Amazon’s Evolving Ecosystem: A Cyber-bookstore and Application Service Provider

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Abstract
Amazon.com has been through several stages of development: first as a cyber-bookstore, then a cyber-market, and now an Application Service Provider (ASP). I apply the concept of “business ecosystem” to describe the evolution of Amazon.com, and highlight the role of web services in the shaping of its ecosystem. The company plays a central role in the ecosystem, working with a network of partners to bring products and services to customers. By continually trying to improve the health of its ecosystem, Amazon ensures its own survival and prosperity. The mechanisms through which Amazon has created its ecosystem are discussed and ideas for firms looking to create analogous business communities are advanced. Copyright © 2009 ASAC. Published by John Wiley & Sons, Ltd.

JEL classifications: M1, M15, M19

Keywords: Amazon, business ecosystem, web services, value, strategy

Résumé
Amazon.com a désormais deux visages: celui du E-Retailer que nous connaissons tous, et celui moins connu, d’Application Service Provider (ASP). Dans cet article, je présente le concept d’écosystème d’affaires et le rôle joué par les Web services dans la constitution de cet écosystème. L’activité d’ASP d’Amazon est récente et marque une nouvelle phase de développement de l’entreprise au cours de laquelle elle a constitué une véritable communauté d’affaires composée de très nombreux partenaires. Amazon occupe aujourd’hui une place centrale au sein de ce réseau de valeur. A travers cet article j’analyse le développement de l’écosystème d’affaires d’Amazon. J’espère, modestement, que lecture de cet article sera une source d’inspiration pour les entreprises souhaitant développer leur propre écosystème d’affaires. Copyright © 2009 ASAC. Published by John Wiley & Sons, Ltd.

Mots clés : Amazon, écosystème d’affaires, services d’assistance web, valeur, stratégie.

Created by Jeff Bezos in 1994, Amazon.com has become an Internet heavyweight. Designed originally as a cyber-bookstore, the company progressively became a network of merchant sites, thanks to the Amazon Associates Program. Today, over a million partner sites sell their products through Amazon. The purpose of this change was mainly to increase sales but also to improve the value proposition for Amazon customers. In 2002, the launch of Amazon Web Services (AWS) marked a new stage in the history of the firm as well as a significant evolution of its business model. As described in Figure 1, in addition to its e-retailer business, Amazon transformed itself into a true ASP (Application Service Provider) with the decision to make its knowledge of the development of e-commerce software available to its partners. Today, many firms and independent developers use these web services to directly interact with Amazon’s platform and its databases. These third-party sites now account for 30% of the sales recorded by Amazon.
(Amazon.com, 2009). Since the end of 2005, Amazon has capitalized on its information and communication technology (ICT) infrastructure and now offers storage capacity (Amazon S3) and computing power (Amazon EC2) to other firms whether they are partners or not. Indeed, these various initiatives, which are part of a deliberate decision to open the platform and create value, have enabled Amazon to build a true business ecosystem for the benefit of all its partners. The purpose of this article is to illustrate the process leading to the creation of this ecosystem, beginning with a monograph of the firm (Isckia, 2007; Isckia & Petit, 2005). I first describe the concept of a business ecosystem and the strategic implications for firms interested in creating these business communities. I then briefly introduce the web services’ technology and explain Amazon’s platform role and the contribution of the Amazon Web Services (AWS) in the development of its ecosystem.

The Concept of Business Ecosystem

We owe the concept of “business ecosystem” to James Moore (1993, 1996, 1998). This concept provides a different outlook on competitive dynamics and especially on the innovation process: “In a business ecosystem, companies co-evolve capabilities around a new innovation: they work cooperatively and competitively to support new products, satisfy customer needs, and eventually incorporate the new round of innovations” (Moore, 1993, p. 76). An ecosystem is a business community that brings together firms from various interdependent industries. Ecosystems that were recently born around Apple’s iPod, Salesforce’s CRM platform, Facebook, or Google illustrate the wealth, complexity, and dynamics of these structures. These business communities are usually structured around one leader striving to share its commercial philosophy or its technological standard (Gueguen, Pellegrin-Boucher, Torres, 2004; Torres-Blay & Gueguen, 2003). Moore (1998, 2006) also stressed this dimension and the need for the leader to develop the kind of vision to which the ecosystem’s members can adhere. In this framework, the role of the leader is to encourage the convergence of all other community members’ visions and ensure that their efforts will enable the development of beneficial synergies for the customers. This shared vision is indeed a way of structuring innovation efforts and ensuring coordination amongst actors within the ecosystem. Relationships between the firms of an ecosystem are complex and betray a mix of cooperation and competition, thus illustrating cooperation situations as analyzed by Nalebuff and Branderberger (1996). Because of this, the frontiers of an ecosystem are unstable and fluctuate depending on the interactions between member firms. Even if ecosystems are dynamic by nature, they nevertheless remain regulated by one or several leader firms—the keystone organizations (Iansiti & Levien, 2004a). The keystone plays a structuring role within its ecosystem in terms of value creation and value sharing. This is indeed true of Amazon.com within its ecosystem. The role and activity of the leader is enriched by the members of the business community who act as complementary product/service providers (Moore, 1998). Complementary products or services (Nalebuff & Branderburger) enable the creation of network externalities and accelerates the spread of a product/service or standard (Katz & Shapiro, 1985, 1986) within the ecosystem.

The “Who’s Who” of Business Ecosystems: Functional Diversity

A recent analysis by Iansiti and Levien (2004a) enhanced Moore’s work by offering inter alia a typology for a better understanding of the various actors’ roles within an ecosystem. Like Moore, Iansiti and Levien argued that no firm can work in isolation, especially when it comes to innovation. Within an ecosystem, the activity of a firm relies on a mesh of relationships characterized by varying degrees of intensity with other partner firms that are more or less significant in the innovation process. In this context, the networks represent the framework around which relationships between firms are based (Shapiro & Varian, 1998). It is therefore important not only to be aware of these relationships, but to know what role each firm plays in each relationship. Within a biological ecosystem, some species are irreplaceable and their disappearance prompts a reorganization of the system—these are pivotal species. Others are more or less interchangeable, and the dominance of one or another is the result of circumstances related to the history of the system—these are redundant species. They are also useful to the system, since if one tends to become rarer, another is ready to proliferate and replace it. Similarly to an ecosystem, Iansiti and Levien distinguished three potential functional groups within a business ecosystem:

- Dominators: One can distinguish the physical dominator, whose role consists in dominating all of its ecosystem’s niches via integration strategies, enabling it to control the maximum number of nodes within its network and thereby capturing the value created for its own benefit. On the other hand, there exists a value dominator or hub landlord whose role is to extract the maximum value from the network without trying to
dominate it. In both instances, the objective pursued is to extract the maximum value without redistributing it to other actors. The resulting effect is usually a weakening of the business ecosystem.

- Keystones: This type of actor plays a significant role in both the creation and the redistribution of value created within the network. Contrary to a dominator, it does not try to control the whole network and its actors, but rather positions itself on a few nodes and assumes leadership. The keystones often resort to platform strategies that provide an opportunity to take advantage of the other network actors' contributions by facilitating access to some resources. They usually adopt a “win-win” attitude vis-à-vis the other members of their ecosystem.

- Niche players: There are many such actors who are small in size and pursue a specialization strategy in order to differentiate themselves from the others. They account for a large part of the value created within the ecosystem. The resources they access via the platform, made available to them by the keystone, give them an opportunity to develop new products or services. Indeed, they maintain a very close relationship with the keystone by actively contributing to the platform's evolution and the dynamics of the ecosystem.

This typology offers a better understanding of each actor’s role and the strategies adopted. It also better positions the concept of an ecosystem in relation to other management studies. In an ecosystem, leadership is usually assumed by the firm able to identify and implement the terms of collaboration that are best suited to each member of the community. However, the objective is the ecosystem’s overall performance rather than that of a single actor. Therein lies the difference between a business ecosystem that is supported by a keystone and a distribution network. For Coughlan, Anderson, Stern, and El-Ansary (2006), a distribution network is a set of independent organizations striving to make a product or service available for consumption. However, as opposed to a keystone-led ecosystem, this does not mean that the members of a distribution network will act in the best interests of the network as a whole. Rather, each one will try to maximize its own profit with the risk of leading to suboptimal situations: “Maximizing the system’s profits is not the same as maximizing each member’s profits” (Coughlan et al., p.199). An actor that seeks to increase his/her power within the network usually does so at the expense of another actor or group of actors. By strengthening its position in the network, the actor attempts to achieve better control over the distribution network. The business ecosystem is a broader concept that encompasses distribution channels. Both involve the co-creation of value, but a business ecosystem involves more complex forms of value co-creation, combining input services of different types to produce a larger service or product. Yet for Moore (1998), the aim of an ecosystem is about leadership and control. Wal-Mart’s ecosystem development illustrates this approach (Moore, 1993). In the stage that followed its ecosystem’s development and the increase in the number of its sales outlets, Wal-Mart strove to reinforce its negotiating position with its suppliers by forcing them to charge low prices and to use its own supply-chain management tools (Chandran & Gupta, 2003).

In this model, suppliers have little autonomy and are guided by a pilot (i.e., leader), in this case, Wal-Mart. Wal-Mart is therefore more akin to a physical dominator than a keystone, and primarily seeks to control its network for the purpose of extracting the maximum amount of value. This attitude is also reflected in Wal-Mart’s information system, which includes proprietary applications providing suppliers with real-time information on their products. If Wal-Mart’s platform, like Amazon’s, promotes the coordination of actors within its ecosystem, it relies on a proprietary architecture that does not enable its partners to innovate and find new interaction terms with existing services.

Iansiti and Levien’s (2006) typology also identified another characteristic of ecosystems linked to the very nature of relations between members. Indeed, the literature on business ecosystems shows common features with numerous theoretical studies on organizations, such as the ecology of organizations (Hannan & Freeman, 1989), the enterprise networks (Baker & Faulkner, 2005) or the economy of organizations (Williamson, 1975). For Moore (2006), business ecosystems are a third organizational form of exchanges in addition to the firm and the market usually considered in TCE (Transaction Cost Economics) (Coase, 1937; Williamson) without representing a hybrid form. If the firms belonging to an ecosystem are indeed in relationships with each other, it would seem that the nature of these relationships is slightly different from those observed in an enterprise network. Indeed, enterprise networks are usually structures resulting from massive outsourcing and made up of autonomous firms linked through a succession of more or less recurring transactions. Conversely, a business ecosystem does not lead directly to a transaction logic and transaction cost or ultimately to ownership, but instead it leads to an access and usage logic (Rifkin, 2000). In this fashion, platforms correspond to open architectures that enable members of an ecosystem to access resources and use them to develop new services that may interact with those already available on the same platform. If for Williamson the transaction (the
Within an ecosystem, firms must strive to take advantage of all available expertise and resources, which assumes they have access to them. Platforms permit the standardization of access to these resources and contribute to increasing the density of the partners’ network. De facto, they encourage the ecosystem’s increased productivity and the creation of new services. Therefore, those actors that successfully impose the use of their platform will play a key role in their ecosystem by fostering value creation and the coordination of the actors. For Iansiti and Levien (2004b), “Keystones can increase ecosystem productivity by simplifying the complex task of connecting network participants to one another or by making the creation of new products by third parties more efficient” (p. 73). The niche players can connect to these platforms so as to use available resources directly, or to build new products and services based on them. This is the case today with ScoutPal, which has developed a value-added service based on AWS for Amazon Market Place members, and with Associate-O-Matic, an integrator that combines AWS and offers turnkey solutions to the other member firms of Amazon’s ecosystem. Niche players usually opt for specialization that encourages them to innovate in order to maintain a sufficient level of differentiation compared to the other actors, therefore ensuring their survival. However, if platforms represent opportunities that offer access to certain resources to which they can add value through new services, they can also be construed as threats to their own survival. Indeed, if they are too generic, their services may be incorporated into the platform by the keystone as a way for it to enhance its own value proposition. In this respect, the recent buyout by Amazon of CustomFlix, a start-up specializing in DVD publishing on demand, is very significant. In the face of the explosion of the VoD (Video on Demand) market and the proliferation of start-ups in this field (Digeo, Dotcast, MidStream, Myrio, Widevine, Netflix, etc.), Amazon decided to incorporate this new type of service into its platform. Thus a new video-on-demand service—launched in September 2006—called Amazon Unbox Video enables downloading of films viewable on one’s TV or PC. This example underlines the importance for the keystone to take advantage of certain expertise or integration skills that enable it to select, within its ecosystem, those services that may be integrated into its platform. Moreover, it illustrates the importance for companies to concentrate on their core competencies in order to combine them to create new sources of value (Hamel & Prahalad, 1990, 1994). If the process described above results in the elimination of some niche players, it also contributes to attracting new players to the ecosystem and ensures its diversity.

The analytical framework offered by Iansiti and Levien (2004a) highlights some elements with important implications from a strategic point of view. In the first instance, it stresses the importance of platforms in the evolution of a business ecosystem. Indeed, in many environments, networks and platforms shape the nature of relationships between partners and the value allocation within the ecosystem. The degree of openness of these platforms, their architecture, and their access terms encourage competitive interplay within and between ecosystems. In order to promote value creation and value sharing within the ecosystem, the deployment of these technological infrastructures should be considered in a collaborative rather than a proprietary perspective. Indeed, this is what highlights the difference between Wal-Mart and Amazon. These platforms generate much more value for the ecosystem when they rest on an open and modular architecture rather than a monolithic architecture. Furthermore, analysis shows that the keystone plays an especially important role by creating and, more importantly, by sharing the value generated via their platform. However, the expertise and resources required in order to develop such a strategy are not evenly spread throughout an ecosystem. The success stories quoted by Iansiti and Levien (2004a) all have a common feature: these firms were able to promote changes in their platforms by taking advantage of the potential offered by ICTs, and by striving to develop new functionalities and new services wherever possible (Kogut & Kulatilaka, 2001) so as to increase their usefulness to the other communities. In exchange, this behaviour reinforces their weight in the ecosystem. On one hand, this involves access to integration expertise, and on the other, an acute strategic vision (Kirby & Stewart, 2007). This strategic vision is founded on the premise that ICTs should not be considered through the traditional business model viewpoint based on ownership. Rather, they should be
considered as models based on freedom of access and sharing. Finally, innovation is akin to a natural selection process between niche players. Platform strategies (Gawer & Cusumano, 2002) adopted by keystones are bent on stimulating innovation. Yet here again, the fact that a technology is made available to the niche players does not necessarily mean that all will be able to make use of it in a creative manner. This betrays a difference in the distribution of expertise required by the niche players in order to innovate. It represents an element of positive selection. Those who are able to capitalize on the technology available through a high degree of specialization and a focused strategy will continue to co-evolve; the others are very likely to disappear. In other words, the niche players’ survival is conditioned by their ability to develop and build on their distinctive knowledge through the production of technological artefacts. In this context, it is important to understand that the technology adopted by the keystone is liable to retroact within its ecosystem via contributions from complementors and other niche players.

Web Services: The Heart of Business Ecosystems

Web service technologies provide both a language-neutral and environment-neutral programming model that accelerates application integration inside and outside the enterprise. According to the W3C (World Wide Web Consortium), a web service is a software system designed to support communication between remote applications over a network. This is not new, since it was the aim pursued with the Common Object Request Broker Architecture (CORBA) or the Distributed Component Object Model (DCOM) of the early ‘90s. However, some technical difficulties impeded the development of these architectures, and it took another ten years of combined effort by the likes of Microsoft, Sun, and IBM for application servers to accommodate partners’ components directly via the Internet.

In concrete terms, the objective of web services is to facilitate access to applications between companies and thereby simplify electronic data interchange. A web service is thus a software component implemented in any language, portable on any platform, and embedded in a layer of Extensible Markup Language-based standards (XML). It must be dynamically detected and called upon by other services. This partly standardized technology is based on three key components: Simple Object Access Protocol (SOAP), Web Services Description Language (WSDL), and Universal Description Discovery and Integration (UDDI). At the present time, SOAP, WDSL, and UDDI make up the core of service-oriented architectures (SOA). Web services’ technical specifications are available on the W3C site.

For companies, this represents an opportunity to migrate from a monolithic, self-contained information system to a network of services managed by several companies and orientated towards the same customers. Application integration through web services yields flexible, loosely-coupled business systems. These service-oriented architectures (Erl, 2005; Mattern & Wood, 2006) today represent a powerful response to the issue of system heterogeneity between business partners. Over the last few years, web services have become the core of business ecosystems by ensuring the connectivity, ease of access, and availability of a number of e-services, irrespective of which systems’ architectures are supporting them (Barros & Dumas, 2006).

The Birth of Amazon Web Services (AWS)

AWS came into existence thanks to the work of internal developers, who in the ‘90s had begun to think about how to improve processes for associates and the syndication of content. At the end of 1996, Amazon launched its Amazon Associates Program. Within ten years, the number of associates jumped from 4,000 to 900,000 (Amazon.com, 2002, p. 4). The Amazon Associates Program was primarily a means to acquire new customers—in this case, niche players—and thereby increase traffic on Amazon’s site, which contributed in turn to increasing its visibility and its sales (Figure 1: Amazon’s Business Model Evolution). Yet it also turned Amazon into a true hub and thus reinforced its status as a keystone within its ecosystem. A significant evolution of this first affiliate model was witnessed in 2002, mainly thanks to the use of XML. Indeed, as early as 2000 Amazon’s developers were testing XML-based services, a prelude to what would become AWS.

The objective was to facilitate the repeated use of data (product description, picture, price, etc.) in a transparent manner for the associates. In concrete terms, the purpose was to develop an XML-based application programming interface (API) enabling direct queries to be made to the Amazon database from a specific website. In this respect, XML’s attraction versus HTML, when coupled with an XSL style sheet, lies in its ability to segregate the contents from the style. In this manner, information included in a web page may be reused in other applications. Yet for Amazon, the use of XML meant a total rethinking of its platform (Roush, 2005). The objective was to evolve towards a modular approach as a means to improve the way the associates’ requirements were taken into account (Baldwin & Clark, 1997). As mentioned by Carr (2003), this modular approach has
enabled Amazon to tap into new value deposits. However, the project met with some resistance from Amazon’s managers. For Robert Frederick (Roush, 2005, p. 3), the manager in charge of the technical team, “The main concern was that we were going to expose valuable information and concepts that we had spent years developing.” Yet Frederick had a solid argument to convince his opponents (Roush, 2005, p. 3): “Amazon’s payback would be the innovative applications dreamed up by external developers. These applications would vastly increase the variety of contexts in which Web surfers might encounter products from Amazon.” Finally, the project was approved and the generalized use of XML made it possible for Amazon to launch its first web service in early 2002: Amazon E-Commerce Service (ECS).

However, the impact of web services is not limited to the syndication of content and to the creation of a partners’ network. The opening of the Amazon database and the development of AWS also contributed to standardizing part of its partners’ business processes. Such is the case of numerous middleware integrators and publishers, such as Mercent, MorseBest, MonSonn, RightScale, and Associate-O-Matic, which offer customized solutions to Amazon’s partners. Indeed, today this community of actors is highly dependent on Amazon. By offering publishers the ability to develop software solutions that facilitate interfacing with some modules in its platform, Amazon maintains a regulatory power over its ecosystem. From this point of view, Amazon’s platform plays a structuring role within its ecosystem and thus contributes to its evolution while offering it some degree of control. Still, one should be clear about the meaning of “some degree of control.” In fact, by virtue of its position, Amazon could easily “close the tap” and suspend the circulation of its web services. Yet this
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decision would be totally counterproductive, as it would destroy years of effort spent building business communities that directly contribute to sales and value creation. Insofar as niche players develop new services requiring access to Amazon’s platform, their destinies are linked together. By offering its web services free of charge, Amazon introduces switching costs that encourage niche players to remain faithful (Iansiti & Levien, 2004a). In this fashion, the keystone can reduce the uncertainty related to its partners’ network. Indeed, as the environment shared by Amazon and its partners is highly dynamic, niche players might be tempted to “look elsewhere.” Yet the keystone has no incentive to control its environment (as IBM did until the eighties), but rather should stimulate its partners’ creativity by opening some components of its architecture, and by striving to improve interoperability and thus value creation (Iansiti & Levien, 2004a). In other words, Amazon has no incentive to rely on switching costs that would favour lock-in situations, but instead needs to adhere to the logic of continuous development of its platform so as to stimulate innovation within its ecosystem. As mentioned by Sawhney and Parikh (2001), “Value will lie in creating modules that can be plugged into so many different value chains as possible. Companies and individuals will want to distribute their capabilities as broadly as possible rather than protect them as proprietary assets” (p. 81). From this point of view, the keystone’s technological choices at the architectural level are very important. They determine the potential for exploring new strategic options that could favour the emergence of innovation clusters in the ecosystem. In this respect, the choice of open standards avoids problems associated with irreversible technologies leading to entropy and a weakening of the ecosystem.

The Surge of Amazon Web Services (AWS)

By January 2008, more than 300,000 independent developers were using AWS (Amazon.com, 2007, p. 2). Alan Taylor, a former Amazon developer and the creator of Amazon Light, was one such developer. His website offers only a simple search box for finding and buying any product available on Amazon.com. After clicking on the selected product, the web surfer sees a picture of and information about the product, its price, consumers’ advice and, naturally, the ability to purchase it online. This is nothing out of the ordinary, but upon closer inspection, one can find some functionalities not available on Amazon’s site. For instance, until last year, it was possible when searching for a DVD to check whether the movie was also available for rent on the Netflix’s website, the leader of video-on-demand in the US. Likewise, when searching for a CD, it was possible with one single click to check if it could be downloaded from Apple’s iTunes site. For books, Amazon Light also provides information as to whether the book they are looking for is available in the book store of their choice. Today, Amazon Light uses Application Programming Interfaces (API) from Google, Blogger, del.icio.us, and offers a whole range of services. Taylor gives no information on Amazon Light’s transformation rate or on commissions earned. The most salient feature illustrated by this example is the creativity expressed by Taylor through his site and his experimentation with new services that might be of interest to Amazon. Thus, by offering its web services free of charge to independent developers, Amazon fosters co-creation of new services and encourages innovative effort by niche players.

AWS’s underlying strategy is to give developers unlimited access to Amazon.com’s core, that is, its platform and databases. Through this approach, it is the value embodied by this specific asset that is shared with Amazon’s partners. Yet insofar as this specific asset translates the embodiment of core competencies, one must admit that AWS development shows the sharing and spreading of these competencies within the different user communities in a philosophy of value co-creation (Prahalad & Ramaswamy, 2000, 2003, 2004).

Today, Amazon’s strategy has been copied and represents a fundamental trend of the web 2.0: the creation of platforms to host services, storage capacity, and computing power. On this point, the Web 2.0 Summit’s success is symptomatic. This conference, which was held in San Francisco in early November 2006, rallied actors both big and small from the information technology world around the theme “Disruption & Opportunity.” Indeed, for the supporters of this approach, the web 2.0 services have progressively replaced the old traditional proprietary applications. The ICT industry’s future will rest on virtual infrastructures, which should worry established players and whet newcomers’ appetites. Microsoft has already taken note of this challenge, and responded with its ambitious Office Live project: the future no longer rests with autonomous applications installed on users’ workstations, but with online applications to be billed on demand. It is this approach that turned SalesForce into the world’s number one vendor of hosted customer relationship management solutions (CRM). Its AppExchange platform offers a wide range of services billed on demand. For its part, Google launched its Google OS project: the development of an operating system federating all of its services. One could consider Google OS a central service accessed from any web browser, with such browsers later becoming the main application in this new environment.
Yet the foremost advantage contributed by the AWS is to make the work of thousands of independent developers available to Amazon, thus turning its platform into a true hub. For Iansiti and Levien (2004a), “Platforms serve as an embodiment of functionality that forms the foundation of the ecosystem, packaged and presented to members of the ecosystem through a common set of interfaces. Ecosystem members then leverage these interfaces as a kind of toolkit for building their own products and think of them as the starting point for their own value creation” (p. 148). The contribution of third-party sites to the innovation effort is very important. They act as “complementors” working on the development of new services, which one day may be incorporated into the platform. This is a reason Moore (2006) called business ecosystems “complex adaptive multi-contributor systems” (p. 52). In 2006, Amazon went even further in opening its platform by launching two new web services: Amazon Simple Storage Service (S3) and Amazon Elastic Compute Cloud (EC2). Amazon S3 is a hosting service for developers that offers a reliable, efficient, and very inexpensive hosting infrastructure. In this way, Amazon now makes its hosting infrastructure available to developers who in turn no longer have to make massive capital investments and consequently are able to concentrate on creating new services without concern for increased capacity needs if such services are successful. As for Amazon EC2, this service simply offers the full computing power of Amazon’s infrastructure. This service is also primarily aimed at developers who want to use the virtual machines’ power. In both instances, the billing of these services is based on demand. When both of these web services are considered together, they form a very attractive offer as they provide the flexibility companies require for their information system, computing power, and storage capacity.

The adoption of EC2 and S3 is booming. Indeed, the bandwidth utilized by these services in the fourth quarter of 2007 was greater than the bandwidth utilized in the same period by all of Amazon.com’s global websites combined (Amazon.com, 2007, p. 2). Amazon is one of the largest websites in the world, which means that AWS-powered sites are now bigger collectively than Amazon.com, at least when measured by bandwidth usage.

The Health Check-Up of Amazon’s Ecosystem

As indicated, Amazon now has two dimensions: one that reflects its activity as an e-retailer and the other its activity as an ASP. Both of these activities are intimately linked, even though they remain fundamentally different (Carr, 2005).

Amazon has a strong, negative cash conversion cycle whereby cash is generated from customers long before it must be paid back out. Indeed, Amazon’s retailing model is based on high inventory turnover and operates with low overheads. Originally applied only to book retailing, this model required a net working capital limited to 30 days of sales, as opposed to 80 for traditional bookstores. This model extends today to a wide range of products sold on Amazon, which translates into significant cash flow benefits for the firm (Table 1: Amazon Key Ratios). As Amazon orders most of its

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<td>Amazon Key Ratios (Retrieved from: Amazon.com)</td>
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<td>Net sales</td>
<td>14,835</td>
<td>10,711</td>
<td>8,490</td>
<td>6,921</td>
<td>5,263</td>
<td>3,032</td>
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<td>Gross profit</td>
<td>3,353</td>
<td>2,456</td>
<td>2,039</td>
<td>1,602</td>
<td>1,257</td>
<td>992</td>
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<tr>
<td>Operating income</td>
<td>655</td>
<td>389</td>
<td>432</td>
<td>440</td>
<td>270</td>
<td>63</td>
</tr>
<tr>
<td>Net income from operations</td>
<td>476</td>
<td>190</td>
<td>359</td>
<td>588</td>
<td>35</td>
<td>(149)</td>
</tr>
<tr>
<td>Depreciation &amp; amortization</td>
<td>246</td>
<td>205</td>
<td>121</td>
<td>76</td>
<td>75</td>
<td>82</td>
</tr>
<tr>
<td>Capital expenditures</td>
<td>(224)</td>
<td>(216)</td>
<td>(204)</td>
<td>(89)</td>
<td>(46)</td>
<td>(39)</td>
</tr>
<tr>
<td>Tax benefits from stock options</td>
<td>(257)</td>
<td>(102)</td>
<td>(7)</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<tr>
<td>Gross margin (% of sales)</td>
<td>22.60%</td>
<td>22.93%</td>
<td>24.02%</td>
<td>23.15%</td>
<td>23.88%</td>
<td>32.72%</td>
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<tr>
<td>Net profit margin (% of sales)</td>
<td>3.21%</td>
<td>1.77%</td>
<td>4.23%</td>
<td>8.50%</td>
<td>0.67%</td>
<td>(4.91%)</td>
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<td>Operating margin (% of sales)</td>
<td>4.42%</td>
<td>3.63%</td>
<td>5.09%</td>
<td>6.36%</td>
<td>5.13%</td>
<td>2.08%</td>
</tr>
<tr>
<td>Operating cash flow (OCF)</td>
<td>1,405</td>
<td>702</td>
<td>733</td>
<td>566</td>
<td>393</td>
<td>174</td>
</tr>
<tr>
<td>Free cash flow (FCF)</td>
<td>1,181</td>
<td>486</td>
<td>529</td>
<td>477</td>
<td>347</td>
<td>135</td>
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<tr>
<td>Structural free cash flow (SFCF)</td>
<td>498</td>
<td>179</td>
<td>276</td>
<td>575</td>
<td>64</td>
<td>(106)</td>
</tr>
<tr>
<td>True free cash flow (TFCF)</td>
<td>1,438</td>
<td>588</td>
<td>536</td>
<td>477</td>
<td>347</td>
<td>135</td>
</tr>
</tbody>
</table>
products only after they are sold, Amazon rotates inventory at a faster rate than its competitors. By October 2006, Amazon’s inventory had rotated 14 times in that year against 12 for Costco, 8 for Wal-Mart, and 3 for Barnes & Noble. At that time, its gross margin was 24%, or double that of Costco, and one percentage point higher than Wal-Mart’s (Amazon.com, 2006). Moreover, this very high inventory turnover contributes to limiting Amazon’s risk of obsolescence, with a 2% rate compared to 4% for traditional retailers. The recently adopted pre-sales system has also helped Amazon reinforce this trend. For instance, for the European launch of the new Nintendo Wii console, the Amazon.uk site sold its entire inventory in seven minutes. With time and the explosion of sales volumes, Amazon has been able to invest in its infrastructure equipment and most notably in tools and software for inventory management, demand forecasting, and order processing. In 2004, the six Amazon distribution centres in the US were able to process three times more orders than in 2000 at half the cost and at less than 7% of sales (Amazon.com, 2006). These investments have thus helped Amazon keep its operating costs very low and protect a higher gross margin than its competitors. Partner sites have contributed directly to this performance.

Amazon’s financial results for 2007 were quite impressive. Net income rose from $190 million to $476 million, an increase of 150%. Net sales rose from $10.7 billion to $14.84 billion, an increase of 39%, and international sales grew 35%. Operating income increased 69% to $655 million compared with $389 million in 2006, and operating cash flow rose from $700 million to $1.40 billion, an increase of 100%. The 2007 free cash flow more than doubled and has reached $1 billion for the first time. In 2006, new sales incurred higher costs since operating cash flow decreased by nearly 4% while sales increased by 26%. For the full 12 months of 2007, Amazon’s true free cash flow grew 59% year-on-year and the firm’s structural free cash flow grew 64% to $498 million. In 2008, Amazon reached a point of operating leverage. This is clearly visible when checking the company’s key ratios (Table 1: Amazon Key Ratios).

ASP activity, which is Amazon’s second dimension, was built upon the know-how acquired by the company’s ICT teams in the area of software development. In 2007, the company invested about $818 million in research and development (R&D), which represented 5.5% of that year’s total revenues. The company’s focus on R&D facilitates development of new services, which help in maintaining its strong market position. This activity is embodied today by Amazon Enterprise Solutions and AWS. Similar to the Merchant@ programme aimed only at third party sellers, what is targeted here through these two activities is primarily an increase in sales generated by Amazon’s partners. In 2002, when AWS was launched, third-party sellers accounted for 17% of sales recorded by Amazon. This increased to 22% in 2003, 26% in 2004, 28% in 2005, and 30% by the end of 2006 (Amazon.com). The Merchant@ programme was already based on web services, but Amazon used them internally and solely to facilitate its relationships with its associates.

Today, Amazon has not published figures on the sales achieved via Amazon Enterprise Solutions and AWS, but what seems obvious is that the firm is having success through these two programmes and is benefiting from a real laboratory, which reinforces its R&D efforts and allows new services to be tested in real time. However, even if the company doesn’t specify revenues from its web services, it is presumably part of the “other revenue” line (in the detailed financial statements), which was $383 million for 2007 and includes AWS and online retailing services to other retailers (Amazon Enterprise Solutions). Some people could argue that revenues from web services are not very important with regard to total income, but the relative importance of these revenues takes on a different dimension when compared to some of the more famous names in the “on-demand” business. For instance, that $383 million in on-demand revenue is larger than the number two vendor of hosted CRM solutions, RightNow Technologies, whose 2007 total revenue was $112 million. Moreover, this $383 million is not so bad compared with Salesforce, the market and technology leader in on-demand business services, whose total revenue for the fiscal year 2007 was $497 million.

AWS could be considered an idea box where Amazon can seek future growth drivers. The Seattle firm can thus rely on an army of independent developers that can pick up from third-party sellers and generate additional sales thanks to AWS. These independent developers numbered 120,000 in 2005 while today there are 330,000 using AWS to power private sites like Alan Taylor or Amazon Light, or real services like ScoutPal. Unlike traditional associates where commissions range from 4% to 8.5% (depending on sales volume or product category), Amazon charges a 15% commission on sales generated through AWS. For their part, the Amazon Enterprise Solutions account for 5% of US and about 3% of international sales, and this should continue to increase in the years to come. As a sign of the ecosystem’s dynamism, many middleware integrators and publishers have appeared which facilitate the task of retailers who wish to become Amazon partners. In all instances, additional sales generated by the associates and other partners are indispensable to Amazon, as they help compensate for the gross margin loss due to free shipment above $25, and the launch of Amazon Prime. This new service offers
customers unlimited expedited shipping with no minimum purchase amount for a flat annual fee.

For some analysts, the future of giants like Amazon or eBay lies in an increase in the speed and volume of sales permitting investment in new firms such as Mercent and breaking into new markets via their respective business partners. For Eric Best, the founder of Mercent, an integrator certified by Amazon, it is becoming possible to access markets representing several million consumers by combining the web services of several retailers (Lewis, 2004). According to Best: “While retailers can, and will continue to, sell their goods through their own Web sites, the association with a mall such as Amazon carries more than just cache: from the consumer’s point of view, there’s no need to enter credit card information into numerous sites around the Internet with dubious security; one-stop shopping and the ability to connect with just one retail interface is appealing, as are the standards, for quick delivery and customer service” (Lewis, 2004). However, Amazon’s position is concerning to financial analysts as well as retailers. The former are aware of the tensions between both business models and wonder how long Amazon will be able to sustain sales growth and preserve margins. The latter are afraid to see Amazon transform itself into a new Wal-Mart and give up its keystone role in favour of that of a dominator. Indeed, some retailers did not hesitate to follow Toys “R” Us’ lead and join GSI Commerce Inc, a rival platform that currently includes close to fifty large retail chains and makes the full technical infrastructure necessary for e-commerce available to them.

Discussion

Summary

As indicated, Amazon plays a pivotal role in its ecosystem by operating as a keystone. In ten years of existence the firm has been through several stages of development, first as a cyber-bookstore, then as a cyber-market, and today as an ASP. As mentioned by Carr (2005, para. 4): “On one side stands the familiar on-line retailer, pitching a plethora of goods such as books, toast- ers, and plasma TVs. The other consists of an information-technology company that provides merchants with a software platform for Internet sales. Amazon, in other words, is playing both ends of the supply chain—it’s a retailer, and it’s a supplier of software to other retailers.” These various stages of development correspond to significant changes in the firm’s business model. By betting on AWS, Jeff Bezos turned Amazon.com into a true ASP enjoying a vast expertise in the field of e-commerce and related technologies. If Web 2.0 is about communities, web services, and SOAs, then by anyone’s standards, Amazon has just launched the ultimate e-service.

Obviously, the company is still a force to be reckoned with and has the potential to make a significant impact on the way e-services evolve. Amazon has not forgotten its retailer activity however, and its expertise in the areas of online sales and back-office management have earned it a hub position within a wide network of actors placed in a situation of interdependence. Indeed, in addition to traditional associates and independent developers, a large number of middleware integrators (certified by Amazon) and publishers are totally dependent on Amazon. Recently, the launch of S3 and EC2 further strengthened Amazon’s position by offering, on a turnkey basis, all services needed by entrepreneurs wishing to start-up in electronic commerce. Due to Amazon’s specific weight in the value chain of these various communities, the firm has promoted a true “value network” (Lecocq & Yami, 2000). By continually improving the ecosystem as a whole, keystones like Amazon ensure their own survival and prosperity. They do not promote the health of others for altruistic reasons; they do it because it’s a well-suited strategy. However, if Amazon’s position within its ecosystem confers obvious benefits, the company does not seem to be taking advantage of it for the moment, and is preserving a “win-win” relationship with its partners. Amazon does not attempt to confiscate the value created by its partners nor does it try to lock them into a relationship of domination. Besides, one of Amazon’s strengths lies in this “intelligence” of business relations. It manifests a great awareness of its own role versus that of its partners on one hand, and on the other the potential value that may result from their contribution (Kirby & Stewart, 2007). With the launching of AWS, Bezos proves that he has remained faithful to the spirit that drove him at the outset: “We shall take risks rather than satisfy ourselves with timorous investment decisions whenever we will foresee a sufficient probability of winning against competition” (Hof, 2003, para. 33). More generally as a keystone, Amazon has a vested interest in making available to its partners the means to express their creativity and innovative capabilities. In this context, and in order to maintain its status, Amazon’s greatest challenge in the coming years will be to monitor its ecosystem so as to spot the emergence of communities that are likely to bear innovations representing new value deposits or threats to existing value deposits. This will continue to require a real technological expertise capability from the management team, and the ability to orchestrate this expertise in the framework of a strategy that is capable of reconciling the two faces of Amazon.
Contributions to Scholarship

For years, markets and hierarchies have dominated our thinking about competition and competition policy. The fact is that business ecosystems are widespread in many areas and it should be accorded equal recognition in theory and policymaking. Business ecosystems reshape both markets and hierarchies. As a result, companies will increasingly want to establish business ecosystems to coordinate innovation across complementary contributions arising within different markets and hierarchies. From this point of view, the ecosystem organizational form should provide a new framework for competition policy, regulation, and antitrust actions. Moreover, the ecosystem-based view has a number of broad implications for knowledge management, one of which is the central importance of interdependency in business. A company’s performance is dependent on the firm influencing resources outside its direct control. Related to this is the importance of integration skills, that is, the ability to combine resources that exist outside of its own organization.

Applied Implications

Today, platforms and telecommunications networks are at the very heart of convergence between the media and telecommunications sectors. This convergence implies that telecommunications regulation lies at the crossroads of many policies such as industrial policy, competition policy, content regulation, R&D, and innovation policy. However, regulatory design depends heavily on economic characteristics, and most of all, on markets’ organization and structure. Ignoring the ecosystem organizational form within this area could lead to regulatory mismatches: unfounded regulation, waste, and misuse of regulator resources, innovation, and investments delays. For instance, Amazon is requiring that print-on-demand (POD) books be printed inside Amazon’s own fulfillment centers. Thus, the question: “Is Amazon using monopolistic tendencies to corner the POD market?” is very important for various actors within the publishing industry such as authors, publishers, and consumers.

Thus, clarifying and understanding the relationships between actors within business ecosystems is a crucial issue to improve the efficiency of competition and regulation policies.

Limitations and Future Research Directions

Beyond the Amazon case, an analysis of business ecosystems paves the way for interesting research in several domains. The typology of actors or functional groups as suggested by Iansiti and Levien (2004a) enables, for instance, the completion of existing grids of analysis in the field of industrial marketing, and notably, the interactive approach developed through the work done by the IMP (Industrial Marketing and Purchasing). In the field of strategic management, the study of business ecosystems permits, as indicated by Gueguen et al. (2004), the completion of the analytical framework of collective strategies (Astley & Fombrun, 1983). Scientific concepts have an explanatory footprint that is not unlimited, and there is a need for extensive work to define their boundaries. The two research pathways we have mentioned above could contribute to this fencing work by better understanding the concept of the business ecosystem, making it more robust and operational.

Notes

1 http://www.37signals.com
2 http://www.scoutpal.com
3 http://www.associate-o-matic.com
4 http://www.mercent.com
5 http://www.morsebest.com
6 http://www.monsoonworks.com
7 http://info.rightscale.com/content/about
8 http://www.kokogiak/amazon4
9 This service is only available in Australia, Canada, and the United States.
10 http://www.rightnow.com/
11 See: http://phx.corporate-ir.net/phoenix.zhtml?c=176060 &p=irol-printondemand

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