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Revenue Streams of Cloud-based Platforms: Current State and Future Directions

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ABSTRACT

Platform as a Service is at the peak of inflated expectations. The term denotes some of the latest developments in the Information and Communication Technology industry, which are significantly changing the way services are produced, consumed, and deployed. While companies are investing in the underlying technology of cloud-based platforms, the emphasis on business model innovation and re-thinking the revenue streams falls behind. This study shows that current revenue streams of cloud-based platforms are unpretentious and follow simple patterns. Most cloud-based platform providers focus only on direct revenue streams, which are typically based upon subscription fees. Multi-sided business models and innovative ways of revenue generation are rarely present, even though the manner in which cloud platforms are commercialized is the deciding factor for the economic outcome.

Keywords

Business model, cloud computing, platform as a service, revenue streams.

INTRODUCTION

In the last decades, companies started to realize that customers are interested in services and not in products: in other words, customers want the coffee but not the coffee machine, they want the compressed air but not the machine to compress the air, and they want the hole in the wall but not the drill. Due to increased bandwidth and novel mobile devices, the emphasis on service found its way into the information and communication technology (ICT), which sparked the “everything as a service” hype. Cloud computing is at the peak of the inflated expectations. While cloud computing facets like Integration as a Service or Security as a Service are already on the “slope of enlightenment”, Platform as a Service (PaaS) is at the very peak of the hype cycle (cf. e.g. Gartner 2010a). An increasing number of PaaS solutions - such as Microsoft Windows Azure, SAP Business ByDesign or Facebook Developers - are introduced into the market and are waiting to take off.

The recent trend toward “everything as a service” - also referred to as “hyperdigitization” (cf. Gartner 2010b) – is one of the major directions in the digital economy, which refers to an economy that is “based on the digitization of information and the respective information and communication infrastructure” (Zimmermann 2000, p. 729). This novel type of economy consists not only of technological aspects, but also and especially of business benefits and challenges (Zimmermann 2000). Cloud-based platform services or PaaS per se have no objective business value, only the commercialization of the technology via a suitable business model unleashes its latent economic potential. However, while companies are investing a considerable amount of money in the underlying technology of cloud-based platforms – be it for explorative reasons or simply to be able to keep up with the competitors – business model innovation and re-thinking revenue streams are neglected. This is critical because the latter is very important: the same technology commercialized in different ways may result in different economic outcomes (cf. Chesbrough 2010). Despite their impact, PaaS business models have not yet been sufficiently considered in literature. This paper provides a first step in facilitating the design of the commercialization of PaaS solutions by answering the following question: what revenue streams exist for cloud-based platforms and how could they evolve in the future? Therefore, this paper aims at showing current revenue streams, delineating future directions, and providing managerial implications to design future revenue models for cloud-based platforms. These contributions can be a starting point for decision makers in their business model innovation plans: tinkering with the design of revenue streams in connection with related business model components is a main source of innovation (Chesbrough 2010; Drucker 1985) and can theoretically prepare and pave the path for experimentations in practice.

The remainder of the paper is structured as follows: a background section introduces a business perspective on ICT business models and a technological perspective on cloud computing. These two perspectives are brought together in the

subsequent section, in which revenue streams of cloud-based platforms are described. The discussion section summarizes the findings and outlines managerial implications and future trends. The paper concludes with an outlook on future research.

BACKGROUND

Just as the revenue model is widely accepted as a key element of a business model with connections to many other business model components, PaaS is at the core of the cloud computing architecture since it is connected to the Infrastructure as a Service (IaaS) and the Software as a Service (SaaS) layer. In order to assess revenue streams of PaaS solutions, insights are relevant into both: the business and the technological perspective. In the business sub-section, a short introduction to the business model element “revenue stream” is provided; in the technological sub-section, PaaS is defined and positioned into the cloud computing architecture.

Business Perspective: Business Model and Revenue Stream

The revenue streams refer to the money an organization generates from each customer segment. The revenue model is the blueprint that defines how the organization creates value for itself by defining the sources of the revenue (revenue stream) and mechanisms to generate the revenue (revenue generation mechanism).

This definition (on the basis of Johnson, Christensen and Kagermann 2008, Osterwalder and Pigneur 2010) emphasizes that an organization may have multiple revenue streams with different revenue generation mechanisms. The revenue model is acknowledged as a key element of a business model by many authors (e.g. Chesbrough 2007, Johnson et al. 2008, Timmers 1998) and can be considered as a hub with strong connections and interplays with other business model components. The heart of a business model typically consists of the revenue model and the value proposition. They both have a strong influence on one another because each organization must ask itself: “for what value is each customer segment truly willing to pay?” (Osterwalder and Pigneur 2010, p. 30). Besides the revenue model and the value proposition, there are further business model building blocks which include key resources, key processes, cost structure, customer/market segments, customer relationship and distribution channels. The major interplays of the business model component “revenue model” take place between the components customer segments, distribution channels, value proposition, and customer relationship (cf. Chesbrough 2007, Johnson et al. 2008, Osterwalder and Pigneur 2010).

Technical Perspective: Cloud Computing and Platform as a Service

Platform as a Service is a special new way of developing and selling software, for which a platform (be it a hardware configuration, an operating system, a software framework) is opened towards external developers as a service.

This definition is based on the examination of common features which frame the nature of PaaS (on the basis of Lawton 2008; Stanoevska-Slabeva and Wozniak 2010; Vaquero, Rodero-Merino, Caceres and Lindner 2009; Weinhardt et al. 2009). Platforms in the software industry are considered to “refer to a hardware configuration, an operating system, a software framework or any other common entity on which a number of associated components or services run” (Poel, Renda and Ballon 2007). PaaS is a web-based development platform concept which is open to external developers through Application Programming Interfaces and can be used to develop applications or components.

One of the most cited definitions of cloud computing was proposed by Vaquero et al. (2009), who perceive clouds as “large pool of easily usable and accessible virtualized resources”. These resources can be dynamically reconfigured to adjust to a variable scale, while allowing optimal resource utilization at the same time. The prevailing conceptualization of a cloud computing architecture is the three-layer approach (see Figure 3) with PaaS at the core (on basis of Vaquero et al. 2009, Stanoevska-Slabeva and Wozniak 2010). PaaS is the middle layer connecting the IaaS and the SaaS layers. PaaS can be based on interfaces to the IaaS layer and can therefore provide a flexible and programmable link to the infrastructure and a development environment, on which components are developed and can run. To the SaaS layer, software development environments are offered as a service to external software developers.

Users of cloud-based platforms can be grouped into service consumers and service providers: consumers are end users who consume the SaaS services (e.g. an on-demand Customer-Relationship-Management system) whereas service providers use technical services of a cloud-based platform to provide offers (e.g. Customer-Relationship-Management software). As service providers use value-added technical services provided by the cloud-based platform, they are also regarded as technical users. The roles in the context of PaaS are outlined in Figure 1: PaaS providers typically address two customer segments, service provider and service consumer. Consequently there are different revenue streams for the two different customer segments.

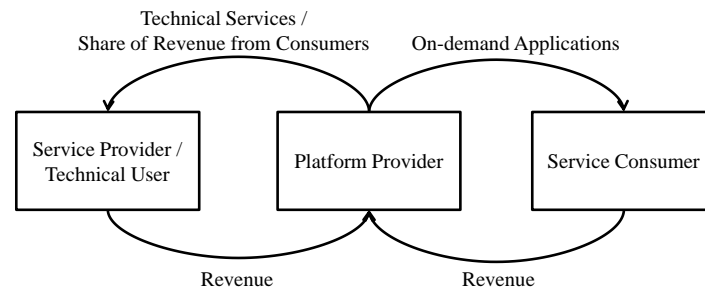


Figure 1. Roles in the in the context of PaaS

REVENUE STREAMS OF CLOUD-BASED PLATFORMS

In this section the business and the technological perspectives are brought together. With the diffusion of the Internet, a wide range of studies have been conducted to increase our understanding of the mechanisms of and the reaction to revenue models in the digital economy. For instance, revenue streams already have been analyzed with respect to digital content such as newspapers and magazines (Eisenmann 2002; Gallagher, Auger and BarNir 2001), digital music (Doerr, Benlian, Vetter and Hess 2010; Kusek and Leonhard 2005), electronic commerce (Bakos 1998; Mahadevan 2000), or online games (Walker 2003). As cloud computing is a quite recent phenomenon, only little has been written about the revenue perspective on cloud computing so far (Choudhary 2007).

In order to identify consistent patterns and relationships of primary and secondary revenue streams of cloud-based platforms, an exploratory quantitative content analysis was conducted (Bryman and Bell 2007; Neuendorf 2002). This research method was chosen because it is very flexible and provides a systematic approach of synthesizing a wide range of data. To answer our initial research question “what revenue streams exist for cloud-based platforms” a total of 25 distinct platforms were analyzed in the properties directness and frequency of revenues (see next section). We chose 25 platforms which give a representative overview over the existing PaaS market (cf. Figure 3 and Table 1). To cluster the results of the content analysis, a supplementary focus group discussion was conducted. The focus group consisted of four experts with at least 10 years of experience in the software industry at a major software company. Selection of these experts was purposive (based on willingness to participate, availability, and experience level). The discussions also helped to obtain deeper insights into future directions as described in the discussion section.

Suitable Revenue Streams for Cloud-based Platforms

Evidence from the prior cited studies suggests that in the digital economy, the Internet particularly abets *multi-sided* business models. That means that revenues are generated through interactions among multiple stakeholders rather than through one-on-one transactions, which is the traditional way for physical products in the real economy (Bughin, Chui and Manyika 2010). On the one hand, cloud-platform providers receive a part of their revenues *directly* from consumers (e.g. subscriptions or user-based transactions such as pay-per-view); on the other hand, a significant portion is generated *indirectly* by claiming a revenue share from the developers of third-party products and services.

Besides the differentiation between direct and indirect revenue streams, the *frequency* or amount of revenue generation can be a useful discriminative criterion (Enders, Hungenberg, Denker and Mauch 2008). Whereas charges for an app or add-on download are typically paid once, smaller but continuous payments (e.g. pay-per-click, pay-per-lead) have gained considerable momentum. In addition, more and more companies secure additional constant revenues by offering other services such as continuous training and certification along with the core value proposition.

On the basis of the analysis of 25 cloud-based platforms and a thorough literature review on revenue streams in the digital economy, a variety of suitable revenue streams for PaaS providers were derived. The study showed that many revenue streams are sub-genres of a generic revenue stream type. The focus group discussion was therefore used to categorize the identified revenue streams into eight distinctive revenue stream types. Suitable revenue stream types for cloud-based platforms are: subscription, transaction-based, revenue sharing, additional platform services, advertisements, affiliate services, admission fees, and download/upgrades of applications. These revenue stream types are classified along the dimensions directness (direct vs. indirect revenue) and frequency (non-recurring vs. recurring): see Figure 2, and described below.

Recurring	Subscription Transaction-based Additional services (certification, training)	Advertisements Affiliate services
Non-recurring	Admission fee Downloads/upgrades	Revenue sharing
	Direct Revenue	Indirect Revenue

Figure 2. Potential revenue streams of cloud-based platforms

- **Subscription:** Subscriptions (also referred to as fees per term) are fixed installments a cloud-based platform consumer pays for getting access to and using a certain service of the platform. Rather than selling services individually, subscriptions allow software to be sold as packages (Bala and Green 2007). For both PaaS consumers and providers, this approach provides a dependable basis for calculating costs and revenues and for planning service levels and capacity. An additional advantage is that the platform provider does not have to perpetuate a competition between present and future versions. According to Choudhary (2007) „individual features can be released as soon as they are completed whereas the perpetual licensing model requires them to be withheld until a new version of the software is completed“.
- **Transaction-based:** User- or usage-based transaction (also referred to as utility computing) is another way of generating revenues (Rappa 2004). Whereas subscriptions do not (or only partially) consider a consumer’s platform usage – so-called fixed up-to or fixed-fee contracts (Sundararajan 2004) – user-based transactions are typically based to the usage behavior of the platform consumer. According to Paleologo (2004), this is normally a financial benefit for the consumer, since costs are charged proportional to the volume of the performed transactions. Also, it establishes ties between usage and payment. However, from a PaaS provider’s point of view, user-based transactions results in high costs for the administration of service billing and collection (Kittlaus and Clough 2009).
- **Revenue Sharing:** PaaS providers can request a commission or revenue share for placing and promoting an application that was developed by an individual software vendor onto the platform.
- **Additional platform services:** There is the possibility to sell other services on the cloud-based platform, e.g. different service support levels, which offer developer training material, courses or the certification of an individual or organizational capability (like certified developer, certified independent software provider).
- **Advertisements:** Online advertising is a way for generating indirect revenue by demanding a share of an advertiser’s income (e.g. pay-per-lead or sale) or by selling ‘screen area’ (e.g. pay-per-view or click) on the platform. It can also be applied for reducing the price of subscription fees or for establishing a free-pricing strategy (University of Pennsylvania 2009), granting consumers free access to the platform under condition of ‘in-platform-ads’.
- **Affiliate services:** Affiliate services offer another indirect mode to generate revenue from a third-party, but without needing to bother consumers with unspecific and clumsy promotions and offerings. For instance, by embedding a PaaS provider’s ecosystem, a revenue share can be produced from additional services the platform provider is not capable or willing to render (e.g. consulting, etc.).
- **Admission fees:** Admission or registration fees are another form of revenue generation. Consumers are charged with this, typically a one-time remuneration, in order to be granted access to the cloud-based platform or for cross-charging initial administrative costs.
- **Download/upgrades of applications:** A way of generating revenues is the provision of new or significantly improved features by applications. For instance, at the beginning of 2011 an estimated number of 200,000 applications for Android and around 400,000 applications for Apple iOS were offered on these respective platforms.

These revenue streams can be applied to support different PaaS strategies. For example, a subscription fee has a similar effect as a flat fee in the telecommunication industry - the offered service can be consumed without time and quantity constraints. This typically results in higher consumption volumes and subscribers. Thus, subscription fees basically encourage a fast acquisition of a critical mass of consumers’ usage and contributions. By comparison, transaction- or usage-based revenue models result in lower level of consumption, but might encourage a higher number of users. Of

particular importance are combinations of revenue models. They enable the company to take advantage of all positive effects of the involved revenue models.

Actual Utilized Revenue Streams of Cloud-based Platforms

While the value offered by cloud-based platforms to the service consumer (cf. Figure 1) is characteristically the on-demand provision of a service, the value proposition towards the technical user can vary. Within the cloud computing architecture PaaS, solutions can be classified in accordance to their value proposition to the service provider. The classification on the basis of the value proposition is particularly suitable because the value proposition is at the heart of a business model (together with the revenue stream which is closely linked and which impact each other mutually) and links the organization-internal and external business model components. The differentiation of the PaaS solutions was obtained by analyzing the value propositions of 25 cloud-based platforms. The evaluation of 25 platforms with regard to the main services that a PaaS provider offers revealed three distinguishable sub-classes of PaaS:

- *Focus on development*: a PaaS provider’s main value proposition is focused on supporting the development of applications. Examples include: Microsoft Azure, Google App Engine, and Bungee Connect.
- *Application-based integration*: the main value proposition is the integration of the developed applications into an existing SaaS solution. For example, SAP Business ByDesign, Force.com and Suiteflex allow applications development, which can be integrated into their existing SaaS solutions (ByDesign, salesforce.com, and Netsuite respectively).
- *Focus on distribution channel*: the distribution channel is the most important value offered. Facebook Developers, Apples iOS, and Zoho Creators offer distribution channels, over which developers find their potential users.

Figure 3 combines the three classical layer of cloud computing with the newly derived sub-classes on the PaaS layer.

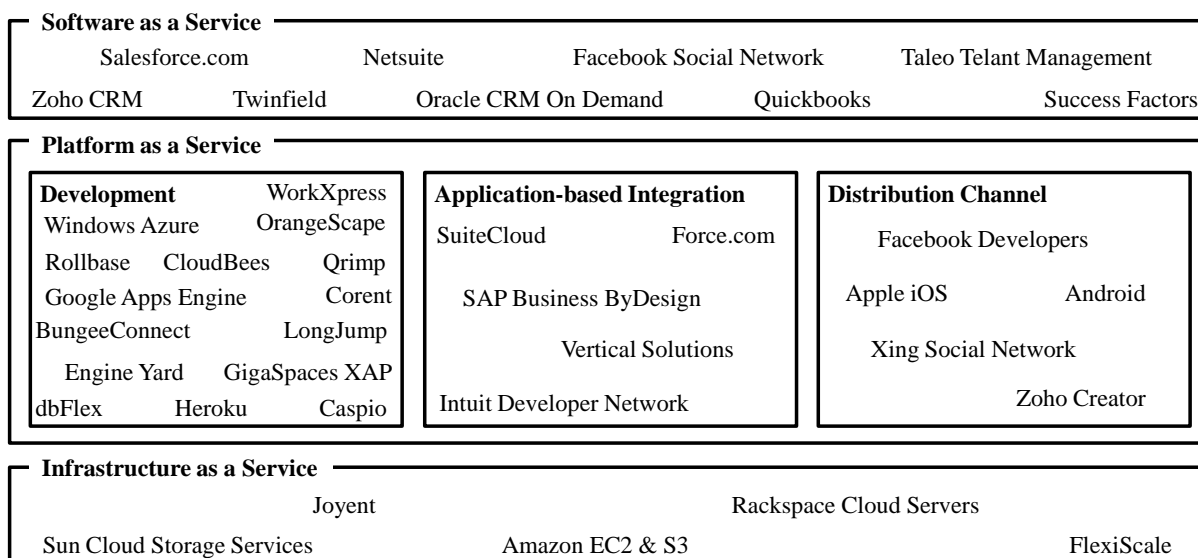


Figure 3. Three layers of Cloud Computing and the sub-classes on the PaaS layer

Table 1 illustrates which platform provider currently relies on which revenue streams: marked with an “X”. The table also includes hyphens (“-“), which stand for “not defined yet”. Some PaaS providers, like CloudBees, do not yet earn money from the consumers, while others, like Bungee Connect, do not earn from either side (cf. Figure 1) at the moment – they still run on venture capital.

PaaS provider \ Revenue Mechanism	Service Provider								Service Consumer							
	Subscription	Transaction	Revenue Sharing	Additional services	Advertisement	Affiliate services	Admission fees	Download/Upgrades	Subscription	Transaction	Revenue Sharing	Additional services	Advertisement	Affiliate services	Admission fees	Download/Upgrades
Development-focused platforms																
Bungee Connect	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Caspio	X														X	
CloudBees	X	X							-	-	-	-	-	-	-	-
Corent	X								-	-	-	-	-	-	-	-
dbFlex	X		X						-	-	-	-	-	-	-	-
Engineyard		X		X				X	-	-	-	-	-	-	-	-
GigaSpaces XAP	X	X		X					-	-	-	-	-	-	-	-
Google App Engine		X		X					X	X						X
Heroku		X						X	-	-	-	-	-	-	-	-
LongJump	X	X						X	X							
Microsoft Azure	X	X		X					-	-	-	-	-	-	-	-
OrangeScape	X								-	-	-	-	-	-	-	-
Qrimp	X								-	-	-	-	-	-	-	-
Rollbase	X	X	X						X							
WorkXpress	X								X	X						X
Application-based integration focused platforms																
Force.com	X			X		X			X							X
Intuit			X	X					X	X						X
SAP Business ByDesign			X	X					X							X
SuiteCloud	X								X						X	
Vertical Solutions	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Distribution channel focused platforms																
Android	X		X		X				X						X	X
Apples iOS	X		X		X				X						X	X
Facebook Developers			X		X					X						X
Xing			X		X				X							X
Zoho Creator	X			X					X							X

Table 1. Current revenue mechanisms of PaaS providers

The platforms Microsoft Windows Azure, SAP Business ByDesign, and Facebook Developers are selected as prime examples to represent the revenue streams of one of the three PaaS sub-classes each (cf. Figure 3).

The *Microsoft Windows Azure* (<http://www.microsoft.com/windowsazure>) platform focuses on development and comprises several developer services (like Windows Azure, SQL Azure, AppFabric). Microsoft Windows Azure leaves it up to the service providers to choose one of the following revenue streams: (a) subscription offers, subdivided into three packages: Windows Azure Core for \$59.95/base unit/month, Windows Azure and SQL Azure Extended for \$109.95/base unit/month, or SQL Azure Core for \$74.95/base unit/month, (b) transaction-based respectively Pay-As-You-Go models based on computing (extra small instance for \$0.05 per hour, up to extra large instance for \$0.96 per hour), virtual

network usage, storage usage or use of the content delivery network, and (c) Microsoft offers MSDN and Partner Packages. Service consumers are addressed by the Windows Azure marketplace called Microsoft Pinpoint, which is currently in beta version and does not yet handle payment services for consumers.

SAP Business ByDesign (ByD; <http://www.sme.sap.com>) is a fully integrated on-demand business management software designed for small and midsize businesses. Within the feature pack 2.6, SAP provides a Software Development Kit which enables SAP's ByD partner network to develop extensions for SAP ByD. The developed applications are provided to consumers via the SAP store. Before being accepted by SAP, all ByD partner solutions must pass a quality review and SAP will get a percentage of all sales. SAP's ByD solution is sold to consumers for a monthly subscription fee: from \$149 for basic users to \$54.00 for efficiency users.

With its large user base the *Facebook Developers* (<http://developers.facebook.com>) platform stands out as a distribution channel through which developers can find potential users. It enables enterprises and individual developers to integrate their applications and services into the Facebook website, gaining access to millions of potential users. Currently, Facebook consumers install 20 million applications every day. The revenue is based on advertisement and revenue sharing with Facebook Developers. Facebook offers Facebook credits API for service providers, which enables developers to use these credits as a method for purchasing digital and virtual goods within their application (transaction-based or based on upgrades within the applications). Service providers can redeem credits received at a rate of \$0.10 per credit, minus a service fee of \$0.03 per credit redeemed.

DISCUSSION

Current State: Revenue Streams of Cloud-based platforms

The evaluation of 25 cloud-based platforms shows that current revenue streams of PaaS solutions are unpretentious and follow simple patterns: most cloud-based platform providers focus on direct revenue streams, which are typically based upon subscription fees. The relatively mature development-focused platforms rely on transactions in addition. Most revenue comes from the developer side, which does not come as a surprise since this type of platform is designed for developers. Application-based integration platforms feature more differentiated revenue streams and focus on the consumer-side as well. The major income stems from subscriptions at the consumer side. Distribution channel focused platforms is the only type of platform that tends to make also use of advertisements, which can be explained by the nature of this platforms, which is distinguishable due to its large consumer base. Revenue sharing is a concept that is rather prevalent in this type of cloud platform. However, the major revenue stream for this type of platforms as well is the subscription stream. Application-based integration and distribution channel focused platform providers also make some profit with the provision of downloads for the consumers. Multi-sided business models and innovative ways of revenue generation are rarely present.

Future Directions: Expected Evolution and the Power of the Unexpected

Cloud computing is often simply regarded as a new way of outsourcing (Gartner 2010a), which may be an explanation for the unpretentiousness with which platform providers design their revenue models. The tendency to stick to an established and simple model is well-known in the history of technological innovations. From a business perspective, companies seem reluctant to change a traditional business model (e.g. Chesbrough 2010) or simply lack the knowledge and experience to do so. From a technical perspective the dominant logic can prevent companies from realizing the latent economic value in a technological innovation. It may take decades before a truly new product is invented on the basis of a technological innovation. The tendency is clear: at the beginning, most new technologies are simply regarded as a new means to get existing things done – be it in a more efficient, safer or faster way. Only after some time new applications and deployments arise on the basis of the new technology (Drucker 1999). As the railway was the revolutionary element of the Industrial Revolution and an anti-counterfeiting application in the Internet of Things was a product with no precedent, cloud computing does not seem to be on such a maturity level yet. However, tinkering around with technology as well as with the business model can be one way towards the invention of a new business idea.

A less ambitious evolution trend is related to the usage of a new technology. Experience with other ICTs suppose that novel technologies are first used for scientific and research purposes, followed by commercial exploitation, and only later for hobby and entertainment (on basis of MacInnes 2006). Cloud computing is currently focusing on scientific use and is just starting to getting used commercially.

Implications for Jumping to the Next Evolutionary Level

To fill the gap between the current states with its shiftless use of business model concepts and exploitation of the technology towards the next evolutionary steps, a focus group discussion with four PaaS experts was organized to compile concrete managerial implications for developing the PaaS business. The commercialization process of emerging technologies needs to consider social, technical, economic and political/legal (STEP) factors. The implications for platform providers are therefore structured on the basis of the STEP approach (cf. Mettler and Eurich 2011).

Social Implications

Keep in mind that your brand stands for trust, emotions and reputation: Platform providers have to define quality standards and make sure the developers comply with these standards. While it may be desirable to have a large number of developers on the platform, one should be very careful in approving the developed applications. The same holds true for advertisement: while advertisement subsidizes services, offensive advertisement may discourage users to consume services from the platform and the brand may suffer damage.

Approach new target groups: The construction-kit character of cloud-based platform allows for more customized services. This means that differentiated target groups can be approached. Customers must now rather be regarded as individuals than customers or market segments (see also Zimmermann 2000).

Position yourself in the service value network: The cloud computing approach abets the modularization of the business: start-ups, but also established small and mid-sized companies stand for one product. A new type of intermediaries appears (see also Zimmermann 2000).

Technical Implications

Assess integration opportunities: Identify the type of the PaaS solution, assess the possibility of integrating into other PaaS solutions of another type. For instance, if you have development-focused PaaS offerings, you may want to assess the integration opportunities into application-based or distribution channel focused PaaS offerings. Another option could be the integration into a social network or a downstream integration into digital goods: e.g. sending an invoice to the inbox of the consumer's bank (see also Katz and Shapiro 1985).

Evaluate the support of migration opportunities from other cloud-based platforms: The support of the migration process from other platforms should enable an easy migration of cloud-based applications. By doing so switching costs can be reduced dramatically. This helps service providers to overcome lock-in effects (cf. Farrell and Klemperer 2007). Provisioning of migration tools may thus contribute to attaining the critical mass of consumers (cf. e.g. Katz and Shapiro 1985).

Economic Implications

Become aware of the link between revenue model and strategic goals: A specific strategic goal requires an appropriate revenue model. For example, subsidized services can support the development of a broad user base; whereas high prices have to be justified by offering exquisite services for distinguished customers. Consequently, a revenue model may undergo various changes in order to be aligned to the specific strategies.

Design your business model as early as possible: A post-hoc economic exploitation of a cloud computing technology may be of less value than pursuing the technology from the early stages within an appropriate business model (see also Chesbrough 2010).

Assess possibilities for multi-sided revenue streams: There is a potential for cross-subsidization, which means that one group of users subsidizes another. Third parties such as health insurances, financial institutions or government bodies also come into question as service sponsors, thereby transcending the traditional one-to-one business relationships (see also Bughin et al. 2010).

Enable cooperative or federated business models: One potential scenario for the future is that PaaS as well as SaaS platforms will integrate into federated and interoperable offerings. In order to support one-stop-shopping in such environments, various revenue models need to be integrated into one. Interoperability of revenue models as well as the breaking down of revenue models will be the basis for revenue sharing among federated platforms.

Political / Legal Implications

Ensure that you respect local laws: This could be an issue, for instance, if advertisements are allowed.

Guarantee privacy: Different laws may allow foreign governments to access data (cf. e.g. Weinhardt et al. 2009). This aspects is also much related to the aspect of maintaining your image and brand (see also Armbrust et al. 2009).

CONCLUSION AND OUTLOOK

The analysis of 25 cloud-based platforms revealed that the current revenue streams of PaaS solutions are unpretentious and follow simple patterns: most cloud-based platform providers only focus on direct revenue streams, which are typically based upon subscription fees or user-based transactions. In the short-term, platform providers could follow the suggested managerial implications to inspire their value offers. In the medium-term, future research may deduce lessons learnt from drop-outs and analyze why platforms failed and disappeared. In the long run, companies need to develop the ability to question and innovate their business models: experimentation and effectuation are two means to exercise business model innovation potential. The theoretical and practical contributions of this article can serve decision makers as a starting point for their business model innovation plans.

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