ICT STRATEGY REPORT

for the Ministry of Justice and Public Administration of the Republic of Serbia

Final Report

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1. EXECUTIVE SUMMARY

This "ICT Strategy Report" document of the "Consultancy Services to Develop an ICT Strategy and Implementation Roadmap for the Justice Sector in the Republic of Serbia" project is the result of project work conducted between March 2012 and June 2013. This report is the first of its kind in the history of Serbian Justice Sector, which demonstrates the increasing significance of Information and Communication Technologies (ICT for short) in the everyday operations.

The new Justice Reform Strategy of Serbia formulated 5 high level expectations towards a modern Justice System:

- Independence
- Impartiality and Quality
- Competence
- Accountability and
- Efficiency.

The Management of the Ministry recognised that ICT tools (formulated as e-Justice) are indispensable assets to carry out the Reform Strategy.

In fact, the creators of this ICT Strategy report, together with the experts within the Ministry and other Justice Sector organisations did not regard the development of the Information and Communication Technology as a goal itself, but instead they were investigating the possible ways how ICT may contribute to the overall Justice Reform Strategy.

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Moreover, several donor organisations are providing funds for the modernisation of the Justice Sector and significant part of these funds is being spent on the implementation and modernisation of Information Technology tools. In order to efficiently allocate the available funds in the future it seemed necessary to construct an overall expert recommendation and strategic plan for the ICT. Therefore the major objective of the ICT Strategy formulation project was to "Develop a comprehensive ICT Strategy for the Justice Sector in the Republic of Serbia to guide the development and implementation of ICT policies, ICT infrastructure, Information systems and ICT human capital."

This ICT Strategy Report demonstrates the overall ICT goals and recommends Strategic actions towards the experts recommended ICT vision.

Experts recommended ICT Vision

The Experts recommended ICT Vision depicts the desired state of ICT in the strategic time horizon of 5 years. It formulates overall characteristics for the operations and the major themes of this recommended vision are:

- **Unification** – to unify ICT methods, tools, applications and competences across the sector in order to provide the same high quality user experience for each end-user and institution
- **Service orientation** – to regard end-users and institutions as customers of ICT with their business needs and well balanced with the opportunities and potential of the ICT organisation and architecture. ICT organisation should focus on provision of business grade ICT offered "as a service"
- **Optimisation** – to utilize "best for value", "market available" resources for efficient ICT service
- **Professionalism** – to constantly develop the ICT staff and ICT processes by proper trainings, motivation system, performance measurement and well defined operational roles in order to keep pace with the development of technology and the changes of business expectations. Enhance the ICT human resources to enable highly competent service and support

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- **Consolidation** – to use internationally recognised standards for ICT service provision and to utilise economies-of-the-scale considerations by concentrating the technical and human resources in order to provide efficient services

The overall ICT Strategy is based on "IT as a service" (ITaaS), which is an operational model where the ICT organization of the institution is run like business, acting and operating as an internal service provider.

In regard of Architecture, the major characteristic elements of the Experts recommended vision are:

1. Application systems should be uniform for the similar institutions and should be developed, implemented and operated from central Data Centres or to be locally operated with Central Backup Data Centre (all data daily synchronized in one place).
2. Wide Area Network and Local Area Networks should have the required capacity and reliability to access the central applicaiton and database servers
3. Architecture elements should be designed and implemented in a way, that their services should provide the required functionality for end-users, they should be resilient to changes of the expectations and they should interact with each other to reduce manual work. Middleware should facilitate interoperability and information exchange between external systems and if it is necessary between various internal solutions.
4. New or upgraded application systems should significantly reduce the amount of paperwork by implementing secure digital communication methods and channels for information exchange
5. Design, implementation and operation of various components of the ICT architecture should be done in a way to ensure best value for money at every moment in the future
6. The Justice Sector ICT should be properly defended against security threats and temporary or permanent outages

In regard of Organisation the major characteristic elements of the Experts recommended vision are:

1. There should be a centralised ICT unit or organisation inside of Ministry of Justice and Public Administration (in accordance with Ministry's systematization or future vision and possibilities) with motivated and skilled staff members, whose overall responsibility areas are

   o Strategy and Monitoring to monitor the execution of the ICT Strategy and to continuously align the Strategy with the business needs
   o Execution and Development to manage the ongoing projects
   o Support and Coordination to prepare regulations for ICT operations and to provide operation and maintenance services

2. There should be a centralised Service Desk to provide 2nd level support for end-users, while 1st level support should be at the local ICT organisations
3. Local ICT operations at the various institutions should be carried out by local ICT staff
4. A well formed motivation system is at place which emphasises professional training, career advancement and continuous feedback in accordance with the actual legal framework (Law on Civil Servants ("Off. Gazette of RS", no. 79/2005, 81/2005 - corr., 83/2005 - corr., 64/2007 67/2007 - corr., 116/2008 and 104/2009)

In regard of Governance, the major characteristic elements of the Experts recommended vision are:

1. ICT processes should be well defined, documented at all levels and clear responsibilities are assigned for executive and monitoring roles.
2. These processes should be communicated for the end users with special care for ICT security related processes
3. Key ICT processes should be supported by specialised ICT tools and methodologies
4. ICT performance should be measured and regularly reported to management of the Ministry

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5. It would be useful to follow standards in this area for example COBIT framework (Maturity of ICT processes should generally be raised to the level 3 or 4 from the currently typical levels of 1-3, thus providing a more effective and efficient provision of services).

Strategic goals

The above Experts recommended Vision of the Justice Sector is the description of "How ICT services and operations should look like in a 3-5 years time?" In more detail it formulates ICT goals using the Balanced Scorecard approach, which examines possible ICT goals from four perspectives:

- ICT services as the internal and external customers (end-users) may see them
- ICT procedures and operations which are needed to provide the required services
- ICT staff and end-user competences, attitudes needed for high quality service provision and continuous self-development
- ICT financing capabilities needed to provide proper financing and mechanisms to reach the goals.

The ICT goals were arranged according to the above four perspectives and the contribution of goals for reaching other goals were also depicted.

To enable simpler handling of the ICT goals, they were grouped into 18 High level ICT goals, which are the following:

1. Establish professional, service oriented organization
2. Establish central, well-structured, sector-wide organization
3. Ensure sustainability through "service life cycle management"
4. Ensure full governance through service performance measurement
5. Introduce Service Help Desk to provide support
6. Ensure sustainability via proper financial (budget) management
7. Ensure high quality user experience
8. Ensure supportive working environment
9. Ensure high availability and reliability
10. Ensure high efficiency
11. Ensure information security
12. Increase knowledge and proficiency
13. Ensure widely available web-based services for all users
14. Maintain various delivery channels and stimulate usage of modern ICT resources
15. Ensure vendor-independent service architecture
16. Ensure vendor-independent communication architecture
17. Ensure vendor-independent interoperability and information exchange architecture
18. Good balance of internal and external services with efficiency in mind

Recommended Strategic Actions

For all of the above Strategic goals, several Strategic actions were defined and recommended by the Consultants. These Strategic actions are specific to-do's to support the achievement of the goals. Since the prioritisation and the decisions on the execution of the individual Strategic actions are the Ministry's responsibility, the set of Recommended Strategic actions may be regarded as a menu to select from, depending on the possible funding and other circumstances.

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2.   INTRODUCTION

The last phase of the *"Consultancy Services to Develop an ICT Strategy and Implementation Roadmap for the Justice Sector in the Republic of Serbia"* project developed the ICT Strategy Report. This report is an extension of the previously delivered and accepted Penultimate Report containing a detailed description of the recommended Strategic actions.

These recommended Strategic actions form a set of **possible** development activities (because in coming years there could be some changes in strategic actions) during the upcoming 3-5 years.

The main sections of the ICT Strategy Report are the following:

- Recommended Strategic goals

   This section describes the desired state of the Justice Sector ICT in terms of ICT goals. The ultimate question answered by this section is: **Which are the key future goals of ICT to efficiently support the objectives and what are the circumstances to reach these goals?**

- Recommended Strategic actions

   This section provides a detailed analysis of the 18 identified ICT goals in terms of their current status, their desired state and finally the proposed Strategic actions to work towards the goals.
   The ultimate question answered by this section is: **What are the recommended Strategic actions to reach the actual future state of ICT and under what possible circumstances should they be implemented?**

- Annex

   Description of the used methodology plus further details related to the ICT goals, the preconditions and execution of the Strategic actions together with an initial cost and resource estimation recommended by Experts.

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3.   RECOMMENDED STRATEGIC GOALS

This Section contains the overall Expert recommended vision of the ICT within the Justice Sector, together with the ICT goals to be achieved within the strategic time horizon. The goals provide the basis of detailed planning of Strategic actions and are the following:

1. Establish professional, service oriented organization
2. Establish central, well-structured, sector-wide organization
3. Ensure sustainability through "service life cycle management"
4. Ensure full governance through service performance measurement
5. Introduce Service Help Desk to provide support
6. Ensure sustainability via proper financial (budget) management
7. Ensure high quality user experience
8. Ensure supportive working environment
9. Ensure high availability and reliability
10. Ensure high efficiency
11. Ensure information security
12. Increase knowledge and proficiency
13. Ensure widely available web-based services for all users
14. Maintain various delivery channels and stimulate usage of modern ICT resources
15. Ensure vendor-independent service architecture
16. Ensure vendor-independent communication architecture
17. Ensure vendor-independent interoperability and information exchange architecture
18. Good balance of internal and external services with efficiency in mind

Establish professional, service-oriented organisation

Progressive ICT units or organisations inside of Ministry of Justice and Public Administration (in accordance with Ministry's systematization or future vision and possibilities) act as if they were market driven "companies" whose major aim is to deliver solutions to their in-house clients. This attitude-change which emphasises "value for money" approach instead of pure technology approach will lead to more satisfied end-users, better balanced expectations and efforts and in overall to most efficient and effective investments and operations. Highly achieving professional ICT can be only the result of highly achieving and motivated ICT staff. Although the motivation possibilities are limited by budgetary constraints, yet there are human resources management practices which help staff motivation. **This change will ensure that the ICT units or organisation may manage resources more efficiently, and focuses on the real needs of the participants of the Justice Sector.**

Establish central, well-structured, sector-wide organization

Well-established, fully operational and central ICT units or organization inside of Ministry of Justice and Public Administration (in accordance with Ministry's systematization or future vision and possibilities) within the Serbian justice sector, which has the authority and capacity to cooperate and fulfill the needs of all Justice sector institutions and stakeholders. The organization should be dynamic, which will allow it to quickly adjust itself internally in response to any future changes. **This will ensure that the ICT units or organization can be resilient for the future transformations of the sector in Serbia and continue to support all interested parties and stakeholders.**

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Ensure sustainability through "service life cycle management"

Service Life cycle management is a continuous activity covering the design, implementation (aka. transition) and operation of the ICT services. Its major focus is the evolvement of the services: that is the operational experience and the changing external or user-expectations lead to newer and newer improvement cycles of the services. The ICT organisation should adapt to this ever-changing approach since the Justice sector and the expectations are far not static. **By achieving this goal, the alignment of ICT services, systems, processes with the business needs can be continuously ensured.**

Ensure full governance through service performance measurement

It is a general management fact, that only the subjects which can be measured can be managed. This is especially true for ICT services, where the subjective evaluation of end-users may differ from that of the ICT staff. ICT operation performance measurement is not a goal in itself, but a tool for continuous alignment of ICT goals and business expectations, for balancing service quality and costs, and for communication of the achievements of ICT. **By achieving this goal, the real expectations towards ICT may be in balance with the performance contributing to a more efficient and financially effective ICT.**

Introduce Service Help Desk to provide support

A centrally operated (yet locally served) Service Desk provides one stop shop interface between the end-user and the ICT organisation, which accepts the requests, manages the solution, escalates the problem to higher level if needed and provides feedback to the end-user. **By achieving this goal a uniform service can be provided to every end-user of ICT in terms of quality of service and response times.**

Ensure sustainability via proper financial (budget) management

Although heavily dependent on nature of the implemented ICT component, initial investments of ICT systems usually comprise less than one third of the total of operations costs over their life-cycle. To sustain appropriate level of services to end users, the operational environments, the user support channels and the costs of operational activities should be established and budgeted. Because of the budgetary limitations, most of the ICT developments are financed by donor organisations. These organisations require careful planning, effective and efficient spending of the funds on their projects. The developments are to be aligned with long term strategic Expert recommended vision of the Justice Sector and must contribute to common values of transparency, equal access and others. **By achieving this goal, the alignment of ICT systems and changing business expectations and also the provision of necessary resources can be ensured.**

Ensure high quality user experience

End user satisfaction relies on the overall performance of the systems they are using. Performance is partly the result of functional richness of the systems; partly result of the end-user environment they are working with. End user environment should not be a bottleneck for ICT services and its efficient management is a key component of high quality services. **By achieving this goal, end-user support towards the business process improvements may be ensured, thus contributing to a higher efficiency of the processes.**

Ensure supportive working environment

The ICT systems which support the core processes of the Justice Sector are in transition. Some of these systems were implemented during the recent years or are just being implemented at all, or pilot institutions. Any decisions related to these core systems determine the ICT support of the processes for several years and they

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all have very high budgetary influence. Because majority of the end-users are participants in the core processes, the provision of functionally rich and high performance applications is the key contributor to user experience. **To achieve this goal, the core ICT systems of the Justice Sector must provide the required support for the major processes across all institutions for the next several years aiming the introduction of uniform ICT system (improving and connecting existing solutions or introducing all new solution).**

Ensure high availability and reliability

Strong support from end-users may be expected only if the execution of their tasks with ICT systems is not cumbersome. This means acceptable performance of workstations, network, printers and other equipment with minimal downtime. Supportive working environment is partially a question of investment, but also rationalisation of available resources and a proper, predictable service whenever any unexpected event occurs. **By achieving this goal, end-user support can be gained which contributes to higher performance in judicial procedures and to a more effective allocation of funds.**

Ensure high efficiency

Fragmented development and operational efforts within a company or a governmental sector may cause sub-optimal allocation of resources via parallel implementation of similar functions. Without a single point approach on commonly used tools and methods, same procedures may be are re-invented at various parts of the organisation. Another danger is the incompatibility of independently devised solutions and the large effort needed to implement overall changes. The primary answer to these challenges is the strengthening of Ministry's regulatory and control functions over ICT and the unification of services, methods and tools used within the Justice Sector. **By achieving this goal, optimal usage of resources may be ensured and the overall ICT architecture becomes more resilient to changes.**

Ensure information security

Regarding the sensitive nature of information gathered and handled during judicial processes, information security (and personal data protection) has a distinguished role. Strengthening information security is a journey to strengthen technical measures, development of security-related processes and to principally raise awareness of users. **By achieving this goal, the trust towards the Justice Sector can be deepened.**

Increase knowledge and proficiency

No modern ICT tools can be efficiently used without fully knowledgeable users and supporting staff. Moreover ICT-related decisions of the management heavily influence long term success or failure of the operations. Confident actors can utilize the full power of the ICT systems, in contrast: under-skilled actors will not only make more errors, but will find circumventing solutions to avoid usage of ICT tools. Moreover knowledge exchange between actors in the same role significantly contributes to increase efficiency of work by avoiding the need to "reinvent the wheel". By nature of the Justice sector, knowledge exchange is especially crucial for legal practitioners in the field of case law, which needs significant ICT support. **By achieving this goal, the efficiency of the systems will be raised and new opportunities are opened to conclude better decisions or to further simplify the procedures.**

Ensure widely available web-based services for all users

Web-based services for participants of judicial processes and for the general public open opportunities to take part in the processes and to access information without limitations on location and time. These services may contribute to easy access to information on case law, legal database of national and EU sources of legislation,

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to the reduction of paper based documents, and to the central operations and management of the web-base technologies provide efficient ICT support environment. **By achieving this goal, judicial procedures may be sped up, require less human interactions and contribute to better transparency. Moreover providing up-to-date information on the legal system (case law, legislation) to the general public may increase the trust in the legal system and contribute to better adherence to the law.**

Maintain various delivery channels and stimulate usage of modern ICT resources

One important aspect of interactions with "clients" of the Justice Sector is the channel of communication. Traditionally the direct face-to-face communication and the official postal mails served as vehicles for information exchange. With the broadening of technical opportunities, the physical movement of information is replaced by electronic channels which are much more convenient and cheaper is some cases. For example, usage of e-mails, SMS's, smart phones, tablets, and web portals may significantly reduce the time and cost of communication. **By achieving this goal cost savings and equal access to all can be achieved.**

Ensure vendor-independent service architecture

Justice Sector is a strongly regulated area and all regulatory changes must be reflected in the operational processes. Thus it is essential to have an ICT architecture which is robust, yet flexible to the changes. The monolithic approach is hard to adapt to the changes but it is easier to manage, implement and maintain, experts opinion and recommendation is to build the architecture from smaller building blocks which can be easily integrated with each other, with as small modifications as possible. Standardised technologies and interfaces between the building blocks also contribute to avoidance of vendor-lock-in. **By achieving this goal in line with experts recommendation the ICT systems of the sector will be easily adaptable to the changing external and internal expectations, but monolithic approach has its advantages as stated.**

Ensure vendor-independent communication architecture

Communication infrastructure is a key element of modern ICT architecture, especially if the various institutions rely on information exchange in order to execute their everyday tasks. Efficient remote operation of ICT applications is also relying on highly available and robust communication architecture. On the other hand to build and maintain a dedicated communication network accessible for every Justice sector institution is very costly. Therefore an optimal solution must be found in which either governmental resources are used, or the architecture is a proper mix of own network segments (until functional without investing in replacement) and network segments of competing third party suppliers. **By achieving the goal, highly reliable and performing communication links can be established with minimal risk of vendor-lock-in.**

Ensure vendor-independent interoperability and information exchange architecture

Seamless integration of workflows of various Justice sector institutions can significantly raise the efficiency of internal procedures by reducing the amount of tedious manual work and paper based operations. This can only be established if the information exchange between the institutions is based on internal interoperability standards relying on Serbian National Interoperability Framework and which is flexible to any required changes. **By achieving this goal, the workflows may adapt to changes of external expectations or internal process improvements with smaller effort and with lower risk of vendor-lock-in.**

Good balance of internal and external services with efficiency in mind

Considering economies of scale, some ICT services/activities are better to be acquired from vendors than to be provided by internal staff. This is especially true for technical and human resource capacities which cannot be

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fully exploited by the Justice Sector itself. It is always a hard task to find the proper balance considering the economic, regulatory, security and reliability factors. . **By achieving this goal, the boundaries between in-house and outsourced services should be clear and not to be mixed, thus contributing to the provision of high level services with acceptable costs.**

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4. RECOMMENDED STRATEGIC ACTIONS

This section details the high level Strategic goals and their associated Strategic actions.

4.1 ESTABLISH PROFESSIONAL, SERVICE ORIENTED ORGANIZATION

4.1.1 INTRODUCTION

Service oriented ICT organization focus not only on the technical solutions, but they behave as "vendors", keeping in mind customer satisfaction, alignment with business and money for value. Service orientation is an attitude of full ownership by ICT, ownership for functionality, issue handling, problem solving, security, high availability, end-user support, training and several other aspects. Usually services are what the users regard as a service and not the technology functions of ICT. For example, end-users are considering the total up-time of an application; they are not interested in the individual availability of their workstations, network, servers, and database.

However service orientation does not mean satisfying unlimited expectations, since services are accompanied by rules, service levels. Therefore the services need to be precisely catalogued, their parameters are carefully defined and agreed on by the business.

Service provision has a lot of technical requirements (for example a centralised Service Desk which is described later), but the key element if the ICT staff. ICT staff members should be open, customer and problem oriented, communicative and proactive.

In order to achieve service oriented ICT operations over the whole Justice sector, highly motivated and trained staff is needed. Additionally reducing staff turnover can further increase the quality of the work delivered by the employees. Staff motivation put emphasis on different motivational factors.

Some of the motivational factors are limited by legal constraints (i.e. law on public servants).

4.1.2 MAJOR DEVELOPMENT ACTIONS

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. Adapt a **service oriented approach in provision of IT services** for end-users
2. Assembly of a **service catalogue** for all services provided by IT together with the quantifiable user expectations and conditions of service provision
3. **Network with peer organisations in the EU and region** and use experience from other countries that have already solved the organisation of the ICT sector in the judiciary by organising Study Visits, Twinning projects, Comparative Analysis etc.

4.1.2.1 ADAPT A SERVICE ORIENTED APPROACH IN PROVISION OF IT SERVICES FOR END-USERS

IT Service Orientation is an emerging phenomenon of the recent two decades, mainly as an effect of the development of the ITIL (Information Technology Infrastructure Library) framework which is the core of the current ISO 20000 standard. The original definition of IT service is "A set of related functions provided by IT systems in support of one or more business areas...". In simple terms, service orientation means that end-users of IT systems (applications, hardware, networks and other components) are facing with the possibilities IT offers for them and not the technology background behind.

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Other important characteristic of service orientation is that the services are defined together with the rules applicable for them, and the rules define who is allowed to require and authorise such a service and how much time it might take to serve the request.

Service orientation is a critical attitude change for an ICT organisation, which regards end-users (and other stakeholders) as virtual "customers" whose satisfaction is an important criteria.

Adapting a service oriented approach is basically a transformation of how ICT conduct business: well defined internal procedures, communication interfaces, rules are the prerequisites.

4.1.2.2 ASSEMBLY OF A SERVICE CATALOGUE FOR ALL SERVICES PROVIDED BY IT

Service catalogue is a basic idea of service oriented approach of ICT operations – and ITIL framework -, which regards ICT units or organisation as a provider of services instead of a provider of technical capabilities. Services should be defined from the viewpoint of the end-users. Service catalogue has an important secondary objective: to enable well substantiated outsourcing decisions. Service Catalogue is a good communication tool with the end-users which answers the question: "What can I expect from ICT?"

The establishment of IT service catalogue should be one of the preconditions to outsourcing decisions in the Justice Sector. In order to determine the needs for outsourcing service and achieve its long lasting effect all technical aspects and components as well as users expectations should be identified and carefully selected.

Defining exact measures and measurement methods is a key component of every well formulated outsourcing contract together with the sanctions for not meeting the target levels.

A Service Catalogue may cover the following service categories:

- Application services (e.g. e-mail service, Case Management service, Application service, Budgeting software service
- Hardware & Equipment services (e.g. Standard desktop provision service, Internet access service, Printing service etc.)
- Technical services (e.g. Backup service, Server maintenance service, etc.)

The Service Catalogue should not only list the above services but for each service it should contain the sub-services (e.g. in case of e-mail service, the sub-services may include e-mail account creation, anti-spam service, mail virus protection service, e-mail delivery service, etc.), Moreover the major characteristics of the service are also to be defined (e.g. description of the service, required service levels, users of the given service, current provider of the service (e.g. local ICT/central ICT/third party vendor/other governmental agency).

4.1.2.3 NETWORK WITH PEER ORGANISATIONS IN THE EU AND REGION AND USE EXPERIENCE FROM OTHER COUNTRIES THAT HAVE ALREADY TRANSFORMED THE ORGANISATION OF THE ICT SECTOR IN THE JUDICIARY

This action refers to gathering as much intelligence on ICT units as possible before starting any strategic actions that have big impact.

When taking serious actions that require large amounts of funding and human resource, as well as take a lot of time, one must be as certain as possible in the outcome of the actions. One way of achieving that is by networking with peer organizations that had taken similar actions in the past and learn from their experience. This will ensure that the execution of the strategically actions is conducted in an informed fashion from the planning stage to the final results.

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This specific action should focus on gaining knowledge in the overall ICT organization in the judicial sector, but also solutions to practical problems that may arise during the implementation of the organization.

4.2 ESTABLISH CENTRAL, WELL-STRUCTURED, SECTOR-WIDE ORGANIZATION

4.2.1 INTRODUCTION

The extensive use of ICT in a large and complex system such as Serbian Justice (approx. 18,000 employees) and the successful transformation to a service oriented ICT requires ICT units or organization inside of Ministry of Justice and Public Administration (in accordance with Ministry's systematization or future vision and possibilities), in order to be able to provide an effective and widely available support to almost all activities and participants in the Justice sector.

There are many factors dictating such first step:

- Current distributed, non-coherent, loosely-structured, low-authority organization of ICT, has caused an inefficient use of ICT, with varying levels of its implementation and understanding across the sectorial I institutions;
- The overall visibility of ICT across the sector is fairly low, with insufficient understanding and priority levels, even at the top management;
- There is generally a lack of understanding of the overall importance and ability of ICT to decisively influence the key goals of the current restructuring of the overall judicial organization, in order to achieve its much better efficiency, reduce case backlog, and in general significantly improve the citizens' impression of the justice system openness and well-organized equal access to justice for everyone;

Based on the assessment of current operations, ICT units should

- be better organized, using by the knowledgeable high-level ICT management,
- have access to common resources and services
- have well-structured, training-supported career paths, that could ensure their advance both in knowledge and assigned positions in the organizational structure of the sector.

In order to achieve this Expert recommended vision, ICT units or organization inside of Ministry of Justice and Public Administration (in accordance with Ministry's systematization or future vision and possibilities), which has the authority and capacity to cooperate and fulfill the needs of all Justice sector institutions and stakeholders. The organization should be adjustable in response to any changes.

The ICT units or organization should have qualified staff that will enjoy regards and visibility within the Justice sector. The major recommended responsibility areas of the ICT organisation are the following:

- Strategy and monitoring
- Execution and development
- Support and coordination

The central ICT units or organisation inside of Ministry of Justice and Public Administration (in accordance with Ministry's systematization or future vision and possibilities) should have a relatively small size, but with proper balance of staff and assigned responsibilities.

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4.2.2   MAJOR DEVELOPMENT ACTIONS

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. **ICT Awareness Campaign**: In order to achieve higher level of common understanding on the role of ICT within the whole sector it is necessary to implement an ICT Awareness Campaign, which could result in both institutional and political readiness to implement future changes to ICT organizational structure.

4.2.2.1   IMPLEMENT AN AWARENESS CAMPAIGN WITHIN THE JUSTICE SECTOR ON THE IMPORTANCE OF THE ICT IN MODERN JUSTICE PROCESSES

In the Serbian Justice sector the conditions have grown to the level where there is a need for further possible organizing the ICT sector, all with a strategic goal to make the whole sector more efficient. Yet to ensure full support from the top management of the Ministry and other key institutions, an awareness campaign should be implemented with a goal to present and justify the Justice ICT strategy and vision to all relevant stakeholders in next 3-5 years.

The campaign needs to be well prepared, focused with clearly defined goals and target audience. Timely executed and the support gained immediately used. Analysis of the feedback should be performed during the campaign and adequate adjustments should be immediately applied. As a deliverable of the Justice sector ICT strategy project a detailed Communication and Change Management Plan is prepared which would be the foundation of the awareness raising.

It would be a great advantage if the campaign includes internal well-motivated high-level legal professionals to act as the "ambassadors" of ICT in Justice.

4.3   ENSURE SUSTAINABILITY THROUGH "SERVICE LIFE CYCLE MANAGEMENT"

4.3.1   INTRODUCTION

The fulfilment of this goal would ensure real return on the investments that are made in the creation/improvement of the ICT systems. Also by making the ICT systems sustainable all of the intended stakeholders can truly benefit from the use of the systems.

The sustainability of ICT systems has three major components:

- provision of good quality services to satisfy the end-users' requests for accessing and using their systems
- continuous alignment of the changing business requirements and the ICT systems
- provision of enough resources (financial and human) to maintain the required services for each relevant ICT systems and execute the necessary modifications

ICT sustainability is therefore about gathering and fulfilling user requirements and about planning and providing resources to maintain the ICT systems.

Service Life Cycle management is a repeating cycle of the following activities:

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- **Service Design** to determine required new or altered services, determine expectations and design ICT components and processes how to deliver the services
- **Service Transition** to implement the services and establish the needed capacities and skills to operate them
- **Service Operation** to maintain the services and manage the issues, problems arising during service provision

Service Life cycle development should be based on the service catalogue described at the "Service orientation" strategic goal section. It should regard the ICT services continuously evolving, providing good interfaces between the end-users and the ICT units or organisation to gather requests, issues, to clarify needs and involve end-users in implementation and to communicate the results towards them.

Service life-cycle management should find a good balance between business needs and resource opportunities. Therefore service development should be preceded by careful business analysis, evaluation of implementation options and examination of long term cost effects of the new or altered services. This is essential to establish common understanding of the parameters of the new or altered services and to be prepared for the Service Operation activities in terms of expected expenses and resources.

To raise the overall service levels to the end-users, all end-user requests (both to solve their ICT related problems and to further develop the functionality of systems) should be centrally gathered and managed. End-users also need to be informed on the new ICT systems or changes in the ICT systems in a timely and adequate manner so that all stakeholders at all levels are aware and prepared. Change management is crucial for introduction of any kind of new system in place of an old one. Therefore very high attention is required on this objective during the strategy implementation.

4.3.2   MAJOR DEVELOPMENT ACTIONS

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. Prepare and implement long-term Feasibility Study and TCO methodologies for all ICT systems in order to help with the financial planning.
2. Establish change management practices into implementation projects and regular two-directional information flow between ICT and end-users covering requirements, changes and policies.

4.3.2.1   PREPARE AND IMPLEMENT LONG-TERM FEASIBILITY STUDY AND TCO METHODOLOGIES FOR ALL ICT SYSTEMS

The need for the introduction of new processes, implementation of new functionalities or applications requires analysis in advance to the start of introduction, in order to ensure that business requirements are satisfied in an effective and efficient approach, as well, justified and accepted by the higher-level bodies. The long-term Feasibility Study helps Justice institutions to:

- clearly define needs,
- consider alternative sources,
- review current and future technological and economic feasibility,
- define implementation alternatives and support decision
- consider benefits and risks, and at the end,
- conclude final decisions of "make-or-buy".

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It enables the organisation to minimize costs of solution implementation while ensuring that the solutions enable sustainability on a long run. By preparing and implementing Feasibility study, the business management should assess, identify and justify technically feasible and cost-effective solutions that satisfy business requirements and recommend its implementation.

The estimation of the Total Cost of Ownership is an important part of any strategic planning and supports the decision makers to justify and decide on implementation. TCO calculations provide indispensable input for yearly budget planning which eliminates the risk of important ICT systems being underfinanced and thus being unable to realise all possible benefits.

It provides information to the Justice institutions of the cost of the ICT solutions in terms of:

- Original cost of the hardware and software
- Costs of hardware and software upgrades, lease, or purchase
- Costs of introduction of new solutions for replace existing
- Costs of maintenance of different parts of the solution (and in total)
- Direct costs of operations (third party services, utilities, costs of facilities, human resource costs, stationary costs, etc.)
- Costs of the technical support
- Costs of training
- Costs of compliance (audits, security checks, certificates, etc.)
- Costs of certain activities performed by users

4.3.2.2 ESTABLISH CHANGE MANAGEMENT PRACTICES INTO IMPLEMENTATION PROJECTS AND REGULAR TWO-DIRECTIONAL INFORMATION FLOW BETWEEN ICT AND END-USERS

All changes, relating to infrastructure, applications and usage of the ICT should be formally managed in a controlled manner. Changes (including those to procedures, processes, systems, and service parameters) should be logged, assessed and authorised prior to implementation and reviewed against planned outcomes following implementation. As well, communication to the end-users is highly important action step which should enable end-users to easily accept and use all new systems or changes provided to the current ones. The communication should be two-directional, in order to allow end-users to comment and provide additional value to the requirements of the ICT systems and minimize errors. The change procedures should be defined and communicated to all stakeholders in the Justice sector. End-users and other stakeholders must be properly informed on the changing working procedures and ICT support prior to the changes themselves. Tracking and reporting on changes should be established.

The most important Change Management practices are the following:

- Involvement in work (specification, migration, test)
- Involvement in decision making
- Clear communication about the expected changes, their scope and effects
- Increasing skills and self-confidence by trainings
- Provision of end-user support after implementation takes place

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4.4 ENSURE FULL GOVERNANCE THROUGH SERVICE PERFORMANCE MEASUREMENT

4.4.1 INTRODUCTION

The definition of the CoBIT framework for IT Governance is the following:

"IT governance is the responsibility of executives and the board of directors, and consists of the leadership, organisational structures and processes that ensure that the enterprise's IT sustains and extends the organisation's strategies and objectives."

Ensuring IT to sustain and extend objectives is only possible if these objectives are well defined and the progress is measured. Performance appraisal of ICT operations is a usually subjective matter for the end-users and management. If the general expectations of efficiency, effectiveness, quality of service, responsiveness and others are not linked to well defined measures than this might lead to continuous disputes between ICT units and user organisations. Moreover, without a well defined measurement system, the ICT units may not set quantifiable goals, and are not able to measure the progress towards their goals.

The other possible problem at this area is the different language the ICT and the users speak. ICT usually measures its performance in technical terms (e.g. bandwidth, server uptime, server utilisation, etc), while end-users have different perception, they think of ICT performance as service quality, overall availability and functional richness of application systems.

On the other hand, the measurement of internal technical parameters are important for the ICT management and for the decision makers, since based on planned and actual performance measures, they can decide on investments and resource allocation.

Consequently ICT performance measurement should have two levels:

- a technical level, where various system parameters and operational parameters may be measures. These are usually called Operational Level Agreements (OLAs)
- a management and user-focused level where the services provided to the end-users may be measured

The technical level measurements may be supported by automatic tools of System Management Systems.

These measurements are especially important in case of third party services, since exact Service Level Agreements should be made with vendors, which define the required service levels together with the sanctions of not meeting the objectives.

The management and user level performance measures are sometimes harder to define, but there should be an agreement between the ICT units and Ministry's management. The Strategic Goals defined in Section 3 should be investigated and exact measures should be defined for them. One key element of performance measuring is a "User satisfaction survey" which requires short but structured feedback from end-users. It is recommended to execute this survey once in a year, using predefined questionnaires.

The results of the performance measures should be used to improve quality of service, thus the results could be considered during the yearly planning procedure of the institutions and the Ministry.

4.4.2 MAJOR DEVELOPMENT ACTIONS

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. **Define exact performance measures** for each individual goal of the ICT Strategy
2. Define **Service Level Agreements with third party vendors** which contain the services they provide, their required technical parameters, their measurement methods and the possible sanctions.

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3. Define and implement **technical level performance measures for internal services**
4. Define and use an **End User Satisfaction survey** to assess user's perception on ICT services
5. Implement a **unified and regular reporting service for management** about the major ICT performance measures

4.4.2.1   DEFINE EXACT PERFORMANCE MEASURES FOR EACH INDIVIDUAL GOAL OF THE ICT STRATEGY

IT strategic planning is required to manage and direct all IT resources in line with the business strategy and priorities. The IT function and business stakeholders are responsible for ensuring that optimal value is realised from project and service portfolios. The goals of the ICT strategy should be reflected in and executed by the IT strategic actions, which specifies concise objectives, action plans and tasks that are understood and accepted by both business and IT. In order to have a clear picture of the state of execution of ICT strategy, the performance measurement system should be introduced, to ensure that the right steps are taken and in line with the set ICT strategic goals.

This action would enable Justice sector stakeholders to confirm that agreed-upon IT objectives have been met or exceeded, or that progress toward IT goals meets expectations. The effective performance requires monitoring, which should include definition of relevant (exact) performance indicators, systematic and timely reporting of performance, and prompt acting upon deviations. Where agreed-upon objectives have been missed or progress is not as expected, management's corrective action should be reviewed. The results of the measurement should be periodically reviewed against targets, the causes of deviation should be analysed, and actions to address the causes should be initiated. The results of the performance measurement should be reported to enable senior management to review the institution's progress toward identified goals.

A crucial role of performance measures is to communicate the contribution and added value of ICT towards the key decision makers. This may also be used to acquire funds or make balanced agreements considering performance and budgets.

4.4.2.2   DEFINE SERVICE LEVEL AGREEMENTS WITH THIRD PARTY VENDORS AND RENEW CONTRACTS

The need to assure that services provided by third parties (suppliers, vendors and partners) meet business requirements, requires an effective third-party management process. This process is accomplished by clearly defining the roles, responsibilities and expectations in third-party agreements as well as reviewing and monitoring such agreements for effectiveness and compliance. Effective management of third-party services minimises the business risk associated with non-performing suppliers.

The Justice sector should define a framework that provides a formalised service level management process between the Justice sector and third parties. The framework should maintain continuous alignment with business requirements and priorities and facilitate common understanding between the Justice sector and third parties. The framework should define the organisational structure for service level management, covering the roles, tasks and responsibilities of internal Justice sector staff and external third parties' services. Effective communication between IT and third parties regarding services required should be enabled by a documented definition of an agreement on IT services and service levels. This action also includes monitoring and timely reporting to stakeholders on the accomplishment of service levels. It enables alignment between IT services and the related business requirements.

All critical IT services based on business requirements and IT capabilities should be defined and agreed in SLAs. This should cover provider commitments; service support requirements; quantitative and qualitative metrics for measuring the service by the stakeholders; funding and commercial arrangements (including penalties for not meeting the defined SLAs), if applicable; and roles and responsibilities, including misunderstanding of

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the SLA. Items such as availability, reliability, performance, capacity for growth, levels of support, continuity planning, security and demand constraints should be considered.

4.4.2.3 DEFINE AND IMPLEMENT TECHNICAL LEVEL PERFORMANCE MEASURES FOR INTERNAL SERVICES

Effective communication (between IT and business) regarding services required is enabled by a documented definition of an agreement on IT services and service levels. This process also includes monitoring and timely reporting to stakeholders on the accomplishment of service levels. This process enables alignment between IT services and the related business requirements.

A framework that provides a formalised service level management process between the end-users and service provider should be defined. The framework should maintain continuous alignment with business requirements and priorities and facilitate common understanding between the customer and provider(s). The framework should include processes for creating service requirements, service definitions, OLAs and funding sources. These attributes should be organised in a service catalogue. The framework should define the organisational structure for service level management, covering the roles, tasks and responsibilities of internal and external service providers and customers.

The technical level performance measures (Operating service agreement) should explain how the services will be technically delivered to support the SLA(s) in an optimal manner. The OLAs should specify the technical processes in terms meaningful to the provider and may support several SLAs.

4.4.2.4 DEFINE AND USE AN END USER SATISFACTION SURVEY TO ASSESS USER'S PERCEPTION ON ICT SERVICES

A user's perception on ICT services is important component of measuring the performance of the ICT systems, as well how the ICT units is performing its activities within the whole sector. Continuous improvement is achieved by on-going monitoring, analysis and acting upon deviations, and communicating results to stakeholders. Management of the quality provided is essential to ensure that IT is delivering value to the business, continuous improvement and transparency for stakeholders. One key element of performance measuring is a "User satisfaction survey" which requires short but structured feedback from end-users. It is recommended to execute this survey once in a year, using predefined questionnaires.

Since the SLAs provide quantitative measures on some operational parameters, the end-user satisfaction survey should focus on the following aspects:

- delivery on promise
- attitude of IT staff (communication, empathy, helpfulness, flexibility, etc.)
- ICT training facilities
- functional completeness of application systems

4.4.2.5 IMPLEMENT A UNIFIED AND REGULAR REPORTING SERVICE FOR MANAGEMENT ABOUT THE MAJOR ICT PERFORMANCE MEASURES

Effective IT performance management requires a monitoring process. This process includes defining relevant performance indicators, systematic and timely reporting of performance, and prompt acting upon deviations. Monitoring is needed to make sure that the right things are done and are in line with the set directions and policies.

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This strategic action aims developing senior management reports on ICT's contribution to the business, specifically in terms of the performance of the ICT operations, ICT-enabled investment projects, and the solution and service deliverable performance of individual projects. It should include in status reports the extent to which planned objectives have been achieved, budgeted resources used, set performance targets met and identified risks mitigated. It should foresee senior management's review by suggesting remedial actions for major deviations. It should provide the report to senior management, and solicit feedback from management's review.

Other advantage of regular reports is to raise the awareness on ICT and to get ICT efforts acknowledged by senior management.

This management ICT reports may not be very sophisticated and using technical jargon. Instead they should focus on notions easily understandable by non-ICT staff or decision makers.

4.5   INTRODUCE SERVICE HELP DESK TO PROVIDE SUPPORT

4.5.1   INTRODUCTION

Service Desk is the primary interface (Single Point of Contact) between end-users and the ICT units. Its primary role is to accept requests, problems and issues to manage their resolution and on the other hand to provide information to end-users about services, expected changes and others. Service Desk usually may be accessible via phone, e-mail, web or other means of communication.

Timely and effective response to IT user queries and problems requires a well-designed and well-executed Service Desk and application support process. This process includes setting up a service desk function with registration, incident escalation, trend and root cause analysis, and resolution. The business benefits include increased productivity through quick resolution of user queries. In addition, the business can address root causes (such as poor user training) through effective reporting.

Service Desk should be the channel to forward end-user requests to the ICT units, whether they are request for new functionalities or reports, or they are issues the end users encounter with. Service Desk should register all incoming requests and according to its nature, Service Desk personnel should solve them or forward the request to specialists. In general Service Desk may face 3 levels of support:

- first line support which handles easily solvable issues and which can be solved locally at the institutions
- second line support which handles more complicated issues requiring specialist knowledge of the underlying application or component
- third line support which handles complex issues requiring involvement of vendors

Service Desk should be able to register and store each requests until its resolution.

To solve the everyday usage-related problems and questions of end-users, application support service should be formed. Application support differs from technical support, because it focuses on the business processes and their realisation in the systems and not on technical issues. Application support may provide guidance how complicated situations are to be handled by the systems and what kind of workaround solutions exists for special cases. Consequently staff of application support should consist of employees with deep knowledge of the processes and regulations applied to them.

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4.5.2 MAJOR DEVELOPMENT ACTIONS

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. Establish **Service Desk** on with clear responsibilities of first line, second line and application support

4.5.2.1 ESTABLISH SERVICE DESK WITH CLEAR RESPONSIBILITIES OF FIRST LINE, SECOND LINE AND APPLICATION SUPPORT

The main goal of this action is establishment of Service Desk in order to:

- provision of good quality services to satisfy the end-users' requests for accessing and using their systems
- continuous alignment of the changing business requirements and the ICT systems

This successful completion of this action should ensure that whenever the users have a problem it will be solved in shortest possible time. Service Desk should solve end-user incidents within reasonable time limits. First level support should be able to handle users' everyday problems preferably with local resources to ensure quick solution. Second level support should focus on more complicated incidents which might require specific knowledge, resources or skills and might have access to third party resources (e.g. vendors, external knowledge bases, etc.). Application support should focus on providing "how-to-use" information on specific application related issues and should gather future end-user requirements.

Service Desk should be supported by a centrally operated, but locally used application system, which registers all end-user requests, enables distribution of tasks for internal workforce and which provides escalation of incidents to higher level support.

4.6 ENSURE SUSTAINABILITY VIA PROPER FINANCIAL (BUDGET) MANAGEMENT

4.6.1 INTRODUCTION

The ability to participate in planning and to offer support in manage funds for ICT developments and operations is a crucial prerequisite to modernise the Justice Sector ICT and to execute the Strategy. The realisation of ICT developments results in better services and more efficient business processes, but requires significant investment funds and usually raises operational expenses. Implementation costs usually form only a smaller proportion of total lifetime costs of any system implementation, since in the upcoming years of operations, several additional expenses may arise, like yearly support costs of implemented systems or cost of ICT personnel supporting the implemented systems.

On the other hand, implementing a new system not only raises the quality of services, but may significantly reduce existing costs.

Source of funds

Usually funds for implementation and funds for operations come from four different sources:

- Ministry's and Institutions' operational budget
- Ministry's investment budget, which can even be the result of a governmental decision

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- Institutions' investment budget
- Donor organisations

The operational budgets are usually planned using a baseline approach with considerations on the changed ICT elements and the ongoing, renewed or new service contracts.

Most Donor organisations provide funds only if the developments are substantiated and agreed on during multi-round talks and are aligned with the strategy of the institution. Therefore communication to Donor organisations should cover not only the technical objectives of the planned ICT developments, but they should be linked to improvements of general performance of the sector (like reducing backlog, increasing transparency, providing better quality of judgement). All development projects should be prepared by using a uniform Business Case structure, which defines the expected results. Moreover, even at the project initiation, there should be a clear picture of the expected costs for the whole life-time of the implemented ICT systems.

On the other hand, raising funds for ICT projects can be successful, if the status of the ongoing projects are clearly communicated, and a post implementation review is made for each major project to proof the prudent spending of the funds.

ICT support of budget planning and monitoring

There is a second aspect of budget planning and management, related to ICT, namely the ICT support of these processes. To plan, model, consolidate and keep track of scenarios, forecasts and actual budgets, usually a complex ICT system is used which not only contains the budget figures, but also supports the approval process of budget planning and revision.

Budget planning process should be traceable, with clear indication of different budget versions and actual spending.

4.6.2 MAJOR DEVELOPMENT ACTIONS

The following actions can help in fulfilling the high level goals.

1. Establish a **yearly donor conference** which demonstrates the results and the goals of the next time period
2. Establish **ICT Strategy update responsibility** within the Ministry with clear role of aligning the ICT Strategy and the Business Strategy of the Sector.
3. Define a **uniform Business Case structure** for ICT related investments.

4.6.2.1 ESTABLISH A YEARLY DONOR CONFERENCE WHICH DEMONSTRATES THE RESULTS AND THE GOALS

Various donor organisations provide the bulk of the ITC investment budget for the majority of the Strategic actions. Therefore it is a critical communication task for the Ministry to demonstrate that the donor funds are spent with utmost care and spending is aligned with the strategies of the Ministry and of the whole Justice sector.

Potential donor organisations should be presented with the results of the past projects, short term and long term goals of the Ministry and the institutions. A yearly conference is a proper tool to present these results and plans, for which the business leaders of the Ministry should prepare themselves. High level representation from the Ministry is essential. Presentations should focus on strategic alignment and measureable achievements of the various projects.

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Optionally other governmental institutions and the media may be invited to the event to demonstrate the prudent spending of taxpayer and donor money.

4.6.2.2   ESTABLISH ICT STRATEGY UPDATE RESPONSIBILITY WITHIN THE MINISTRY

The ICT Strategy of the Justice sector was prepared considering the Justice Reform Strategy and the current organisational and regulatory environment. Whenever these external conditions change or the Ministry top management reassigns its priorities, the strategy must be aligned with the new conditions. Other trigger for Strategy update is the emergence of new ITC paradigms which might be applicable within Justice sector..

Update of the Strategy may cover the following components:

- ICT goals and high level ITC goals
- Strategic actions
- Priorities and therefore schedule of the Implementation roadmap

Strategy updates should be driven by the business leaders of the Ministry and ICT unit, also representatives of key organisations should participate in process with proposals. It is recommended to have regular (e.g. quarterly) meetings to evaluate the Strategy execution and external conditions, resources and modify the strategic goals, actions, priorities and schedule.

The ICT units would have a primary role in Strategy updates which are to be communicated within the Justice sector.

4.6.2.3   DEFINE A UNIFORM BUSINESS CASE STRUCTURE FOR ICT RELATED INVESTMENTS

Investment related decisions in the Justice sector have long term effect on the technical capabilities of the ICT, but they also have long term effect of the financing, staffing and resource allocation.

To facilitate these decisions, a high level overview of the planned projects is needed which is exactly the Business Case. To help the decision makers, it is highly recommended to have a common structure of all Business Cases. The major sections may be the following:

- Problem definition
- Business impact of the planned project
- Project description
- Project goals
- Project assumptions and constraints
- Major deliverables and milestones
- Cost benefit analysis
- Alternatives to the project

During this Strategic action a more detailed template should be developed together with the roles and responsibilities to prepare and approve the Business Cases.

In later stages of project preparations – after a positive decision - more detailed Feasibility Studies – which cover the technical details and implementation alternatives in much more details - might be prepared.

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4.7 ENSURE HIGH QUALITY USER EXPERIENCE

4.7.1 INTRODUCTION

ICT infrastructure plays a crucial role in smooth operation of the judicial processes, since outdated, slow and not supportive end-user environment not only makes the execution of the individual procedure steps tedious with possibly long waiting times, but can even prevent the execution of certain steps. Moreover low perform-ance workstations, networks, printers and scanners can even prohibit the implementation of application sys-tems.

In order to ensure supportive working environment, the Justice Sector in Serbia should consider a combination of automation, control, and resource management.

Provision of reliable workstations is partially a technology, partially an operational issue. Some technological components need significant improvement in order to be able to satisfy user expectations, and on the other hand the capability of the IT units should be developed to proactively prevent problems, and whenever they occur, to provide quick solutions for them,

Because of financial restrictions it is not a viable option to renew the whole ICT infrastructure to the largest possible capacity which suits the needs of the users. Compromises should be made and resources should be allocated to parts of the ICT architecture which hinder the everyday usage of ICT the most. For various end-user roles, there need to be defined minimal and optimal level of technical requirements for workstations, and these should be considered whenever new purchases are made. Improvement of workstations may be achieved by relocation also (even across institutions' boundaries) of equipment with satisfactory performance.

4.7.2 MAJOR DEVELOPMENT ACTIONS

Considering the above Expert recommended vision of the area, the following development actions are recom-mended:

1. Develop **technology standards for end-user environment** and implement the changes
2. Define profiles and implement **Desktop virtualization** solution for a wide circle of end-users

4.7.2.1 DEVELOP TECHNOLOGY STANDARDS (FOR END-USER ENVIRONMENT)

In order to make maintenance relatively simple, it is highly recommended to restrict the variety of used compo-nent types and used technologies across the Justice sector. In addition of economies of scale in purchases, it has additional advantage of

- potential replacement of a malfunctioning hardware component with an other component
- no need to maintain and continuously develop lots of different technical skills for ITC staff members
- faster development and improvement of applications because of standardised software environment and communication protocols
- easier exchange of information between various systems

Technology standards for end-user environment apply to following:

- o desktop applications,
- o operation systems
- o desktop PCs, thin-client devices, laptops, tablets, smart phones etc.
- o portable storage devices, USB memory sticks and media players with storage capacity)
- o specialist equipment (e.g. scanning devices, bar code readers,)

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Naturally not all aspects of the technology environment may be fully standardised: regarding special local requirements or vendor specialities, there might be deviations, but it is strongly recommended that the technology standards are fully considered when purchases are made.

These technology standards need revision every few years to follow the development of the available technologies.

4.7.2.2   DEFINE PROFILES AND IMPLEMENT DESKTOP VIRTUALIZATION SOLUTION

Maintenance of thousands of end-user workstations is a tremendous job if every installation and configuration changes must be performed manually. To eliminate the needs of physical interaction several technology solutions were invented during the recent years from remote access to full desktop virtualisation.

Deploying desktops as a managed service lets Serbian Justice sector respond more quickly to changing needs and opportunities. The Justice sector can reduce costs and speed up the service by quickly and easily delivering virtualized desktops and applications to each justice institution. These desktop solutions should be scalable, consistent, fully secure, and highly available to ensure maximum uptime and productivity.

Before any desktop virtualization implementation, it is needed that all user should be profiled such as IT development staff, IT operations/support staff, general professional users, transaction workers, other (non IT) technical staff, office based power users, mobile and remote professional users.

The advantages of virtualization are:

- Reduced costs for hardware;
- Save the space for IT equipment;
- Reduced power consumption;
- Reduced consumption of other IT resources;
- Easier administration;
- High security and resistance to failure;

Full virtualisation is a very large project and it is recommended to have a pilot operations as a starter and by evaluating its results, decision can be made on the extension of the model.

4.8   ENSURE SUPPORTIVE WORKING ENVIRONMENT

4.8.1   INTRODUCTION

Supporting working environment has several components, like performing hardware components, good quality ICT support and functionally rich and reliable application systems. The first two components were covered by other sections.

Because several specific applications are covered by other sections (i.e. at Training, Knowledge Sharing, Measurement sections, e-Services), this section focuses on the core applications of Courts, Prosecutor Offices, Penitentiary system, Directorate for Management of Seized and Confiscated Assets and Ministry of Justice and Public Administration.

From technical viewpoint there are three ways of improving Justice sector functionality of ICT systems:

1. development / implementation of a new system;

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2. functional improvement of an existing system – where minor improvements are needed and the systems are in good conditions and using modern technology;

3. roll-out of an existing system – where the systems is fully functional but it doesn't cover each organization;

In all cases, following the technical decision, the services must be procured in an open and competitive way.

ICT systems can simplify, improve and accelerate business processes in the Justice sector in Serbia. They should meet, as well, the specific needs of individual user groups (judges, prosecutors, prison staff, court staff, etc.), but still preserving uniformity of the overall ICT setup (common IT architecture and interdependencies) within the Justice sector.

The main advantages of ICT systems uniformity are:

1. Easier integration of different ICT systems and flexibility toward improvement of ICT systems functionalities;
2. Standardized, uniform application of Justice sector procedures, decisions and changes;
3. Accurate data presentation and adequate access to information, both for public or internally within the Justice sector organisations;
4. Improved cost-effectiveness through elimination of parallel development of similar ICT systems for different Justice sector entities, reduced maintenance and easier implementation of new functionalities;
5. Easier and uniform exchange of information with other governmental agencies;

However, the uniformity is not an ultimate goal; different Justice sector entities may use different systems provided.

Virtually all branches of the Justice sector needs functionally improved core ICT systems. In selecting the proper implementation solution, the expected future operational costs should also be seriously considered, since these would be later covered by the institutional budgets.

To ensure smooth processes across the sector, common business concepts should be defined and documented in order to simplify the systems and for further development. These may include common case statuses, common events, common rules, common data model and common processes.

Expert explanation for:

- Records Management functionality in the ICT Strategy Report (refer to records management) is a specialised functionality used by the Prison Administration to keep track of the attributes, major events and decisions on the inmates – on personal level – it can contain for example medical attributes, work-in-prison attributes, etc.
- Case Management systems are specialised Document Management systems to keep track of the lifecycle of judicial and prosecutorial cases by managing Case related events, documents
- Document Management systems are general-purpose application systems, used to track and store electronic documents and their versions/status and other attributes. Thus, a general Document Management system within the Justice Sector (or elsewhere)may be used to systematically manage the creation/input, movement and update of various documents within the system, or even be used to support various types of processes (e.g. to manage and store procurement-related documents; human resource management-related documents, finance-related documents, etc.)

Thus the Case Management systems are usually relying upon the Document Management systems, but extend them with special features (like full workflow management, case allocation, case-law support, court statistics/prosecutorial office statistics, courtroom administration, court fee management and several others).

Conclusion:

„Case Management System is Document Management System with implemented judicial (and prosecutorial) workflow" (or both).

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4.8.2 MAJOR DEVELOPMENT ACTIONS

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. Implementation of Case Management system at regular courts
2. Implementation of Case Management system at all Prosecutors' Offices
3. Implementation of Case Management and Records Management system at Prison Administration
4. Extend functionality of Case Management systems (i.e. full electronic case management)
5. Implementation of Case Management system in the Misdemeanour Courts
6. Integration of Commercial Courts and functional improvement of their Case Management System
7. Asset management and Case Management systems implementation for DMSCA
8. If necessary (and if there is no other solution), Implement a **pilot Management Information System** on Case Management systems to produce uniform analytical support for Case related performance indicators

4.8.2.1 IMPLEMENTATION OF CASE MANAGEMENT SYSTEM AT REGULAR COURTS

The development of centrally operated and managed Case Management system is the latest large-scale effort in modernization and automation of courts proceedings, and important step towards e-Justice. Its centralized architecture, relying on industry standard stack of technologies, should contribute to lower operational costs, more efficient and effective use of the hardware infrastructure and greater long-term flexibility, since performance scaling, storage capacity growth and operational management of a central server-farm is much easier to accommodate in one place, than with hundreds of geographically distributed servers.

This centralized "cloud" architecture shows its strengths and flexibility particularly in case of court organization changes (e.g. reducing or increasing number of courts or units, or changing location of courts etc.). However in such centralized architecture, Business Continuity is of crucial importance, since any problem at the computing centre, either on software, hardware or network level, can completely prevent usage of the system for large number of court users. Consequently, redundancy and high-availability should be carefully and skilfully designed and built into the future architecture of the judicial ICT system, if there are funds in the budget for the proposed solution.

The MoJPA should conduct a careful and exhaustive feasibility study to determine the technical and procurement approach to provide optimal level of functionality and performance with acceptable and sustainable total costs of ownership whilst satisfying the requirements of a transparent and competitive procurement process.

4.8.2.2 IMPLEMENTATION OF CASE MANAGEMENT SYSTEM AT ALL PROSECUTORS' OFFICES

The development of the Standard Application for Prosecutors' Offices (SAPO) that automates business processes at pilot prosecution offices (Basic, Higher, Appeal and Republic PO) is an ongoing project.

Based on the results of the pilot, availability of funds in the budget and on the careful investigation of feasibility of the options, the Ministry should decide on the technical approach to follow or to create new solution, in line with the requirements of a transparent and competitive procurement process.

The existing or new application shall automate and facilitate all the required aspects of PO business processes, such as organizational management, personal records, case management, international cooperation, education, anti-corruption activities, laws and regulations, publications, news and statistics.

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4.8.2.3   IMPLEMENTATION OF CASE MANAGEMENT AND RECORDS MANAGEMENT SYSTEM AT PRISON ADMINISTRATION

AEPS requires two major sets of functionalities to support their everyday activities:

- **The PDL Personal Records** refers to the data and information that is related to the PDL personal profiles, activities and the events during the life in prison (PDL Reception, PDL Daily activities and actions (Account Balance, Medical Records, Visit Management, Package Management, Incident registration, Storage Control, PDL Employment, Cell Allocation Details, ID Cards), PDL Release).
- **The Prison Functional operations** where the PDL is interacting with the Prison Operations and/or Services. These interactions between the PDL and the Prison Operations need to be registered, monitored in SAPA to the most details reasonably possible (Statistics and reporting, Pharmacy, Hospital, Messroom (kantina), Guards Management, Arms Management).

Standard Application of the Administration for Execution of Penal Sanctions (SAPA) is under implementation at some pilot institutions.

Based on the results of the pilot, availability of funds in the budget and on the careful investigation of feasibility of the options, the Ministry should decide on the technical approach to follow or to create new solution, in line with the requirements of a transparent and competitive procurement process.

4.8.2.4   EXTEND FUNCTIONALITY OF CASE MANAGEMENT SYSTEMS (I.E. FULL ELECTRONIC CASE MANAGEMENT)

The ICT unit, in cooperation with users from different types of courts should determine which subset of case management capabilities should be "unlocked" for each type of courts, in order to provide optimal level of functionality and performance for different types of courts.

This is particularly important in light of existing WAN bandwidth constraints, where widespread use of heavyweight case management capabilities would clog the network and harm the performance of the application. Additionally, a critical precondition for electronic case management in courts is proliferation of professional-grade scanners to support digitalization and OCR of paper documents.

Other functional extension possibilities include the development of interfaces to other governmental institutions (e.g. with Ministry of Interior to access citizen residence data, with independent bailiffs to forward information).

The execution of Strategic action "Introduction of Service Oriented Architecture" opens new possibilities to easily integrate Case Management systems. It makes it possible to define and implement inter-institutional electronic workflows thus significantly reducing the time and efforts to communicate with prosecutors, penitentiary facilities.

The integration without SOA implementation is also possible, but it requires careful planning and is more rigid to changes.

4.8.2.5   IMPLEMENTATION OF CASE MANAGEMENT SYSTEM IN THE MISDEMEANOUR COURTS

Misdemeanour courts have the least developed ICT infrastructure of all courts in Serbian judiciary and they are currently not part of the judicial WAN. Lightweight traffic cases typically comprise approximately 65% of all misdemeanour cases in Serbia. While the Traffic Police's information system captures all information necessary to instigate traffic misdemeanour cases, these instigations are presently being printed, hand-carried to the courts

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and then manually re-entered into court registry books or re-keyed into registry Excel spreadsheets, instead of being electronically submitted through electronic data exchange.

These facts indicate that automation of the misdemeanor courts is high priority task, particularly considering that most misdemeanor cases include financial elements (fines) that are valuable source of income for the state budget.

In this situation, Ministry of Justice and Public Administration has several options:

1. Development of a brand-new CMS specifically tailored for the Misdemeanour courts, using modern set of technologies and centralized, service-oriented architecture.
2. Establish a full common platform solution for all institutions within the Justice sector

In any case, the Misdemeanour court system should comprise at least the following major features:

- Standard case initiation, management and disposition functions
- Limited case management capabilities (preferably with support for photo and video evidence)
- Generation of standard documents from templates
- Process and document workflows
- Secure data exchange with other systems (Traffic Police, Central Court Portal, Treasury, National Bank of Serbia etc.) using Enterprise Service Bus.
- Financial tracking for fees and fines
- Event scheduling and reminder functions
- Advanced statistical reporting (standard + ad-hoc reports)

4.8.2.6 INTEGRATION OF COMMERCIAL COURTS AND FUNCTIONAL IMPROVEMENT OF THEIR CASE MANAGEMENT SYSTEM

The current AVP system has some architectural disadvantages. The distributed architecture requires large amount of local servers, with properly trained local staff to maintain. Whenever the local databases are synchronised to a central database, this is always cumbersome and may cause delays or inconsistencies in statistical reports. Additionally, it is difficult to exchange information (e.g. via Enterprise Service Bus) with the Prosecution and Ministry of Interior, due to common master data for all courts not being in one place.

In addition to architectural improvements, modern Case Management system at Commercial courts would need direct data link to some other institutions, like the National Bank of Serbia or Business Register and similarly to potential improvements at regular courts Commercial courts should also strengthen document digitalization, full electronic workflows and introduction of digital signatures.

In ideal situation, the Justice system should look for unified and modern case/content management systems, across the sector, which would be connected to the Central Court Portal. However, in the realistic situation of scarce financial resources, the Ministry of Justice and Public administration has the following options regarding the future of the Misdemeanour Court System:

1. Architectural improvements and modernization of the current system (switching to centralized architecture), Enterprise Service Bus and adopting common master data framework.
2. Phasing-out the current system and implementing customized version of an other solution at commercial courts
3. Establish a full common platform solution for all institutions within the Justice sector

The final strategic direction should be taken after careful consideration of sustainability and total costs of ownership and the requirements of a transparent and competitive procurement process.

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4.8.2.7 ASSET MANAGEMENT AND CASE MANAGEMENT SYSTEMS IMPLEMENTATION FOR DMSCA

The Directorate for Management of Seized and Confiscated Assets has started a project for two information systems, Document/Case Management System and Asset Management System. The software solutions are implemented and running in DMSCA premises. The Case Management System consist the next functionalities:

- Manipulation of documents (creation, processing, distribution, storing, indexing and searching);
- Archive;
- Scanning;
- Import and conversion of documents in different formats;
- Workflow management

The Case Management software consist the next functionalities:

- Electronic case dossier;
- Standardized forms;
- Workflow management;
- Management of case resources (staff, rooms, cars);
- Preparation of prosecution file;
- Reporting and Analytics;
- Knowledge management;

The Asset management software consists of the next functionalities:

- Management of documentation (contracts; creation and processing of e-documents, indexing and organizing, workflow, archiving)
- Asset management (administration, registration/de-registration);
- Work order management;
- Financial management;
- Reporting;

At the present, the two systems are in place, but not used to the full extent. Ministry of Justice and Public Administration has the following options regarding the future of the Directorate for Management of Seized and Confiscated Assets System:

1. The functionalities of both systems should be upgraded and training organised for the end-users for usage of the two systems.
2. Establish a full common platform solution for all institutions within the Justice sector

The final strategic direction should be taken after careful consideration of sustainability and total costs of ownership and the requirements of a transparent and competitive procurement process.

4.8.2.8 IMPLEMENT A PILOT MANAGEMENT INFORMATION SYSTEM ON CASE MANAGEMENT SYSTEMS TO PRODUCE UNIFORM ANALYTICAL SUPPORT

Current status of use of Case Management systems within the Serbian Justice sector is such that there are several such systems, used to various extent.

Besides the obvious need to provide a common interface between these systems (Enterprise Service Bus), so that the various data can be exchanged in a meaningful way, there is also a need to provide some sort of an overall software "umbrella", sitting on top of all these systems, providing various sector-wide types of information, most often statistical data. Currently, this sector-wide statistical data requires substantial effort to complete, by a number of people on various positions in the sector.

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Designing a pilot system, which would be used to test the feasibility, practicality and scope of usefulness of such Management Information system,, or to establish a full common platform solution for all institutions within the Justice sector. Any of mentioned actions could significantly improve the ability of the Ministry's top management to instantly obtain valid statistical and other relevant sector-wide information when and where needed

The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.9 ENSURE HIGH AVAILABILITY AND RELIABILITY

4.9.1 INTRODUCTION

As ICT tools are playing more and more significant role in everyday working processes, they become mission critical and need special considerations to provide availability and reliability. The overall goal is to design and implement available ICT architecture, which would ensure that system is supportive and available to the end users even under unexpected conditions.

Because of financial restrictions it is not a viable option to renew the whole ICT infrastructure to the largest possible capacity and redundancy. Compromises must be made and resources should be allocated to parts of the ICT architecture which hinder the everyday usage of ICT the most.

Capacity management and in general the operation of central server farms is much flexible than capacity management of hundreds of local servers, which will contribute to lower operational costs. However in case of this architecture, Business Continuity issues have much larger relevance, since any problems at the computing centre or at the network can prevent usage at the end-users. Consequently certain redundancy should be build into the architecture and proper measures are to be taken to reduce risks of ICT service outages.

Finally physical security measures of server rooms should be investigated and improved if necessary, by stricter control of physical access and implementation of automatic fire alarm systems, proper air-conditioning and uninterruptable power supply.

IT staff for the Justice Sector should plan and design an on-premises highly available and reliable working environment that is designed for ease of manageability. Some of the examples which could be applied in the Justice Sector are:

- Disaster recovery centre

  Proper data centre planning is the key to a successful high availability deployment. The Justice Sector needs to consider a variety of factors, including the best method for protecting legacy applications, existing data centre hardware and resources as well as which high-availability method will meet needs and budgetary constraints.

- Server virtualisation

  The importance of high-availability technologies has increased with the popularity of server virtualization. There are a variety of ways to architect high availability into a virtual infrastructure, including failover clustering, load balancing and fault-tolerance technologies. When evaluating these options, the Justice Sector should also account for their existing hardware, software and budgetary constraints.

- Business continuity planning

  A business continuity plan enables critical services or products to be continually delivered to clients. Instead of focusing on resuming a business after critical operations have ceased, or recovering after a disaster, a business continuity plan ensures that critical operations continue to be available. The Justice Sector should develop a plan how to proceed if system failure happens.

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- Cloud Computing should increase the current level of use of all services of the Justice Sector, through the use of the new technologies of "cloud computing".

4.9.2   MAJOR DEVELOPMENT ACTIONS

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. Development and implementation of **Business Continuity plans and Disaster Recovery plans** based on risk assessment of possible (technical) problems
2. **Server consolidation** (virtualization)
3. Analysis and consolidation of IT resources (technology), upgrade for **no-single-point of failure** by implementing necessary redundancies for server components and networks.
4. Set up **backup centre(s)** and mechanisms for off-site storage for backup data.
5. Achieving decentralization of service (transparency and efficiency), and consolidation of resources (cost reduction), with dramatically increase of its efficiency, by using Infrastructure for e-Government on the national level with new technology of "**cloud computing**".

4.9.2.1   DEVELOP AND IMPLEMENT OF BUSINESS CONTINUITY PLANS AND DISASTER RECOVERY PLANS

Business Continuity Plans and Disaster Recovery Plans are both for unexpected situations (e.g. hardware failures, electricity outages, etc.) which effect ICT systems. Business Continuity Plans are pre-defined operational procedures how the working processes should be conducted whenever a resource needed for them is not available. Typical action in a Business Continuity Plan is to switch to manual administration while a needed system is not operational.

Disaster Recovery is the process an organization uses to recover access to their software, data, and/or hardware that are needed to resume the performance of normal, critical business functions after the event of either a natural disaster or a disaster caused by humans.

Regular backups stored at proper locations are crucial elements of any Disaster Recovery Plan.

Because of the importance of data in Serbian Judiciary and its sensitivity the development and implementation of business continuity plans and disaster recovery plans have to be based on SRPS ISO/IEC 2700# and 20000 standards' recommendations. These plans have to cover all steps of the business continuity planning lifecycle: analysis, solution design, implementation, testing & acceptance, and maintenance.

4.9.2.2   SERVER CONSOLIDATION (VIRTUALIZATION)

In the case of server consolidation, many small physical servers are replaced by one larger physical server in order to increase the utilization of hardware resources.

Server consolidation has several advantages like much better load balancing, lower operational and maintenance costs, better capacity management and last but not least consolidation of servers reduces energy consumption of the servers up to 90%.

A virtual machine can easily be relocated from one physical machine to another as needed. Because of the easy relocation, virtual machines can be used in disaster recovery scenarios. Some emerging new technologies like blade servers are also helping the virtualisation efforts with a more easily scalable architecture.

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In the current technology environment of the Serbian Justice sector however, virtualisation may be a viable solution only after the currently decentralised applications (mainly Case Management systems) are replaced by centralised applications. The best approach would be to form virtualised server environments whenever the new centralised systems are implemented or rolled-out.

4.9.2.3   UPGRADE FOR NO-SINGLE-POINT OF FAILURE BY IMPLEMENTING NECESSARY REDUNDANCIES FOR SERVER COMPONENTS AND NETWORKS

The Serbian Judiciary ICT system is strong as each its component is strong: application, server and networking. Since the most applications in Serbian Judiciary should be centralized as much as possible, it is a must that redundancy has to be provided in order to provide business continuity in case of incidental situations. Any failure of the application or data base server or loss of connection to the servers would implicate problems at Justice institutions so all measures should be performed to prevent such incidents.

Business Continuity Plans and Disaster Recovery Plans handle situations when harmful events occur. But the probability of technical problems may be reduced by building in redundancies into the basic infrastructure. From technical perspective the critical components are the servers, the networks and the power supply since their outage results in blocking of business processes for several end-users. Consequently redundancies should be built in into these components. On the other hand, temporary lack of ICT infrastructure does not cause an irreversible damage, thus redundancies should be scaled and implemented aligned with the expected damages. Possible solution is to outsource whole services itself. A good approach is to quantify the losses of critical infrastructure elements. Naturally some factors are hard to quantify (e.g. bad media coverage of non-working courts). This means that Data Centres should have the highest availability and alternative sources of electricity should be provided.

 The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.9.2.4   SET UP BACKUP CENTRE(S) AND MECHANISMS FOR OFF-SITE STORAGE FOR BACKUP DATA

Off-site data protection, or vaulting, is the strategy of sending critical data out of the main location (off the main site) as part of a Disaster Recovery Plan. Data is usually transported off-site using following methods:

- Using removable storage media (data tapes or optical storage) or
- Electronically via a remote backup service.

It is highly recommended that both methods should be used in the Serbian Justice sector. Storage media should be stored in containers with proper physical security against unauthorised access, fires and natural disasters.

Because of the centralization of application operations that are being performed in the Serbian Judiciary's ICT system, it is crucial to ensure server operations. Therefore the data centres being implemented should be able to take over some of the load of others whenever it is necessary.

4.9.2.5   CLOUD COMPUTING

Primary tool for public administrations "to be recognised as being open, flexible and collaborative in relations with its citizens and businesses" is e-Government. Primary focus of e-Justice lies in Independence and maximizing its public value by increasing efficiency and effectiveness and constantly improving e-services.

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The goal of the proposal is to use an infrastructure for e-Government on the national level for solving the problems in e-Justice and challenges of lack of effective and efficient management of the existing resources.

In the case of consolidation for achieving a modern Justice System through decentralization of service (transparency and efficiency), and consolidation of resources (cost reduction), by using Infrastructure for e-Government on the national level, should focus on:

- Implementation of equipment and software, and integration into existing infrastructure of eGov
- Consolidation of services in the Serbian Justice sector
- Decreasing complexity of services in the Serbian Justice sector
- Increasing of availability, uniformity and consistency of services in the Serbian Justice sector
- Realization of common internal services
- Decreasing of data basis on the optimal level
- Integration of existing electronic services into the system for exchange of data
- Use standards, manuals, detailed recommendations and the best practices for using the new, enhanced eGov infrastructure for cheaper, simpler and more efficient management and maintenance

This centralized "cloud" architecture shows its strengths and flexibility particularly in case of court organization changes (e.g. reducing or increasing number of courts or units, or changing location of courts etc.). In this way MoJPA is in position to easily secure data exchange with other systems (Traffic Police, Central Court Portal, Treasury, National Bank of Serbia etc.)

4.10 ENSURE HIGH EFFICIENCY

4.10.1 INTRODUCTION

Because of the several information channels between the Justice Sector's actors, it is recommended to have uniform standards within the justice system as well as common goals within the overall government ICT plans.

The major aim of unification is the reduction of parallel developments, sharing of best ICT practices across institutions and the provision of the same quality services to the clients of the Justice Sector, independently of the specific institution.

To improve document and data exchange possibilities there is a need for software systems unification which should affect mostly server operating systems, application platforms and databases. The unification would contribute to the easier integration among different systems, data compatibility. Other advantage is the better focusing of ICT staff on a narrower set of applied technologies, thus contributing to better services.

Based on the implemented systems a unified legal information system could be developed to provide access to all current information concerning active regulations, decisions and definitions of judicial authorities (Constitution, International Legal Acts including original English versions, Codes, Laws, Laws for ratification, Regulations, Instructions, Acts for amendments, etc.)

Selected parts of the above mentioned unified systems should be made available for the public by the unification of public web sites. Keeping in mind the differences between the various courts, common look and feel standards for the similar design, structure and information of institutional web sites should be established.

In case of non-core ICT systems of the Justice Sector, unification of Budgeting and Accounting Systems, HR systems (some functions are currently pursued by Excel sheets or other local databases) would provide additional advantages.

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One of the fundamental factors of the above described unification activities is the unification of the data nomenclatures which means that all judicial organizations across the country should use the same data nomenclatures for core events in court trial, mandatory and conditional attributes of events in the court trial, possible lawsuits, etc.

Another field of non efficient operations is the current widespread usage of desktop printers, because long term operational costs are much higher than in the case of much fewer large capacity network printers. Printer consolidation is a viable solution especially if the collection of printed documents is allowed only by usage of electronic ID cards, since it maintains the required security level (and controls the number of pages printed). However printer consolidation needs the change of attitude of staff and can be more easily adapted if the usage of electronic documents in Case Management systems require less frequent printings.

In addition to the above-mentioned technical unifications, some of the key organisational and process aspects should also be unified, that is, common high-level policies and procedures to be defined for:

1. Project Management
2. Security
3. Operations and Maintenance

4.10.2 Major development actions

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. Define **common master data** used for all systems together with their maintenance responsibilities
2. Develop **common look-and-feel technical standards** for all web pages of the sector and develop centralised access points.
3. **Implement common software for non-core procedures** of accounting, HR management, asset management.
4. **Extend the case management capabilities** of the implemented case management system (which is the backbone of the Case Management Systems) for other case management processes within the sector, or establish a full common platform solution for all institutions within the Justice sector.
5. Adapt and implement **common project management methodology** for all projects within the sector.
6. Adapt and implement **common ICT security methodology and procedures**.
7. Adapt and implement **common ICT operations and maintenance** organisational **roles and procedures** for all institutions of the sector.
8. **Consolidate desktop printers** and implement printing control with some system for identification (ID cards, etc.)

4.10.2.1 Define common master data used for all systems

The purpose of this action is definition of common master data with unified format and the uniform attributes to be used by all developed in the future information systems. This action will optimize the process of information exchange between different systems and should minimize the inaccurate data entering.

The definition of common master data should contribute to the introduction of a unified software mechanism for data extraction from different systems and would facilitate the implementation of various e-government services and it is a prerequisite for implementation sector wide reporting and Management Information System. Common master data may include institutions, case-types, professional staff, document types, postal codes, etc.

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Definition of common Master data is not only and ICT related task, but it is sustainable in long term, only if the data ownership and responsibilities for data master data entry, updates, archiving are also defined. Master data should be accompanied by historical information and in-time-validity as well. This means for example that not only current status of professional staff (with job positions) is to be stored, but past values with their validity period could be retrievable as well.

4.10.2.2 DEVELOP COMMON LOOK-AND-FEEL STANDARDS FOR ALL WEB PAGES OF THE SECTOR

The purpose of this action is the unification of the web pages of the judicial institutions from the perspective of visual design, technical functionality and content. Through the implementation of this action a higher level of access to legal information will be achieved, the search for legal information will be facilitated and public awareness of the processes in the judiciary will be improved.

Looking ahead, unified judicial web pages can become an entry point to the different types of electronic judicial services to be provided within the e-government.

Common look-and-feel standards may cover graphical elements, colours, standard menus, used languages (and transliterations), but should not restrict the applied technology (e.g. portal engines). Standardisation should not go into the extremes, for example it is even recommended to have uniform look for all basic courts, but for example, the web pages of the higher courts might have deliberately slightly different look from the web pages of the basic courts.

Any actions in establishing Look-and-feel standards must fully follow official Guidelines for making web site of the state administration.

The resulted Look-and-feel standards should be an obligatory attachment for any future tenders about web-page developments in the sector.

4.10.2.3 IMPLEMENT COMMON SOFTWARE FOR NON-CORE PROCEDURES OF ACCOUNTING, HR MANAGEMENT, ASSET MANAGEMENT

The commonly used systems in any organization, such as *Accounting, Finances, Budget Planning and Tracking, Human Resources and Asset Management* are usually implemented as standard solutions across the organization; furthermore, in case of the government institutions, some governments even procure and implement such common systems for the whole government, with uniform access to such a common system.

In the case of Serbian Justice Sector, we have a number of institutions, with different types of authority and need for access and/or processing of data used by these systems. Regardless of the fact that institutions such as courts are independent, the use of such common systems is not prescribed here, as long as the different types of access and processing are built into such a system, reflecting their legal position and authority.

Most of the above discussed systems can be classified as parts of an *Enterprise Resource Planning (ERP)* system; such systems generally cover the following logical functional areas (modules): *Financial accounting, Management accounting, Human Resources, Project management, Data services and Access control. Common Archiving and Common Knowledge network* are other important components for the Justice sector that could be added to the list of these common systems.

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4.10.2.4 EXTEND THE CASE MANAGEMENT CAPABILITIES OF THE IMPLEMENTED CASE MANAGEMENT SYSTEM

Courts in Serbia are using a variety of Case Management systems, providing different sets of functionalities.

Regardless, as an inevitable step towards e-Justice, the strategic orientation of the Serbian court system should be widespread utilization of case management systems in all courts. Accordingly future judicial applications should be re-engineered and upgraded to include some (or all) of the following functionalities or establish a full common platform solution, depending on target court needs:

1. Support for all common types of electronic content (text/documents, photos, audio and video)
2. Support for electronic forms capture, to enable e-filing via central court portal.
3. Documents exchange with other systems (e.g. police, tax administration, National bank of Serbia)
4. Granulated role-based access control
5. Automated content generation and lifecycle management based on dates and events.
6. Support for qualified electronic signatures and timestamps
7. Support for content annotations (assigning meta-data and keywords)
8. Support for content dependencies and links, such as cross-references, or other types of relationships indicating that changes of one document have impact on another document.
9. Keeping history of all actions and changes performed on documents (i.e. audit log and versioning).
10. Support for business workflows which ensure that users adhere to standard court processes.
11. Automatic user notifications on the new content and content updates that affect their work.
12. Publishing of selected documents of public court portal.

It should be stressed that all electronic case management systems shall require significant increase of WAN bandwidth and massive provision of professional scanners with automatic paper feed to all affected courts, as well as equipment for recording of hearings.

The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.10.2.5 ADAPT AND IMPLEMENT COMMON PROJECT MANAGEMENT METHODOLOGY

The main goal of this action is establishment a common ICT project management rules for each institution involved in the processes of IT project management. Each institution should use similar methods and approaches for planning, monitoring, reporting, cost control, quality management, risk management and change management.

In addition, ICT system implementation practices are to be unified as well. There should be a common methodology (and templates) to develop requirement specification, architecture design, system design, testing and data migration. To develop such uniform procedures, international methodologies are to be followed (e.g. PMBOK/PRINCE for general project management, RUP-Rational Unified Process)

Project management methodologies are often supplied by project management (or portfolio management) tools In this case, regarding the relatively small number of projects it is not necessary to implement such an advanced tool, but basic project planning tool may be implemented.

4.10.2.6 ADAPT AND IMPLEMENT COMMON ICT SECURITY METHODOLOGY AND PROCEDURES

The main goal of this action is establishment of a common ICT security rules which should be defined and implemented in all justice institutions to ensure a proper level of data security and citizen's privacy. The common ICT security policy should contain general principles of information security, specific rules for some areas of security and guidelines for ICT systems physical security, ICT systems logical security, electronic data security and security principles and awareness training of judicial personnel.

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All personnel should be trained and educated in system security principles, including periodic updates with special focus on security awareness and incident handling. Security policies and procedures should also be developed by using international standards and frameworks. (e.g. SRPS ISO 2700# standards for security management, COBIT for assessing and developing internal control environment, Common Criteria for establishment of security related technical requirements).

4.10.2.7 ADAPT AND IMPLEMENT COMMON ICT OPERATIONS AND MAINTENANCE ORGANISATIONAL ROLES AND PROCEDURES

The main goal of this action is establishment of a common duties and responsibilities for ICT related jobs across the whole sector and adoption of common uniform processes for ICT operations and maintenance for:

- technical problems solving
- report generations
- data backups and restorations,

To follow a unified approach it is recommended to implement the ITIL framework (base of ISO 20000 standard) to determine the major ICT operational processes. At the current maturity of ICT organisation, it is not recommended to have a fully and rigorously implemented standard, but the major terminology and processes are to be considered. These might include:

- Incident management
- Release management
- Service level management
- Configuration management
- Capacity management
- Availability management

Some aspects of the above domains are handled by other Strategic actions. Some procedures might require implementation of support tools (e.g. Service Desk, Architecture inventory, etc.), but at the current maturity the emphasis is on the procedures and roles and not on the technical tools.

4.10.2.8 CONSOLIDATE DESKTOP PRINTERS AND IMPLEMENT PRINTING CONTROL BY USAGE OF ID CARDS

Ministry of Justice and Public Administration in past spent a huge amount of money on yearly basis for toners and paper. This cost can be enormously cut by implementing consolidation of desktop printer and printer control mechanism. Printer control mechanism provides following:

- Global printing network in Serbian Judiciary,
- Complete transparency of all printing operations,
- Data security: for example by using ID cards or PIN entering on the network printers, only authorized persons can have access to the printed materials
- Print job status control,
- Central resource repository,
- Grouping of printing platforms,
- Alerting and error control,
- History of printing jobs,
- Reports

According to industry benchmarks the Cost per Page (CPP) of desktop printers (depending on technology) is around 3-4 cents and the CCP for large capacity network printers is about 1 cent. The savings are mainly on toner and maintenance costs. Moreover, implementation of ID card/PIN based printing has a psychological

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effect to print only documents which are needed to perform job related tasks, but nevertheless this may induce resistance.

The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.11 ENHANCE INFORMATION SECURITY

4.11.1 INTRODUCTION

The core procedure of justice is about information gathering, evaluating and decision based on the information. The information is valuable for every participant of the cases, because hiding, possessing and modifying information can alter the course of a case and can result in discrepant decisions.

The purpose of enhancing information safety and security within the Justice Sector is to ensure the proper usage of information and to prevent abuse with information. Information security is based on three fundamental principles of:

- confidentiality,
- integrity and
- availability.

To enhance information security, the Ministry and the other institutions should plan, evaluate and implement various controls. These controls can never provide a guarantee of 100 percent, and the higher the aimed security levels are; the more resources are needed to implement the controls. Consequently security controls should be in balance with threats.

Information Security is a complex area but there are widespread international frameworks and methodologies (i.e. COBIT, Common Criteria, ISO 27000# family) which provide a concise model to address security issues.

What is important while developing and introducing different aspects of the ICT security is to consider ICT security as aggregation of legal/procedural, organisational and technical activities. SRPS ISO/IEC 27000 family of standards could be used as basis for introduction of ICT security related procedures and models.

Increasing security is usually against work efficiency, since execution of procedures may become more complex. If security measures cause large overhead, then people tend to bypass them, which in turn can decrease security! Thus the most important task is to find a proper balance between risks and countermeasures. The foundation of building a proper security infrastructure is a properly executed risk assessment.

Another component of security is the usage of legal software; because illegal software downloads may seriously threat security via uncontrolled Trojans, backdoors and viruses. Desktop virtualisation and centralised desktop management may be a proper solution for that. One of possibility is to replace the software with open source solutions where these threats do not exist.

Deliberate human threats may also be handled by the "least privilege" principle, stipulating, "Do not give any more privileges than absolutely necessary to do the required job." A general principle to be applied is the "segregation of duties", meaning that sensitive transactions (with computer systems) are to be authorised, executed and controlled by different persons.

All (sensitive) transactions should be logged, the logs should be unchangeable, and tools should be implemented to evaluate and control the logs. An important principle is that "all deviancies should be carefully investigated".

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Because most human related security events are linked to internal staff (and contractors), heavy emphasis should be put on their awareness-raising and security training. Clear policies should be defined for implementation and certification of ISO/IEC 27001, information security management systems (ISMS)

Authentication should not be only covered in relation with computer systems, but in terms of physical access as well. Whenever it is required, electronic personal ID cards and readers should be deployed which enables corridor or room level control of staff and visitor movement.

Usual problem of application systems is the accidental loss of data or functionality after changes executed in the system (i.e. deployment of new patch or software version). To prevent such losses, the careful testing of new system should be regulated and tests should be done within separate test environments.

4.11.2 Major development actions

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. Introduce and certify institutions in justice sector for ISO/IEC 27001 Declare IT security related roles and responsibilities by preparing an **Information Security Policy and Security procedures** based on a well founded IT Risk analysis.
2. Establish a **software license database** to keep track of software usage together with formal procedures to acquire, install and revoke software deployed on end-user equipment
3. Implement **Identity Management** function within the IT units to review end-user access to software functions and data keeping in mind the "least privilege" principle and "segregation of duties" principle to operate well controlled procedures to assign and revoke user rights. Link this procedures to HR functions of hiring, promotion, maternity leave, other ceases and quitting jobs.
4. Develop capacities to **analyse transactional logs.**
5. Review and **strengthen authentication and authorisation** methods (i.e. password policies, two-phase authentication).
6. **Improve physical security** of data centres, server rooms and other sensitive areas by installing security doors and electronic ID cards for staff/visitors.
7. **Raise the awareness** of staff on IT security issues by development of an internal communiqué and sanctioning.
8. Establish **dedicated test environments** for all IT systems filled with depersonalised data.
9. Define **common technical security requirements** for all information systems (based on the sensitivity of data) on data transmission, logging, authentication, data storage which can be required from all vendors delivering IT systems.

4.11.2.1 Declare IT security related roles and responsibilities by introdicing and certification of the standards SRPS ISO/IEC 27001 and by preparing an Information Security Policy and Security procedures

Strengthening information security can be partly done by implementing technology solutions for various tasks (e.g. virus scanner, intruder detection systems, firewalls, application controls, etc.), but these technologies cannot fully produce their effect without defining rules for the human staff. All IT security related rules and roles should be defined based on relevant domestic and international standards such as SRPS ISO/IEC 27001 and 20000.

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Security Policy defines on a high level what is important from ICT security point of view and what the Justice sector expect from its staff in terms of ICT security. The Security Policy has to be understandable for each user and staff member.

4.11.2.2 ESTABLISH A SOFTWARE LICENSE DATABASE

Budget planning of software licensing renewal is essential for optimization of resources. Unified data base with all relevant data of all software licenses provides management with the planning tool for purchasing and renewal of new software. This also guaranties optimized usage of software licenses. License database is a critical component of Software Asset Management which also covers unification of software base with elimination of parallel software, unification of software versions and determination of user privileges to acquire and use various software packages. Software license database is also essential to establish and maintain legal compliance.

Creation of software license database is usually accompanied by definition of internal software request/authorisation procedures which are part of a typical Service Desk application, but can also be defined independently from it.

Possible solutions to avoid this action is to replace the license software with open source solutions (for example OS Linux, Office suite Libre Office etc.).

The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.11.2.3 IMPLEMENT IDENTITY MANAGEMENT FUNCTION WITHIN THE IT ORGANISATIONS TO REVIEW END-USER ACCESS TO SOFTWARE FUNCTIONS

Identity management is best defined as, "those IT and business processes, organizations, and technologies that are applied to ensure the integrity and privacy of identity and how it translates to access."

The ICT units should focus on:

- Deploying and managing secured identities via strong authentication/authorization methods, the use of encryption and digital signatures, etc.
- Providing a secure framework for delivering identity management from a tool and administrative perspective as well as from a "secure identity" perspective.

The basic principle of Identity Management is to provide access rights on a need-to-have basis, that is authenticated users may access only system functions and data which is needed to carry out their tasks. Other important aspect is that Identity Management should tackle the changing user roles, that is job entries and exits, promotion, temporary leaves, etc. in a prompt manner.

Identity Management may be supported by specialised software which may cover:

- administration of job positions and user rights based on a central user repository
- support of identity management procedures of request for access, job entry, withdrawal of rights, etc.
- automatic setting of access rights in each systems by automated interfaces (e.g. via LDAP)
- monitoring access and auditing access rights

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4.11.2.4 DEVELOP CAPACITIES TO ANALYSE TRANSACTIONAL LOGS

Transactional logs (or logs in general) are generated by various components of an application system from network devices to database management components on the important events and activities. They serve various goals, like:

- system troubleshooting
- compliance checks with security policies
- and forensics.

Regular analysis of transactional logs may detect security breaches and may contribute to the clarification of the circumstances. The analysis may detect unauthorised access (e.g. when initiated system transactions are compared to data on staff holidays or sick leaves), attempts to use system functions under not normal conditions (e.g. outside of regular working hours or concurrent transactions by the same user from more than one device).

The log analysis also has a dissuasive effect: whenever staff members know that their IT activities are traced, they are not tempted to make not permitted transactions.

Transactional logs may be stored and analysed by various tools, from text editors to specialised log analysers. This later tools usually has some pattern recognition engine with parameter driven rules and automatic notification function whenever unusual pattern are encountered.

4.11.2.5 REVIEW AND STRENGTHEN AUTHENTICATION AND AUTHORISATION METHODS

One of the key areas of IT security is the regulation of access rights to various IT resources (servers, ITC system functions, documents, data, etc.). In the Justice sector access to information has critical importance, since unauthorised access may seriously endanger the objectivity of the justice system. Therefore organisational and technical measures should be taken to ensure these methods.

There are several methods to strengthen authentication:

- User ID / password pairs
- Physical tokens (USB token / smartcard / display tokens with one time passcode)
- Biometric features (fingerprints / iris / voice identification)
- One time tokens (special display tokens / mobile SMS tokens)

Their usage depends on the desired security level and the field of application In case of users having frequent access to restricted information (e.g. judges, advocates) a special hardware token or smartcard may be the solution to extend the usual userID / password pair.

To enter highly restricted areas (e.g. server rooms of the critical ICT applications), usually chipcards and biometric identification is used.

Even the simplest type of authentication/authorisation methods should be strengthened with mechanisms of:

- automatic authorisation change whenever the position of a staff member changes (leaves, promotions, relocations)
- restrictions length and complexity of passwords
- forced password changes in every 3 months or so
- setting authorisation profiles depending on job positions and having a well defined (and regularly audited) process on handling any additional access requests
- segregation of duties to separate authorisation / execution / control roles of certain transactions
- two-men-rule (or four-eyes-principle) to regulate the approval/execution of certain transactions to 2 independent staff members (even sometimes in a partly random manner).

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The final strategic direction should be taken after careful consideration of sustainability and total costs

4.11.2.6 IMPROVE PHYSICAL SECURITY OF DATA CENTRES, SERVER ROOMS AND OTHER SENSITIVE AREAS

When looking at physical security of data centres, server rooms and other sensitive areas, the ICT organisation needs to perform risk assessment of the data and equipment. There are a few basic principles that should be followed for all data centres:

- Low-key appearance,
- No windows if possible or windows protected by metal bars and secured glass,
- Limited number of entry points,
- Anti-passback and man-traps,
- High security doors with access control,
- Security cameras,
- Make fire doors exit only (and install alarms on them),
- Permanent security staff,
- Enforce regular testing of security procedures
- All other measures specified by SRPS ISO/IEC 2700# standards.

Currently virtually all Justice sector organisations have their own server rooms, sometimes with only the basic physical security mechanisms. The planned centralisation of the Case Management systems will reduce the risk of these server rooms, but nevertheless local servers and network equipment will remain at the locations.

Security measures should be aligned with the value of protected equipment and information, therefore a risk analysis should be performed on the typical sites.

The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.11.2.7 RAISE THE AWARENESS OF STAFF ON IT SECURITY ISSUES BY DEVELOPMENT OF AN INTERNAL COMMUNIQUÉ

The main goal of this action is establishment of a various common ICT security control mechanisms for detection, prevention and correction of non desired activities. Security policies, procedures and mechanisms should be developed by using international standards and frameworks. (e.g. ISO 2700# standards for security management, COBIT for assessing and developing internal control environment, Common Criteria for establishment of security related technical requirements).

All personnel should be trained and educated in security principles, with special focus on security awareness and incident handling. Awareness of the end users should be raised by the communication of the most basic security threats and expected behaviour of staff.

The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.11.2.8 ESTABLISH DEDICATED TEST ENVIRONMENTS FOR ALL IT SYSTEMS FILLED WITH DEPERSONALISED DATA

Most information systems at the Justice sector undergo changes during their lifetime, since regulations, procedures and thus user functional requirements change regularly. To ensure that every system change satisfies the requirements and is implemented properly, they should be rigorously tested. It is a basic principle that no modification should be allowed in the live systems without testing it in a separate test environment,

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The main goal of this action is provision of test environment that can be used for testing and acceptance of different information systems without prejudice to the data confidentiality. Other advantage of dedicated test environments is to avoid possible problems of direct modification of live systems, which may cause unexpected errors.

Depersonalized data should contain all the mandatory and optional attributes. Test environments do not need the performance of the live systems. Dedicated test environments may be logical or physical. In the former case the databases, application servers and other components of a system run on the same physical environment as the live system, but as a different "virtual machine" (technical realisation depends on the architecture).

The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.11.2.9 DEFINE COMMON TECHNICAL SECURITY REQUIREMENTS FOR ALL INFORMATION SYSTEMS, DATA TRANSMISSION, AUTHENTICATION

The main goal of this action is establishment of common ICT technical rules for enhancing information safety and security within the Justice Sector in order to ensure the proper usage of information and to prevent abuse with information.

All personnel should be trained and educated in security principles, including periodic updates with special focus on security awareness and incident handling.

Technical security requirements are specific requirements based on the classification of data accessed, handled and forwarded by information systems. Data classification may determine categories like public, confidential, secret and top-secret in alignment with current regulations, including law on personal data protection. Information systems (or their modules) receive the highest data classification they handle and technical security requirements should be defined for each classification of information system.

Technical security requirements may include the following areas:

- data/document storage (encryption, accessibility)
- usage of secure channels during data transmission (security layer, protocols)
- user authentication and authorisation (data visibility, rules for passwords, forced password change, two-phase authentication, usage of tokens/smartcards)
- segregation of duties for information systems handling classified data (strongly separated transaction authorisation, execution and control)
- restriction of I/O operations (data save, screen copies, disabled ports, etc.)
- handling system logs (encrypted logs, controls over log access and modification)
- security systems (e.g. firewalls, demilitarised zones, intruder detection, etc.)
- physical access control of specific servers, data centres, etc.

The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.12 INCREASE KNOWLEDGE AND PROFICIENCY

4.12.1 INTRODUCTION

The purpose of education and training within the Justice Sector is to create, improve and support competencies for the following employees/ training target groups:

- End users
- ICT staff

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- Decision makers/managers.

Using a systematic, logical and structured approach concerning the whole training process, starting from the training needs analysis (TNA) and ending with the evaluation is strongly recommended.

The training domain is affected by ICT in two different ways:

1. ICT tools can support the above described training process by proper methods for planning, organising, presenting and following-up the trainings
2. ICT is in itself a domain/area of the trainings at various levels.

In the process of creation and strengthening of the professional capacity of the whole Justice Sector, the crucial and coordinative role regarding Training has the Judicial Academy.

One crucial aspect of the legal system is to provide equal access and equal judgement to all. Because the public trust of the judicial system is highly influenced by the time needed to the final settlements and by the uniformity of decisions of similar cases, the knowledge sharing between the various courts is an essential element of an efficient and trusted system. Knowledge sharing is not limited to case law, but virtually all aspects of operations may be beneficial if the various organisations and staff members with similar roles share their experience with each other. This way, lots of efforts can be spared, best practices may be spread and reinventing the same approaches could be eliminated.

Information technology may be on one hand an active supporter of knowledge sharing efforts by providing tools and methods to elicit and share knowledge. On the other hand knowledge sharing within the fragmented IT organisation is also helping the provision of better ICT services.

In alignment with its business strategy and the distribution of responsibilities within the Justice sector, the Judicial Academy is the primary institution for all forms of education in the Justice system. This does not mean that all ICT related trainings are hosted or held by the Academy itself, but the Academy is informed of all trainings for the records.

To answer the challenges of ICT trainings an organised set of training activities should be established.

The most important segment of ICT training is increasing digital literacy of all employees. Digital literacy in Juridical Sector should be standardised in accordance with internationally recognised, especially among EU countries, programmes. All new employees should possess appropriate certificate as a proof that they are digitally literate, or should gain it in period no longer than six month from the moment of recruitment.

Additionally, and depending on the work place end-users should be skilled for manipulation with databases and reports as well as for usage of programs for project planning, presentations, web editing and different soft skills " etc. For this kind of training internationally recognized standards also should be used.

Different soft skills "behaviour"/attitude-trainings (workshops, discussions) on commitment, ethics, and data protection issues for all participants are recommended.

For decision makers/managers, there are some crucial training topics, to enhance managing judicial administration tasks. In order to make decisions on ICT issues, awareness about importance and role of ICT in modern judicial systems and the EU should be developed. For them basic project management skills are also important.

There is another field where information technology may play important role in the future: to implement modern and efficient training methods for general (not only ICT) trainings, namely e-Learning and Blended learning methods. These methods require investment in equipment, and Internet bandwidth, but can spare tremendous amount of time spent on travel and accommodation.

If the training responsibilities of the Judicial Academy are strengthened, this should be reflected in the development of the training facilities as well. Specialised ICT trainings (for example for trainings simulating cybercrime) might require specialised training rooms.

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Another aspect of trainings is the perpetual knowledge sharing of Justice Sector professionals about their work, their problems, and their solutions. Knowledge sharing also covers publication and distribution of training materials and juridical publications (e.g. virtual library) and coordination and organisation of international training seminars and exchange programs. Knowledge sharing can significantly improve quality and efficiency of the Justice Sector processes, thus its development may be important component of the Strategy. The Judicial Academy can have a crucial role in development of knowledge sharing activities. The Academy may not only deliver the processed cases to the legal professionals via its trainings and courses, but may develop a Documentation Centre containing all relevant processed cases. This Documentation Centre can be based on the Case Management systems of the Justice Sector.

Some practices related to common procedures of the Justice Sector should be regulated by the Ministry, but to share experience of participants, a common platform should be established. The primary candidates may for knowledge sharing may be budget planning and general information provision to clients of the sector, since this kind of information is uniform across the sector. Tools may internal include mailing lists, discussion forums, Intranet pages and internally organised conferences and workshops as well.

Knowledge sharing of IT related issues is twofold: the IT staff should avoid the parallel development of the same functions satisfying local needs and IT staff should share all experience about solutions of issues and problems of the end-users.

4.12.2 Major development actions

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. Implement a **comprehensive Training Register** to support the whole training process within the Justice Sector from the initial planning of the trainings till the evaluation of them.
2. Establish a scheme and written principles **for ICT related trainings** for the sector by analysing the detailed needs, and provide the necessary resources to have continuous and sufficient education for staff (ICT trainers' network), for managers and for the ICT professionals themselves.
3. Introducing of **e-Learning** for the most common trainings and invest into pilot e-Learning operations.
4. Establish a **Documentation Centre under the responsibility of Judicial Academy** and the interfaces to the used Case Management systems (case law)
5. Develop a **commonly used set of metadata** to identify cases and case related documents (consider introduction of European Case Law Identifier)
6. Establish a **searchable portal for case law related information** for the general public and external legal professionals
7. Implement **knowledge sharing functionality (mailing lists, Intranet pages, discussion forums)** within the Justice Sector for selected organisation units
8. Assess all **locally developed applications** and support the **rollout** of the most useful systems
9. Establish **knowledge sharing functionality of the Service Desk** application
10. Organise **annual ICT conferences** within the Justice Sector

4.12.2.1 Implement a comprehensive Training Registry to support the whole training process

In general, the Judicial Academy, as the designated institution within the Justice Sector for all training activities, is covering the training needs of its target groups. The training target groups can belong to different institutions within the system, i.e. the Ministry itself, various types of courts at various levels, prosecution organization, prisons etc.

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One of the clearly necessary conditions for the successful management of all these training activities within such a large and complex environment as Serbian Justice Sector is the existence of a comprehensive Training Registry. The key function of the Registry is to allow in one place, by the means of electronic, on-line communication, access to all information regarding training, including:

- All standard and non-standard courses, seminars, workshops, etc. offered over a long enough period of time, e.g. one year, with necessary details about their content, duration, accessibility, location, etc.
- All already registered attendees to the planned and already performed courses, as to allow for easy and various statistical reports and other necessary information about training activities;
- Links to any current and future Human Resources systems, in order to keep updated career records, for all staff within the sector, which would in turn allow for up-to-date information and decisions regarding their career advances, whether they satisfy certain legal and professional requirements, etc.
- Ability to register for a course through a Training Web site/portal, for all qualified candidate

The Training Registry would typically consist of the training registry database (which could be a part of a wider competency training database, including all training materials, etc.) and an application, supporting on-line access to registration and information about it.

4.12.2.2 ESTABLISH A SCHEME AND WRITTEN PRINCIPLES FOR ICT RELATED TRAININGS FOR THE SECTOR

The purpose of education and training within the Justice Sector is to create, improve and support competencies (a sum of the required knowledge, skills, and attitudes) for the following employees/ training target groups:

- End users: judges, prosecutors, court and prosecutorial employees, Ministry staff;
- ICT staff;
- Decision makers/ managers.

There are more, smaller and specific target groups, e.g. service help-desk staff, IT administrators, new users of applications, newly hired personnel etc.

Another way to define the training target groups is by employees of different institutions of the Justice sector: courts, prosecutor offices, prisons etc.

4.12.2.3 INTRODUCING E-LEARNING FOR THE MOST COMMON TRAININGS

E-learning is a training method which comprises various forms of electronically supported learning and teaching. There are many possibilities to consider: e-learning can include delivery of just-in-time information and guidance from experts, the training can be on-line or off-line, computer-based or web-based. e-learning can take place in or out of the classroom. Main benefits of using e-learning:

1. Enables to learn anywhere (in the classroom, at work place, home)
2. Enables to learn anytime (time-flexible, people learn when it is suitable for them)
3. Supports different learning needs (people learn in different ways)
4. Suitable for mass-training
5. Significantly less operational costs as organising, travelling, accommodation, catering etc

It is important to stress that the development of e-learning materials / software for e-learning framework requires significant resources, thus it is profitable only if the given training is held for a wider audience and over a longer time-period.

Crucial element of a fully developed e-Learning infrastructure is a Learning management system. There are commercial off-the-shelf (COTS) solutions, but in this case, especially for a pilot implementation an open source solution might be selected and used.

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4.12.2.4 Establish a Documentation Centre within the Judicial Academy

Establish a **Documentation Centre within the Judicial Academy** and the interfaces to the used Case Management systems. Currently, the Supreme Court of Cassation shares the experience of most important cases, but publication of lower level court decisions is fragmented.

The specific situation in Serbian justice system, where there are several Case Management systems in use , requires that the future Documentation Centre, in order to really represent single reference point for all areas of judiciary, establishes operational links with all of the above systems.

Such Documentation Centre, in order to be commonly and efficiently used, would have to establish its own portal, linked to the general Justice portal, and with controlled access rights. Such portal could contain the following components:

- Jurisprudence part with judicial decisions (case law) database, containing several components (e.g. country-wide in Serbia, European Civil Rights Court, regional jurisprudence, International Courts),
- Library, with various other documentation relevant to case search
- Laws, either Serbian or relevant international/EU
- News
- Other information of interest to those searching for specific court cases, i.e. a sophisticated search criteria ability

This Documentation Centre should be accessible to legal professionals – both to professionals currently working in the Justice Sector and to independent professionals (e.g. lawyers, public notaries) also, but certain parts may be allowed for access by the general public as well.

4.12.2.5 Develop a commonly used set of metadata to identify cases and case related documents

The term common explanation of metadata is that it refers to "data about data", in other words, metadata is used (created either through automated or manual processes) to describe in a standard fashion, the content of some data structure. The core standard for metadata is ISO/IEC 11179-1:2004, and the widely accepted original set of 15 classic metadata terms, is known as the "Dublin Core Metadata Element Set".

Metadata definition can simplify a number of key operations on the case-related documents in the judiciary, whether they are to be found in a database, or on a web page or portal. Metadata allow for a simplified search process.

When one is trying to apply the metadata principles to identify cases and case-related documents, it is clear that the first step is to identify which types of data are regularly appearing on every case and on individual case-related document.

4.12.2.6 Establish a searchable portal for case law related information and legal database for the general public and external legal professionals

The goal of this action is to develop a centralized legal information portal to access "processed" information of closed cases in form of case law related information and access to the current full regulatory environment (laws, bylaws, governmental acts, etc.) including the relevant EU regulations. This legal database system should provide both current and historical information on national legislation, court decisions, case law, administrative procedures, EU and the world legislation, national legislation in translation. The database should be searchable

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based on various metadata during portal operations no new piece of document/information is generated but the portal provides access to already classified documents.

4.12.2.7 IMPLEMENT KNOWLEDGE SHARING FUNCTIONALITY (MAILING LISTS, INTRANET PAGES, DISCUSSION FORUMS) WITHIN THE JUSTICE SECTOR

This action focuses on implementing suitable knowledge sharing solutions that will allow the Justice sector employees to have access to an internal knowledge database in the form of intranet pages, discussion forums or mailing lists and be able to actively participate and contribute to the pages or discussions.

Additionally the newly employed staff will be able to quickly find answers to some questions that require more experience and thus strengthen further the institutional knowledge.

By their nature, the knowledge sharing systems are usually not rich in transactional functionality but they support searches on various criteria. They may contain edited and regularly updated content (like process manuals, how-to-do descriptions, etc.), but their major feature is to support interactivity between staff members of various fields. It is a basic principle that knowledge sharing applications will contain useful information only if entering content is an easy task.

4.12.2.8 ASSESS ALL LOCALLY DEVELOPED APPLICATIONS AND SUPPORT THE ROLLOUT OF THE MOST USEFUL SYSTEMS

During the Diagnostic phase of the project, it has been discovered that there is a number of various types of local applications, developed usually to satisfy the specific need of an institution. Such local applications are normally not known to other institutions and their staff, except by accident. This action stipulates that, by assessing the value and applicability to other institutions of each such local application, the sector might achieve a sizeable increase in productivity and efficiency overall, without the need to immediately invest any significant funds.

In order to do this, the ICT organisation should collect, analyse both from the technical and functional side the value of each such application, and then eventually offer some of them (with possible modifications) to other institutions in the sector.

4.12.2.9 ESTABLISH KNOWLEDGE SHARING FUNCTIONALITY OF THE SERVICE DESK

The establishment of the knowledge sharing functionality will improve the information exchange options among Justice Sector professionals about their work, their problems, and their solutions. This might significantly improve the efficiency of the Service Desk, since this way most arising ICT related problems need to be solved only once. Other advantage of knowledge sharing is, that some of the simplest cases may be shared with the end-users promoting self-service and thus reducing the workforce needs of the Service desk.

The staff members in various organizations with similar roles will be able to share their experience with each other. This way lot of efforts can be spared, best practices may be spread and reinventing the same approaches could be eliminated.

Knowledge sharing should be implemented by a simple searchable database of already solved cases grouped into some groups. Discussion forums among ICT professionals may also be implemented to facilitate resolution of more complicated issues.

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4.12.2.10 ORGANISE ANNUAL ICT CONFERENCES WITHIN THE JUSTICE SECTOR

One of the possibilities to share knowledge within the sector is to organize the annual ICT conference. It also gives a good opportunity for:

- providing information and news related to ICT development, including about implementation of the ICT strategy;
- learning from external guests, incl. international;
- raising awareness about importance of ICT in the modern judicial systems and the EU practices;
- creating the right attitudes and necessary commitment.

Recommended training methods for the conference:

- presentations combined with interactive sessions;
- open discussions;
- brainstorming or problem solving in smaller groups.

The annual conference might have distinct sessions for business decision makers and for ICT personnel.

4.13 ENSURE WIDELY AVAILABLE WEB BASED SERVICE FOR ALL USERS

4.13.1 INTRODUCTION

Justice Sector is very important part of economy and can greatly affect the ability of society to change. Acceleration of the procedures that can be achieved by using modern forms of communication are significant. Provision of web-based services is not a technical goal in itself but a general tool to improve the judicial services in the country by providing round-the-clock opportunity to major stakeholders (citizens, legal persons, and legal professionals) to obtain general or specific information and to carry out transactions related to judicial cases.

According to the European Commission Directorate General for Information Society and Media, the online availability of Public Services is roughly evaluated on a 5 level scale[1]:

- Level 1: Information – a given service provides access to general information on the service
- Level 2: One way interaction – a given service provides dynamic information and forms required for service request can be downloaded from the website of the service
- Level 3: Two way interaction – electronic forms can be used to initiate a service
- Level 4: Transaction – full electronic case handling of the procedure (including notification, delivery and payment if necessary)
- Level 5: Personalisation – proactive, automated service delivery

Major developments in web based should be executed at areas with high level of interaction with the citizens or legal professionals. This means, that the major focus is the development of court portals, the portal of the Judicial Academy and the portal of MoJPA.

Case flow services should be used extensively by the legal representatives who have the most frequent contacts with the judicial institutions. For possible improvements, system access portal personalization is one of the first steps. This approach would allow users to mark cases they are interested in which will improve efficiency of the services. Providing web service, similar to the services of other state institutions may be charged which would improve the provision of such services financed out of own revenues.

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[1] Source: Method paper 2010 – Preparing the 9th Benchmark measurement

(http://ec.europa.eu/information_society/eeurope/i2010/docs/benchmarking/eGovernment_Benchmarking_Method_paper_2010.pdf)

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The next possible step in the improvement of services is the ability to download documents which are created by the courts or that have been submitted by other participants in the proceedings. Certainly, such an improvement would have to be done keeping in mind the legal provisions on access to documents: therefore some form of electronic authentication of users should be introduced.

Another development area is the establishment of electronic payment for court fees and other levies. Because the implementation of an electronic payment scheme requires large investment and strict security measures, it is recommended to have a single electronic payment system for all governmental institutions. Thus in this area Justice Sector should join to the planned governmental payment system and the major task is to develop the proper interfaces.

For Judicial Academy the development of web portal is necessary to reduce manual work required to keep content up-to-date. All trainings/courses should be automatically published on the portal; and training material need to be downloadable as well.

The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.13.2 MAJOR DEVELOPMENT ACTIONS

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. In order to achieve higher level judicial availability to citizens and legal professionals, **setting up a common data structure framework for court information publication** is a start.
2. Set up a **central location for public court document storage and access**. Court document generation and publication to parties of interest need to be standardized and could lead to better control over information distribution.
3. Develop a proper **authentication and authorisation scheme** for accessing published documents on court portal. This should be used by judicial professionals (advocates, public enforcers) and later may be extended to the general public.
4. Develop a **common form management component** to cover all forms to-be in electronic format. Align the electronic forms with the paper based ones.
5. Enable **electronic form submission for citizen's inquiries** of vindication of their current legal status, approval of not being in any kind of prosecution and other processes.
6. Enable **electronic form submissions for legal professionals** for selected processes.
7. **Implementing personalisation and notification of registered users**. Centralized system could then keep track of preferred cases as they move from different instances of courts and providing fast notifications of relevant information.
8. Final major step would be the **provision of capability for payment of court taxes and fees** to citizens and legal persons.
9. Develop new **portal for Judicial Academy** which enables automatic publication of training calendar/ trainings courses / training materials and provides interactivity in applications for the courses.

4.13.2.1 SETTING UP A COMMON DATA STRUCTURE FRAMEWORK FOR COURT INFORMATION PUBLICATION

In order to facilitate integration of court and cases information data from different CMS and DMS systems, it is necessary to establish common data structure framework, identifying data models and common data fields, formats and validation rules for major objects and entities used in judicial software applications (e.g. case, contact, court decision etc.) The common data structure framework should also define various codebooks.

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The existence of a common data structure framework and joint data dictionary relieves the software developers of many problems: identifying all required data fields and formats, conceptualizing high-level entities, designing database schemas and ensuring that each court system is capable of exchanging the necessary information with other systems and updating central database used by court information portal.

The primary responsibility for the setting up of common data structure framework should be assigned to the future ICT governing body.

4.13.2.2 SET UP A CENTRAL LOCATION FOR PUBLIC COURT DOCUMENT STORAGE AND ACCESS

The court information web portal is envisioned as centralized public access portal that will allow users to:

1. Query case status and docket information for all courts in Serbia
2. Access various forms, templates, case laws, court statistics and other information of interest
3. Submit electronically various forms and inquiries for selected court processes (e-filing)

This bi-directional access approach requires establishment of central, robust document and case information repository, serving as aggregation and distribution point for all Case Management systems in use. One or more backup/redundancy nodes should be considered in Kragujevac, Niš or Novi Sad, depending on availability of funding. The best solution for this recommendation is to be done by using Infrastructure for e-Government on the national level for solving the problems in e-Justice and challenges of lack of effective and efficient management of the existing resources.

The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.13.2.3 DEVELOP A PROPER AUTHENTICATION AND AUTHORIZATION SCHEME FOR ACCESSING PUBLISHED DOCUMENTS ON COURT PORTAL

Court Portal and all court information systems will contain sensitive information and documents that need to be accessible only to people with appropriate permissions. For ICT systems accessible only to staff of the Justice sector this can be regulated by internal system administration procedures. For ICT systems potentially accessible for external users – and Court portal is such a system – administration of user authentication and authorisation should be based on different foundations. Access to case related documents should be restricted to certain users who have legal right to access the documents. These users may include advocates, prosecutors or even the suitors, respondents and their representatives or witnesses. Access should be provided on a case by case basis.

Authentication to restricted documents needs to be linked to pre-registration. Registration may be general (e.g. for advocates) or clearly linked to a certain case. Consequently advocates who may represent several clients need to be registered only once, but they need specific authorisation for each case they are officially involved.

This means that a central external user repository should be created, which differs from the user repository of the Court Case Management systems (which contains staff of courts).

The authentication policies may evolve towards more secure user authentication mechanisms, such us:

- Qualified electronic certificates on smart cards or USB tokens;
- SMS verification codes/tokens

Additionally, user actions should be authorized both on the client side and server side, in order to eliminate risks of bypassing client-side role security by technically skilled users and/or hackers.

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4.13.2.4 DEVELOP A COMMON FORM MANAGEMENT COMPONENT TO COVER ALL FORMS TO-BE IN ELECTRONIC FORMAT

ICT unit in cooperation with interested parties in the Justice sector, equipped with appropriate software components, to convert and standardize all frequently used paper forms into electronic format. Such effort plays a vital role towards achieving the goals of electronic forms submission and electronic content management.

The forms digitalization should combine at least the following efforts:

- Creating standardized library of electronic versions of paper-based documents (PDF format or other comparable format), keeping track of the evolving versions of the same forms over time to ensure compliance with the actual regulations
- Creating capability in the existing and future software systems to process electronic forms and validate and store forms-data in the underlying judicial databases for further processing.
- Standardize electronic form templates to be use by judicial systems, by populating data placeholders using the information from judicial databases.
- Define internal policies for using qualified digital signatures in the documents to ensure integrity and non-repudiation of electronic documents and forms.

This strategic action requires much more human effort than direct financial investment to complete.

The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.13.2.5 ENABLE ELECTRONIC FORM SUBMISSION FOR CITIZEN'S INQUIRIES

One of the most frequent citizen inquiries is the request for certificate of current legal status. Currently, in most cases citizens are required to physically appear at the court in order to file the request, and provide proof of payment of court fees. This and other similar inquiries could be automated, via court website, where a citizen would be given e-filing and payment instructions with reference number related to their request.

Depending on the implemented forms (which initiate various processes), a proper authorization and authentication may be necessary.

Implementation of forms may be gradual, and first steps may serve as a kind of pilot-case for implementation of large-scale electronic forms submission.

The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.13.2.6 ENABLE ELECTRONIC FORM SUBMISSIONS FOR LEGAL PROFESSIONALS FOR SELECTED PROCESSES

Legal professionals should be allowed to submit selected forms and documents in Portable Document Format (PDF) or other widely used electronic format, supporting qualified electronic signatures.

In such scenario, court Case Management systems would accept digitally signed filings for selected processes. In case that relevant laws and rules of procedure stipulate mandatory keeping of paper copies for all court documents, the submitter could be allowed to provide the supporting hard copy within a given time period from initial e-filing of the document. This way, the number of required physical visits to the court could be significantly decreased for legal professionals.

This is particularly important for inter-organizational exchanges involving huge number of cases, such as electronic submission from the Police, Tax Administration and Customs administration on one side, to the courts on the other.

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The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.13.2.7 IMPLEMENT PERSONALISATION AND NOTIFICATION OF REGISTERED USERS AT CENTRALISED COURT PORTAL

The centralized court portal home page should be customizable for registered users. Frequent visitors, such as legal professionals would benefit from personalized home page, displaying information such as status of their ongoing cases, various deadlines, scheduled hearings and other notifications.

In addition, registered users should be able to subscribe to notification and status updates on their cases, deadline reminders or similar events, based on selected filters and criteria. Supported communication channels should include e-mail or SMS.

Electronic notifications could be charged per delivery, using Value Added Services provided by mobile operators (for SMS delivery), or on pre-paid basis (for delivery via email), to facilitate financing sustainability of the deployed IT infrastructure.

The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.13.2.8 PROVIDE CAPABILITY FOR PAYMENT OF COURT TAXES AND FEES TO CITIZENS AND LEGAL PERSONS

A majority of cases have a financial element involving court fees and/or fines. Thus, all court Case Management systems should be able to record the date, case number, case party role, payment amount, and payment method. This data can be obtained electronically from the Treasury department, in XML format, using web services, so courts will be able to electronically review and accept the payments relating to their cases.

There are two main preconditions for implementation of capability for electronic processing of payments:

1. Each Case Management system should be able to assign unique payment ID ("poziv na broj") related to personal ID number (JMBG) and/or case number. All payments of fines and court fees should be referenced by this unique payment ID, generated and maintained in the system, for easier tracking of payments and remaining obligations.
2. After proof of payment was registered, the system should issue a receipt confirmation showing the unique transaction ID, date, court name, case number, payment amount, payment date, payee name, case participant role, and remaining balance due.

Courts could also consider installing payment terminals in the court halls, which could accept both cash and payment cards and issue printed receipts on the spot. Implementation of payment terminals and other electronic payment methods may be aligned with governmental level implementation of e-payment. Individual payments may adhere to one of the two variants, depending on MoJPA policy:

1. Citizen or legal person can specifically designate payments for particular case, or
2. All fines and fees from any court would accrue on personal account, and payments would be automatically subtracted from total amount due. The second approach requires central repository of unpaid fines and fees from all courts by establishing a full common platform solution for all institutions within the Justice sector.

The final strategic direction should be taken after careful consideration of sustainability and total costs.

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4.13.2.9 DEVELOP NEW PORTAL FOR JUDICIAL ACADEMY WHICH ENABLES AUTOMATIC PUBLICATION OF TRAINING CALENDAR, TRAININGS COURSES AND TRAINING MATERIALS

In order to increase the efficiency in the communication and information dissemination for the training processes in the Justice sector implemented by the Judicial Academy (JA), this strategic action calls for introduction of a new web portal of the JA that will provide the staff with the capacity to easily manage the publication of training related calendar, courses and materials.

Basic training related information should be obtained from the Training Register to be developed in Strategic action 9.1 ("Implement a comprehensive Training Register to support the whole training process"). While that Training Register is mainly for the internal purposes of the Judicial Academy, the portal served as an outside window to certain information. The two Strategic Actions may be joined into a single one, but the Training Register may be implemented without the renewal of the portal.

This is a low effort action with a moderately high impact, as the portal would serve hundreds of justice sector employees. The high impact is due to the possibility for the portal to be used as a tool in the implementation of many of the planned strategic actions that require trailing as part of the process.

The final strategic direction should be taken after careful consideration of sustainability and total costs.

4.14 MAINTAIN VARIOUS DELIVERY CHANNELS AND STIMULATE USAGE OF MODERN ICT RESOURCES

4.14.1 INTRODUCTION

Serbian population is still relatively modest user of Internet, both on European and world scale. According to the newest statistics (2012) on the number of general Internet and Facebook users in Europe, from the Internet World Stats site (http://www.internetworldstats.com/), Serbia, with 56.2% population using Internet is in 35th place, out of 53 countries in Europe.

Considering these statistics, it is clear that the Justice Sector in Serbia, in order to ensure that some of the admittedly key pillars of the Justice Reform Strategy, "Impartiality and Quality of Justice", "Efficiency of the Judiciary" are improved in the future, should implement a variety of delivery channels to be used for exchange of information between the Justice system institutions and their clients, including the general population, as most numerous kind.

These channels should vary from the more traditional, old-fashioned ones, such as regular mail, less dependent on ICT, to modern technology most-used ones: SMS messages ("texting"), email, and various other Internet-based methods, such as portals and web sites. The differences between these delivery channels, besides the level of ICT dependence, are manifested in many other ways, such as: speed of delivery, cost of delivery, width of reach, ability to transfer various types of information, ability for easy response/dialogue, quality/security of delivery, etc.

The need for use of various delivery channels thus is dictated by the varying ability and readiness of the different groups of general population, as well as other specific groups of potential clients of the Justice system (lawyers, experts, etc.), to use more modern, ICT-related channels as opposed to the traditional ones.

Looking at the current situation with the use of most common ICT in Serbia, some new delivery channels are becoming obvious candidates:

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- *Mobile phones SMS messages* ('Texting"): considering the wide-spread use of mobile telephony in the country, this delivery channel is a clear candidate. However, it imposes certain limitations, such as secure delivery, length of message, privacy and confidentially issues. Other limitation is the lack of guaranteed delivery of messages. Regardless, it can certainly be considered for the delivery of certain types of judiciary information to an individual client in time. The major fields of application of this channel may be the sending of notifications to participants of a given process and the sending of verifying information (i.e. one time PIN code) used for two-phase identification.
- *Email messages*: with an increased effort to enable full implementation of the electronic signature and use of electronic documents, this channel can be become a ubiquitous tool in the massive exchange of all kinds of information and documents. There are technology solutions to enable safe delivery with application of digital signature, time-stamping and hash-coding.
- Trusted delivery services (Register E-mail - REM) as secure and proofed mechanism for delivery of electronic documents which is responsible Information Intermediary (by the Law of electronic document).
- *Web sites*: these can provide useful method of fairly simple and cost-effective delivery of information to a large number of clients, both public and private (secured). When paired with the use of individual access codes/passwords, assigned to individuals, it can be used as a very cost-effective and timely tool to deliver all kinds of information to individual users of the Justice system.
- *Web Portals*: for the systems with many different institutions, use of a portal is probably much more effective and simpler for the clients, since it eliminates the need to visit numerous web sites (e.g. courts) to find out information of interest.
- *Court/Public Information Kiosks:* these are already used in some court jurisdictions in the region, providing quick access to information regarding the case hearing locations and timing within the court premises, and other similar type of information. If organized as a kiosk, it can also provide access to other information, such as printing of forms, inquiries, and alike.

In order to implement variety of delivery channels, and at the same time allow for more easily implementable solutions, the Justice Sector would probably have to use a gradual approach, where certain delivery channels would be designed and used before the others, while at the same time improving current channels.

It is important to note that any new approaches here should be accompanied by adequate and timely public information and communication campaign, making it well-understood and accepted by the future users.

4.14.2 MAJOR DEVELOPMENT ACTIONS

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. Consider all necessary **legal changes required to implement proposed new ICT delivery channels** in Justice Sector;
2. Define **technical standards for the implementation of new ICT delivery channels**;
3. Procure, develop and implement **additional software elements/systems** necessary to utilize the new ICT delivery channels;
4. Liaise with external organizations in charge of the general use of additional delivery channels (e.g. mobile phones service providers, Internet service providers, etc.) and **investigate most cost-effective approaches and technologies** for the use in Justice Sector;
5. Include the use of additional delivery channels into **common IT security methodology and procedures**.

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4.14.2.1 CONSIDER ALL NECESSARY LEGAL CHANGES REQUIRED TO IMPLEMENT PROPOSED NEW ICT DE-LIVERY CHANNELS IN JUSTICE SECTOR

One important aspect of interactions with "clients" of the Justice Sector, or indeed between the "actors" (i.e. employees) themselves, is the channel of communication. Traditionally the direct face-to-face communication and the official postal services served for a long time as vehicles for information exchange. Usage of e-mails, messaging and web portals has proven to significantly reduce the time and cost of communication.

The need for use of various delivery channels thus is dictated by the varying ability and readiness of the different groups of general population, as well as other specific groups of potential clients of the Justice system (lawyers, experts, etc.), to use more modern, ICT-related channels as opposed to the traditional ones.

The delivery channels are in fact applicable; however some of the new channels do **require legal changes** in order to be considered for wider application. A good example is the use of electronic signature, which has been approved in Serbia years ago, but the necessary by-laws have still not been completed, so that its use is still at the very beginning.

The considerations of all necessary legal changes must be done with full understanding of the technical requirements to implement such new channels, since these can affect the legal changes. There is also a pressing need, considering Serbia's future in EU, to consider any upcoming requirements from EU in order for the Serbian Justice sector to fully participate in pan-European initiatives in this area.

4.14.2.2 DEFINE TECHNICAL STANDARDS FOR THE IMPLEMENTATION OF NEW ICT DELIVERY CHANNELS

All of the above in the case of Serbian Justice Sector is in fact applicable; however some of the new channels do require, besides the legal changes in order to be considered for wider application, a clear **establishment of technical standards** for their implementation. These standards should be defined in line with all applicable wider Serbian and EU technical standards for the operation of any such channel, e.g. use of a web portal, or mobile phones text messaging, with the additional safety/security concerns, stemming from the specific justice sector requirements.

One of the key technical standards may be the new HTML5 standard, which significantly improves the generation of web-pages and which is a leading technology for content publication on smart phones and tablets

4.14.2.3 PROCURE, DEVELOP AND IMPLEMENT ADDITIONAL SOFTWARE ELEMENTS/SYSTEMS NECESSARY TO UTILIZE THE NEW ICT DELIVERY CHANNELS

Some of the new ICT channels for information exchange within the Serbian Justice Sector may in fact require procurement and implementation of various software elements and systems, while others may not. As an example, use of text messaging through the existing mobile phone providers' networks may require some additional application of security measures, or linking to existing Case Management Systems, in order to automate the sending of these messages to parties in a court case under certain conditions.

4.14.2.4 INVESTIGATE MOST COST-EFFECTIVE APPROACHES AND TECHNOLOGIES FOR THE USE IN JUSTICE SECTOR

In order to implement variety of delivery channels, and at the same time allow for more easily implementable solutions, the Justice Sector would probably have to use a gradual approach, where certain delivery channels would be designed and used before the others, while at the same time improving current channels. Also, the

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delivery through the current channels can be improved and upgraded; as an example, the existing web portal can start delivering court case electronic documents to specific case parties and participants, using previously issued access codes/passwords.

In parallel with definition of all necessary legal conditions and technical standards, the most effective approaches and technologies to be used by top priority new ICT channels should be investigated and determined

It is important to note that any new approaches here should be accompanied by adequate and timely public information and communication campaign, making it well-understood and accepted by the future users.

4.14.2.5 INCLUDE THE USE OF ADDITIONAL DELIVERY CHANNELS INTO COMMON IT SECURITY METHODOLOGY AND PROCEDURES

Once there is a clear idea of the types of desirable new ICT channels, their priority and legal, technical and financial requirements, it would be necessary to include them into the common IT security methodology and procedures. Such action may require, due to sometimes completely new paradigm that a new ICT channel would bring, a very different and new approach to IT security, i.e. expansion of the current security methodology and procedures. However, this cannot be defined and stated in advance, until it is clearly known which new channels are selected, and which specific technologies they are going to use in the justice sector specifically.

This action encompass the study of compatibility of the new channels IT security rules, as may be dictated sometimes by their common providers (e.g. mobile service provider) with the current IT security methodology and procedures, as applied within the justice sector. Any discrepancy should be defined and resolved, so that the two fit together.

4.15 ENSURE VENDOR-INDEPENDENT SERVICE ARCHITECTURE

4.15.1 INTRODUCTION

The Justice Sector in the Republic of Serbia has developed a track record for the last years in managing increasing needs for integrated justice processes for the benefit of the citizen, business and its government partners. The foundations of this achievement have been the laws and procedures, the successive donor programmes, the e-Justice decision and the collaboration between all stakeholders.

Considering the limited Justice Sector resources there is a growing perception amongst the Ministry and the other involved institutions that the only feasible way forward is "moving forward together" by furthering harmonization and simplification, and doing so obtaining the anticipated benefits of tighter collaboration and integration, sharing and pooling of resources, co-management of Justice IT systems.

In order to take full account of the fact that Justice Sector procedures should be available to users and managed centrally and not a single institution perspective and to avoid pre-empting the IT architecture, the business process model should describe exchange of information between stakeholders such as judges and prosecutors, without discriminating between information exchange within the same institution from those across several institutions.

The business process model is a key asset to improve the consistency between legal and IT developments, being the common reference point to both. It is therefore important to obtain a reasonable assurance of quality of the underlying business process model at the time of approval of the legal bases and IT systems specifications.

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During the next years, the Justice Sector would face several challenges related to the usage of information technology: unification of processes inside the agencies and between the agencies, implementation of evolving business changes, information sharing with other Justice Sector's stakeholders. In order to cope with those challenges, the Justice Sector should design and implement Service Oriented Architecture to be settled on the National e-Government infrastructure.

A SOA-based architecture will provide a loosely-integrated suite of services that can be used within multiple justice domains. SOA would define how to integrate widely disparate applications for an environment that multiple implementation platforms. SOA would achieve the goals of increased interoperability, increased federation, and increased business and technology domain alignment.

Furthermore, the fact that services are designed to be intrinsically interoperable directly facilitates business change. As business processes are augmented in response to various factors, services can be reconfigured into new compositions that reflect the changed business logic.

4.15.2 MAJOR DEVELOPMENT ACTIONS

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. Introduce **business process management** in cooperation with the business areas to define business processes and align them with the changing expectations and regulations. Defined business processes provide input for system developments and any changes planned on the existing IT systems
2. Introduce **Service Oriented Architecture** to enable flexibility and reusability
3. Establish **sector-wide architecture management** responsibilities to maintain a registry for ICT systems and major characteristics together with the required procedures.
4. Implement SOA on the National e-Government infrastructure.

4.15.2.1 INTRODUCTION OF BUSINESS PROCESS MANAGEMENT IN COOPERATION WITH THE BUSINESS AREAS

There is an increasing need of introduction of new functionalities and automation of the current ones within the Justice sector. One of possible perception amongst the Justice sector institutions is centralization. The foundations for realization of centralisation is based on harmonization and simplification, and doing so obtaining the anticipated benefits of tighter collaboration and integration, sharing and pooling of resources, co-management of Justice IT systems. As different segments of the Justice sector are becoming more and more complex, there is a need of improvement of understanding with regards to alignment of business processes with the IT. The business process modelling is a way to align business with IT and better understand each other. The business process model is a key asset to improve the consistency between legal and IT developments, being the common reference point to both.

BPM is a collection of methods and tools used to document, improve, and monitor business processes.

The ICT unit is charge for introduction of the BPM in the Justice sector. IT is essential to engage business stakeholders to drive the BPM initiative. IT needs to be a support mechanism and to assist with technology, but otherwise, needs to facilitate the business with managing their own processes.

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4.15.2.2 INTRODUCTION OF SERVICE ORIENTED ARCHITECTURE TO ENABLE FLEXIBILITY AND REUSABILITY

During the next years, the Justice Sector would face several challenges related to the usage of information technology: unification of processes inside the agencies and between the agencies, implementation of evolving business changes, information sharing with other Justice Sector's stakeholders. In order to cope with those challenges, the Justice Sector shall design and implement Service Oriented Architecture (SOA).

SOA is a disciplined approach to designing, creating, and managing services that improve business functions and processes. SOA philosophy treats all software components as services, and provides the framework for independent services to interact with each other across a network. SOA is an architecture, a process, and a design paradigm. A mature SOA contains a catalogue of component entities (called services). Services are easily modifiable, granular, and reused in multiple combinations to create business-oriented solutions (called applications).

The benefits of introduction of SOA are described below:

1. Flexibility. Under a typical hierarchical programming model, a change in one part of the application affects every component beneath it. With SOA, the practice of separating services ensures that change impact is isolated to the component being changed.
2. Reuse. Using the same service in separate systems increases efficiency, improves quality and lowers costs. This is directly related to the business benefit of reusing IT assets.
3. Enhanced troubleshooting. Distinct systems enhance the management of performance, security, and optimization issues. A problem that cripples one service does not adversely affect any other service. Problems are more easily isolated and managed.
4. Easier integration. The practice of writing a service in a language-neutral and platform-neutral interface makes integration easy for the developer of a new service.
5. Comprehensibility. Consistent communication among stakeholders through planning, design, delivery, and change stage. Communication is a key aspect of good SOA governance.

4.15.2.3 ESTABLISH SECTOR-WIDE ARCHITECTURE MANAGEMENT RESPONSIBILITIES TO MAINTAIN A REGISTRY FOR ICT SYSTEMS

The main goal of this action is establishment of centrally maintained and managed "configuration database" of all judicial ICT systems which will include the following information as minimum:

- Basic information – unique system identification, main functionality, list of institutions which use the system, starting date of system usage, date of system decommissioning.
- Operational information – entire information related to the system life cycle (e.g. system status – under development, put into operation, decommissioned), as well as information regarding the administrative decisions (e.g. deployment, parameters, system documentation, etc.).
- Technical information – all technical details, helping the IT staff to maintain the system.
- Legal information – the entire contract and license related information.

The result of this action will prevent parallel developments and overlapping, and will improve determination of future needs and technology gaps. The registry itself may be realised by implementing a commercial-off-the-shelf (COTS) architecture management tool, but regarding the relatively small number of ICT applications, as a starter an internally maintained simple registry with accompanying diagrams on deployment will suit the needs. The major focus should be on the procedures, how the changes in the architecture are handled and how the registry is maintained. It is worth to mention that this registry is NOT an inventory of individual equipment.

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4.15.2.4 IMPLEMENT SOA ON THE NATIONAL E-GOVERNMENT INFRASTRUCTURE

Hardware platform for implementation of SOA should be the National e-Government infrastructure. Justice Sector will have to dispose their own niche with resources in virtual infrastructure, secured and highly protected of other parts of the System (users, applications, databases). This platform is redundant and high available, with uninterrupted and aggregate power supply, physical and technical strict access control with video surveillance, and door interlocking.

4.16 ENSURE VENDOR-INDEPENDENT COMMUNICATION ARCHITECTURE

4.16.1 INTRODUCTION

Communication between the various actors of the Justice sector is currently mainly paper-based. The major advantage of ICT applications supporting the workflows of the Justice sector can only be exploited if the majority of information exchange is done on electronic communication channels.

Other advantage of reliable communication architecture is the possibility to implement and operate centrally managed web-based applications which significantly reduce the need for local operations and thus contributes to an overall increase of efficiency.

In technology terms there are several possibilities to build communication architecture, links to remote sites may use optical, copper and the networks within the buildings may also rely on various technologies.

Building a nationwide communication network to each justice institution however would require a huge investment and is probably beyond the budgetary opportunities of the Justice sector ICT. Therefore some parts of the communication architecture should rely on other public or private networks as leased lines or packet/cell switching connections.

Because of the geographically distributed institutions, an extensive communication network is needed with large enough bandwidth. Since the amount of transferred data is probably increasing during the next years, the required capacities of the communication architecture should be carefully planned. In-house LANS should also be improved to cope with the increased traffic.

Serious consideration should be devoted to the implemented technologies and to the ownership of the communication equipment, since the overall architecture needs to be vendor independent, meaning that any single vendor could be replaceable within reasonably short time whenever need arises.

Although there are long-term plans to develop a full-scale governmental network within Serbia to serve institutions like courts, prosecutors' offices, prisons, but there is no guarantee that this network will be available during the time horizon of the Justice sector ICT strategy

4.16.2 MAJOR DEVELOPMENT ACTIONS

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. **Develop networks** with not sufficient capacity

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4.16.2.1 DEVELOP NETWORKS WITH SUFFICIENT CAPACITY

To fully support proper work of business processes and applications in the Serbian Justice sector it is needed a modern computer network fully based on TCP/IP protocol. It is important to mention that this network should:

- Be reliable
- Be highly secured
- Be redundant
- Support Quality of Service (QoS)
- Support prioritization of traffic
- Besides data, support transfer voice and video too
- Be be supported and supervised from centralized position

All telecommunications links should has redundant topography and should have enough bandwidth to provide quality transfer of data/video/audio over TCP/IP.

In a simplified form, the network of the Justice sector has two parts:

- Wide Area Network (WAN) joining the various sites of institutions
- Local Area Networks (LAN) joining the ICT equipment of a single site of an institutions

Ownership and operation of the two types may differ, since to build a full WAN only for the Justice sector is probably not a feasible option, therefore third party service providers will be used to provide full capacities.

In case of LANs even if the equipment (routers, switches, etc.) is owned by the justice institutions, the planning, implementation and operations may be outsourced.

4.17 ENSURE VENDOR-INDEPENDENT INTEROPERABILITY AND INFORMATION EXCHANGE ARCHITECTURE

4.17.1 INTRODUCTION

Individual components and aspects of justice procedures and processes can no longer be considered independently of each other – interdependencies should be recognized, documented and respected, incompatibilities should be solved. The complexity will increase exponentially if all systems are interlinked. Therefore the exchanges of messages should be functionally and technically compatible and the IT systems of different stakeholders should be able to process them immediately to ensure the synchronization of the systems. Centralized Case Management is the main candidate for intensive real time exchanges between Courts, Prosecutors' Offices and Prisons spread in the Republic of Serbia as well as with Ministry (Directorate for the Administration of Seized Assets and Administration for the Enforcement of Penal Sanctions)

Interoperability should be planned to a large extent and shall be achieved in the Justice environment relying on Serbian National Interoperability Framework. For system simplification and further development, it is advantageous to also 'factor out' common business concepts that should not be duplicated in separate systems.

- Common status - The status of cases is similar across all Justice Procedures.
- Common business events - Justice Stakeholders perform actions that trigger business and system events. Incoming messages from lawyers or other external participants also trigger the same or similar events.
- Common rules - These are rules specified and valid for all cases – or at least a particular set of cases. Additionally, other areas of rule use should be explored.

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- Common processes - Picking out the common processes and procedures from current Justice Procedures and systems will give input to build a more modular, easily-adaptable, easily-extendable system.
- Common Data Model - The Justice Systems data models are all similar, but not in any manner unified.
- Common terminology - This is essential to achieve consistency across systems, data and procedures.

4.17.2 MAJOR DEVELOPMENT ACTIONS

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. Development and implementation of **Interoperability standards** relying on Serbian National Interoperability Framework (protocols of communication, message exchange standard) within the Justice Sector and with other institutions

4.17.2.1 DEVELOPMENT AND IMPLEMENTATION OF INTEROPERABILITY STANDARDS

Interoperability is a key concept meaning the ability of ICT systems and of business processes they support to exchange data and enable sharing of information and knowledge. As well, all involved parties should cooperate and reach certain level of business process integration/automation. This would help the Justice sector deliver better services to the citizens, improve its decision making, and reach higher level of operational efficiency. Interoperability consists of 4 levels:

- Legal, dealing with legislation alignment, so the information exchanged has legal weight.
- Organisational, which is dealing with organisational and process alignment between stakeholders which provide to and accept services one from each other, and use these services to enable them to operate effectively together.
- Semantic, dealing with semantic alignment and explaining how the exchanged information should be explained and understood,
- Technical, dealing with syntax, interconnection and transport of information between the stakeholders and explaining models involved and services (open interfaces, interconnection services, data integration, middleware, security, etc.)

The Justice sector should develop and adopt Justice Interoperability framework relying on Serbian National Interoperability Framework, which would provide guidelines for different topics related to the exchange of information between the systems. As well, it should implement the standards and maintain (upgrade, change) according to the needs in the sector. It should be responsible for the level of technical interoperability, and as well initiate implementation of other levels of interoperability toward responsible organisations.

The standards for interoperability should be developed relying on Serbian National Interoperability Framework for integration of different processes, both inside the Justice sector, and with other institutions.

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4.18 HAVE A GOOD BALANCE OF INTERNAL AND EXTERNAL SERVICES HAVING EFFICIENCY IN MIND

4.18.1 INTRODUCTION

The operations of ICT equipment and services within a geographically disperse environment require highly skilled staff and proper technical background. In some cases third party service providers may provide the necessary services in a more efficient and effective way. The possible benefits of outsourcing in general are:

- Lower operational costs
- No need for investment for the Justice Sector
- IT services continuity
- Use of strict methodologies, possession of quality or other certifications
- Independence from the work force fluctuation

In some cases the major drivers of outsourcing are of regulatory nature: constrained by the salary limitations of public servants, some highly skilled resources cannot be employed by public administration institutions. Moreover regulatory limits of the ICT staff size may be another driver for outsourcing.

A common characteristic of good outsourcing contracts is that they have a clear description of the conditions, expectations, (quality) measures and sanctions. These are handled by service descriptions and Service Level Agreements (SLA).

Sourcing decisions have a long lasting effect on the Justice Sector, thus the outsourced services should be carefully selected. The basis of any sourcing agreement is the clear definition of a Service Catalogue of ICT, and the decomposition of end-user services to technical services. Unless complete end-user services are to be outsourced (i.e. network and email service), the agreements with third party contractors should cover these technical level services. Defining exact measures and measurement methods is a key component of every well formulated outsourcing contract together with the sanctions for not meeting the target levels.

Whether to outsource or not always requires a careful investigation of factors like:

- specific objective of outsourcing
- current and expected quality of service
- availability of market players with required skills and geographical coverage
- ownership of infrastructure
- expected costs
- savings on resources
- effects on the organisation

4.18.2 MAJOR DEVELOPMENT ACTIONS

Considering the above Expert recommended vision of the area, the following development actions are recommended:

1. Prepare **feasibility studies** for outsourcing of various activities.
2. Develop a **dashboard for IT service level measurements**

4.18.2.1 PREPARE FEASIBILITY STUDIES FOR OUTSOURCING OF VARIOUS ACTIVITIES

The main objective of this action is to gain a preliminary vision of which activities can be outsourced in terms of lack of internal resources in a long term, presence of external vendors, which can be engaged and necessary

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financial resources for activities implementation. Outsourcing may have various drivers from cost reduction to quality improvement; these should be considered during the studies.

It is necessary to take into account the presence, the lack or the need for a legal basis for outsourcing of these activities, especially in terms of handling of security sensitive data.

The resulted Feasibility Studies may serve as a basis for outsourcing (or in-sourcing) specific ICT services and can be used for outsourcing tenders or for budgeting purposes.

4.18.2.2 DEVELOP A DASHBOARD FOR IT SERVICE LEVEL MEASUREMENTS

An ICT Service level dashboard is a management tool for ICT management to overview the actual and past status of the ICT services and to initiate actions if the measures are outside of the predefined boundaries. This dashboard should show the major characteristics of the ICT services (e.g. number of ICT requests waiting in the queue, average data transfer speeds, average number of days to decide on a change request for an implementation project).

Dashboard is also important to measure and overview the service quality provided by third party vendors nd it has crucial role to communicate the ICT performance for the Ministry management.

The development of a dashboard for IT service level measurements should become a part of the Service Desk knowledge sharing functionality with aim to improve the information exchange options focused on outsourcing services needs. The IT performance measurement should contribute to IT services quality especially quality of outsourcing contracts.

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