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HOW SAAS APPLICATION LED TO CLOUD ENABLED BUSINESS INNOVATION: A CASE STUDY FROM CHINA

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Abstract

Although cloud computing is increasingly viewed as a catalyst for business innovation, many executives wonder whether and how it can enable the emergence of new business opportunities. This research-in-progress case study presents the business drivers and implementation of a leading telecommunication carrier from China in revolutionizing its SaaS application to a cloud enabled service platform in its innovation to develop a multisided platform business model. The preliminary implicatons from the case reveal that to gain value from cloud enabled business innovation, firms need to develop business strategies based on four key elements: customer needs probing, value proposition positioning, cloud enabled platform construction, and ecosystem development.

Keywords: Business innovation, Service platform, Huizhou mobile, 139.com, Cloud computing.

1   Introduction

As business environment increases in volatility and competitiveness, firms are required to not only improve their strategic and technological agility but also reduce the complexities of their business and IT operations to sustain their competitive advantage. Cloud computing is viewed as an innovative way to utilize the Internet to offer on demand IT resources to multiple clients on a pay-per-use basis(Staten et al. 2008; Fox et al. 2009). It also offers a tremendous amount of computing power to enable innovative business insights and to gain competitive advantages. A survey conducted by IBM that was generated based on a sample of 572 business and technology executives across the globe suggests that while cloud computing is widely recognized as an important technological innovation, relatively few organizations have actively embraced cloud computing to drive business model innovation (Plummer et al. 2008). However, an increasing number of organizations are looking to cloud computing to drive new business initiatives and to transform industries. To address this gap, we interviewed stakeholders from a telecom operator in China, Huizhou Mobile, which offers an exemplary business case in revolutionizing its Software as a Service (SaaS) application to a cloud enabled service platform and successfully creating an innovative multisided platform business model. The purpose of this paper is to identify factors that led to the successful implementation of cloud enabled business innovation.

We proceed the remainder of the paper as follows. Section 2 reviews previous work on IT-enabled innovation and business impact of cloud computing, followed by research method and brief description of the case study procedure. Section 4 and 5 details how Huizhou Mobile implemented its SaaS application from delivering singular mail service to a variety of cloud enabled one-stop local public and municipal information services. Some preliminary implications and future plan are concluded in the final section.

2   RELATED WORKS

2.1 IT-enabled innovation

Innovation is generally viewed as any method or artefact that is a significantly novel and valuable outcome of deliberate human activity in order to create value in a given environment and realized by acquiring and utilizing appropriate capabilities and resources(Rogers, 1998; Muhammad 2013; Ahuja et al. 2014). At the firm level, management executives often concern about the business model innovation for revenue growth and performance improvement (Barua et al. 1995; Chesbrough, 2007). IT-enabled innovation usually represents business innovation that is driven or enabled by IT or IS (Ahuja et al. 2014).With the rapid development of information technology, there have been tremendous advancements in IT-enabled innovation. Tushman and Nadler (1986) posit that visionary leadership and also people, structures and values are important factors that affect whether an organization realizes benefits from innovation. Despite significant technology advancement, firms still face challenges with respect to finding suitable benefits-led approaches to IT. On the one hand, IT innovation solutions from the supply side (equipment vendors and application providers, etc.) have increased, on the other hand, due to risk-averse preference of business operation and uncertainty of business realization of IT , there is a lack of active adoption of new technology, such as cloud computing, from the demand-side.

2.2 business impact of cloud computing

Cloud computing has been widely viewed as an effective way to access and utilizing highly scalable, and managed computing resources available on demand and is capable of responding to end users' business requirements and billed in a pay-as-you-go manner. As a paradigm shift in IT services delivery, cloud computing has impact on both service consumers and service providers. On one side, service consumers can access all kinds of information or rent on-demand computational power through network from any device. On the other side, service providers will be able to configure the computing and storage resources

and deploy it through public, private and hybrid way. Past research investigated the impact of cloud computing adoption on organizations (Martens and Teuteberg 2011;Son et al. 2011). Sarkar and Young (2011) found out that the main benefits of adopting Infrastructure as a Service, one of three cloud computing service models, were increased scalability, reduction of IT infrastructure complexity, increased agility and cost reduction. As well as reduced costs and increased efficiencies, Paul, Michelle and Scott (2014) illustrated by the case of an US manufacturing company that cloud services can provide business transformation payoffs through cloud enabled business model innovation. Although China witnessed a fast and dynamic growth of cloud computing services in recent years, papers describing cloud enabled business innovation and its business impact in Chinese firms context are rare. Thus, it is important to conduct the case study and advance our understanding on the approaches for cloud driven business model innovation.

3   METHODS

This article is based on a series of on-site interviews on the business value of cloud computing conducted in the telecommunication industry in China between March 2012 and October 2012. One author has collaborated with China Mobile, the largest telecommunication carrier in China, for nearly 10 years and has conducted in-depth field studies to examine the "how and why" of cloud enabled service innovation. Huizhou Mobile has kindly shared its best practices with us. All authors have considerable research and practitioner experiences and follow the case research procedures recommended by Yin (1995) and Eisenhardt (1989).

We first interviewed the key participants involved in the 139.com evolution in Huizhou Mobile and analyzed documentation from multiple sources within the company over a period of three years. Specifically, we carried out several rounds of interviews with the VP of the company, general manager of the department of Business Development, general manager of the department of Information Systems to understand the motivations, challenges and the implementation of 139.com and its evolution. Next, other stakeholders including the director of the third party service provider and the director of the local government agencies were also interviewed to acquire information regarding the formation of the service ecosystems. Finally, the case findings were validated based on feedback from all the interviewees.

4   CASE BACKGROUND

Huizhou Mobile, founded in 2000 in Huizhou city, Guangdong province, China, is a subsidiary of China Mobile Group Guangdong Company Limited (CMGC) and a local leading mobile service provider with approximately 1500 employees in nearly 80 locations and around 450 million US$ annual revenue in 2010. Before 2009, the main business of Huizhou Mobile focuses on voice and data value added services that target traditional communication needs of its subscribers. The emergence of new and advanced technologies and business models magnified the impact and substitution effect on the traditional communications sector. In 2010, CMGC speeded up its business transformation with the slogan "from mobile communication expert to mobile information expert" and developed the 139.com mobile mail service, a Software as a Service (SaaS) application, that is offered free of charge to its existing subscribers. In the beginning of 2010, CMGC planned to launch a marketing promotion in all cities in the province to stimulate and entice subscribers to try it out and get accustomed to using its mobile mail service. The management of CMGC believed that this promotion would spawn accelerated growth in its new service, improve its customer retention rate, and increase subscriptions of other bundled paid services, and hence, improve its operating revenue.

Huizhou Mobile launched a marketing program in February 2010 with various promotions to entice users to use its free service but soon found an intriguing phenomenon. During the initial promotional period of the 139.com mailing service, users who received the promotions, such as those in the form of promotional

cards and discounts, tried the 139.com service. However, upon completion of the marketing and promotion campaign, many of the consumers did not continue to use the free mobile mail service and expressed no intention to continue using it. After some investigation, the reason behind this dilemma became clear. First, free mailing services in China were a mature market. There are many established domestic and foreign service providers that offer such services for free such as QQ mailing service provided by Tencent, one of the big three Internet companies in China, and Gmail service provided by Google. As a late comer to the market, 139.com mailing service had no distinctive advantage. Second, in terms of customer service, many people were reluctant to switch to a brand new service provider once they were accustomed to existing ones. For mailing services, the lock-in effect is powerful because people kept all of their social contact addresses with a particular service provider and it would have been highly inconvenient for them to switch to other providers. Hence, two key management issues faced by the management of Huizhou Mobile are: 1) How to entice users to continue using the 139.com mobile mail service? 2) How to expand the 139.com mobile service to a new business area to generate a new revenue stream in the long term? After several rounds of brainstorming, the management of Huizhou Mobile realized that they need to revolutionize and redesign the value proposition of 139.com mailing service and differentiate it with competition. To fulfil and realize this business service innovation, they harness the cloud enabled business capability to create new business opportunities.

5   FOUR-PHASE CLOUD ENABLED BUSINESS INNOVATION

A business project to develop cloud enabled innovation was implemented and fully executed for the first time in May 2008, with the aim of (a) transforming mobile mailing service to an integrated one-stop local public and municipal information service, and b) restructuring 139.com into a multilayer cloud enabled service platform (CESP). The project was led by Huizhou mobile's General Manager and senior managers from the Business Development Department who were tasked with the responsibilities to collaborate with local government, large enterprises, and small and medium companies. The business innovation process consists of four phases: customer needs probing, value proposition positioning, platform construction and ecosystem development. A conceptual framework of the implementation is shown in Figure 1.
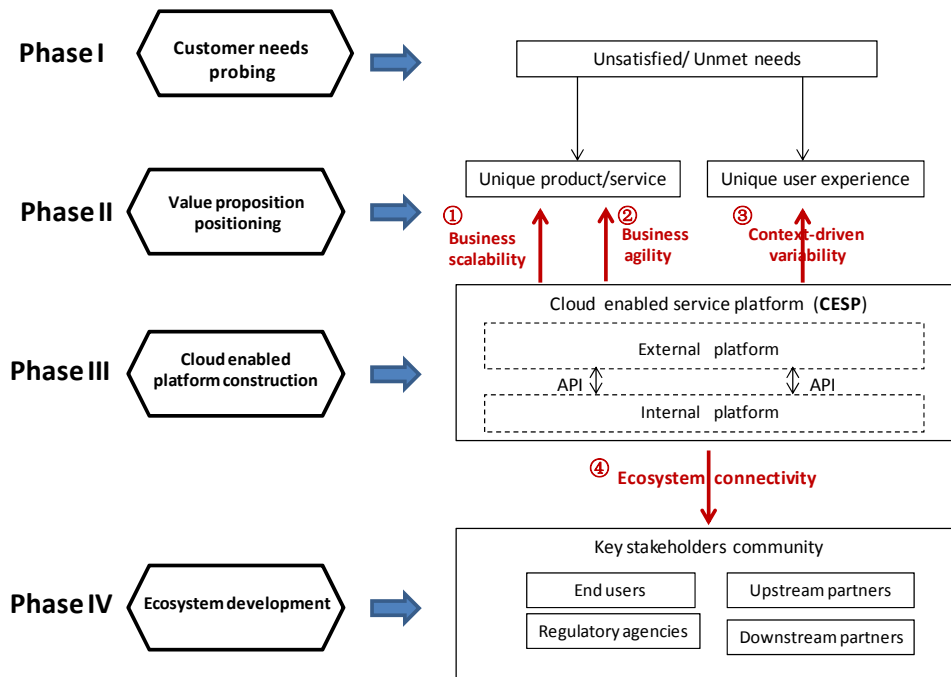
Figure 1   Cloud enabled business innovation implementation framework

5.1 Phase 1: Customer needs probing

Since people regard mailing as a standardized information service, it is important to identify customers' unmet needs so as to differentiate the 139.com mailing service from those offered by its rivals. Together with management and key employees from different departments, active users of its service, and external business partners, Huizhou Mobile organized five workshops to analyze the general trends of user needs and the specific needs of local people to uncover those that were desired but not available. Besides residential customers, the target customers were extended to include business users. With the popularity of mobile adoption and the digital fusion, three dimensions of general trends of user needs emerged (see Table 1). It was also found that the specific interests of local people in Huizhou had shifted (1) from traditional point-to-point voice and message based communication service to many-to-many rich media based social networking service, and (2) from nationwide standardized information service to local customized information service. More specifically, the residents in Huizhou indicated strong needs in: (1) local public information services, such as health care and community services, that currently can only be gathered in a highly inconvenient way by accessing multiple websites hosted by different service providers, and (2) municipal public information services, such as social security and utility payments, which were controlled by the local government and not openly accessible to residents. In other words, the niche market relating to the unique content for customized and localized information and its one stop electronic delivery was a promising but uncultivated area which Huizhou Mobile could redesign its products and services as well as user experiences around them.

	Was ⟶ Now and Future	
Information needs	Single media and standardized information (e.g. Voice, short message, e-Mail)	Rich media and customized information (e.g. Blog , mini blog, podcast, social network website)
Social needs	One to one linear social relationship	One to many or many to many social networking
Experiential needs	Unidirectional and non-personalized experience	Interactive and personalized experience

Table 1 Trends of user needs

5.2 Phase 2: Value proposition positioning

Value proposition is viewed as the benefits that a product or service offers to customers, especially by being different from or superior to a competitor's product or service. This phase has two main goals: 1) to reposition the value proposition based on the probing of customer needs in phase 1, and 2) to choose suitable delivery approaches for the new value proposition. Huizhou Mobile first changed the value proposition of 139.com from its basic mailing service to cover a series of bundled information services that include mailing, social networking and customized local information services and also enhanced user experiences to meet or exceed customer expectations. Following that, unfortunately, as they were planning to put their ideas into action, they found at least three obstacles: First, Huizhou Mobile primarily focused on voice and data based communication services and have limited capability and experience to provide diversified local information services. Second, given the volatility and uncertainty in market competition as well as the complexity and ambiguity of user needs, newly designed products and services should be quickly to deploy and easily to scale up/down. However, the existing IT infrastructure and its corresponding capability cannot support such kinds of business initiatives adequately. Finally, the previously launched 139.com mailing service did not have the function to support context-awareness interaction which thus hindered the enhancement of user experiences. To solve these problems, Huizhou

Mobile began to find appropriate business and technical approaches for the new value propositions. On the one hand, they discussed which types of content could be acquired from external partners including government agencies. Then, several rounds of negotiations were held between Huizhou Mobile and the potential business partners to reach a win-win solution to acquire mutual benefits. On the other hand, they realized the inefficiency of using traditional IT capability to drive such kinds of new service innovation and decided to develop a cloud enabled platform in response to the volatility and uncertainty of customers and service partners' needs.

5.3 Phase 3: Cloud enabled platform construction

Given the design principles of cloud computing, such as scalability/elasticity, on demand self service and multi tenancy, Huizhou Mobile began to develop and update its cloud enabled service platform (CESP) based on its previous 139.com application. The CESP has internal and external components. The internal component focuses on infrastructure management and enterprise business process management. This not only masks the technological complexity of the lower-level computing resources, but also offers more flexible interfaces that support automated new service delivery to attract a broader range of end users, service providers, among others. The external component includes two independent but related modules that serve as aggregator and content distributor of local and municipal public information provided by external collaboration partners and the government. Among other elements, the external platform offers an enhanced user experience and features such as My Console, which is a personal portal that provides users the ability to access customized information with versatile applications, including e-government as well as local and municipal public information services. All components of the external platform are loose coupling and integrate with the internal platform through API (Application Programming Interface).

Traditionally, delivery of large-scale enterprise IT service has been a labor-intensive task, requiring significant capital investments and involving complex processes. CESP, as described above, provides a platform supporting application level innovation services in a consistent, reusable, and automated manner. We identified at least four distinctive business capabilities enabled by the design principles of cloud computing and cloud based IT capability. First, CESP was designed to accommodate the computing resources to quickly scale in and scale out, enabling more innovative applications to be easily deployed simultaneously. With the help of cloud based scalability capability, the platform enables Huizhou Mobile to benefit from business scalability and thus provides versatile but unique information product or service. Second, given the resource pooling attribute of CESP, different physical and virtual IT resources can be shared and dynamically assigned and reassigned in response to user access. With cloud based automation and integration capability, the heterogeneous resources can be managed more effectively to ensure smooth and rapid service delivery. This not only allows unused resources to serve a variety of needs of multiple consumers at maximum efficiency, but also helps Huizhou Mobile to achieve business agility and further capture fast-mover advantage. Third, the multi-tenancy characteristics of CESP, i.e., the ability to use the same software and interfaces to configure resources and isolate customer-specific traffic and data, provide a high degree of customization to support each target user's specific needs. Consequently, the context-driven variability provided via the external platform allows users to have some degree of control over the interaction configuration settings while also allows businesses to offer more user-centric experiences. Finally, as many of the new services are controlled or provided by third parties, Huizhou Mobile realized the importance of establishing a strong relationship with them at the beginning of the project as well as the importance of cooperative alliances. CESP was designed as a multi-sided platform to bring together two or more distinct but interdependent groups of participants. For example, with the aggregation and collaboration capability, the two components of the external platform provide the local and municipal public information to lure a large number of users to access the content free of charge in order to subsequently attract more participants of the platforms "on the other side", i.e., service partners. The platform also enables ecosystem connectivity, which facilitates external collaboration with partners and customers, among other key stakeholders.

5.4 Phase 4: Ecosystem development

According to Merriam-Webster, ecosystem is generally defined as "the complex of a community of organisms and its environment functioning as an ecological unit". In terms of our case context, that complex includes not only traditional members such as software and hardware providers but also end users, regulatory agencies, partners, third parties and any other entities in the environments that have a bearing on the other components. In order to promote its new business innovation successfully, Huizhou Mobile made great effort to build the largest local alliance based on the central tenets of win-win cooperation and to enhance the sustainability of its business innovation with the support of a business ecosystem. Three approaches were used to facilitate the formation of the ecosystem. First, Huizhou Mobile proposed to organize a steering committee that provided guidance and directions for projects involving collaboration between the local government and the company. Huizhou Mobile made a commitment to the government to use the platform to promote the government's information transparency and improve the efficiency of administration, which ultimately benefit the local residents. In return, the local government provided the consent to release the controlled information content to the platform, which appeals to the residents and entice them to visit regularly. Moreover, Huizhou Mobile changed the name of 139.com to citizen portal service to emphasize the types of services provided and to enhance brand recognition. Second, Huizhou Mobile actively used highly popular social media, such as Sina Weibo and Mobile Weibo (both of them are popular social network websites in China), to attract segmented local customers who interact with other community members on a regular basis. Third, strong industry alliances consisting of 250 local service providers, content providers and other small and medium enterprises were established to use the platform to develop more than 150 featured applications, such as mobile commerce, mobile payment and local public and municipal information services. All of these measures brought together disparate groups of people to collaborate and share information and resources with one another, which further facilitated the development of an ecosystem.

6   CONCLUSION AND FUTURE WORK

One important consideration for business executives nowadays is that how to utilize new generations of information and communication technology, such as cloud computing, to drive new business model innovation. This exploratory analysis of four-phase journey of a leading telecom operator in China illustrates how large firms revolutionize its Software as a Service (SaaS) application into a multisided platform driven ecosystem. Our future work are twofold. First, we try to collect more data to quantify the key benefits generated from the cloud enabled service platform. Second, through refining the extant literature, we plan to build a conceptual framework with solid theoretical foundation to guide the cloud enabled business innovation in other businesses.

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