Concept for Advanced Electronic, Mobile and Intelligent Government Services

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Abstract: *For the first time this document looks into a unique aspect of using new technologies in government services business. It identifies the necessity of unique approach in application and implementation of electronic, mobile and intelligent management in government services. New unique terms are being introduces like e-m-i-Government and e-m-Service. Until now they were used separately as e-Government, m-Government and i-Government, and e-Service and m-Service respectively. The conditions have evolved now, predominantly in developed countries, not to use these terms separately. It is necessary to think strategically during the implementation of either of these segments, not to separate or independently study these segments. Here we are presenting an advanced and different way of applying new technologies in using and providing government services.*

Keywords: *government services, e-m-i-Government, e-m-Service*

1. INTRODUCTION

A story about a unique new electronic, mobile and intelligent Government (e-m-i-Government) could be compared to a story about a group of blind people all touching one part of a horse and trying to describe the whole animal. Soon, there is an argument what that animal really looks like until a man with a sight comes by and describes the whole thing. In our case, the man with the sight is still not here, that is, no one in the world has created a project for its implementation. For now, we are only hypothesizing the process through unifying different views of interested parties and through experiences of those who have made some progress in its development. What is certain, the new e-m-i-Government is much more than a digital summary of individual programs of federal and local government. To sum up the e-m-i-Government today, we postulate three of its aspects:

    i.   e-m-i-Government is a new look and a system to access services, data, information and knowledge by the citizens, legal and business entities, different organizations and institutions as well as professionals (journalist, historians, sociologist, anthropologists, etc.). Here, all public services and information that government wants to announce will be compiled as well as those that are considered public information even if they are currently not in government's political interest.

    ii.   New e-m-i-Government is a mechanism to decide WHAT government services, being state or local, should perform. The decision making is broaden to many more entities,

service process becomes more transparent and public, and less influenced by narrow partisan interests.

iii. It provides better customer service (for citizens and businesses) and builds necessary infrastructure to perform these tasks.

2. WHAT DOES NEW E-M-I-GOVERNMENT PROVIDE

Better source of information. Widening implementation field of democratic processes. Better customer service.

The e-m-i-Government task is not only giving better services or collecting and processing data, but also creation and distribution of necessary information and knowledge elements. It should provide:

- One-time and correct collection of all relevant data, information and knowledge where they occur.
- Appropriate storing of all data, information and knowledge until they are used
- Appropriate circulation of data, information and knowledge that provides the true information and true knowledge in a real time at a real place
- Timely processing of data, information and knowledge
- Use of data, information and knowledge according to previously established procedures and levels of access.

2.1. How to Reach New Solutions

To reach e-m-i-Government one cannot do without a clear vision, concept, plan and a program development. Complete development strategy of a such complex and complicated project has to be done in stages and phases. e-m-i-Government entails using information and knowledge, application of information, communication and mobile technology. The new use should improve: efficiency, productivity, transparency and accountability. All the improvements gear towards citizens, businesses, all governmental and non-governmental organization and institutions as well as government employees.

All countries, including ours, have worked or are working on implementing e- Government. Now it is time to step out, since all the new technologies and databases are so developed that is necessary to essentially take a different approach and improve customer service.

At the same time it is imperative to work on electronic, mobile and intelligent operations and services.

Prerequisites: Existence of automated information and mobile systems is a prerequisite for implementation of e-m-i-Government. Since there are very few of those systems we will also concentrate on the basics for future improved operations. In order for government services systems to work properly, all participants (**without exceptions**) have to follow same principles and timely exchange data, information and knowledge necessary for their own work and work of all other participants in these services and decision making processes.

If we have an appropriate infrastructure, if the citizens trust information, communication and mobile technologies (trust the privacy and protection of their data), if there are defined relations between interested parties (government services, government, businesses, citizens) then we can build a stabile e-m-i-Government structure. Basic elements for such 'structure' would be based on information, communication and mobile technologies, trust, privacy, and protection.

3. SOME OF THE RESULTS OF NEW SOLUTIONS

Improved access. By implementing e-m-i-Government and e-m-Service the citizens will be provided with better access to information and knowledge, as well as with the improved service. By allowing direct access for all government employees to every department we provide more efficient contact and create trust between citizens, businesses, and government services (all users and customer service). It will raise morale among government employees and improve efficiency, while managers will easier manage employees. Service departments will be provided with improved access to data, information and knowledge, as well as more efficient work and services. The internal efficiency of supply departments will increase. Consolidation of data will increase

the quality of reports as well as electronic exchange of documents and information. Operations expenses will decrease while supply management will improve. Isolation of communication within government services and service users will be eliminated; businesses will have improved access to information and services, and the expenses of internal communication will decrease.

Better contacts. In the world today, e-Government is used within context of local and city governments, so one can find an e-Government definition as "a possibility for a local government to provide information and service through Web, as a 'touch screen' kiosks or through interactive voice recognition". These services and functions are available to citizens and businesses 24hrs a day, 365 days a year. To decrease expenses of servicing citizens the electronic access to information has to be provided, and to realize overall understanding of relations between citizens, businesses and government services, integration of information has to be completed.

Usable Infrastructure. Consists of combination of hardware (servers, computers, mobile devices), networks that connect above mentioned hardware components and service software applications.

Electronic Services. By using the Internet, government services bring their services closer to citizens, businesses and other organizations and institutions. e-m-i-Government can enormously speed up transition towards knowledge based economy. Transition to electronic, mobile and intelligent services entails big changes of government services internal procedures that can be very complicated to execute. The challenge for government services is to adapt and implement innovative way of work, including correct and stable relations with citizens, businesses and other organizations and institutions.

3.1. Goal of Implementing E-M-I-Government

The goal of implementing new administration that is based on new concepts and new solutions is to provide efficient system of collecting, processing and using data by all participants (county, city, municipality) using organizational procedures and modern information resources. There has to be the same level of efficiency in coordinating all participants in order to at least reach the following goals:

- improving work of all government services
- improving technical and technological databases
- providing quality based services and tasks
- timely and excellent execution of obligations defined by the law
- increasing the level of education for all participants, especially service providers.

Automation of current services. No. Implementation of e-m-i-Government t should not be restricted to automation of current services and current ways of performing work procedures, but to offer a new solution based on real needs, which realization will ensure modern technological accomplishments.

Unique system. E-m-i-Government will be able to realize all those tasks only if they are conceptualized and implemented as a unique system. Additional requests to the solutions that are offered by the concept (that must be done first) are for the system to be: rational, functional and coordinated with the environment, to be developed on realistic approach (in phases, modular), to use the latest technologies, to provide integration of information and expert systems as well as the knowledge bases, to provide adaptation of computer technology in work environment.

3.2. Who Needs E-M-I-Government?

First of all those would be citizens, businesses, government, and government employees.

Government – to ease lines at service windows and to reduce cost of its services. Citizens usually have bad experiences dealing with government administrators, and every change that will reflect good relationship with citizens shows that something is happening in their favor. From the government perspective it is a double benefit: big savings and satisfied citizens (voters)

Citizens – service users that would now be able to quickly and without waiting do their business through electronic or mobile devices and at the same time do not have to stand in long lines in order to get a timely and correct information or to accomplish work that sometimes requires multi day walking from window to window. It is necessary to note that in this way the government

administration becomes closer to citizens, and citizens themselves become participants in servicing and managing local and state structures.

Government employees – will have simpler tasks and better communication with other employees within the same or different departments; faster and more efficient execution of tasks by managing electronic and mobile documents and/or their set up for mobile or Web use.

It is necessary to exchange experiences and compare strategies with other experiences. It should be stressed that the tasks should be performed by unique standards because it will be necessary to connect all government services into a cohesive base and that there will be problems with different formats of data and different platforms that are or will be used.

4. REFORMATION GOALS

Decisions and support. Introducing e-m-i-Government and e-m-i-Services is a very difficult task that will need deep changes in organizing, working and thinking on all levels. Strong political decision and clearly defined visions are necessary to fully use the potentials that are provided by automation of administrative work. Without strong, consistent and clear political support it is not possible to modernize the work of government services (state and local administration) which are introducing electronic, mobile, and intelligent government services.
Administrational Model Change. Parallel with introducing modernization and automation of administrational work the essential model change needs to be addressed. If we would only to automate current procedures we would only strengthen current model and extend its inefficient results. The goal of e-m-i-Management is to change the essential administrational work, which means: to make it simpler, more open, with more results that are based on knowledge, and user oriented.
How current administration does their work? Work in government services currently is done in isolation in that way that each department does its part of work without any connection or interest for quick and efficient service that is end-user oriented. The service user goes from one department to the other that are not connected (from one window to another) to perform necessary tasks.

Automation at the service window. Automation of the service winodws with this kind of procedures will only speed up its work, but the user will still go from one window to the other in order accomplish its governement service related needs. The user of these services will be able to do the neccessary work with governement services much faster, but not all the services can be done at one window. Using the new solutions the connection between citizens and government services will be improved. Computerizing services at the windows will shorten the time to process forms from few days to few hours. Transparency is established, corruption decresed, hand typed data-entry eliminated as well as possible misakes, paper forms decreased, and beter and more organized documentation is kept.

4.1. How and where to Start with Changes

Prerequisit for successful start. For the successful start of e-m-i-Management development and business inteligence implementation, it is necessary to:

- train all participants that will in any way participate or work on those tasks
- introduce them to future work
- explain the outlook of further development

First of all, Politics and Strategy of e-m-i-Government development needs to be done and suggest appropriate amount of prjects and theoretical solutions.

Scope of work. Theorotical solutions should immediately offer all applications (maximum number) to immediatly look into size of scope of work and changes in doing business that need to be realized during development and exploatation of new knowledge based systems. Also, it should be stressed out how much and what savings will be possible when the work is completed. All tasks should be developed in cooperation with municipal, city and state government as well as other countries, especially neighboring countries, that are also working on the same or similar

projects. Experiences should be exchanged with everyone and confirm ones own strategy with other experiences.

Connecting. We should pay special attention to facts that one day it will be necessary to combine all BiH governemnts into one whole unite (not only within BiH but with other countries as well) and that there will be problems with different data and platforms on which original databases have been developed and conducted.

Identifiying priorities.

- it is impossible to do all of it at one time

- it is necessary to define priority work and priority actions

- Since initial investments into technological innfrastructure are big, it is neccessary to identify the most important services, so they would take the priority and be availabe to users.

- Define priorities, including value of goals that are most promissing

- Clearly defined priorities qualify for allocation of recources and optimize full organizational possibilities.

- Single out the most important services that can be realized through mobile or electronic devices.

Work in that way to first develop devices that will make citizens satisfied and the ratio between time for divelopemnt and cost is acceptable. Efficiently choosing priorities ensures: faster development, end-user and governemnt employees satisfaction, better effects, and transparency.

From the beggining it needs to be known how to measure a success, how to follow work progress, and what are the critical procedures and how to resolve them.

4.2. What is Neccessary to do to Have a Successfull Implementation

Estimate Implementation.

- do users of government services demand that particular service
- do departments have appropirate technology and capacity to sustain that project
- is the cost of project and reform acceptable

Estimate analytics.

- is the proposed service appropriate for transfer to electronic or mobile services
- does creation of such services help with better and more positive imadge of government with citizens.
- Does the introduction of new service used with new technologies save time to do work
- Does new service require new financial investments

Avoiding mistakes. All the above are the questions that need to be answered before implementation of business intelligence into e-Service solutions has even started. There could be significant consequences if any of those qustions are forgotten or disregarded. Carefully chosen initiative in developing and implementation brings significant advantages, and most importantly unnecessary and costly mistakes are avoided. At the end of the analasys it is necessary to create a list of priorities out of which term plan needs to be created for application development for e-m-i-Government, based on the business intelligence standards.

Measuring results. Judging success or failure is only possible if in the begining the criteria for measruing results is defined. To show the value of doing business through use of new technologies, it is necessary to create criteria and measures according to which the parametars will be measured, such as the satisfaction of the Web or mobile page users, quality of services, savings, system respond time etc. It is necessary to do this to get the support for continuation of work, to imporve quality of applications, and development of new ones.

Considering misssteps and consequences. It is necessary to stimulate users that seek and obtain their services through using electronic and mobile devices. Everything has to be done very

carefully, since the missteps done in the begining can have enormous consequences for entire future development. Tasks that are critical in any stage have to be emphasized in order to stress out thier resolution or development. Big attention has to be paid to protection of data, networks and applications. If there would be a loss of data in the early phases of implementation, newtork or application fails, that will lead to a big disapointment by governement employees and the users of their services.

Protecting e-m-i-Government and e-m-Service systems. While developing new solutions in implementation of business intelligence the attention needs to be paid to data protection, network and application protection, and only then pay attention to desing, content, and response time. When implementing new sites this needs to be considered from the very begining of creation since the exposure of these systems to different dangers is much higher than usual levels. The proctection has many specifics since the data, information, and knowledge that these sites are connected to are confidential and private, and their exposure would have negative effects.

4.3. What tre the Trends that Run Implementation E-M-I-Government

Table 1. *Trends that manage e-Government*

Category Trend		Trend
User of services	1.	Faster service
	2.	Self-service
	3.	More choice of service
	4.	Integrated solutions
e-self service	5.	Integrated services
	6.	Smooth support
	7.	Flexibly meet the requirements
	8.	Increased visibility of the process
Organization	9.	Relocation of jobs in the external environment
	10.	Services under the contract
	11.	Virtual distribution
Employees	12.	Looking for the best and brightest
	13.	Retaining talented staff
Technology for business	14.	Integrated applications
	15.	The integration of multiple channels
	16.	Intermediary applications between the old and new software and equipment
General technology	17.	Mobile Web Applications
	18.	Mobile devices for processing and exchange of information
	19.	Convergence of infrastructure
	20.	Business intelligence

Users of the service quickly change their habit of seeking services, particularly by using of new technologies. Now the services are increasingly required by computers or mobile devices (e-m-Service). Identifying the trend is not just a new opportunity e-m-i-Business of the public Administration (government administrative bodies, administrative services and organizations exercising public authority), but also recognizing different services and business ideas. Diverting public administration in a new direction can last several years.

Here we suggest 20 major trends that public administration should lead to the implementation of business intelligence in the management and e-m-Government and e-m-Service. The ability to observe these trends gives a better chance for a better understanding of the opportunities that lie ahead in public administration.

Users value the services that are fast and do not like to delay services or waiting in line. Delay in any step of the process is unacceptable, and it usually occurs due to poorly designed processes that contain a lot of unnecessary.

5. GOING DIGITAL AND MOBILE

E-M-I-Government is a very complex and expensive manner of running business. The first step in identifying the leader in implementation of business intelligence (BI) in e-m-Government is

seeking government or governmental organization setting innovative questions to itself and reformulating

Table 2. *Business digitalization*

Forms of BI implementation in e-Services	What are the new possibilities for servicing with regard to the trends in view the user and the service?
	What is all that managing such changes?
Structured the foundations set new rules	Which digital, mobile and intelligent technologies will become dominant in public government?
Models of BI implementation in e-Services	Which models are better adapted to new business opportunities?
	Which business processes have to be change?
Strategic framework provides the first best choice	How to provide transfer from the current model to the model of e-m-i-Government with regard to their readiness?
	What challenges do we need to face in introducing a new business model?
Design of e-Government and BI	Who are the target users?
	What makes an **intelligent** offer valuable?
Specific strategies for what you wish to achieve in the field of providing services	What is financing like? Is the service directly charged?
	How do you keep a good quality personnel?

rules for providing services. When the public government responds to strategic questions that it sets for its self, the result will be revolution in business. By changing questions the innovators change the rules of the game for all participants. Innovative government bodies try to reformulate the direction of providing services by including the user in the process of servicing, using the advantages of new technological opportunities.

A well designed and implemented digitalization of business processes can change the relationship between the giver and the user of services (public government, citizens, and business systems). Asking new questions produces new answers, but also repeatedly form a complete chain of services. The question of "becoming intelligent" is not a luxury but dire need. It is not a manner of insuring a fine move of the border of services activities, but it is learning how to become intelligent and at the same time insure a high level of quality.

The first step in reformulating is analysis of environment, consideration of the situation above the surface of its activities and seeking new forms of e-m-Service, model and solution based on which public government will be built. The following table presents difference among the forms of e-m-i-Government, its models and business solutions. Those three forms set the rules of the game.

## 5.1. Required Technologies to Enhance E-M-Services

Determine which technologies can be used for efficient serving. High-tech ranges from genuinely useful (browsers and Web), through potentially good ones as wireless Web, digital services and business intelligence, to the light reflections of high technology.

It is necessary, first of all, to: identify patterns, determine which technologies are causing problems, identify deficiencies in existing models.

Once the form is understood, it is time to "go further". The model of business intelligence implementation in the e-m-Government determines how to achieve the ultimate goal. It helps to focus on customers, internal suppliers and actions to ensure quality and cheap servicing.

If we have the relevant infrastructure, if citizens have confidence in the information, communication and mobile technology (believe in the privacy and protection of their data), if there are defined relationships between interested partners (local authorities, government, business, citizens), then we could build a stable structure of e-m-i-Government.

The basic elements of this "building" would be based on new technologies, the most important of which are concepts of Internet, Intranet and Extranet.
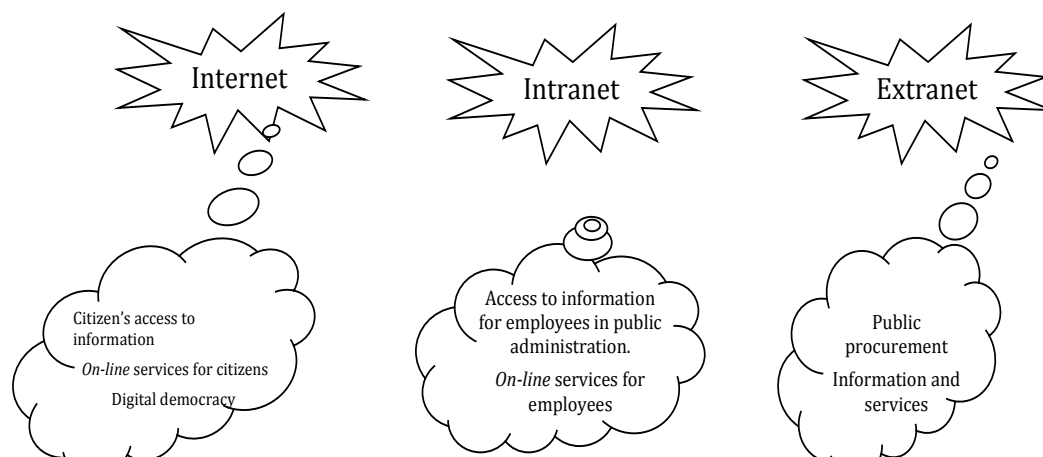
Figure 1. *Internet, Intranet and Extranet in the function of public administration*

Several factors determine the information technology that can be used to provide communication support to specific business systems or groups of users by the public administration. The following are main ones:

Participants - The number of people who send or receive information ranges from 2 to several thousand.

Types of sources and destinations - the source and destination of information may include people, files, and sensors and so on.

Location - sender and receiver can be in the same room, in different rooms at the same location or at different locations.

Time - the messages can be sent at a specified time and received almost simultaneously. In this case, we say that communication is synchronous. Phones, teleconferences, meetings face-to-face are examples of synchronous communication (in real time). Asynchronous communication, on the other hand, refers to the communication when the recipient receives the message a little later than it was sent. **Media** - Communication may include one or more media. Today's computers can handle several types of media such as text, voice, graphics, images and animation. When using different media to communicate, it can increase the efficiency of the message, accelerate learning, increase possibilities of solving problems. However, working with multiple media can reduce the efficiency and productivity of the system and can significantly increase costs. As it can be predicted that the world of Intranet will progressively rise it is likely that everyday business communication between users will begin to receive significantly different and varied forms.

5.2. Necessary Preconditions

Infrastructure - a modern and liberalized digital telecommunication infrastructure enables citizens, economic entities and administrative bodies quick and inexpensive access to digital public services and represents a communications base for e-m-i-Government. The use of this infrastructure is, therefore, important for the objectives of e-m-i-Government, especially in remote and undeveloped areas.

e-m-Payment - electronic and mobile public services require electronic and mobile payment models. Such models of payment must be better defined and more improved, and in the interim period it is necessary to keep the traditional method of payment to allow a gradual transition and prevent the digital division among citizens.

Security - Security of transactions and the protection of information and knowledge play a significant role in the successful implementation of e-m-Services. There are several aspects of security, but it is particularly important to establish mutual trust in order to support widespread use of electronic interaction between the user and the administration, but also within the

administration itself, by using common solutions for establishing "identity" of the participants in digital transactions.

Standards - are extremely important for the successful development and integration of public services and information. Standards have a dual purpose:

- to provide a joint operation between heterogeneous electronic and mobile solutions applied in different areas of e-m-i-Government and

- to enable the coordination of development of all activities.

The legal infrastructure – e-m-i-Government requests a new legal framework that would adequately regulate broad use of electronic and mobile technologies in public administration and in the government relations with the population and economic entities. The first steps toward defining the legal framework are made by adopting the Law on Electronic Signature, etc., but the legal framework needs to be much more develop in order to encompass all aspects of e-m-i-Gov.

Institutional infrastructure - the successful development of e-m-Government and implementation of business intelligence requires efficient management structure that will plan, coordinate, execute and evaluate new strategy of e-m-Services.

5.3. Self Service - Empowered Users

An increasing number of users now no longer takes the keys of the car to go and get the service, but are increasingly taking the keyboard to accomplish this. Users are looking for solutions that can be offered by self-service, which will not only save their time, but give them certain powers. If they are seeking information or services without the assistance of administrative staff, they are interested in solutions-based self-service, available 24 hours, 7 days a week and 365 days.This trend is spreading. Users want to receive service at any time and in any place, and they can get it

if the public administration has developed its services and if the user has any way of accessing the information system of public administration. The lesson that the reform of the public administration of the developed world has learned, and that enabled self services to its customers are: **e-m-Service must focus on the user and not on the technology**. To focus their attention on the needs of users, management must pay attention to "the entire operation."

This can be achieved if:

- The emphasis is on simplicity, assigning each request only one goal to remove distractions,
- they remove Web pages that load slowly,
- they eliminate error messages during the process of obtaining services.

To achieve self-service trend means to achieve the strategy of e-m-Services. Effects of the countries that have adopted it (Canada, Singapore, United States, Estonia, ...) were assessed as good. For this to be achieved administration must build new infrastructure and design new protocols that will modernize the process of self-service. Integration of business processes at the level of administrative authority is crucial to serve customers well. The emergence of self-service as a key customer requirement means that the public administration, in order to provide it, must work fast to **integrate existing applications, processes and equipment.** It must be emphasized that this is a very complex and difficult task.

5.4. More Choice – Increased Personalization

Public administration must increase the number of services that will be offered on-line and must adapt them to the needs of users. On-line service providers win over the classic management especially in the choice of services. Service users prefer sites where they offer everything under one roof. This guarantees solutions that offer great choice of services in an easy way. The most successful online portals collect a large number of data and information about the services and make them available to users whenever they need them. When broadband Internet access is everywhere sufficiently widespread, video content will become available to a larger number of services; visual trend will spread better awareness at the time of obtaining services.
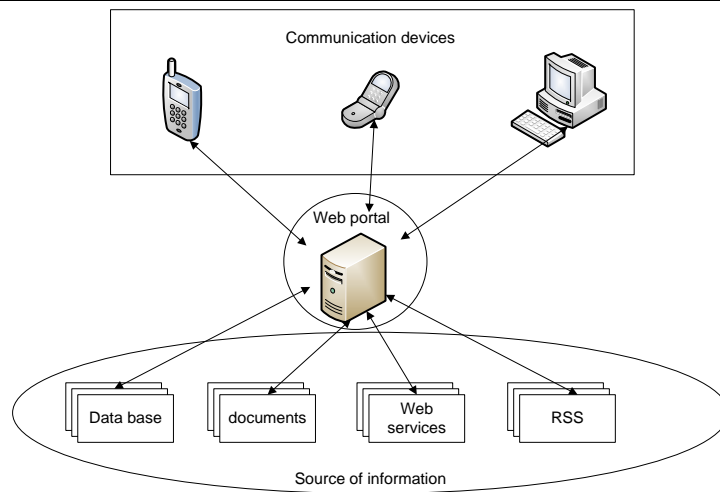
In contrast to traditional management, administration which is operated by the principle of e-m-Services and implements a business intelligence into it, will eventually be in a position that personalizes the activities of providing services to each individual user. Encouraging users to leave information about their profile by tracking their clicks on their Web sites and segmenting their interests, online administration will receive access to a much larger number of data compared to traditional service providers. These data can be used to personalize the activities of each services user, such as sending an alert via e-Mail about the new services that you might be interested in, or specially created portals of services to the taste and preference of individual users.

**Integrated solutions** ⟶ **YES** ------fragmented services ⟶ **NO**
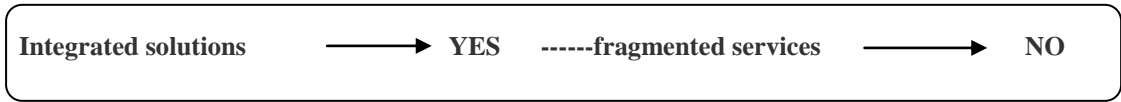
This is the time shift toward integrated solutions. Service users are rapidly transitioning from individual solutions to integrated solutions. They increasingly require solutions in one place, "under one roof". Administration of the developed countries in this model has a higher number of services per transaction, more pleasant and cheaper service. To solve the problem of "choice", users are looking for integrated solutions because they make process of seeking and obtaining services easier for them.

5.5. How to E-M-Services

New models, new communications, new services, different administrations and new service. The purpose of the implementation of new technologies is customer's satisfaction and cheaper services. In addition to new technologies it is necessary to develop new organizational models that will further narrow the gap between providers and users of services. In future time services must precede the service process and should be part of every interaction between actual and potential users and the public administration.

Conducting the process of providing services to customers must be made easy and oriented to problem solving, and it is also the most important trend in today's business. Providing services at the present time is not just a matter of relations between a single user to a single administration. Due to the relocation of certain business functions in the external environment, many phone services require coordinated action of two or more administrative authorities. To provide services that will guarantee customer satisfaction, administration must better coordinate their service partners. In **fact all of them should be considered as one expanded administration**, due to quality services. This will help in gathering more information and data about users, which will be vital for the election of a new working strategy .

Implementation of integrated applications and business practices that they support will be increasingly critical for ensuring quality processes. This cannot be realized only in the domain of the public administration, but also in the domain of its relationships with other business partners and customers. The result should be integration of public administration with the entire necessary environment.
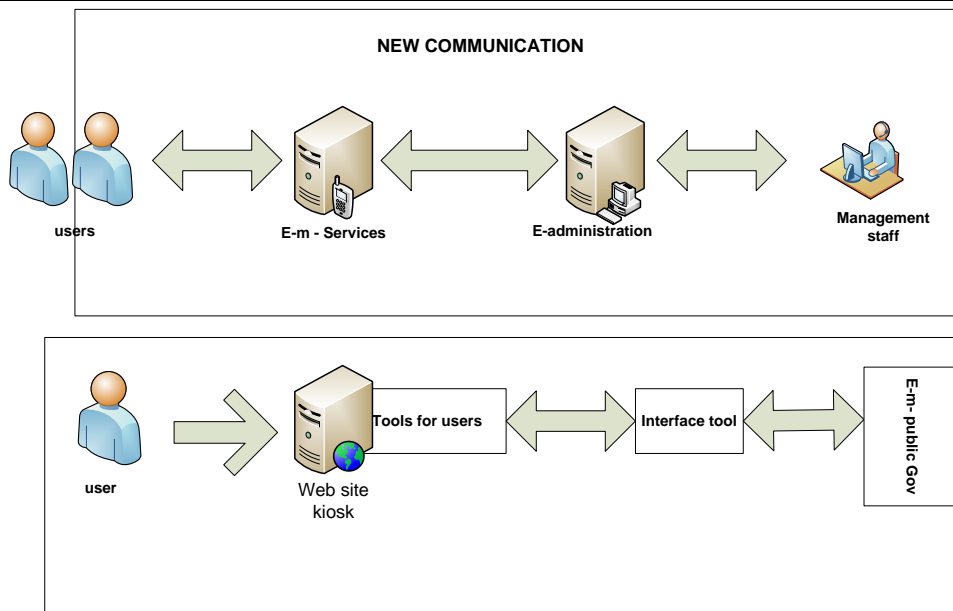
6. CONCLUSION

e-m-i-Administration will be able to fulfill only when its conceived and implemented as an unique system which should be:

- Rational, functional and compatible with the environment,
- That it was developed on a realistic approach (phased, modular),
- That it uses the latest technologies,
- To facilitate the integration of information and expert systems, and knowledge base,
- To allow Suiting to computer technologies in operating conditions.

Development of e-m-i-Administration means not only the introduction and use of new technologies, but also the transformation of existing procedural and organizational models within the public administration.

To be fully realized the concept of e-m-i-Administration and e-m-Services should be initiated in two ways: increasing computer literacy of citizens and construction of appropriate information infrastructure. These two activities are linked with one another, but it is essentially necessary to create the conditions that would lead to an increase in the number of Internet users by increasing the number of access points and the number of clients on a global network. In parallel, it is necessary to work on ensuring the infrastructure and security mechanisms enabling secure access to e-m-i-Services and leading to the establishment of interoperability, both in the domestic scene as well as at the international level.

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