Research Contribution

e-Business Models applied to Education

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Executive Summary

This article is based on the literature review around the Web 2.0 and its potential for education. A number of new services have appeared on the Web and are commonly regrouped under the label of “Web 2.0”. The objective of this article is to show how the Web has evolved to this new system, to identify the different applications available and to define the various existing business models. Furthermore, this article will present the various opportunities of implementing a Web 2.0 based system for education, and will present the cost and limits of such an implementation.

Résumé

Cet article de recherche est basé sur une analyse de la littérature autour des notions du Web 2.0 et des opportunités possibles pour l’éducation.

Un grand nombre de nouveau service sont apparus sur Internet et sont communément regroupé sous le terme de « Web 2.0 ». L’objectif de cet article est de décrire l’évolution du Web, et d’identifier les différentes applications disponibles, mais aussi de définir les divers modèles économiques existants. En outre, cet article présentera les opportunités à mettre en place des solutions Web pour l’éducation, et exposera les coûts et les limites à l’implantation d’un tel system.
Keywords

Web 2.0, Web services, Business models, Internet, Higher Education, Distance Learning, E-education, E-learning, Collaboration, Participation, New technologies

Mots Clés

Web 2.0, Services Web, Modèles économiques, Internet, Education, Enseignement à distance, Education en ligne, Collaboration, Participation, Nouvelles technologies
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Introduction

Since its creation, the Web has completely evolved, with a large number of technological developments. Those technological developments have made Web services less expensive, faster and much more accessible. Indeed, according Moore’s law (1965)\(^1\), the processing power doubles every 18 months, and similar evolution are existing for storage costs and network speeds. All those factors have led to increase the population of internet users and developed new ways of using the Web, with more coordination and interaction between users.

As developed in the JISC report (2008)\(^2\), “The e-revolution and Post-Compulsory Education”, e-business organizations are characterized by the three following elements:

- **Customer focus:** Customer are at the heart of the whole process, and e-business organization respond very quickly to customer demand by adapting the entire value chain as the demand changes are increases.

- **Organization Integration:** E-business organizations are closely link to, thanks to technological capabilities, their clients, suppliers, partners and others actors of their environment. This enables them to concentrate on their core activities and to collaborate with others and outsource very easily all other non-core activities.

- **Common systems:** The development of standards and common systems enables to reduce costs and to facilitate the flow of information

All these new improvements and services are providing a much more participating experience, where users collaborate and interact more easily. Franklin and Van Harmelen (2007)\(^3\) describe this phenomenon of contrast between the actual Web 2.0 and the former Web (“Web 1.0”) as:

>“In Web 1.0 a few content authors provided content for a wide audience of relatively passive readers. However, in Web 2.0 everyday users of the web use the web as a platform to generate, re-purpose, and consume shared content. With Web 2.0 data sharing the web also becomes a platform for social software that enables groups of users to socialize, collaborate, and work with each other. This change of use is largely based on existing web data-sharing mechanisms being used to share content, in conjunction with the use of web protocol based interfaces to web applications that allow flexibility in reusing data and the adoption of communications protocols that allow specialized data exchange.”

As a result, according to Dr. Crook (2008)\(^4\), the expansion of Web 2.0 has impacted the Web in 4 different ways as identified below:

- Inquiry
- Literacy
- Collaboration
- Publication

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1 (MOORE, 1965)  
2 (Jos Boys and Peter Ford, 2008)  
3 (Tom Franklin and Mark van Harmelen May 2007)  
4 (Dr. Charles Crook, John Cummings, Tony Fisher, Rebecca Graber, Prof. Colin Harrison, Dr. Cathy Lewin, Dr. Kit Logan, Prof. Rose Luckin, Dr. Martin Oliver, Prof. Mike Sharples, May 2008)
I. The Web 2.0

A. What is Web 2.0?

Web 2.0 is a term that became famous after first O’Reilly MediaWeb 2.0 conference in 2004. However there are still some divergences in the ways people consider this expression as Tim O’Reilly notes: “still a huge amount of disagreement about just what Web 2.0 means, with some people decrying it as a meaningless marketing buzzword, and others accepting it as the new conventional wisdom” (O’Reilly 2007).

On one hand, the Web 2.0 is considered as an evolution of technology to new services, and on the other hand it is defined as a new network of social interaction. But in both visions, the internet user and its relationships with others, instead of websites contents and machines, are now placed in the center of the web. Indeed, the web 2.0 is definitely considered as a network structure.

But first of all Web 2.0 is considered to be a new version of Web 1.0, a new platform not only of information but also of participation.

Charles Crook and al. (2008) explained the fact that Web services have evolved a lot thanks to a development of Internet technologies, and mentioned the following factors:

- **Widening internet access**: inexpensive broadband connectivity and devices has created a vast constituency of users. Moreover, many Web 2.0 services depend on ‘network effects’ – that is, they achieve greater viability when they attract greater numbers of users.
- **Greater fluency of interaction**: wireless networks have made access ubiquitously available and faster networks have extended the menu of material that can be downloaded and uploaded – in particular, bandwidth-demanding video is now readily shared and exchanged.
- **The browser as universal platform**: the browser is becoming the universal interface to a range of online applications and remotely stored data. These ‘Rich Internet Applications’ (RIAs) have given many online applications and services the look and feel of desktop software. These services are accessible from most devices with a full browser and internet access, making them largely independent of local operating systems and local storage.
- **Managing data on an epic scale**: inexpensive storage allows web service providers to store vast amounts of user-created or user-related material. This may include incidentally-detected choices that users have made, as well as selections or files that they have intentionally uploaded and then tagged. Many Web 2.0 services are based upon interrogating, integrating, and sharing that data.
- **Endless shelves in the internet marketplace**: although some internet contributions may be more prominent than others (made more visible by greater publicity), all internet contributions can be equally findable once a URL is assigned. The 'cost' of web publication is small and equally distributed across all users, thus creating a strongly participative culture of engagement.

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5 (Dr. Charles Crook, John Cummings, Tony Fisher, Rebecca Graber, Prof. Colin Harrison, Dr. Cathy Lewin, Dr. Kit Logan, Prof. Rose Luckin, Dr. Martin Oliver, Prof. Mike Sharples, May 2008)
Publication space for user-generated content: inexpensive storage has encouraged sites to act as silos for material that users have submitted. Thus, the range and depth of material available has increased and this, in turn, has developed a larger user base for such material.”

But technology evolution is not the only driver for Web 2.0 development, as it responds to internet users demand and need. Crook and al, looked at the term “intersubjectivity” which corresponds to a human ability to relate intelligently with others. This is the former idea of the “collaborative” concept which characterises the Web 2.0. Crook and al (2008) describe:

“It is not difficult to see how intersubjective capabilities would support intelligent action. Solving a problem collaboratively exploits these capabilities. One person’s assumption that they share understandings with a collaborator creates a powerful platform because, upon that platform, they may each then construct creative conversational reasoning. It should also not be difficult to see that achieving intersubjectivity has emotional or motivational force as well. Human beings seem to value and seek a certain feeling of resonance that arises from reciprocal understandings of this kind with others. There is a sense of intimacy associated with knowing that the other person knows what you know – and also that they know that you know they know this, and so on in a recursive pattern of mutuality.”

As an extension of this concept, Ross Dawson (2009) developed the following Web 2.0 framework to define the scope of Web 2.0, and the implications and opportunities for organizations.
Dawson (2009) defines seven different characteristics of Web 2.0:

- **Participation**
  
  Every aspect of Web 2.0 is driven by participation. The transition to Web 2.0 was enabled by the emergence of platforms such as blogging, social networks, and free image and video uploading, that collectively allowed extremely easy content creation and sharing by anyone.

- **Standards**
  
  Standards provide an essential platform for Web 2.0. Common interfaces for accessing content and applications are the glue that allow integration across the many elements of the emergent web.

- **Decentralization**
  
  Web 2.0 is decentralized in its architecture, participation, and usage. Power and flexibility emerges from distributing applications and content over many computers and systems, rather than maintaining them on centralized systems.

- **Openness**
  
  The world of Web 2.0 has only become possible through a spirit of openness whereby developers and companies provide open, transparent access to their applications and content.

- **Modularity**
  
  Web 2.0 is the antithesis of the monolithic. It emerges from many, many components or modules that are designed to link and integrate with others, together building a whole that is greater than the sum of its parts.

- **User Control**
  
  A primary direction of Web 2.0 is for users to control the content they create, the data captured about their web activities, and their identity. This powerful trend is driven by the clear desires of participants.

- **Identity**
  
  Identity is a critical element of both Web 2.0 and the future direction of the internet. We can increasingly choose to represent our identities however we please, across interactions, virtual worlds, and social networks. We can also own and verify our real identities in transactions if we choose.”
B. The Web 2.0 applications

Web 2.0 is also characterized by the large number of applications available to users.

1. Blogs

The « blog », or web-log, first defined in 1997, by Jorn Barger. A blog is a system that allows a single author to write and display articles on the web in time-ordered. This system allows readers to add comment about the “posts” displayed. This process of posting and commenting illustrates the whole nature of blogging, where the blog’s author communicates to an unlimited number of people.

The main characteristics of blogging are the sense of immediacy, the openness and interactivity between the author and readers (through comments), but also the linking. Linking is an important part of blogging, as it corresponds to the conversational nature of blogs and to the sense of immediacy. It facilitates finding and referencing of the information displayed on different blogs.

As mentioned below are the different kind of links possible:

- Permalink: a permanent URL created by the system which corresponds to a particular post.
- Trackback: this kind of link allows a reader (blogger) to inform another blogger that he/she has commented a post on a blog.
- Blogroll: Is a list of links of other blogs that the author likes or which talk about the same subject.

2. Wikis

A wiki is a page that can be edited by any person who has access to it. Wikipedia is still the most famous website using the concept of wiki. It is a collaborative tool, where an edit button enables people to participate to the production of content by deleting, editing and displaying. The objective of this kind of tool is to facilitate the production of a workgroup, by having a simple page, very flexible, where anyone can have access and provide some content. Facing so much openness and facilitation for interaction we can question ourselves about the security of such a system. In fact, that type of software can be very easily disrupted with false editing and vandalism, but some security exists. Indeed, many wikis usually have an “history function” which enables to restore previous versions. And others argue that in general vandalism and mistakes are quite quickly corrected by the audience. For example, at the beginning of Wikipedia, many people where worried about the veracity of the information displayed on the web sites, but as times goes by the information are being corrected and added so that the whole database is getting richer and more precise. It doesn’t mean that all information displayed on Wikipedia are correct but at least with time it is getting more and more precise, to such an extent that millions of user are now choosing Wikipedia as a primary source of information.

3. Tag and social bookmarking

A tag is a keyword or a particular associated to a digital object (website, post on a blog, picture, etc...) . The objective of this kind of metadata is to describe the object and facilitate its finding when browsing and searching. Golder and Huberman (2005) define the new concept of collaboration

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9 (Scott A. Golder and Bernardo A. Huberman August 2005)
through tags as: “collaborative tagging is the practice of allowing anyone – especially consumers – to freely attach keywords or tags to content.”

The concept of tagging has been expanded to “social bookmarking”, particularly with the development of the website www.del.icio.us. Millen, Feinberg and Kerr (2005)\(^\text{10}\) distinguish the differences between tagging and social bookmarking as followed:

> “Social bookmarking systems share a number of common features. First, they allow individuals to create personal collections of bookmarks and easily share their bookmarks with others. These centrally stored collections can be accessed from any Web-connected machine.

> A second, and significant, enhancement in these systems is the use of keywords, or tags, that are explicitly entered by the user for each bookmark. These tags allow the individual user to organize and display the collection with meaningful labels. Furthermore, multiple tags allow bookmarks to belong to more than one category, a limitation of the traditional hierarchically organized folders found in most Web browsers. The final distinguishing characteristic of these social bookmark applications is the social nature of their use.”

Beyond the concept of tagging Anderson (2007)\(^\text{11}\) describes a distinction between two new terms: “folksonomy” and “collabulary”.

> “A folksonomy is a collection of tags created by an individual for their own personal use and a collabulary is a collective vocabulary.”

4. Multimedia sharing

During the last years, the storage and sharing of multimedia content has encountered a big increase, in such platforms as YouTube, Slideshare or Flickr. This service illustrates very clearly the concept of Web 2.0, “where users are not just consumers but contribute actively to the production of Web content”. This phenomenon is now implemented in a large scale where millions of people download and upload, share and exchange multimedia contents. This trend is getting even bigger as the adoption cost of high quality media technology is getting cheaper.

5. Audio blogging and podcasting

Podcasts are audio recordings that can be played on a computer or on any MP3 player. Audio blogging has the same structure as general blogs, but instead of posting information in a textual format, some audio recording are posted and shared to visitors of the blog. Distribution is very simple, because interested listeners subscribe to RSS feeds and therefore receive directly the information and podcasts files as soon as there are available.

6. RSS and syndication

RSS is a combination of digital formats which permits users to receive directly update from websites, blogs, or podcasts which are RSS-enabled, with no need to visit each web site.

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\(^{10}\) (David Millen, Jonathan Feinberg, Bernard Kerr 2005)

\(^{11}\) (P. Anderson Feb. 2007)
C. The Web 2.0 Business Models from Michael Rappa

When implementing a new Web site there are various possible approaches to generate revenues or at least cover the costs. Michael Rappa (2010) in its “Managing the digital enterprise” exposes taxonomy of the various business models existing on the Web.

He distinguishes nine different categories of business models:

- Brokerage
- Advertising
- Infomediary
- Merchant
- Manufacturer (Direct)
- Affiliate
- Community
- Subscription
- Utility

The following points will describe the nine Categories as defined by Michael Rappa (2010)\(^{12}\), see annex A.

1. “Brokerage Business model”

   “Brokers are market-makers: they bring buyers and sellers together and facilitate transactions. Brokers play a frequent role in business-to-business (B2B), business-to-consumer (B2C), or consumer-to-consumer (C2C) markets. Usually a broker charges a fee or commission for each transaction it enables. The formula for fees can vary. Brokerage models include:”

   - “Marketplace Exchange
   - Buy/Sell Fulfillment
   - Demand Collection System
   - Auction Broker Transaction Broker
   - Distributor
   - Search Agent
   - Virtual Marketplace

2. “Advertising Business Model”

   “The web advertising model is an extension of the traditional media broadcast model. The broadcaster, in this case, a web site, provides content (usually, but not necessarily, for free) and services (like e-mail, IM, blogs) mixed with advertising messages in the form of banner ads. The banner ads may be the major or sole source of revenue for the broadcaster. The broadcaster may be a content creator or a distributor of content created elsewhere. The advertising model works best when the volume of viewer traffic is large or highly specialized.”

   - “Portal
   - Classifieds
   - User Registration
   - Query-based Paid Placement

\(^{12}\) (RAPPA, 2005)
- Contextual Advertising / Behavioral Marketing
- Content-Targeted Advertising
- Intromercials/Ultramercials

3. “Infomediary Business Model”
“Data about consumers and their consumption habits are valuable, especially when that information is carefully analyzed and used to target marketing campaigns. Independently collected data about producers and their products are useful to consumers when considering a purchase. Some firms function as infomediaries (information intermediaries) assisting buyers and/or sellers understand a given market.”
- “Advertising Networks
- Audience Measurement Services
- Incentive Marketing
- Metamediary

4. “Merchant Business Model”
“This model concerns wholesalers and retailers of goods and services. Sales may be made based on list prices or through auction.”
- “Virtual Merchant
- Catalog Merchant
- Click and Mortar
- Bit Vendor

5. “Manufacturer (Direct) Business Model”
“The manufacturer or "direct model", it is predicated on the power of the web to allow a manufacturer (i.e., a company that creates a product or service) to reach buyers directly and thereby compress the distribution channel. The manufacturer model can be based on efficiency, improved customer service, and a better understanding of customer preferences. [Dell Computer]”
- Purchase
- Lease
- License
- Brand Integrated Content

6. “Affiliated Business Model”
“In contrast to the generalized portal, which seeks to drive a high volume of traffic to one site, the affiliate model, provides purchase opportunities wherever people may be surfing. It does this by offering financial incentives (in the form of a percentage of revenue) to affiliated partner sites. The affiliates provide purchase-point click-through to the merchant. It is a pay-for-performance model -- if an affiliate does not generate sales, it represents no cost to the merchant. The affiliate model is inherently well-suited to the web, which explains its popularity. Variations include, banner exchange, pay-per-click, and revenue sharing programs. [Barnes & Noble, Amazon.com]”
- "Banner Exchange
- Pay-per-click
- Revenue Sharing
7. “Community Business Model”
“The viability of the community model is based on user loyalty. Users have a high investment in both time and emotion. Revenue can be based on the sale of ancillary products and services or voluntary contributions; or revenue may be tied to contextual advertising and subscriptions for premium services. The Internet is inherently suited to community business models and today this is one of the more fertile areas of development, as seen in rise of social networking.”

- “Open Source
- Open Content
- Public Broadcasting
- Social Networking Services

8. “Subscription Business Model”
“Users are charged a periodic -- daily, monthly or annual -- fee to subscribe to a service. It is not uncommon for sites to combine free content with "premium" (i.e., subscriber- or member-only) content. Subscription fees are incurred irrespective of actual usage rates. Subscription and advertising models are frequently combined.”

- “Content Services
- Person-to-Person Networking Services
- Trust Services
- Internet Services Providers

“The utility or "on-demand" model is based on metering usage, or a "pay as you go" approach. Unlike subscriber services, metered services are based on actual usage rates. Traditionally, metering has been used for essential services (e.g., electricity water, long-distance telephone services). Internet service providers (ISPs) in some parts of the world operate as utilities, charging customers for connection minutes, as opposed to the subscriber model common in the U.S. “

- “Metered Usage
- Metered Subscriptions

D. The limits of Web 2.0
II. E-Education

We can see that Internet has completely revolutionized the world, from the way we consume, to the way we have access to information, but even to the way we interact between each other. This phenomenon has had a great impact on every sector of activity. It can be seen has a revolution and present many challenges to adapt oneself to changes that big, but in fact it is a great opportunity for all organizations to improve their structure. In the case of education, which was originally composed of traditional organization, this present a lot of challenges, as developing and e-education system, requires much more than just publishing content online. It needs an entire adaption of the whole organization, from knowledge management systems, to courses content, to evaluation criteria, etc.... But this present also great opportunities of development as the Internet technologies offers a great range of advantages, accessibility, low costs, wide audience, interactivity, etc...

The Web based education is actually developing very fast to respond to the student’s demand which is today use to have access on Internet to everything they need. People can make purchases, look for information, plan a trip, and check their bank account, etc... anytime during the day. Furthermore, they are expecting the same convenience and all-day long accessibility from education.

The main characteristics of Web-based education are that education is available to students anytime, anyplace and to anyone.

The following element is a list of reason gathered by David Nicol (2004) across its research and discussions that explain the desire of implementing a Web-based education platform.

- To improve learning quality
- To improve the student experience
- To reduce costs
- To gain competitive advantage
- To expand or break into new markets
- To widen access
- To facilitate flexible learning
- To improve retention
- To improve organizational efficiency

A. Higher Education: Challenges and opportunities

Higher Education is facing many challenges as it must adapt to the changing shape of student body, and the evolution of employment and the economy. At the same time, institutions are also facing cost effectiveness issues that they have to manage with ethics and corresponding to large public interest issues.

At the beginning of Internet, many thought that face-to-face education will very quickly change to completely web-based education but instead, we see that education has moved to some model called “hybrid”, “enhanced” or “blended” learning. In Annex B, the table developed by Goldstein (2002), defines those terms in term of type of service provision and typical market.
Higher education, as described above, is facing many different types of pressures such as the one mentioned below. They must improve themselves to respond efficiently to those pressures.

- **Cost pressure:** They must reduce their costs, increase their productivity, look for new revenue outcome, improve students’ retention, pass costs on students, outsource their non-core activities....
- **Increase student expectations:** Differentiate themselves with better competitive advantages, improve their facilities and courses provided, provided an added value experience to students.
- **Increase in competition:** They are facing much more competition, and must therefore increase their notoriety and improve their brand identity, by specializing themselves in some area of expertise.
- **Increase of regulation:** Development of better process, and reporting and measurement tools.

**B. Strategies for e-education**

Developing an e-education platform based on e-business practices doesn’t necessarily means to create a more commercial and profit-driven education. But it doesn’t mean either to only put online your document. It goes much further and requires a completely new organizational model.

Four different type of organization could be implemented to provide a full e-education structure:

1. **Embedded**
   It corresponds to the creation of a new internal division which would be in charge of developing online all administrative activities: registration, schedules, courses, etc... This type of organization limits itself only to administrative activities and is therefore not a full e-education system.

2. **Separate structure**
   It consists in creating a whole new structure online with a new program or new courses or directed to a new market. This allows to touch a wider range of audience without having to invest in a new campus. It could be used to provide customized education, but can also be a platform for research and administrative activities.

3. **Spin-Out Structure**
   This is a mix of the two solutions above. It is structure that is developed internally until it reaches a certain point and is therefore separated to the original structure and is considered as an independent organization.

4. **Joint Venture / Collaboration**
   The development of an e-education system can also be the result of a collaborative projects of universities working together to develop a shared educational platform. It allows to reduce costs, but also to provide a bigger platform to a wider audience. But obviously it may not have the same value in terms of brand identity and notoriety.
All these types of structure correspond to different level of integration in the original Education organization of the University or school implementing. It is therefore very important that organization think about where they want to go and what kind of structure they want to develop. Osterwalder and Pigneur (2002) noted the following aspects that must be taken into account when implementing an e-education system:

1. **Products and services**
   What products and services are we offering? What is our competitive advantage and added value for student? Will people be willing to pay or subscribe for those products and services?

2. **Information and knowledge**
   How is our knowledge management system organized? Is it efficient? Is it secure enough? Is it easy enough to use for students, for teachers,...? Can we customized the information provided according to the different users profile?

3. **Infrastructure and network**
   What kind of infrastructure is need to provided good quality of service? Is our infrastructure adding value? How can we improve or infrastructure/ system/ process, to be more efficient?

4. **Relationship**
   What kind of relationships do we have with partners? How can we facilitate relationships? How can we ensure customer/student loyalty and satisfaction?

5. **Financial side**
   How much does this system costs? Are we able financially to implement such a solution? Is it worth it? What kind of business models can be used? Can we make revenue or value creation out of this system?

In terms of economic models, we saw above that many different types of business models are available on the Web. But if we want to provide content to student for free, we must refer to the 4 free business models identified by Chris Anderson. The picture below describes those business models and the interactions it concerns. Those business models could I think all be used for an e-education platform, but must be defined at the start of the platform development.
1. The 4 Free Business Models of Chris Anderson (by David Armano)

- **Free 1: Paid products subsidizing free products**
  In this model, organizations provide a free product, in order to encourage customers to purchase another one.

- **Free 2: Advertising based model**
  In this model, the revenues come from the advertisement on your site. The more audience you get on your website and generally the more money you get from advertising.

- **Free 3: “Freemium”, Paying people subsidizing free people**
  In this model, the service is free, but in order to get access to all the features, you need to pay for a fuller version. The subscribers to this paid version are the one who makes the site profitable.

- **Free 4: The "gift economy"**
  In this model, organizations give something for non-monetary rewards. They expect to get a reward but it can be platform where users share skills, information, knowledge, advices, etc...

Furthermore, as we saw in the first section, Michael Rappa categorized the different e-business models. Lam and Harrison- Walker (2003)\(^\text{14}\) also developed a typology of e-business models but which is based on objectives. They distinguish two kinds of objectives: “relational objectives” and “value based objectives”.

\(^{14}\) (Lam LONG and Harrison WALKER, 2003)
They also divide those two kinds of objectives into sub-categories:

- **Relational Objectives**
  - Direct Access: no middlemen between producer and consumer
  - Network development:
    - Corporate communication: Provide corporate information to customers or prospects, to enhance demand for products and/or services, and/or to increase brand awareness.

- **Value-based Objectives**
  - Financial improvement
  - Product and Channel enrichment: developing loyalty and long-term relationships.

The following matrix describes the concept developed by Lam LONG and Harrison WALKER (2003), but was adapted by John Powell (2008):

John Powell (2008) also developed a matrix based on Michael Porter’s generic value chain which identifies the 4 element of an educational organization impacted by the implementation of a Web-based system:

- Information and Knowledge Market
- Customer Relationship Management
- Stakeholder relationship management
- Supply Chain Management

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15 (Powell, 2008)
16 (Powell, 2008)
The two previous matrix show that institutions/organization/companies may want to develop a e-business project for very different reasons: to change their brand image or differentiate themselves from competition, to reach a new segment, to create a interactive network, to benefit from Internet accessibility and interactivity to improve the quality of their services..... In terms of educational institutions/organizations those reasons can also be determinant and value. Indeed, an institution who wants to be seen as innovative, needs today to be proposing e-education services, but few years ago MIT, for example decided to implement an Open Educational Resources project first to differentiate itself but also to reach a new target. It is also a good way for school and universities to create a network of people interested by a particular subject for example, where experts, teachers, students and professional can get together and discuss. As exposed earlier this enables to reach a larger audience, facilitate participation and collaboration and develop platform of discussion and information sharing.

The second matrix shows that the implementation of such a project may have huge impact on the entire organization, as it facilitate all information sharing. But this kind a project needs a lot of internal adaptation. For example; are courses proposed on campus suitable for web-based diffusion (content, format, copyrights,.....), can we propose the same educational resources on line?, How will the student be assessed?, Our softwares/ computer materials adapted for for such a system?, How will this web-based system be funded?

But e-education platform are essentials and are developing quite quickly. It is obvious that it presents many benefits that will be presented below but such a project generally costs a lot of money and needs to be financed. As universities and school are developing Open Education resources with the objective of proposing educational document/ courses for free it is tricky to find the right business model as

**C. e-Education model**

The main objective is to set up an efficient educational platform, to improve quality of educational courses and services. The implementation of such a model of education presents many advantages for both students and institutions.

1. **Benefits**
A Web-based education present many advantages for students, and Porter (1997)\(^\text{17}\) identified the following elements:

- The possibility to learn at one’s own pace
- The ability to learn in a convenient location
- The opportunity to learn about other topics not covered in the courses
- The occasion to participate to prestigious Universities programs without having to relocate
- The option to learn as they prefer (mode of learning)
- The opportunity to use a range of different technologies
- The capacity to direct one’s own learning

Rosenberg (2001)\(^\text{18}\) also identified different benefits of e-learning, with a much more general perspective, which are listed below:

- Lowers costs
- Enhances business responsiveness
- Brings consistency
- Allows customization
- Content is more timely
- Content is more dependable
- Learning available 24-7
- No user "ramp up" time
- Is universal
- Builds community
- Is scalable
- Leverages corporate investment in the web
- Provides an increasingly valuable customer service

2. Costs

Rumble (2001)\(^\text{19}\) identifies 5 different kinds of costs for e-education:

- The cost of developing e-materials
- The cost of teaching students on-line
- The cost of administering students online
- The cost of providing the infrastructure and support within which e-education can operate
- The cost of planning and managing e-education

In his article “E-Education: Whose benefits, whose costs?” (2001)\(^\text{20}\), Rumble explains that according to him a Web-based educational system is more expensive than face-to-face education. He argues that face-to-face education is cheaper, among other reasons, because of savings made on academic labor which may have impact on education quality. He also explains that by implementing an e-

\(^{17}\) (Porter, March 2001)
\(^{18}\) (ROSENBERG, 2001)
\(^{19}\) (Rumble, E-education - Whose benefits, whose costs?, 2001)
\(^{20}\) (Rumble, E-education - Whose benefits, whose costs?, 2001)
education system, the organization may make important saving on and off-campus, mainly through administrative activities. We can easily imagine that organization will try to pass those costs on students.
D. Open Educational Resources (OER) Funding Models

There is a wide range of funding models that could be sustainable, to provide Open Educational Resources, that have been analyzed by Downes (2006)\(^{21}\) and Dholakai (2006)\(^{22}\).

1. Funding models from Downes

**Endowment model**

“This model is based on funding. The fund is then managed to sustain the project from the interest earned from the original fund. For example, the Stanford Encyclopedia of Philosophy is sustained thanks to the interest earned from funds raised from different charitable foundations. The $190000 of interest from the 3 to 4 million dollars raised from charity (Zalta, 2005).”

**Membership model**

“On this model, institutions or organizations get together to form a bigger consortium, they contribute to an amount of money and are in exchange granted some privileges. “The Sakai Educational Partners Programme, for example, is a for-fee community that is open to educational. Members contribute USD 10 000 and in turn are granted a set of privileges, including early access to roadmap decisions, code releases and documentation.” (Sakai, 2005).\(^{23}\)

**Donations model**

On this model, a project supposed worthy of support by the wider community requests, and receives donations. Donations are in turn managed by a nonprofit foundation, which may apply them to operating expenses or, if amounts are sufficient, seek to establish an endowment. The Apache Foundation (Apache, 2005) or even Wikipedia are examples of the implementation of such a model.

**Conversion model**

“According to Sterne and Herring (2005) “In the Conversion model, you give something away for free and then convert the consumer of the freebie to a paying customer.” They argue that such an approach is needed because “there is a natural limit to the amount of resources the Donation model can bring to an open source project, probably about USD 5 million per year”. In the educational community, the conversion model has proven popular, having been adopted by Elgg\(^{24}\).”

**Contributor-pay model**

“Adopted by the Public Library of Science, the “PloS Open Access Model: One Time Author-Side Payments” (Doyle, 2005). In this model it’s the contributors who pay for the cost of maintaining the contribution, and the provider thereafter makes the contribution available for free.”

**Sponsorship model**

“The sponsorship model can range from intrusive commercial messages, such as are found on commercial television networks, to more subtle “sponsorship” message, as are

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\(^{21}\) (Downes, 2006)

\(^{22}\) (Dholakia, U. King, J. & Baraniuk, R., 2006)

\(^{23}\) (Sakai, 2005)

\(^{24}\) http://elgg.org/
found in public broadcasting. In online educational initiatives, various companies have supported OER projects on a more or less explicit Sponsorship basis, often in partnership with educational institutions. Examples include the MIT iCampus Outreach Initiative (Microsoft) (CORE, 2005) and Stanford on iTunes project (Apple) (Stanford, 2005).”

Institutional model
“This model is a small variation from the sponsorship model as it is the institutions themselves who develop and support an OER project. The most famous example of this model is the MIT’s OpenCourseWare project."

Governmental model
Very close to the institutional model, the governmental model is characterized by a direct funding for OER projects by government agencies. Becta project is a good example of the UK government support for OER projects.

2. Funding models from Dholakai

Replacement model
“This model consist in financing the implementation of an open resource project with the saving made from the non-replacement of the original knowledge management system. The educational content stored, disseminated, and re-used through the OEP [open education programme] often replaces the use of other technology software and infrastructure such as course management systems, virtual learning environments (e.g., Blackboard), and proprietary data repositories and web-sites (Wright, Yoshimi and Gavilan, 2005).”

Foundation model
“If the OEP grows to a significant size in a particular subject area, in total number of users, in serving users of a particular country or geographic region, etc., it could seek ongoing funding from foundations, philanthropic institutions, professional societies, trade or industry groups, individual firms, governmental and/or non-governmental agencies that are focused on this particular niche. The key to implementing this model is to identify an underserved user segment, and then focus the programme’s efforts and initiatives in serving this segment, thereby creating a differentiated brand image. A variation of the foundation model is a consortium model, where the OEP charges a fee from affiliated universities and institutions for joint development and ownership of the project.”

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25 http://ocw.mit.edu/index.htm
26 http://www.becta.org.uk/
Segmentation model
“This model relies on the idea that while providing open access to all the educational content on the site to users, the OEP can simultaneously provide “value-added” services to specific user segments and charge them for the services. Examples of such specific services that could be offered are: sales of paper copies of culled content organized around a particular topic, training and user support to institutional users for annual fees, housing and dissemination of copyrighted content within the same site on a subscription basis, “ask-an-expert” services for a fee, and consulting services to provide custom education to corporate clients.”

Voluntary support model
“A revenue model based on voluntary support emulates fund-raising methods used by National Public Radio, National Public Television, and other media outlets in the United States. From time to time, these media organizations run fund-raising campaigns to raise money from conscientious users to financially support their operation. Recent revenue models, employed successfully by blogs such as tip-jars, the solicitation of “micro-patrons” (e.g., www.kottke.org) who contribute micropayments (e.g., Micali and Rivest, 2002; Yang and Garcia-Molina, 2003) could be used in conjunction.”

6.3. Other support models for open educational resource projects
The most intriguing support possibility for open educational resource projects based in higher education that is not mentioned above is to reduce the cost of the open educational resource projects so drastically that there is little or nothing left to fund. This is the approach taken in joint work by the Sakai Project, an open source course management system, and eduCommons, an open source opencourseware management system. The two projects are working together to leverage all the effort that already goes into building and publishing online courses. Many universities, including the Michigan and Utah State Universities, already have funding, processes, and personnel in place to build online courses within their chosen course management tool. If a “one button” feature could be added to these systems that exports an open version of the official course into a university’s opencourseware collection, this would remove many of the major costs associated with running open educational resource projects.

6.4. Summary of funding models
Obviously, there are dozens of funding models that an open educational resource initiative might adopt. Because every initiative will have different goals and exist in a different institutional context, no single model will fit every project. However, there is still much that individuals and institutions can learn by watching the beginning attempts at sustainability that are just emerging in many previously-grant-funded open educational resource initiatives.

3. Funding models from Wiley
Wiley (2006)27 defined three models for open educational resource projects in higher education: the MIT model, the USU model, and the Rice model.

The MIT Model

27 (Wiley, 2006)
The objective of MIT OCW is to publish every courses present on campus over the Net. It’s a project that is planned to last on the long term as it is highly supported by the MIT institution. “One the key drivers and enabler for the MIT project has been the lever of Foundation and private donor support it has been able to achieve. It has also successfully engaged vendors (such as Sapient, Microsoft, Maxtor, Hewlett-Packard, Akamai, and NetRaker) in partnerships. The annual budgets for MIT OCW projected from 2007 through 2011 are over £ 2,155,000 per year, with the most resources allocated to staff (including eight core staff, five publication managers, four production team members, two intellectual property researchers, and ten department liaisons) technology and contracted services. Without significant external funding, it is unlikely that any other institution will be able to replicate the MIT model.”

The USU Model
“This model is a hybrid of centralization and decentralization of both organization and services, and work is distributed across some employed staff and a number of volunteers. The goal of USU is to publish as many of the courses as possible. Faculty members volunteer to coordinate this work as part of their teaching or advising responsibilities by making USU OCW-related work eligible for credit in their courses. The USU has also acquired the William and Flora Hewlett Foundation support with more than £125, 300 over the life of the project. The annual projected budget for USU OCW in 2007 is just over £63,647 (including one full-time Director, two half-time graduate students, and three half-time undergraduates). It is likely that this model could be replicable by other universities.”

The Rice Model
Completely decentralized this model is sustained by volunteer who bring all their support through materials and services. The objective of this model is to allow the collaborative development of educational resources. Development costs are maintained very low as it all relies of volunteering and collaborating. The site provides a lot of documentation and advices “on course building, technical and pedagogical support and to help authors deal with copy right issues”. This is a good example of volunteer driven open educational project.
Conclusion
Bibliographie


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### Categories of e-business model from Michael Rappa (2006)

<table>
<thead>
<tr>
<th>Type of Model</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Brokerage Model** | Brokers are market-makers: they bring buyers and sellers together and facilitate transactions. Brokers play a frequent role in business-to-business (B2B), business-to-consumer (B2C), or consumer-to-consumer (C2C) markets. Usually a broker charges a fee or commission for each transaction it enables. The formula for fees can vary. Brokerage models include: 

*Marketplace Exchange* -- offers a full range of services covering the transaction process, from market assessment to negotiation and fulfillment. Exchanges operate independently or are backed by an industry consortium. [Orbitz, ChemConnect](#)

*Buy/Sell Fulfillment* -- takes customer orders to buy or sell a product or service, including terms like price and delivery. [CarsDirect, Respond.com](#)

*Demand Collection System* -- the patented "name-your-price" model pioneered by Priceline.com. Prospective buyer makes a final (binding) bid for a specified good or service, and the broker arranges fulfillment. [Priceline.com](#)

*Auction Broker* -- conducts auctions for sellers (individuals or merchants). Broker charges the seller a listing fee and commission scaled with the value of the transaction. Auctions vary widely in terms of the offering and bidding rules. [eBay](#)

*Transaction Broker* -- provides a third-party payment mechanism for buyers and sellers to settle a transaction. [PayPal, Escrow.com](#)

*Distributor* -- is a catalog operation that connects a large number of product manufacturers with volume and retail buyers. Broker facilitates business transactions between franchised distributors and their trading partners.

*Search Agent* -- a software agent or "robot" used to search out the price and availability for a good or service specified by the buyer, or to locate hard to find information.

*Virtual Marketplace* -- or virtual mall, a hosting service for online merchants that charges setup, monthly listing, and/or transaction fees. May also provide automated transaction and relationship marketing services. [zShops and Merchant Services at Amazon.com](#) |
| **Advertising Model** | The web advertising model is an extension of the traditional media broadcast model. The broadcaster, in this case, a web site, provides content (usually, but not necessarily, for free) and services (like email, IM, blogs) mixed with advertising messages in the form of banner ads. The banner ads may be the major or sole source of revenue for the broadcaster. The broadcaster may be a content creator or a distributor of content created elsewhere. The advertising model works best when the volume of viewer traffic is large or highly specialized. 

*Portal* -- usually a search engine that may include varied content or services. A high volume of user traffic makes advertising profitable and permits further diversification of site services. A personalized portal allows customization of the interface and content to the user. A *niche portal* cultivates a well-defined user demographic. [Yahoo!](#)

*Classifieds* -- list items for sale or wanted for purchase. Listing fees are common, but there also may be a membership fee. [Monster.com, Craigslist](#)

*User Registration* -- content-based sites that are free to access but require users to register and provide demographic data. Registration allows inter-session tracking of user surfing habits and thereby generates data of potential value in targeted advertising campaigns. [NYTimes](#)

*Query-based Paid Placement* -- sells favorable link positioning (i.e., sponsored links) or advertising keyed to particular search terms in a user query, such as Overture's trademark "pay-for-performance" model. [Google, Overture](#)

*Contextual Advertising / Behavioral Marketing* -- freeware developers who bundle adware with their product. For example, a browser extension that
automates authentication and form fill-ins, also delivers advertising links or pop-ups as the user surfs the web. Contextual advertisers can sell targeted advertising based on an individual user's surfing activity.

**Content-Targeted Advertising** -- pioneered by Google, it extends the precision of search advertising to the rest of the web. Google identifies the meaning of a web page and then automatically delivers relevant ads when a user visits that page. [Google]

**Intromercials** -- animated full-screen ads placed at the entry of a site before a user reaches the intended content. [CBS MarketWatch]

**Ultramericals** -- interactive online ads that require the user to respond intermittently in order to wade through the message before reaching the intended content. [Salon in cooperation with Mercedes-Benz]

### Infomediary Model

Data about consumers and their consumption habits are valuable, especially when that information is carefully analyzed and used to target marketing campaigns. Independently collected data about producers and their products are useful to consumers when considering a purchase. Some firms function as infomediaries (information intermediaries) assisting buyers and/or sellers understand a given market.

**Advertising Networks** -- feed banner ads to a network of member sites, thereby enabling advertisers to deploy large marketing campaigns. Ad networks collect data about web users that can be used to analyze marketing effectiveness. [DoubleClick]

**Audience Measurement Services** -- online audience market research agencies. [Nielsen//Netratings]

**Incentive Marketing** -- customer loyalty program that provides incentives to customers such as redeemable points or coupons for making purchases from associated retailers. Data collected about users is sold for targeted advertising. [Coolsavings]

**Metamediary** -- facilitates transactions between buyer and sellers by providing comprehensive information and ancillary services, without being involved in the actual exchange of goods or services between the parties. [Edmunds]

### Merchant Model

Wholesalers and retailers of goods and services. Sales may be made based on list prices or through auction.

**Virtual Merchant** -- or e-tailer, is a retail merchant that operates solely over the web. [Amazon.com]

**Catalog Merchant** -- mail-order business with a web-based catalog. Combines mail, telephone and online ordering. [Lands' End]

**Click and Mortar** -- traditional brick-and-mortar retail establishment with web storefront. [Barnes & Noble]

**Bit Vendor** -- a merchant that deals strictly in digital products and services and, in its purest form, conducts both sales and distribution over the web. [Apple iTunes Music Store]

### Manufacturer (Direct) Model

The manufacturer or "direct model", it is predicated on the power of the web to allow a manufacturer (i.e., a company that creates a product or service) to reach buyers directly and thereby compress the distribution channel. The manufacturer model can be based on efficiency, improved customer service, and a better understanding of customer preferences. [Dell Computer]

**Purchase** -- the sale of a product in which the right of ownership is transferred to the buyer.

**Lease** -- in exchange for a rental fee, the buyer receives the right to use the product under a “terms of use” agreement. The product is returned to the seller upon expiration or default of the lease agreement. One type of agreement may include a right of purchase upon expiration of the lease.

**License** -- the sale of a product that involves only the transfer of usage rights to the buyer, in accordance with a “terms of use” agreement. Ownership rights remain with the manufacturer (e.g., with software licensing).

**Brand Integrated Content** -- in contrast to the sponsored-content approach (i.e., the advertising model), brand-integrated content is created by the manufacturer itself for the sole basis of product placement.
### Affiliate Model

In contrast to the generalized portal, which seeks to drive a high volume of traffic to one site, the affiliate model provides purchase opportunities wherever people may be surfing. It does this by offering financial incentives (in the form of a percentage of revenue) to affiliated partner sites. The affiliates provide purchase-point click-through to the merchant. It is a pay-for-performance model -- if an affiliate does not generate sales, it represents no cost to the merchant. The affiliate model is inherently well-suited to the web, which explains its popularity. Variations include, banner exchange, pay-per-click, and revenue sharing programs. [Barnes & Noble, Amazon.com]

- **Banner Exchange** -- trades banner placement among a network of affiliated sites.
- **Pay-per-click** -- site that pays affiliates for a user click-through.
- **Revenue Sharing** -- offers a percent-of-sale commission based on a user click-through in which the user subsequently purchases a product.

### Community Model

The viability of the community model is based on user loyalty. Users have a high investment in both time and emotion. Revenue can be based on the sale of ancillary products and services or voluntary contributions; or revenue may be tied to contextual advertising and subscriptions for premium services. The Internet is inherently suited to community business models and today this is one of the more fertile areas of development, as seen in rise of social networking.

- **Open Source** -- software developed collaboratively by a global community of programmers who share code openly. Instead of licensing code for a fee, open source relies on revenue generated from related services like systems integration, product support, tutorials and user documentation. [Red Hat]
- **Open Content** -- openly accessible content developed collaboratively by a global community of contributors who work voluntarily. [Wikipedia]
- **Public Broadcasting** -- user-supported model used by not-for-profit radio and television broadcasting extended to the web. A community of users support the site through voluntary donations. [The Classical Station (WCPE.org)]
- **Social Networking Services** -- sites that provide individuals with the ability to connect to other individuals along a defined common interest (professional, hobby, romance). Social networking services can provide opportunities for contextual advertising and subscriptions for premium services. [Flickr, Friendster, Orkut]

### Subscription Model

Users are charged a periodic -- daily, monthly or annual -- fee to subscribe to a service. It is not uncommon for sites to combine free content with "premium" (i.e., subscriber- or member-only) content. Subscription fees are incurred irrespective of actual usage rates. Subscription and advertising models are frequently combined.

- **Content Services** -- provide text, audio, or video content to users who subscribe for a fee to gain access to the service. [Listen.com, Netflix]
- **Person-to-Person Networking Services** -- are conduits for the distribution of user-submitted information, such as individuals searching for former schoolmates. [Classmates]
- **Trust Services** -- come in the form of membership associations that abide by an explicit code of conduct, and in which members pay a subscription fee. [Truste]
- **Internet Services Providers** -- offer network connectivity and related services on a monthly subscription. [America Online]

### Utility Model

The utility or "on-demand" model is based on metering usage, or a "pay as you go" approach. Unlike subscriber services, metered services are based on actual usage rates. Traditionally, metering has been used for essential services (e.g., electricity, water, long-distance telephone services). Internet service providers (ISPs) in some parts of the world operate as utilities, charging customers for connection minutes, as opposed to the subscriber model common in the U.S.

- **Metered Usage** -- measures and bills users based on actual usage of a service.
- **Metered Subscriptions** -- allows subscribers to purchase access to content in metered portions (e.g., numbers of pages viewed). [Slashdot]
## Annexe B

Educational Strategies by Golstein (2002)

<table>
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<th>Educational strategy</th>
<th>Service</th>
<th>Market</th>
</tr>
</thead>
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<td>Convenience (anytime, anywhere)</td>
</tr>
<tr>
<td></td>
<td>Individual or cohort-based</td>
<td>Part-time</td>
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<tr>
<td></td>
<td>Asynchronous delivery</td>
<td></td>
</tr>
<tr>
<td>Hybrid (combination of online learning and classroom-based study)</td>
<td>Instructor-led or content-led</td>
<td>Flexibility</td>
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<tr>
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<td>Individual and cohort-based</td>
<td>Mixed-mode</td>
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<tr>
<td></td>
<td>Synchronous and asynchronous delivery</td>
<td></td>
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<td>Blended (online materials supplement face-to-face learning)</td>
<td>Instructor-led</td>
<td>Service enhancement</td>
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<tr>
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<td>Cohort-based</td>
<td>Full-time and part-time</td>
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<tr>
<td></td>
<td>Synchronous and asynchronous delivery</td>
<td></td>
</tr>
<tr>
<td>Traditional learning</td>
<td>Instructor-led</td>
<td>Experience</td>
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<tr>
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<tr>
<td></td>
<td>Synchronous delivery</td>
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Annexe B
Annexe C
Table 2.