

MOBILE VIDEOCONFERENCING SYSTEMS FOR ENTERPRISE

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Abstract: The following article is to outline the opportunities in the near future that can be ensured by the use of mobile video communication technology in processes related to entrepreneurship. It is also an attempt to prove that such a form of communication, not only will complement the range of tools dedicated for modern business, but already has become an important element for the management of many companies and institutions in Poland.

It also has a direct impact on the development of entrepreneurship. At the same time publication indicates the direction in which the changes are likely to proceed in the area of organization management, and how the technologies themselves must evolve to meet the expectations of users. The article has also one practical aspect - shows an example of actual implementation of these solutions provided by one of the producers of the video communication technology in Poland.

Keywords: Information technologies within entrepreneurship, Enterprise in information society, Mobile videoconferencing, Decision support, Videocommunication Smartphone

Introduction

The development of global economy and civilization is conditioned by one of the socio-economic categories, namely entrepreneurship and its importance is being emphasized for many years. In the scientific literature the term of entrepreneurship has appeared over 200 years ago, naming the entrepreneur as a person who invests resources into the unknown and risky future [4]. In the thirties of the last century the entrepreneurship was defined as one of the most important factors of economic development [16]. Entrepreneurship is being analyzed by the scientists of many disciplines, such as: economics, sociology, economic history, psychology, political science, or law.

There is certain established knowledge on the subject of entrepreneurship, nevertheless it is difficult to identify a single, universally accepted definition, although most of them have much in common. Moreover, each can see the entrepreneurship in a different way, and changes appearing in the business environment force to redefine the existing views. An overview of the definitions is presented in the following Table 1 (“Chosen definitions of entrepreneurship”).

Table 1. Chosen definitions of entrepreneurship

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| J.A.Schumpeter | Entrepreneurship is a new combination of means of production that allow to introduce a new product or new technology, to open new market, to gain new sources of raw materials or to introduce a new organization. |
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| K.Krajewski, J.Śliwa | Entrepreneurship is an activity of certain persons correlated with the ability of action for finding and implementing new ideas, which results are approved by the market and provide fruitful results for both: wizards and consumers. |
| W.Bielecki | Entrepreneurship is the ability to see and use the new production, service or organization capabilities, that give the opportunity for a relatively large benefits in the conditions of lack of certainty as to the success of the whole project. |
| T.Kraśnicka | Entrepreneurship is a special type of activity of persons working individually or within the organization, consisting in the use of opportunities found in the environment through the execution of enterprises (launching innovations, creating new organizations or revitalizing the existing ones) that provide economic and (or) non-economic effects to their subjects and to the environment. |
| K.Krajewski | Entrepreneurship is a resultant of individual characteristics (talents, skills, energy, imagination, common sense, willingness to risk) and socio-economic characteristics generated in their environment (the availability of resources, local economic traditions, absorbency of individual society for business initiatives, social and economic policy, local climate around business activities). |
| J.Machaczka | Entrepreneurship is the whole of activities related to the launch of each new project. |
| J.Targalski | Entrepreneurship is considered as the process of using threats, opportunities and available resources for creating and (or) development of the company, as the process of initiating and making changes, vanishing periodically till the appearance of the new initiatives. |
| Global Entrepreneurship Monitor | Entrepreneurship is the whole of actions taken by individuals, teams, and companies, in order to set up new businesses or expand the existing ones. |
| R.W. Griffin | Entrepreneurship means launching an individual economic enterprise and taking an active part in its management. |

Source: [8]

The classical theory of entrepreneurship has been developed and perpetuated in the literature by J. Schumpeter, who saw the entrepreneur as a person characterized by a creative activity involving the implementation of new ideas. He emphasizes, however, that the role of the entrepreneur is skillful use of creative business innovators. When the functional characteristics of entrepreneurship has been identified, five features has been separated, including:

- a) production and distribution of new products,
- b) introduction of new production's methods,
- c) introduction of new economic firms,
- d) exploring new markets,
- e) disclosure of new sources of supply for raw materials and supplies.

In the characteristics presented above, the entrepreneur is clearly aimed at the changes that defined as a natural attribute of all his actions. So, all processes involving the entrepreneur (manager) require continual collection, analysis and exchange of information, continuous interaction with a multi-dimensional environment, the ability to adapt, and finally the ability to create new opportunities. These tasks require considerable amount of manpower, time and resources. The more entrepreneurship shows the businessman, the greater number of such processes he implements. From this it follows the natural conclusion that any tool improving implementation of these tasks increases the chances of entrepreneurs to achieve a success. *Ipsa facto*, it significantly impacts on the enterprise.

Another area of activity, which in recent times has been strongly developed by IT companies, is a whole range of possibilities related to conferences, videoconferencing and other forms of mobile broadband. These technologies have evolved over the last few years and recently provide a solid foundation for the next stage of implementation of experiences, including completely mobile forms.

Moreover, cloud computing offers new ways to use IT resources, it creates an opportunity to increase efficiency and flexibility. It opens up new opportunities for small business, particularly for ones operating in a niche or those which are characterized by only seasonal demand on resources. It is important not only to describe the possibilities offered by mobile videoconferencing systems, but also to identify areas where they can be used. Solutions should be developed in those areas that provide access to knowledge, facilitate access to e-trainings and information about them, enable realization of main objectives of each organization, and finally improve any human activity (in particular the entrepreneurship). At this point we reach a common element, connecting more and more wider capabilities of mobile devices, the infrastructure used by them (including the potential of cloud computing), as well as IT tools dedicated for videoconferencing - the effect of synergy, which consists of a combination of those technologies.

Mobile devices supporting the entrepreneurship

According to the Central Statistical Office, the number of active SIM cards in Poland in the first quarter of 2012 reached a value of about 50 million units [20] and in almost every quarter increased by at least another million [21]. It means, that statistically each Polish citizen uses any kind of mobile device, and a few million others have second mobile phone or other such device. From this it follows, that the mobility becomes a reality, it is not only a subject of analysis and publication, it is not just a domain of people who likes novelties. The natural consequence of this fact is wider use of mobile phone (in particular: smartphone or tablet) as a tool that provides access to the organization's IT resources. A bit earlier the potential of mobile phones in the show business, as an excellent tool to promote, propagate and online gaming, has been recognized [5]. The size of the worldwide online gaming market is estimated at around 18 billion \$ and still growing of about 20% per year. Now, with an exponential development of the technological aspects, and

consequently increase of memory and processing power, there are next challenges facing the mobile devices.

According to Strategy Analytics report, the industry leader Samsung, in the last year has delivered 69.4 million devices. That is an increase of 56% compared to the same period last year. Apple reported a 6.6% sales growth and found buyers for approx. 37 million iPhones. Third of the leaders, LG Electronics, has sold approx. 10 million devices. In the described period, the total volume of smartphones delivered to the world market has increased by 36% and has reached the amount of 209.5 million devices [17].

In today's business reality, mobile devices have become a tool enabling authorized persons the permanent and unrestricted access to e-mail, databases, CRM, ERP, etc., and are a significant element of computer-aided support for informative and decision-making processes, or even a component of integrated systems of emergency notification [3].

Mobile solutions have significantly improved the work and efficiency of individual organizational units, such as sales departments. With remote access to business data, such as: offers, pricing and promotional details, information on marketing activities, historical data on co-operation with the individual client, etc., the work efficiency has significantly increased. Important improvements have also been seen within the processes of effective planning of business meetings, as well as within the elements of supervision by superiors.

Mobile devices also facilitates the recording and analysis of market and managerial information, a few years ago sent in the form of printouts. Thanks to this fact the time of distribution of received orders has been significantly shortened.

The processes of data analysis concerning the effectiveness of marketing activities, the demand for particular product groups, pricing policies of competitors and efficiency evaluation of sales managerial staff have also been significantly improved. Mobile systems finally improves reporting processes, due to significant reduction of time needed for preparation of required reports and tables.

The collection of market information runs much more efficiently, as it is possible to use e-surveys as tools for recording and analysis of information, not directly related to the sales activities, but supporting them.

Moreover, mobile solutions enable managers to have current supervision over the efficiency activities executed by field workers (e.g. sales representatives). Also the degree of control over costs generated by workers is much more higher, because budgets do not have to take into account certain costs, generated frequent business trips.

The potential of the mobile market is also recognized by the major manufacturers and suppliers of IT solutions. For example, during the Mobile World Congress, SAP and Symantec have presented new solutions for mobile device management support and announced the implementation of Mobile Device Management class software. According to the latest declaration of Sybase, the Afaria platform will also gain several new administrative features. Sybase has also announced that

Afaria 7.0 version will gain an new interface, analytics functions, new administration tools and options facilitating the administration of costs connected with the maintenance of mobile infrastructure. The SAP software is to be integrated with the analytic environment of SAP Business Objects. There are also plans to integrate the administrative tools with systems allowing to forecast and optimize the cost of telephony and data transmission. Symantec not only introduces software supporting the management of mobile environments integrated with Microsoft platform, but also a software supporting security management for Android based devices. According to experts, the administrative tools are being developed mainly for easier maintenance of several popular devices based on Android, iOS and Windows Phone. The analyzes carried out for Symantec show that most large companies are working to ensure the access for employees to corporate applications and business information from the private mobile devices [22].

IBM is another provider that continues the development of offer for developers' solutions, dedicated for mobile devices. According to IBM, its platform can be successfully used to create all kinds of mobile applications, designed for devices based on the iOS, Android, Windows Phone, or BlackBerryOS operating system, so all major solutions currently available on global market. Software provided by IBM enables customers to automate the activities related to the transfer of applications between mobile platforms. IBM has also announced the introduction of their new tools supporting the management of corporate mobile solutions. Besides the support for mobile applications' developers, the software giant also plans to provide the supporting software for management of corporate mobile devices, seeing the opportunity for further development of this market. According to the announcement, the IBM Endpoint Manager software based on BigFix technology acquired by IBM in 2010, helps all the users to manage mobile phones, tablets and personal computers [23].

Mobile videoconference in business – characteristics of Polish branch

The desire of man for global integration [7] and the development of IT technologies have made it possible to create professional, economical and easy-to-use tools enabling not only to launch videoconferences for many participants at the same time, but also to carry out their everyday duties, regardless of current location of team members [11], [24].

Recently, when smartphones have become very popular in retail trade, the first demands, flowing from the market, for analogous mobile solutions have appeared. Both in terms of successors for notebooks or tablets, as well as smaller devices - smartphones. More and more often the mobility achieved by notebook equipped with a mobile device is no longer sufficient. Users begin to look for solutions also well suited for smaller devices. Three main factors have direct impact on this situation:

- a) more and more efficient devices (processors, memory cards),

b) constantly increasing possibilities of offered technology and software,

c) more and more accessible and affordable possibility to transfer packet data.

In the following part of this article, two examples of practical implementation of such solutions will be presented.

According to statistical data, provided by one of Polish producers, the number of organizations using videocommunications tools is steadily growing [12], [13]. The growth of number of organizations using this type of solutions in Poland in 2011, compared to 2009, was approximately 42.5% and each year is kept at minimum 20%, while the number of established independent connections in the same time has increased of about 82% [18] and each year is kept at minimum twenty percentage points.

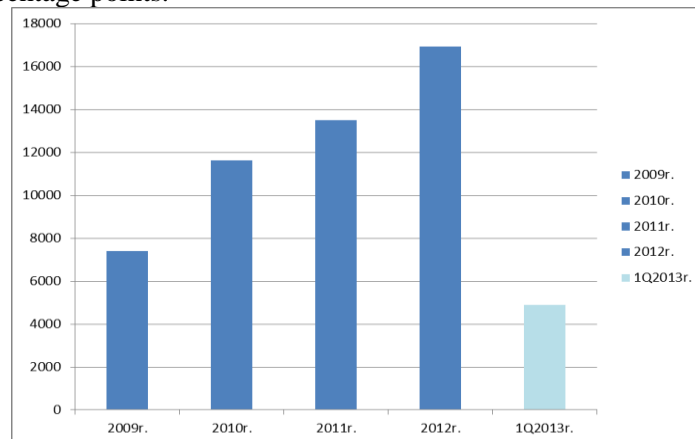


Figure 1. Number of independent video sessions in years 2009-2012 and the first quarter of 2013r.

Source: [Vidc13]

It turns out that not only the number of customers seeking and using this type of technologies increases, but also the number and size of organized conferences, the number of participants per single meeting, and the duration of single sessions. It can therefore be concluded that the increasingly larger audience is aware that professional videocommunication solutions, are effective and safe tools [14]. Also the interest in the possibilities of increasing the mobility through the use of mobile devices is steadily increasing [24].

Case studies

The following chapter contains two examples of use of mobile videocommunication technologies in specific areas of business life [24]. The first is the implementation of a mobile consultancy office (help desk), while the second one is an example of typical support for management processes through a central multiconference server, co-operating with a group of mobile devices.

e-VideoHelpDesk

e-VideoHelpDesk is a solution dedicated mainly for online experts' services, expanding at the same time functionality of traditional counseling helplines (help-desks). Within the system the client receives an application to handle his e-service, certain amount of access accounts for consultants, the overall branding consistent with his current Web site and extensive administration panel to manage the service [24], [10], [9].

In this case, the client has also expressed the need to equip some of his consultants in devices providing completely remote consultancy services. Due to the nature of work of this group of professionals and associated with it frequent business trips, they could also give advices in remote way, staying away from the office and their working stations (PC computers).

As an answer to client's needs the e-VideoHelpDesk system was implemented as a cloud computing, with functionality additionally extended to smartphones with implemented communicator for Android system.



Figure 2. Videocommunicator in Android version (via Internet browser)

The most important aspects of this case [24]:

1. Nature of subject: commercial partnership
2. Branch: authorized service of industrial equipment
3. Problem: improvement of logistics operations
4. Solution: implementation of e-VideoHelpDesk
5. Benefits:
 - a) increase of scale of specialists' availability,
 - b) reduction of costs connected with travelling to clients, about 25%.

e-VideoBusiness

e-VideoBusiness is a dedicated version of VidCom.pl system created for modern and efficient business, being a response to the need for fast and undisturbed exchange of information; this is an unique possibility to organize videoconferences between departments or field staff (e.g. sales representatives scattered across the country or even globe) and the headquarters, between national or international trading partners, or the virtual board meetings or shareholders meetings – without

barriers of distance and with no limit of participants. Purchasing dedicated version e-VideoBusiness, client receives clear and friendly-in-use application for videoconferencing and an access account (or accounts) for virtual meetings' participants. On client's request, the full application branding (consistent with client's web site) and the ability to install system's components on client's internal servers are available [24], [10], [9].

In this case, the client has also expressed the need to equip some of his managers in the devices enabling permanent contact with their teams, despite frequent business trips. In particular, it was important that company's top management would be able to manage the organization in emergency situations, regardless of the place of staying of its members.

As an answer to client's needs the e-VideoBusiness system was implemented in server version (the whole of software within client's internal IT structure), with functionality additionally extended to smartphones with implemented communicator for Android system.



Figure 3. Videocommunicator in e-VideoBusiness version

The most important aspects of this case [24]:

1. Nature of subject: joint stock company
2. Branch: investment
3. Problem: increase of management efficiency
4. Solution: implementation of e-VideoBusiness
5. Benefits: significant improvement of managerial processes.

Technology issue

Encountered in the practice technologies of transfer multimedia data dedicated for mobile devices, although often very useful, are still difficult to fully integrate. Popular digital services, already widely used in Polish reality, e.g. trade, banking, work, culture, science and education, transport and logistics, energy, and finally administration [15], certainly owe their success to the increasingly better infrastructure. At the same time the potential of audience (users) is much larger, because research shows that over 50% of population is actively using Internet. In

2010, 63% of households had Internet access; in the first half of 2011, 74% of households had Internet access with a link of min. 1 Mbps - so considered as a broadband [2]. Other studies have shown that in the middle of 2011 Internet coverage was 56%, while more than 20 million Poles used computer, of which 17.5 million regularly [GUS12]. Both GUS and CBOS [CBOS11] researches show that in 2011 more than 90% of people with higher education used Internet regularly.

In case of transfer of multimedia data through mobile devices, these processes require a little more effort and time essential to develop the infrastructure and the equipment itself. In particular, the problem is the effective and fully compatible combination of technologies used in various solutions (e.g. PC communication, GSM and VoIP). In addition, currently used solutions do not yet meet all the expectations of end users. More and more efficient solutions dedicated for compression and data transfer may allow to overcome the existing limitations. The interest of market is growing rapidly, together with the development of mobile devices offer (smartphones, tablets, netbooks).

So there is still a need to develop new IT solutions that enable the creation of fully integrated, efficient and effective multimedia data transfer systems, regardless of hardware or software platforms. Manufacturers and suppliers of these technologies, in order to meet the constantly increasing requirements of clients, are forced to provide more and more advanced solutions. For example - a multimedia server able to handle the above identified needs efficiently, should meet dozens of very specific and complex technical terms, such as: receiving a stream using own protocol; modular design, with the ability to append own modules using API; support for various operating systems, including mobile and many others [19]. The implementation of these tasks is a challenge for the design departments and even greater for developers [24]. However, providers attentively following the development of market and customers' expectations, must make every possible effort to meet the growing demands.

Summary

Extensively announced multimedia revolution, thanks to HSPA networks, widely propagated LTE and more and more cheaper devices, becomes a reality. The driving force behind the changes is the increasing popularity of smartphones and mobile Internet development. What changes await mobile services providers, and what the businesses willing to take advantage of this potential? This question is to be answered in details in the nearest future, but certainly we shouldn't ignore the technological "revolution", which we are witnesses. Media, for several years now, propagate the idea of approaching era of mobile business, however the next few years may prove to be disruptive for the dissemination and exploitation of the mobile potential.

It turns out that not only the number of users of mobile videoconferencing solutions is steadily increasing, but also the number and size of organized conference, the number of participants' per single meetings, or the duration of each

session. It can therefore be concluded that the increasingly larger audience is aware that professional videocommunication devices and systems are effective and safe work tools. A similar trend is also being seen in the context of mobile devices. Of course, not in every case the notebook will be replaced, but certainly the nearest foreseeable future will belong to mobile devices.

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MOBILNE SYSTEMY WIDEOKONFERENCYJNE DLA PRZEDSIĘBIORSTWA

Streszczenie: Niniejszy artykuł przedstawia możliwości jakie w bliskiej przyszłości mogą być zapewnione przez zastosowanie technologii komunikacji wideo w procesach związanych z przedsiębiorczością. Jest też próbą udowodnienia, że taka forma komunikacji, nie tylko uzupełni zakres narzędzi dedykowanych dla nowoczesnego biznesu, lecz już stała się ważnym elementem dla zarządzania wieloma przedsiębiorstwami i instytucjami w Polsce. Wpływa też bezpośrednio na rozwój przedsiębiorczości. Jednocześnie publikacja wskazuje kierunek zachodzenia prawdopodobnych zmian w obszarze zarządzania organizacją oraz ukazuje jak same technologie muszą rozwinąć się aby sprostać oczekiwaniom użytkowników. Artykuł ma też jeden praktyczny aspekt - pokazuje przykład faktycznego wprowadzania w życie tychże rozwiązań dostarczanych przez jednego z producentów technologii komunikacji wideo w Polsce.

Słowa kluczowe: technologie informacyjne w przedsiębiorczości, przedsiębiorstwo w społeczeństwie informacyjnym, wideokonferencja mobilna, wspomaganie decyzji, wideokomunikacja, smartfon

移動視頻會議系統，為企業

摘要：下面的文章是概述機會在不久的將來，可以通過在相關的創業過程中使用的移動視頻通信技術來保證。這也是一個嘗試，證明通信這樣的形式，不僅將補充的專門為現代商務工具的範圍，但已經成為許多企業和機構在波蘭管理的重要組成部分。它也有創業的發展產生直接影響。同時發布指示在其中的變化很可能繼續在組織管理領域，以及技術本身必須如何演變，以滿足用戶的期望的方向發展。該文章也有一個實際的方面 - 顯示在波蘭的視頻通信技術的生產商之一提供這些解決方案的實際執行的例子。

關鍵詞：信息內企業家精神，企業在信息社會，移動視頻會議，決策支持，視頻通信技術的智能手機。