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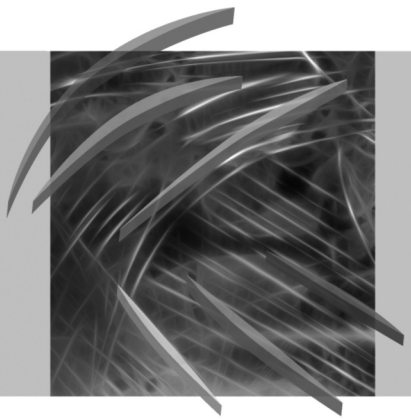

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Information Systems in Business

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SELECTED AREAS OF WEB 2.0 TECHNOLOGY APPLICATION IN PARTNERSHIP ENTERPRISES

Abstract: The paper presents basic areas within which partnership enterprises conduct business activity and which may be supported by Web 2.0 technology. A starting point for the discussion is the nature of Web. 2.0 technology, which has recently become an important business platform. Then, the nature of partnership enterprises is presented, which, due to their geographic dispersion, become a natural sphere for the application of Web 2.0 technology. Finally, the last section of the paper presents various areas where modern technology may be utilized, in particular: internal communication among partners, internal communication within a partnership system and communication with customers. There is also presented an example of utilizing Web 2.0 technology in making an application available with the aid of SaaS-type solutions.

Keywords: Web 2.0, partnership company, cooperation.

1. Introduction

Evolution of technology allowed users of Internet services to gain a significant share in creating the web content. This approach to the Internet has become known as Web 2.0. A basic advantage resulting from the new way of viewing the Internet is the fact that the users of Internet services become their co-designers. It allows to build closer relationships among internauts; it also results in strong identification with the generated content. Web 2.0 technologies have also become a business platform and presently play a crucial role in many types of organizations. Due to such factors as considerable geographic dispersion, many plants coexisting within a single business and simultaneous cooperation with many business entities, Web 2.0 technologies have naturally found their way into partnership enterprises. These technologies facilitate communication and information exchange within both individual organizations and partnership systems, as well as between company employees and customers. At the same time, with the help of web services and SaaS-type solutions, Web 2.0 technology allows to make business applications available in a manner which is both easy and effective. The aim of the present paper is to present selected areas of Web 2.0 technology application in partnership enterprises.

2. The nature of Web 2.0 technology

Internet services which constitute examples of Web 2.0 are not just another version of the Internet or WWW solutions. They reflect a change in the approach to designing and providing services by encouraging a greater activity and involvement of users. Providing a precise definition of Web 2.0 and specifying a border separating it from Web 1.0 would be extremely difficult. According to the dominant view, any modern Internet page which is not a classic web page may be defined as a Web 2.0 service. Basic differences are displayed in Table 1.

Table 1. Basic differences between Web 1.0 and Web 2.0 Internet services

Web 1.0	Web 2.0
• Banner adveritising • Uploading multimedia files to websites • Downloading music • Artists who make available only the promotional versions of their works • Classic *on-line* encyclopaedias • Private websites • Buying books *on-line* • Systems of bookmarks and favourite pages in browsers	• Context advertising • Uploading multimedia files to special services and "tagging" them • Renting films • Artists who make available the whole albums and collections of their works • "Wiki"-type encyclopaedias • Private blogs • *On-line* publishing • RSS readers – for reading news headlines

Source: [Valacich, Schneider 2010].

In the above table it has been shown that the services connected with Web 2.0 are significantly contributing to a further increase in the Internet dynamics. Examples of technologies utilized in this area include the following [Nowicki, Turek 2010]: AJAX, web services, RSS, widgets, mashups, wiki, podcasts and blogs.

AJAX is a technology used for dynamic design of Internet pages and applications, or their fragments. It usually utilized the XML and JavaScript solutions. AJAX allows to modify, update and use an application without the necessity to refresh the whole web page.

WebServices are Internet services characterized by independence in the spheres of hardware, software and technology. This means that an access to these services can be obtained from any platform, with the help of any device. WebServices are described with such phrases as: *any device*, *any network*, *any service*. On the basis of this technology it is possible to develop applications which allow access to widely dispersed data and information. A user has access to this data or information regardless of the browser, device (e.g. laptop, smartphone, or palmtop) and operating system they are using.

RSS systems and readers are presently becoming an integral part of Internet browsers and services. These technologies allow for automatic and dynamic updat-

ing of information headlines on various web pages. In this way a user is always notified about the appearance of the newest information in their areas of interest.

Widgets are additions to basic operating systems. They facilitate the communication of many applications with a user by utilizing systems of automatically updated windows. Thus, a person using a widget is able to continuously follow these applications. Examples of such solutions include calendars, timetables, e-mail operating, monitoring sales or stocks, exchange quotation, etc.

Wiki-type technologies are most commonly associated with "Wikipedia" – the Internet encyclopedia which is designed by web users. Its popularity and the number of its entries are dynamically increasing. A growing reliability of information found in the encyclopaedia is a crucial factor in contributing to its expansion. The Wiki technology as such refers to specific Internet pages which not only can be viewed but also designed, edited and altered directly with the aid of any Internet browser. Such technologies as AJAX, WebServices and Wiki are often applied together with solutions known as mashups. The concept has been borrowed from music creators generating new works by mixing up several already exiting ones. The technology of mashups allows, on the basis of available technologies, to create quickly Web 2.0 applications and Internet services. In order to do so, a software designer utilizes ready tools and an available fragment of the source code.

Another example of Web 2.0 technology is a podcast. It is a type of an Internet service facilitating easy publication of multimedia files (images, sounds and films). These files are often arranged in a series of episodes or cyclical programmes. Podcasts can be created by anonymous Internet users such as television stations, radio stations, etc.

Blogs are a very popular form of cyclic text publications on the Internet. The use of services offering the possibility of blog writing is usually free of charge. The users may remain anonymous, use a so-called "nick" or introduce themselves officially using their own name and surname. Writing a blog is a very popular form of presenting one's personal views or opinions on particular topics, and this kind of activity is frequently taken up by politicians, actors and singers.

Tools deriving from Web 2.0 technology play a very important role in viewing the Internet in terms of a business platform. Examples of solutions used in business include:

– geographically dispersed teams,
– informatics outsourcing,
– SaaS,
– ASP.

Virtual teams have been found useful in various situations and contexts. Usually they consist of geographically dispersed experts. Solutions offered by Internet services allow such experts to work together on various projects and fulfill particular tasks without it being necessary for them to travel in a physical sense of doing so. A common example utilizing the solution of geographically dispersed teams can be

found in telemedicine. One of its aspects is the possibility for distance consultations and diagnostics performed by doctors from specialist clinics and health centres.

Similar solutions find an application in informatics outsourcing. This concept means that certain areas of company activity are singled out (e.g. information systems administration, accountancy, computer programming, graphic design) and external entities are made responsible for them, working via the Internet.

The SaaS (Software as a Service) technology is a delivery model of functional applications in the shape of various services. Such applications are activated and utilized via Internet connections. Enterprises which choose this form of access do not have to bear high costs connected with the purchase and launching of a given solution. Subscription payments for the provided services are common. Thus, the cost of purchasing a server, as well as the administration, modernization and operation of the IT department is reduced.

A similar approach is utilized by the ASP (Application Service Provider) technology. This model of providing access to services does not require steady subscription payments, but the amount of payment depends proportionally on how extensively a given application is utilized. Thus, an access to the software and the content of computers and the network is given upon request.

3. A characteristics of partnership enterprises

Practically from the moment it came into being, the Internet, as a vast computer network, has been viewed from the angle of benefits it might bring in the sphere of enhancing the functioning of companies, especially with regard to relaying and exchanging information. Because of geographic dispersion of company branches, sub-contractors and contractors, the Internet has contributed to the development of organizations known as partnership enterprises. This term refers to a company which seeks for cooperation rather than competition. This goal is fulfilled by entering into numerous agreements with suppliers and purchasers, as well as establishing alliances with contractors in order to make competitive market offerings without the necessity to have one's own resources in order to do so [Romanowska, Trocki 2002].

Among the most important reasons why entrepreneurs decide to enter into a partnership relation the following are most frequently listed:

- an opportunity to retain one's grasp of particular markets or to conquer new ones,
- an opportunity to conduct business without the necessity to have one's own resources or in a situation when one has only a fraction of the necessary resources,
- an occasion for technological, organizational and economic development,
- reduced risk of conducting business activity,
- a cooperation with large companies and corporations,

– an opportunity to use prestigious brands and trademarks,
– advantages resulting from large-scale operations,
– utilization of well-tried patterns of management and organization,
– more efficient sale of products and services,
– higher profits.

The very nature of partnership systems means that they are composed of a large number of entities and, as a rule, constitute a network structure. Depending on the number of partners and their economic and organizational potential two types of partnerships are distinguished:

– peer-to-peer networks,
– single-entity dominated networks.

In peer-to-peer networks all participants of the system have equal opportunities to influence the functioning of the whole enterprise. They are characterized by large flexibility, which facilitates rapid reactions to changes taking place in the business environment.

A single-entity dominated network is established when one large company initiates business relations with many partners. Such a company usually plays the part of an organizer of the whole system.

Figure 1 is a graphic display of the two types of networks, i.e. peer-to-peer network and single-entity dominated network.

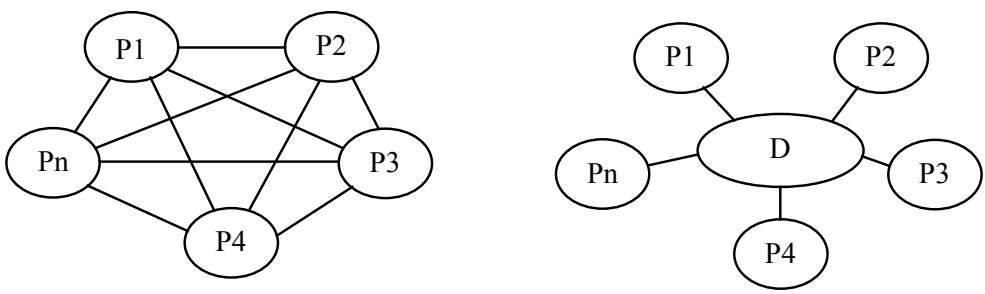

Figure 1. Graphic display of a peer-to-peer network (left) and a single-entity dominated network (right)

Partnership associations can also be viewed from the angle of levels of cooperation. Any two companies present on the market may either be competitors or not. If they used to be competitors and then decided to cooperate, we have to do with horizontal cooperation. In the case of cooperation among companies which have not previously competed with one another, we have to do with vertical cooperation. The two types of cooperation are displayed in Figure 2.

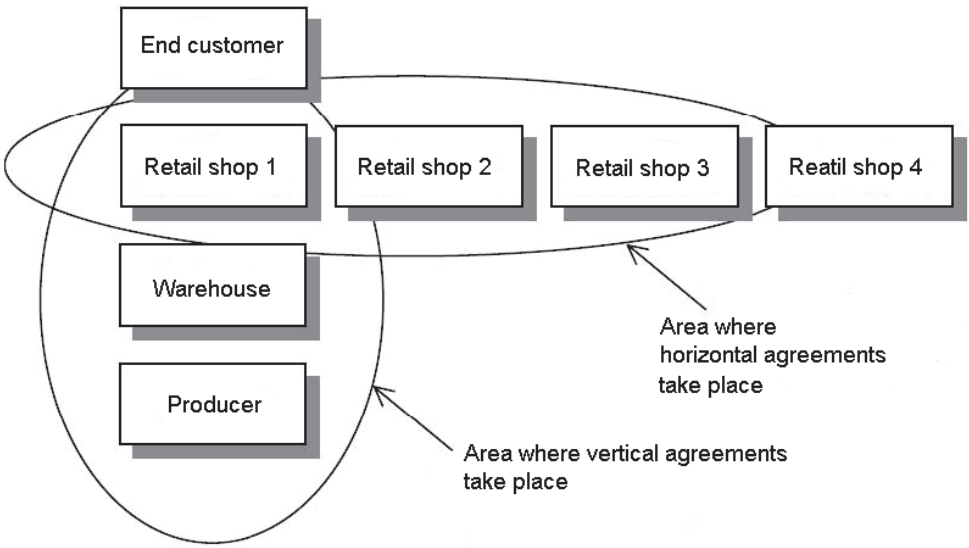

Figure 2. Graphic display of horizontal and vertical cooperation

In each of the presented cases the agreements have a different character. As for competitors, they have to come to an understanding about their prospective shares in the market, amount of production, and the principles of management and organization of the partnership system. In most cases the companies have to agree to make concessions to each other in order to develop optimal principles of cooperation. Cooperation of companies which are competitors is known as an alliance. In the case of vertical agreements, establishing a partnership relation does not require such extensive negotiations. Establishing a partnership enterprise will consist mostly in the coordination of activities and integration of the participants, and will also require reaching an agreement with regard to developing a common business strategy.

In economic practice, partnership agreements may have the following forms (in the order reflecting the closeness of the association between the sub-contractors): business agreements, distribution agreements, sub-supplies, licenses, franchising, subsidiary, merger, etc.

4. Areas of Web 2.0 application in partnership enterprises

Web 2.0 technologies are characterized by a large amount of interaction between entities which generate the content of Internet services and their users. The users may influence the content, shape and form of what is relayed. The solutions, mentioned in Section 1, which distinguish Web 1.0 technology from Web 2.0 technology allow partnership enterprises to enhance the efficiency of their functioning within three areas:

– communication inside single partnership enterprise,
– communication within the partnership system,
– communication with external subjects.

Yet another area is connected with extending Web 2.0 in the direction of providing access to applications, e.g. in the shape of SaaS technologies.

Internal communication of individual partners does not actually differ from communication and information exchange within organizations and enterprises functioning in a traditional way. It does not mean, however, that the workers cannot use the advantages of Web 2.0 technology. The most popular solutions in this area include: widgets, Wiki, network communicators, blogs and social portals. These technologies not only contribute to enhancing communication processes among employees of a company, but also, with the aid of tools (e.g. widgets) properly integrated with the informatics system or other Internet services, they make it possible for employees to be up-to-date with regard to various indicators, trends and events. What is more, the processes connected with finding information on the web become much faster.

An important aspect of internal communication in an organization which utilizes Web 2.0 is also the fact that any contact which takes places between people leaves a trace in databases, which may be referred to at any time and re-interpreted. This is helpful in situations when employees forget something or claim that they have not received some piece of information.

A range of advantages resulting from the application of Web 2.0 technology within a partnership system is much wider than in the case of an individual organization. Such systems often consist of dozens, or even hundreds, of entities. Utilizing social portals, company blogs and private blogs, as well as services which allow to upload graphic files and films, positively affects the efficiency of cooperation while developing common projects. Friendly relationships are established among some of the persons involved and their Internet interaction is motivating for others. For instance, if one of the partners has finished some stage of works and informs about this on their company blog, the other partners want to keep up and work more intensely to complete their own tasks. Another important thing is the opportunity to exchange experience, send instructions and advice. Apart from helping to establish friendly relationships among partners, Web 2.0 solutions contribute to a better coordination of activities which results in keeping up with work schedules while working together on particular tasks or projects.

Communication with customers encompasses both issues connected with public relations and with advertisement. Establishing a community where users of a given product may communicate with one another and exchange experience allows to create a base of knowledge which, as a result, contributes to developing better products, reducing defects and optimizing functionality. In the Web 2.0 era, any person or entity who wish to create their image or launch new products, have to take web users and their reactions into account. Treating the customer and their expectations as the most important element of business, a company has to set great store by customers'

opinions. Web 2.0 tools provide a wide plethora of opportunities for the users to create a reality of some kind on the web and influence its further development in a possibly optimal, flexible and quick manner [Pelczar 2009].

Web 2.0 technology has also contributed to a change in the approach to the issue of advertising on the Internet. Advertisements have become contextually adjusted to the profile of a user and their individual needs by using prompts such as key words that they search for and the content of web services that they browse through. In this area Google company, with its AdSense system, is a leader on the market. A similar approach is utilized by Google in the AdWords system. In this case, context advertisements are shown as sponsored links in the search results. Context advertisement is an ideal solution for the systems of partnership enterprises. Individual partners do not conduct their own marketing activity, because they usually use the logo and trade name of the whole network. In this way, they considerably reduce the outlays on advertising since the cost is borne either by the network organizer or by all co-operators proportionally.

An important element of Web 2.0 is providing access to software via the Internet. SaaS services (Software as a Service) are a practical solution in this area. The technology is a mode of delivering functional applications in the shape of a service. Such an application is not activated by the user's computer, but by the SaaS supplier's servers. The Internet and an Internet browser become an intermediary element, as is displayed in Figure 3.

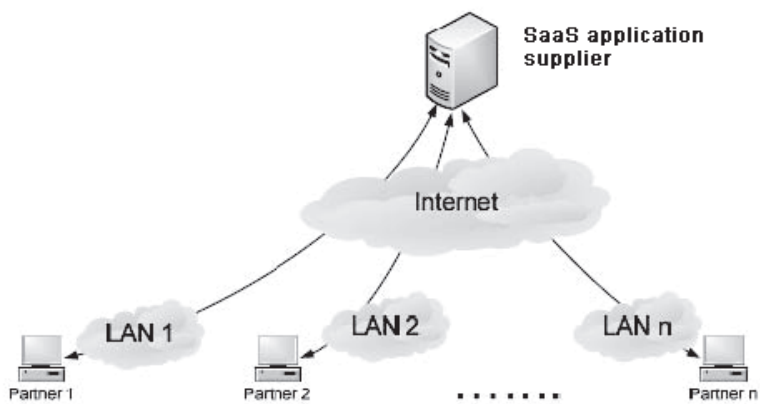

Figure 3. SaaS model for a system of partnership enterprises

The presented approach allows to gain a number of advantages both by a user (partner) and a supplier (organizer of a partnership system). From the point of view

of the user, the advantage lies in eliminating the necessity for a time-consuming and labour-consuming process of implementation. The system is available as soon as a browser is activated. Applications made available with the help of SaaS can be easily expanded by allowing new entities to enter into the partnership system. Furthermore, the aspect of payment for such applications should be mentioned, too. Many partners could simply not afford to implement and utilize advanced informatics systems (e.g. ERP). Thanks to SaaS and the possibility of paying usage fees negotiated in the partnership agreement, the cost of utilizing an application is much lower than in the case of a traditional distribution.

From the point of view of a service supplier, the list of advantages brought by SaaS is also very long. The necessity for installation and configuration of software for individual partners is eliminated – software management is centralized. The whole partnership system relies on a single common database, which prevents system breakdowns in cooperating entities on the one hand and becomes a basis for managing the cooperation network (e.g. utilizing OLAP or OLTP) on the other.

There is no doubt that the dynamic development of the Internet that caused the evolution of services and tools from Web 1.0 to Web 2.0 is continued. Changes in this area are unavoidable and happen on the fly. For several years one speaks about Web 3.0 Internet. The simplest definition of this notion says that Web 3.0 is the Web 2.0 network that is extended for solutions of semantic networks [Nesselrath 2007]. Other definitions advert on the aspect of the utilization of the artificial intelligence and software agents which interpret data in the manner similar to human [Watson 2009]. Most often, however, one turns the attention to the fact that Web 3.0 lets on the context delivery of knowledge and information to the user. Context, that is taking into account the aspect of the place, persons and situations. Thanks to this the Web 3.0 "knows" what in a given moment the user may look for and what is to him most necessary. It overtakes the man in his intentions.

Solutions based on Web 3.0 will successfully be, and in some cases are already used in enterprises based on partnership. Like in Web 2.0 such solutions may support its functionality in the areas (communication of employees of single enterprise based on partnership, communication inside the system based on partnership, the communication with external subjects). There is, however, a change in the realization of business and information processes. For example, traditional solutions based on Web 1.0 or Web 2.0 can support the enterprise based on partnership in the area of periodic ordering of goods in the head office. In the case of the application of Web 3.0 possible is the automatic analysis of warehouse-states of the partner and automatic generation of the order. The context of the situation is taken here into account, including holidays or periodic changes of the demand on some goods. Realization of the order as contrasted to the classical situation also runs more efficiently. In Web 3.0 the partner is automatically identified, so it is not necessary to find him in the database for the purpose of an invoice issue, or checking the state of his debt level.

5. Conclusions

The paper has been an attempt at presenting basic areas of utilization of Web 2.0 in partnership enterprises. It has focused on general characteristics of the employees' communication of single enterprise based on partnership, communication within partnership systems and communication with customers, as well as providing access to software with the help of web services. Presently, in all these areas Web 2.0 technologies play an important part and affect the processes of information and data exchange and their accessibility. Modern Internet solutions contribute to the interactions between company employees and customers. Allowing the users of Internet services to participate in creating their content contributes to a better coordination of activities. An active participation of all economic actors in editing web services has a positive influence on the coordination of activities by increasing the speed of obtaining well-directed feedback.

At the present moment it is difficult to foresee what further development of Internet users' activity will look like in the sphere of business. Thanks to Web 2.0 solutions, it has become possible to stimulate activities which were previously not taken into account. In all probability, an important direction of future development will be connected with utilizing semantic networks and the popularization of man – computer/Internet interactions without the necessity to use classic interfaces (such as a keyboard or a screen). Such solutions have already been labelled as products of Web 3.0 technology.

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WYBRANE OBSZARY ZASTOSOWANIA TECHNOLOGII WEB 2.0 W PRZEDSIĘBIORSTWACH PARTNERSKICH

Streszczenie: W artykule zaprezentowano podstawowe obszary funkcjonowania przedsiębiorstw partnerskich, które mogą być wspomagane przez technologię Web 2.0. Punktem wyjścia rozważań jest istota technologii Web 2.0, która stała się obecnie ważną platformą biznesową. W dalszej kolejności zaprezentowano istotę przedsiębiorstw partnerskich, które ze względu na rozproszenie geograficzne stają się naturalną płaszczyzną zastosowania Web 2.0. Ostatnia część prezentuje obszary wykorzystania nowoczesnych technologii internetowych, ze szczególnym uwzględnieniem: komunikacji wewnętrznej partnerów, komunikacji wewnętrznej systemu partnerskiego oraz komunikacji z klientami. Zaprezentowano również przykład wykorzystania Web 2.0 w udostępnianiu aplikacji, przy zastosowaniu rozwiązań typu SaaS.