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**SUCCESS FACTORS IN IMPLEMENTING MOBILE TECHNOLOGIES
IN RUSSIAN ENTERPRISES**

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**ФАКТОРЫ УСПЕХА ВНЕДРЕНИЯ МОБИЛЬНЫХ ТЕХНОЛОГИЙ
НА РОССИЙСКИХ ПРЕДПРИЯТИЯХ**

This work discusses the challenges of the mobilization process at enterprises in Russian industries. Mobile devices are characterized as necessary tools to perform any business action in the competitive market environment. In this context, mobile employees usually want to get access to data from any mobile devices, including their private ones. Because of high responsibility for a corporate IT department in terms of security and network scalability, an open access of users to all their applications and databases should be managed in a special order. This work outlines steps that need to be done to ensure success in implementing corporate mobility to improve efficiency of business processes and to reduce costs based on the conventionality of Russian enterprises.

MOBILE TECHNOLOGIES; CONSUMERIZATION OF IT; MDM; BYOD MODEL; COPE MODEL; CONCEPT OF ENTERPRISE MOBILITY; EMM; INFORMATION SECURITY MEASURES.

Рассматриваются проблемы осуществления мобилизации предприятий в условиях отраслей российской экономики. Мобильные устройства становятся необходимыми инструментами осуществления операционной деятельности предприятия в конкурентной рыночной среде. Мобильным сотрудникам необходим доступ к данным и приложениям с любых мобильных устройств, в том числе находящихся в их личном пользовании. Вследствие высокой ответственности подразделений ИТ за обеспечение безопасности и масштабируемости сетевой инфраструктуры проблема открытого доступа мобильных пользователей к корпоративным приложениям и базам данных должна решаться специальным образом. Описывается последовательность шагов, которые должны быть осуществлены для достижения успеха в реализации концепции корпоративной мобильности с учетом опыта российских предприятий.

МОБИЛЬНЫЕ ТЕХНОЛОГИИ; КОНСЬЮМЕРИЗАЦИЯ ИТ; РЕШЕНИЯ MDM; МОДЕЛЬ BYOD; COPE; КОНЦЕПЦИЯ КОРПОРАТИВНОЙ МОБИЛЬНОСТИ ПРЕДПРИЯТИЯ; EMM; СРЕДСТВА ИНФОРМАЦИОННОЙ БЕЗОПАСНОСТИ.

Introduction. The challenges of developing corporate mobility at enterprises. Definition of needs in mobility. The implementation of mobile solutions and the application of information technology belong to the major challenges of IT departments of Russian enterprises due to their demands for scalability, security, and visibility of applications.

To provide mobility is a priority task for today's organizations. Nowadays employees want to get access to data from any mobile devices, including their private ones. Moreover, now applications, needed for a job, are not limited to a mobile e-mail client. Applications for Windows and mobile operating systems, web-applications, which can be located both in the «cloud» and in

the data processing center are increasingly required. For IT-departments, open access of users to all their applications and data is a serious problem in terms of security and network scalability. Depending on the mobility concept, enterprises may apply systems for mobile device management (MDM) or enterprise mobile management (EMM) to ensure secure access in data and applications. However, these systems are not enough to guarantee the delivery of applications to users regardless of their location. The efficient use of these systems require a network infrastructure providing a secure delivery of applications to different kinds of mobile end devices. Simultaneously, challenges

and open issues in respect of the productivity, manageability and further spread-out need to be settled.

The high number of various mobile devices used in enterprises calls for a scalable infrastructure that may be supported by the corporate network. Thus, IT departments are required to set up an infrastructure for mobile applications capable to handle on the one hand queries that need broadband access and the large number of users with various kinds of mobile end devices. One of the major tasks is to satisfy the mentioned demands for scalability and productivity without the need of purchasing new equipment all the time. At the same time IT departments are required to guarantee absence of confidential documents and to ensure that they operate in accordance with the requirements set by regulating authorities to the industry and information security such as PCI-DSS and HIPAA requirements (a proprietary information security standard when handling plastic cards and transferring data about people's health insurance).

To summarize, the major challenges related to corporate mobility concept implementation are:

- security of devices, applications and data;
- scalability that allows managing a growing number of devices, applications and data;
- simplification of the network infrastructure due to its consolidation;
- visibility of users, devices and applications that helps to plan activities and eliminate problems; and
- configuration and deployment management.

Enterprise Demands for Mobility. Conservative pragmatism is a common strategy for corporate IT departments. The principle «never touch a running system» seems quite logical to them. However, this strategy is not advisable when an enterprise goes mobile. The number of queries from users reaches a certain critical point. That is a very common scenario for mobile devices. Initially the use of mobile technology in a corporate environment was limited in the executives of companies only. Subsequently the mobile by the employees started to use mobile technology. This process cannot be ignored. Together with other similar trends it is now called consumerization of IT (CoIT).

New devices are increasingly used as real mobile workstations. This is caused by two essential factors [1]:

1. Capabilities and maturity of technology. In terms of their capabilities in document processing, mobile devices such as tablets cannot be compared to the capabilities of conventional laptops or PCs. However, in most cases the functionality and ergonomics of tablets are enough for simple document processing if it does not imply any serious formatting tasks. Shortly, the major advantage of mobile devices is a chance to look through documents quickly and then make decisions.

2. Need to work remotely. To work remotely has a long tradition in business. However, for quite a while capabilities of technology could not satisfy this need. A survey of more than 150 managers of IT, IS and business departments, which has been conducted by the «Centre of Corporate Mobility of the Company «IT», has revealed that the use of smart phones and tablets is a sequence of real needs of those who work in businesses. Mobile technologies help to improve communication among and with remote workers (81 %). Moreover, new capacities of mobile technology may enhance current business processes (61 %) and trigger the development of new ones (50 %). The deferred demand for mobility that appeared due to the failure of the previous technology (PDA) is now streaming in the market.

These factors, which improve field work with information and, as a result, increase and improve the operative decision-making, have enabled the extensive use of mobile devices in the corporate environment. Consequently, tablet PCs pretend to become an widely accepted device in the briefcase of a business person replacing folders with paper documents and at the same time providing facilities for any time and any place business communication and enabling the access to up-to-date information. If they will they take this place (and to what extent) is too early to say, but the current situation cannot be ignored any longer by IT directors.

The Rational IT-management assets of a modern enterprise is one of the prerequisites for professional growth of its workers (which

positively influences development of enterprise knowledge database) and it results in lower operating costs for communication. Introduction of mobile technology into business processes of an enterprise becomes an important factor for its efficiency growth whereas search for rational technological solutions to mobilize the enterprise is a headache of its IT department. In order to take a reasoned decision it is necessary to develop a *concept of corporate mobility* strategy, which ensures the compliance with the company's security requirements in respect of data transfer and applications and ensures the successful integration of mobile devices into the existing IT environment of the enterprise.

The key advantage of mobile devices for enterprises is the higher labor productivity because of the shorter time for feedback quicker decision-making, and problem-solving. As corporate mobility is progressing, employees use more and more their personal smart phones for work and companies will be ready to stimulate the use of personal mobile devices.

The extension of user's experience related to different kinds of smart phones and tablets results not only in limited consumption of information, but also active «dialogue» reaction on the part of the users of mobile devices, which implies interaction with information resources and applicable systems. These mobile devices have actually consolidated into a new class of workstations – mobile ones.

Today entrepreneurs are ready to introduce mobile technology in order to offer new services for their employees and clients. However, uncontrolled process of developing corporate mobility entails a lot of hidden rocks and there are still no general routs or ways to avoid them.

According to the agency «Harris Interactive and Bank of the West»[2], the utmost barrier for the wider use of mobile technology in the small business is the lack of experience (33 % of respondents) and high costs (25 % of responds).. In the corporate segment, the picture is slightly different. The security issues are named as the most important factor. Big companies operate commonly with large amounts of information that need to be protected in accordance with the legally established procedures and the data that cannot end up in the hands of competitors. That

is why they need effective protection of mobile devices from different risks.

MDM and BYOD Concepts While Introducing Corporate Mobility. According to [3] most modern mobile device management systems (MDM) for enterprises have a complicated structure. it is necessary to attract considerable human and finance resources to introduce them. (Because of their complicated structure the introduction of modern mobile device management systems require remarkable human and financial resources.)According to IT specialists, decisions need to be made in line with the tasks the system has to perform according to the list of maintained equipment and according to the cost of ownership.

Implementation of a full scale MDM system at this stage of development of Russian corporate IT infrastructures is rather difficult and companies are waiting for suitable solutions. So-called «box» products in the field of mobile device management have to provide opportunities for companies to network mobile devices of employees – both corporate and personal ones – in an easy and secure way.

For instance, such an approach has been used in the company «Surgutneftegas». At the expense of the solution Microsoft System Center Mobile Device Manager 2008, the users have an access to the corporate infrastructure and can safely store information in a mobile device whereas IT administrators have a centralized mobile device management system with uniform safety policy, ability for remote initialization, switching off, locking out connections and even removal of data from a device e.g. if the device has been lost.

Mobile platforms are attractive for Russian credit organizations, too. In particular, a full scale mobile infrastructure has been introduced on the basis of the platform Symantec Mobile Management in Vneshekonombank of the Russian Federation. The strategy of the bank development for the next few years implies a considerable increase in the number of devices and provision of access from a mobile device to a large selection of bank services.

One of the urgent issues for many Russian companies is the use of mobile devices that are

brought by employees. It is referred to the BYOD concept (bring your own device). Employee's personal smart phones and tablets, of course, help companies to save money on purchase of equipment and at the same time ensure delicate handling of a device, since it is employees themselves who have paid to buy it. Nevertheless, BYOD creates serious problems in terms of infrastructure and safety management, which makes this concept unattractive for many companies.

According to the survey conducted by Russian company-system integrator «IT» in October 2013 [4], among Russian companies interested in mobility, 60 % of companies do not regulate in any way mobile access to corporate resources even though 56 % support BYOD. One third of organizations have not analyzed their structure yet to see if they are ready to introduce mobile technology. The half of companies that have had an audit realize that they need to modernize their IT infrastructure.

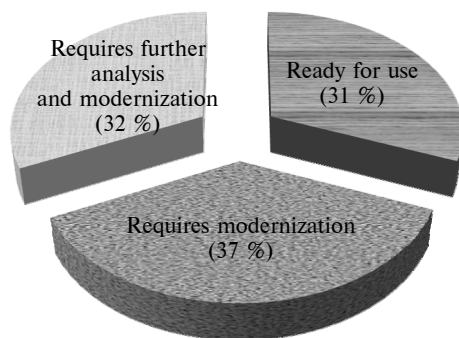


Fig 1. Readiness of Russian enterprises for mobilization.

Source: «IT» 2013

Basic communication resources are the most popular among mobile users. About 95 % of respondents plan to provide mobile access to corporate e-mail and 90 % of respondents plan to allow a mobile access to corporate file resources, such as shared Windows folders and Share Point document libraries, seen at same.

The next most common group of services includes decision-making tools. Introduction of mobile solutions to reflect the key business indicators is discussed in 58 % of companies whereas 18 % have already introduced such

solutions. One more category of services that is interesting in terms of mobilization comprises of advanced communication means such as IP telephony, instant messages and videoconferencing. The share of companies using such solutions is 13–16 percentage and by the end of 2014 it is expected to grow up to 30-40 percentage.

Corporate Mobilization Models. As mentioned above, the use of employees private mobile devices despite advantages and simultaneously entails new threats in terms of corporate data security. There are several ways to meet this problem.

1. Prohibition to work by BYOD-model. It is worth noting that to ban the use of private mobile devices does not mean turning down mobility. In this case the company provides the employees with protected corporate-owned mobile devices (COPE –corporate-owned personal equipment). Standardization of devices decreases maintenance costs and costs for support of employees who spend more than 20 % of their time away from their fixed workstations. This approach is spread in Japan, but it is not popular in Russia.

2. Free use of any devices and applications, with the IT department helping users to install the necessary applications. This approach is more common for companies belonging to the small and medium-sized business segments and for developing markets (China, India and others). In this case money is saved by the company as there is no need to buy mobile devices or licensed software or to develop mobile applications, but the security issues are affected. Additionally, compatibility problems between different platforms and applications may occur.

3. Trade-off alternative: the IT department of the company permits employees to use their private devices, but regulates which services can be used, develops mobile versions of specialized corporate systems, introduces means of remote management and protection of mobile devices owned by employees on the basis of the MDM concept.

This last alternative seems to be the most promising as it gives freedom of choice to the

workers and provides safety of the corporate information. However, in practice this way may prove to be more expensive than corporate purchase of devices. For BYOD it is typical to have a variety of both hardware platforms and software versions with different vulnerability characteristics. In a number of cases a lot of device protection schemes have to be developed according to the uniform procedures that are applied to corporate devices.

Purchase of mobile devices is widely used in Russia not only for the money-saving reasons, but due to the lack of well-established channels of work with suppliers of smart phones. It is because of difficulties in making contracts with producers of mobile devices and in maintaining this pool of device. Direct delivery of devices

from manufacturers is not common, which entails additional risks. Sometimes, there are exceptions for top-managers, who are supposed to have such a range of equipment owing to their status, and for employees who always travel or who need to be available 24 hours a day. Moreover, the package of paid devices does not include smart phones but tablets.

Policy of Russian companies in terms of mobile communication payment is more flexible. Many companies are ready to compensate communication expenses to a reasonable extent if their employees have to talk a lot over the mobile phone or use mobile Internet for work reasons. But with spreading mobile technologies there is a trend to turn down this practice.

Table 1

Statistics of Russian companies implementing corporate mobility strategy [5]

Company	Mobile services	Developer	BYOD or COPE	Number of users
Deutsche Bank, RF	n/d	n/d	BYOD	up to 30 000 users
Ford Sollers	Good Collaboration Suite (corporate e-mail, calendar, tasks, etc.), WebEx (videoconferences), corporate social network Yammer	Ready to use services	BYOD	n/d
Alfa-Capital	Corporate e-mail	In-house development	BYOD	n/d
Baltika	Corporate e-mail, CRM, file interchange GlobalSCAPE	Customized development	COPE (Galaxy S3 Mini Samsung on Android)	6000
Evrasia (drilling company)	«Mobile approval» on the basis of SAP Mobile Platform	Solution of the company «Innoway»	BYOD	n/d
SB Bank	Corporate e-mail, mobile application for service subdivisions (interacts with ABS and uses geolocation functions while in service. When workers maintain an ATM or a terminal, the application sends information to the bank about location, condition of the device, productivity of workers, which helps reflect the data in due time on the interactive map for clients of the bank and control its personnel)	In-house development	n/d	n/d
Finam	Corporate e-mail, SoftPhone (mobile device can be used as an office phone with corporate extension)	In-house development	n/d	n/d

Source: CNews Analytics, 2014.

Success Factors in Implementing Mobile Technology in Russian Enterprises

1. Presence of clear and documented strategy of corporate mobility at the enterprise, which implies not only expansion of applied functionality of workstations but mainly improvement and development of business processes.

Quality extension of user experience in terms of a bigger range of available form-factors of mobile devices has created opportunities not only for selective consumption of information, but also active «dialogue» reaction on the part of mobile device users. This implies broad interaction with information resources and applied systems. As a result, mobile devices have actually turned into a new class of workstations – mobile workstation.

2. System approach to define limits of corporate mobilization coverage of workers at different levels of management of the enterprise, depending on importance of functions they perform and economic efficiency.

It implies:

1) Defining the number of mobile workers and providing them with corporate mobile devices or using their own gadgets to implement work processes at different levels of enterprise management;

2) Providing access for the mentioned workers to corporate resources and applications from mobile devices

3. Presence of actualized corporate standards at the enterprise for provided and supported by IT specialist mobile devices and mobile platforms («BYOD list»)

Standardization of mobile operating systems and mobile devices is one of the major tasks that have to be embraced in the concept and strategy of enterprise corporate mobility. This helps handle with the most common reason of its non-use, namely, diversity of mobile devices and platforms in the market. The concept of corporate mobility, its politics and regulations of use coordinate requirements of the information safety services and readiness of end-users and businesses to apply their own mobile devices more widely for the work purposes.

4. *Provision of information safety service of the enterprise with technological means to manage mobile devices and provide their secure measures*

Implementation of facilities to manage mobile devices into the IT infrastructure of the

company – the so-called Enterprise Mobility Management – EMM – is the most essential factor to provide legitimacy and transparency of control over mobile access to corporate information resources and systems in terms of information politics and regulations that are in force in the enterprise.

Prospects of Corporate obility Implementation in Russian enterprises. Even though there are obvious problems, corporate mobility is to develop. It is guaranteed by widely spread mobile technology at the consumer's level, its easiness for use and capability to increase efficiency of business. Among drivers of BYOD introduction that are common for Russian business, one can mention the geographic factor, because there are quite a lot of companies in the economy that operate in the immense territory. For such business it is important to create and maintain the effective communication environment that will help react to external and internal changes in due time.

Another factor in favor of mobility is the young and middle generation (from 16 to 35 years) who tend to use devices not only in their common lives, but also at work. Constant integration of life with social networks gives a certain momentum to develop BYOD concepts, since social networks have become not only an entertaining system, but also a good business tool, which gives rise to progress.

In the opinion of a number of analysts of the Russian IT market, there are three groups of industries that can get maximum advantages because of mobilization. First, these are industries with area-spread infrastructure and field visits: repairs, object check-ups, etc. For instance, this is railway transport and electric power industry. Second, these are all fields of activities where there is need for informing in a quick way about change of the situation or new orders. For example, courier and transport services, taxis, medical aid teams. Third, these are such industries that traditionally invest in IT, i. e. retailing, with mobile technology applied on shop floors, warehouses when accepting and inventorying goods and those who do this for customer attraction and retention.

Experts of the company «IT» believe that in Russia in all enterprises that have IT services in the corporate environment, the level of corporate mobility is comparatively high. The leaders are finance sector (including insurance), production, retailing, and energy industry [4].

At the same time it is necessary to provide means for safe access to data and devices. Many cautious executive, when thinking of developing corporate mobility, remember about cases of loss of electronic media. Development of mobility is retarded mainly because of the fear to lose data important for the company, risk of sensitive information seepage. In addition, provision of safe mobile work of executives and employees in Russian companies is at a low level for the present.

Russian companies gradually increase their accounts of the number of workers who need mobilization of their activities, as it has demonstrated in surveys and research done by the Centre of Corporate Mobility «IT» [6]. However, the share of companies that already use the relevant technological solutions is still low.

An average cycle for decisions to implement corporate mobility management systems takes from half a year to a year. Today executives are conscious about it because of their own

experience and set high priorities to mobilization projects for IT and IS departments. In combination with a large number of projects that are at the stage of implementation and piloting, one can say that there is an active growth in this field of business automation, which improves its labor productivity indices through increased personal productivity of employees and executives. Because of it, the distribution of corporate mobility is just a matter of time and efficiency of promotion of its advantages.

Conclusion. The successful introduction of mobile technologies in business is a challenging task. This paper analyzes challenges Russian enterprises face when mobilizing their business. The challenges are predominantly technical or organizational reasoned by user needs to get access to corporate data anywhere and anytime. The BYOD tendencies among users cause increasingly additional problems for company IT departments. Thus, a clear company policy and guidelines for mobilization are needed.

REFERENCES

1. **Cmirnov N.** Korporativnaia mobil'nost'. Computerworld *Rossia*. 2013. № 11. URL: <http://www.osp.ru/cw/2013/11/13035463/> (rus)
2. **Eddi N.** Tekhnologiia pomogaet malym predpriiatiiam povysit' effektivnost'. *eWeek*, 2012, October 08. URL: <http://www.eweek.com/small-business/mobile-technology-helping-small-businesses-boost-efficiency/>
3. **J. Gold Associates.** Upravlenie mobil'nost'iu na predpriatii. Belaia Kniga J. Gold Associates, 2005. URL: http://www.jgoldassociates.com/WhitePapers/Managing_Mobility_in_the_Enterprise_White_Paper.pdf
4. Korporativnaia mobil'nost' rynka Rossii v 2013 g. – sostoianie i tendentsii razvitiia. Tsentr korporativnoi mobil'nosti «AiTi». M., 2013–2014. URL: <http://mobility.it.ru/files/remday2013-surveyresults-rus.pdf> (rus)
5. Mobil'nost' v biznese: opros CNews Analytics. Moskva, 2014. URL: www.cnews.ru/reviews/new/mobile-2014/ (rus)
6. **Orlik C.** Sistemnyi vzgliad na organizatsiiu mobil'nykh rabochikh mest. *Den' korporativnoi mobil'nosti AiTi*, 2012. URL: <http://mobility-day.it.ru/images/pdf/emd2012%20-%20keynote%20orlik%20-%20public.pdf> (rus)
7. Prais Vaterkhauz Kupers Grup. *Tekhnologicheskii prognoz*. 2013. Vyp. 1. URL: <http://pwc.com/technology-forecast/1-2013>
8. **Von der Nien Dzhulian.** Mobil'nye prilozheniia dlia Biznesa Mobile Business Applications. *Maikl Amberg i Maikl Lang. Innovatsii cherez smartfon & Co: Potentsial'nye vygody mobil'nykh ustroystv*. sb. Diussel'dorf: Simpozium, 2011.
9. **Bazul Ragul C.** Kontseptual'naia model' transformatsii tsennosti i gotovnosti predpriatii. *Trudy Natsional'noi konferentsii ASEM. Institut tekhnologii. Dzhordzhiia, SShA*, 2005.
10. **Verklas Stefan.** Prilozheniia dlia smartfonov : biznes-prilozheniia. Ins Zeitalter Mobiler Gesch Ftsprozesse, 2011.

СПИСОК ЛИТЕРАТУРЫ

1. **Смирнов Н.** Корпоративная мобильность // Computerworld Россия. 2013. № 11. URL: <http://www.osp.ru/cw/2013/11/13035463/>
2. **Эдди Н.** Технология помогает малым предприятиям повысить эффективность // eWeek, 2012, October 08. URL: <http://www.eweek.com/small-business/mobile-technology-helping-small-businesses-boost-efficiency/>
3. **J. Gold Associates.** Управление мобильностью на предприятии. Белая Книга J. Gold Associates, 2005. URL: http://www.jgoldassociates.com/WhitePapers/Managing_Mobility_in_the_Enterprise_White_Paper.pdf



4. Корпоративная мобильность рынка России в 2013 г. – состояние и тенденции развития / Центр корпоративной мобильности «АйТи». М., 2013–2014. URL: <http://mobility.it.ru/files/remday2013-surveyresults-rus.pdf>
5. Мобильность в бизнесе: опрос CNews Analytics. Москва, 2014. URL: www.cnews.ru/reviews/new/mobile-2014/
6. Орлик С. Системный взгляд на организацию мобильных рабочих мест // День корпоративной мобильности АйТи, 2012. URL: <http://mobility-day.it.ru/images/pdf/emd2012-%20-%20keynote%20orlik%20-%20public.pdf>
7. Прайс Ватерхауз Куперс Груп // Технологический прогноз. 2013. Вып. 1. URL: <http://pwc.com/technology-forecast/1-2013>
8. Вон дер Ниен Джулиан. Мобильные приложения для Бизнеса Mobile Business Applications // Майкл Амберг и Майкл Ланг. Инновации через смартфон & Co: Потенциальные выгоды мобильных устройств: сб. Дюссельдорф: Симпозион, 2011.
9. Базул Рагул С. Концептуальная модель трансформации ценностей и готовность предприятий // Труды Национальной конференции ASEM / Институт технологии. Джорджия, США, 2005.
10. Верклас Стефан. Приложения для смартфонов : бизнес-приложения. Ins Zeitalter Mobiler Gesch Ftsprozesse, 2011.

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