Osterwalder & Pigneur (2002) extend this basic framework with the financial perspective (how much?).

In this paper, we define an Internet-based business model as follows: *A business model is a simplified reflection of a company's products, services and its revenue streams. The Internet-based business model includes various actors, their roles and justifies how the company generates a value proposition and how it transmits this value to its customers supported by IT.*

2.3 A Framework for Business Model Design and Analysis with Web 2.0 Principles

In this chapter the authors build their framework by aggregating the five principles of Web 2.0 and the business model framework to an analysis scheme to study the incorporation of the Web 2.0 principles into Internet-based business models. As business model framework, the authors make use of the business model canvas from Osterwalder & Pigneur (2009). Due to the fact that the canvas is based on a multi-dimensional typology, it is a very flexible instrument to describe various types of business models. Osterwalder & Pigneur (2009) describe a business model based on nine elementary building blocks:

- 1) Customer Segments (CS) an organization serves.
- 2) Value Proposition (VP) solves a customer's problem and satisfies their needs.
- 3) Channels (CH) deliver the Value Proposition to customers through communication, distribution and sales channels
- 4) Customer Relationships (CR) are established and maintained with each Customer Segment.
- 5) Revenue Streams (R\$) result from the Value Proposition.
- 6) Key Resources (KR) are the assets required to offer and deliver the previous elements.
- 7) Key Activities (KA) describe the most important things an organization must do to make its business work.
- 8) Key Partnerships (KP) deliver the organization with outsourced resources and activities.
- 9) Cost Structure (C\$) describes all costs occurred by running the business.

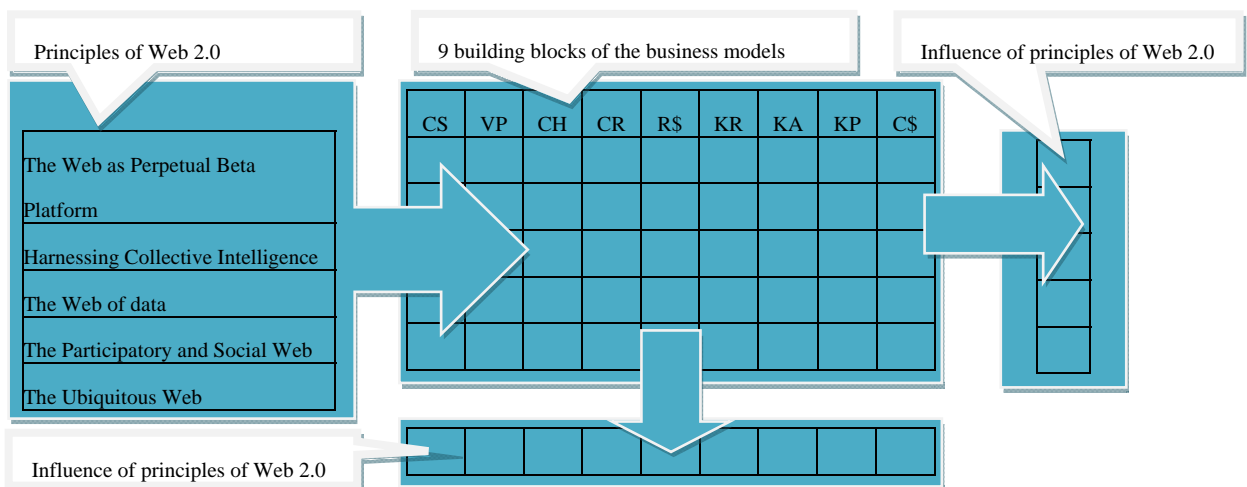


Figure 1. Morphological matrix for business model design and analysis with Web 2.0 principles.

Figure 1 shows the authors' framework. It structures the qualitative study of the role of each Web 2.0 principle in the business model canvas' nine building blocks. Horizontally, the model depicts the role of a single pattern in the overall business model and vertically the role of all patterns for each building block.

3 SCENARIOS FOR WEB 2.0 PRINCIPLES IN TWO GENERIC BUSINESS MODELS FOR SCIENTIFIC JOURNALS

3.1 Traditional Business Model: Subscription-based

Figure 2 shows a typical business model for a traditional scientific journal. In the following, we will briefly describe the process for the traditional business model. For each print edition, the journal calls for paper for relevant topics, whereupon authors submit their papers for a first formal review by an editor. If the paper meets those requirements, it will be forwarded to internal or external experts (peers). Within this process, inter alia, the paper is reviewed in terms of topic, form and presentation, methodology, level of innovation and the relevance for practice (ZEL, 2006). On the basis of the assessment by the reviewer, the journal decides about the publication of the paper or its refusal. After accepting the paper for publishing, the negotiations about the copyrights between the journal and the author begin. In the traditional model, these rights are often assigned to the journal or publishing house. The paper is filed electronically by the journal. The final process step is the distribution in the form of an article for the physical print edition as well as an electronic PDF-file through the website. In addition, especially for authors – the key partner and primary source for content – the website contains other information like scope and format for the call of papers or also checklists. A lot of scientific journals do not have an Internet-optimized business model. The website is primary aligned to the customer segments with focus on the recipient market as well as the advertising market. The revenue model is based on subscription fees for readership. Both, prices for subscription and correlated increases in profits indicate a niche platform with focus on the reader market as primary customer segment and, therefore, it strengthens the assessment of the STM market by Morgan Stanley (2002).

Key Partner <ul style="list-style-type: none"> ▪ Publishing house ▪ Researchers ▪ Academics ▪ Experts ▪ Reviewer 	Key Activities <ul style="list-style-type: none"> ▪ Content ▪ Peer Review ▪ Publishing ▪ Sale 	Value Proposition <ul style="list-style-type: none"> ▪ Periodical scientific articles ▪ Ad Space 	Customer Relationships <ul style="list-style-type: none"> ▪ Subscriber Information 	Customer Segments Recipient market : <ul style="list-style-type: none"> ▪ Libraries & Universities ▪ Researchers & Schools ▪ Practitioner Advertising : <ul style="list-style-type: none"> ▪ Advertisers
	Key Resources <ul style="list-style-type: none"> ▪ Rights & Licenses ▪ Content ▪ Knowhow ▪ Ranking 		Channels <ul style="list-style-type: none"> ▪ Print ▪ Web 	
Cost Structure <ul style="list-style-type: none"> ▪ Wages ▪ IT & Website ▪ Print / Reproduction 		Revenue Streams <ul style="list-style-type: none"> ▪ Subscription Print ▪ Subscription Web ▪ Subscription Print + Web ▪ Advertising ▪ Fundraising 		

Figure 2. A generic Internet-based business model for a subscription-based journal.

Especially smaller journals with a relatively small readership will face a problem regarding the dilemma between reader and advertising marketing as well as the diffusion and adoption of their content distribution over the website. With the transformation into an Internet-based business model, the number of users needs to increase significantly in order to generate a value proposition for advertisers. Because of the extremely inelastic price elasticity of demand (see introduction), a reduction in subscription fees leads only to a marginal increase in the sale of online subscriptions. Furthermore, the very low marginal cost of distribution for online content has also been included into our assumptions. Therefore, it is rather doubtful whether the additional revenues generated from the advertising market are able to compensate or even to exceed sales from the reader market, if content is only available through the web-platform. From this point of view, further instruments are needed for

the platform to fulfill its coordination function and to increase its media penetration. On the one hand the platform has to be opened by interfaces and supplemented by the principle *The Ubiquitous Web* to achieve a higher number of paying recipients and users. On the other hand the Web platform has to offer a clear value proposition to its customer segments. Particularly *Collective Intelligence*, by collective indexing and evaluation of publications and linking to further articles by readers as well as strategic key partners, involves the users harder in the value creation process. We assume that comment functions are suitable instruments to increase the user's active participation. Together with aids for the navigation, created by the collective, the added value of the electronic journal will further be increased. This extends the value proposition for the reader market and enables a new form of collaboration and interaction between authors and recipients and ultimately leads to a social network. The participation of users combined with several publications, the journal is building up Key-resources such as difficult to imitate databases and therefore sets up a competitive advantage. The principle *The Web as Perpetual Beta Platform* generates added value not only for the customer segments but also for key partners like authors and reviewers. The *Ubiquitous Web*, especially the mobile Web 2.0, enables a further distribution channel for content. The relatively small displays of smartphones are not suitable for reading extensive publications. But they are suitable as a kind of digital assistant, for example during the research process. Tablets like the iPad or the GALAXY Tab are a new generation of mobile devices and they are very well suited for reading ePapers. Content and services can be provided to customers as well as to key partners anytime and everywhere. The use of social software like wikis or blogs allows a more effective collaboration with key partners by optimizing the process for content production.

On the one hand the journal reduces the production costs. On the other hand waiting times within the review process (queue for publishing) can significantly be shortened (Björk & Hedlund, 2004). A consistent implementation of the principles of Web 2.0 into the Internet-based business model leads to a new form of interaction with customers and other actors and finally to an increased value proposition. The redistribution of financial resources into the deployment of efficient Web 2.0 collaboration tools, integrated into the ubiquitous Web platform, leads to both the acquisition of further customers, researchers and authors as well as to loyalty of the existing ones. This results in a higher submission rate of publications, whereby, the quality of published articles, the reputation of researchers and the ranking of the journal can be increased. An improvement in quality has a positive impact on customer acquisition and customer retention.

3.2 Disruptive Business Model: Open Access Publishing

The second scenario for a business model has two objectives. *First*, on the basis of Open Access Publishing the authors describe an Internet-based business model for scientific journals, which is different from the traditional subscription-based model, mainly due to its disruptive features. *Second*, the authors will show how to model a hybrid Internet-based business model on the basis of the framework and to explain the impact of the principles of Web 2.0.

The OAP business model consists of the basic types of content, context and connection services. Our generic business model (see Figure 3) can be positioned as a content provider, but the platform distinguishes from competitors and from the traditional business model by context services as well as by elements from the area of Intra-connection. OA is a collection of publishing models, which reallocates the costs of publishing from subscribers to the content suppliers. The goal is to provide knowledge for free over the Internet for everyone. Furthermore, OA is a movement that directly competes with the traditional journals and which calls their business models as well as their market positions into question (RIN, 2008).

In contradiction to traditional models, with OA, copyrights often remain with the author. In some cases, the publications are published both over the Internet and in the print magazine. As regards the additional rights of use like reception, print or citation, there is disagreement among OA publishers (Müller, 2008). In the course of the general open source movement, several projects for standardized license agreements have been initiated over the past years. The most popular are the GNU General

Public licenses, Creative-Commons Licenses and Digital-Peer-Publishing-Licenses (Informationsplattform Open Access, 2009).

Key Partner <ul style="list-style-type: none"> ▪ Experts ▪ Reviewer ▪ Digital Repositories ▪ Print-on-Demand 	Key Activities <ul style="list-style-type: none"> ▪ Content ▪ Peer Review ▪ Platform Management ▪ Publishing ▪ Sales 	Value Proposition <ul style="list-style-type: none"> ▪ Articles for free ▪ Free search ▪ (Print-on-Demand) ▪ Social Networking ▪ Social Research ▪ Quality and Reputation ▪ Tools for Publishing ▪ Target Marketing 	Customer Relationships <ul style="list-style-type: none"> ▪ Online Profiles ▪ Community-of-Interest 	Customer Segments Recipient market : <ul style="list-style-type: none"> ▪ Libraries & Universities ▪ Researchers & Schools ▪ Practitioner ▪ Students ▪ Public Authors market : <ul style="list-style-type: none"> ▪ Researchers & Schools Advertising : <ul style="list-style-type: none"> ▪ Advertisers
	Key Resources <ul style="list-style-type: none"> ▪ Content ▪ Copyrights ▪ Platform ▪ Knowhow ▪ Ranking 		Channels <ul style="list-style-type: none"> ▪ Web ▪ Mobile ▪ (Print) 	
Cost Structure <ul style="list-style-type: none"> ▪ Wages ▪ Platform Management 		<ul style="list-style-type: none"> ▪ Marketing ▪ (Print-on-Demand) 	Revenue Streams <ul style="list-style-type: none"> ▪ Author fee ▪ Membership fee ▪ Advertising ▪ (Print-on-Demand) 	

Figure 3. A generic disruptive business model for OAP.

In a "Free Business Model" at least one major customer segment benefits from a free offer. From an economic perspective, however, a value proposition requires at least one other customer segment or part of the business model to generate appropriate revenue streams to cover at least the expenses (Osterwalder & Pigneur, 2009; Anderson, 2008). An appropriate Internet-based business model, therefore, requires a multi-sided Web-platform, which generates added value for at least two customer segments. If we change the revenue model for the recipient market and articles are available for free, the customer segments will increase in scope. OA is also able to minimize or even eliminate entry barrier caused by high subscription fees and the customer segment of the readership, for example, can therefore be extended to students or in general to the public.

Compared to the traditional business model OA has a significantly different revenue model. The journal charges a fee from the authors to cover the cost for quality assurance as these are assigned to the external process of production. This leads to another customers segment. Authors are no longer just key partners but are transformed into paying customers within the business model. With author fees or membership fees for institutions, the total cost or at least a majority of the cost are covered. These two characteristics, *The Web as Perpetual Beta Platform* and *The Web of Data* exhibit the largest impact on OA publishing. On the one hand authors generate essential revenue streams to substitute the customer segment of readership. On the other hand researchers also produce content, a fundamental key resource for the platform. If the platform supports the whole process chain, then optimizations in the content production, the review process, the content distribution as well as archiving can be achieved and costs will be reduced. Through RIAs Web-based workplaces for researchers can be implemented. We assume that such webtops not only create a significant value proposition for this customer segment, but also support the acquisition of new authors and reviewers. We suppose that an increased number of authors lead to further positive effects.

First, by the increased rate of submissions of papers more articles can be rejected, which improves the journal's reputation. This produces a crucial value proposition for both the author market and the recipient market as well. *Second*, the platform is more successful the more authors publish articles, because authors are also potential readers. *Third*, electronic publishing is not necessarily linked to scheduled topics and a broader field of research and also niche segments can be implemented with the concept of the so-called Long Tail.

Because of the marginal costs for distribution or by charging a submission fee, the journal runs just marginal financial risk due to the author fees. By creating an online identity for the authors and readers, the above effects can be reinforced, the collaboration intensified and a social research network established. Through the involvement and an active participation, researchers extend their profiles and

thus their online reputation within the research community. Elements and tools are their papers, multimedia extensions, tagging, comments or weblogs. Social tagging and bookmarking, for example, create extensive web directories and navigation aids and are an important value proposition for users as well as key resources for the journal. ResearchGate (www.researchgate.net) is an example of an appropriate social network for researchers. Mendeley (www.mendeley.com) is another notable example of an academic social network and reference management web-platform with more than 100 Million document uploads (Mendeley, 2011).



Figure 4. The free available iPhone-App from the Social Science Research Network [SSRN] offers both content and context as services on the basis of OAP.

With mobile Web, the media penetration can further be increased regarding all customer segments. Smartphones and Tablets can support the value proposition for context and connection providers. The iPhone-App launched in October 2009 by the Social Science Research Network (SSRN) illustrates the enormous potential for such mobile context services in the scientific environment (see Figure 4). In June 2011 more than 346'000 abstracts and over 280'000 scientific publications from about 164'000 authors had been provided and to date about 46 Million papers have been downloaded by 800'000 community members (SSRN, 2011). Extended mobile applications in the field of Intra-connection services will further extend the added value. Scientists may be supported in their research process. Fast searching, collective tagging and bookmarking, social networking, leaving comments, publishing status reports or adding photos or videos to related articles (for example during the visit of a conference) are only one part for potential mobile services.

4 POTENTIAL IMPACTS OF WEB 2.0 PRINCIPLES ON INTERNET-BASED BUSINESS MODELS IN THE SCIENTIFIC PUBLISHING MARKET

In this chapter we will discuss some potential impacts of Web 2.0 principles on Internet-based business models for traditional scientific journals as well as for Open Access Publishing. In doing so, we will highlight the main impacts without claim to measure these effects.

Regarding the composition of the key partners, the transformation of the traditional business model into an Internet-based one will have no effect but they will be better bound to the journal and the acquisition of new partners, most of all authors and experts, will be supported accompanied with a higher loyalty to the journal. The new Web-platform becomes an essential key resource and its management a core activity with an impact on the cost structure. Because the Web-platform is not a supplement to the print product (magazine), but rather the central distribution and communication channel, the value proposition is strongly influenced by Web 2.0 and will boast biggest changes within the business model. The consistent implementation of Web 2.0 principles expands the online offering with tools for effective collaboration. The active participation of users as well as their interaction on the Web-platform leads to a social network for researchers and generates added value. Data like user profiles or tracking the surfing behaviour improve customer relationship. In addition to potential self- or automated services such data are also a substantial added value for advertisers and corresponding offers like target marketing and personalized adds over the Web-platform. For the advertising market,

the value proposition can further be increased by the offer of cross-media services (print, online and especially mobile) integrated on the platform and ubiquitously distributed. We suppose that revenue streams of traditional journals are slightly affected because of various causes and can be justified as followed. *First*, it has been shown that the price elasticity of demand is very inelastic. *Second*, the journal is positioned in a niche market. *Ceteris paribus*, revenues can increase only slightly but the Internet as distribution channel helps to reduce costs of production and costs for the content distribution.

In contrast to the traditional business model the composition of key partners is changing for the disruptive Open Access Publishing. A consistent Open Access strategy does not explicitly exclude print editions but integrates the offer not primary in the business model and its value proposition. Therefore, publishing houses can be neglected or even excluded as key partners. Magazines or even books can be printed on-demand by providers like lulu.com or niuu.de, which send the print products directly to their customers. If users could create their own individual journal and print by an on-demand provider, this would be an innovative value proposition for the recipient market. Both inimitable data such as the pool of articles, user profiles or other forms of user generated content together with the platform represent the most central key resources within the Open Access business model. The fact that copyrights often remain with the authors, currently represents new problem areas and issues to solve. To increase the media penetration and to gain new customers the journal has to open its platform through interfaces to integrate content or services into external meta-platforms or applications like Mash-Ups. Platform management contains steady process for further developments as well as the continuous evaluation of the individual features. The basic idea of OAP, free digital availability of knowledge, requires a long term and sustainable revenue model. For this purpose, in addition to the recipient market, at least one other customer segment is required to generate revenue streams and has been found in form of the authors' market. Revenues are generated through authors or membership fees as well as by submission fees. This *pay to play* approach is also associated with criticism and threats. One of those perils is that financially weak researchers (for example young researchers) do not get the opportunity to publish in appropriate journals due to lack of funds. Thus it may happen that not quality but money controls publications. An implementation of the business model in compliance with the principles of Web 2.0 leads to a significant increase in the reach of the Web platform. The enlargement of the customer segments will also increase the traffic on the website with impact on advertisers. A higher traffic is not necessarily accompanied by a better value proposition for advertisers because of potential scattering loss. Only associated with personal online profiles a higher traffic enables intelligent target advertising services and therefore a significant value proposition for the advertising market which in turn regenerates revenue streams.

5 CONCLUSION AND CRITICAL REFLECTION

Open Access Publishing is a countermovement to the traditional business models of scientific journals and Web 2.0 opens up online-publishing to everybody. In this paper the authors have aimed to contribute to the design as well as understanding of innovative and disruptive business models for scientific publishing. As a first step, the authors have presented a morphological matrix for both developing and analysing design options. Based on O'Reilly's Web 2.0 principles and patterns, the matrix combines five selected Web 2.0 characteristics with nine building blocks of business models. The framework has been used to describe two exemplary business model scenarios for scientific journals and to discuss assumptions about potential impacts of Web 2.0 principles on scientific journal markets as well as on Open Access Publishing.

The two generic Internet-based business models discussed show that the patterns *The Participatory and The Social Web* and *The Web as Perpetual Beta Platform* and *The Ubiquitous Web* likely will have a strong impact on Internet-based business models for scientific journals. By the active participation of the users in the production process, the position of traditional publishing houses can be weakened and the demand for quality will increase. Regarding this, collective intelligence will make a great contribution, but it could also become a central task for content providers. Due to the content distribution over the Internet, OAP challenges the current role of publishing houses within a journal's

business model. In particular, the mobile Web 2.0 poses a high potential for creating new value propositions to existing as well as to new customer segments.

Our framework offers both researchers and practitioners a thorough and flexible instrument for the further study of the impact of principles of Web 2.0 on Internet-based business models. It allows to model new business models as well as comparing existing ones or to make benchmarks with special reference to Web 2.0 principles. Through further iterations the model can be adapted or expanded to the next step in the evolution of Web 2.0 respectively to the “Web Squared” according to O’Reilly & Battelle (2009).

The primary intention of this paper has been the presentation of a morphological matrix based on Web 2.0 principles and a business model canvas. The paper does not claim to measure the impact of Web 2.0 principles on implemented success variables but discusses potential appropriate impacts for the two different scenarios.

Follow-up research could study existing Open Access Journals and classify their business models according to the adoption of Web 2.0 principles and patterns. Another next step would be to find out how the inclusion of 2.0 patterns relates to success measures of journals’ stakeholders.

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