Web based face to face e-Governance Systems

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Abstract. The information administrative services and their management so called e-Governance is collective, collaborative process. The aim of the paper is to present the research, experience and results of the use of Web based face to face oriented information and communication methods and tools for improving and democratization of the information administrative services and their management processes (e-Governance). The functions and architectures for the online face to face organized e-Governance systems are proposed. The pilot implementation of the Web based videoconference forms of collaboration as management meetings and educational events is presented, evaluated and discussed.

Kew words: e-Governance, administrative management processes, videoconference, transparency, electronic services satisfaction, functions, architecture.

1. Introduction

In the strategy Europe 2020 on "Smart, sustainable and inclusive growth" (EC, 2010), are given the main problems of the European Union, its priorities and goals until 2020 and the initiatives which will catalyse progress for each priority. The main priority is smart growth (develop of an economy based on knowledge and innovation), sustainable growth (promoting a more resource efficient, greener and more competitive economy), inclusive growth (fostering a high employment economy, delivering economic, social and territorial cohesion). The smart growth means that EU should ensure full use of information and communication technologies and that innovative idea will be lead to new products and services. The priority is supported with tree flagship initiatives. One of them is "Innovation union" and its goal is "re-focus research and development (R&D) and innovation policy on the challenges facing our society". At EU level, the Commission will work on speeding up setting of interoperable standards; streamline administrative procedures to facilitate access to funding. Other flagship initiative is "A digital agenda for Europe". Its goal is to "Speed up the roll-out of high-speed Internet and reap the benefits of digital single market for householder and firms". At EU level, the Commission will work on creating a true single market for online content and services, promoting Internet access and take-up by all European citizens, providing a stable legal framework.

In connection with these priorities nowadays the all European Institutions discuss the problem of the creation and regular work from single point to access to data sets produced and held by whole administrative space. According to the Decision No 922 of the European Parliament and of the Council on interoperability solutions for European public administration (EC, 2009) they have to follow these goals, to contribute their implementation and at the same

time to serve the citizens and business effective, efficient and collective work in conditions of transparency and predictability. At the same time they have to keep the principles of:

- openness;
- technological neutrality and adaptability;
- reusability of the documents;
- privacy and protection of personal data;
- security of data and services.

In Directive 2003/98/EC on the reuse of public sector information (EC, 2003) was planned that public sector bodies should promote and encourage reuse of documents, including official texts of a legislative and administrative nature in those cases where the public sector body has the right to authorize their reuse. The possibility for reuse can be improved by limiting the need to digitize paper-based documents or to process digital files to make them mutually compatible. Later it comes some recommendations and opinions about more effective application of the reuse of Public Sector Information in connection with Internet Things development (EC, 2010).

Until now this task is not full decided. But it is in close connection with interoperability of information, which is necessary for the realization of the Europe 2020 done task for "once access". Now days the idea for this task decision is to organize mobile (temporary) "one stop" work place or specialized regional centers. The problem is more impotent because it is also in connection with the task of Europe 2020 for ensuring the cross-border continuity of public services, crucial for sustaining mobility in Europe. For decision of this problem it is important not only the indicator "online availability" but "electronic services use" also. The value of the indicator "electronic services use" is under 30% (Krasteva, 2011). The main factors for these low results are:

- electronic services unsatisfaction;
- complicated and expensive procedure for production of electronic signature;
- limited Internet access;
- insufficient information about online services.

Consumers are satisfied with the speed and quality of the administrative services. But they want to achieve a higher degree of the contact in the interactive administrative service work. They want to communicate with its implementation and to be involved in its preparation also. This will avoid errors, misunderstanding and achieve higher efficiency. It is necessary to work in this direction, since it has reserves.

The procedure for certification and electronic signature are still complex and expensive. It is not always necessary. The idea for greater flexibility in the application of the electronic signature is imposed – for example such as greater use of the registration system. This is particularly relevant for services provided to individuals. Some best practice from the banking sector could be borrowed, also. Privacy Enhancing Technologies (PETs) have entered in to practice and could be more wide used.

The requirements to increase Internet access are very actually. They are summarized in two directions: (1) the penetration of broadband high speed Internet and (2) use of the trend of the extremely wide use of the mobile services to achieve hardware and software independence.

Overcome the deficiency of information about online services is closely connected to the system of continuous education and its adapting to solve the problems in this area. The question of dissemination of "good practices" and even the extraction of implicit knowledge of them remains open. This is particularly important for the sustainability of the e-Governance processes.

Research consulting firm Capgemini conducted by the European Commission in late 2009 (Krasteva, 2011) shows that the greatest impact on the low level of the indicator "electronic services use" has the factor "electronic services satisfaction" (fig. 1).
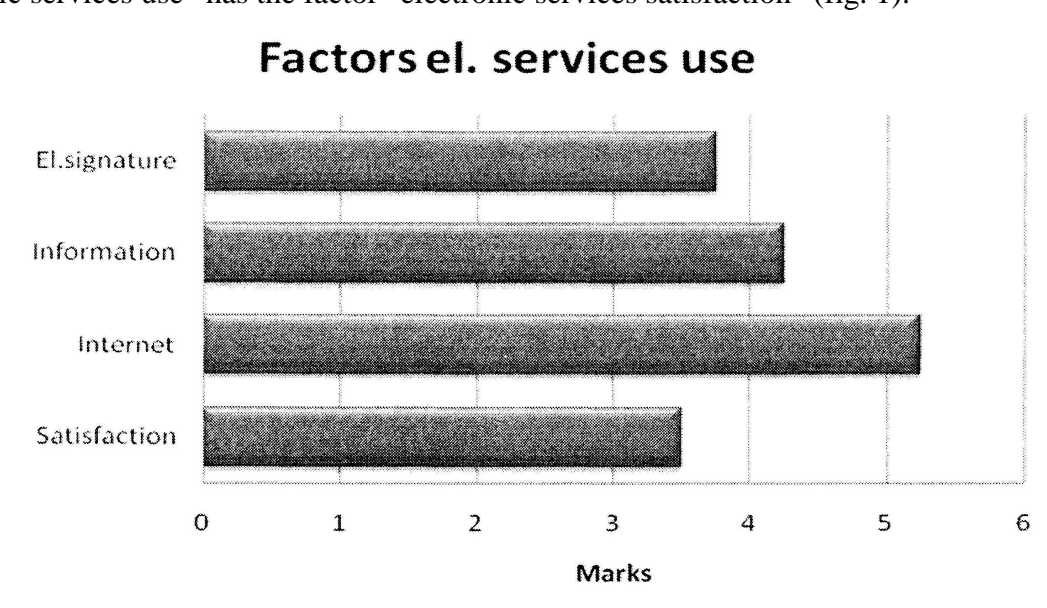

Fig. 1. Influence of the factors for "electronic services use"

In the field of administration management processes the bodies are organized hierarchically. with a lot of levels for implementation of various operational, tactical and strategic functions (Tsankova, 2008). The administrative management process is organised in tree management levels: (1) operative in our case municipalities; (2) tactic in our case regions; (3) strategic in our case central government (Marinov, &Tsankova, 2011). Like invariant process the administrative management includes all management stages: planning, controlling (accounting), analyses and decision making, regulation and generally is connected with all its resources. All these requirements have to be alienated to receive satisfaction results of the administrative services and "electronic services satisfaction".

2. **Theoretical aspects and methodological decisions**

Nowadays there are four stages in the development of the public management theory (Tsankova, 2010):
- Cybernetic Sense
- New Public Management
- e-Governance
- e-Democracy

According to management theory in Cybernetic sense every management process including e-Governance is hierarchical, invariant (Wiener, 1948) and involves the stages: planning, accounting, analysis and decision making, regulation. It is realized under management object in our case – administrative services. In the case of public administration this means that the whole administrative management process in all its stages and levels has to be in close connection with citizens, so it must be citizen oriented.

The New Public Management (NPM) has added the principles and indicators of effectiveness and efficiency in the whole management process (Manliev, 2006) with its stages-planning, accounting, analysis, regulation. It adds a market oriented approach into manage the public sector. In practical aspect this lead to involve "one stop"` technology in the administrative services.

The e-Governance includes the use of information communication tools in the administrative management process. Thereon i2010 it was necessary to create a single contact point for administrative services. The basis decision was the free access through Web portal (Siemens, 2008). Everybody even without any registration could visit the Internet site to see the information about every administrative service or just to download an application form. The stakeholder can see the functional, structural and information characteristics of the services. The portal`s aim is to provide Internet access to quality administrative services to the citizens and institutions, which are interested, including the business and the people with disabilities. It helps to integrate the information systems, which are used in all administration levels. Gratefully its development is a basis for the opportunity to contribute to the last fourth stage of the online administrative services:

- Information – the administrative authorities upload information to their Internet site about their status and administrative procedure, which is accessible to everybody.
- One-way interaction – the authorities upload information to their sites and give an opportunity to download application forms.
- Two-way interaction – the client can send completed forms to the administrative units electronically, but they are not duty to respond him on-line.
- Full transaction – the on-line interaction between stakeholder and administrative authorities, in such way that the customer to receive the final documents on-line.

The last stage in administrative management process is e- Democratization, which involves exclusively new functionality. The citizens would like not only to receive planning and accounting information but to participate in decision making also. They would like to be involved directly in the whole administrative management process. This is in the close connection with satisfaction of the administrative management processes and leads to more wide use of the on line administrative services.

2.1. Functionality aspects.

The administrative management process is process of collaboration between administration and stakeholders of administrative services (Marinov, &Tsankova, 2011). There are three forms of the on-line collaboration between them: communication, interactive collaboration and face to face collaboration. All four management stages (planning, accountability, analyses and decision making, regulation) could be subject of collaboration also.

Communication can be thought as exchange of unstructured information. For example typical applications for this collaboration form are Phone call, e-mailing, Instant Messaging (IM). Communication enables the achievement of openness, understanding and awareness of users of information services. Unresolved issues remain these for full transparency and involvement of users in the preparation and decision making.

*Interactive collaboration*l refers to interactive work toward a shared goal, for example via brainstorming, conferencing, social networking through the technology WEB 2. In this case, it is achieved by providing some empathy of customers and dialogue between administration and users, but there is no guarantee of consistency. It is also possible and manipulation of users opinion for external purposes.

Face to face collaboration refers to complex interdependent work to achieve a shared goal. A good example for understanding this is the work of a project team or a sport team. At the moment the world wide disseminated tools for face to face collaboration besides on Internet based telephony (Skype) and videoconference technology. In this case is realized not transparency only, but participation, empathy and involvement of the citizens into administrative management process at hole. It is difficult to achieve manipulation of opinion for external purposes.

We will pay attention on the use of videoconferencing for the face to face administrative management purposes because it is tool for decision of all four above considered problems for the low value of the indicator "electronic services use". At the first place it presents a possibility for high transparency and real life participation. Videoconferencing is an information-communication technology, which gives to the participating in the information transfer parties an opportunity to connect and interact within the framework of the ongoing processes while taking part in a multidirectional interactive communication. From the beginning it was used for control operations in: transport (Baker, 2011), security systems (Wainfan, &Davis, 2004), law administration, etc. After that it was used in the distance learning.

According to our investigations videoconference technology is usable in all administrative management levels and processes. We raise the hypothesis, that it could be helpful and effective to receive full satisfaction of the citizens from the on line administrative services.

- Managers from all levels to carry out a direct contact with public, private and social institutions as well to organize various remote activities (meetings, seminars, deliberations, e-democracy events, etc.). In addition could be organized without paper meeting's protocols. Besides it could be reduced and make minimum the corruption.
- Staff members from different departments and institutions have the opportunity to get into contact and interact with their managers and each other over high speed and secure connection, analyzing and sharing both - information and ideas (team building and team work).
- The external subjects (clients) of the organizations in the public and private sector receive the opportunity to visit and interact with persons in charge of the various organizational units of the institutions and business offices that interested them without the need to leave their position. This means that it could be used for collective trans border project work.
- It is possible to organize parallel, multi-purpose performance of different administrative and management processes (parallel presentation of the processes in back and front office for example for the purposes of a single point access). It will be possible to organize heterogeneous network with PC and mobile devices like GSM, smart phones, tablets etc.
- It will possible to organize face to face remote electronic training of the staff (Howard, MacLaughlin, &Supernaw, 2004). The control functions like examines and tests are very light and secure organized. The consultation could be remote given also.

As is shown on figure 2 for the group of factors for improving the usage of electronic services the correlation in the operational, local management level between "electronic services satisfaction" and indicator "electronic services use" is very closed in comparison with other factors. This means that the electronic forms of transparency and directly involvement in decision making process like videoconference are more preferable. The similar is situation with the factor "insufficient information about online services". The deficit of information about online services is closely connected to the system of continuous education and the distance form of learning. This once again shows that the use of face to face videoconferencing could be very helpful in this case.
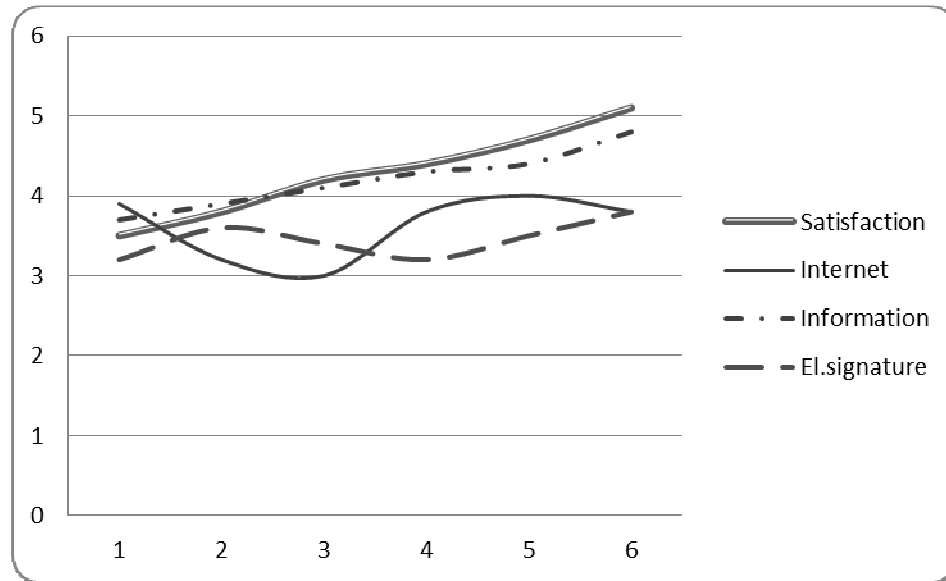
Fig. 2. Correlation between "electronic services satisfaction" and "electronic services use"

The group of criteria for improving the effectiveness of the application of the videoconference processes includes:

- operational i.e. accelerating stages of coordination and reduce the total length of processes;
- reducing travel costs;
- daily expenditure saving;
- employers time saving;
- decision making partizipation acceleration;
- technical expenses.

Our analysis in this group of criteria shows that the effectiveness of the administrative management processes after involving the videoconference technology is with above 10% smaller expenditure.

2.2. Architecture

The architecture of the "single point access" system with videoconference can be constructed as an extended three tier online based system for administrative services. For example, suppose we have three tiers architecture with Web based applications for administrative services. The consumers, citizens, institutions and business are able to connect to the system with various conventional channels (fig. 3). In general it is formed three tiers: (1) the input of requires for Web based services, (2) management user logic including videoconferencing and (3) institutional data based management systems. The input tier includes first of all security functions as proxies, firewalls, etc. and could be organized as a cloud computation in regional centers. At the second tier – management user tier- the user queries are elaborated through Web portal. In this way is realized the principle of "single point access". When processing requires videoconferencing system that is Web based, it will operate at this tier. On this tier has to be involved software for data exchange and transfer among the institutions, with which can be reach interoperability and reuse of the administrative information. The third tier includes the different institutional registers, organized like Databases, managed by own Database Management Systems and accessed by Meta Database.
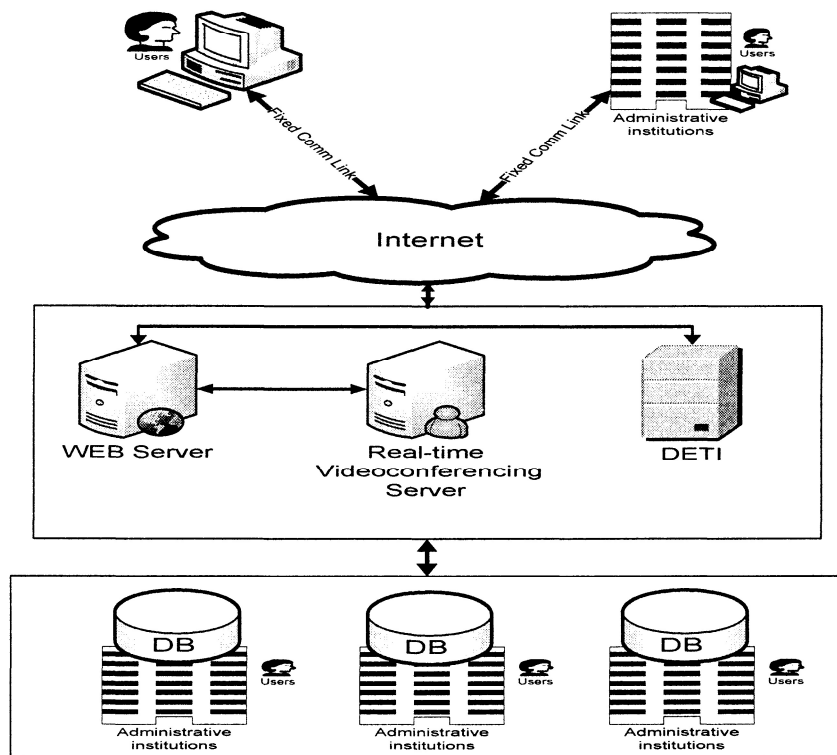
Fig.3. Extended three tier system for Web based administrative services with
videoconferencing

The including of input through mobile devices will require presentation by two cluster's
access respectively to the global Internet network and mobile network - fig. 4.
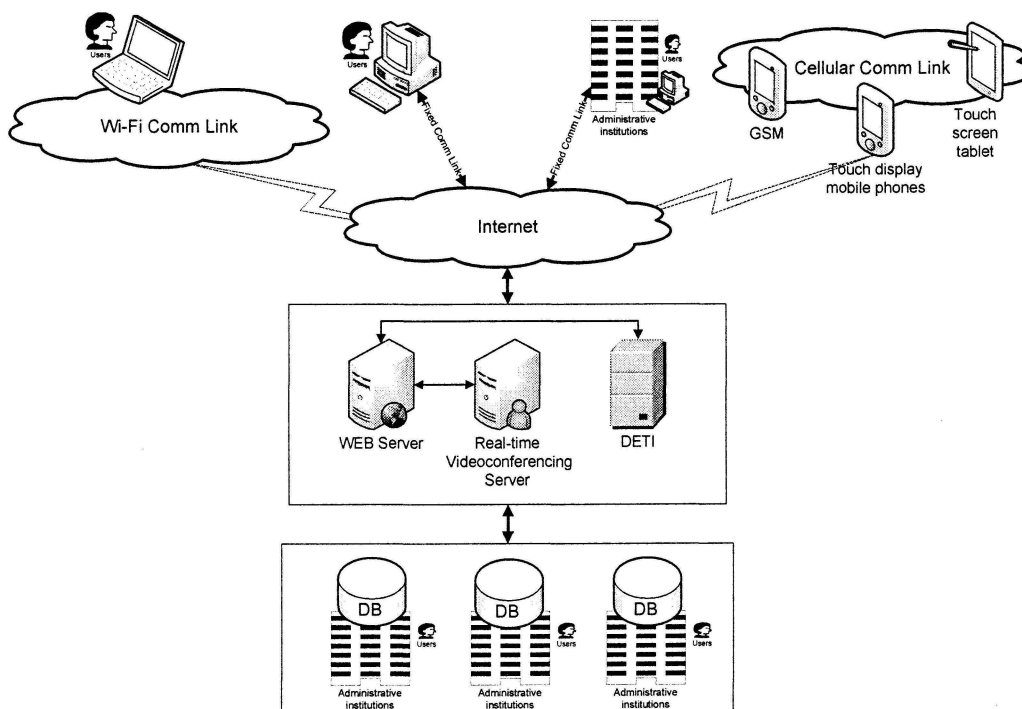
Fig.4. Extended three tier system for online face to face heterogeneous access to administrative services

3. Implementation

The main reasons to propose videoconference technology for use in e-Governance processes are its available costs and the possibility to give higher degree of openness, transparency, visibility, user's participation and satisfaction in the real processes. The videoconference allows to two or more participants from different locations to communicate via live two-way (interactive) audio and video connection (http://fman.tu-sofia.bg). In managerial aspect the videoconferencing could be classified on: one-to-one, one-to many, many to many centralised or decentralised connected points. In technical aspect the videoconference could be classified on: desktop based, laptop based and heterogeneous.

Our first experience was with one to one remote videoconference connection in the field of education. It was organized like a remote course work MS Power Point presentation - fig.5. This event includes process of presentation with two-way interaction between lecture and student and also the course work assessment. On the screen are shown three processes: the student with its presentation, the lecturer questions and process of assessment.
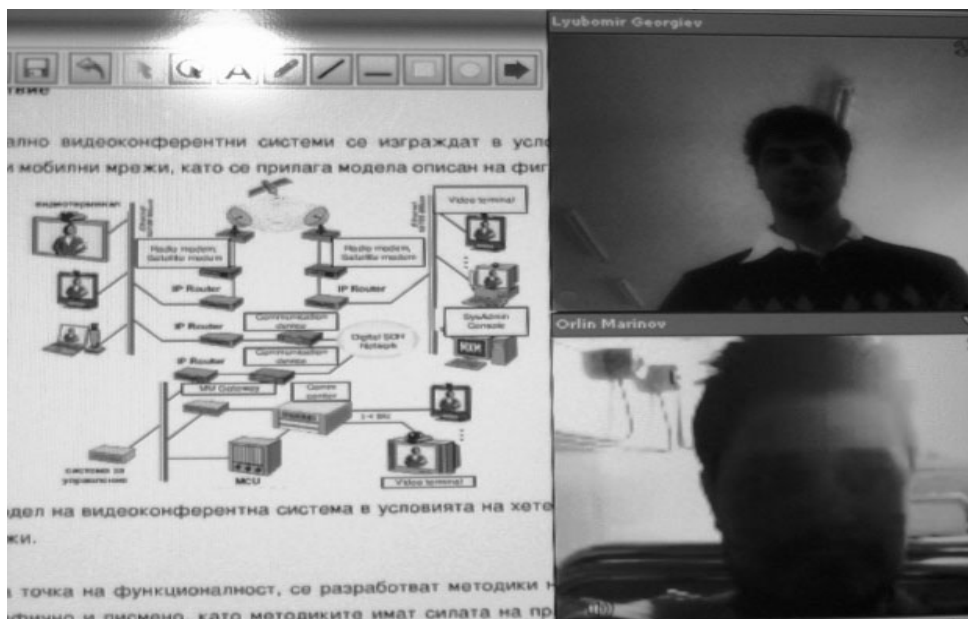

Fig.5. Remote course work presentation

The multipoint interaction was realized in two next events:
1) For the synchronization of the administrative services between front and back offices in "one stop" office in municipality. The citizens, which are in the front office could observe and participate in their real administrative service.
 2) For multipoint communication during III International Scientific Conference for e-Governance in the town of Sozopol during June 2011, done on fig.6. On the screen are shown: the participants with papers from three different remote points, their real presentations and the real conference room with on-site participants.

Fig.6. Multipoint communication during III International Scientific Conference for e-Governance – Sozopol'2011.

Our experience shows that the videoconferencing systems give basic advantages to organize on-line face to face administrative management processes. The main results are such as:

- Secured access - the distance interaction enables that both the information and the activities reach to a wider group of staff members and correspondents, who at the moment are prevented from being physically present on these events.

- Catering for a wider group of clients.

- Adoption of new technologies and medium - the public and business institutions could have adapted the distance interaction as a means of reacting to the ups and downs of the market situation by reducing the number of unavoidable business trips.

- Widening the possibilities, visibilities and openness of e-Governance.

- Increasing of the effectiveness by reducing the number of trips – enables that the business travels can be decreased and even avoided which leads to cuts in the costs of transportation, increase of productivity of the labor through lessening of the regulated business absences, decreasing in the amount of the materials needed, communication at regular intervals with wider group of participants is achieved.

- Increasing of the efficiency of e-Governance because minimize of waste of time.

- Convenience and flexibility for both those employed and the clients – the employees and the clients are not restricted from fixed dates and hours like in the regular working process which is confined to a certain working time and with the necessity of physical presence.

Most of these techniques were tested in various environments. This includes business and public administration subjects of governance and education in public administration and governance.

The main problems for implementation of such solutions are two. First of them – there are large number of people working in public administration that do not wants to change their way of working voluntary. Second – some of the local governance authorities does not have enough resources for even buying a computer, which meets minimum technical requirements.

4. Conclusions and recommendations

Pilot solutions on use videoconference in information administrative services and its management – e-Governance show that it is suitable to receive more transparent, visible and user satisfaction administrative management processes. Videoconference technology, which synchronizes the parallel operation of back and front office in a "one stop" organization in face to face manner, gave a very good result in the municipality of Blagoevgrad. Multipoint links with the our country and abroad for remote education and conference reporting demonstrate the effectiveness and efficiency of this technology in information management processes. In further work the scope of current solutions can be extended to include mobile network architecture for testing there. This will build heterogeneous video system with more wide functionality - fig. 7. For example the initialization of the meeting could be done via GSM or smart phone. The meeting results could be presented in paperless form.
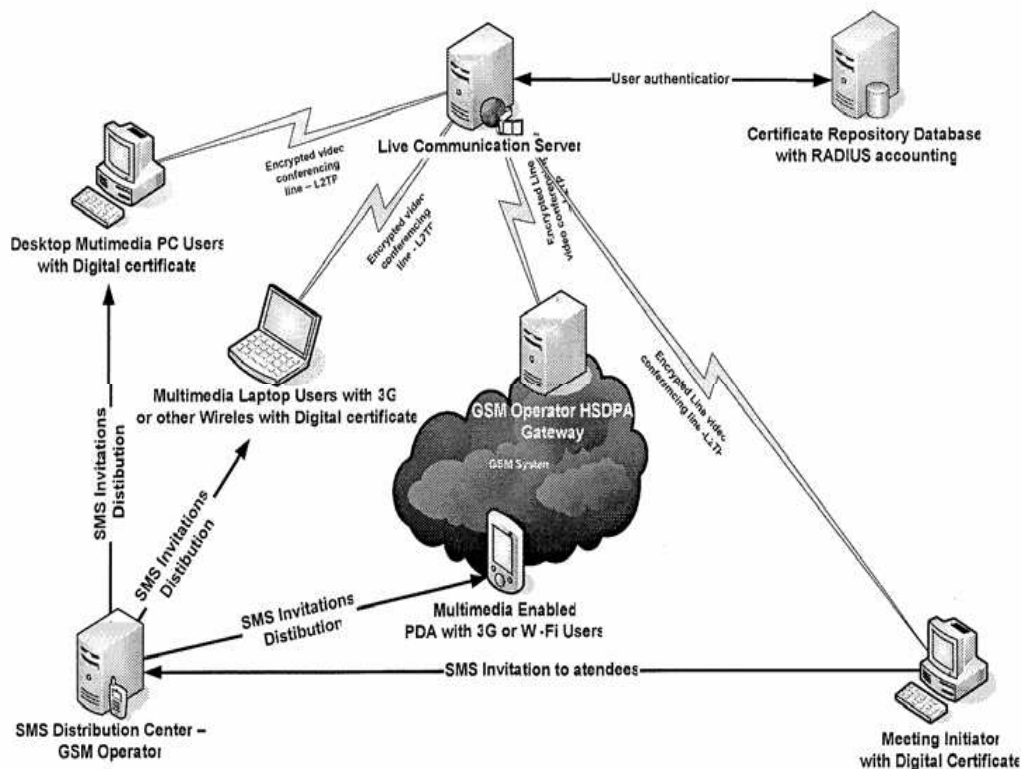

Fig.7. Architecture of the heterogeneous videoconference system

Videoconferencing systems with heterogeneous mobile networks can be used for:
- written correspondence in close succession;
- synchronous or asynchronous consultations through the Internet;
-retranslation of telecourses (or telecasting) broadcasted over the radio/television;
- learning with records on digital media (CD-ROM/DVD, etc.);
- learning with remote control access (Pocket PC/Smartphone, etc.);
- integrated activities for remote conferencing – integration of life sessions with organiser for a group of team members on a given task or field.

The fast development of the mobility devices will give many new ideas. In this case main task will be the connection of the two networks.

All these results are achieved during the national project implementation "Research and educational centre for e-Governance", with the financial support of the Bulgarian National Science Fund.

There a lot of work to include these results in the real life. One of them - to make these technologies widely available for local level public administration passes through low cost videoconference multimedia hardware device implementation.

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