CONCEPT OF THE
Integrated Information System Concept for the Ministry of Foreign Affairs and European Integration

The document was created as part of the United Nations Development Programme's Project "Building Institutional Capacity of the Ministry of Foreign Affairs and European Integration"

CONTENTS

INTRODUCTION

Through "Building Institutional Capacity of the MFAEI" project, United Nations Development Programme (UNDP) is assisting the Ministry of Foreign Affairs and European Integration (MFAEI) in strengthening its institutional capacity in the process of achieving its European Integration goals and commitments.

Currently, the ordinary activities of MFAEI staff include development, expedition and processing of large amounts of data, under supervision of MFAEI leadership, coordination with MFAEI subdivisions and subordinated structures, monitoring implementation of international treaties and international agreements Republic of Moldova is part of.

An increase in the efficiency of the actions above is possible by implementing an Integrated Information System (IIS), providing a proper environment for cooperation, document creation and storage, which would increase overall organizational efficiency, ensure secure access to truthful and up-to-date information, accelerate shared internal processes and facilitate information exchange irrespective of user location.

Apart from that, the IIS will offer a set of tools to organize decision-making policy, control and manage document workflows, provide reporting facilities etc.

In order to ensure authenticity and genuineness of decisions made by MFAEI management bodies, IIS will rely on Digital Signature Infrastructure.

The Integrated Information System of the MFAEI is based on different infrastructure components:

- Working legislation and regulatory component
- Technical infrastructure and user workgroup component
- Data and knowledge infrastructure component
- Telecommunication and network services component.

GENERAL

Full Name: *Ministry of Foreign Affairs and European Integration - Integrated Information System*

Short Name: *MFAEI IIS or IIS*

The aim of the Concept is to help MFAEI to describe an Integrated Information System as a part of the Ministry of Foreign Affairs and European Integration infrastructure. The concept presents a future vision as how the system should operate once all its subsystems are built and integrated. The IIS will be designed in accordance with existing legal frameworks and in consideration of the fact that the system should become a part of the information and telecommunication components of e-government infrastructure in Moldova.

2.1 The purpose and objectives of IIS

The **purpose** of IIS is to advance a modern e-government solution in order to offer a more qualified public service and make the decision-making process more transparent. IIS encourages the use of Information and Communication Technologies (ICT) for a more efficient and transparent exercise of MFAEI functions.

Definition of the system:

MFAEI IIS represents the suite of all subsystems, data, information flows and circuits, storage and usage procedures and means that contribute to fulfillment of Ministry objectives. The results of System functioning are described in Chapter 4.5 System Function Results.

MFAEI IIS is part of the State Information Resources of Republic of Moldova.

IIS Description:

MFAEI IIS will be an Information and Telecommunications System characterized by the existence of a single point of access to resources, applications and informational services within MFAEI. This will represent a tool to support all the activities of the Ministry by offering technical means of information exchange, collaboration and transparency of ongoing activities. In these conditions, IIS will create an accessible information environment, modern and secure in order to ensure communication and collaboration for MFAEI personnel and its subdivisions, diplomatic representatives and other authorized state officials.

IIS objectives:

- Implement a secure and protected collaboration environment, which offers collaboration means to MFAEI employees no matter where they are physically located, as well as means to ensure informational integration with external systems;
- Offer accurate and quick data in order for MFAEI employees to fulfil their functions;
- Introduce a reliable and efficient document management system powered by workflow procedures in order to ensure fast documents delivery to recipients and deadline monitoring;
- Reduce image risks caused by delays, contradictory messages or actions due to lack of information from decision makers part;
- Generation of data repositories related to the activities of the Ministry and its subdivisions, in order to make MFAEI activity more efficient;
- Transparency of activities and decisions within MFAEI;
- Offer authentic, true, up-to-date and consistent information to all involved actors;
- Reduce response time and offering support for decision-making;
- Fast, guaranteed access to data and information irrespective of location;
- Continuous information of population;
- Homogenize information, messages and actions in subdivisions and representatives;
- Reduce costs, increase quality and diversity of communication means;

2.2 IIS Principles

The fundamental principles on which the IIS will be built are:
- **Legality principle** - the functions and operations undertaken by the system and its users are of legal nature and in conformance with human rights and national legislature;
- **Authenticity principle** - the data stored and presented by the system is authentic. Its authenticity is certified both by presence of track record of a datum creation as well as the presence of digital signatures against electronic documents. The authenticity of electronic documents also ensures non-repudiation;
- **Identifiable principle** - information packages carry a state wide unique classification code that allows univocal identification and reference to information;
- **Audit logging principle** - the system registers information about changes to information so that it is possible to restore the history of development of an artefact as well as the state of an artefact at an earlier stage;
- **Software independence principle** - the system can be built based on custom-built modules or on commercial, of the shelf software. The concept does not limit in any way the approach to software development as long as it satisfies the needs and presents the best value for money;
- **Single system principle** - while exposing and supporting multiple features and business functions the system is built as an integral element and is also used by personnel via a single interface. More so, this principle requires for the future expansion and enhancement of the system to be done on the system itself via protocols and connection points designed into the system from the start.
- **Usability principle** – structure, content, access means and navigation are focused towards the users of the system.
- **Extensibility principle -** the system components offer facilities for adjustment and extension of existing functionalities in order to comply with changing requirements of MFAEI.
- **Principle of using open standards** – both for interoperability with external systems and for ensuring longevity of information in accordance with existing norms.
- **Security principle** – protecting the integrity, accessibility and confidentiality of information.

2.3 Key Terminology

Antivirus - software package that protects operating software from malicious attacks.

API - application programming interface - a protocol describing the means a system can interconnect/interoperate with other software systems.

Audit Logs - records about actions taken within a software system.

Certificate Authority - issues and authenticates Digital Certificates. Entity within the Digital Signature Infrastructure.

COTS - commercial off the shelf - software packages available for sale and that do not involve custom development activities.

Digital Certificate - authenticity tokens by which digital signatures are created and verified. Entity within the Digital Signature Infrastructure.

Document Management - the practice used to capture, manage, store, preserve, deliver and dispose of 'documents' across an enterprise. In this context 'documents' can be used to describe a myriad of information assets including images, office documents, graphics and drawings as well as the new electronic objects such as Web pages, email, instant messages and video.

Domain - (technical) a logical group of computers that share a central directory database. This central database contains the user accounts and security information for the resources in that domain. Each person who uses computers within a domain receives his or her own unique account, or user name. This account can then be assigned access rights to resources within the domain.

E-mail - one of the most frequently used Internet services. It emulates the mail service where people send messages to addressees.

ICT - Information and Communication Technologies.

IIS - Integrated Information System.

Infrastructure Security System - security services designed to ensure integrity and availability of hardware and software systems. It includes autoupdate of software, remote administration and installation, antivirus, firewalls etc.

Instant Messaging - a service within a corporation or on the Internet that allows instant exchanges of text, voice and file transfers between two people. The service operates based on a presence mechanism that registers where a person is currently logged in.

Internet - the global network.

Internet services - the totality of services available on the Internet and as a consequence to personnel of the MFAEI with access to Internet.

LAN - Local Area Network - the physical and technological infrastructure that ensures interconnectivity of computer systems within close premises (a building or floor). The defining characteristics of LANs include their higher data-transfer rates, smaller geographic place, and reliance on owned networking infrastructure (as compared to leased service from third parties).

License Management - the discipline of correct recording and accounting of available software licenses and their use on actual computer systems.

MFAEI - Ministry of Foreign Affairs and European Integration.

PKI - Public Key Infrastructure - it enables users of a basically unsecure public network such as the Internet to securely and privately exchange data and money through the use of a public and a private cryptographic key pair that is obtained and shared through a trusted authority. The public key infrastructure provides for a digital certificate that can identify an individual or an organization and directory services that can store and, when necessary, revoke the certificates.

Records Management - the practice of maintaining the records of an organisation from the time they are created up to their eventual disposal. This includes classification, storage, security, and destruction or archival preservation of records.

Secure Networks - networks that guarantee confidentiality and security of communication.

Single Sign On - facility that grants both internal and external users access rights to system's services based on their home domain credentials. The assumption here is that the home domain is trusted by the host domain.

Task Management - a process of managing a task (or task portfolio) during its lifecycle, including planning, testing, tracking and reporting. Effective task management presupposes managing all aspects of a task including its status, priority, time, human and financial resources assignments, recurrence, notifications and so on.

Trusted domain - same as Domain defined above with the constraint that it is operated by a trusted external party. Information provided by a trusted domain can be assumed to be authentic and correct.

Virtual Private Network - a computer network in which some of the links between nodes are carried by virtual circuits in some larger network (e.g., the Internet) as opposed to running across a single private network. The links of the virtual network are said to be tunnelled through the larger network. One common application is secure communications through the public Internet.

WAN - Wide Area network - a computer network that covers a broad area (i.e., any network whose communications links cross metropolitan, regional, or national boundaries)

Web - World Wide Web is a very large set of interlinked hypertext documents accessed via the Internet. Currently it's almost synonymous with the Internet as people find it most usable and easy to access.

Wireless access - an access means that connects computer systems by means of radiofrequency transmissions

Workflow - definition, execution and automation of business processes where tasks, information or documents are passed from one participant to another for action, according to a set of procedural rules. Organisations use workflows to coordinate tasks between people and synchronise data between systems.

Workgroup Network - the network designed to serve a workgroup.

THE LEGAL BASE

The Ministry of Foreign Affairs conducts its activity in conformity with the Constitution and the laws of the Republic of Moldova, the decisions of the Parliament, Decrees of the President of the Republic of Moldova, decisions of the Government, and other normative documents, international treaties and agreements to which the Republic of Moldova is party.

The system under consideration is governed by the same legal and normative framework and specifically it complies with laws and regulations in the area of information system development and software lifecycle.

Specifically the processes governing system's conceptualization and creation are defined by Technical Regulation "Software lifecycle processes" RT 38370656 - 002:2006 by Ministry of Information Development.

The decisions and available solution space is also shaped by the Republic of Moldova related normative base as well as international standards and practice in the area.

3.1 Moldovan Normative Base

- Law on telecommunications no. 241-XVI of 15.11.2007;

- Law on access to information no. 982-XIV of 11.05.2000;

- Law on informatics no. 1069-XIV of 22.06.2000;

- Law on information and state information resources no. 467-XV of 21.11.2003;

- Law on electronic document and digital signature no. 264-XV of 15.07.2004;

- Law on personal data and its protection no. 17-XVI of 15.02.2007;

- Law on registries no. 71-XVI of 22.03.2007;

- Law on state secret no. 106 of 17.05.1994;

- Law on normative acts of the Government and other central and local public authorities no 317-XV of 18 July 2003;

- Law on public function and the status of civil servants no. 158 of 04.07.2008;

- Law on diplomatic service no. 761-XV of 27.12.2001;

- Decision of the Government of the Republic Of Moldova on special telecommunication systems of the Republic of Moldova no. 735 of June 11, 2002;

- Decision of the Government of the Republic Of Moldova on approving the Concept of governmental telecommunications system no. 183-17 of 16.02.2005;

- Decision of the Government of the Republic Of Moldova about centres of public keys certification no. 945 of 05.09.2005;

- Decision of the Government of the Republic Of Moldova on approving the Rules on the use of digital signature in electronic documents of public authorities no. 320 of 28.03.2006;

- Decision of the Government of the Republic Of Moldova on National Strategy on creating the informational society – "Electronic Moldova" no. 255 of 09.03.2005;

- Decision of the Government of the Republic Of Moldova on the Concept of electronic government no. 733 of 28.06.2006;

- Decision of the Government of the Republic Of Moldova on approving the Concept of the integrated system of electronic documents flow no. 844 of 26.07.2007;

- Decision of the Government of the Republic Of Moldova on approving the Concept of governmental portal no. 916 of 06.08.2007;

- Decision of the Government of Republic of Moldova on measures regarding the creation of an Automated Information System "State Register of legal units" no.272 of 6 Mar 2002;

- Decision of the Government of Republic of Moldova for approval of the Concept of the Automated Information System "State Register of Population" and the regulations regarding the state register of population no.333 of 18 Mar 2002;

- Decision of the Government of Republic of Moldova for approval of Regulations for Ministry of Foreign Affairs and European Integration no.1156 of 4 Nov 2005;

- Decision of the Government of Republic of Moldova for approval of Regulations regarding the activity of diplomatic missions of Republic of Moldova no.744 of 29 June 2007;

- Decision of the Government of Republic of Moldova for approval of Regulations regarding the Electronic mail system of public administration authorities no. 969 of 23 Aug 2007.

- Decision of the Government of Republic of Moldova regarding the Official Page of Republic of Moldova in the Internet Nr. 765 din 05.07.2006

3.2 International Normative Base and Practice

Besides the local normative base, this concept relies on international research findings best practices, guidelines, standards, interoperability frameworks, model solutions and requirements. The list includes a series of references used by the authors during the development of this concept paper:

- *Electronic Information*:
    - Guidelines on best practices for using electronic information by DLM Forum, http://dlmforum.typepad.com/gdlines.pdf

- *Document/Records Management Systems*:
    - MoReq2 - Model Requirements Specification for the Management of Electronic Records, http://www.moreq2.eu/
    - DoD 5015.02-STD RMA Design Criteria Standard by US Department of Defence, http://jitc.fhu.disa.mil/recmgt/standards.html
    - ISO 15489 Information and documentation - Records Management by ISO, http://www.iso.org/iso/catalogue_detail?csnumber=31908

- *Internet standards*:
    - published by Internet Engineering Task Force (IETF), http://www.ietf.org/

- *XML standards*:
    - published by The World Wide Web Consortium (W3C), http://www.w3.org/
    - published by OASIS, http://www.oasis-open.org/

- *Metadata standards*:
    - DCMI Element Set (ISO Standard 15836) published by The Dublin Core Metadata Initiative, http://dublincore.org/

- *Character coding systems*:
    - The Unicode Standard by The Unicode Consortium.

SYSTEM FUNCTIONALITIES

4.1 Main Functions of MFAEI

Considering the integrated nature of the system, MFAEI functions are great in number and diverse, both as goal and content. They are defined on the basis of Ministry of Foreign Affairs and European Integration's Regulation approved by Decision of Government of Republic of Moldova Nr. 1156 of 04.11.2005.

Elaboration and promotion of state foreign policy

- Elaboration of concept and legal documentation regarding the state foreign policy;
- Promotion of government policy with regard to European Integration and membership of Republic of Moldova in the Stability Pact of South-East Europe;
- Coordination of official statements and positions of the supreme bodies of state power in matters pertaining to international relations and European Integration of Republic of Moldova;
- Participation in the development and implementation of security policy, including ensuring the coordination of national activities related to developing cooperative relations with Euro-Atlantic relevant structures;
- Ensure promotion of the interests of Moldova in international organizations with universal, regional and sub-regional levels;
- Regulate the organization of foreign visits for state dignitaries at the level of President, Prime Minister and other officials entitled to carry out bilateral and multilateral negotiations with external partners, as well as regulation for visits of foreign officials and dignitaries to our country, including arrangements to monitor achievement agreed within them.

Coordination of the activity of cooperation structures

- Coordination of activity of specialized central government and other central administrative authorities in connection with implementation of a single policy on international relations;
- Coordination of relation of Moldova with the EU institutions and Member States of the EU in effective implementation of the Action Plan Moldova - EU and achieve the objective of European integration;
- Coordination of relationships between central ministries and other administrative authorities in Moldova and international organizations and institutions.

Information and communication functions

- Coordinating organization for public information campaign in Moldova on the prospects of EU membership, the effects of European integration of Moldova and benefits of participation in European bodies, regional and sub-regional;
- Preparation and presentation of proposals, in predefined mode, on developing relations with other countries and international organizations, based on analysis of information on bilateral and multilateral relations, development of international life and interests of the Republic of Moldova;
- Preparing advice on the participation, membership and mandate of the official delegations of the Republic of Moldova in international conferences and meetings;
- Express the agreement for distribution by the central organs of public administration and other central administrative authorities of official information on the foreign policy of Moldova;
- Contribute to foreign media information on foreign and domestic policy of the Republic of Moldova.

Consular and diplomatic functions

- maintain diplomatic and consular relations of Moldova with other countries and international organizations;
- Coordinate the work of Moldovan diplomatic missions abroad;

- Contributing to the establishment and maintenance of inter-connections and other external relations of the Parliament of Republic of Moldova;
- Organization of consular activities in Moldova and abroad;
- Contribute to developing relations with Moldovan Diaspora;
- Protect the rights and legal interests of Moldovan citizens abroad;
- Support the smooth functioning of diplomatic missions and foreign consular representations in Moldova.

Elaboration and evidence of international treaties

- Elaboration and endorsing of treaties drafts;
- Submission of proposals for ratification, approval, acceptance of international treaties;
- Initiate and participate in negotiation of international treaties;
- Ensure functioning of a single system to record international treaties Republic of Modova is part of;
- Certificate the translations in the state language of international treaties;
- Submission to the publication of the international treaties Republic of Moldova in part of;
- Direct monitoring and reporting on the implementing of the international treaties and other international agreements Republic of Moldova is part of.

Diplomatic service personnel training and development

- Organise trainings for diplomatic service personnel

Most of listed diplomatic and consular functions are found integrally in "Diplomat" and "Consul" subsystems for which, MFAEI is the registrar of:

- travel document, issued to citizens of Republic of Moldova registered in consulates (State Register of Population);
- visas issued to foreign citizens and citizens without citizenship, employees of diplomatic missions (State Register of Population);
- accredited journalists (own function);
- official delegations (own function);
- non-grata persons (own function);
- license to register transport means for diplomatic missions (State Register of Transportation);

Record of foreign citizens, immigrants and persons without citizenship in Republic of Moldova is the responsibility of the Ministry of Internal Affairs of Republic of Moldova and are stored in AIS "State Register of Population".

It is worth mentioning that "Consul" and "Diplomat" subsystems have been conceived and approved separately of the present concept (in fact, conceptions and even implementations of these subsystems have started before the works on the present concept had started). In these conditions, IIS concept just outlines the necessity to integrate these subsystems without going too much into detail as to the objects and functions of these subsystems, focusing on the integration aspects of all MFAEI IIS subsystems.

At the same time, MFAEI acts as a registrar of international treaties within AIS "State Register of juridical acts of Republic of Moldova". The Treaty component forms the "Registry of Treaties".

4.2 Main Functions of MFAEI IIS

Having MFAEI functions and the objectives of integrated information system to be implemented as a starting point, MFAEI IIS needs to fulfill, besides specific functions determined by the objectives, purpose and destination of the present Concept, the following main functions:

- Implement a secure and protected communications collaborative environment, which offers communication collaborative means to MFAEI employees, regardless of their physical location and means to ensure integration with external information systems;
- Implement a reliable and efficient document management system powered by workflow procedures, in order to ensure fast documents delivery to recipients and monitoring their compliance with deadlines;

- Form the data repositories necessary for the activity of MFAEI subdivisions. These include data insertion, update and deletion. These functions are fulfilled during every day activities of Ministry employees as well as during data exchange with public administration authorities;
- Ensure data provision from data repositories;
- Ensure authenticity at all stages of data collection, storage and presentation;
- Ensure data protection and security at all stages of data gathering, storage, processing and using State Information Resources;
- Supply public authorities and citizens with relevant information;
- Ensure interaction with IIS and other State Information Systems;

Besides basic functions, MFAEI IIS needs to ensure some auxiliary functions required for a good work of the system.

ICT Infrastructure Administration Functions

- granting access to authorised bodies;
- infrastructure maintenance, updates and development;
- support and assistance during IIS use;
- conformance with software products licensing terms.

Audit and Control Functions

- inspection and audit of activities;
- preservation of history of changes and actions;
- statistics gathering and reporting.

Auxiliary Functions

- management of permanent and ad hoc work groups;
- allocation of thematic work spaces (sites) to groups;
- strict bookkeeping of records (finalized documents);
- management of activities and calendars/agendas for individuals, work groups and top executives;
- access to resources based on individual and group permissions.

4.3   Basic Functional Areas

The integrated information system of MFAEI includes the following functional areas:

- Bilateral cooperation,
- Multilateral cooperation,
- European Integration,
- State diplomatic protocol,
- Treaties (International Law),
- Consular affairs,
- International economic relations,
- Public relations,
- Audit,
- Analysis, monitoring and evaluation,
- Secretariat and archive,
- Support (accounting, human resources, logistics, reporting).

The fulfilment of the functions listed above is ensured via the following subsystems (some of which already exist):

- **Intranet subsystem**: ensures communication and collaboration functions of MAEIE and includes application support for:
    - Allocation of workspaces (sites),
    - Organization of thematic workgroups,
    - Creation and management of draft documents,
    - Records management,
    - Organization of work agendas and activities,
    - Ensuring access rights according to permissions,

- Preservation of version history for audit purposes,
- Collection of statistics for reporting etc.
- **Specialized subsystems**: include both owned systems (Diplomat and Consul) as well as administrative function systems - universal to majority of organizations such as human resources and personnel, accounting, budget planning and execution, logistics and procurement.
- **Registry of Treaties**: registers and informs about treaties that RM is signatory.
- **Communication subsystem**: delivers voice and informal communication by integrating telephony, fax, instant messaging and voice over IP services.
- **MFAEI Web Portal subsystem**: offers access to public information.
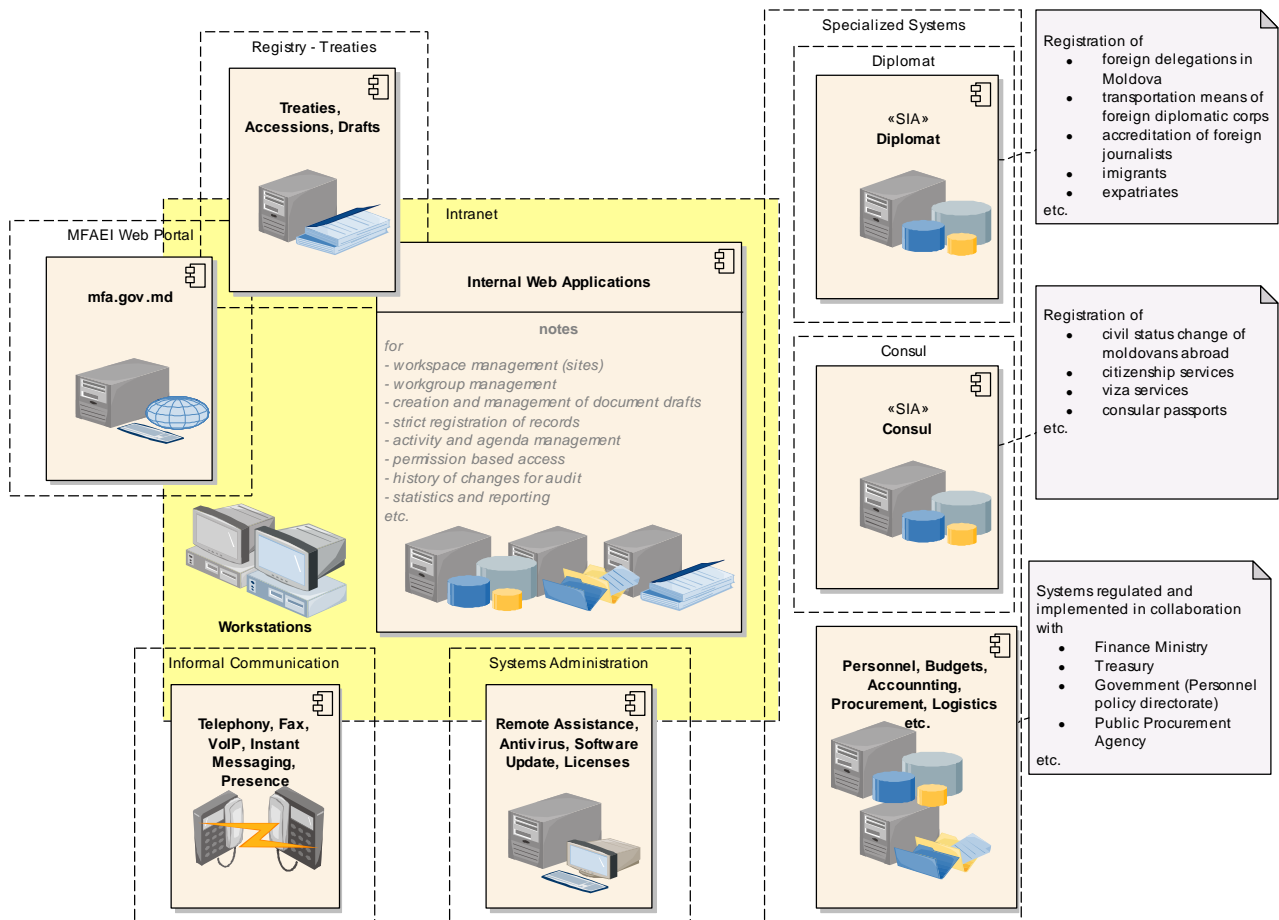- **Administration subsystem**: monitors and ensures normal operation of IIS.

Figure 1 — Subsystems that service the functional areas of IIS of MFAEI

As shown, the identified subsystems have both tangential and overlapping connections. This is intentional and each overlapping depicts a strong relationship that requires attentive and thorough development of the functional modules that service these areas. The tangential connections present a reduced integration point. Such integration is made by ensuring that final and approved documents in one functional area can be registered in the other.

The concept paper describes more thoroughly the subsystems with overlapping relationships as these represent the integrated components of the systems. The tangentially related subsystems must be analyzed and developed independently as they require knowledge and expertise in specific business domains and are better developed by teams having such expertise. As such, the systems depicted in Specialized Systems area are not in scope of the current concept.

4.4 Interconnectivity of IIS Functional Modules

The distributed nature of MFAEI subdivisions, the different functional areas, the pursued goals of the IIS force a strong coupling between various functional modules of the integrated system. Figure 2 presents the strictly necessary connections and their nature. For example, the coupling with external systems is made via internet services - services that are outside the control of MFAEI and that must be secured in case of confidential or secret communication. Depending on the capacities of the integrated system, data exchange is performed via different channels such as direct coupling, Web Services, XML of CSV files or other means of data encoding and transport. Also, functional modules with a great level of coupling must be built together and for them multiple integration points and transport is provided.
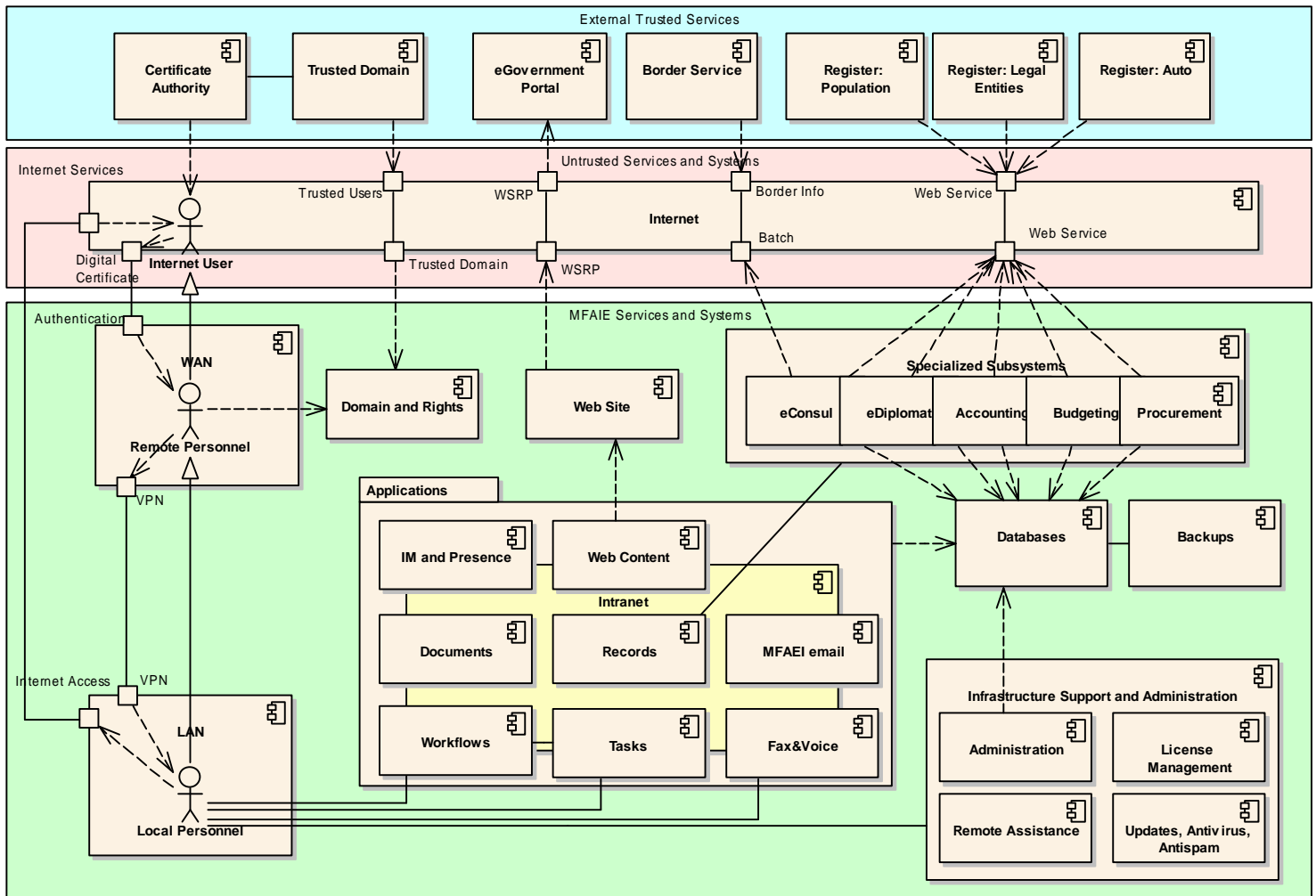

Figure 2 - MFAEI IIS subsystems and components

The overview diagram above highlights the following:

1. The MFAEI Integrated Information System includes ALL the internal applications available within MFAEI. Its central point is the Intranet that supports all other subsystems and services: Workflow Management, Document and Records Management, Task Management, MFAEI email, Portal Publishing tools, Instant Messaging and Presence, Fax and Voice integration etc.

   Additionally it offers integration points to specialized subsystems such as eConsul, eDiplomat, Finance and Accounting, Budgeting, Public Procurement. Each of the specialized subsystems communicates with external systems required by the normative base and regulations. Interaction includes Ministry of Finance, Treasury, Public Procurement Agency etc.

2. Integrated MFAEI system needs to communicate to external systems:

    a. Certificate Authorities that issue Digital Certificates and identifies people and systems as part of Domains.

    b. Trusted Domains that exchange people and system credentials on a need to know basis. This enables people and systems from trusted domains to be served within the MFAEI Integrated system.

    c. eGovernment Portal that publishes MFAEI public records, documents and information on the central Government Portal.

    d. State Information Resources such as State Registers of Persons, State Register of Legal Entities, State Register of Cars.

    e. Border Service systems.

3. Integrated MFAEI system is aware of at least three types of Users:

    a. Local Personnel that works within LANs and have access to ALL MFAEI applications. Remote Personnel are treated the same as Local Personnel once they are part of Virtual Private Network.

    b. WAN users - on the precondition that Internet Users are in the possession of a Digital Certificate and are part of a trusted domain, they can authenticate and be admitted to MFAEI WAN.

    c. Internet Users that have access to Internet services.

Users are assigned rights in the IIS as specified in Domain and Rights system. These are potentially received from Trusted Domains.

4. Support and Administration subsystem ensures normal working conditions to all MFAEI personnel equipment, workstations and systems. It integrates with the Task Management system for tracking tasks. Parts of these subsystems include Licence Compliance, Updates, Antivirus, Administration and Configuration of systems, Remote Assistance etc.

4.5 System Function Results

Exploitation of the IIS within MFAEI ensures reaching the following of the goals:

- reduction on paper support dependency by moving to electronic document management,
- single point of access for all subsystems and functional modules of the system,
- permanent and ad hoc workspace management facilities and their integration,
- reliance on technical means that ensures proper process adherence for documents and records management,
- adequate document and record retention and preservation means,
- efficient task and agenda coordination for individuals, groups and top executives
- automation of routine tasks such as transfer of documents,
- reduction of cost of verbal communication by reliance on integrated telecommunication means etc.

ORGANIZATIONAL STRUCTURE OF THE SYSTEM

Fundamental functions related to IIS creation, composition, structure, functionality and use are the responsibility of MFAEI and its subdivisions.

Role	Responsibility
Information Resources Owner	**MFAEI** In order to ensure information integrity, MFAEI will transfer backup copies of databases and file repositories to third parties that have the necessary resources to guarantee optimal preservation conditions to backup media.
IIS Owner	**MFAEI**
IIS Hosting	**MFAEI** IIS is an information technology based system. IIS server-side as well as their supporting infrastructure is hosted in specially designed rooms within MFAEI central office buildings.
Elevated Access Rights	**MFAEI top executives** MFAEI top executives receive periodic reports form IIS administrator with the list of individuals with elevated access rights. Based on these reports MFAEI issues orders or resolutions regarding inclusion/exclusion from the list of specific individuals.
Registrars	**MFAEI personnel** MFAEI personnel is authorised to register and to update information in IIS.
Users	**MFAEI personnel, authorised individuals from other state institutions** IIS administrator, based on authorised body decisions, ensure transfer/allocation of rights to IIS users.
Administration, Monitoring and Support of IIS	**MFAEI IT directorate** MFAEI IT Directorate is tasked with the administration, monitoring and support of IIS components and infrastructure.
Web Site Administration	**Mass Media and Public Relations Directorate** The directorate identifies materials for publication, redacts them and publishes on mfa.gov.md web site. It gets assistance from IT directorate maintaining web site infrastructure and functionality and with resolution of various technical issues.
State Register of Treaties Administration	**International Law Department** The department registers and maintains the register of RM accessions to international treaties or about signing of bilateral treaties or agreements. It gets assistance from IT directorate maintaining register infrastructure, data integrity preservation and resolution of various technical issues.

Table 1 - Roles and responsibilities of IIS owner

SYSTEM DOCUMENTS

6.1 Input/output Documents

Currently the MFAEI relies on the Classification of Records for diplomatic services of the Republic of Moldova that regulates more than 500 types of documents. Many of the categorized items in this list are rarely used and will be added by administrative roles once there is a real need to support a particular type of document. The following table lists the Classes, Subclasses defined by the Classification and provides example documents registered under the specified class/subclass.

Many of these types of documents must be acted upon following strict legal regulations such as The Law on International Treaties, The Law on Petitions etc.

It must be mentioned that all of the mentioned documents serve as both input and output:

- first the documents are captured as part of various business processes or in response to assignments and tasks,
- later the same information serves as reference preparing other documents or responding to other assignments and tasks.

The Classification of diplomatic services documents approved by ministerial order no. 226/b/39 of 19. 03. 2007 defines the Classes/Types of documents presented in Table 2 - Classes/subclasses of documents and examples:

Code	Class/subclass	Example documents
0	ORGANIZATIONAL, PERSONNEL, TRAINING, ARCHIVAL, LIBRARY AND OTHER GENERAL PROBLEMS	
01	ORGANIZATIONAL PROBLEMS OF MFAEI ACTIVITY	Laws, Presidential Decrees, Government Decisions and Orders, Addresses, Declarations, Memorandums, Work Instructions, Circulars, Programmes, Activity reports etc.
02	REQUESTING AND TRANSFERRING CORRESPONDENCE WITH REPUBLIC OF MOLDOVA AND FOREIGN ORGANIZATIONS	Correspondence, Incoming/Outgoing document registries, Lists regarding document execution control, Petition registries, etc.
03	ORGANIZATIONAL, PERSONNEL AND TRAINING	Normative acts relating to personnel, Minister/Ambassador/Consular orders regarding personnel movement, Personal profiles, Diplomatic personnel records etc.
04	LEGAL MATTERS	Draft laws, decrees, decisions, Assessments of draft statutory acts, Contracts, Correspondence etc.
05	LIBRARIRAL AND ARCHIVAL MATTERS	Classifications, Inventory of folders, Minutes about acceptance-transfer to archive, requests about issuance of copies of archived documents, correspondence etc.
06	DEPUTY PRIME-MINISTER, MINISTER OF FOREIGN AFFAIRS AND EUROPEAN INTEGRATION DOCUMENTS	Documents printed on Government templates with Minister signature.
1	PROTOCOL, CEREMONIAL, REPRESENTATIONAL AND PRIVILLEDGES MATTERS	
10	PROTOCOL, CEREMONIAL, REPRESENTATIONAL AND PRIVILEDGES MATTERS	Statutory acts regarding protocol and ceremonial, Minister and Deputy Minister agendas, Letters of accreditation-recall, Invitations, Speeches etc.

2	**POLITICAL, ECONOMIC, SOCIAL, PRESS, CULTURAL, MILITARY MATTERS**	
	BILATERAL RELATIONS	
20	GENERAL MATTERS	Strategies, Concepts, Statutory acts, Projects, Synthesises, Evaluations, Forecasts, Informative bulletins regarding bilateral relations.
21	PRESS MATTERS	Press releases, Declarations, Synthesises, Articles etc.
22	BILATERAL RELATIONS	Motivations, Country fiches, Informational, analytical notes, Informations, Articles etc.
23	ECONOMIC MATTERS	Statutory acts, Work instructions, Circulars, Economic reports, Analyses, Correspondence etc.
24	CULTURAL AND EDUCATIONAL MATTERS	Programmes, Notes, Suggestions etc.
29	BILATERAL TREATIES	Treaties, Conclusion of treaties, Full powers, Ratifications, International conventions.
3	**INTERNATIONAL, SUBREGIONAL ORGANIZATIONS.**	
	MULTILATERLA RELATIONS.	
33	UN AND SPECIALIZED AGENCIES	Reports, Analyses, Synthesises, Programmes, Speeches, Articles, Notes, Informations etc.
34	INTERNATIONAL ORGANIZATIONS	idem
35	EUROPEAN ORGANIZATIONS	idem
36	INTERNATIONAL ORGANIZATIONS WITH MILITARY AND SECURITY ORIENTATION. TRANSDNESTER CONFLICT.	idem
37	SUBREGIONAL ORGANIZATIONS	idem
39	NEGOTIATIONS AND MULTILATERAL TREATIES. TREATIES WITH INTERNATIONAL ORGANIZATIONS.	Treaties, Conclusion of treaties, Accessions, Letters, Full powers, Assessments, Informations etc.
4	**CONSULAR MATTERS. CONSULAR LAW.**	Consular statutory acts, Circulars, Assessments, Verbal notes, Informational notes, Consular correspondence etc.
5	**FINANCE, ACCOUNTING, PROCUREMENT, TECHNICAL AND LOGISTICS**	
50	FINANCE. ACCOUNTING.	Bookkeeping notes, Contracts, Statement of accounts, Registers, General Ledger, Cash registers, Inventory lists, Statistical reports etc.
55	PROCUREMENT, TECHNICAL AND LOGISTICS	Acceptance, transfer, ascertainment and destruction documents, Stamp and seal issuance records, Correspondence etc.
6	**UNIONS**	Meeting Minutes, Expenditure reports, Correspondence etc.
9	**OTHER**	

Table 2 - Classes/subclasses of documents and examples

6.2 Technological Documents

Besides the document types mentioned above the system also must handle a series of technological information elements:

- Signatures for digitally signed documents, resolutions, records etc.,
- Digital certificates used to produce digital signatures,
- Scanned images of documents,
- Texts of paper documents,
- Keywords and indexes that facilitate search and document retrieval,
- Groupings, classifications and libraries relating to a particular domain of activity,
- Access groups with access to a document list, grouping or class of documents and records,
- User lists and their rights,
- Audit logs of user and system activity,
- Versions of documents and their change history,
- Technological documents regarding storage and exchange protocols, network parameters, equipment configuration, operating procedures etc,
- Aggregated reports and statistics about system use.

6.3 Lifecycle of Documents and Records

All documents have a life cycle:

- Initially, in response to some request (a record), documents are created and worked on,
- Later the documents are accepted as definitive and referenced as authoritative in other activities becoming records and
- Once documents become no longer used in day to day use these are archived in conformance to regulations.

These stages in a document's lifecycle cause the distinction between Active Documents, Records and Archived Documents. The following sections present differences handling documents at different stages of their lifecycle.

6.3.1 ACTIVE DOCUMENTS

These are documents in use, such as e-mail messages in an information worker's inbox, a newly created report or analysis on someone's workstation, the documents in a document library, or the pages on a corporate Web site. It is expected that active documents will change over time, be copied and shared, and generally move about the organization being used by personnel in their day to day work.

Active documents may be declared as records if they serve as evidence of an activity or transaction performed. Some types of active documents will never become records.

At some point in a document's life cycle, it stops being active. If the document is a record, it should be saved and protected for some retention period.

6.3.2 RECORDS

These are documents or other physical or electronic entities in an organization that *serve as evidence* of activities or transactions performed by the organization. They must be retained for a certain period so they can be produced if needed e.g. for regulatory or legal discovery. When an active document is declared to be a record, it is moved or copied to a protected place such as a physical vault or an electronic records repository, and it is assigned a retention period that specifies how long the organization will keep it.

6.3.3 ARCHIVED DOCUMENTS

These are documents that are no longer active but are not records (either because they no longer have to be retained or because they were never classified as records). Archived documents are kept by an enterprise for non-legal reasons such as for historical preservation.

THE INFORMATION SPACE OF THE SYSTEM

7.1 Overview

Information objects if IIS must be, first of all, identified in its subsystems, which include:

- Internal collaboration system (Intranet) which represents the single, uniform and centralized space of collaboration, coordination and secure access to integrated information system resources;
- System of management of documents and records, including circulation of electronic documents and integration with external services like email, fax, phone which allow capturing of all incoming documents;
- System of workflows control, which ensures completion of all internal phases in case of specific business functions;
- Task and agenda management system, which offers support for specific MFAEI activities like a) organizing and publishing Ministry and Deputy Ministry Agendas; b) program of MFAEI events; c) Organizing the visits of MFAEI officials; d) organizing international debates; e) organizing economic missions; f) negotiation of treaties etc;
- System of secure and protected communication with diplomatic missions;
- Telecommunications system, fax, instant messaging and presence;
- Digital Signature Infrastructure;
- Ministry website and websites of diplomatic missions, including integration with Government Portal and IIS;
- State Registry of Treaties;
- System of administration of information resources, including software licenses;
- Internal systems (AIS Diplomat, AIS Consul, Accounting, Human Resources, Budgeting, Public Acquisitions etc.);
- External systems (State Registers of Population, Enterprises, Juridical Documents, Public Employees, System of circulation of electronic documents etc.) for obtaining information necessary for the subsystems listed above.

7.2 Information Objects

The table below describes the information objects required to ensure the integration of above listed subsystems. This section describes the most important information objects and defines them at a high level in order to keep the size and level of the concept paper relevant. Final details about informational objects and their attributes will be made as part of detailed analysis during elaboration of each of the mentioned subsystems.

Information Object	Ownership	Identifier	Scenarios	Key attributes
Person	borrowed	IDNP	- inclusion in the list of personnel of new hires - transfer between subdivisions or to diplomatic missions - person leaves MFAEI definitively	Personal Data
User	owned	Set by MFAEI regulations Example: anonim@mfa.md	- creation of a user identifier in MFAEI domains - creation of an email account - deactivation of an account	Credentials Access rights Digital certificate
Workgroup	owned	not regulated; will be designed as part of the project and included in	- setup of a task force to work on a particular subject - setup of departmental workgroups	Direction of work Members

		internal MFAEI regulations		
Site	owned	not regulated; will be designed as part of the project and included in internal MFAEI regulations	- setup of a workspace/site for collaboration of a workgroup or on a subject - retrieval of information based on site's subject/direction of work	Direction of work Access rights Members
Document draft (irrespective of its format - text, fax, email etc)	owned	Classifier of RM diplomatic service documents Example: 226/b/39	- answer to requests from management - group/individual initiatives based on roles	Content Version Author Change history Keywords
Record	owned or borrowed	Classifier of RM diplomatic service documents Example: 226/b/39	- receipt of an external document - approval of a draft - archival of the record - disposition of a record	Document Approval note Author Class Retention scheme Keywords
Paper Record	owned	Classifier of RM diplomatic service documents Example: 226/b/39	- receipt of information on paper - receipt of a copy of a paper document	Metadata Scanned document Physical location data Keywords
Class/document group	owned	Classifier of RM diplomatic service documents Example: 22	- approval of a new class/group of records - conformance with Classifier of RM diplomatic service documents	Classification scheme Class Document Template
Agenda (individual, workgroup, subdivision, top executive etc.)	owned	not regulated; will be designed as part of the project and included in internal MFAEI regulations	- information regarding planned activities of an individual, group or top executive	Owner Activity list
Task	owned	not regulated; will be designed as part of the project and included in internal MFAEI regulations	- status change on an information object that requires user action - creation of a task by an authorised person	Assignee Resolution period Task content Author
Resolution	owned	Classifier of RM diplomatic service documents Example: 353.1	- resolution of an authorised body	Note Signature Signature date Validity date
Digital signature	borrowed	conform PKI	- digital signing of a document or resolution - authenticity check	(according to PKI in use)

Digital certificate	borrowed	conform PKI	- issue a digital certificate to an authorised entity - revocation of a digital certificate - archival of a digital certificate - authenticity check	(according to PKI in use)
Informal communication (including phone conversations, webcasts, instant messages etc)	owned	not regulated; will be designed as part of the project and included in internal MFAEI regulations	- informal phone, chat, instant messaging conversations - email exchange	Date Content Participants
Software License	owned	not regulated; will be designed as part of the project and included in internal MFAEI regulations	- procurement of software - end of life of software - allocation/installation of a software package	Physical license location Validity period Keys Allocation
Audit log	owned	not regulated; will be designed as part of the project and included in internal MFAEI regulations	- registrations regarding actions undertaken by different agents	Date and time Agent Action nature Action result

Table 3 - Information Objects and their attributes

7.3 Scenarios and Services

7.3.1 INTRANET SERVICES

The most important aspect of the Intranet service is that it offers a single point of entry to other IIS components. The Intranet offers a Web based User Interface that is accessible to ALL MFAEI personnel. The main function of the Intranet is to organize workspaces and workgroups. The Intranet is available in MFAEI WAN to authorised personnel. The information available is only for Internal Use and Confidential levels of security. Usually these are templates, internal documents or draft version of documents that eventually become publicly available.

Another important feature of the Intranet is aggregation and presentation of a summary of changes and events that took place in the IIS and that are in further responsibility of the user or a workgroup he belongs to. These also include notifications subscribed for by the user himself.

For sure, some features are available to users outside the Intranet too. Still, the integrated facilities become available only here. Reliance on the existing processes and tools is equivalent to the current way of work within the ministry and represents a fallback mechanism.

Besides the Web based UI the Intranet offers a File based access path that allows personnel to handle their outputs as usually - by creating and storing files on a File server.

Other features exposed by the Intranet and described subsequently include:
1. Fast and accurate document searching and location (7.3.2)
2. Document Version Control (7.3.2)
3. Document Change Control and Change Notification (7.3.2, 7.3.4)
4. Flexible, integrated security for documents and folders (7.3.2, 9)
5. Retention plans for records(7.3.2)
6. Classification of records (7.3.2)
7. Document based Workflow (7.3.3)
8. Auditing capabilities (9.3).

7.3.2 DOCUMENT AND RECORDS MANAGEMENT

An integral part of each Intranet is the functionality related to information creation, grouping, presentation and classification. These features represent functionality for:

a. Document Management system - allowing creation and distribution of documents,
b. Records Management system - handles records differently due to their constant nature.

Both, Document and Records management systems must:

- ensure user friendliness to authorised users via clear and easy to identify system functions,
- impose restrictions for un-authorised or limited access users via mandated security policies,
- keep audit logs of user and system actions for administrative purposes.

It must be noted that there are a series of significant differences between Document and Records Management Systems. The IIS must provide adequate facilities to support both.

Document Management	Records Management
allows documents to be modified;	prevents records from being modified;
allows documents to exist in several versions;	allows a single final version of a record to exist;
may allow documents to be deleted by their owners;	prevents records from being deleted (except in certain strictly controlled circumstances);
may include some retention controls;	must include rigorous retention controls;
may include a document storage structure, which may be under the control of users;	must include a rigorous record arrangement structure (the classification scheme) which is maintained by an administrative role;
is intended primarily to support day-to-day use of documents for ongoing business.	may support day-to-day working, but is primarily intended to provide a secure repository for business records.

Table 4 - Differences between Document and Records management systems

Document and Record Management handles files in native format irrespective of their purpose e.g. texts, records, pictures, audio, video, images, scanned documents, office documents etc. It also will offer facilities to integrate workflows for specific types of documents and records.

7.3.3 WORKFLOW MANAGEMENT

The IIS integrates a Workflow Management component that allows records and documents to pass all the required stages of development and approval before becoming resolved. It is needed to assist in handling vast numbers of documents. The component includes functionalities such as searching, editing, sharing, and distributing documents, with a familiar, easy to understand user interface.

Initially only a few of the workflows will be rigidly applied in the IIS - workflows for processes that the MFAEI must comply with legal requirements such as hiring, transferring, petition resolution etc. Otherwise, the IIS will rely on generic, personnel driven workflow as presented below.

The workflow depicted in Figure 3 presents how a generic document enters the MFAEI Integrated Information System, how it is captured and classified as a record, additional records it generates and the activities that are performed in order to prepare an output to it. As stated, the flow is generic and for particular types of inputs the flow is strictly defined to pass a specific processing procedure.

It must be noted that most of the documents, for urgency reasons are received as a copy of the original. The copies are often received by Fax and with increased frequency, by email. This sole fact generates additional activities depicted at the end of the workflow: - when the original is received, Secretariat identifies the records captured previously received as a "copy" and replaces

them with original. The replacement should be undertaken carefully so that any of the written resolutions are not lost. Another serious issue is caused by the difficulty to identify the previously emitted resolution and this causes another round of processing of the document with potentially different results.
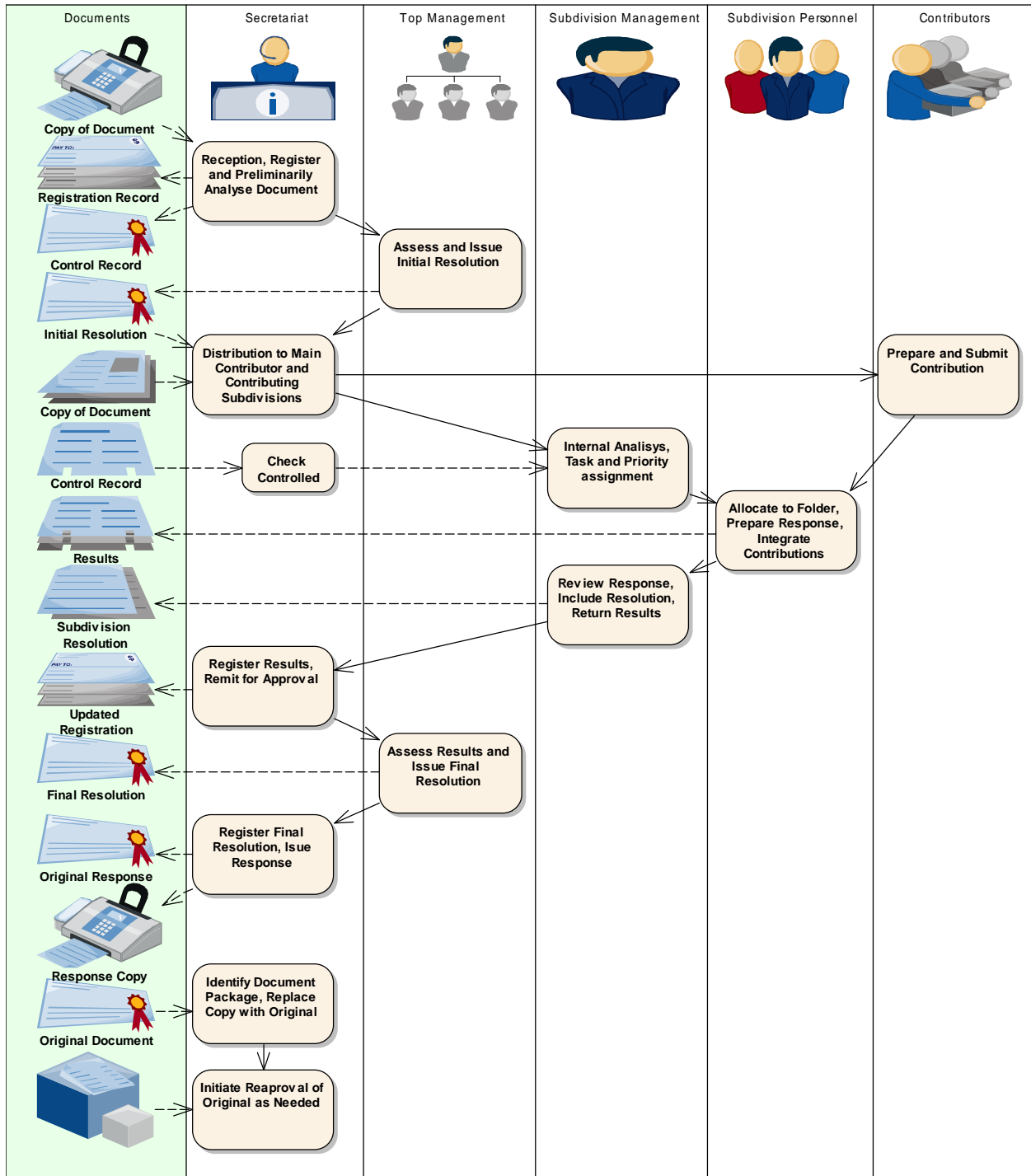

Figure 3 - Generic Document Workflow

One of the goals of the Integrated Information System is to reduce the number of documents received as "Copy" and only later in "Original". This goal is achievable by the reliance on Digital Signature of Electronic Documents having the same legal weight as the paper signatures. The IIS will include features that work with Electronic Signatures and facilitate the move internally to a digital signature infrastructure. However, the system is not able to completely eliminate this

drawback because the majority of documents are received from external bodies and reliance on a Digital Signature Infrastructure for production cannot be achieved.

Besides support for the generic workflow, the IIS will implement workflows for specific processes within logistics, system administration, HR and other business units as these are formalized.

7.3.4 TASK MANAGEMENT

A task is an activity that needs to be accomplished within a defined period of time. An assignment is a task under the responsibility of an assignee which should have a start and end date defined. One or more assignments on a task put the task under execution. A task is judged to be completed when all the assignments for the task have been completed. Tasks can be linked together to create dependencies.

When completed, an item on a task list is *checked* or *crossed* off. The traditional method is to write these on a piece of paper with a pen or pencil, usually on a note pad or clip-board.

The Task Management System should allow:
1. Adding notes by anyone assigned to a task with control over who sees it.
2. Grouping of tasks by type to provide more informative reporting. There is no restriction to the task types available as the system administrator sets them dynamically.
3. Prioritization of tasks. This will support the escalation of an issue and improve the task management process. Task assignees will be notified when a task has been escalated.
4. The update of the task status by the user who is currently assigned to it. This status is displayed keeping them informed throughout the task management cycle.
5. The automatic generation of tasks at regular intervals.
6. Users to schedule events related to a task. The system should provide a weekly snapshot of meetings related to specific tasks in the system. Reminders via e-mail of pending events and the scheduled time should be sent
7. The attachment of links to documents associated to the task.

The Task Management System works in two different ways:

- Independently where superiors, MFAEI personnel or external staff manually create new tasks/calls for MFAEI to solve and assigns them to groups or individuals.
- Integrated with Document Management system - when a document reaches a specific state, tasks are automatically created and assigned to responsible group or personnel to handle the situation.

7.3.5 MAINTENANCE OF MINISTRY WEB PORTAL

MFAEI operates a web portal that is accessed via Moldova's eGovernment Portal. The MFAEI portal is administered internally by its various subdivisions. Once materials are published, these integrate into the eGovernment Portal automatically, without need of further human intervention.

Also, the contents on the portal will be published directly from within Intranet without any other publishing tool support.

It must be mentioned that many diplomatic missions still have web pages of their own. While these are less complex the IIS will offer content creation, update and publication facilities for each of the Web Page administrators. The web pages will all have a similar structure and template so that all diplomatic mission web pages have a consistent look and feel. As an additional feature will be the possibility to administer diplomatic mission web pages from a single location - MFAEI central offices. While the actual content might be generated remotely within the mission, web page administrators will get access to publishable material and publish it without the need to be remote.

7.3.6 FAX AND VOICE INTEGRATION

Voice services have the potential to significantly reduce costs of exchanges via telephone networks. While conversation over the phone in the central building are free of charge and

convenient, exchanges via ordinary telephony services with remote and "on the go" personnel incurs significant costs.

This concept envisions reliance on a "transparent" internal telephony service to connect ALL its personnel. The service relies on a server that transfers automatically calls to and from remote users via VoIP. Callers do not need to check in advance the location of the phoned party; they use the service as currently by using an internal directory and dialing the number. The system will identify the location of the called party, the best current route and channel and will transparently establish the connection that users will use un-aware of the underlying technology in use. The same is applicable for Fax interchanges only that data will be routed to dedicated recipients.

7.3.7 MANAGEMENT OF INSTALLED SOFTWARE LICENSES

The reasons that follow cause the need for a distinct System of Management of software licenses as it is not fully supported by the other components of the IIS. It also generates a separate Information Space item.

Management of software licenses is based on concurrent and interdependent technical and organisational/process measures. The technical tools will rely on an inventory system, a discovery system, and a mechanism for automatic comparison and alerting both administrators and end-users. The process measures will include instructions, user guides, process and policy definitions, as well as on-going effort to educate end users and to maintain the orderly status in the licensing part of work.

Management of software licenses usage and compliance is done via an integrated series of networked services that automatically gather information about software installed on personnel workstations and MFAEI servers. The accuracy of this information is pre-conditioned by using a monitoring and managing system running on both workstations and as a central records database.

7.4 Information Flows

The MFAEI information flows include at least the distinct patterns depicted in Figure 4:

- communication with the citizens where MFAEI makes known its international relations and related activities to the public;
- communication with leadership bodies of Moldova, specifically the President office, the Prime Minister Office and Parliament,
- inter-ministerial collaboration specifically with Ministry of Economy and Commerce and Ministry of Justice. Collaboration with other ministries is on a project basis and is more sporadic.
- communication within central MFAEI offices between departments, directorates and leadership,
- communication with remote diplomatic missions acting in foreign countries,
- communication with foreign countries and their diplomatic missions accredited in Moldova,
- integration with other State Information Resources governed by the Ministry of Information Development.
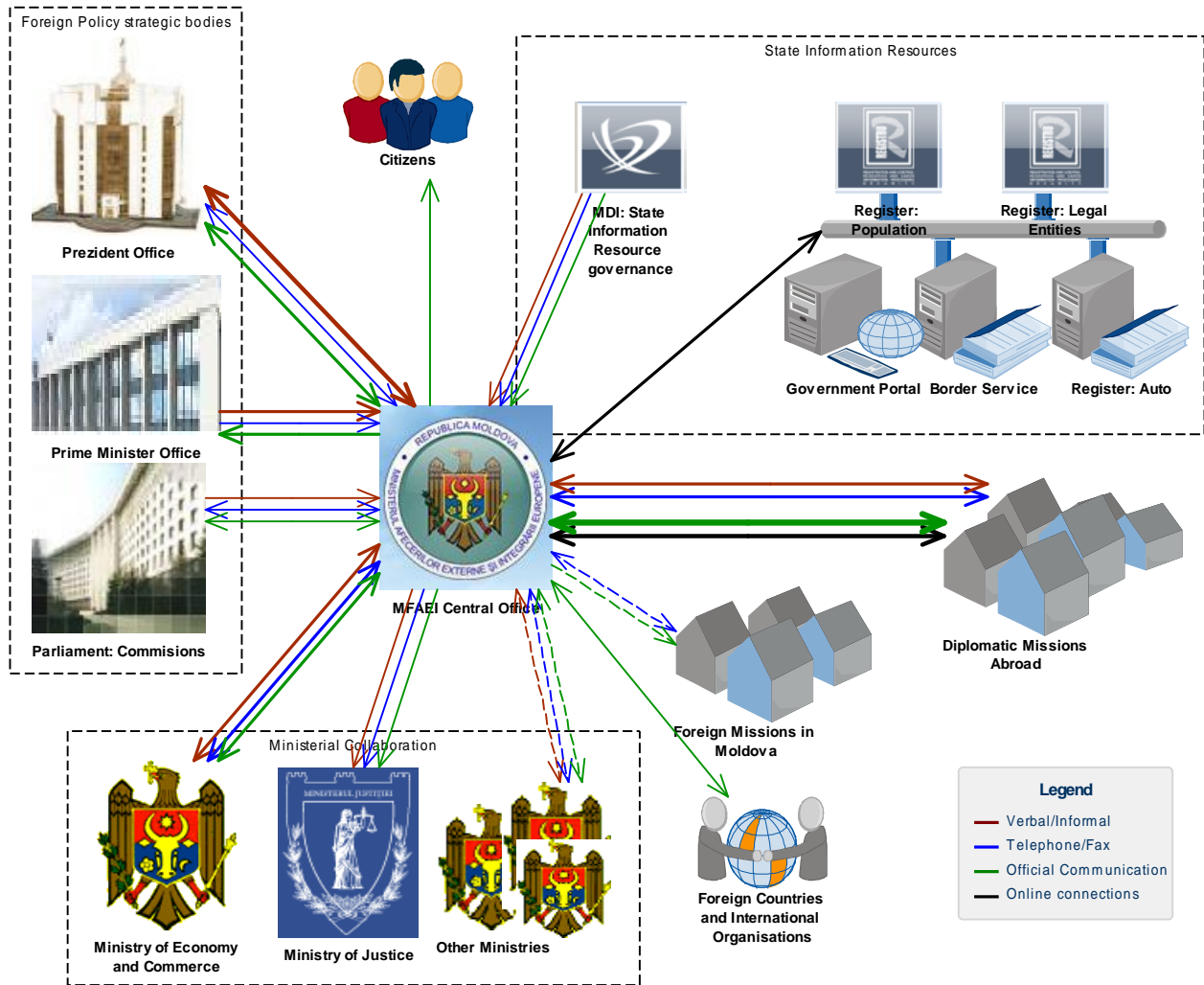
Figure 4 Communication Flows

7.4.1 INTERACTION WITH OTHER PUBLIC ADMINISTRATION BODIES

The MFAEI has a special position by representing Moldova's interests abroad. As such, it coordinates all the foreign official exchanges. As such it must also inform all the other representatives carrying out foreign communication about its current state and the directions.

The main public authorities that MFAEI closely works with are:

- The Office of The President - The President sets Moldova's Foreign Policy. He touches foreign affairs issues and the MFAEI continuously advises and consults The President in these matters. The President also sets forth the main direction of the foreign policy and the MFAEI needs to align its other decisions and actions with it.
- The Office of the Prime Minister.
- Parliament, specifically the Foreign Policy and European Integration commission as well as the National Security, Defence and Public Order commission, - these commissions are the most active bodies in the alignment of legal and normative base to the external environment. It continuously communicates with MFAEI on foreign policy objectives, direction of negotiations, international law etc.
- Ministry of Economy and Commerce - since one of the MFAEI goals is promotion of Moldova's economic interests the MFAEI continuously coordinates this policy with MEC.
- Ministry of Justice - in order to comply, align and integrate with international treaties the MFAEI continuously coordinates with the Ministry of Justice legal matters regarding these.

- Ministry of Interior – since most of the work done by the Moldova's consular offices in foreign countries is related with solving legal issues of Moldovan citizens, MFAEI permanently communicates also with Ministry of Interior.

Besides these, as part of various programmes and activities, other ministries or public administration bodies require advice or direction during their own participation in international forums and dialogs. These interactions do not have a continuous nature and only take place in response to other external events planned either by MFAEI or the receiving Ministry.

Still, for the purposes of creating an integrated informational system the MFAEI needs to establish communication paths to other State Resources and for this it needs to coordinate its actions with Ministry of Information Development and Centre of Special Telecommunications. This coordination extends at least on these systems:

- Governmental Portal - the single official dissemination point of the Government. In this integration point MFAEI has the registration role for public information authored by MFAEI.
- Certification Authorities - the issuer of digital certificates to dignitaries and cleared personnel
- "State register of population" automated system offers access to information about individuals, their registration address, documents issued to them. As required by Government Decision no. 333 of 18.03.2002, "Concept of automated information system 'State Register of Population'(SRP)" and Regulations regarding State register of Population, the information in SRP can be supplied to MFAEI on a contract basis. The contract will state the intention of the information request and the way it will be used, volume and data structures, language of documents, types of media to supply data on, frequency of requests, data protection measures, control procedure as well as the pay procedure (free, costs or charge). Details regarding the way and means of transfer of information will be agreed upon during project development.
- "State register of legal entities" offers access to data about all legal entities established legally, their legal address, rights to undertake various licensed activities.
- "State register of statutory documents" distributes statutory documents on the Internet as required by Government Decision no. 1381 of 07.12.2006. MFAEI can freely search, consult, copy and print documents from Internet. There is also the option to receive documents in other ways and if needed such an option will be considered during development phases of the project.
- "State register of transport units" stores and offers data regarding any transporting means registered in Moldova. MFAEI will act as a user when requesting information on diplomatic corps transport units. MFAEI requests registration of transport units for diplomatic corps providing details about the registration. This particular service is part of eDiplomat subsystem.
- "State register of state functions and public officials" approved by Government Decision no. 1373 of 01.12.2006 is used as an information source about diplomatic personnel and during hiring processes.
- Integrated Information System of Border Service, approved by Government Decision no. 834 of 07.07.2008 is used for visa processing. MFAEI acts as both User and Registrar during checks of previous visas and issuance of new visas to foreigners. This particular service is part of eConsul subsystem.
- Ministry of Internal Affairs databases are consulted as a user by MFAEI (specifically, eDiplomat and eConsul subsystems) regarding events/incidents involving foreigners.

7.4.2 INTERACTION BETWEEN SUBDIVISIONS AND DIPLOMATIC MISSIONS

The main characteristic of the MFAEI are its foreign diplomatic missions. These are distributed in many countries and still carry out a single message - that of the interests of Moldova and its citizens. Ensuring this requires constant flows of information between diplomatic missions and MFAEI central offices.

Besides the geographical distributed nature of diplomatic missions, internally they are similar to other subdivisions, albeit smaller people-wise and with specific mandates. Still, diplomatic missions can be viewed as subdivisions of MFAEI that participate in its overall information flows.

Internal communication takes both official and informal form. Informal exchanges take place when experience personnel collaborate with their colleagues in order to address some small issues during their day to day work.

Official exchanges are used for bigger assignments initiated by either one of the subdivisions or at Top Leadership request. For these assignments departments need assistance or resources from other departments and the presence of official directives, decisions and requests presents the basis for resource reallocation.

7.4.3 INTEGRATION WITH SPECIALIZED SYSTEMS

MFAEI relies on a series of specialized subsystems designed to implement specific functions. These subsystems interact with IIS at an aggregated level - for example, input data is processed and stored in the specialized system while reports and analysis based on them are aggregated and approved for peruse and storage within IIS. The specialized systems are approved and developed individually. We can list the following such systems:

- **eDiplomat** - an automated system for recordkeeping regarding foreign delegations, transportation means of the diplomatic corps, foreign journalist accreditations, registration of immigrants and expatriates etc.
- **eConsul** - an automated system that facilitate consular activities, mainly those related to visa issue to foreigners, Moldavian citizens support abroad, their civil status, consular passports etc.
- **Finance and Accounting** - an accounting system used both in central offices as well as in diplomatic missions. The system must follow public accounting practices as these are different in public sector. The accounting and finance practice is coordinated by the Ministry of Finance and the Treasury.
- **Budgeting** - a specialized software package - "Financing plans" ("Plan de finanţare") - used for planning, approval and execution of budgets. The package is developed and supplied by the Ministry of Finance and is used to get access to budget management systems. MFAEI personnel use this package to supply and extract information as needed. Once the planning phase of budget management is complete, MFAEI receives and uses authorised records regarding budget allocations and budget execution plans that it must follow.
- **Acquisitions** - public procurement follows a process regulated by the Law on Public Procurement. These processes are overseen by Agency for Material Resources, Public Procurement and Humanitarian Aid and specific processes are regulated by Government Decisions. While the most important parts of the processes are undertaken internally and are supported by the IIS it is important that a connection point is established between the IIS and the Agency so that acquisition processes become more transparent and effective.
- **Inventory** - the IIS does not include facilities specific for Inventory and warehouse management. Features for record keeping and communication are present for these activities too. The IIS will offer a connection point to a specialized Inventory system so that relevant information becomes available to interested parties while the majority of records are managed separately.
- **State register of Treaties** - consists of records about the treaties that Republic of Moldova is part of and is maintained by International Law Department. The register might include texts of the treaties (scanned images) and authentic translations for reference. The register includes mainly public records and is made available to the MFAEI portal.

These subsystems operate independently and support specific MFAEI functions. The IIS only captures statistical records and documents related to their operation and facilitate dissemination according to IIS rules and access rights.

COMMUNICATION SYSTEM

8.1 Overview

The communication system relies on the cabling and equipment infrastructure that local area networks are built upon and that include gateways to Internet for intercommunication. This infrastructure will be expanded and re-tooled in order to offer adequate performance and capacity levels.

The communication system consists of networked hardware as well as services running on different nodes of the network.

8.2 IIS Network and Services

MFAEI operations are critical for the state, so the Integrated Information System services must be sustainable and offer resilience functionality. This poses additional needs on the overall communication system. The diagram (Figure 5) depicts the way the infrastructure elements are deployed. The black bolded associations show the normal operational data flow paths, while the orange (gray in printed version) associations show alternate paths. Alternate paths ensure service availability in cases of hardware or software failures. On such events the system will switch to the additional hardware while the main components are being serviced, rebuilt or restored.
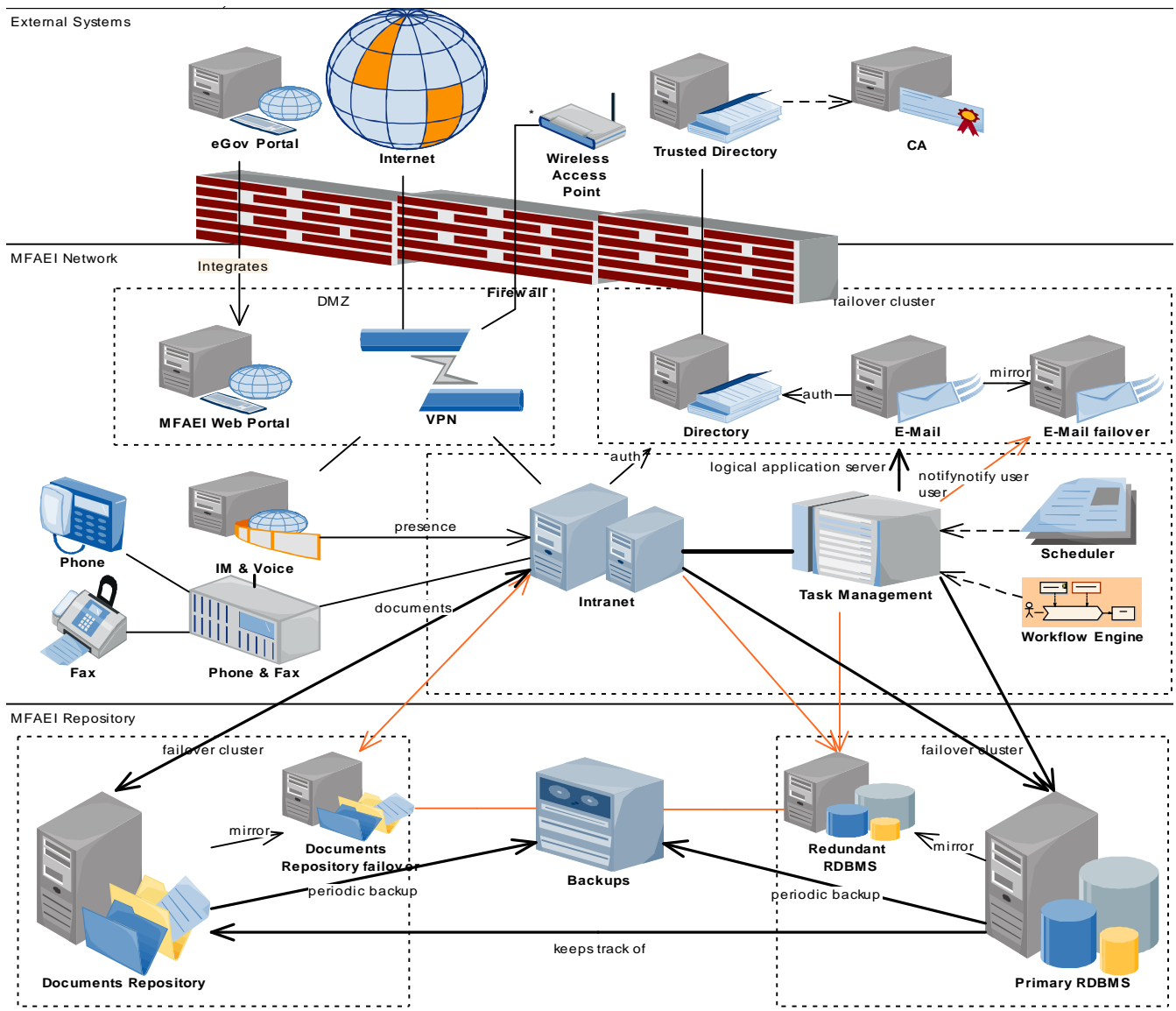

Figure 5 - Communication System of the MFAEI IIS

The depicted Intranet and Task Management services are grouped in a Logical Application Server and could be both co-located on the same server or each distributed on separate clusters. In the case of a distributed deployment, the Intranet can use one of the load balancing techniques, but the Workflow Engine component of the Task Management service should be able to execute workflows in a distributed manner.

It is important to note, that due to difficulty of monitoring and ensuring secure communication, use of Wireless technology should be restricted to strictly controlled access points. In order to not encumber use of these channels, it is recommended that connections via Wireless technology are assumed as coming from the Internet and thus, similar controls and checks are enforced.

8.2.1 LOCAL AREA NETWORK

LANs are deployed and functional in all MFAEI subdivisions. Two types of LANs are distinguished:

- Workgroup Networks
- Secure Networks.

Where security and confidentiality of records is essential, separate LANs are used for secure and work networks. It is important that these LANs do not connect in any uncontrolled way. As a rule, secure LANs do not connect with Workgroup networks at all.

8.2.2 WIDE AREA NETWORK

MFAEI does not build separate physical WANs. When needed WANs are built as Virtual Private Networks via ordinary Internet protocols and infrastructure.

8.2.3 INTERNET

Most of the communication services for integrated services are delivered over Internet to remote locations. More so, MFAEI personnel uses Internet Services described below on a daily basis. Thus, the Internet is treated as a vital resource that the IIS uses and in order to ensure proper usage by less technically knowledgeable personnel, it is important that reliance on this resource is done in a managed manner.

8.2.4 WIRELESS ACCESS

Wireless technologies are widespread and offer numerous advantages for on the go personnel. The IIS communication system will include Wireless access points for both internal and external users. Still, these access points will be assumed to reside in the Internet zone and will require personnel to pass the required authentication and authorisation procedures before gaining access to Intranet resources.

8.2.5 REMOTE ASSISTANCE AND ADMINISTRATION

Many of the workstations and equipment of MFAEI personnel reside in remote locations, often out of country in foreign diplomatic units. MFAEI does not intend to hire specialized personnel to support these system components. In order to be able to offer adequate levels of support MFAEI relies on a remote assistance and administration service that allows support personnel to assist, configure, update and fix most of the calls received from remote or on the go personnel. This service closely integrates with Task Management system so that calls are recorded and tracked to completion.

8.3 Internet Services

The Internet has become an enabling resource globally. It allows systems and people to communicate more effectively without the need for organizations to deploy their own infrastructure. The IIS will ensure presence of infrastructure as well as policy and procedural support that enables its personnel access to Internet services and resources.

8.3.1 E-MAIL

E-mail is one of the most frequently used communication means between people. MFAEI offers its personnel such a service. The service is very important for normal operation and as part of the integrated system it needs to be properly managed, backed up and highly available. The IIS will include facilities to easily integrate e-mail exchanges as documents or records as well as a notification mechanism for task management.

8.3.2 WEB

The Web is currently almost synonymous with the Internet as people find it most usable and easy to access. It presents a plethora of information that MFAEI personnel can use to research various topics. More so, MFAEI itself maintains a Web Site accessible via eGovernment Portal.

8.3.3 FILE TRANSFER

File transfer is a generic term for the act of transmitting files over a computer network or the Internet. There are numerous ways and protocols to transfer files over a network. The MFAEI users will be able to transfer files between them through email, instant messaging or shared workspaces. Also there must be the possibility to upload files to the Web or Intranet servers, for publishing them if needed or to send to other users the file link.

8.3.4 INSTANT MESSAGING

While currently MFAEI personnel uses Instant Messaging as a personal internet service, it is envisioned that as part of IIS MFAEI operates an Instant Messaging internal service that lists all its internal personnel. While labeled "internal" the service is in fact available to all personnel - both local, remote and "on the go". Such a configuration, besides allowing instant short message exchanges and facilitating communication also offers a presence service that is useful to task management and assignment.

SYSTEM INFORMATION SECURITY PROVISION

9.1 Security Concerns

Security concerns cover a series of aspects such as:

Integrity ensures that the data is always correct and complete. Measures to ensure this comprise of:

- protection against disaster by preparing both incremental and full data backups. These are depicted in section 9.4 Availability, Backups and Recovery.
- reliance on a trustworthy infrastructure that does not silently corrupt data - both hardware and software. These are depicted in section 9.5 Infrastructure Security System.

Availability ensures that users can access data when needed but it also relies on backups so that data is restored after disasters. Some aspects of this are depicted in section 9.4 Availability, Backups and Recovery.

Confidentiality limits access to data only to those authorised. It also depends on availability or otherwise nobody can access it. Sections 9.2.1 User Management and User Group Management and 9.2.3 Domains and Directories provide more details on this.

Authenticity guaranties that that data has not been altered. Besides being authentic it is important to ensure that it cannot be repudiated i.e. the authors are not able to refute the provenience of the document. Section 9.2.2 Digital Signature Infrastructure provides more details about this.

Sensitive and Secret documents, records and information will be operated under unified security rules developed by the Government in compliance with the Law on state secrets. These might originate in the IIS but are later transferred and managed in a separate system/environment that is able to guaranty compliance.

9.2 Digital Signature and User Rights

Digital signature and User Rights are security features designed to ensure authorisation, confidentiality, authenticity and non-repudiation. It relies on Digital Signature infrastructure as well as Directory systems to manage User rights and application authorisation.

9.2.1 USER MANAGEMENT AND USER GROUP MANAGEMENT

The MFAEI personnel are authorised to work with and contribute to specifically allowed documents, records or information items. For this reason the administrator of integrated system manages (adds, edits and deletes) user groups into a Directory Service hierarchy.

A group is characterized by a name and the permissions (the roles that the group should assume), which will define the access to the information system functionalities. Each group should contain a list of users. The user inherits all its permissions belonging to a group.

Rights and User management is handled first by a Systems Administrator. Later privileged users, when they create a new resource are able to manage rights locally and such an approach no longer requires Systems Administrator intervention.

During authentication the system will verify users' credentials and authorise them to access allowed information.

9.2.2 DIGITAL SIGNATURE INFRASTRUCTURE

Many outputs of MFAEI personnel require proper authentication in order to be accepted as an official document. For these, MFAEI operates a Digital Signature system that allows MFAEI signing authorities to sign official documents. The digital signature system relies on the Moldova wide accepted system of Digital Signature infrastructure based on an approved digital certificates hierarchy. The certificates are issues and managed by an external Certificate Authority.

9.2.3 DOMAINS AND DIRECTORIES

The MFAEI authorised personnel operates in internal Domains with their credentials and rights managed at the directory level. The system also extends a chain of trust with external government domains and users from these domains authenticate themselves using trusted certificates.

9.2.4 SINGLE SIGN ON

Based on the above infrastructure, the MFAEI integrated system will employ a Single Sign On facility that grants both internal and external users access rights to system's services based on their home domain credentials.

9.3 Audit Logs

An important security need is the reliance on Audit Logs for administrative analysis of system's health and operation as well as to audit user activity. The IIS will rely on an Audit Logs mechanism following industry best practices.

9.4 Availability, Backups and Recovery

MFAEI personnel will depend heavily on the availability of the system in order to fulfil their daily tasks. This poses significant challenges on the integrated system infrastructure so that it is resilient to hardware or software faults. In order to address this need infrastructure includes redundant circuits (depicted in Figure 5) that consists of fail-over nodes that will take over load when the main system is down for maintenance or restoration. An even better idea is to rely on clusters of 3 or more computers for each important node but this choice will be constrained by the available budgets and load on the systems.

A general security policy will be implemented to address security concerns. The personnel will be trained and educated in the area of security threats and risks they might be exposed to.

The security policy includes provisions for periodic security audits that will verify policy and security rules compliance as well as deficient areas that require addressing.

The system tracks very important data, documents and records. Their preservation requirements are absolute and the system offers features that will ensure their preservation. These are based on periodic incremental and full backups of the repositories and databases. While the diagram in Figure 5 depicts the backups node it must be stressed that reliability of the backups cannot be ensured only by hardware and software means. Strict backup creation and verification procedures must be followed by administrative staff.

9.5 Infrastructure Security System

Infrastructure Security Systems are security services designed to ensure integrity and availability of hardware and software systems. These services are designed to correct errors in hardware and software system components and include antivirus, anti spam, software update services, integrity checks, license compliance etc.

9.5.1 ANTIVIRUS

An Antivirus will be deployed in MFAEI specifically:

- across all IIS servers
- on all workstations.

Antivirus use policy is backed by top officials agreeing on risk levels and ease of use and expense of maintenance of systems. Mechanisms for periodic reviews and escalation of issues to decision makers and stakeholders will be employed.

9.5.2 SOFTWARE UPDATE SERVICES

Periodic and orderly update of the IT Systems is a basic and fundamental requirement for any organisation using computers.

The objectives of the Software update services include:

- workstations/laptops/servers in MFAEI will be up to date with latest critical and security updates.
- secure operation of update infrastructure and secure installation of updates.
- single point of administration/updates approval and download from internet.

CONCLUSION

The concept paper presents a vision of the future infrastructure, facilities and capabilities of and Integrated Information System within the MFAEI. It does not identify the gaps between the current state of ICT within the MFAEI and this concept. The gaps are assessed and presented in a separate document presenting the requirements for future acquisition, development, customization and implementation projects. The key decisions in this document and listed below offer benefits that far outweigh the negative implications they might carry:

Alignment with the Internet

The Internet offers a cheap and extensible platform to develop upon. Reliance on Internet infrastructure reduces system maintenance, operational, training and extensibility costs. Still, the Internet cannot be controlled or trusted and this incurs additional concerns regarding reliability of service or security of communications. Both of these can be and have been mitigated by careful design. The implementation teams should build upon the experience and practice in this area.

Integration of modern services, such as email, instant messaging, VoIP improves ad-hoc communication both internally and with external subdivisions. Their integrated nature will also reduce the risks of leaking confidential information to external parties.

Reliance on National and International Experience with Similar Systems

Internationally, governmental bodies, especially from EU and US, have funded, researched and developed similar systems. The experience is documented and published as standards, guidelines, best practices or reference models. The IIS should build up upon this experience.

Adoption of the Web Browser as the Single Point of Access to Services and Systems

Offers personnel a clear and uniform path to doing their work that will reduce training and support needs whether personnel is local or "on the go".

World Wide Web services are pervasive in all aspects of modern technology. Reliance on Web technologies delivered via a modern Web Browsers makes available the system in its latest version and level of integration. Still, the Web Browser misses some important real time or interactive user interface capabilities but these are deemed as satisfactory compared to current modus operandi.

The Web Browser moves the bulk of processing requirements on application and database servers that support the system. Still, the benefit of having a controlled repository of documents and data as well as relying on a trusted processing means on a trusted application server is a much more important capability of the system. Integrated documents and records repositories ensure personnel worldwide access to all the information available.

Reliance on Digital Signature Infrastructure

The solution offers the opportunity to move completely away from paper based operation for internal operation. It offers document and record authentication by Electronic Signature by individuals removing the need of paper.

Offers the opportunity to receive and send electronically signed documents and records to cooperating bodies once these are ready to do so. This will remove the need to work with "COPY" embodiments of original documents received via Fax or Email attachments.

It is readily available to ensure authenticity of informal exchanges (via Email) both internally and externally. It also presents the opportunity to encrypt internal or confidential communications.

Reliance on Open Standards for Record Preservation

Using open standards for communication, presentation and preservation of information ensures business continuity within the MFAEI. The open nature of standards guaranties presence of sufficient specification detail that will allow readability of documents and records in the long term. The MFAEI does not need to worry about vendor lock-in that will potentially obsolete the data by it becoming unreadable sometime in the future, or that will force the MFAEI into unfavourable terms when negotiating with vendors of proprietary software and formats.