



Distance Management of SMEs Using ICT Solutions

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The paper contains a description of a research conducted in collaboration with some Erasmus for Young Entrepreneurs programme Romanian students, concerning the use and implementation of ICT (Information and Telecommunication Technology), especially in distance managing Small and Medium Enterprises (SMEs). The paper is a response to the nature of contemporary business management, with the constantly increasing amount of work, bureaucracy and the necessity to travel on business combined with the need to manage the company being away. In the research the students assumed the roles of the employees and entrepreneurs simultaneously, to gain the perspective from both points of view – supervised by the authors. The aim was to find and test the effectiveness of the available ICT remote management instruments in the context of SMEs. The aim was to create a study of implementation in real-life conditions, considering the advantages and disadvantages of the solutions tested, including possible future trends. The result was a set of recommendations for business people. Apart from the educational value of the research, the unique, dual perspective assumed by the students participating in it, provided them with a practical insight and skills to better understand and make a better use of the conditions of managing and being managed. The results described here both practical and academic value. The resulting recommendations may constitute the basis of positive changes and improvement in the use of advanced technology in business activities. It is worth noting with its international character the study focuses not only on selected Polish enterprises, but the resulting contents reflects the situation in SMEs in the EU as well, thus it may be a starting point for analyzing other regions worldwide.

Keywords:

distance management
ICT
SMEs
e-management
blended management
B-management
young entrepreneurs

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INTRODUCTION

H. Fayol (1916) suggested four management functions: planning, organizing, leading and controlling. Planning is deciding where to take a company and selecting steps to get there. Organizing means bringing together physical, human and financial resources to achieve objectives. Leading involves motivating employees. Controlling involves measuring achievement against established objectives and goals (noman, 2016). These functions may be supported by Information and communication technology (ICT). The key task of ICT is to support employees and employers in business processes in both big companies and SMEs. An increased use of ICT solutions may solve operational challenges, improve customer service, maximize resources and eliminate fraud, communications problems and waste, as well as definitely improve SMEs' international collaboration.

Nine out of every 10 enterprises is an SME, and SMEs generate two out of every three jobs. They stimulate an entrepreneurial spirit and innovation in the EU and are thus crucial for fostering competitiveness and employment. By comparing its data with the thresholds for the three criteria - staff headcount, annual turnover and annual balance sheet total - an enterprise can determine whether it is a micro, small or medium-sized enterprise. See table 1 below.

PRELIMINARY NOTES

Using information systems effectively requires an understanding of the organization, people, and information technology shaping the systems. An information system provides a solution to important business problems or challenges facing the firm (Laudon & laudon, 2006). (see Fig. 1.)

Companies deal with the following four areas: ICT strategy, Management & Support, Informa-



Fig. 1. ICT system, organization, people and technolog.(Laudon & Laudon ,2006)

tion Systems and ICT Infrastructure (see Fig. 2).

According to Mráz (2015) Information Systems (IS) represent the ICT area and manage the provided functionalities. Other company ICT elements provide functionality to information systems. The ICT Strategy defines the basic, long-term rules for the form and utilization of information systems. Management & Support serve the management securing individual processes. ICT Infrastructure is a logical physical foundation upon which the individual information systems are created. To meet new requirements consistently and in a pre-determined process, it is necessary to design IS implementation and development in a long-term perspective. ICT areas enable companies to focus on their principal activity, on the smooth provision of functionalities to the user (Mraz, 2015). To obtain proper ICT functionalities in SMEs it is necessary to take into account the concepts described above. Based on the research conducted by the authors in the past, the hybrid approach seems to be appropriate to have ICT functionalities.

Table 1: The SME classification

(<http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition/>, access 2016-08-08)

Enterprise category	Headcount: Annual work unit (AWU)	Annual turnover	Or	Annual balance sheet total
Medium-sized	< 250	≤ EUR 50 million	Or	≤ EUR 43 million
Small	< 50	≤ EUR 10 million	Or	≤ EUR 10 million
Micro	< 10	≤ EUR 2 million		≤ EUR 2 million

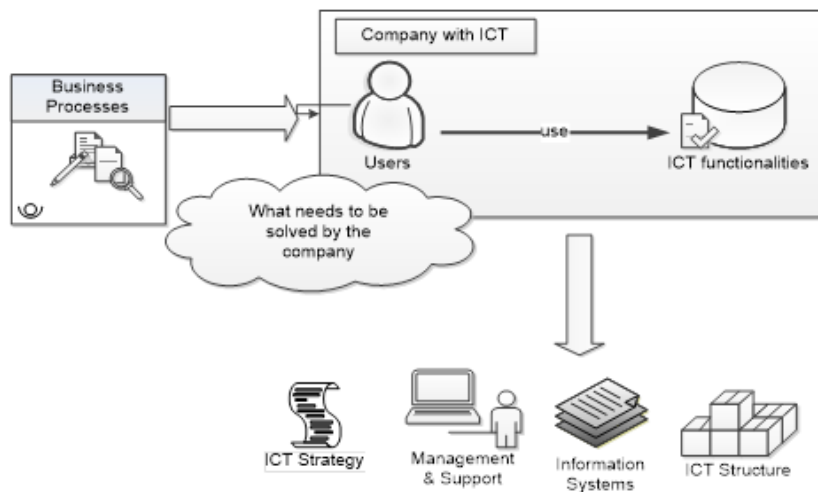


Fig. 2. ICT system, company, people and technology.(Mráz 2015)

LITERATURE REVIEW

There are a lot of publications on hybrid or blended solution, especially related to: hybrid computing (Rekimoto & Saitoh, 1999) blended learning (Garrison & Kanuka, 2006) but there are only few related to blended or hybrid management. Mostly they regards: hybrid economy (Altman, 2007) blended management styles (bizshifts-trends, 2013) a blended approach to leadership (Boundless, 2016). Is, however, difficult to find publication on blended management, hybrid management or B-management.

Given the pivotal role that blended or hybrid solutions play in some trials, it is important to establish whether or not using this concept in SMEs is warranted.

The current thesis examines the unique way of the use of hybrid ICT in SMEs. This area has been surprisingly neglected until recently, as the majority of the literature on blended and hybrid solutions focuses on other scientific disciplines, as mentioned above. To appreciate the synergy effects of using the blended approach in SMEs, the different methodologies used to investigate this topic should be examined.

RESEARCH METHODOLOGY

ICT in SMEs is researched in literature in several perspectives. One of them investigates how ICT help businesses to function efficiently. Currently, in the context of ICT and the present situ-

ation, business people, IT specialists or any other authorities must take the past into account. Both the past and current situation is needed to improve the future operational efficiency. The general goal is to make informed predictions or forecasts using ICT to improve the business and to avoid problems that could affect the development of these kinds of solutions. Business people and IT specialists also use forecasting to extrapolate how trends will change, or as a benchmark for a long-term perspective of e-management. Various systems and tools have been launched for employers and employees: webinars, mobile solutions, software to monitor employees, video meetings, uploading files, projects and teamwork systems, tracking applications, social media etc.

The literature review and the analysis of currently conducted research shows that at present various issues related to the use of ICT and the methods to implement them must be faced. The ICT projects performed currently dedicated to SMEs do not often include the developmental trends and distance management issues. In addition, the results obtained are inconclusive and insufficient. Consequently, many researchers have concluded that more research is needed in the area of e-management.

Therefore, this paper addresses the following questions:

Is it possible to obtain and to apply effective ¹ distance management systems for SMEs?

Which distance management solutions may be

¹ Effectiveness-The degree to which objectives are achieved and the extent to which targeted problems are solved. In contrast to efficiency, effectiveness is determined without reference to costs and, whereas efficiency means "doing the thing right," effectiveness means "doing the right thing.", Read more: <http://www.businessdictionary.com/definition/effectiveness.html#ixzz4GII8b5TC>

most suitable to use in SMEs?

What further development, trends and recommendations of distance ICT implementation, with particular emphasis on SMEs may be expected?

To answer these questions, tests of possible distance ICT were made. To deal with the first issue, the theoretical framework of using ICT was examined and reflected in the development of on-line systems. The data for conducting the study were collected from primary sources: company reports, official websites of companies and universities, as well as from secondary sources such as books, articles, and journals.

Some data were also acquired by means of telephone conversations with representatives of ICT providers, companies offering ICT or business solutions. Moreover, the authors' personal experience in teaching at universities constitutes a much relevant source of valuable, reliable and up-to-date information on using ICT in education. The technical aspects were examined by installing and testing examples of available ICT distance solutions. In order to receive the answer to the second question, a comparative analysis of useful

e-management systems was carried out. A literary query conducted led to the identification of several management ICT systems dedicated to SMEs. They are: webinars, mobile solutions, software to monitor employees, video meetings, uploading files systems, projects and teamwork systems, tracking applications, social media etc. The answer to the last question above was found

by testing all the solutions selected by searching for systems on the Internet using the effectiveness criteria established by the authors. The research involved Erasmus for Young Entrepreneurs students from Romania. They assumed the roles of the employees and entrepreneurs simultaneously, to gain the perspective from both points of view – supervised by the authors. It is worth noting that “Erasmus for Young Entrepreneurs” is a cross-border programme facilitating the exchange of entrepreneurial and management experience by a stay of a newly established or potential entrepreneur with a well-experienced entrepreneur running a small or medium-sized enterprise (SME) in another country. The programme: reinforces entrepreneurial attitudes by offering skills, knowledge and experience; increases the number of start-ups and boosts their resilience; fosters the cross-border transfer of ideas, knowledge and cooperation between small firms; helps small firms to network, innovate, and go international; helps to create jobs.

MAJOR RESULTS

For several years, activities have been undertaken on a global scale by software companies, as well as research centers and universities, to implement ICT in SMEs. Resources available online include several professionally developed software solutions. Demonstration versions and tests of those systems are available and can be used at companies.

As a result of the analysis of Internet resources, the distance ICT solutions which have been iden-



Fig. 3. Distance management of SMEs using ICT, Own elaboration

tified, characterized and tested in the classroom with Erasmus students are outlined below:

Using selected internet services and social media

File transfer protocol (FTP)

For this part of the project, the student ² was responsible to find information about Internet services and social media.

The program FTP is one of the most commonly used network protocols for data transfer in organizations and various companies (<http://www.serv-u.com/ftp>, access date 2016-08-07).

FTP is a relatively easy to use it and fairly easy to set up. With this method for managing employees FTP servers may be accessed. Every file ever sent to, or from, an FTP server remains on the server until an IT administrator deletes it. The program is actually a practice of security solutions. It gives companies the opportunity to track file transfers: what, where to, by whom and when they are sent. Connecting to FTP is easy and can be done in several ways. An FTP user usually is an agent of communication to interact with the server to download or upload files (markle, 20016).

E-mail

E-mail and phone - The manager can control all employees using both phones and e-mail. This aspect of managing is easy to deal with and it offers the opportunity to communicate and control the exchange of information to control the quality of performance. Employers generally have the right to read employees' email messages, unless the company policy assures workers that their e-mail messages will remain private (Guerin, 2016).

Facebook groups

Facebook Groups are used as an online meeting place to discuss ideas. It is intended for those whose business communicates primarily on Facebook. Creating a Facebook group brings employees together. Needless to say it involves inviting employees, virtual assistants or interns

to join, and using it as a means to communicate with the team. It facilitates managing. Blocking employees from accessing Facebook altogether, on the other hand, may increase productivity by ensuring that your employees have their minds on the job and not on their status updates (Karasiewicz, 2016). Facebook groups are a useful tool for exchanging ideas and they allow the manager to organize, control and support employees' activities (Jaehnig, 2016).

Uploading and sharing files ³

Sharing and uploading files and safety of data are relevant issues involved in distance management. Problems to solve in this field include sharing information with a specific group. The relevant knowledge concerns the browser requirements, the type of documents - with or without special characters, the valid file format, etc.) (Vizcarra, 2016). It is important to be able to perform selected actions with the document (<https://support.google.com/drive/answer/2494822?co=GENIE.Platform%3DDesktop&hl=en>, access date 2016-08-08).

By means of this function collaboration of the entire office over one common document is possible. To implement this function an example solution may be Google Drive (<http://www.gcflearnfree.org/googledriveanddocs/sharing-and-collaborating/full/>, access date 2016-08-09.), having a Google account or not, as well as Google Docs to work simultaneously on the same document (<https://www.google.com/docs/about/>, access date 2016-07-09).

Distance monitoring employees

In this part of the research, the Erasmus students ⁴ were responsible for finding software that monitors employees, and for testing it with other students. Such software has monitoring features and control functions, providing a valuable tool for monitoring employee activity while on duty. A manager needs control methods as regards his

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employees, to achieve more information about them and their work. It is recommended to use software to track employees' activity. Some of the features worth considering are the ability to see and record all of the windows opened by employees, the programs run by them, and the websites they visit. (<https://www.google.pl/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=Manual-OsMonitor.pdf>, access date 2016-08-08).

This category of software allows the user to monitor, track or record:

- Screenshots (Real-time monitoring / Camera-shots)
- Websites visited / social media
- Chats / IM conversation
- E-mail through Outlook
- Files (e.g. copying, deleting, renaming, and plugging/ejecting USB disks)
- Application usage / windows opened (Sanchez et al., 2016).

If it is desirable to limit the access of employees to data, such software makes it possible. Employers often lack the knowledge of how to block non-business-related websites which employees visit at work. There are two methods to do it: Black list and White list. All the websites can be visited except the URL on the Black list. Only the websites from the White list can be visited (<http://www.os-monitor.com/how-to-block-website.htm>, access date 2016-08-09).

In addition, chatting, games, Internet games and all unwanted software may be blocked, according to the employees' rights (<https://www.google.pl/webhp?sourceid=chrome-instant&ion=1&espv=2&ie=UTF-8#q=Manual-OsMonitor.pdf>, access date 2016-08-08).

It is possible to monitor employee activity remotely through web-enabled devices, like smartphones, laptops and company computers in a transparent mode (employees see and know they are being tracked) or in a silent mode. Such software shows keystrokes, tracks word searches and identifies which employees are browsing those sites. It alerts when restricted websites are accessed, including social media pages, or when keywords are entered into a search engine. Such a program shows if employees are playing online

games, searching for other jobs or checking out the competition. It monitors chat and email messages to ensure sensitive information is not being shared without proper authorization. It shows when documents and files are accessed and attached to the outgoing email. It notifies if files or documents are deleted or if deleted documents are retrieved. It notifies also if critical data is saved to an external device, including USB drives, also it tracks when documents are printed and from which computer and employee account specific files are sent from. The software collects screenshots, records information tracked and keeps it safe in the cloud. It is even able to track employee attendance and idleness and tell if the employee is truly engaging in reading or researching website content on the page or if the computer has been left idle with the appearance of working. This program filters and blocks unauthorized websites and it warns employees of possible violations, should they continue to try to access a restricted site (Sanchez, 2016). It is also successful in detecting other issues at surveyed organizations (Veriato, 2016).

Programs with functions presented above include Veriato 360 (2016), Hubstaff (2016) with additionally GPS locations, OsMonitor (2016), Work Examiner (2016). In authors' opinion this software makes it possible to monitor employees easily and efficiently and is worth recommending to company owners who want to see the activity, the productivity of their employees, to see if they are stealing from the company non-authorized information or raise the company's efficiency.

Conducting online meetings

For this section of research the student ⁵ was responsible for video meetings. Supervision is manager's key responsibility. Supervisors monitor and direct the work of employees, evaluate, motivate and reward employees and have the added responsibility of leading, organizing, planning and coordinating activities critical to a department, unit or area of business operations. Keeping production high and operations running smoothly requires effective controls over employees (Sessoms, 2016). A useful tool in this area is the function of video meetings to see

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what is done, what has been done and whether it is organized well. It may be one of the most efficient ways to manage all the activities. The key issue is to organize the meeting in the most efficient way.

First of all, a list of points to reach should be made them by following some easy steps: establishing the subject of conference, the people to participate. It is vital to have always a second plan for possible changes and others challenges, and to estimate how much time you need (Saar, 2016).

Most companies use this type of meetings expecting more benefits. The research performed so far on video conferencing resulted in distinguishing 4 advantages (Ryan, 2016): - time saving; - affordability; - increased productivity; - tangible return on the investment.

Video sessions may be characterized as follows: all video sessions are made each day, at the same hour (this has as an advantage, the manager can see if all the employees are on time and if everybody is present) and in the same place (in a meeting office).

This kind of solution is used especially by SMEs, as more employees require more time. There is a need for a quick, easy and affordable way to have a “face-to-face” meeting (Tlips & Trics, 2016).

Team working

Within this part of research the Erasmus student ⁶ was responsible to select and test software that facilitates employees’ effective team work. Such software can keep all the team's tasks in one place, collaborate and work in real time from each localization. Moreover, it can keep plan projects and the records of them. It allows the users to upload and share files, notify the team and to show them to clients if necessary. This kind of application offers communication tools such as: SMS reminder, chat, call systems etc.

There are many applications which possess the function described above. The example used by the students in the research is Teamwork (2016). It is available on smartphones as well (<https://www.teamwork.com/>, access date 2016-08-09).

Tracking of employees and cars

During this part of the research the Erasmus student ⁷ was responsible for selecting and testing some solutions for tracking employees from each localization. This kind of solution was tested in this research because employees sometimes happen to be not in the right place during their work hours. After researches and analyses it turned out that certain rules for the GPS tracking of employees should be mentioned: the legality of GPS

Table 2: Advantages of team working systems (Perez, 2016)

Advantages	
For the individual:	For the SMEs
more rewarding	increase in the quality of work
less job stress	reinforced spirit of unity
shared responsibility	improved working environment
shared success	increase in communication and information
	more creative solutions
	complex projects
	team members accept and understand better the decision taken

Table 3: Disadvantages of team working systems (Perez, 2016)

Disadvantages	
For the individual:	For the SMEs
they mask the individual work	it takes more time than individual work
unequal contributions (social loafing)	decisions must be agreed
difficulty in defending their own opinions over others	the tendency to support or reject the person and not the idea

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tracking, drawing the line between work and personal time, employee consent sometimes necessary, company policies (Gomez, 2016).

For a manager of a company some methods for tracking employees, to achieve specific information may be recommended:

- Software to achieve global position from employees' phones by means of mobile phones – it is useful to know which of employees are lying about their position (<https://mobile-tracker-free.com/>, access date 2016-08-08).

- Software to check the cars position from your company – also you can use a system which can give you information about speed, aggressive driving and some false routes (<http://www.brickhousesecurity.com/category/gps+tracking/vehicle+tracking+devices.do>, access date 2016 -08 -09).

- Software to check who is leaving your perimeter – this is useful to see if some of your employees are leaving your company area.

Those applications can also help if an employee lose (or it is stolen) his mobile phone or laptop. It can be a major problem taken into account the data inside (Śledzenie, 2016)z Thus, if the manager knows that an employee must visit a client with his laptop and the laptop is still seen in the company you know that the employee is lying (Prey, 2016). Another important issue is to know where the cars from the company are in a given place, if the employee is in it, or the car is given to somebody else. For this, it is useful to be able to see if the phone location and the car location are the same.

Some examples of programs that meet the above functions are Prey, Mobile Tracker Free, etc. and a brand for car tracking is Brick House Security. In this research one has been selected and tested.

Using mobile solutions

Within this part of the research the Erasmus student ⁸ was responsible for mobile solutions in small and medium enterprises. The access to mobile information in the near future is likely to become more widespread among users than the access to information from the desktop computer, leading to a new era of mobile intelligence. The

combination of business intelligence and analytical mobile technology, mobile phones, smartphones and other mobile devices has the potential, through which business processes in any company can be revolutionized (Pawlak-Lis, 2013)

Employees who need to travel to support customers are no longer constrained by their inability to access information remaining in the company. The access to information from anywhere and at any time improves company's ability to respond to customer needs (Rosen, 2002)

Benefits include keeping businesses and employees connected with each other and customers either at the office or on holiday. It gives individuals the ability to communicate instantly and respond immediately to business situations. The costs involved in establishing the equipment and training required to make use of mobile devices may be a challenge. Mobile IT devices can expose valuable data to unauthorized people if the proper precautions are not taken to ensure that the devices, and the data they access, are secure.

Training by use the webinars

During this part of research the Erasmus student ⁹ was responsible for selecting, analysing and testing a webinar (short for a web-based seminar). Conducted via the Internet, it is usually a live meeting, presentation, or workshop between participants in different locations. Participants interact by sharing slides, documents and audio in real time (Maljaars, 2016). The individual hosting the webinar is linked in a live web-based video conference to an audience—the viewers and listeners of the webinar from all over the world. Hosts can show themselves speaking, switch to their computer screens for slideshows or demonstrations, and even invite guests from other locations to co-host the webinar with them (Abouttech, 2016). Participants can display slides, stream video, record, chat, edit, create on the screen. A secure Internet connection and a pair of headphones or speakers is enough to give or attend the presentation within a webinar (Maljaars, 2016).

Some technologies employed include software and functionality different for presenters and at-

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tendees. Software may run as a web browser application (frequently relying on Adobe Flash, Java, or Webster to provide the operational platform). Other web conferencing technologies require downloading and installation of software on each participant's computer.

Numerous webinars include: GoToWebinar (2016), AnyMeeting (2016), Zoom (2016). For analysis and research the software program GoToWebinar has been used.

FUTURE WORK AND RECOMMENDATION

Although the results of research and tests have demonstrated the effectiveness of the use of distance management ICT solutions, they could be further developed in a number of ways by testing more available solutions and testing the systems on many subjects such as logistics,

e-business etc. It is worth mentioning that the authors did not find much information in literature on the approach presented in this work. What is more, it is difficult to find descriptions of concepts and methods related to blended management or B-management – a mixed (integrated, hybrid) management method, combining traditional management methods (direct contact of employers with the employees) with activities carried out remotely using a computer (M-management). See fig. 4.

The ratio of each component is selected depending on the business activity, as well as employer's and employee's needs. This method seems to be effective as it creates a flexible way to manage a company with regard to the objectives, themes and specific business and employees. The advan-

tage of B-management is certainly in the remote and direct forms of activating the employees and working together on-line - employers and employees. The organization of time in B-management is facilitated thanks to the remote sessions and not forced as in the case of traditional stationary meetings.

CONCLUSION

This paper examines the use of distance management systems in SMEs. Although this kind of systems can give SMEs a lot of benefits, their use is still a complicated issue for the complexity of its implementation. Moreover, unique Blended Management Methodology has been presented.

According to the authors it is possible to use e-management systems in other fields of study. The use of solutions available in the CC (Cloud Computing) creates the possibility of using systems for business activity anywhere and at any time. The only conditions that must be met are the hardware (personal computers, laptops, tablets, smartphones) and the Internet access. The interviews at SMEs and tests confirmed earlier assumptions that the solutions presented in the article are currently not used in SME business activities.

The proposed concepts show that SMEs can become virtual to such a degree that almost all the ICT tools will be used as terminals in the public cloud. To use these resources in the cloud, a variety of tools, such as desktop computers, notebooks, netbooks, tablets, smartphones, may be used. The analyzed cases show that obtaining financial and organizational benefits from implementing the distance solutions appear almost immediately. It should be noted that part of distance management systems are in the early stages of development. For this reason, users (managers and employees) may feel some discomfort due to the slow work, not sufficient technical support from providers of systems. The crucial issue is lack of integration of all systems.

Research showed that hybrid distance systems or blended management systems can perform all the function of management: planning, organizing, leading and controlling. However, in authors' opinion those system should just support managers. Face-to-face contact will be still important because of the human nature. During the research it turned out that there are many ethical issues

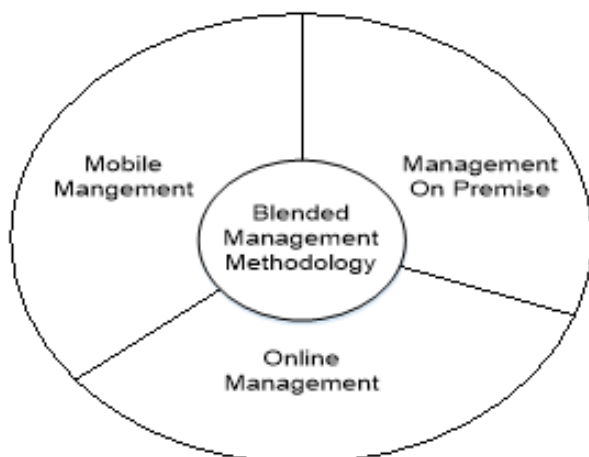


Fig. 4. Blended Management Methodology, own elaboration

which should be taken into account by managers. This methodology should be implemented only after special training of managers and employees. They should be aware of advantages and disadvantages resulting from using distance management systems.

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