	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

A P P R O V E D

National Bureau of Statistics

General Director,

Oleg CARA


DocuSigned by:  
  
D2E544F570734A0...

11 June 2021

# TERMS OF REFERENCE

**for developing the Information Subsystem "Population and Migration Statistics"**

Chisinau 2021

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


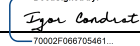

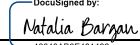

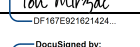
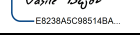
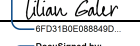
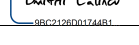
### DOCUMENT CHECKLIST


No.	Version	Date	Author	Comments on Changes
1.	1.0	21.02.2021	Ion AMARFII	Initial development
2.	1.2	24.04.2021	Ion AMARFII	Applying changes according to the received requests
3.	1.3	30.04.2021	Ion AMARFII	Transferring some specifications to another document
4.	1.4	09.06.2021	Ion AMARFII	Applying changes according the last version of the Technical Concept

### DOCUMENT RECIPIENTS

No.	Organization	Subdivision	Form of Document	Use
1.	UNFPA	-	Original, hard copy	Keeping the original copy
2.	National Bureau of Statistics	DSPM, DR	Soft copy	
3.	National Bureau of Statistics	DGTI, DMS/SSDA	Soft copy	


### PEOPLE INVOLVED IN DEVELOPING THIS DOCUMENT

No.	First Name, Surname	Subdivision	Position	Responsibility	Signature
1.	Ion AMARFII	UNFPA	UNFPA Consultant	Author	
2.	Igor CONDRAT	UNFPA	Project Officer, UNFPA	Coordination	
3.	Aurelia SPĂTARU	NBS	Deputy General Director	Coordination, inputs	
4.	Natalia BARGAN	DSPM	Head of Division	Inputs	
5.	Valentina ISTRATI	DR	Head of Division	Inputs	
6.	Ion MÂRZAC	DGTI	Head of DG	Inputs	
7.	Vasile BUJOR	DGTI	Head of Designing IT Applications Division	Inputs	
8.	Lilian GALER	DMS	Head of Division	Inputs	
9.	Dmitrii CALINCU	DMS	Head of Administrative Data Sources Service	Inputs	


	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

## TABLE OF CONTENTS

<b>Introduction .....</b>	<b>5</b>
<b>1. General Information .....</b>	<b>7</b>
1.1. Terms used in the ToR.....	7
1.2. References and Legal Issues for Developing the IT Subsystem.....	11
1.3. IT Subsystem Development Principles .....	14
1.4. IT Subsystem Intended Use, Goals and Tasks .....	16
<b>2. IT Subsystem Architecture .....</b>	<b>18</b>
<b>3. Involved Parties and IT Subsystem Roles .....</b>	<b>21</b>
3.1. IT Subsystem Business Roles .....	21
3.2. IT Subsystem Purchaser .....	21
3.3. IT Subsystem Owner.....	22
3.4. IT Subsystem Holder.....	22
3.5. IT Subsystem Registrar .....	22
3.6. IT Subsystem Administrator .....	22
3.7. IT Subsystem Users and their Role .....	22
<b>4. IT Subsystem Functional Model .....</b>	<b>26</b>
4.1. IT Subsystem Data Model.....	26
4.2. IT Subsystem Functionalities .....	31
4.3. IT Subsystem Key Workflows .....	37
4.4. IT Subsystem User Interface.....	38
4.5. IT Subsystem Reporting, Auditing and Statistical Mechanism .....	38
<b>5. IT Subsystem Functional Requirements .....</b>	<b>40</b>
5.1. Conventions used to formulate Functional Requirements .....	40
5.2. UC01: Drill data on Statistical Indicators.....	40
5.3. UC02: Use Dashboard .....	41
5.4. UC03: Edit Statistical Unit Profile Data .....	42
5.5. UC04: Process Updates from the Technological DB.....	44
5.6. UC05: Search/View Data .....	47
5.7. UC06: Receive notifications .....	49
5.8. UC07: Configure Statistical Indicator .....	50
5.9. UC08: Retrieve Data and Reports .....	51
5.10. UC09: Carry out Indicator Calculation Procedures .....	54
5.11. UC10: Administer Users and Access Control.....	55

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

5.12.UC11: Manage Metadata .....	57
5.13.UC12: Configure the IT Subsystem.....	58
5.14.UC13: Operational Monitoring, Diagnostics and Troubleshooting.....	59
5.15.UC14: Data Exchange with External Systems.....	61
5.16.UC15: Calculate Statistical Indicators.....	63
5.17.UC16: Carry out Automatic Procedures .....	64
5.18.UC17: Send Notifications .....	64
5.19.UC18: Log Events.....	65
5.20.UC19: Backup and Disaster-recovery Procedures.....	66
<b>6. IT Subsystem Non-functional Requirements .....</b>	<b>68</b>
6.1. IT Subsystem General Requirements .....	68
6.2. IT Subsystem Performance Requirements .....	69
6.3. Requirements for Software, Hardware and Communication Channels.....	70
6.4. Requirements for Data Migration and Population .....	71
6.5. Security and Protection Requirements .....	73
6.6. Requirements for IT Subsystem Deployment .....	79
6.7. IT Subsystem Documentation Requirements.....	80
6.8. Licensing and Intellectual Property Requirements .....	80
6.9. IT Subsystem Warranty, Maintenance and Technical Support Requirements .....	81
<b>7. End-product and Delivered Components .....</b>	<b>83</b>
<b>Annex 1. Generic Workflows to Update the Statistical Units Profile Data .....</b>	<b>85</b>
A1.1. Description of Basic Business Process.....	85
A1.1. Describing the Automatic Data Receipt Sub-process.....	87
<b>Annex 2. Statistical Indicators related to the Number of Population.....</b>	<b>89</b>
<b>Annex 3. Statistical Indicators related to Vital Statistics .....</b>	<b>90</b>
<b>Annex 4. Statistical Indicators related to Migration .....</b>	<b>97</b>
<b>Annex 5. Statistical Indicators related to demographic calculations.....</b>	<b>99</b>

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

## Introduction

The changes in population, as well as the direct correlation between the country population and its development level triggered a great interest towards demography. Just like other Eastern European countries, the Republic of Moldova is going through important demographic transformations, which reveal themselves through continuous decline of the birth rate, population shrinking, ageing, greater domestic migration from rural areas to cities, thus having contributed to further depopulation of rural settlements, as well as amplification of emigration, especially of the working age young population.

The implications of these demographic changes, in the context of country socio-economic development, are shown in the National Development Strategy "Moldova 2030" as a desideratum to integrate the population dynamics into the general framework of social-economic policies and strategies aimed at national, regional and local development.

Demographic statistics are fundamental for studying and defining a wide range of policies concerning the socio-economic matters as the number of population is the main denominator in estimating a large spectrum of sector policy monitoring indicators, but also in assessing the public finance system sustainability and long-term efficiency on the basis of population forecasts and other demographic indicators.


On a different note, nowadays, the Statistical Authorities concern throughout the world is to enhance the efficiency of producing official statistics by cutting down the costs of statistical data collection and processing. On the other hand, the statistical system is facing with the requirement to mitigate the burden on respondents, having curbed bureaucracy to this end.

And last but not least, the current goals of statistical activity also relate to:

- increasing the frequency of producing and publishing up-to-date statistical data without augmenting the respondents' burden;
- ensuring, as much as possible, the coverage of reference population;
- avoiding errors, excluding or significantly reducing the non-response rate and operating with precise data;
- submitting promptly the data, having diminished the timeframe between the availability of statistical information and the moment of event/phenomenon it relates to or describes;
- strengthening the National Statistical Authority public image.

Having regard to these goals and to constraints as well, the Statisticians-demographers are more and more oriented towards reconsidering the traditional methods of data collection and producing vital statistics, and, namely, identifying alternative options to traditional methods of data collection on the basis of standard forms. To this end, the development, maintenance and operation of a comprehensive and reliable IT Subsystem/statistical register (to contain accurate and up-to-date information) are essential for producing vital and socio-demographic statistics on population and migration.


At the same time, as per Measure 6.31 of the Government Action Plan (GAP) for 2020-2023, approved by GD No. 636/2019, the National Bureau of Statistics (NBS), as the central authority in the field of statistics (Art. 7 of Law No. 93/2017 and Point 2 of the Regulation on NBS Organization and Operation, approved by GD No. 935/2018) has defined its goal to make the production of vital statistics more efficient, having used "multi-register" systems. This goal is to be achieved along with the development, usage and continuous update of the AIS "Population and Migration Statistics" (ISS PMS) to this end (Sub-measure 6.31.2.). Pursuant to GAP Sub-measure 6.31.1., one of the technological solution development stages is to create a corresponding set of rules necessary to establish and operate the AIS.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Practically, the Information Subsystem "Population and Migration Statistics" is aimed to ensure coordinated pooling of individual data, including personal data, held by state information resources, which are relevant for the production of official statistics on population and the characteristics thereof, vital events and population mobility to produce demographic statistical indicators. This should enable the production of relevant, reliable and internationally comparable statistical data, including domestic and international migration, annual estimation of population number with usual residence in territorial aspect, etc.

In the short- and medium-term, the Information Subsystem "Population and Migration Statistics" shall support the country endeavors in organizing the Census of population and housing planned for 2023 in order to offer additional data or by adopting the data from administrative data sources pursuant to the Census Program, as well as by validating certain responses in order to ensure data quality.

This document presents a conceptual vision in terms of creating and operating the Information Subsystem "Population and Migration Statistics", including matters regarding the IT Subsystem goal and objectives, principles, core characteristics, functionality and conceptual architecture, functional and non-functional requirements. Further we included a brief description of key components of the future solution, having emphasized the principles and functionalities to be taken into account while developing each component.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


## 1. General Information

### 1.1. Terms used in the ToR

Table 1.1. displays the acronyms and abbreviations used in this Document.

**Table 1.1. Acronyms and Abbreviations used in this Document.**

No.	Abbreviation/Acronym	Description
1.	BPIIS	Border Police Integrated Information System
2.	COTS	Commercial off-the-shelf
3.	CRE	Cadaster of Real Estate
4.	DB	Database
5.	DGTI	General IT Division
6.	GSBPM	Generic Statistical Business Process Model
7.	GSIM	Generic Statistical Information Model
8.	ICT	Information and Communications Technology
9.	IT	Information Technology
10.	IMIS	Integrated Medical Information System
11.	ISR	Integrated Statistical Research
12.	ISS	Information Subsystem
13.	ITS	IT System
14.	DBMS	Database Management System
15.	KPI	Key Performance Indicators
16.	NBS	National Bureau of Statistics
17.	POGD	Portal of Open Governmental Data
18.	PSA	Public Services Agency
19.	QBE	Query by Example is a BD query method allowing to use a selected text string in the native language. The core advantage is the lack of specific requirements towards the information request structure.
20.	SDD	Software Design Document
21.	SLA	Service Level Agreement
22.	SMS	Statistical Metadata System
23.	SPOF	Single Point of Failure
24.	SRATUA	State Register of Administrative and Territorial Units and Addresses
25.	SRCSA	State Register of Civil Status Acts

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


No.	Abbreviation/Acronym	Description
26.	SRIRPSIS	State Register of Individual Records in the Public Social Insurance System
27.	SRP	State Register of Population
28.	SRS	Software Requirements Specification
29.	TLS/SSL	TLS Protocol or its predecessor and SSL Protocol are cryptographic protocols that ensure reliable communication between two computer network hubs for such actions like visiting Websites/web pages, e-mail, Internet-fax, simultaneous exchange of messages and other data transfers.

The definitions of terms frequently used in this Document are explained in Table 1.2.


**Table 1.2. Definitions and Terms used in this Document.**

No.	Abbreviation/Acronym	Description
1.	Check Inquiry/ post-counting	Feasible international approach to evaluate the censuses of population and housing. It is a repeated counting of population based on a representative randomly selected template.
2.	Database	A collection of data organized as per the design structure describing the core characteristics and relation amongst entities.
3.	Marriage	Union of spouses concluded in compliance with the regulatory documents.
4.	Credentials	A set of symbols that establish the identity and authenticity of Users and systems within information systems.
5.	Population ageing coefficient	The number of people aged 60 years and above per 100 inhabitants.
6.	Data	Elementary information units about people, subjects, facts, events, phenomena, processes, objects, situations, etc. presented in a way enabling their notification, commenting, and processing.
7.	Personal data	Any information referring to an identified or identifiable individual (subject of personal data). To this end, an identifiable person is the one who can be identified, directly or indirectly, in particular, through referring to an identification number or to one or more specific elements describing the person physical, physiological, psychical, economic, cultural or social identity.
8.	Death	Permanent disappearance of all evidence of life at any time after live birth has taken place (postnatal termination of vital functions with no possibility of resuscitation).
9.	Divorce	Dissolution of a marriage in compliance with the procedure set forth by the regulatory documents.
10.	Emigrant	Person who left his/her country and lived abroad for at least nine




	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

No.	Abbreviation/Acronym	Description
		months out of the last 12 months, residing in the RM for at least nine months out of the previous 12 months.
11.	Immigrant	Person who entered the RM and lived in the country for at least nine months out of the last 12 months, residing abroad for at least nine months out of the previous 12 months.
12.	Demographic Dependence Index	The number of non-working age people per 100 working age people.
13.	Data Integrity	Data status when they maintain their content and are interpreted unambiguously in cases of random actions. It shall be deemed that the data maintained their integrity if they are accurate and reliable.
14.	Logging	Function of recording the information on events. The records about events entered into the information systems include details about the date and time, User, identified personal data, and action carried out.
15.	Metadata	The way of assigning semantic value to the data stored in the database (data about data).
16.	Vital statistics	Births and deaths as they have been described by the appropriate terms.
17.	Live birth	Birth of a child who breathes or shows any other evidence of life (such as beating of the heart, pulsation of the umbilical cord or defined movement of voluntary muscles), regardless of gestational age.
18.	Information object	Virtual representing of tangible and intangible entities in place.
19.	Population with usual residence	People who have lived on the Moldovan territory during the last 12 months, regardless of temporary absences (for purposes of recreation, holidays, visits to friends and relatives, business, medical treatment or religious pilgrimage, etc.).
20.	Birth order of live birth	Numerical order of a live birth relative to the total number of live births of mother.
21.	Information resource	Set of documented information in the IT system, maintained as per the requirements and legislation in force.
22.	Young-age dependency ratio	The ratio between the people aged 15-59 years at the beginning of the reference year.
23.	Old-age dependency ratio	The ratio between the people aged 60 years and above at the beginning of the reference year.
24.	Gross reproduction rate	The average number of daughters a woman would have if she survived all of her childbearing years, subject to the age-specific fertility rate.
25.	Infant mortality rate	The number of young children who died under the age of a year per 1000 live births during a reference year.
26.	Standardized mortality rate	The adjusted rates remove the effect of population different structure, enabling valid comparison between two or more populations.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

No.	Abbreviation/Acronym	Description
27.	Specific mortality rate by ages	The ratio between the number of deaths for a certain age group and the average number of people of that age group.
28.	Overall demographic dependency ratio	The number of children aged under 15 years and of elderly (aged 60 years and above) per 100 people aged between 15 and 59 years, at the beginning of the reference year.
29.	Overall fertility rate	The average number of children born by a woman during her fertility life subject to the age-specific fertility rate.
30.	Usual residence	The place where a person has lived during the last 12 months, regardless of temporary absences (for purposes of recreation, holidays, visits to friends and relatives, business, medical treatment or religious pilgrimage, etc.). The following persons alone shall be considered to be usual residents of the geographical area in question: (i) those who have lived in their place of usual residence for a continuous period of at least 12 months before the reference time; (ii) those who arrived in their place of usual residence during the 12 months before the reference time with the intention of staying there for at least one year. When the circumstances mentioned under paragraphs (i) or (ii) can be determined in no way, "usual residence" can be the place of legal or registered domicile.
31.	ISS PMS	An IT Subsystem that is part of the NBS Integrated Information System, comprising a mix of interconnected IT resources and technologies, computerware, information and organizational means, necessary to carry out activities related to the production of population and migration statistics (data collection, conveyance, and quality control, performing the aggregation, analysis, preparation, application of statistical algorithms, storing, accessing and archiving statistical information).
32.	IT system	All software and hardware ensuring data automatic processing (the information system automated component).
33.	Information system	A system aimed to process the information along with the associated organizational resources such as human and technical resources, which deliver and disseminate the information.
34.	Software Design Document	A guiding Document of the IT System comprising detailed description of the following approaches: data structures and their constraints, the IT System architecture, which provides all conceptual sections of an IT System, the IT System interface covering the conceptualization of all User Interface components, the IT System functionalities comprising detailed description of all IT System implementation scenarios.
35.	Software Requirements Specification	A Document containing detailed description of all interaction scenarios between Users and the IT Application.
36.	Life expectancy	The estimated number of years a person at a certain age may expect to live, if the Specific mortality rate by the age groups for a reference year

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

No.	Abbreviation/Acronym	Description
		would not change throughout his/her entire life.
37.	Life expectancy at birth	The number of years, on average, a newborn can expect to live if the current death rates do not change over time.
38.	Migration growth/ net migration	Difference between the number of immigrants and the number of emigrants.
39.	Natural growth	Difference between the number of live births and the number of deaths throughout the year, which can be: <ul style="list-style-type: none"> <li>• Positive natural growth (increase) – the number of live births exceeds the number of deaths;</li> <li>• Negative natural growth (decrease) – the number of deaths exceeds the number of live births.</li> </ul>
40.	IT Subsystem	A component (with the possibility of functional separation) of a complex IT system.
41.	Information and communications technology	A common term that comprises of the technologies used for information exchange and handling.
42.	Data truthfulness	The extent to which the data stored in the computer memory or in documents match the real status of the field-related objects mirrored by those data.

### *1.2. References and Legal Issues for Developing the IT Subsystem*


Having considered the current Moldovan legislative and regulatory framework and the relevant international practice, a series of acts, standards and good practices can be highlighted, which provisions shall be considered during the process of ISS PMS design, development and implementation.

To this end, as many as 47 legal and regulatory acts have been identified for the ISS PMS development, implementation, and operation, assigned to different groups depending on their applicability level as follows:

- European regulatory framework, European and international recommendations and good practices;
- national legal framework that regulates the field of official statistics;
- national legal framework in the field of computerization and IT;
- standards and good practices in the area of ICT.

#### **I. European regulatory framework, European and international recommendations and good practices:**

1. Regulation (EC) No. 763/2008 of the European Parliament and of the Council of 9 July 2008 on population and housing censuses.
2. Commission Recommendation of 23 June 2009 (2009/498/EC) on reference metadata for the European Statistical System.
3. Regulation (EC) No. 223/2009 of the European Parliament and of the Council of 11 March 2009 on European statistics.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


4. Regulation (EU) No. 1260/2013 of the European Parliament and of the Council of 20 November 2013 on European demographic statistics.
5. Commission Implementing Regulation (EU) No. 205/2014 of 4 March 2014 laying down uniformed conditions for the implementation of Regulation (EU) No 1260/2013 of the European Parliament and the Council on European demographic statistics, as regards breakdowns of data, deadlines and data revisions.
6. Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC. <http://data.europa.eu/eli/reg/2016/679/oj>.
7. Commission Regulation (EU) 2017/712 of 20 April 2017 establishing the reference year and the program of the statistical data and metadata for population and housing censuses provided for by Regulation (EC) No 763/2008 of the European Parliament and of the Council.
8. UNECE, UNSTATS Recommendations on the fundamental principles of official statistics. UNECE guidelines, specialist publications (e.g. *Guidelines on the use of registers and administrative data for population and housing censuses; Using Administrative and Secondary Sources for Official Statistics: Principles and Practices*).

## II. National legal framework that regulates the field of official statistics:

9. Law No. 100 of 26.04.2001 on Civil Status Documents, Official Gazette No. 97-99 of 17.08.2001.
10. Law No. 93 of 26.05.2017 on Official Statistics, Official Gazette No. 216-228 of 30.06.2017.
11. Government Decision No. 768 of 12.10.2011 approving the National Strategic Program on demographic security of the Republic of Moldova (2011-2025), Official Gazette No. 182-186 of 28.10.2011.
12. Government Decision No. 406 of 02.06.2014 approving the Program for integrating the aging issues into policies, Official Gazette No. 153-159 of 13-06-2014.
13. Government Decision No. 1451 of 30.12.2016 approving the Strategy for developing the National Statistical System 2016-2020 and the Action Plan on its implementation, Official Gazette No. 40-49 of 10.02.2017.
14. Government Decision No. 935 of 24.09.2018 on NBS Organization and Operation, Official Gazette No. 377-383 of 05.10.2018.

## III. National legal framework in the field of computerization and IT:


15. Law No. 982 of 11.05.2000 on Access to Information, Official Gazette No. 88-90 of 28.07.2000;
16. Law No. 1069 of 22.06.2000 on Informatics, Official Gazette No. 73-74 of 05.07.2001.
17. Law No. 467 of 21.11.2003 on Computerization and State Information Resources, Official Gazette No. 6-12 of 01.01.2004;
18. Law No. 71 of 22.03.2007 on Registers, Official Gazette No. 70-73 of 25.05.2007.
19. Law No. 241 of 15.11.2007 on Electronic Communications, Official Gazette No. 51-54 of 14-03-2008.

	<b>Information Subsystem "Population and Migration Statistics"</b>	<b>Security Classification</b>
		C2 – Internal Use

20. Law No. 133 of 08.07.2011 on Protection of Personal Data, Official Gazette No. 170-175 of 14.10.2011.
21. Law No. 91 of 29.05.2014 on Electronic Signature and Electronic Document, Official Gazette No. 174-177 of 04.07.2014.
22. Law No. 142 of 19.07.2018 on Data Exchange and Interoperability, Official Gazette No. 295-308 of 10.08.2018.
23. Government Decision No. 1123 of 14.12.2010 approving the Requirements for ensuring the security of personal data while processing them by the appropriate IT Systems, Official Gazette No. 254-256 of 24-12-2010.
24. Government Decision No. 546 of 20.07.2011 approving the Regulation on service rendering by the Telecommunications System of Public Administration Authorities and amending some GDs, Official Gazette No. 118-121 of 22.07.2011.
25. Government Decision No. 7104 of 20.09.2011 approving the Strategic Program for the Governance Technological Upgrade (e-Transformation), Official Gazette No. 156-159 of 23.09.2011
26. Government Decision No. 656 of 05.09.2012 approving the Program on Interoperability Framework, Official Gazette No. 186-189 of 07.09.2012.
27. Government Decision No. 857 of 31.10.2013 on the National Computerized Society Development Strategy "Digital Moldova 2020", Official Gazette No. 252-257 of 08.11.2013.
28. Government Decision No. 1090 of 31.12.2013 on Government Electronic Service for Authentication and Access Control (MPass), Official Gazette No. 4-8 of 10.01.2014.
29. Government Decision No. 405 of 02.06.2014 on Government Integrated Electronic Service for Digital Signature (MSign), Official Gazette No. 147-151 of 06.06.2014.
30. Government Decision No. 700 of 25.08.2014 on Government Open Data, Official Gazette No. 256-260 of 29.08.2014.
31. Government Decision No. 701 of 25.08.2014 approving the Methodology for Publishing the Government Open Data, Official Gazette No. 256-260 of 29.08.2014.
32. Government Decision No. 708 of 28.08.2014 on Government Logging Electronic Service (MLog), Official Gazette No. 261-267 of 05.09.2014.
33. Government Decision No. 211 of 03.04.2019 on Interoperability Platform (MConnect), Official Gazette No. 132-138 of 12.04.2019.
34. Government Decision No. 375 of 10.06.2020 approving the AIS Concept "Register of Electronic Signature-based Representation Powers" (MPower) and the Regulation on keeping the Register of Electronic Signature-based Representation Powers, Official Gazette No. 153-158 of 26-06-2020.
35. Government Decision No. 376 of 10.06.2020 approving the Concept of Government Electronic Notification Service (MNotify) and the Regulation on the operation and use of Government Electronic Notification Service (MNotify), Official Gazette No. 149-151 of 19.06.2020.

#### IV. Standards and good practices in the area of ICT:

36. Generic Statistical Business Process Model (Version 5.1, January 2019), <https://statswiki.unece.org/display/GSBPM/GSBPM+v5.1>

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


37. Generic Statistical Information Model (version 1.2), <https://statswiki.unece.org/display/gsim/Generic+Statistical+Information+Model>
38. Technical Regulation RT 38370656-002:2006 "Software Life Cycle Processes", approved by the written Order of the Ministry of IT and Communications No. 78/2006.
39. Standard of the Republic of Moldova SMV ISO CEI 15288: 2009, "Systems and Software Engineering. System Life Cycle Processes".
40. SM ISO/CEI 12207 "Systems and Software Engineering. Software Life Cycle Processes".
41. SM ISO/CEI 27002 "Information technology. Security Techniques. Code of practice for information security controls".
42. SM ISO/CEI 15408-1 "Information technology. Security Techniques. Evaluation Criteria for IT Security. Part 1: Introduction and General Model".
43. SM ISO/CEI 15408-2 "Information technology. Security Techniques. Evaluation Criteria for IT Security. Part 2: Security Functional Components".
44. SM ISO/CEI 15408-3 "Information technology. Security Techniques. Evaluation Criteria for IT Security. Part 3: Security Assurance Components".
45. Michael O. Leavitt, Ben Shneiderman, Research-Based Web Design & Usability Guidelines, [https://www.usability.gov/sites/default/files/documents/guidelines\\_book.pdf](https://www.usability.gov/sites/default/files/documents/guidelines_book.pdf)
46. World Wide Web Consortium (W3C) Recommendations (<http://www.w3c.org>) on the quality of web page content, possibilities to view the accurate information by using the widespread Internet browsers ,and compatibility with different IT platforms.
47. WAI (Web Accessibility Initiative) Recommendations (<http://www.w3c.org/WAI>) on ensuring the possibility to use the site resources by people with disabilities.
48. WCAG (Web Content Accessibility Guidelines) Recommendations <http://www.w3.org/TR/WCAG21/>
49. W3C Recommendations (<http://validator.w3.org>) on WEB page testing. All WEB pages generated by the IT applications devised under this Project shall be tested as per these Recommendations.

### *1.3. IT Subsystem Development Principles*


In order to ensure the attainment of the objectives set forth, in the process of ISS PMS design, development and implementation full account of the following general principles shall be taken:

- **Principle of legality**, which implies the creation and operation of the IT system in compliance with the national legislation in force and with the relevant internationally recognized norms and standards, as well as with the fundamental principles of official statistics (legal mandate to produce statistical data; relevance, impartiality and legal access; professional standards and ethics; accountability and ethics; preventing data misuse; official data sources; confidentiality; national/international coordination and cooperation; application of international standards);
- **Principle of respecting the human rights**, which stipulates the use of the system in strict compliance with the national regulatory acts and with the provisions of treaties and conventions in the field of human rights to which the Republic of Moldova is a party;



	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

- **Principle of focusing on stakeholders' needs**, which implies that the IT solution will provide complete functional capabilities to respond to the needs of all stakeholders in the processes of collecting, producing and disseminating population and migration statistics;
- **Principle of decoupling from the technological platform**, which ensures that the ISS PMS would not be conditioned by the selection of the technological platform to be implemented thereon. Independence from the technological platform presumes that the ISS PMS could be implemented and operated on a variety of technologies affordable to the NBS, and the best technological option would be selected. In this way, the rational use of available ICT resources and smart investments in ICT would be secured;
- **Principle of dividing the architecture by layers**, which means the design and implementation of the ISS PMS functional components in compliance with the interface standards amongst layers;
- **Principle of service-oriented architecture (SOA)**, which means the assignment of IT system application functionalities into smaller distinct units, called services that can be shared in a network and used together to create applications to implement the IT system business functions. These technology-independent components can be implemented without rigid mutual dependences, and will interact via external interfaces driven by open standards. This gives flexibility in choosing technologies and independent life-cycles for the ISS PMS components. Likewise, it would enable the stakeholders to select alternative technological options for data entering and accessing capabilities;
- **Principle of reusing the existing capabilities**, which implies that the ISS PMS would be implemented through the reuse, at its components level, of current ICT capabilities accessible to the NBS. The development of new capabilities specific for the ISS PMS would be done only when such are not available in the NBS current ICT architecture (keeping the SOA architecture and sharing, where possible, those capabilities with other IT systems). This presupposes the use of government platform services or solutions implemented in the NBS to develop the ISS PMS components;
- **Principle of alignment with the NBS wide ICT architecture**, which implies that the ISS PMS location in the ICT architecture is explicitly delimited relative to other NBS IT systems. The ISS PMS shall be implemented bearing on the ICT architecture principles established by the NBS and be able to interact with other ICT architecture components. In their turn, the ICT architecture principles shall be aligned with the government architecture principles;
- **Principle of open data and interoperable model**, which implies that the data model supported by the ISS PMS is documented and communicated to all interested actors. The ISS PMS is to be built on the basis of accepted relevant standards and aligned with the government and department data model (adopting the already existing taxonomy and semantics at the national and department level, and its enrichment to meet the needs specific for population and migration statistics);
- **Principle of design-supported security**, which implies designing the ISS PMS, having full knowledge of information security risks that may affect the IT system smooth operation. The applicable legal requirements to protect personal data shall be considered at the ISS PMS design stage and implemented at the System development stage. The ISS PMS shall ensure controlled, transparent and accountable access to data;
- **Principle of data integrity, completeness and accuracy**, which implies the implementation of mechanisms allowing to store the content and clearly interpret the data under the

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

circumstances of accidental influence, and to eliminate data accidental distortion or liquidation phenomena, delivering a sufficient volume of data to perform the IT system business functions and ensuring a high degree of data matching with the real status of ISS PMS objects they represent and which are parts of the ISS PMS;

- **Principle of public information accessibility**, which implies the implementation of procedures to ensure the applicants' access to public information provided by the IT solution;
- **Principle of expansibility**, which stipulates the possibility to expand and supplement the IT system with new functions or improve the functions already in place;
- **Principle of priority of first person/single center**, which implies the existence of a senior responsible person assigned with sufficient rights to make decisions and coordinate the activities aimed at creating and using the IT system;
- **Principle of scalability**, which implies ensuring the IT solution constant performance upon the increased IT system data loads and requests;
- **Principle of simplicity and convenience of use**, which implies the design and implementation of all applications, hardware and software resources available to the ISS PMS Users, based exclusively on visual, ergonomic and logical design principles.

#### *1.4. IT Subsystem Intended Use, Goals and Tasks*


The ISS PMS is part of the NBS Integrated Information System, representing a mix of interconnected IT resources and technologies, computerware, information and organizational means, enabling the performance of activities related to the production of population and migration statistics (collection, conveyance and quality control of data, performing the processes of aggregation, review, preparation, application of statistical algorithms, storing, accessing and archiving statistical information).

The NBS shall use the ISS PMS in order to automate the process of data collection and produce official population and migration statistics, as well as ensure the dissemination of these statistics to a wide range of Users at the national, regional and international level.

Hence, along with the ISS PMS implementation, it is envisaged to attain the following goals:

1. Ensure the possibility to estimate the total number of resident population and its socio-demographic structure at any given time, as well as the changes occurring within the population.
2. Enhance the efficiency of vital statistics production by using "multi-register" systems.
3. Mitigate the respondents' burden, financial costs for collecting and producing official statistics, as well as the administrative burden on data sources, in relation to the provision of data for statistical purposes, by automating the process of data adoption via the interoperability mechanisms with external IT systems.
4. Mitigate the respondents' burden during the population census by using pre-filled census questionnaires and validating the census data by confronting them with the administrative data sources (using a single identification code and/or other single identifiers) and switching to register-based censuses in the long-run to cut down the census costs and produce census statistics more frequently.



	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

5. Enhance the quality of relevant statistical products and data, having ensured data automated processing as per the established validation rules, automatically applied the indicator calculation algorithms and continuous monitoring of inputs and outputs quality.
6. Improve the quality of estimates derived from survey researches, using the AIS RPM as a survey qualitative basis, as an auxiliary data source to calibrate the estimates, as well as to shape the behavior of non-respondents.
7. Increase the frequency of statistical data production and dissemination, their updating, where appropriate, by organizing automated data collection, processing, validation, and calculation of statistical indicators.
8. Diversify the developed and disseminated statistical indicators by implementing innovative methodologies to calculate the indicators and applying the feedback from the beneficiaries of statistical products to develop products that meet the users' current needs and respond to crises (e.g. Covid-19).

During the System operation, in order to implement the ISS PMS proposed goals, it is envisaged to carry out the following tasks:

1. Automating the process of collecting, storing, combining, reviewing, producing and/or processing in any other way the administrative and/or individual/personal data, with the aim to produce statistics.
2. Creating and continuously updating the information resources in demographic statistics with the aim to produce the respective indicators and provide computerized support to decision-making carried out at any level.
3. Optimizing the cost-efficiency ratio while producing demographic statistics, by using administrative data from public or private sources, including individual/personal data, and generating, updating statistical indicators where necessary.
4. Facilitating inter-institutional communication and collaboration, especially with the holders of administrative data, which are of interest for producing demographic statistics, using ICT solutions in the process of data collection and, respectively, cutting down the burden thereon.
5. Ensuring due protection to personal data collected while producing population and migration statistics, having applied data encryption, pseudonymization, and, where appropriate, anonymization to the extent they would not hinder the achievement of ISS PMS goals, as per the personal data protection policy approved by the NBS. Safeguarding the information with limited accessibility via the protocol for granting access rights to authorized users, default information filtering mechanisms and hindering information unlawful change, deletion, destruction, or dissemination.
6. Ensuring appropriate mechanisms to monitor the quality of used data while producing vital and migration statistics, as well as generating statistical products, in light of: data relevance, accuracy, timeliness, promptness, affordability and clarity, comparability and coherence.
7. Ensuring interoperability with third party information resources to carry out mutual exchange of data.
8. Establishing and strengthening the statistical information dissemination system, diversifying the range of statistical products made available to NBS beneficiaries.

	Information Subsystem "Population and Migration Statistics"	Security Classification
		C2 – Internal Use

2. IT Subsystem Architecture

The ISS PMS shall provide a WEB interface to be accessible through widely used web browsers (MS Internet Explorer/MS Edge, Mozilla FireFox, Opera, Google Chrome or Safari). From the functional standpoint, a reliable and scalable solution shall be developed to cope with the increased number of concurrent users and increased volumes of information managed by it.

The ISS PMS will be based a service-oriented architecture with at least three layers (that excludes any direct application-database interaction), involving cutting-edge WEB technologies. To ensure an appropriate level of information security, the delivered IT Subsystem shall enable safe connections between the client stations and the application server to safeguard reliable transmission of information (via VPN channels and TLS/SSL sessions).

The ISS PMS shall be deployed and operated within the government platform *MCloud*. To ensure the attainment of goals submitted to the IT solution, due consideration shall be given to the architecture described in Figure 2.1., while designing, developing and implementing the ISS PMS.

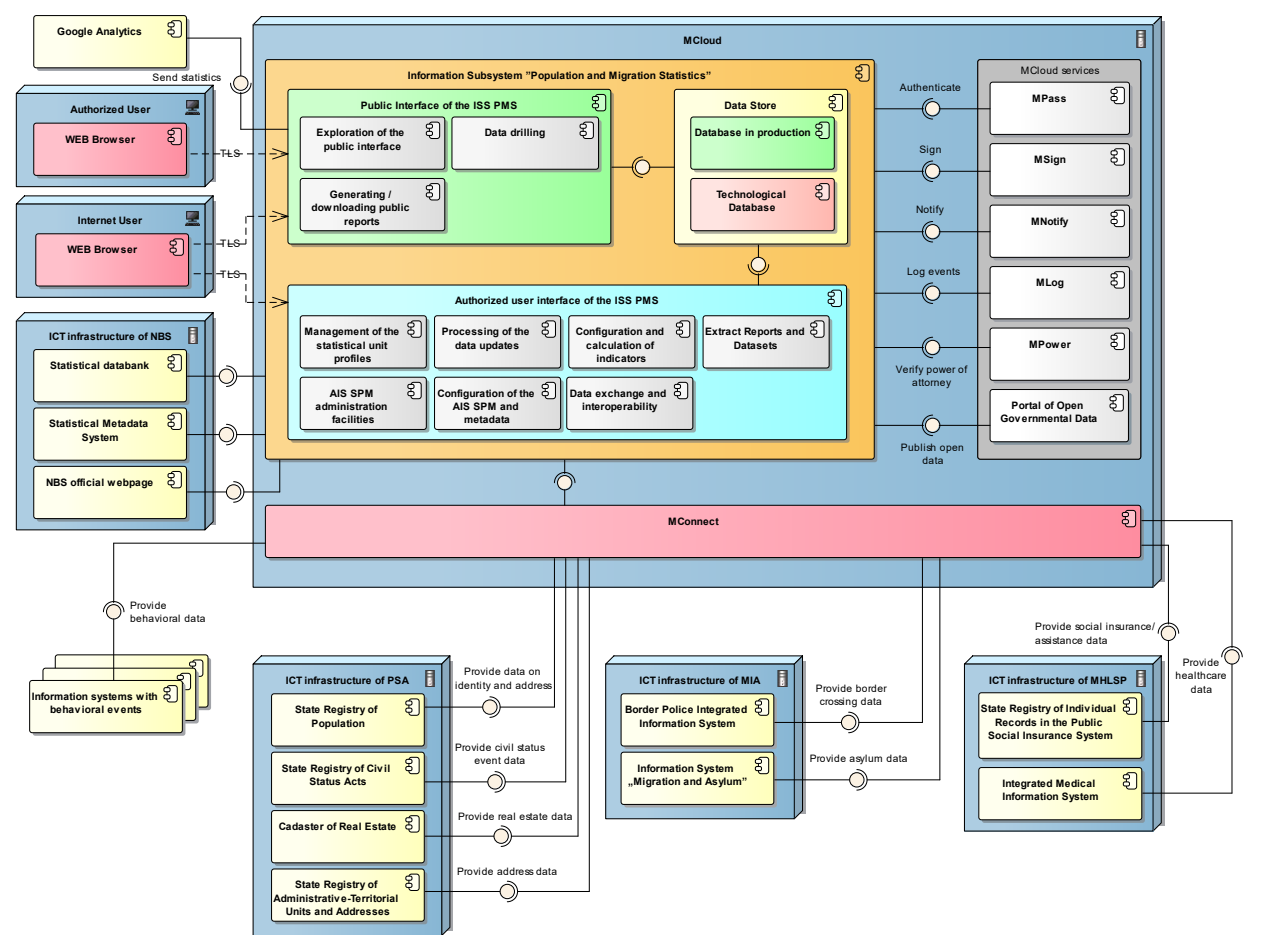



Figure 2.1. ISS PMS Architecture.

As shown in Figure 2.1, the resource pooling solution to ensure the ISS PMS functionality consists of seven distinct categories of hubs:

- **MCloud** – the ICT infrastructure of the government common technology platform that makes up the government cloud (*MCloud*), which, as a rule, hosts all IT Systems held by the Moldovan Public Authorities, and which will host the ISS PMS as well. It is worth noting that

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

the ISS PMS will use MCloud platform services. All connections with external IT Systems will be carried out mainly via the Government Interoperability Platform MConnect.


- **NBS ICT Infrastructure** – the National Bureau of Statistics ICT Infrastructure, which hosts the Statistical Databank, the Register of Statistical Metadata and the official Web Page, with which the ISS PMS should integrate and exchange data.
- **PSA ICT Infrastructure** – the ICT Infrastructure of the Public Services Agency, hosting the SRP, SRCSD, CIP and SRATUA. The ISS PMS will not interact directly with these IT Systems. Such interaction shall be provided via the Interoperability Platform MConnect.
- **MIA ICT Infrastructure** – the Ministry of Internal Affairs ICT Infrastructure, hosting the IISBP and "Migration and Asylum" IS. The ISS PMS will not interact directly with these IT Systems. Such interaction shall be provided via the Interoperability Platform MConnect.
- **MHLSP ICT Infrastructure** – the Ministry of Health, Labor and Social Protection ICT Infrastructure, hosting SRIRPSIS and IMIS. The ISS PMS will not interact directly with these IT Systems. Such interaction shall be provided via the Interoperability Platform MConnect.
- **Google Analytics Infrastructure** – Google Service ICT Infrastructure intended to collect the data on Internet Users' behavior and generate statistical reports related to the use of the ISS PMS Public Interface.
- **IT System Infrastructures containing behavioral events** – ICT infrastructures of IT Systems that can deliver behavioral data related to Statistical Units. The ISS PMS will not interact directly with these IT Systems. Such interaction shall be provided via the Interoperability Platform MConnect.
- **Client computers** – computers from where the authorized and anonymous Users (depending on the assigned rights and roles) will access the ISS PMS functionalities.

Pursuant to the deployment diagram and components displayed in Figure 2.1, the ISS PMS consists of three core components:


- **Public Interface** – a functional component accessible to anonymous Users, providing access to public information (for example: *exploring public content, data 'drilling', generating diagrams and infographics, generating/downloading public reports*).
- **Authorized Users' Interface** – an important ISS PMS component to support the activity of NBS employees and implementation of key business processes aimed to provide population and migration statistics (for example: *configure and calculate statistical indicators and associated aggregates, process the events to update the data received from external sources, manage the Statistical Units' profiles, retrieve reports and data sets, configure and administer IT Subsystem facilities and interoperability, etc.*).
- **Data store** – an ISS PMS component responsible for the storage of data related to population and migration statistics managed via those two databases: database in production and technological database.

To implement a number of functionalities, the ISS PMS will use a series of platform services and APIs provided by government and external IT Systems as follows:

1. **Update the data repository** provided by the Statistical Databank to send data intended for "Population and Demographic Processes".
2. **Update the statistical metadata** provided by the NBS Statistical Metadata System to update the values of statistical metadata used within the ISS PMS business processes.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

3. **Publish official data** provided by the NBS official Web Page to be published, as well as the related reports produced within the ISS PMS business processes.
4. **Authenticate** provided by the platform service MPass to authenticate the Users via electronic or mobile signature.
5. **Sign** provided by the platform service MSign to affix electronic or mobile signature on documents and forms prepared within the ISS PMS business processes.
6. **Notify** provided by the platform service MNotify to implement a universal and centralized mechanism to notify the ISS PMS Users.
7. **Log event** provided by the platform service MLog to log sensitive business events produced during the ISS PMS operation.
8. **Verify power of attorney** provided by the platform service MPower to check the representation powers of Authorized Users and authorize their access pursuant to those powers.
9. **Publish open data** that interacts with the Government Open Data Portal (<https://date.gov.md>) to publish the sets of public data produced within the ISS PMS business processes.
10. **Provide data on identity and address** disclosed by the SRP to automatically receive the data on Statistical Units' identification, documentation, and domicile/residence.
11. **Provide civil status event data** disclosed by the SRCSA to automatically adopt the data on civil status events related to Statistical Units.
12. **Provide real estate data** disclosed by the CRE to automatically receive the data on identification and registration of housing where the Statistical Units reside/have their domicile.
13. **Provide address data** disclosed by the SRATUA to automatically receive the data on identification and registration of housing where the Statistical Units reside/have their domicile.
14. **Provide border crossing data** disclosed by the BPIIS to automatically receive the data related to the Moldovan state border crossing events by individuals.
15. **Provide asylum data** disclosed by the "Migration and Asylum" IS to automatically receive the data related to the events recorded in the casefiles of immigrants in the Republic of Moldova.
16. **Provide social insurance/assistance data** disclosed by the SRIRPSIS to adopt automatically the data related to the occupation of Statistical Units and events of granting social assistance.
17. **Provide healthcare data** disclosed by the IMIS to adopt automatically the data related to disabilities, birth/death events and provision of healthcare to Statistical Units.
18. **Provide behavioral data** disclosed by the IT Systems of Moldovan public authorities and economic entities based on which behavioral events of Statistical Units (to check their real existence) can be received.
19. **Send statistics** provided by Google Analytics to deliver Internet Users' behavioral data within the ISS PMS public interface.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

### 3. Involved Parties and IT Subsystem Roles


#### 3.1. IT Subsystem Business Roles

In compliance with the legislation in force, the following Moldovan entities are interested or shall be involved in the process of ISS PMS development and operation:

- **National Bureau of Statistics** – as the entity responsible for the ISS PMS implementation and smooth operation. The NBS Population and Migration Statistics Division is the ISS PMS direct Beneficiary, while the General IT Division shall be actively involved, along with the DSPM, at all stages of IT Subsystem design, development, putting into production and operation.
- **United Nations Population Fund (UNFPA)** – as the Purchaser of ISS PMS design, development and implementation services. Along with the NBS, the UNFPA experts shall be involved in monitoring of ISS PMS design, development and implementation activities.
- **Public Services Agency** – as Provider of data related to the identity, residence/domicile, ID documents and biometric data related to the Moldovan population via the State Register of Population, State Register of Administrative and Territorial Units and Addresses, State Register of Civil Status Documents, and Cadaster of Immovable Property/Real Estate.
- **Ministry of Internal Affairs** – as Provider of data on crossing the state border of the RM by Moldovan citizens and foreigners via the Border Police IT System and the Integrated Information System in the area of Migration and Asylum.
- **National Social Insurance House** – as Provider of data on social assistance granted to Moldovan citizens via the State Register of Individual Records in the Public Social Insurance System.
- **Ministry of Health, Labor and Social Protection** – as Owner and Holder of the Integrated Medical Information System to deliver baseline data necessary to calculate statistical indicators within the ISS PMS.
- **E-Government Agency** – as the body empowered to carry out e-Transformation activities. E-Government Agency shall provide access to interoperability platform MConnect and to MCloud platform services (MPass, MSign, MLog, MNotify, MPower and Government Open Data Portal).
- **Information Technology and Cyber Security Service** as the entity that administers *MCloud*, which hosts platform services implemented under the entity administering the Government Common Platform MCloud hosting horizontal e-government services the ISS PMS is supposed to integrate with.
- **Owners of IT Systems of Statistical Units behavioural data** to provide milestones on Statistical Units existence and viability, based on which it can preserve the active status of their profile (for example: *Tax Register – any tax settlement event, MPay – any electronic settlement event, commercial databases – any service-receiving related event, etc.*).

#### 3.2. IT Subsystem Purchaser

The United Nations Population Fund is the ISS PMS Purchaser. Therefore, it is supposed to carry out all activities aimed to select the ISS PMS design/development/implementation service provider, monitor

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

the ISS PMS design/development/implementation processes and submit the ISS PMS to the NBS, following the IT Subsystem final acceptance stage.

### *3.3. IT Subsystem Owner*

The National Bureau of Statistics, as the central authority in the area of state official statistics, is the ISS PMS Owner. The NBS shall be assigned the responsibility to coordinate the national statistical system, the activities related to the development and production of official statistics therein. The NBS is empowered with the right to manage, produce and use the data and resources contained in the ISS PMS and shall be responsible to ensure the establishment, efficient operation, continuous maintenance and development of this IT Subsystem.

### *3.4. IT Subsystem Holder*

The Information Technology and Cyber Security Service (ITCSS) is the ISS PMS Holder as the ISS PMS is to be hosted under the Government Common Platform MCloud. As the ISS PMS Holder, the Information Technology and Cyber Security Service shall address all technical issues that may occur throughout the period of ISS PMS operation.

### *3.5. IT Subsystem Registrar*

The employees of the Division of Population and Migration Statistics are the ISS PMS Registrars, as well as the NBS operators working at the central and local level. Part of data stored within the IAS PMS are officially recorded data within external IT Systems (for example: *State Register of Population, Cadaster of Immovable Property/Real Estate, etc.*), adopted by the ISS PMS via the interoperability mechanism.

### *3.6. IT Subsystem Administrator*

The ISS PMS System Administrator is one or several people appointed by the National Bureau of Statistics (as a rule, employees of the General IT Division). The Population and Migration Statistics Division staff will administer the ISS PMS content. The ITCSS shall exercise the administration functions at the level of ISS PMS MCloud infrastructure (Technical Infrastructure Administrator).


### *3.7. IT Subsystem Users and their Role*

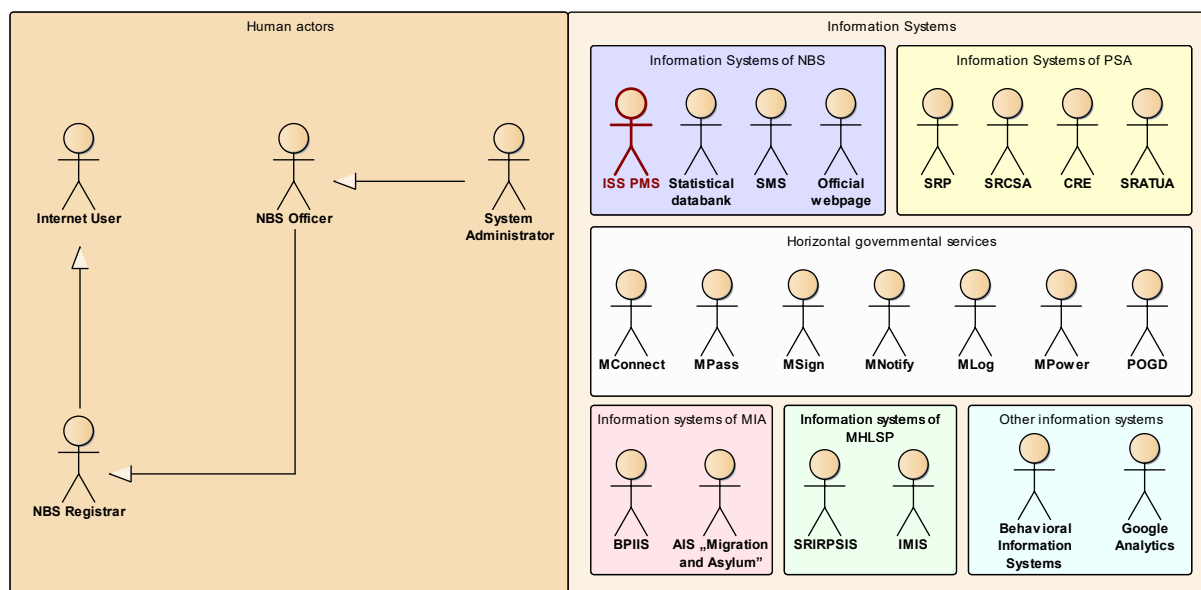
The human roles and the IT Subsystems that interact with the ISS PMS are displayed in Figure 3.1. As shown in this Figure, five categories of human actors and six categories of IT Subsystems will interact under the application.

**Internet User** – human actor accessing the ISS PMS public interface from outside to view public reports and the values of calculated statistical indicators. This category of actors shall have access to the following functionalities:

- exploring the ISS PMS public interface content;
- defining the queries and generating public reports;
- ‘drilling’ the data related to the statistical indicators calculated by the ISS PMS and viewing the details as diagrams or infographics.



	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use




**Figure 3.1. ISS PMS Actors.**

**NBS Registrar** – a human actor, representing all NBS Authorized Users responsible for quality assurance of ISS PMS baseline/primary data. Depending on the specific rights configured for each NBS Registrar, it is envisaged to differentiate their access to data and actions carried out. The actors concerned will have access to the following functionalities:

- accessing all functionalities available to Internet Users;
- using Dashboards to view the notifications and access quickly the electronic forms specific for their job duties related business events;
- managing the Statistical Units' profiles falling under their competence;
- monitoring automatic updates;
- processing assisted updates;
- resolving import anomalies;
- searching/viewing the data stored in the ISS PMS DB;
- receiving notifications.

**NBS Officer** – a human actor representing the NBS staff specialised in demographic and migration processes responsible for implementing the Methodology for calculating the statistical indicators, statistical indicator calculation and report preparation related to demographic and migration processes. Depending on the specific rights configured for each NBS Expert, their access to data and actions carried out shall be differentiated. The actors concerned shall have access to the following functionalities:

- accessing all functionalities available to Internet Users;
- accessing all functionalities available to NBS Registrars;
- configuring statistical indicators;
- formulating queries to generate/retrieve reports and data sets;
- importing by hand the data based on standard files;

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

- launching by hand statistical indicator calculation procedures.

**System Administrator** – a human actor, empowered to administer the System Users, configure the IT Subsystem, and start/stop/restart the IT Subsystem components. If the technological environment includes sufficient capabilities to carry out administration works, then their implementation in the System is optional. This category of actors shall have access to the following functionalities:

- accessing the functionalities available to all categories of ISS PMS Users;
- administering the Authorized Users' profiles, roles and access rights;
- managing the system of classifiers, nomenclatures and metadata;
- configuring the ISS PMS operation parameters;
- configuring flows, forms and reporting templates;
- quick monitoring, diagnosing the ISS PMS operation issues and their troubleshooting;
- administering the application server;
- administering the technological DB and the DB in production;
- generating reports related to IT Subsystem auditing and its DB information content;
- producing backups and restoring the ISS PMS functionalities in case of disaster.


#### NBS IT Systems:

- **ISS PMS** (*Information Subsystem "Population and Migration Statistics"*) – IT Subsystem intended to produce population and migration statistics (collection, conveyance and quality control of data, carrying out aggregation, analysis, preparation, using statistical algorithms, storing, accessing and archiving processes of statistical information) representing the implementation goals outlined in this Document.
- **SDB** (*Statistical Databank*) – the NBS data repository storing all official statistics of the RM;
- **SMS** (*Statistical Metadata System*) – the IT System where all categories of NBS statistical metadata are recorded;
- **NBS official Web Page** (<https://statistica.gov.md>) – a WEB Page through which citizens shall be granted access to demographic and migration statistics.

#### Public Services Agency IT Systems:

- **SRP** (*State Register of Population*) – an IT System, the integration with which would enable automatic adoption of data on identity, residence and domicile of individuals (all people having IDNP, including foreigners and stateless people visiting the Republic of Moldova);
- **SRCSA** (*State Register of Civil Status Acts*) – an IT System, the integration with which would enable automatic adoption of data related to civil status events recorded by the Moldovan Public Authorities;
- **CRE** (*Cadaster of Real Estate*) – an IT System, the integration with which would enable automatic adoption of data on registered immovable property/real estate related to individuals' housing;
- **SRATUA** (*State Register of Administrative and Territorial Units and Addresses*) – an IT System, the integration with which would enable automatic adoption of addresses recorded on the Moldovan territory.



	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

#### MCloud Government Services:

- **MConnect** – Government interoperability and data exchange platform. The ISS PMS will use this platform to exchange data with other Public Authorities IT Systems (for example: *SRP, SRCSD, CIP, SRATUA, IISBP, AIS "Migration and Asylum", SRIRPSIS, IMIS, etc.*).
- **MPass** – platform service used to control access to IT Systems and ensure authentication procedures via electronic or mobile signature.
- **MSign** – platform service used to apply and validate electronic signatures, including mobile signatures.
- **MNotify** – platform service used to notify the ISS PMS Authorized Users;
- **MLog** – platform service used to log all critical business events related to IT Systems held by Moldovan Public Authorities.
- **MPower** – Register of Electronic Signature-based Representation Powers that provides data regarding the power held by Authorized Users to carry out specific actions within the ISS PMS.
- **POGD** (*Portal of Open Governmental Data* <https://date.gov.md>) – portal of government open data via which the ISS PMS will publish KPIs, statistical indicators and public reports produced under its business processes.

#### Ministry of Internal Affairs IT Systems:


- **BPIIS** (*Border Police Integrated Information System*) – the integration with which would enable automatic adoption of data on state border crossing events by individuals;
- **AIS "Migration and Asylum"** – the integration with which would enable automatic adoption of data related to case-files of applicants for asylum to record or update the Statistical Units' profile data, kin relationships amongst people who immigrated in the Republic of Moldova, and other relevant data of ISS PMS business processes.

#### Ministry Health, Labor and Social Protection IT Systems:

- **SRIRPSIS** (*the State Register of Individual Records in the Public Social Insurance System*) – the integration with which would enable automatic adoption of data on Statistical Units' disabilities, guardianship or parental assistant relations, etc.;
- **IMIS** (*Integrated Medical Information System*) – the integration with which would enable automatic adoption of data on morbidity of individuals and of different categories of behavioral events. Likewise, this is an alternative source to receive the birth and death events of individuals.

#### Other IT Systems:

- **IT Systems supplying behavioral data** – the integration with which would enable adoption of milestones on Statistical Units' existence and viability based on which to keep the active status of their profiles (for example: *Tax Register – any tax settlement event, MPay – any electronic settlement event, commercial databases – any service-receiving related event, etc.*)
- **Google Analytics** – external IT System used to collect statistics and generate reports and KPIs on using the ISS PMS public interface.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

## 4. IT Subsystem Functional Model

### 4.1. IT Subsystem Data Model

Having considered the shaped area (automating the process of data collection and production of official population and migration statistics), it is possible to delimit all information objects to be taken into account while developing the ISS PMS.

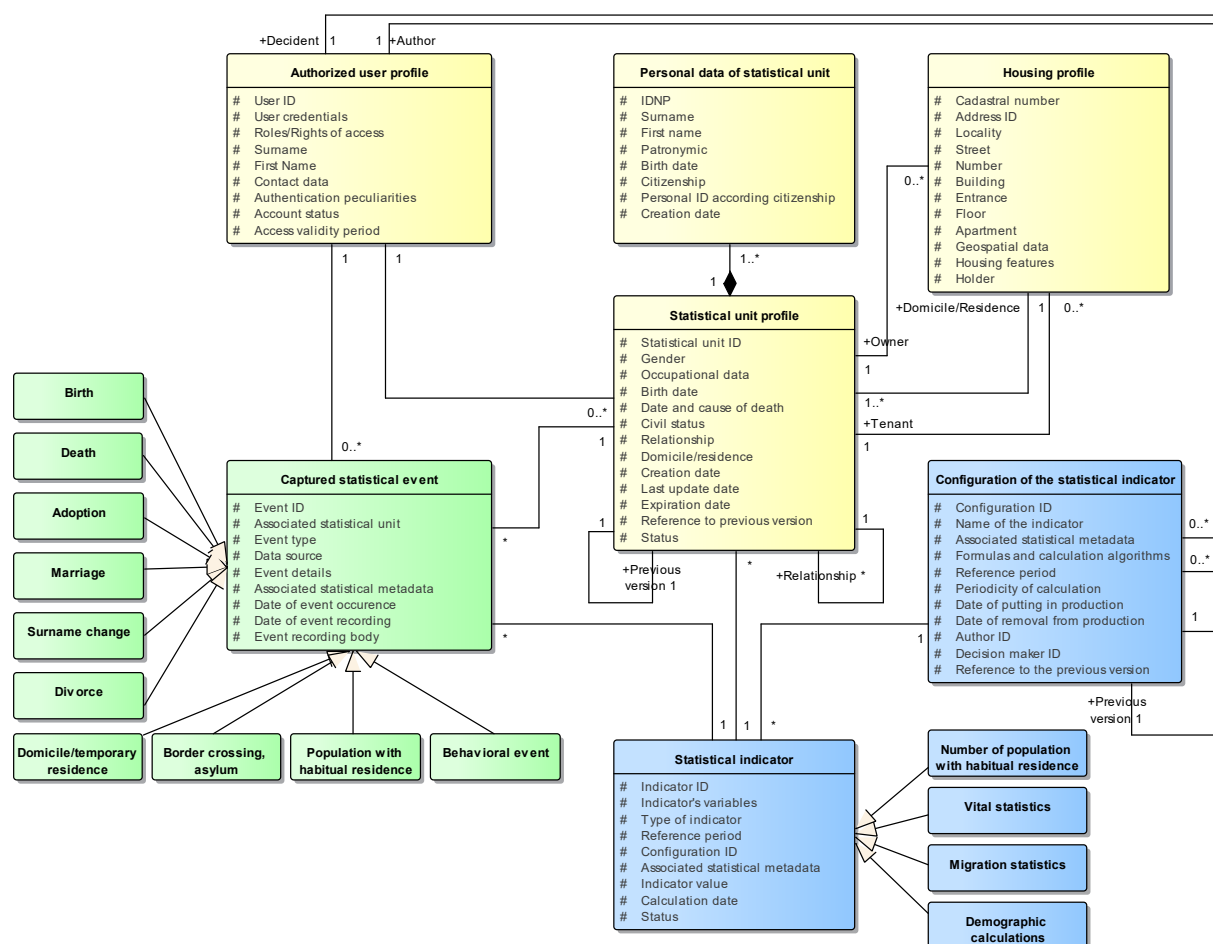



Figure 4.1. ISS PMS Information Objects.

As shown in Figure 4.1, the IT solution consists of four categories of information objects of various complexity to be taken into consideration while designing, developing and implementing the ISS PMS.

1. Profile.
2. Captured statistical event.
3. Statistical indicator.
4. Configuration of the statistical indicator.

It should be noted that the data model reflected in Figure 4.1 is a high-level one. This model reflects some aspects needed to understand the specifics of the information objects with which the future developers will operate. The developer must use the Generic Statistical Information Model (version 1.2) as an international standard that must be taken into account during the design, development and

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

implementation of software solutions that will automate the business processes of statistical authorities.

The ISS PMS objects may be identified by using, for each of them, a single identification number (including the one offered by the Provider of data set the information object is stemming from).

## 1. Profile

This is a complex information object that defines all profiles of basic data used by ISS PMS business processes. This information object presumes there are two profile categories in place, namely:


- A. **Statistical Unit Profile.** It represents the individual's registration data (data to be taken into account when calculating the statistical indicators). As a rule, the Statistical Unit profile data are collected and recorded as long as events captured from external IT systems are gathered. Due to security reasons, the Statistical Unit profile is to be divided at the DB level into two separate entities: one with depersonalized data used to calculate statistical indicators, and the other with encrypted personal data used to process the data consumed/retrieved from external data sources and address the import anomalies.

The Entity with Personal Data shall store the following categories of data:

- a) IDNP;
- b) Surname;
- c) First Name;
- d) Patronymic;
- e) Birth date;
- f) Citizenship;
- g) Personal Digital Code related to citizenship;
- h) Statistical unit ID;
- i) Creation date.

The Entity with Depersonalized Data shall store the following categories of data:

- j) Statistical unit ID;
- k) Gender;
- l) Occupational data;
- m) Birth date;
- n) Date and cause of death;
- o) Civil status;
- p) Relationships data;
- q) Domicile/residence;
- r) Date of profile creation;
- s) Date of last update;
- t) Date of profile expiry;
- u) Reference to previous versions;


	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

- v) Profile current status;
  - w) Other categories of relevant data.
- B. **Authorized User Profile.** It represents the profiles of IT system authorized users to be engaged in the ISS PMS business processes, which would need authorized access to the IT system data or to rendered electronic services. The following categories of data shall be stored for the Authorized User profile:
- a) Authorized User Identifier;
  - b) User credentials;
  - c) Roles/rights of access;
  - d) Authorized User Surname;
  - e) Authorized User First Name;
  - f) Contact data;
  - g) Authentication strategy/restrictions (user+password, electronic signature, IP access address, etc.);
  - h) Account status;
  - i) Access validity period.
- C. **Housing Profile.** This is a complex information object providing the data on housing where families and Statistical Units have their domicile/residence. Housing is described by the following categories of data:
- a) Cadaster number;
  - b) Address ID;
  - c) Locality (pursuant to CUATM);
  - d) Street;
  - e) Number;
  - f) Building;
  - g) Entrance;
  - h) Floor;
  - i) Apartment;
  - j) Geospatial data;
  - k) Housing features;
  - l) Holder.

## 2. Captured Statistical event

This is a complex information object, which data are adopted from external data sources, serving as basis to update the Statistical Individual Profiles or to calculate statistical indicators. This information object is characterized by the following categories of data:

- a) Event Identifier (pursuant to data source);
- b) Associated statistical unit(s);

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


- c) Type of event;
- d) Data source;
- e) Event details;
- f) Associated statistical metadata;
- g) Date of event occurrence;
- h) Date of event recording;
- i) Event recording body.

The ISS PMS shall be able to receive and process the following demographic processes-related events:

- A. **Birth Events.** Category of events on which basis it is expected to add new Statistical Unit profiles and establish parent-child kin relationship.
- B. **Death Events.** Category of events on which basis it is expected to record deaths, their causes, deactivate the profiles or update the social status of Statistical Units.
- C. **Adoption Events.** Category of events on which basis new Statistical Unit profiles could be added and parent-child kin relationship could be established.
- D. **Marriage Events.** Category of events on which basis it is expected to update the profile data, establish the relationship of spouses and update the social status of Statistical Units.
- E. **Surname Changing Events.** Category of events on which basis it is expected to update the Statistical Unit profile data.
- F. **Divorce Events.** Category of events on which basis it is expected to update the profile data, establish the relationship of spouses and update the social status of Statistical Units.
- G. **Events of Registration /Change/Cancel of Domicile/Residence.** Category of events on which basis it is expected to add new housing, update the existing housing data, set/update the data on domicile/residence of Statistical Units and families.
- H. **Border Crossing and Asylum** Category of events based on which the statistical units profile data can be added/updated (based on the state border crossing event data), established the emigrant/immigrant status and the level of international migration, as well as the case of granting asylum/residence permit for foreign nationals and stateless persons.
- I. **Population with habitual residence.** Category of events based on which will be captured the number of the resident population on the territory of the country at a certain time and at the lowest territorial level (based on censuses results) and updated annually the data on the number of population with habitual residence during intercensal periods.
- J. **Behavioral Events.** Category of events on which basis it is expected to validate the existence of Statistical Units. These are to be received from diverse categories of sources, such as: commercial databases, Tax Register, Payment system MPay when a Statistical Unit is detected.
- K. **Other categories of events** identified during the ISS PMS operation or accessible following the implementation of new IT systems.

### 3. Statistical Indicator

This is a complex information object, which values are calculated on the basis of demographic events captured from data sources, and the calculation rules are defined by the indicator configurations. This is

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

the ISS PMS key-information object, which covers most of the IT system goals, including the following categories of data:

- a) Indicator ID;
- b) Indicator's variables;
- c) Type of indicator;
- d) Reference period;
- e) Calculation date;
- f) Configuration ID;
- g) Associated statistical metadata;
- h) Indicator value;
- i) Status.

The ISS PMS shall be capable to calculate the following categories of indicators:

- A. **Number of population with habitual residence.** Represents the indicators that reflect the absolute size and demographic characteristics of the population (age, sex, place of residence, ethnicity, spoken language, religion, citizenship, etc.) that has a habitual residence in a defined space and for a defined period (at census date and during the intercensal period). From a statistical point of view, the population is a community that is systematically updated: population change under the impact of birth, death and migration flows, influenced by other events in society, and are updated in periodic censuses.
- B. **Vital statistics.** It represents a set of indicators related to the current statistics on demographic events (birth, death), as well as on civil status (marriages, divorces). Overall, these indicators describe the vital statistics.
- C. **Migration statistics.** It represents a set de statistical indicators referring to the demographic phenomenon of population territorial/geographical mobility (migration of population).
- D. **Demographic calculations.** It represents a set of statistical indicators on certain characteristics of population.

#### 4. Configuration of the Statistical Indicator

This is a complex information object used to define the principles for calculating the statistical demographic indicators within the ISS PMS. This type of information objects shall be defined by the following categories of data:

- a) Configuration ID;
- b) Name of the calculated indicator;
- c) Associated statistical metadata;
- d) Formulas and calculation algorithms;
- e) Reference period;
- f) Periodicity of calculation;
- g) Date of putting into production;
- h) Date of removing from production;

<div><div>STATISTICA</div><div>MOLDOVEI</div></div>	Information Subsystem "Population and Migration Statistics"	Security Classification
		C2 – Internal Use

- i) Author ID;
- j) Decision maker ID;
- k) Reference to the previous identifier configuration versions.

4.2. IT Subsystem Functionalities

The functionalities provided by the ISS PMS are displayed in the diagram below. As shown in Figure 4.2, the ISS PMS will provide its functionalities to relevant actors via 19 Use Cases.

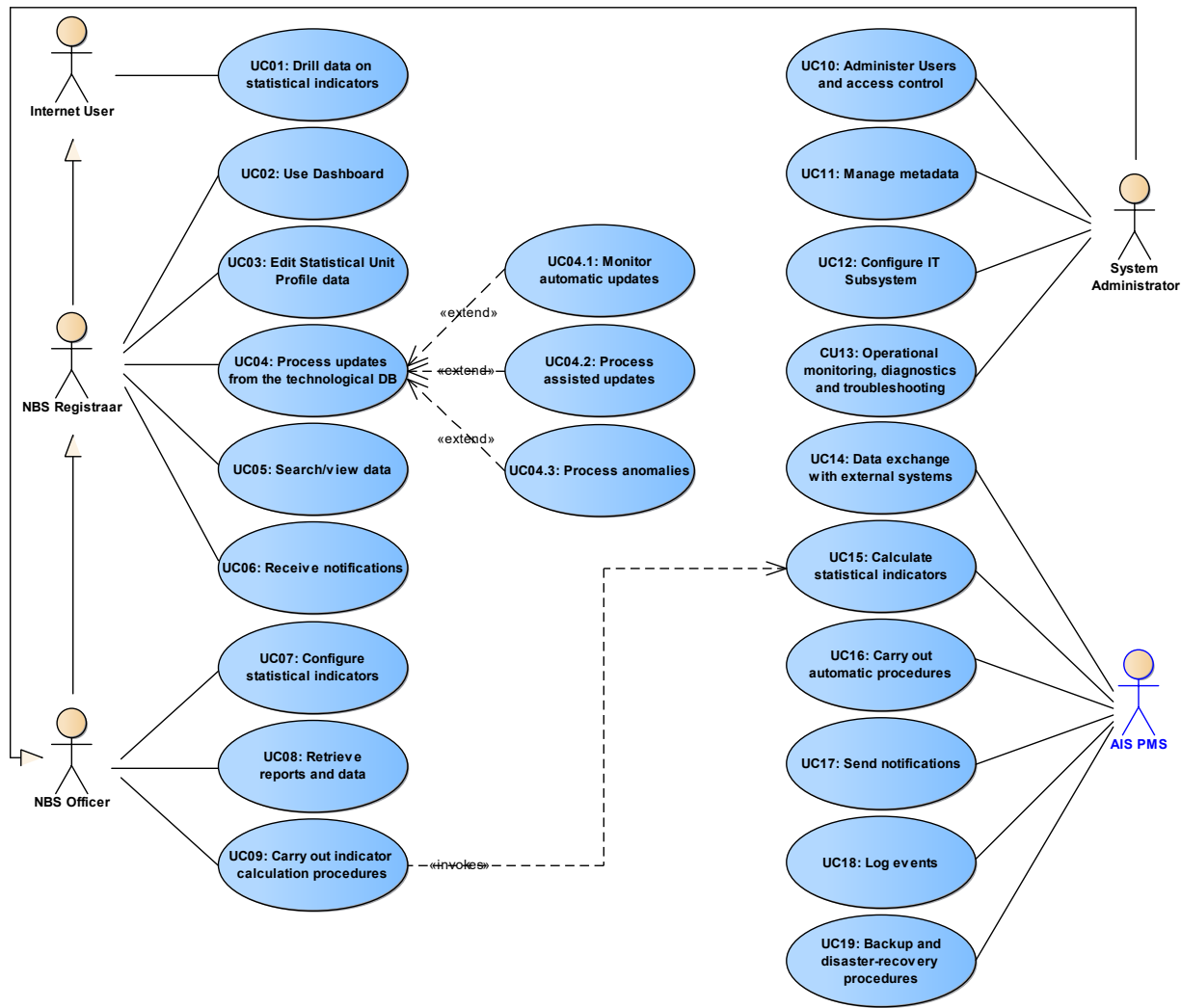



Figure 4.2. ISS PMS Functionalities.

UC01: Drill data on statistical indicators

This is a complex Use Case through which the ISS PMS will provide public access to the set of calculated indicators and stored in the DB. Internet Users will have public access to the values of statistical indicators via certain visual mechanisms for data drilling (presented as infographics) and their retrieval as text (for example: *retrieval of trends as a table*).



	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

## UC02: Use Dashboard

This is a functionality via which the ISS PMS Authorized User shall be warned, be able to view and quickly access all business events specific for his/her job duties or his/her interaction with the ISS PMS (system notifications, workflow events, etc.).

Likewise, the Authorized User will have direct access to functionalities related to the notified business events via personal Dashboard (opening the electronic form of the Statistical Unit Profile, opening the electronic form of import anomaly to be addressed, opening the report on data imports processed automatically, etc.).

The Home Page of the ISS PMS Authorized User Interface will serve as Dashboard to store all related elements and notifications.

The Dashboard shall comprise also an area (Favorite) devoted to configuring and displaying the list of electronic forms related to current activities carries out by the Authorized User.

## UC03: Edit Statistical Unit Profile data

A complex Use Case to consolidate and anonymize/pseudonymize the data related to the Statistical Unit Profile. To a large extent, the profile data shall be received automatically via UC13 from external IT systems (SRP, SRCSD, CIP, SRATUA, IISBP, AIS "Migration and Asylum", SRIRPSIS, IMIS, etc.). Likewise, this Use Case will provide facilities to insert and update the profile data by hand.

## UC04: Process updates from the technological DB

A complex Use Case that provides all functionalities for processing the records comprised by the technological DB in order to update the data set administered via the ISS PMS (the updates received from external data sources). The updates received from external data sources shall be processed via three procedures:


- **UC04.1: Monitor automatic updates.** Enables automatic processing of appropriate records held by the technological DB. It shall be used to process only the technological DB records coming from sources deemed by the NBS as fully reliable. The NBS Registrar will have access to an interface for viewing and monitoring the automatic updating process of the ISS PMS DB in production as it is a fully automated updating procedure.
- **UC04.2: Process assisted updates.** Enables assisted processing of appropriate records held by the technological DB. It shall be used to process the technological BD records coming from sources deemed by the NBS as potentially or partially reliable. It is a semi-automatic updating procedure, the Registrar having access to an interface to approve or reject the ISS PMS updating suggestions provided by the technological DB.
- **UC04.3: Process anomalies.** Enables the processing of technological DB records that cannot be processed due to certain anomalies (for example: the Statistical Unit Profile to be updated cannot be found, metadata are incompatible, the updated data refer to a Statistical Unit with the "Deceased" status, etc.). This procedure shall be used to resolve the anomalies and define rules to address future similar anomalies.

## UC05: Search/view data

A Use Case provided by the ISS PMS through which the Authorized Users shall be able to explore the data stock they have access to by virtue of the role assigned within the IT Subsystem and their job duties.

To this end, the ISS PMS will offer a data search mechanism, using different criteria, such as:



	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


- Statistical Unit identification data;
- data related to Authorized Users who processed the DB records;
- details of captured events ;
- business events calendar data;
- captured events calendar data;
- data related to NBS subdivisions that process the ISS PMS records;
- status of records;
- etc.

The ISS PMS will display as results found:

- Statistical Units' Profiles;
- birth events;
- death events;
- adoption events;
- paternity recognition events;
- marriage events;
- surname changing events;
- divorce events;
- social insurance events;
- social assistance events;
- statistical survey events;
- behavioral events;
- events of setting/changing of domicile/residence;
- state border crossing events;
- asylum granting events;
- update anomalies;
- configured indicators;
- other specific targets.

For each category of results the ISS PMS would allow the following actions to be taken:

- for the Statistical Units' Profiles found: view the Profile content, generate the Profile factsheet, select the Profile, change the Profile status, etc.;
- for the captured events: access the captured event content, access the Statistical Unit Profile related to the captured event, generate the captured event factsheet;
- for the configured indicators: access indicator configuring details, change the indicator status.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

It is advisable the ISS PMS to deliver a search mechanism for indexed data and present the results depending on formulated query relevance.

#### **UC06: Receive notifications**

A Use Case through which the ISS PMS Authorized Users, regardless of their role, will receive the notifications related to business events they are involved in or monitor.

The ISS PMS will generate notifications in the requested format and send them out. Users assigned with NBS Registrar, NBS Expert and System Administrator roles shall be able to configure individually, via personal Dashboards, preferences for receiving notifications.

The ISS PMS shall be integrated with platform service MNotify to send notifications to be read via other software (for example: Email notifications).

#### **UC07: Configure statistical indicators**

A complex Use Case through which all statistical indicators mentioned in Annexes 2-5 to this Document shall be configured and integrated. The ISS PMS will deliver visual facilities to define the configuration parameters of statistical indicators, such as:

- statistical indicator's identification data;
- statistical indicator's related metadata (validity period, calculation interval, classification, related statistical metadata, etc.);
- statistical indicator's calculation rules;
- statistical indicators' versions.

Likewise, the ISS PMS will provide facilities to manage a hierarchical classifier intended to classify the configured statistical indicators.

#### **UC08: Retrieve reports and data**

A functionality accessible to ISS PMS Authorized Users enabling the generation of predefined and ad-hoc reports concerning the IT Subsystem information content and Authorized Users activity events.

The reports in question are useful to produce documents and reports specific for the ISS PMS operation, analysis of the IT Subsystem information base, Authorized Users' performance, enabling the retrieval of certain performance indicators used to review the ISS PMS business processes.

Likewise, the ISS PMS will provide functionalities to retrieve the data sets necessary to process and review the data, using external software.


It is advisable that the IT Subsystem incorporates a solution intended to configure and generate reports (report generator). The latter could be also generated based on configurable templates.

#### **UC09: Carry out indicator calculation procedures**

A complex Use Case that provides functionalities to manage the calculation of statistical indicator values by hand through:

- importing by hand baseline data necessary for the calculations;
- configuring the parameters of indicator value calculation procedures;
- monitoring the calculation process;
- viewing and approving/cancelling the statistical indicator calculation result.

This Use Case shall be applied in emergencies or when the automatically calculated data are inaccurate.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

#### UC10: Administer Users and access control

A Use Case that implements functionalities intended to manage Users profiles and access rights to ISS PMS resources and data. The ISS PMS will use three alternative options for User authentication: login+password, electronic signature and NBS LDAP solution.

The IT Subsystem will provide functionalities necessary to manage the groups/roles and their associated rights to be assigned to Authorized Users afterwards. The access rights to User Interface and DB entries shall be defined by the group/role assigned to the User or explicitly for each User separately.

Users performing Administrator's roles will assign specific roles, access rights to ISS PMS data and functionalities to other Users.

#### UC11: Manage metadata

A Use Case through which the following categories of metadata shall be managed:

- **International classifiers**, which values are standardized and internationally accepted (for example: *International System of Units – SI, International Statistical Classification of Diseases, the WHO 10<sup>th</sup> Revision, etc.*);
- **National Official Classifiers** (for example: *Classifier of Administrative and Territorial Units of the Republic of Moldova*);
- **Statistical Metadata** (for example: pursuant to reference metadata "Population and Demography");
- **Interoperability Classifiers/Nomenclatures** (for example: *which values are used to exchange data with third IT system*);
- **Internal Classifiers/Nomenclatures** (for example: *system variables, user interface parameters, IT system configuration parameters and of processes implemented within the IT system, roles, categories of captured demographic events, data sources, etc.*).

The internal classifiers/nomenclatures shall be developed and used within the ISS PMS only when lacking international, national official classifiers/nomenclatures and statistical metadata "Population and Demography".


#### UC12: Configure IT Subsystem

A Use Case that provides all functionalities necessary to configure the ISS PMS operation parameters. It is worth noting that the ISS PMS shall be a configurable system and its tailoring to the User's current needs shall be done via configuring mechanisms with no need to interfere with the program code, its compilation and IT Subsystem repeated deployment activities.

#### UC13: Operational monitoring, diagnostics and troubleshooting

A complex Use Case through which the ISS PMS administrative roles will have access to monitoring functionalities of ISS PMS operation parameters, diagnosing and troubleshooting the technical issues evolved in the process of ISS PMS operation.

This Use Case will provide functionalities to generate predefined and ad-hoc statistical reports on ISS PMS operation events. The reports in question are useful for the analysis of processes carried out, of IT Subsystem information basis, of Authorized Users' performance, enabling the anticipation of information security issues. Unlike UC08, UC13 is intended for IT audit processes to support the information security mechanisms.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

#### **UC14: Data exchange with external systems**

A Use Case that will provide functionalities necessary for the ISS PMS to exchange data with external IT systems or implement the functionalities provided by government platform services.

This data exchange refers to exposing or using the interfaces intended for mutual exchange of data (receipt of data from external sources, sending data towards external IT systems and bidirectional exchange of data).

Part of the integrations with external IT systems (Public Authorities IT Systems – suppliers of data necessary to capture the events on Statistical Units) will be implemented via the Interoperability Platform MConnect. Platform services (MPass, MSign, MLog, MNotify, MPower, and GODP) shall be integrated directly via the APIs disclosed by them. The same strategy shall be used to integrate with Google Analytics.

The ISS PMS shall be integrated with the NBS internal IT Systems largely via micro-service infrastructure.

#### **UC15: Calculate statistical indicators**

A complex Use Case that provides functionalities necessary to calculate the statistical indicator values. The calculations shall be carried out as per each indicator input parameters and algorithm configured via UC07.

The statistical indicator calculation procedure can be launched both by hand (via UC09) and automatically (via UC16).

#### **UC16: Carry out automatic procedures**

A complex Use Case that provides functionalities to launch and automatically operate a number of ISS PMS functionalities aimed to use rationally server resources and provide data to Authorized Users in a timely manner.

This category comprises the following procedures:

- Submit periodically queries to external IT Systems to receive updates for Statistical Units Profiles;
- Calculate periodically statistical indicators based on the updates received from external IT Systems;
- Calculate statistical indicator aggregates and complex reports provided by the ISS PMS;
- Notify the Authorized Users on the delays, inactions related to workflows they are involved in.


It provides the functionalities necessary to calculate the statistical indicators' values. The calculations shall be carried out as per the indicator input parameters and algorithm configured via UC07.

The statistical indicator calculation procedure can be launched both by hand (via UC09) and automatically (via UC16).

#### **UC17: Send notifications**

A Use Case that provides functionalities to notify the ISS PMS Authorized Users. The notifications shall be stored in Authorized Users Dashboards, having provided them with direct access to the electronic form, business event that generated the notification.

The ISS PMS will automatically generate and send notifications related to any business event generated by the processes of data receipt from external sources, data processing received from external sources and calculation of statistical indicators and related aggregates. Likewise, the ISS PMS will automatically

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

generate and send notifications to Authorized Users related to any business event requiring their involvement.

The IT Subsystem will notify the Users both via internal notification mechanisms (integrated in the ISS PMS), and via platform service MNotify.

#### **UC18: Log events**

A Use Case through which the business events generated by the ISS PMS functional components shall be logged. Any event generated under of business processes implemented in the ISS PMS shall be logged and saved in the DB appropriate tables.

The logging mechanism shall be developed on the basis of industry standards and best practices. The IT Subsystem will deliver functionalities to configure business events logging strategies, including: categories of business events subject to logging, the logging (defined or non-defined) timeframe, etc.

Critical or sensitive business events shall be logged in parallel, using platform service MLog (for example: *data import from SRP, accessing personal data of the Statistical Unit Profile, etc.*).

#### **UC19: Backup and disaster-recovery procedures**


A Use Case through which the ISS PMS continuity procedures shall be implemented. In particular, this is about generating backups, restoring the ISS PMS functionalities on the basis of backups, managing historical backups and archiving historical information.

### **4.3. IT Subsystem Key Workflows**

The ISS PMS shall be implemented on the basis of Transactional Principle, when any data addition, update or strike-off is carried out through specific electronic forms to be processed on the basis of specialized workflows.

To ensure the ISS PMS operation under appropriate conditions it is necessary to implement the following categories of workflows:

1. **Data exchange with external systems.** It represents the workflow through which it is envisaged to implement data import and consolidation mechanisms in the ISS PMS, the data being retrieved/consumed from external sources via the interoperability platform MConnect (described by UC14, UC16 functional requirements and the generic flow described in Annex 1).
2. **Automatic/assisted processing of updated and addressing of the anomalies.** This is a workflow through which the data received from external sources are subject to automatic and assisted processing, and the abnormalities recorded after importing the data received from external IT systems are detected and addressed (described by UC04.1, UC04.2, UC04.3 functional requirements and the generic flow described in Annex 1).
3. **Statistical indicator configuration.** This is a workflow through which it is envisaged to create and configure new statistical indicators, modify the existing ones, and put/remove them into/from production (described by UC07 functional requirements).
4. **Calculation of the statistical indicators' values.** This is a workflow through which it is envisaged to calculate and store the values of statistical indicators and related aggregates (described by UC09, UC15 and UC16 functional requirements).
5. **Data dissemination.** This is a workflow through which it is envisaged to implement a mechanism to convey the ISS PMS data towards the NBS internal IT systems and other public authority external IT systems (described by UC14 and UC16 functional requirements).

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

#### 4.4. IT Subsystem User Interface

The ISS PMS shall provide an ergonomic and intuitive User Interface that is accessible to all types of users. The IT Subsystem User Interface shall be accessed via an Internet browser and shall have an intuitive, amiable, balanced and distinct graphical design, optimized for the minimum working resolution of 1360x468 for PCs.

The ISS PMS User Interface shall be responsive for the resolutions of devices, such as smartphones and tablets and optimized for tactile screens.

To ensure user-friendliness, the IT solution shall comprise a contextual online help system for each User Interface.

Depending on the category of users (their rights and roles) the IT Subsystem will provide a customized interface for each category of users.

The ISS PMS will provide a User Interface in Romanian. The procedures for data restoring shall be implemented via simple searches (specifying some search series) or more complex searches, enabling more appropriate information filtering (QBE forms). Regardless of the nature of information sought, the User will apply the same query and information retrieval for all IT Subsystem Sections.

In addition to QBE that would offer the possibility to define visual sophisticated queries, the User Interface shall offer the possibility to fine-tune the search results by ensuring the possibility to filter the data in the list of search results.

The ISS PMS User Interface shall ensure filtering the records corresponding to the search criteria provided to users depending on their access rights.

Indexed values (values from Classifiers, Nomenclatures) shall have the option to be filtered by picking up the value from predefined lists. For numerical types of fields there should be the possibility to filter as per the exact value of the characteristic sought or by search mask. For calendar data fields it would be possible to indicate the exact date or time interval.

It should be possible to export the content of any table with results or electronic form, depending on the type of information comprised in any of the following formats: CSV, XLS/XSLX, PDF. The export of data shall be strictly delimited by roles. All data export actions shall be logged.


#### 4.5. IT Subsystem Reporting, Auditing and Statistical Mechanism

The ISS PMS shall have implemented industry widely used functionalities intended for auditing/logging. It shall be configurable to log technical and business events.

The IT Subsystem will provide a mechanism intended to generate predefined and ad-hoc reports, capable to ensure pertinent analysis or assessment of business processes related to the ISS PMS operation.

The ISS PMS reporting system will delimit four categories of reports:

- **Documents generated on the basis of a predefined template** – a template should be created for each type to be populated with document relevant information (for example: Statistical Unit Profile, etc.);
- **Statistical indicators** – represents the set of statistical reports retrieved based on indicators configured via UC07 and calculated via UC15. This category of reports shall be retrieved via UC01 and UC08;


	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

- **Data sets** – represents data sets in standardized format retrieved from the ISS PMS DB to be used in other NBS applications (for example: data sets to populate the factsheets of population census);
- **Monitoring reports** – represents a category of reports intended for users assigned with administrative roles used to assess how Authorized Users interact with the ISS PMS. This category of reports would enable anticipating performance issues in the NBS activity or the IT Subsystem security and vulnerability issues;
- **Performance reports** – this a category of reports intended to audit and consider the ISS PMS information content aimed to appraise how efficient the activity of NBS employees is (for example: Authorized User Performance Report, Territorial Subdivision Performance Report, NBS overall Performance Report, etc.).

The reporting mechanism peculiarities are described in a series of Sections of this Document, such as:

- Section 5.2 (functional requirements for UC01: Drilling data on statistical indicators);
- Section 5.9 (functional requirements for UC08: Retrieving data and reports);
- Section 5.14 (functional requirements for UC13: Monitoring the operational, diagnostics and troubleshooting activity).



	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

## 5. IT Subsystem Functional Requirements

### 5.1. Conventions used to formulate Functional Requirements

The requirements set forth in this Document have been marked as follows:

- all requirements are indexed with three values **C.X.Y**, where **C** represents the requirement category (**FR** – functional requirement); **X** represents the Use Case the functional requirement is formulated for; while **Y** is the requirement single identifier in the Use Case it is part of.
- The Binding level is mentioned for each functional requirement, namely: **M** – to be implemented mandatorily (**Mandatory**), **D** – to be implemented optionally (**Desirable**), **I** – for information purposes (**Information**).

The Technical Proposal shall meet all mandatory requirements. It may gain competitive advantage for each optional requirement undertaken to be implemented.

The requirements for information purposes are intended to offer more support information to ensure better understanding of the context of other requirements.


### 5.2. UC01: Drill data on Statistical Indicators

The functional requirements set for the exploration facilities of the ISS PMS public interface are listed in Table 5.1.

**Table 5.1. Functional Requirements for UC01.**

ID	Binding level	Functional Requirement Description
FR 01.01.	M	The ISS PMS public interface must provide a search mechanism to view and retrieve the data on the calculated statistical indicators via UC16.
FR 01.02.	M	The search mechanism must provide means to configure the search criteria based on common parameters for generating all statistical indicators (for example: <i>time criterion, geographical criterion, periodicity of indicator calculation, gender, etc.</i> ).
FR 01.03.	M	The ISS PMS public interface must provide exclusively visual means to present the calculated indicators (based on data presentation as diagrams/infographics or on a mechanism for interactive drilling of data under the data presentation interface).
FR 01.04.	M	Throughout the business analysis stage, the Provider, jointly with the NBS, must agree on the types of diagrams used for each category of configured and implemented statistical indicators and the means used for data drilling (navigating from aggregated to disaggregated data and vice versa).
FR 01.05.	M	The ISS PMS public interface must provide different categories of parameters to ensure data drilling (for example: <i>administrative and territorial division, values of statistical metadata (classifiers/ nomenclatures), calculation intervals (for example: age intervals), data aggregation levels</i> ).



	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


ID	Binding level	Functional Requirement Description
FR 01.06.	M	Data drilling must be possible both via the interactive map of Moldova and diagrams adapted to the drilling process (for example: <i>tree map</i> )
FR 01.07.	M	For the generated diagrams related to the calculated statistical indicators, the ISS PMS must provide all possible parameters used to generate diagrams, their type, and the required aggregation level.
FR 01.08.	M	The ISS PMS must enable the generation of diagrams/ data drilling both for a specified time and period (several periods simultaneously).
FR 01.09.	M	The ISS PMS must enable downloading the generated diagrams in JPG/PNG format, as well as the data related to the generated diagram (in verbatim table format).
FR 01.10.	M	The ISS PMS must provide a widget mechanism to publish data in interactive format on external Web pages (based on defined parameters the widget will generate a code that, once inserted in the Web page content, would display the relevant diagram/drilling mechanism).
FR 01.11.	M	All statistical information related to Internet Users interaction with the ISS PMS public interface must be collected via the API disclosed by the Google Analytics (the Provider will carry out all ISS PMS integration activities with Google Analytics).

### 5.3. UC02: Use Dashboard

The functional requirements intended for the operation of Dashboard by the ISS PMS Authorized Users are listed in Table 5.2.

**Table 5.2. Functional Requirements for UC02.**

Identifier	Binding level	Functional Requirement Description
FR 02.01.	M	The ISS PMS must deliver to Authorized Users assigned with Registrar, NBS Expert and System Administrator roles Dashboard solutions to notify them about important business events and provide quick access to their details.
FR 02.02.	M	The following categories of business events must be displayed on the Dashboard: <ul style="list-style-type: none"> <li>• system notifications;</li> <li>• notifications on anomalies to be addressed;</li> <li>• notifications on automatically imported data to be monitored and approved;</li> <li>• other relevant events.</li> </ul>
FR 02.03.	M	The ISS PMS User Dashboard must display only business events relevant for the roles and rights assigned to Authorized Users.
FR 02.04.	M	The Dashboard of the User holding the System Administrator role must

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


Identifier	Binding level	Functional Requirement Description
		display all business events related to ISS PMS functionalities (all notifications displayed in the Dashboard of all ISS PMS Users, and the notifications intended exclusively for Users assigned System Administrator roles).
FR 02.05.	M	The Dashboard must group the business events, having displayed them as indicators with aggregated values (for example: <i>Unread System notifications – 10; Assisted processing events – 21, Unsolved anomalies – 68, New updates – 3; etc.</i> ), which shall comprise hypertext reference to ease the access to details.
FR 02.06.	M	The ISS PMS must display Dashboard detailed records in specialized windows or areas on the User Interface Home Page, which, in their turn, shall have hypertext reference to directly access the details (for example: <i>open windows with the list of anomalies to be addressed</i> ).
FR 02.07.	M	Upon accessing the hypertext reference related to Dashboard aggregated value or detailed record, the ISS PMS must ensure access to detailed information related to them or requested functionality (for example: <i>form to address the anomaly, form with the list of automatic updates, etc.</i> ).
FR 02.08.	D	The ISS PMS should offer each Authorized User a functionality to configure individually Dashboard appearance and content.

#### 5.4. UC03: Edit Statistical Unit Profile Data


The functional requirements necessary to implement the functionalities of managing the Statistical Units profiles are listed in Table 5.3.

**Table 5.3. Functional Requirements for UC03.**

Identifier	Binding level	Functional Requirement Description
FR 03.01.	M	The ISS PMS must provide functionalities intended to manage the Statistical Units profile data.
FR 03.02.	M	Managing the Statistical Units profile presupposes implementing the following actions: <ul style="list-style-type: none"> <li>• create a new profile;</li> <li>• anonymize/pseudonymize the profile;</li> <li>• edit data profile by hand;</li> <li>• update automatically the profile with data from external sources;</li> <li>• deactivate the profile.</li> </ul>
FR 03.03.	M	Upon creating a Statistical Unit new profile the ISS PMS must generate automatically the Statistical Unit identifier and store all personal data in a protected area (to be accessible only to Users with special roles and when processing data provided by external IT Systems), the other data

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Identifier	Binding level	Functional Requirement Description
		being depersonalized/pseudonymized.
FR 03.04.	M	<p>The Statistical Unit profile data must contain the following categories of data:</p> <ul style="list-style-type: none"> <li>• IDNP;</li> <li>• Surname;</li> <li>• Last Name;</li> <li>• Patronymic;</li> <li>• Birth date;</li> <li>• Gender;</li> <li>• Citizenship(s);</li> <li>• Personal Digital Code related to citizenship;</li> <li>• Person's Statistical Identifier;</li> <li>• Civil status;</li> <li>• Occupational data;</li> <li>• Kin relationships with other profiles;</li> <li>• Data on housing ownership;</li> <li>• Data on domicile/residence;</li> <li>• Data on housing rent;</li> <li>• Date of profile creation;</li> <li>• Date of profile expiry;</li> <li>• References to other profile versions;</li> <li>• Profile current status;</li> <li>• Other categories of relevant data.</li> </ul>
FR 03.05.	M	The Statistical Unit Profile management must display in an ergonomic manner all business events (and their details) related to that Profile and categories of data specified in FR 03.04.
FR 03.06.	M	It must be possible to add a Statistical Unit profile only when that Statistical Unit has been recorded in the SRP (has got an IDNP) or there is evidence that the Statistical Unit in question has not been recorded electronically due to his/her religious beliefs.
FR 03.07.	M	Upon adding a Statistical Unit new profile, the ISS PMS must generate and automatically assign the Unit's statistical identifier using a Luhn-type algorithm.
FR 03.06.	M	The ISS PMS must provide functionalities to edit by hand the categories of data specified in FR 03.03 for an existing profile when interoperability facilities are inaccessible, and the Authorized User has been assigned with roles sufficient to carry out such actions.
FR 03.07.	M	The Statistical Units that are not recorded in the SRP due to their religious beliefs must be identified exclusively via Person's Statistical

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


Identifier	Binding level	Functional Requirement Description
		Identifier assigned by the ISS PMS. All profile data of this category of people shall be managed by hand save the statistical identifier.
FR 03.08.	M	The ISS PMS must provide facilities to store the versions of Statistical Units' profile data and use them depending on the specific validity period of those data.
FR 03.09.	M	The Authorized Users must have access to the Statistical Units profile details depending on the configured rights and roles (including those defined at the level of categories of accessible data).
FR 03.10.	M	The Statistical Unit Profile must have an associated document template to be generated (in PDF format) and printed via UC06.
FR 03.11.	M	All events related to accessing and amending the Statistical Units profile data, updating profile data from external data sources, and generating the profile factsheet must be logged via ISS PMS internal mechanisms (via UC18) and in parallel via platform service MLog.
FR 03.11.	M	The power of Authorized Users must be checked via platform service MPower.

#### 5.5. UC04: Process Updates from the Technological DB


The functional requirements set for the facilities intended to process the ISS PMS DB updates based on the data received from external sources via UC14 are listed in Table 5.4.

**Table 5.4. Functional Requirements for UC04.**


Identifier	Binding level	Functional Requirement Description
FR 04.01.	M	The ISS PMS must provide the NBS Registrar with an efficient toolkit to monitor the ISS PMS DB updates or resolve anomalies evolved while processing the data adopted from external IT Systems via UC14.
FR 04.02.	I	By anomaly it is meant the impossibility to process a record received by the ISS PMS via UC14 due to data inconsistency, integrity, and incompatibility issues or due to other issues that make it impossible to automatically process the record.
FR 04.03.	M	Any update subject to processing must be recorded initially in the ISS PMS technological DB and then follow the relevant processing algorithm.
FR 04.04.	M	The ISS PMS must provide a mechanism to define the correspondence tables of metadata values, records stored in the technological DB with the values of metadata used in the DB in production.
FR 04.05.	M	The ISS PMS must comprise a functionality intended to define the confidence level in terms of external data sources according to the principle: <ul style="list-style-type: none"> <li>sources of reliable data, which are processed automatically and</li> </ul>

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Identifier	Binding level	Functional Requirement Description
		do not require additional approval; <ul style="list-style-type: none"> <li>sources of unreliable data, which shall be processed in an assisted manner, requiring approval for processing.</li> </ul>
FR 04.06.	M	Regardless of the processing strategy, all technological DB records must have statuses based on which the ISS PMS will know the strategy for their treatment in the future.
FR 04.07.	M	All technological DB records may have the following statuses: <ul style="list-style-type: none"> <li>non-processed record;</li> <li>processed record;</li> <li>record with anomaly;</li> <li>rejected record;</li> <li>ignored record.</li> </ul>
FR 04.08.	M	The ISS PMS must keep the history of all updates made in the Statistical Unit Profile (it shall be possible to view the previous values of each update operated in the Statistical Unit Profile).
FR 04.09.	M	The ISS PMS must provide a mechanism suitable for navigating in the Statistical Unit Profile versions.
FR 04.10.	M	The ISS PMS must log exhaustively all transactions aimed to update the ISS PMS DB in production.
FR 04.1.01.	M	The ISS PMS must carry out all updates comprised by the technological DB originating from reliable sources, automatically changing the status of records after processing (into processed records).
FR 04.1.02.	M	The ISS PMS must provide a specialized User Interface to view and analyze the updates operated automatically. This Interface will provide facilities to view processed records, accessing their details, searching/filtering the processed records.
FR 04.1.03.	M	The ISS PMS must provide functionalities to retrieve statistical reports on the updates operated automatically; it shall be possible to view or download this report in PDF and CSV format.
FR 04.1.04.	M	The statistical report on the updates operated automatically must be generated based on certain configurable parameters (for example: period, data sources, types of updates, etc.).
FR 04.2.01.	M	The ISS PMS must provide the NBS Registrar with User Interface to process the technological BD records to perform assisted updates of the DB in production (for the records received from sources that shall be checked prior to transferring the data into the BD in production).
FR 04.2.03.	M	The records subject to assisted processing must be stored in a special section of the NBS Registrar Dashboard.
FR 04.2.04.	M	The ISS PMS must provide the NBS Registrar with functionalities to view the details on the processed record and suggest actions regarding the

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Identifier	Binding level	Functional Requirement Description
		way of processing the technological BD record requiring assisted processing.
FR 04.2.05.	M	The NBS Registrar must be able to use three categories of strategies for assisted processing of technological BD records: <ul style="list-style-type: none"> <li>• approve the update;</li> <li>• reject the update;</li> <li>• ignore the update.</li> </ul>
FR 04.2.06.	M	The ISS PMS must change the status of technological BD records approved for or rejected from processing during the next assisted update procedure.
FR 04.3.01.	M	The ISS PMS must provide the NBS Registrar with User Interface to address the anomalies while processing technological BD records.
FR 04.3.02.	M	All anomalies that have not been addressed must be stored in a special section of the NBS Registrar Dashboard.
FR 04.3.03.	M	The ISS PMS must provide the NBS Registrar with functionalities to view the record details that generated the anomaly and possible actions necessary to remedy the anomalies.
FR 04.3.04.	M	Anomalies may evolve in case of: <ul style="list-style-type: none"> <li>• incompatibility of metadata of technological BD records with the metadata of DB in production (for example: <i>a settlement identifier received from the SRP is missing in the ISS PMS</i>);</li> <li>• erroneous format of records received (for example: <i>a textual value is received instead of a numerical value, the numerical value does not match the area of admissible values, etc.</i>);</li> <li>• the Statistical Unit Profile to be updated is missing (for example: <i>upon processing the marriage event the Statistical Unit Profile cannot be found, etc.</i>);</li> <li>• failure to comply with certain constraints (for example: <i>a Statistical Unit divorced after two years of being recorded as dead, etc.</i>);</li> <li>• other reasons that make the record processing impossible.</li> </ul>
FR 04.3.05.	M	The NBS Registrar must have several options to address the anomalies, namely: <ul style="list-style-type: none"> <li>• defining the values in correspondence tables (for example: <i>in case of incompatibility of metadata values stored in the technological BD with the metadata held by the BD in production</i>);</li> <li>• editing by hand the record subject to processing (for example: <i>to ensure accurate processing of technological BD records</i>);</li> <li>• searching and stating explicitly the Statistical Unit Profile subject to update based on the technological BD records (for</li> </ul>

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Identifier	Binding level	Functional Requirement Description
		<p>example: <i>the profile to be updated cannot be found automatically</i>);</p> <ul style="list-style-type: none"> <li>approving the addition of a new Statistical Unit profile based on the data comprised by the technological BD subject to processing (for example: <i>the profile to be updated cannot be found</i>).</li> </ul>
FR 04.3.06.	M	The ISS PMS must provide functionalities to define the rules for future processing of certain groups of typical anomalies (for example: <i>when receiving records with the identifier 150 for Rascani sector it shall be changed automatically to 0150</i> ).
FR 04.3.07.	M	All technological BD anomalies that match the rules defined via FR 04.3.06 must be processed further automatically, taking into account the defined rules.


### 5.6. UC05: Search/View Data

The functional requirements related to the mechanism for searching the data stored in the ISS PMS DB are listed in Table 5.5.


**Table 5.5. Functional Requirements for UC05.**

Identifier	Binding level	Functional Requirement Description
FR 05.01.	M	The ISS PMS must provide a complex mechanism to search data in the whole content of BD in production and technological BD.
FR 05.02.	D	The ISS PMS should provide a mechanism for indexed search of data (for example: <i>using Elastic Search, Apache Solr, etc.</i> ). The search mechanism will use morphological means.
FR 05.03.	M	<p>The ISS PMS must enable defining the following search targets (the search result will display the list of):</p> <ul style="list-style-type: none"> <li>Statistical Units Profiles;</li> <li>birth events;</li> <li>death events;</li> <li>adoption events;</li> <li>paternity recognition events;</li> <li>marriage events;</li> <li>Surname change events;</li> <li>divorce events;</li> <li>social insurance events;</li> <li>social assistance events;</li> <li>statistical survey events;</li> <li>events of setting/changing of domicile/residence;</li> </ul>



	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Identifier	Binding level	Functional Requirement Description
		<ul style="list-style-type: none"> <li>state border crossing events;</li> <li>asylum granting events;</li> <li>update anomalies;</li> <li>configured indicators;</li> <li>other specific targets.</li> </ul>
FR 05.04.	M	The ISS PMS must provide a flexible and advanced mechanism to define the search criteria.
FR 05.05.	M	<p>As search criteria it is envisaged to use:</p> <ul style="list-style-type: none"> <li>Statistical Unit identification data;</li> <li>data related to Authorized Users who processed the DB records;</li> <li>captured event details ;</li> <li>business events calendar data;</li> <li>captured events calendar data;</li> <li>data related to NBS subdivisions that process the ISS PMS records;</li> <li>status of records;</li> <li>etc.</li> </ul>
FR 05.06.	M	When setting too broad search criteria or those requiring too much time and resources to be performed, the ISS PMS must not carry out such queries, urging the User to narrow the search area.
FR 05.07.	M	The search results must be ordered alphabetically or by the date of creation/ last update, depending on the search query relevance.
FR 05.08.	M	The User must be able to define the ordering and grouping criteria of the list content comprising the search results.
FR 05.09.	M	The ISS PMS must offer a mechanism for page layout of search results intended to avoid overloading the WEB browser and data transmission channels.
FR 05.10.	D	The records of search results should be marked (broken down by color or specific icon) depending on the nature or status of the information object found.
FR 05.11.	M	The ISS PMS must provide functionalities to fine-tune the search in the results found.
FR 05.12.	M	<p>The ISS PMS must enable triggering some processes regarding the results found or the group of results found and marked, such as:</p> <ul style="list-style-type: none"> <li>selecting the search result records;</li> <li>viewing details of records found;</li> <li>multiple deletion;</li> </ul>

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


Identifier	Binding level	Functional Requirement Description
		<ul style="list-style-type: none"> <li>actions to address anomalies;</li> <li>other relevant actions.</li> </ul>
FR 05.13.	M	The ISS PMS must display in the search results only the data that match the Authorized Users area of competence, roles and rights defined in the ISS PMS Authorized User Profile.
FR 05.14.	M	The ISS PMS must restrict the access to result details when the User that triggered the search process has no access to information objects sought.
FR 05.15.	M	The ISS PMS must enable exporting the table with search results in CSV or PDF format.

### 5.7. UC06: Receive notifications

The functional requirements set for the mechanism intended to receive the notifications sent by ISS PMS to all Authorized Users are listed in Table 5.6.

**Table 5.6. Functional Requirements for UC06.**

Identifier	Binding level	Functional Requirement Description
FR 06.01.	M	The ISS PMS must notify automatically any Authorized User when it recorded a business event that involves the User's action or modifies the status of managed processes, monitored by him/her or concerning him/her.
FR 06.02.	M	The Authorized Users must receive notifications in personal Dashboards.
FR 06.03.	M	A copy of notifications must be sent to the Email shown in the ISS PMS Authorized Users Profile.
FR 06.04.	M	The ISS PMS Authorized User must be provided with a functionality to configure the preferences in terms of receiving notifications (via Email or Dashboard).
FR 06.05.	M	<p>The ISS PMS must send the whole range of notifications intended for Authorized Users:</p> <ul style="list-style-type: none"> <li>notification on the completion of update processing;</li> <li>notification on receiving the updates to be carried out in assisted manner;</li> <li>notification on anomalies in update processing;</li> <li>notification on the need to involve the ISS PMS workflows;</li> <li>notification on the delay of User actions (exceeding the deadline set for addressing the anomaly, assisted update processing, etc.);</li> <li>notification on issues related to ISS PMS operation;</li> </ul>

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


Identifier	Binding level	Functional Requirement Description
		<ul style="list-style-type: none"> <li>other relevant notifications.</li> </ul>
FR 06.06.	M	A sent notification stored in the Authorized Users Dashboard must contain hypertext reference to open the notification relevant electronic form.
FR 06.08.	M	The ISS PMS Users must receive notifications via Email in HTML or reach text format.
FR 06.09.	M	External notification (read via external means, outside the ISS PMS User Interface) must be sent through MNotify.

### 5.8. UC07: Configure Statistical Indicator

The functional requirements set for configuring the statistical indicators calculated within the ISS PMS are listed in Table 5.7.

**Table 5.7. Functional Requirements for UC07.**

Identifier	Binding level	Functional Requirement Description
FR 07.01.	M	The ISS PMS must provide functionalities intended to configure and manage the statistical indicators calculated based on Statistical Units Profile data.
FR 07.02.	M	Configuring a statistical indicator presupposes implementing the following functionalities: <ul style="list-style-type: none"> <li>adding new statistical indicators;</li> <li>changing configurations of the existing statistical indicators;</li> <li>withdrawing statistical indicators from use;</li> <li>deleting statistical indicators.</li> </ul>
FR 07.03.	M	It must be possible to delete an existing statistical indicator only when there is no indicator-related calculation in the ISS PMS DB.
FR 07.04.	M	Configuring a statistical indicator implies the following actions to be carried out: <ul style="list-style-type: none"> <li>entering the statistical indicator identification data;</li> <li>editing the statistical indicator metadata (validity period, calculation interval, statistical indicator classification, related statistical metadata, etc.);</li> <li>statistical indicator calculation rules.</li> </ul>
FR 07.05.	M	The calculation rules mapped with a statistical indicator must be indicated as follows: <ul style="list-style-type: none"> <li>by inserting the statistical indicator calculation script (to be subsequently used by the ISS PMS for calculation purposes);</li> <li>by mapping the procedures stored in the DB responsible for carrying out the calculations;</li> </ul>

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Identifier	Binding level	Functional Requirement Description
		<ul style="list-style-type: none"> <li>by any other method that can be applied by the ISS PMS without the need to modify the program code or its compilations.</li> </ul>
FR 07.06.	M	The data structures related to the configured and calculated statistical indicators must be designed in accordance with GSIM v 1.2 and the design, configuration, calculation, aggregation/disaggregation of the implemented statistical indicators methodology must be in accordance with GSBPM v. 5.1.
FR 07.07.	M	The ISS PMS must allow for creating several versions of the same statistical indicator (if the change imply methodological modifications, a new version of the statistical indicator must be created pursuant to the new technology).
FR 07.08.	M	When there are several versions of the same statistical indicator, the ISS PMS must use for calculations the version that matches the dates of the version validity period (it is forbidden to configure two and more versions for the same period).
FR 07.09.	M	The ISS PMS must provide functionalities to manage a hierarchical classifier of calculated statistical indicators.
FR 07.10.	M	Managing the hierarchical classifier of calculated statistical indicators presupposes there are the following functionalities in place: <ul style="list-style-type: none"> <li>add new categories;</li> <li>change the existing categories (modify the category name, reorganize hierarchically the categories, etc.);</li> <li>delete the existing category.</li> </ul>
FR 07.11.	M	A category of the hierarchical classifier of calculated statistical indicators can be deleted only when it contains no subordinated category (prior to deletion all subcategories shall be moved to other categories or deleted).
FR 07.12.	M	The ISS PMS must provide functionalities to simulate the calculations of configured statistical indicators. The simulation implies calculating and viewing in real time the values of the configured statistical indicator without saving the calculations in the DB in production.
FR 07.13.	M	The Provider must prove the functionality of UC07, having configured all statistical indicators specified in Annexes 2-5 to this Document.
FR 07.14.	M	The ISS PMS must log all events aimed at configuring and modifying statistical indicators (including via platform service MLog).

### 5.9. UC08: Retrieve Data and Reports

The functional requirements set for retrieving statistical reports and data contained in the ISS PMS DB in production are listed in Table 5.8.




	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Table 5.8. Functional Requirements for UC08.

Identifier	Binding level	Functional Requirement Description
FR 08.01.	M	The ISS PMS must be able to offer several statistical and ad-hoc reports to cover all NBS needs in terms of supplying statistical data on population, migration, and demographic processes.
FR 08.02.	D	It is advisable the report generation to be based on a platform intended to configure the report dynamic generation (for example: <i>JasperReport</i> ).
FR 08.03.	M	The ISS PMS must make available to Users a predefined number of configurable documents/reports and ensure, where appropriate, the production of ad-hoc reports.
FR 08.04.	M	<p>The ISS PMS must provide a set of reports to be generated based on the data stored in the IT Subsystem DB as follows:</p> <ul style="list-style-type: none"> <li>• Statistical Unit Profile factsheet (containing all profile data, events and actions carried out for the Statistical Unit Profile;</li> <li>• Statistical Indicator Profile factsheet (containing all data to configure the statistical indicator, events and actions carried out for the statistical indicator;</li> <li>• Captured event factsheet (birth, death, adoption, paternity recognition, marriage, Surname change, divorce, social insurance/assistance, Statistical Unit behavior, domicile/residence/real estate ownership right, border crossing, asylum, etc.);</li> <li>• Factsheet of data import anomaly;</li> <li>• Reports intended for anonymous Users (reports generated via the public interface) or necessary for implementing statistical indicators drilling mechanisms via UC01.</li> <li>• Reports generated on the basis of all statistical indicators related to the number of population (specified in Annex 2);</li> <li>• Reports generated on the basis of all statistical indicators related to vital statistics (specified in Annex 3);</li> <li>• Reports generated on the basis of all statistical indicators related to migration statistics (specified in Annex 3);</li> <li>• Reports generated on the basis of all statistical indicators related to demographic calculations (specified in Annex 4);</li> <li>• System notification;</li> <li>• Other relevant reports.</li> </ul>
FR 08.05.	M	<p>The ISS PMS must provide a set of reports to be generated based on the data stored in the IT Subsystem DB as follows:</p> <ul style="list-style-type: none"> <li>• ISS PMS performance reports (statistical data on ISS PMS current content) with different aggregation principles (pursuant to geographical area, types of captured events, used data sources, etc.);</li> </ul>

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Identifier	Binding level	Functional Requirement Description
		<ul style="list-style-type: none"> <li>Authorized Users performance reports, which contain statistical data and details on Authorized Users' behavior within the ISS PMS (for example: configured/modified statistical indicators, generated statistical reports, accessed profiles of Statistical Units, etc. with different level of aggregation );</li> <li>Performance indicators;</li> <li>Other relevant reports.</li> </ul>
FR 08.06.	M	All reports implemented within the ISS PMS must be generated based on predefined (editable) templates for each type of report.
FR 08.07.	M	It should be possible to retrieve part of reports generated via FR 14.04 – FR 14.05 as diagrams.
FR 08.08.	D	The sets of reports to be generated as diagrams should be defined throughout the ISS PMS business analysis stage.
FR 08.09.	M	<p>The ISS PMS must enable retrieving the data sets specific for the following categories of reports:</p> <ul style="list-style-type: none"> <li>Reports generated on the basis of all statistical indicators related to the number of population (specified in Annex 2);</li> <li>Reports generated on the basis of all statistical indicators related to vital statistics (specified in Annex 3);</li> <li>Reports generated on the basis of all statistical indicators related to migration statistics (specified in Annex 3);</li> <li>Reports generated based on all statistical indicators related to the demographic calculations (specified in Annex 4);</li> </ul>
FR 08.10.	M	The ISS PMS must provide the data sets necessary to populate the external DB with baseline data used for the census of Moldovan population or different categories of statistical surveys (sampling for statistical surveys).
FR 08.11.	M	The ISS PMS must provide the data sets in a standardized format defined in the process of designing the ISS PMS (e.g. CSV, XML, etc.),
FR 08.12.	M	It must be possible the User to retrieve the generated report or data set for a defined period (containing trends of values of retrieved statistical indicators).
FR 08.13.	M	The ISS PMS must comprise a mechanism to define the set of reports and data available to each category of users, depending on their assigned roles and rights.
FR 08.14.	M	A User that views a report in the system must be able to export it into an editable external file (XLS/XLSX and DOCX).
FR 08.15.	M	By default, the reports must be retrieved in PDF format, while the diagrams – in JPG/PNG format.
FR 08.16.	D	The ISS PMS should enable retrieving the statistical reports specified in

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Identifier	Binding level	Functional Requirement Description
		FR 08.04 and data sets specified in FR 08.10 in electronic format, having applied the NBS digital signature.
FR 08.17.	M	Platform service MSign must be applied as a mechanism for digital signing.
FR 08.18.	M	The ISS PMS must log all events related to report generation and printing, and to data sets retrieval.


### 5.10. UC09: Carry out Indicator Calculation Procedures

The functional requirements set for managing by hand the calculation process of statistical indicators configured via UC07 are listed in Table 5.9.

**Table 5.9. Functional Requirements for UC09.**

Identifier	Binding level	Functional Requirement Description
FR 09.01.	M	The ISS PMS must provide the NBS Experts with a functionality to manage by hand the calculation process of statistical indicators configured via UC07.
FR 09.02.	M	The ISS PMS must provide a mechanism manual data importing necessary to calculate the statistical indicator value (for external sources that cannot deliver data on events related to Statistical Units).
FR 09.03.	M	The manual data importing must be done using a standardized format defined jointly with the NBS during the business analysis stage.
FR 09.04.	M	The ISS PMS must provide an interface to monitor the process of manual data importing, view the importing results and cancel it when issues occur (rollback procedure).
FR 09.05.	M	The ISS PMS must provide a mechanism to manually launch the statistical indicators calculation procedures configured through UC07.
FR 09.06.	M	The manually launch implies defining the calculation parameters (selection of relevant indicators, the period for which to calculate the values, parameters for partial calculation of statistical indicator values, where appropriate).
FR 09.07.	M	The ISS PMS must suggest only the set of statistical indicators active in the periods for which the values should be calculated.
FR 09.08.	M	The ISS PMS must provide an interface to monitor the calculation process of statistical indicator values and view the calculation results.
FR 09.09.	M	When repeated calculation is required for statistical indicator values (calculations for such period have been already carried out), the ISS PMS must exclude the old values, having replaced them with newly calculated values.
FR 09.10.	M	The newly calculated values must be stored in a buffer zone until their



	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


Identifier	Binding level	Functional Requirement Description
		approval to be stored/replaced.
FR 09.11.	M	The ISS PMS must provide functionalities to cancel (rollback) the calculations carried out when issues occur (in case of automatic calculations and those performed by hand).
FR 09.12.	M	The ISS PMS must log all events related to the calculation/cancelling of statistical indicator values (including via platform service MLog).

### 5.11. UC10: Administer Users and Access Control


The functional requirements set for users administration and configuring access to User Interface and the ISS PMS DB content are mirrored in Table 5.10.

**Table 5.10. Functional Requirements for UC10.**

Identifier	Binding level	Functional Requirement Description
FR 10.01.	M	The ISS PMS must provide functionalities to define and manage dynamically the Users and their roles and access rights.
FR 10.02.	M	Each Authorized User must have a profile with the following categories of data: <ul style="list-style-type: none"> <li>• User Surname;</li> <li>• User First Name;</li> <li>• email;</li> <li>• contact phone number;</li> <li>• access login;</li> <li>• access password;</li> <li>• authentication strategy (User+password, electronic signature, LDAP, etc.);</li> <li>• active/deactivated account;</li> <li>• access validity period;</li> <li>• User roles;</li> <li>• particular access rights to User Interface and data;</li> <li>• other relevant data.</li> </ul>
FR 10.03.	M	The ISS PMS must comprise a default category of Users created by the Provider; Users' credentials for the category of <b>SuperAdministrator</b> shall be provided upon delivery.
FR 10.04.	M	The ISS PMS must provide access to some specific functionalities only after User's authentication and authorization. The ISS PMS will ensure support to the following Users' authentication options: <ul style="list-style-type: none"> <li>• electronic signature (via service MPass);</li> <li>• login and password;</li> </ul>

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Identifier	Binding level	Functional Requirement Description
		<ul style="list-style-type: none"> <li>NBS LDAP solution.</li> </ul>
FR 10.05.	M	The ISS PMS must enable specifying the way of User connection to the System (electronic signature, User Name+password, IP address or a combination thereof).
FR 10.06.	M	The ISS PMS must provide a mechanism to define Users access rights to data depending on the categories or types of statistical indicators, Statistical Units geographical area, specific categories of data, etc., taking into account the Authorized Users' job duties.
FR 10.07.	M	The ISS PMS must provide the Authorized Users with functionalities to modify and restore the access password.
FR 10.08.	M	The ISS PMS must ensure protection to Authorized Users' passwords. The used protection method shall make it impossible to intercept, identify by deduction methods and recover the access password.
FR 10.09.	M	The ISS PMS must provide functionality to disable/enable the User's access.
FR 10.10.	M	Communication between the User device and the ISS PMS application server must be encrypted (using SSL/TLS protocol).
FR 10.11.	M	The ISS PMS must be capable to configure the number of parallel sessions to be initiated by the same User.
FR 10.12.	M	The ISS PMS must be capable to configure the period in User inactivity after the session is automatically closed.
FR 10.13.	M	The ISS PMS must prevent any possibility of unauthorized taking over of active sessions initiated by Authorized Users.
FR 10.14.	M	The ISS PMS must enable blocking the session upon the User's request or automatically upon the session expiry.
FR 10.15.	M	The ISS PMS must provide a mechanism for granular management of access rights to its objects and of possible actions thereto (Statistical Units' Profiles, statistical indicators, electronic forms, menus, functionalities, reports, actions of adding/viewing/updating/deleting data, etc.).
FR 10.16.	M	The authorization method of ISS PMS Users must be based on the principle <i>"everything which is not allowed is forbidden"</i> .
FR 10.17.	M	The ISS PMS must provide functionalities to define the Users' groups and roles and facilities for User's association with groups and roles.
FR 10.18.	M	The ISS PMS must grant explicit access rights at the level of User, group, or role. A group of Users may cover several subgroups/roles. A User may be associated with one or more groups and roles, while the User's access rights are determined cumulatively.
FR 10.19.	M	The ISS PMS must allow for granting access rights based on business rules (for example: <i>a record can be modified only when the User is its</i>

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


Identifier	Binding level	Functional Requirement Description
		<i>author or when such action is carried out within a certain timeframe, status, or context).</i>
FR 10.20.	M	The ISS PMS must enable configuring an unlimited number of roles and groups.
FR 10.21.	M	It must not be possible to physically delete a role/group when it is attached to at least one ISS PMS User.
FR 10.22.	M	An Authorized User Profile can be physically deleted only when there is no event logged or record related to it.
FR 10.23.	M	The ISS PMS must enable temporary assigning of rights held by one User to another User. This assignment shall be done through preserving or suspending the rights held by the User that is assigned temporarily with the rights. These powers shall be defined/checked via platform service MPower.
FR 10.23.	D	The ISS PMS should allow for separating the administrative activities (for example: <i>Administrator 1 carries out amendments and Administrator 2 confirms them</i> ).
FR 10.23.	M	The ISS PMS must provide facilities for viewing and generating reports on the configured access rights.  The generation of such reports shall be carried out depending, at least, on the following criteria: group of Users/role, login, properties, permitted actions.

### 5.12. UC11: Manage Metadata

The functional requirements necessary to manage the ISS PMS metadata are included in Table 5.11.

**Table 5.11. Functional Requirements for UC11.**

Identifier	Binding level	Functional Requirement Description
FR 11.01.	M	The ISS PMS must provide a mechanism to manage the nomenclatures, classifiers containing all metadata intended for configuring the IT Subsystem and managing the calculation processes of statistical indicators.
FR 11.02.	M	The following categories of metadata must be used within the ISS PMS: <ul style="list-style-type: none"> <li>• <b>International Classifiers</b>, which values are standardized and internationally accepted (for example: <i>International System of Units – SI, International Statistical Classification of Diseases, the WHO 10<sup>th</sup> Revision, etc.</i>);</li> <li>• <b>National Official Classifiers</b> (<i>Classifier of Administrative and Territorial Units of the Republic of Moldova, etc.</i>);</li> <li>• <b>Statistical Metadata</b> (<i>pursuant to reference metadata "Population and Demography"</i>);</li> </ul>

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


Identifier	Binding level	Functional Requirement Description
		<ul style="list-style-type: none"> <li><b>Interoperability Classifiers/Nomenclatures</b> (<i>which values are used to exchange data with third IT systems</i>);</li> <li><b>Internal Classifiers/Nomenclatures</b> (<i>system variables, user interface parameters, IT system configuration parameters and of processes implemented within the IT system, roles, categories of captured demographic events, data sources, etc.</i>).</li> </ul>
FR 11.03.	M	The Provider must implement a mechanism intended to automatically update the metadata (if any) necessary to exchange data with external IT systems (for example: <i>SRP, SRCSA, CRE, SRATUA, BPIIS, AIS "Migration and Asylum", SRIRPSIS, IMIS, etc.</i> ).
FR 11.04.	M	The ISS PMS must provide a mechanism to export and import classifiers from the User Interface in XML or CSV format. The import and export rights shall be assigned to Users with the role of System Administrator.
FR 11.05.	M	For official, international classifiers and those provided by external IT Systems with which mutual data exchange is performed it is envisaged to limit the rights to modify the values via the ISS PMS facilities.
FR 11.06.	M	For the system of internal classifiers/nomenclatures and metadata, the ISS PMS will deliver a mechanism to define and dynamically manage them (it must be possible to add dynamically categories of nomenclatures/classifiers and their content).
FR 11.07.	M	The ISS PMS must provide functionalities to manage the textual values of classifiers/nomenclatures, other categories of metadata in three linguistic versions: Romanian, English and Russian.
FR 11.08.	M	The ISS PMS must provide functionalities to manage the labels and User Interface messages in three linguistic versions: Romanian, English and Russian.
FR 11.09.	M	The ISS PMS must not allow deleting any category of metadata if it is used at least in one DB record.
FR 11.10.	M	The ISS PMS must offer a mechanism to version the values of metadata and set the time intervals related to the validity of metadata values.

### 5.13. UC12: Configure the IT Subsystem

The functional requirements necessary for implementing the facilities to configure the ISS PMS are included in Table 5.12.

**Table 5.12. Functional Requirements for UC12.**

Identifier	Binding level	Functional Requirement Description
FR 12.01.	M	The ISS PMS must provide facilities to configure strategies for logging business events.
FR 12.02.	D	The ISS PMS should provide facilities to configure new or existent

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


Identifier	Binding level	Functional Requirement Description
		electronic forms to be filled by Users to access the IT Subsystem business logic.
FR 12.03.	M	The ISS PMS must provide facilities to configure the exiting reports (for example: <i>adjusting data sets, reforming the reports, etc.</i> ), amending the implemented template files or specialized platforms (for example: <i>using report generators</i> ).
FR 12.04.	M	The ISS PMS must enable adding and configuring new reports (for example: <i>in case of adding new statistical indicators</i> ).
FR 12.05.	M	The ISS PMS must have facilities to configure reports to be automatically generated on a periodical basis. The automated generation is specific for complex reports requiring longer time to process the data. The automatically generated reports must be stored in the System (to be accessed by the Authorized Users) or sent to new e-mail addresses or specific Users.
FR 12.06.	M	The ISS PMS must have functionalities intended to configure the jobs to be run automatically depending on the time parameters or occurrence of certain business events.  The ISS PMS must allow for adding and configuring new jobs as well as changing operating parameters of the existing jobs.
FR 12.07.	D	The ISS PMS should provide functionalities to configure workflows (for example: <i>sequence of operations, transition of business entities status, generated documents and records, notifications sent, roles involved, actions permitted, etc.</i> ).
FR 12.08.	M	ISS PMS must provide functionality for manual primary data importing based on data sets/files with predefined structure. This functionality will be used for manual data synchronization of the ISS PMS with the official data sources (when the interop is unusual) and external alternative data sources (i.e. NBS information systems, statistical surveys, etc.).
FR 12.09.	M	The potentially variable data of the ISS PMS (operating parameters, constant values, access ways to files/data, parameters for integrating with external IT systems, specific metadata, etc.) must be configurable via the facilities provided by the User Interface with no need to compile and/or deploy again the source code or direct interventions into the DB content.

#### 5.14. UC13: Operational Monitoring, Diagnostics and Troubleshooting


The functional requirements necessary to monitor, diagnose and troubleshoot the technical issues evolved in the course of ISS PMS operation are included in Table 5.13.

**Table 5.13. Functional Requirements for UC13.**

Identifier	Binding level	Functional Requirement Description
------------	---------------	------------------------------------

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Identifier	Binding level	Functional Requirement Description
FR 13.01.	M	The ISS PMS must have incorporated a Heart-beat service to communicate periodically the current status of IT Subsystem operation.
FR 13.02.	M	The ISS PMS must contain mechanisms to monitor the load level and the current status of all key components (the Provider shall offer software to monitor the ISS PMS performance).
FR 13.03.	M	The ISS PMS must send notifications to relevant roles when the performance of its components is degrading (for example: <i>the response time to certain queries exceeds the expected time</i> ).
FR 13.04.	M	The Provider must offer facilities to manage the ISS PMS as follows: <ul style="list-style-type: none"> <li>• starting the ISS PMS components;</li> <li>• halting the ISS PMS components;</li> <li>• restarting the ISS PMS components;</li> <li>• generating backups;</li> <li>• recovering the data on the basis of backups;</li> <li>• refreshing the operating memory.</li> </ul>
FR 13.05.	M	The means must implement the ISS PMS administration functions may be implemented using the platform software orders and facilities, with no need to implement a dedicated graphical interface.
FR 13.06.	M	The Provider must list the means to be used for troubleshooting the technical issues that may occur in the ISS PMS operation.
FR 13.07.	M	The ISS PMS must be able to provide a number of management, statistical, and ad-hoc reports so that the administrative roles can monitor the System activity and status.
FR 13.08.	I	The reports managed via UC 13 are intended for IT audit functions and do not include reports related to business events specific for UC08.
FR 13.09.	M	This reporting is necessary for the entire System, including: <ul style="list-style-type: none"> <li>• nomenclatures and classifiers;</li> <li>• DB records ;</li> <li>• User's activity;</li> <li>• access and security permissions.</li> </ul>
FR 13.10.	M	The reports must be generated based on the following categories of logged events: <ul style="list-style-type: none"> <li>• successful authentication of Users;</li> <li>• failed authentication of Users;</li> <li>• notifications sent;</li> <li>• actions on data (accessing, adding, modifying, deleting).</li> </ul>
FR 13.11.	M	The ISS PMS must enable aggregated retrieval of reports or their detailing per specific User, central or territorial subdivision of the NBS

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Identifier	Binding level	Functional Requirement Description
		or per groups of Users.
FR 13.12.	M	A User viewing a report within the System must be able to export it in a PDF format or in an editable external file (XLS/XLSX, CSV, DOC/DOCX).
FR 13.13.	M	The Provider must implement up to 10 predefined reports for IT audit requested by the NBS. The audit reports that may be generated via the System means will not be implemented in the ISS PMS User Interface.
FR 13.14.	D	To retrieve System reports and statistics relevant for UC13 it is advisable to use a platform dedicated to report configuration and generation.


### 5.15. UC14: Data Exchange with External Systems

The functional requirements set for data exchange between the ISS PMS and external IT Systems are listed in Table 5.14.


**Table 5.14. Functional Requirements for UC14.**

Identifier	Binding level	Functional Requirement Description
FR 14.01.	M	The ISS PMS must be built based on architecture capable to implement interoperability facilities with external IT systems.
FR 14.02.	M	The ISS PMS must carry out data exchange with external IT Systems via the APIs set out by them (non-government IT Systems) and interoperability platforms MConnect (for Public Authorities IT Systems).
FR 14.03.	M	Interactions amongst the NBS internal IT Systems when the services of data provision/receipt are not sought by the IT Systems of other Moldovan PAs must be implemented via micro-services.
FR 14.04.	M	<p>The ISS PMS must be interoperable with the following NBS IT Systems:</p> <ul style="list-style-type: none"> <li>• Statistical Databank – aimed to prepare the sets of data within the ISS PMS and transfer them to the Statistical Databank for "Population and Demographic Processes";</li> <li>• Statistical Metadata System – aimed to import or update statistical relevant metadata for the ISS PMS operation;</li> <li>• NBS official Web Page – for automatic publication of certain sets of public reports produced within the ISS PMS business processes.</li> </ul>
FR 14.05.	M	<p>The ISS PMS must be capable to integrate with the following government services:</p> <ul style="list-style-type: none"> <li>• MPass – for Users authentication and access control;</li> <li>• MSign – for affixing electronic signatures on reports and data sets generated by the ISS PMS;</li> <li>• MLog – to log critical business events;</li> </ul>



	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Identifier	Binding level	Functional Requirement Description
		<ul style="list-style-type: none"> <li>• MNotify – to notify the Authorized Users;</li> <li>• MPower – to check the representation powers of Users necessary to authorize their actions;</li> <li>• POGD – to publish the open data produced by the ISS PMS workflows.</li> </ul>
FR 14.06.	M	<p>The ISS PMS must be integrated via government platform MConnect with the following IT Systems to receive the baseline data to perform statistical calculations:</p> <ul style="list-style-type: none"> <li>• State Registry of Population – for automatic receipt of individuals' identity data (all people having IDNP, including foreigners and stateless people visiting the Republic of Moldova);</li> <li>• State Registry of Civil Status Acts – for automatic receipt of data related to civil status events recorded by the Moldovan Public Authorities;</li> <li>• Cadaster of Real Estate – for automatic receipt of recorded data on immovable property/real estate related to housing;</li> <li>• State Register of Administrative and Territorial Units and Addresses – for automatic receipt of recorded data on addresses on the Moldovan territory;</li> <li>• Border Police Integrated Information System – for automatic receipt of data on state border crossing events by individuals;</li> <li>• Automated Information System "Migration and Asylum" – for automatic receipt of data related to case-files of applicants seeking asylum to record or update the profile data of Statistical Units, kin relationships amongst people who immigrated in the Republic of Moldova, and other relevant data of ISS PMS business processes;</li> <li>• the State Register of Individual Records in the Public Social Insurance System – for automatic receipt of data on Statistical Units disabilities, guardianship or parental assistant relations, etc.;</li> <li>• Integrated Medical Information System – for automatic receipt of data on Statistical Units morbidity, behavioral events. Likewise, this is an alternative source to receive birth and death events of Statistical Units;</li> <li>• IT Systems supplier of behavioral data of Statistical Units (administrative data sources) that will provide references on the existence and viability of Statistical Units based on which the active status of their profiles would be kept (for example: <i>Tax Register – any tax settlement event, MPay – any electronic settlement event, commercial databases – any service-receiving related event, etc.</i>).</li> </ul>

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


Identifier	Binding level	Functional Requirement Description
FR 14.07.	M	Upon receiving some specific updates (for example: <i>birth, state border crossing, marriage, etc.</i> ), the ISS PMS must automatically create a Statistical Unit Profile (where appropriate), automatically assign a statistic Identifier to the Statistical Unit and anonymize/pseudonymize personal data.  The types of events and cases on which basis new profiles of Statistical Units are created shall be identified during the business analysis stage.
FR 14.08.	M	The ISS PMS must integrate with Google Analytics to send statistical data on Public Interface operation.
FR 14.09.	M	Data received via FR 14.06 must be stored initially into a technological DB and then processed and transferred to the DB in production via UC04.1-UC04.3.
FR 14.10.	M	All data exchange events with external IT systems via the procedures described by functional requirements FR 14.04 – FR 14.06 must be logged via the ISS PMS internal logging mechanism and platform service MLog.

#### 5.16. UC15: Calculate Statistical Indicators

The functional requirements set for calculating statistical indicators are listed in Table 5.15.

**Table 5.15. Functional Requirements for UC15.**

Identifier	Binding level	Functional Requirement Description
FR 15.01.	M	The ISS PMS must provide functionalities capable to calculate the values of all indicators specified in Annexes 2-5.
FR 15.02.	M	It must be possible to launch the calculation of statistical identifier values both by hand (via UC09) and automatically (via UC16).
FR 15.03.	M	The statistical indicator calculation procedures must be carried out based on parameters for their configuration (defined via UC07) and on the Statistical Units profile data in accordance with GSIM v.1.2 and GSBPM v.5.1 standards.
FR 15.04.	M	The calculation procedure of statistical indicator values must provide a rollback facility to be used in case of erroneous calculations.
FR 15.05.	M	The calculation procedure of statistical indicator values must provide a facility through which it shall be possible to monitor the calculation process (it will show the progress and the status of the current calculations carried out).
FR 15.06.	M	All calculation events of statistical indicators must be logged (including via platform service MLog).

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

### 5.17. UC16: Carry out Automatic Procedures


The functional requirements intended to carry out automatic procedures are listed in Table 5.16.

**Table 5.16. Functional Requirements for UC16.**

Identifier	Binding level	Functional Requirement Description
FR 16.01.	M	The ISS PMS must provide functionalities to launch automatic procedures intended for the IT Subsystem smooth operation.
FR 16.02.	M	The timing and periodicity of launching the automatic procedures must be configured through FR 12.05.
FR 16.03.	M	The ISS PMS must carry out the automatic procedures to receive data related to Statistical Units Profiles from external IT Systems specified in FR 14.06.
FR 16.04.	M	The ISS PMS must carry out automatic procedures to calculate the statistical indicators configured via UC07 using the facilities provided by UC15.
FR 16.05.	M	The ISS PMS must carry out automatic procedures to calculate the aggregates related to statistical indicators calculated via FR 16.04.
FR 16.06.	M	The ISS PMS must carry out automatic procedures to calculate indicators related to complex reports (the reports that require long time to be generated in advance and retrieved subsequently upon need).
FR 16.07.	M	The ISS PMS must automatically send notifications to Users for the tasks that have not been carried out in due time (for example: <i>anomalies that have not been addressed in a set timeframe</i> ).
FR 16.08.	M	The ISS PMS must trigger the procedure of ISS PMS backup generation pursuant to the schedule configured via FR 12.06 and functionalities provided by UC19.
FR 16.09.	M	The ISS PMS must provide an interface to view the current status of procedures carried out automatically in progress.
FR 16.10.	M	The ISS PMS must provide facilities to manage the automatic procedures: <ul style="list-style-type: none"> <li>• starting manually an automatic procedure;</li> <li>• stopping the execution of an automatic procedure;</li> <li>• resuming the stopped automatic procedure;</li> <li>• cancelling the execution of an automatic procedure.</li> </ul>
FR 16.11.	M	All events related to the operation of automatic procedures defined via FR 16.03 – FR 16.09 must be logged.

### 5.18. UC17: Send Notifications

The functional requirements set for notifying the ISS PMS actors are listed in Table 5.17.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

**Table 5.17. Functional Requirements for UC17.**


Identifier	Binding level	Functional Requirement Description
FR 17.01.	M	Depending on the User (data for configuring his/her profile), the User notification functionality must apply one out of three notification strategies: <ul style="list-style-type: none"> <li>notification via Email;</li> <li>notification sent to Authorized Users' Dashboard;</li> <li>both strategies from above.</li> </ul>
FR 17.02.	M	The ISS PMS must notify the relevant Users when business events specific to their activity occur.
FR 17.03.	M	The notification must comprise access reference to the record/electronic form relevant for the business event that generated the notification (valid for the notifications stored in the User Dashboard).
FR 17.04.	M	The Authorized Users (regardless of their assigned roles) must be able to configure their preferences in terms of notification means.
FR 17.05.	M	All categories of Authorized Users must receive notifications on business events related to their job duties ( <i>e.g. processing an anomaly, assisted processing of data received from external IT systems, delay in carrying out job duties, calculation results of statistical indicators and related aggregates, etc.</i> ).
FR 17.06.	M	The System Administrator must have a functionality to prepare and send notifications to explicit Users or groups of Users.
FR 17.07.	M	The ISS PMS must notify the System Administrator on any issues that affected the IT Subsystem performance and availability.
FR 17.08.	M	The ISS PMS must notify the Users who receive the notifications through external means through MNotify.

### 5.19. UC18: Log Events

The functional requirements set for logging business events produced during the ISS PMS operation are listed in Table 5.18.

**Table 5.18. Functional Requirements for UC18.**

Identifier	Binding level	Functional Requirement Description
FR 18.01.	M	The ISS PMS must provide a mechanism to log all business events related to its use.
FR 18.02.	M	The System Administrator must be able to configure the logging strategies related to business events produced by the ISS PMS through UC12 (including the events to be logged via internal mechanisms only and those logged through MLog).

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


Identifier	Binding level	Functional Requirement Description
FR 18.03.	M	The ISS PMS must provide to the System Administrators a mechanism to search, filter and view details of logged events.
FR 18.04.	M	<p>The following categories of events must be logged:</p> <ul style="list-style-type: none"> <li>• User authentication;</li> <li>• User disconnection;</li> <li>• adding/modifying/deleting/accessing a record;</li> <li>• business events specific to ISS PMS workflows;</li> <li>• exchanging data with external IT systems;</li> <li>• generating/accessing reports;</li> <li>• formulating queries to DB;</li> <li>• other specific business events.</li> </ul>
FR 18.05.	M	<p>The logs must save the following categories of data (depending on the nature of the logged event):</p> <ul style="list-style-type: none"> <li>• identifier of the User who generated the event;</li> <li>• category of the logged event;</li> <li>• time when the event was logged;</li> <li>• the manner how the ISS PMS generated the business event;</li> <li>• the record affected by the business event;</li> <li>• action carried out by the User (for example: <i>modification details, added data, etc.</i>).</li> </ul>
FR 18.06.	M	The ISS PMS must log exhaustively all business events produced.
FR 18.07.	M	The ISS PMS must log in parallel the critical business events through MLog.
FR 18.08.	M	The ISS PMS must provide functionalities to define critical business events to be logged in parallel via platform service MLog (via UC12).

### 5.20. UC19: Backup and Disaster-recovery Procedures


The functional requirements set for generating backups and recovering the ISS PMS functionalities in case of disasters are listed in Table 5.19.

**Table 5.19. Functional Requirements for UC19.**

Identifier	Binding level	Functional Requirement Description
FR 19.01.	M	The ISS PMS must provide functionalities necessary to generate ISS PMS backups and manage their historical versions.
FR 19.02.	M	It must be possible to launch automatically the ISS PMS backup generation procedure (via UC16) or by hand by System Administrators.
FR 19.03.	M	The ISS PMS must provide mechanisms to ensure data integrity when

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Identifier	Binding level	Functional Requirement Description
		failures occur at the level of any of its components.
FR 19.04.	M	The ISS PMS must provide mechanisms for quick recovery of its availability and accessibility when continuity-related incidents occur.
FR 19.05.	M	The ISS PMS must offer facilities to archive the old data and delete them from the production platform.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

## 6. IT Subsystem Non-functional Requirements


### 6.1. IT Subsystem General Requirements

The general system requirements are defined by the policies and strategies developed and adopted in the Republic of Moldova. It is worth mentioning that these acts are stemming from the industry best practices and comprise many organizational measures, as well as a series of technical measures. The system general requirements specific for the ISS PMS are listed in Table 6.1.

**Table 6.1. Performance Requirements imposed on the IT Subsystem.**

ID	Binding level	Requirement Description
GEN 001	M	ISS PMS must be developed according to Agile project management approach.
GEN 002	M	All User Interfaces and the DB content must be prepared in Romanian, using the Romanian diacritical marks.
GEN 003	M	The User Interface of the ISS PMS public interface and the values of textual metadata (classifiers, nomenclatures, description of statistical indicators, etc.) must be accessible in Romanian, English and Russian.
GEN 004	M	The ISS PMS DB data must be stored in single code format (for example: <i>using UTF-8</i> ).
GEN 005	M	The User Interface elements must comply with the Level A of <i>Web Content Accessibility Guidelines (WCAG) 2.0</i> .
GEN 006	M	The User Interface must be optimized to 1360x768 resolution, avoiding the appearance of scrollbars for User Interfaces presented by the IT solution.
GEN 007	M	Where appropriate, the ISS PMS must provide an adaptable public user interface (it must deliver a responsive interface) depending on the device used by it ( <i>notebook, netbook, PC, smartphone, tablet, etc.</i> ).
GEN 008	M	The Public Interface must generate the content pages, considering the best practices on SEO optimization.
GEN 009	M	The data search procedures must be implemented via simple searches (specifying certain search series) or more complex searches, via which more accurate filtering of information could be achieved (QBE forms). Regardless of the nature of information sought, the User must use the same query and data search method for all User Interface sections of the AIS SPM.
GEN 010	M	The AIS SPM User Interface must ensure searching, filtering, and viewing the records matching the search criterion introduced to Users depending on their access rights.
GEN 011	M	It must be possible to export the content of any table comprising the search results in XLS, CSV and PDF format.
GEN 012	M	The ISS PMS must be developed based on SOA multi-layer architecture



	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


ID	Binding level	Requirement Description
		(at least three architectural layers (for example: <i>Presentation Layer, Business-logical Layer and Data Layer</i> )).
GEN 013	M	The ISS PMS must provide web interfaces to interact with NBS external IT systems and with other Moldovan Public Authorities via micro-services and MCloud.
GEN 014	M	The ISS PMS must be optimized in terms of minimal transfer of data between the client computer and server, with a special emphasis on avoiding to the extent possible the useless requests, implementation of AJAX with JSON, minimizing the load of server resources necessary for authentication, authorization and logging procedures.
GEN 015	M	The potentially variable information (for example: <i>different parameters, ways of data storage, ways of connection with external services, classifiers, etc.</i> ) must be configurable and NOT require solution recompilation or direct interventions into the DB.

## 6.2. IT Subsystem Performance Requirements

Performance requirements specific for the ISS PMS that respond to the NBS needs and expectations are listed in Table 6.2.

**Table 6.2. Performance Requirements imposed on the IT Subsystem.**

ID	Binding level	Requirement Description
PER 001	M	The average time for server response must not exceed 3 (three) seconds upon the system nominal load.
PER 002	M	The ISS PMS must be capable to allow for at least 200 Authorized Users to work.
PER 003	M	The ISS PMS must ensure concurrent activity for at least 150 Authorized Users, while the displayed services shall be able to respond to at least 100 concurrent queries without affecting the ISS PMS operation performance.
PER 004	M	The ISS PMS public interface must be capable to serve more than 500,000 anonymous Users per year.
PER 005	M	The ISS PMS public interface must be capable to serve at least 500 concurrent anonymous Users and 300 parallel queries.
PER 006	M	The ISS PMS must be capable to receive, process and store data of more than 20 000 transactions related to Statistical Unit profile events.
PER 007	M	Prior to the delivery of the ISS PMS, all performance and security tests must be conducted.
PER 008	M	Performance testing must include at least two components: <i>load testing</i> and <i>stress testing</i> .


	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

### 6.3. Requirements for Software, Hardware and Communication Channels

Table 6.3 comprise the requirements set for software, hardware and communication technology intended for implementing the ISS PMS.

**Table 6.3. Requirements to secure Software, Hardware and Communications.**

ID	Binding level	Requirement Description
SHC 001	M	The ISS PMS must be possible to install both on dedicated servers and on virtualized environments (the ISS PMS must comply with the requirements for deploying the IT Systems on common government technological platform MCloud).
SHC 002	M	It is necessary to demonstrate the capacity to virtualize by delivering to the NBS a system image that can be uploaded and becomes functional with minimum configuration on one of the virtualization solutions available on the market.
SHC 003	M	The Supplier must prove the possibility to install and operate the ISS PMS in the MCloud infrastructure.
SHC 004	M	It must be possible to access the ISS PMS through communication channels of at least 512Kbps.
SHC 005	D	For the ISS PMS development and operation it is advisable to use FOSS ( <i>free open source software</i> ) platforms, which are portable on UNIX and WINDOWS OS.
SHC 006	M	The Supplier must state explicitly in the bid the software platform on which basis it envisages to develop the ISS PMS and platform software necessary for its operation.
SHC 007	M	The technologies suggested by the Supplier must be accessible to at least three local companies specialized in the software development.
SHC 008	M	In case of use of commercial software platforms to develop and operate the ISS PMS, the Supplier must include in the financial proposal the cost of licenses necessary for developing and operating the ISS PMS (the Provider shall purchase on the NBS behalf all licenses necessary for developing and operating the IT Subsystem).
SHC 009	M	In case if the platform software intended to develop and operate the ISS PMS is based on commercial IT solutions requiring licenses, the Provider Must include in the financial proposal the overall cost of licensing in case of: <ul style="list-style-type: none"> <li>doubling the number of Users;</li> <li>doubling the number of units for processing (CPU or CPU kernels);</li> <li>doubling the number of hubs of application servers /DB.</li> </ul>
SHC 010	M	The ISS PMS must use open standards for communication protocols and formats.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


ID	Binding level	Requirement Description
SHC 011	M	The services displayed to the public by the ISS PMS must be technologically neutral (OS, Internet Explorer, etc.).
SHC 012	M	The generic software recommended for the operation and interaction with the ISS PMS represents the WEB browser.
SHC 013	M	The System must be compatible with at least two the most recent versions of the following WEB browsers: <i>MS Internet Explorer/MS Edge, Mozilla Firefox, Google Chrome, Safari and Opera.</i>
SHC 014	M	Compatibility with <i>MS Edge /MS Internet Explorer</i> browser is mandatory.
SHC 015	D	The ISS PMS should incorporate a Heart-beat service that will display periodically the System regular status.
SHC 016	M	The ISS PMS must provide configurable means for technical logging.
SHC 017	M	The ISS PMS must be capable to produce at least the following levels of technical logging: <i>info; warning; critic; error.</i>
SHC 018	M	The Supplier must list the means to be used for troubleshooting the System.
SHC 019	M	The Supplier must provide means that facilitate the functions aimed at System administration: <ul style="list-style-type: none"> <li>starting the System components;</li> <li>stopping the System of components;</li> <li>restarting the System of components;</li> <li>creating database backup;</li> <li>restoring the data based on the indicated backup;</li> <li>refreshing the System operating memory.</li> </ul>
SHC 020	M	The ISS PMS must operate in TCP/IP networks and in special HTTPS.
SHC 021	M	The Supplier must suggest other network utility services necessary to operate the System.

#### 6.4. Requirements for Data Migration and Population


Table 6.4 comprise the requirements set for data migration and population into the ISS PMS. It is worth noting that the IT Subsystem is to be accepted after populating the DB with data sets provided by the NBS.

**Table 6.4. Requirements for Data Migration and Population.**

ID	Binding level	Description of Migrating Requirement
MIG 001.	M	The NBS must prepare and deliver data sets and metadata necessary to populate the ISS PMS with baseline data. The migrated data format must be agreed upon jointly with the Provider.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

ID	Binding level	Description of Migrating Requirement
MIG 002.	M	The Supplier must convert specific values of metadata related to the external sets of data pursuant to the NBS System of statistical metadata.
MIG 003.	M	The Supplier must include in the technical proposal its approach regarding the implementation of initial migration and population of the DB.
MIG 004.	M	The Supplier must offer a mechanism to ensure automated population of ISS PMS DB with relevant metadata (nomenclatures, classifiers, different types of variables, etc.) and sets of baseline data received from external sources (PSA, NSIH and MHLSP) aimed to consolidate the ISS PMS initial data stock.
MIG 005.	M	<p>In the process of data migration and population the Supplier must be responsible for:</p> <ul style="list-style-type: none"> <li>• defining the methodology applied for data migration and population;</li> <li>• devising the detailed plans for data migration and population;</li> <li>• providing software tools to be used for data migration and population;</li> <li>• defining the requirements for data sets quality intended for migration/population and their processing via the developed mechanisms of data migration and population;</li> <li>• mapping the value of metadata received from external sources (in case of divergences);</li> <li>• defining the reconciliation criteria for the migrated and populated data;</li> <li>• participating in activities aimed at data cleaning and enrichment;</li> <li>• verifying and validating the quality of data sets to be migrated and populated;</li> <li>• populating the ISS PMS DB on the basis of the data sets provided by the NBS;</li> <li>• identifying and resolving the exemptions/errors in the process of data migration and population.</li> </ul>
MIG 006.	M	<p>The Supplier must propose the Methodology for data migration and population to the NBS. The Methodology must comprise at least the following elements:</p> <ul style="list-style-type: none"> <li>• Methodology for preparing the data to be migrated and populated;</li> <li>• Methodology for mapping the migrated and populated data;</li> <li>• Methodology for cleaning and enriching the migrated /populated data and for data quality assurance;</li> <li>• Methodology for completing the value of data requested mandatorily by the ISS PMS, but which are missing in the provided data sets;</li> </ul>

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

ID	Binding level	Description of Migrating Requirement
		<ul style="list-style-type: none"> <li>the procedure for automated migration and population of data;</li> <li>principles of reconciling the migrated and populated data;</li> <li>the recovery plan in case of failure (for each stage of data migration and population);</li> <li>the plan for delivering the mechanism for data migration and population.</li> </ul>
MIG 007.	M	The Supplier must prepare and deliver the detailed plan for initial data migration and population of the ISS PMS (the data migration and conversion strategy). This plan must be aligned with the ISS PMS implementation plan.
MIG 008.	M	The Supplier must deliver to the NBS a software solution to automate the process of initial data migration and population of the ISS PMS.
MIG 009.	M	All initial data migration and population activities of the ISS PMS must be carried out in the operating environment controlled by the NBS. The data must never leave the NBS ICT Infrastructure.
MIG 010.	M	In the process of data migration, the Supplier must comply with the NBS security policy.
MIG 011.	M	The Supplier must demonstrate the accuracy of the toolkit used for initial data migration and population of the ISS PMS to NBS representatives (an acceptance act on initial data migration and population of the ISS PMS shall be signed by the Supplier and the NBS).

### 6.5. Security and Protection Requirements


The ISS PMS shall allow for a proper control over the information security risks posed by the System operation. The implemented security measures shall be aligned with the security policy approved by the NBS and ensure appropriate prevention, detection, and response to security incidents.

The ISS PMS must implement a "Multi-layered security" approach at the System level and have the capacity to integrate with the NBS institutional model to manage information security (based on the set of ISO 27000 standards).

This section sets forth the requirements regarding the ISS PMS security features requested by the NBS.

**Table 6.5. Requirements for Security Architecture.**


ID	Binding level	Requirement
SEC 001	M	The ISS PMS architecture must be designed by applying a "Secure by design" approach.
SEC 002	M	<p>The ISS PMS security architecture must be documented at the technical level. The documentation must comprise:</p> <ul style="list-style-type: none"> <li>description of the implemented security model;</li> <li>current components;</li> </ul>

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

ID	Binding level	Requirement
		<ul style="list-style-type: none"> <li>role of each component from the security standpoint.</li> </ul>
SEC 003	M	The documentation must also comprise specifications on placing the ISS PMS components at the network level and Provider recommendations on access rules at the network level to be set by the NBS aimed to secure access to all System components (for example: <i>communication matrix amongst services</i> ).
SEC 004	M	All system processes related to the ISS PMS components must run with minimum privileges necessary to carry out the assigned tasks.
SEC 005	M	All access credentials used by the ISS PMS must be configurable in administrative interfaces. The ISS PMS must not comprise hard-coded access credentials.
SEC 006	M	The ISS PMS must not comprise open form access credentials stored at the level of its components (DB, configuration files).
SEC 007	M	All ISS PMS disclosed interfaces must be accessed having applied secure authentication methods (for example: <i>X.509 certificates</i> ).
SEC 008	M	Access to functions granted to Unauthorized Users (public interface provided by the ISS PMS) must be controlled with protection means against overloading (for example: <i>CAPTCHA, RECAPTCHA, etc.</i> ).
SEC 009	M	The field contents in the forms filled by Users must be validated both on the client computer and on server prior to its storage into the DB.
SEC 010	M	The ISS PMS must be secured for <i>OWPSA Top 10 vulnerabilities (2017)</i> .
SEC 011	M	The ISS PMS must ensure confidentiality of data sent-received through communication channels.
SEC 012	M	Users' actions must be recorded in electronic logs.
SEC 013	D	The ISS PMS should provide a periodic warning signal about its operational status.

**Table 6.6. Requirements for the Authentication Mechanism.**

ID	Binding level	Requirement
SEC 014	M	<p>The ISS PMS must enable accessing its functions only after User's successful authentication, granting support for at least the following authentication methods:</p> <ul style="list-style-type: none"> <li>login and password;</li> <li>LDAP solution;</li> <li>authentication via electronic or mobile signature (MPass).</li> </ul>
SEC 015	M	The ISS PMS must provide the Users with a mechanism to change and recover individual passwords.
SEC 016	M	The ISS PMS must enable Users' registration and their profile information


	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

ID	Binding level	Requirement
		(for example: <i>login, password, Surname, Last Name, IDNP, Email, etc.</i> ).
SEC 017	M	Users' passwords must be protected. The password protection method must make it impossible to intercept, identify by deduction methods and recover the password (algorithm of unidirectional encryption).
SEC 018	D	The ISS PMS must enable differentiated application of password use policy for different groups of Users.
SEC 019	M	The ISS PMS must assure blocking, or suspending Users' accounts at the level of application.
SEC 020	D	The ISS PMS must enable differentiated application of authentication methods, depending on the roles assigned to Users and on the accessed functional components.
SEC 021	M	The ISS PMS must enable setting the number of simultaneous connections that may be initiated by a User.
SEC 022	M	The ISS PMS must enable setting the expiry time of Users' sessions in case of inactivity (empirical value equals to 15 minutes).
SEC 023	M	The ISS PMS must provide efficient mechanisms to prevent unauthorized taking over of active sessions initiated by Authorized Users.
SEC 024	M	The ISS PMS work session must be blocked upon the User's request or automatically, upon the expiry of the time reserved for the session.

**Table 6.7. Requirements for the Authorization Mechanism.**

ID	Binding level	Requirement
SEC 025	M	The ISS PMS must provide granular management of access rights to its objects and of possible actions thereto (for example: <i>electronic forms, menus, reports, actions aimed to create/view/update/ delete, etc.</i> ).
SEC 026	M	The authorization method the System must be based on the principle " <i>everything which is not explicitly allowed is forbidden</i> ".
SEC 027	M	The ISS PMS must enable defining the groups of Users and roles and User's association with groups and roles.
SEC 028	M	The ISS PMS must enable granting access rights at the level of User, group, or role. A group of Users may cover several subgroups/roles. A User may be associated with one or more groups and roles, while the User's access rights are determined cumulatively.
SEC 029	M	The ISS PMS must enable granting access rights based on business rules (for example: <i>a record can be modified only when the User is its author or when such action is carried out within a certain timeframe, status, or context</i> ).
SEC 030	M	The ISS PMS must enable temporary assigning of rights held by one User to another User. This assignment shall be done through preserving or




	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

ID	Binding level	Requirement
		suspending the rights held by the User that is assigned temporarily with the rights.
SEC 031	D	The ISS PMS should allow for separating the administrative activities (for example: <i>Administrator 1 carries out amendments and Administrator 2 confirms them</i> ).
SEC 032	M	The ISS PMS must provide facilities to view and generate reports on the configured access rights. These shall be subject to parameterize depending on at least the following criteria: group of Users/roles, login User, permitted actions, etc.
SEC 033	M	The ISS PMS must possess capabilities for Users' authentication and authorization via both internal mechanisms and platform service MPass.
SEC 034	M	The ISS PMS must authorize Users' access to User Interface sections and data after checking their powers via MPower.


**Table 6.8. Requirements for Input/ Output Data Validation Mechanism**

ID	Binding level	Requirement
SEC 035	M	The ISS PMS must possess appropriate mechanisms to prevent manipulating the input data (received from Authorized Users, external applications).
SEC 036	M	All actions aimed to modify critical and sensitive data within the ISS PMS must be carried out via specialized forms and documents, pursuant to the workflow set out for these categories of documents (for example: <i>correcting the data of calculated indicators</i> ).
SEC 037	M	The ISS PMS must carry out full and independent validation of data on the Presentation Layer, Business-logical Layer, Data Layer to ensure data integrity, completeness, and accuracy.
SEC 038	M	All data displayed within the ISS PMS must be accompanied by security marking pursuant to a classifier defined by the ISS PMS to this end.
SEC 039	M	Confidential data must not be stored and accessed unsecured within the ISS PMS (for example: <i>log files, caching, etc.</i> ).
SEC 040	M	The ISS PMS must possess mechanisms aimed to additionally protect the outstandingly confidential data (for example: <i>masked display of data, storage of encrypted data, repeated authentication or using User's additional means, etc.</i> ).
SEC 041	M	The ISS PMS must possess routine procedures to check and detect possible corruption of data integrity relations.
SEC 042	M	The ISS PMS must possess adequate mechanisms to prevent any manipulation of data stored under the application.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

**Table 6.9. Requirements for the Logging and Auditing Mechanism.**

ID	Binding level	Requirement
SEC 043	M	The ISS PMS must provide audit components to collect and manage in a centralized manner the audit records at the level of each IT Subsystem module.
SEC 044	M	The audit component must enable granular configuration of audit policy.
SEC 045	M	The ISS PMS must enable setting the audit policy at the level of functional component /section of User Interface, categories of data and at the level of logged event.
SEC 046	M	The ISS PMS must enable setting specific characteristics of events to be logged (for example: <i>produced at a certain time interval, having a certain status, or transiting to a certain status, etc.</i> ).
SEC 047	M	The ISS PMS must enable auditing any event, at the level of any IT Subsystem object or business entity.
SEC 048	M	Each audit record must comprise at least: <ul style="list-style-type: none"> <li>the time when the event occurred;</li> <li>event subject (User's identifier);</li> <li>affected object or entity;</li> <li>event occurred;</li> <li>IP address from where the event was initiated.</li> </ul>
SEC 049	M	The audit records must not comprise confidential data (for example: <i>passwords entered upon failed authentication attempts</i> ).
SEC 050	M	Errors that may occur while logging the audit records must not affect the IT Subsystem regular operation.
SEC 051	M	The audit component must use the system clock set at the OS level of the application server where the event logging functionality is run.
SEC 052	M	The audit component must provide a mechanism to archive the historical audit records. The archiving process shall be parameterized (frequency, age of old data, archive format, intended use, etc.).
SEC 053	D	The ISS PMS should be able to automatically generate notifications to people responsible for the occurrence of certain security events pursuant to configurations set.
SEC 054	D	The audit component should be able to integrate based on open standards with SIEM ( <i>Security Incident and Event Management</i> ) solutions aimed to adopt the audit records produced under the System by the corresponding solutions.
SEC 055	M	The ISS PMS must enable fixing the data historical versions considered as extremely sensitive.
SEC 056	M	Activities aimed to change the status and the responsible for entering records must be logged.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


ID	Binding level	Requirement
SEC 057	M	The ISS PMS must provide handy tools to access and process the logged events, including filtering the audit records by any field held and their export in usual format. The IT Subsystem audit tools shall be readily available to import archives with audit files for occasional analysis activities.
SEC 058	M	The ISS PMS must possess reliable mechanisms to protect the integrity of recorded audit data.
SEC 059	M	The critical business events must be logged in parallel through MLog.
SEC 060	M	The ISS PMS must provide a mechanism to configure business events that shall be logged in parallel via service MLog.

**Table 6.10. Requirements for Exemptions and Errors Management Mechanism.**

ID	Binding level	Requirement
SEC 061	M	The ISS PMS must record in a centralized manner all exemptions and errors generated by its functional components.
SEC 062	M	When an error occurs, the ISS PMS must display a generic error message for the User. The message may comprise an error code and a single identifier to facilitate the engagement of support services.
SEC 063	M	The ISS PMS must possess the tools necessary for analyzing and processing the records related to exemptions and errors.
SEC 064	M	The ISS PMS must be able to automatically generate notifications to responsible people when certain errors occur in the operation of its functional components.

**Table 6.11. Requirements for Resilience Capabilities.**

ID	Binding level	Requirement
SEC 065	M	The ISS PMS must have implemented tools to carry out procedures to generate automatic backups and manage historical backups.
SEC 066	M	The ISS PMS must possess mechanisms to ensure data integrity in case of failures at the level of any components.
SEC 067	M	The ISS PMS must possess mechanisms to ensure quick recovery of System availability and accessibility in case of some continuity incidents.
SEC 068	M	The ISS PMS architecture must be resilient to component failures and have no single points of failure (SPOF).
SEC 069	M	The ISS PMS must possess mechanisms to ensure data integrity in case of some accidental failures at the level of any of its components.


	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

### 6.6. Requirements for IT Subsystem Deployment

Table 6.12 comprises requirements regarding the ISS PMS deployment mechanisms to be implemented by the Provider. They match the recent requirements set for the IT Systems held by Central Public Authorities (CPAs) of the Republic of Moldova.

**Table 6.12. Requirements for IT Subsystem Deployment.**

ID	Binding level	Description of Deployment Requirements
DEP 001	M	The ISS PMS must enable its installation on dedicated servers and in virtualized environments.
DEP 002	M	The ISS PMS must be capable to deliver a containerized infrastructure to be deployed in relevant environments (for example: <i>Docker Engine, Kubernetes</i> ).
DEP 003	M	The ISS PMS must be capable to initiate deployment in several environments simultaneously (for example: <i>development, testing, production</i> ) initiated from zero.
DEP 004	M	The ISS PMS deployment must be carried out via some specialized toolkits.
DEP 005	M	The ISS PMS deployment mechanism must be capable to define the container component to be updated (for example: <i>new version of platform software, updated functional module, etc.</i> ).
DEP 006	M	The ISS PMS deployment mechanism must be capable to manage the container content.
DEP 007	M	The ISS PMS deployment mechanism must be capable to add new components in the container content.
DEP 008	M	To deploy the ISS PMS it is necessary the relevant mechanism to specify in what cluster (dedicated server or cloud) the deployment shall be carried out.
DEP 009	M	To deploy the ISS PMS it is necessary the relevant mechanism to deliver a workflow to compile the code or registers.
DEP 010	M	The ISS PMS deployment mechanism must provide functionalities to deliver an IT solution and carry out third actions (for example: <i>installing additional packages, configuring notifications, etc.</i> ), using the toolkits in place.
DEP 011	M	It must be possible to update automatically the ISS PMS production environment with intervention possibilities by hand (approve the build manual).
DEP 012	M	The Supplier must deliver to NBS all toolkits and scripts necessary for ISS PMS automatic deployment.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

### 6.7. IT Subsystem Documentation Requirements

The ISS PMS shall be accompanied by a full set of technical documentation covering the sections displayed in Table 6.13.

**Table 6.13. IT Subsystem Documentation Requirements.**


ID	Binding level	Description of Documentation Requirements for e-Petitions
DOC 001	M	The Supplier must prepare and publish Interactive Guidance Materials included in the ISS PMS User Interface.
DOC 002	M	The Supplier must prepare and deliver User's Manual in Romanian.
DOC 003	M	The Supplier must prepare and deliver Administrator's Guide in Romanian.
DOC 004	M	The Supplier must prepare and deliver the Guide on System Installation and Configuration (to include at least guidelines for code compilation, installation of application, hardware and software requirements, platform description and configuration, application configuration, and disaster recovery procedures).
DOC 005	M	The Supplier must prepare and deliver the IT Subsystem Technical Design on which basis all IT Subsystem development/acceptance activities shall be carried out (SRS and SDD).
DOC 006	M	The Supplier must prepare and deliver the ISS PMS Architecture Documentation with the description of models in UML language to include a sufficient level of details in terms of Architecture in several cross-sections (including the data logical and physical models).
DOC 007	M	The Supplier must prepare and deliver API documentation disclosed to be integrated with other IT Systems.
DOC 008	M	The Supplier must deliver all guidelines necessary for ISS PMS smooth operation and addressing any potential technical issues.
DOC 009	M	The Supplier must deliver the Source Code for applications and components developed under the Project with the necessary comments to grasp the Program Code meaning.
DOC 010	M	The Supplier must deliver the training documentation for all roles assigned to ISS PMS Users.

### 6.8. Licensing and Intellectual Property Requirements

The NBS shall have all the rights necessary to use, with no time limit, the ISS PMS and all its software components necessary for the System smooth operation. Table 6.14 comprises specific requirements related to licensing and intellectual property rights related to the ISS PMS and its software components necessary for the System operation.

**Table 6.14. Licensing and Intellectual Property Requirements.**

ID	Binding level	Requirement
----	---------------	-------------

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


ID	Binding level	Requirement
LIC 001	I	The NBS must provide the following operating environment for the ISS PMS: <ul style="list-style-type: none"> <li>• Production environment;</li> <li>• Testing /training environment;</li> <li>• Development environment.</li> </ul>
LIC 002	M	The Supplier must include in its financial proposal the licenses for all COTS type software necessary for ISS PMS implementation and operation in those three environments made available by the NBS. They comprise: operating systems, DB management systems, software libraries, utilities and other system software.
LIC 003	M	The number of offered licenses must for accessing and using the ISS PMS (for any environment it is operated in) by at least 200 nominal Authorized Users, as well as unlimited access for anonymous Users and external systems. There would be no restrictions in terms of the number of documents, transactions, or the ways of accessing the ISS PMS (for example: <i>limiting concurrent access</i> ).
LIC 004	M	The number of offered licenses must allow for accessing APIs disclosed by the ISS PMS by any application and external system.
LIC 005	M	The Supplier must convey to the NBS all rights on developments, adjustments, configurations and customizations carried out to implement the ISS PMS pursuant to the requirements. They may be related to third licensed software or may be components developed under the Project.
LIC 006	M	Any data stored under the ISS PMS DBs are the NBS property. Access to these data throughout the Supplier contracting period, and afterwards, is subject to requirements and information confidentiality clauses.
LIC 007	M	The Supplier must present its suggested licensing model for the ISS PMS that shall meet LIPR 001 – LIPR 006 requirements. The Supplier must describe the suggested licensing model, arguing why it is optimal for the NBS, also offering a benchmarking analysis with other licensing models provided as a rule for the offered solution.

#### 6.9. IT Subsystem Warranty, Maintenance and Technical Support Requirements

The Provider shall ensure post-implementation warranty and technical support, covering the sections included in Table 6.15.


**Table 6.15. Warranty, Maintenance and Technical Support Requirements.**

ID	Binding level	Description of Warranty and Technical Support Requirements
GMS 001	M	The Supplier must offer warranty and technical support over 12 months after the ISS PMS final acceptance.
GMS 002	M	The warranty and technical support must meet the National Standard <i>SM ISO/CEI 14764:2015 – Software Engineering. Software Life Cycle Processes</i>

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

ID	Binding level	Description of Warranty and Technical Support Requirements
		– <i>Maintenance.</i>
GMS 003	M	The Supplier must make available to the NBS a Help Desk Service accessible during the business days throughout the year.
GMS 004	M	The NBS Users must be able to call the Help Desk by dialing a national phone number (that matches the telephone numbering of the Republic of Moldova).
GMS 005	M	The communication language with Help Desk is Romanian or Russian.
GMS 006	M	The NBS Users must be able to report alternatively the technical issues evolved via ticketing mechanism, Email, or instant messages.
GMS 007	M	The Supplier must ensure support to document technical issues and their traceability for the Beneficiary.
GMS 008	M	The deadline for response and remedying the reported technical issues must be eight working hours at most following their reporting.
GMS 009	M	For major complexity issues the remediation period must not exceed 72 hours.
GMS 010	M	The Supplier must prove its ability to grant post-delivery technical support in compliance with GMS 001-GMS 006 requirements.
GMS 011	M	Any bug detected during the warranty period must be addressed by the Supplier in due time free-of-change.
GMS 012	M	For any additional change requests an supplementary amendment and amendment must be negotiated and signed.
GMS 013	M	The Supplier and the NBS must sign a SLA specifying the principles of rendering warranty, maintenance and support services.



	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

## 7. End-product and Delivered Components

The end-product (ISS PMS) is composed of software artifacts and system documentation, as well as of knowledge transfer to the software solution Owner, Holder and Administrator. The ISS PMS-related artifacts are displayed in Table 7.1.

**Table 7.1. Licensing and Intellectual Property Requirements.**

ID	Binding level	Artifact Brief Description
DEL 001	M	Complete source code of modules and components necessary to compile the delivered software.
DEL 002	M	Software for primary data migration and population of the ISS PMS.
DEL 003	M	End-product packed for easy installation in the proposed technological environment (including scripts for automated deployment).
DEL 004	M	Documents and reports related to management processes of the ISS PMS design, development, and implementation Project.
DEL 005	M	Technical design (SRS+SDD).
DEL 006	M	Document on ISS PMS configuration and deployment.
DEL 007	M	User's Manual.
DEL 008	M	Administrator's Manual (including a contingency plan).
DEL 009	M	Guidance for removing the deficiencies and carrying out current maintenance activities for the ISS PMS.
DEL 010	M	All training materials for the ISS PMS Users.
DEL 011	M	Technical specifications for the ISS PMS published and used interfaces.
DEL 012	M	Testing plan and in-house testing results (functional, integration, performance, upload, security).
DEL 013	M	SLA signed with the ISS PMS for the period of warranty, maintenance, and technical support.
DEL 014	M	All artifacts to be delivered on electronic medium (DVD+-R).

In addition to the artifacts related to ISS PMS deliverables, all services necessary for knowledge transfer to the NBS displayed in Table 7.2 shall be provided.

**Table 7.2. Knowledge Transfer Services related to the Delivered Artifacts.**

ID	Binding level	Artifact Brief Description
DEL 015	M	The Supplier must carry out training activities intended for the NBS trainers that shall be able to train further all categories of ISS PMS Users.
DEL 016	M	The Supplier must carry out training activities for all categories of Authorized Users and System Administrators.
DEL 017	M	The Supplier must deliver technical assistance services throughout the ISS

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

ID	Binding level	Artifact Brief Description
		PMS piloting.
DEL 018	M	The Supplier must assist the NBS in the ISS PMS acceptance testing activities.
DEL 019	M	The Supplier must deliver assistance services to the NBS in the process of putting the ISS PMS in production.
DEL 020	M	The Supplier must address all ISS PMS deficiencies and errors identified during the piloting and acceptance testing period.
DEL 021	M	The Supplier must grant post-implementation technical support (after putting the System in production) for a 12-month-period, including corrective, adaptive and preventive maintenance as per the <i>SM ISO/CEI 14764:2015 – 2015 – Software Engineering. Software Life Cycle Processes – Maintenance</i> .

<div><div><div>STATISTICA</div><div><div></div><div></div><div></div></div><div>MOLDOVEI</div></div></div>	Information Subsystem "Population and Migration Statistics"	Security Classification
		C2 – Internal Use

Annex 1. Generic Workflows to Update the Statistical Units Profile Data

A1.1. Description of Basic Business Process

In compliance with the diagram shown in Figure A1.1, the ISS PMS shall trigger the jobs intended to interact with external IT Systems to receive automatically data to update the DB.

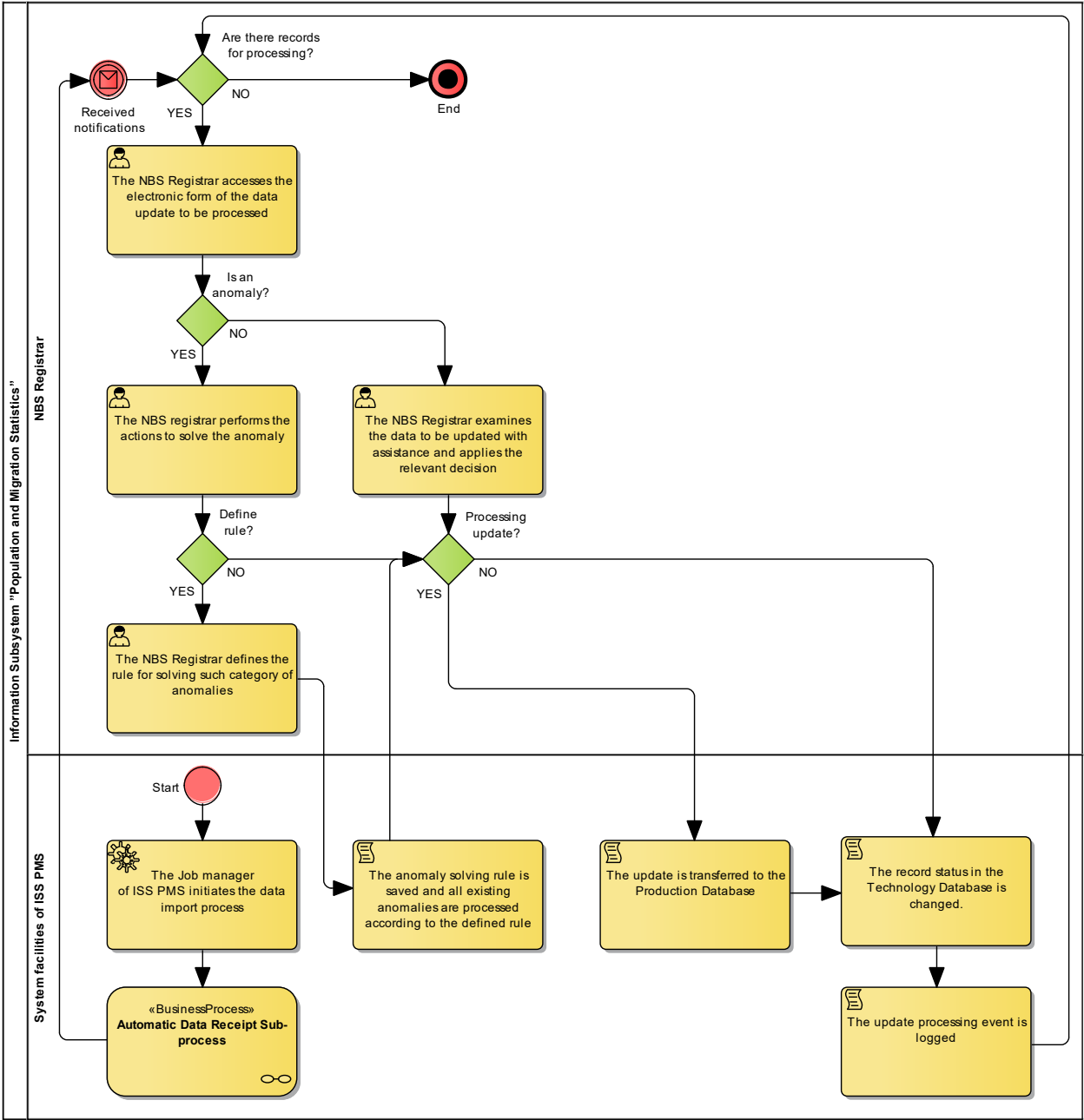



Figure A1.1. Workflow to update the ISS PMS data.

The process of data receipt will run in line with the provisions of the data automatic receipt sub-process explained in sub-paragraph A1.1 of this Annex.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

Once the updates have been received and saved in the ISS PMS technological DB, the NBS Registrars shall be notified via personal Dashboards, depending on their job duties (rights and roles assigned to Authorized User Profile) regarding the anomalies and update events subject to assisted processing.

The NBS Registrar will access from his/her personal Dashboard (or option to be provided by the ISS PMS) each record separately. As a result, the ISS PMS will open the electronic form with the record to be processed by hand.

Regarding the anomaly (generated by the incompatibility of ISS PMS metadata with the metadata used in the form, integrity issues or data consistency, impossibility to find the Statistical Unit Profile to be updated, etc.), the NBS Registrar will address it using different strategies, such as:

- finding and cross comparing the Statistical Unit Profile;
- approving the creation of a new profile for the Statistical Unit (in case it has not been found) based on the baseline data comprised by the ISS PMS data updating form;
- updating metadata interoperability of the NBS System (adding the missing values or changing the existing ones);
- consolidating the data (for example: cross comparison of two or more street names received from external sources with the one held by the ISS PMS in case of data consistency issues);
- setting the values of Correspondence Tables of data used for data transformation and import;
- rejecting the data update event (when the anomaly cannot be addressed or the updates provided by it are not timely to be carried out);
- ignoring it (to be processed later);
- other relevant options.

When the anomaly is typical for several records (from the same source), the NBS Registrar shall be able to record within the ISS PMS the anomaly resolving strategy to be applied in other similar cases.

Based on the anomaly resolving strategy, the ISS PMS removes the anomaly, updates the DB in production for the considered form and for other similar forms (if a rule addressing such types of anomalies has been introduced), changes the status of Technological DB records so that it does not process again the already processed updates, and logs the anomaly processing event.

In terms of assisted updates (the case when data are received from sources that may not be considered 100% safe, requiring approval prior to processing the updates), the NBS Registrar will assist the processing, using different strategies, such as:

- approve the update event (when considering that the data are accurate, and the update shall be carried out);
- reject the data update event (when considering there are certain issues related to the update event data and it is not advisable to carry out the updates);
- ignore it (to be processed later);

Depending on the selected strategy, the ISS PMS shall update the DB in production (if there is such approval) for the approved form, change the status of Technological DB records for the records approved so that it does not process again the already processed updates, and logs the update event for assisted processing.

A1.1. Describing the Automatic Data Receipt Sub-process

In compliance with the workflow of the automatic data receipt sub-process to update the ISS PMS, the functional component triggers automatically the external IT Systems query process aimed to check the availability of updates.

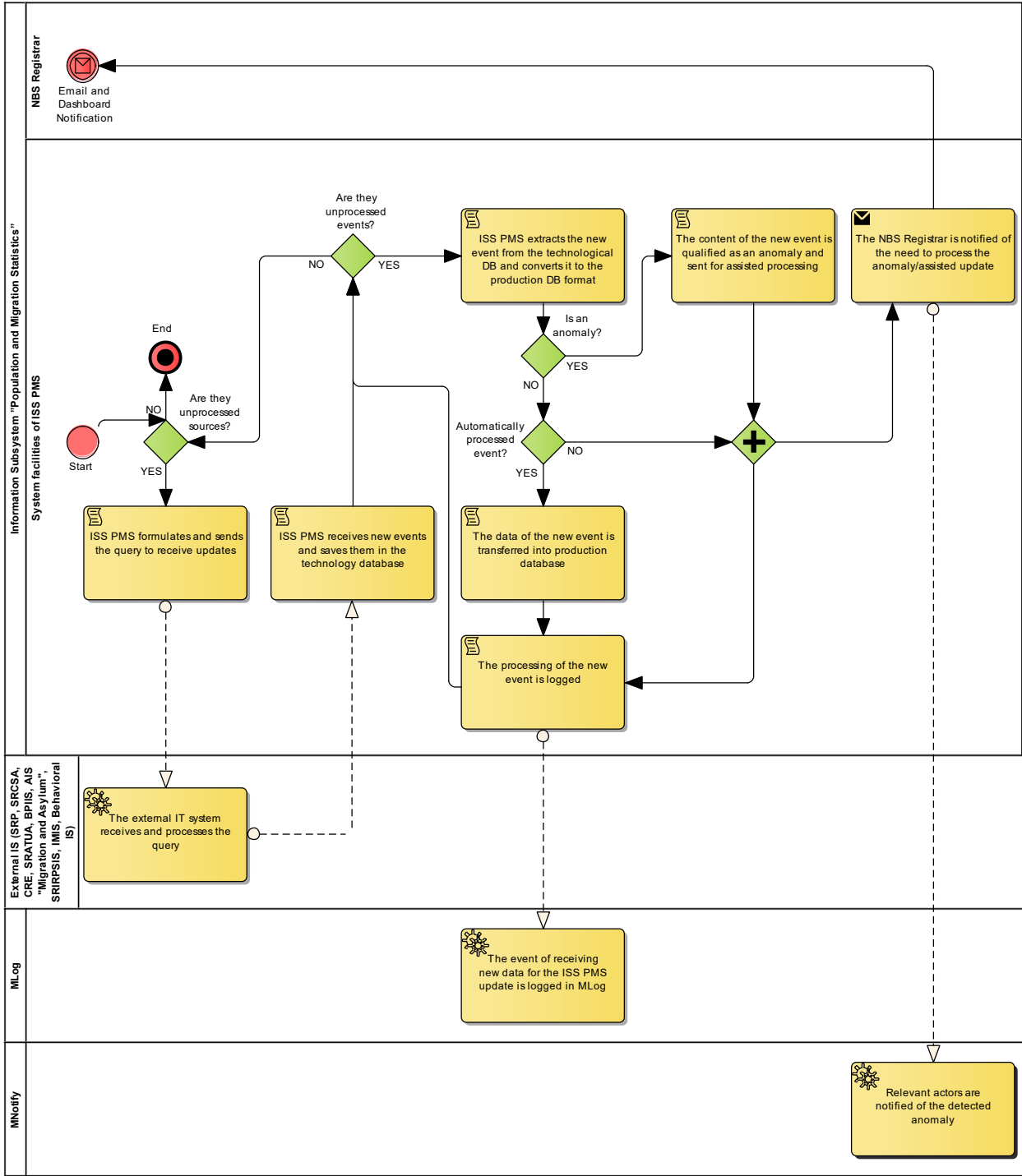



Figure A1.2. Workflow of the automatic data receipt sub-process.

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


The updating process is triggered based on jobs configured in advance for accessing the APIs disclosed by external IT Systems (SRP, SRCSD, CIP, SRATUA, IISBP, AIS "Migration and Asylum", SRIRPSIS, IMIS, Behavioral ISS, etc.) via the Interoperability Platform MConnect.

Following the queries carried out, the IT System in question will return the result (a set of relevant updates, set of interoperability metadata that has been amended, or null result when there is no update). Further, the ISS PMS will adopt each update record, transform the data contained and save it in the specific format of the ISS PMS Technological DB.

If an anomaly is detected in the course of transforming the update record, the latter is assigned the *Unprocessed Anomaly* status in the technological DB, the record receipt event stored in the technological DB is logged, and the relevant NBS Registrar is notified on the need to process the anomaly.

If no anomaly is detected and the record is adopted from a reliable data source (to be subject to automatic processing), the ISS PMS will update the content of the DB in production, assign the update record stored in the technological DB the *Processed* status and log the update receipt and processing event.

When no anomaly is detected and the record is adopted from a reliable data source (to be subject to assisted processing), the ISS PMS shall store the record in the technological DB with the *Unprocessed* status, log the event in the technological DB, and notify the NBS Registrar responsible for processing the updates.


	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

## Annex 2. Statistical Indicators related to the Number of Population

**Table A2.1. Peculiarities of calculating the statistical indicators related to the number of population.**

ID	Indicator	Calculation or Display Peculiarities	Primary Data Used for Calculation
IDC 001	The number of population at the beginning of the year (broken down by gender and age group).	<p>The following indicators shall be taken into account for the reference year:</p> <ul style="list-style-type: none"> <li>the total number of births (broken down by gender);</li> <li>the total number of deaths (by cohorts and broken down by gender);</li> <li>net migration in the previous year (difference between immigrants and emigrants broken down by age and gender) calculated on the basis of data on state border crossing by Moldovan citizens and foreigners and the number of population at the beginning of the previous year.</li> </ul>	IDNP Birth date Death date Gender Date of crossing the state border Division of State Border Crossing Citizenship Net migration
IDC 002	The number of population at the beginning of the year (broken down by district and municipality, residence area and urban/rural settlement).	<p>This is a segmentation of the previous Indicator broken down by:</p> <ul style="list-style-type: none"> <li>district and municipality;</li> <li>residence area;</li> <li>urban/rural settlement.</li> </ul>	IDNP Birth date Death date Gender Domicile Citizenship Date of crossing the state border Division of State Border Crossing Net migration Internal migration
IDC 003	The average annual number of population by gender and age (broken down by district and municipality, area and urban/ rural settlement).	<p>The number of population at the beginning of the previous year, broken down by:</p> <ul style="list-style-type: none"> <li>age;</li> <li>gender;</li> <li>urban/rural settlement;</li> <li>district;</li> <li>residence area.</li> </ul> <p>The number of population at the beginning of the reference year broken down by:</p> <ul style="list-style-type: none"> <li>urban/rural settlement;</li> <li>district and municipality;</li> <li>residence area;</li> <li>age;</li> <li>gender;</li> </ul>	IDNP Birth date Death date Gender Domicile Citizenship Net migration Internal migration




	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


## Annex 3. Statistical Indicators related to Vital Statistics

**Table A3.1. Peculiarities of calculating the statistical indicators related to the number of population.**


ID	Indicator	Calculation or Display Peculiarities	Primary Data Used for Calculation
IDC 004	Live births by legal status and gender broken down by residence area, region, municipality, district and town	The total number of live births broken down by: <ul style="list-style-type: none"> <li>gender;</li> <li>residence area;</li> <li>region;</li> <li>municipality;</li> <li>district;</li> <li>civil status of Mother.</li> </ul>	IDNP Birth date Gender Newborn's status Mother's domicile Civil status of Mother
IDC 005	Live births by legal status, gender and Mother's age broken down by residence area, region, municipality and district	The total number of live births broken down by: <ul style="list-style-type: none"> <li>gender;</li> <li>residence area;</li> <li>development region;</li> <li>municipality;</li> <li>district;</li> <li>age;</li> <li>civil status of Mother.</li> </ul>	IDNP Child's date of birth Mother's date of birth Gender Newborn's status Mother's domicile Civil status of Mother
IDC 006	Live births by Father's age broken down by residence area, region, municipality and district	The total number of live births broken down by: <ul style="list-style-type: none"> <li>gender;</li> <li>residence area;</li> <li>development region;</li> <li>municipality;</li> <li>district;</li> <li>Father's age.</li> </ul>	IDNP Child's date of birth Father's date of birth Gender Newborn's status Mother's domicile
IDC 007	Live births by newborn's order and Mother's age broken down by residence area, region, municipality and district	The total number of live births during the fertility period by: <ul style="list-style-type: none"> <li>gender;</li> <li>residence area;</li> <li>development region;</li> <li>municipality;</li> <li>district;</li> <li>Mother's age.</li> </ul>	IDNP Child's date of birth Mother's date of birth Gender Newborn's order Newborn's status Mother's domicile
IDC 008	Live births by the marriage duration (in Mothers who gave birth for the first time) broken down by residence area, region, municipality, district and town	The total number of live births in a marriage broken down by: <ul style="list-style-type: none"> <li>marriage duration;</li> <li>gender;</li> <li>residence area;</li> <li>development region;</li> <li>municipality;</li> <li>district;</li> <li>Mother's age.</li> </ul>	IDNP Child's date of birth Mother's date of birth Gender Date of marriage registration Newborn's status Mother's domicile Civil status
IDC 008	Live births by gender, weight at birth and duration of pregnancy broken	The total number of live births broken down by: <ul style="list-style-type: none"> <li>gender;</li> <li>weight at birth;</li> </ul>	IDNP Child's date of birth Newborn's status Weight at birth

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


ID	Indicator	Calculation or Display Peculiarities	Primary Data Used for Calculation
	down by residence area, region, municipality and district	<ul style="list-style-type: none"> <li>duration of pregnancy;</li> <li>residence area;</li> <li>development region;</li> <li>municipality;</li> <li>district;</li> <li>Mother's age.</li> </ul>	Duration of pregnancy Gender Mother's domicile
IDC 009	Live births by Parents' age group broken down by residence area, region, municipality and district	The total number of live births in marriage broken down by: <ul style="list-style-type: none"> <li>parents' age;</li> <li>gender;</li> <li>residence area;</li> <li>development region;</li> <li>municipality;</li> <li>districts;</li> <li>Mother's age.</li> </ul>	IDNP Child's date of birth Mother's date of birth Father's date of birth Newborn's status Mother's domicile Civil status of Mother Gender
IDC 010	Live births by settlement	The total number of live births by: <ul style="list-style-type: none"> <li>gender;</li> <li>settlement.</li> </ul>	IDNP Child's date of birth Type of birth Newborn's status Mother's domicile Gender
IDC 011	Birth rate broken down by area, region, municipality and district	The total number of live births by: <ul style="list-style-type: none"> <li>gender;</li> <li>residence area;</li> <li>development region;</li> <li>municipality;</li> <li>district;</li> <li>Mother's age reported to the average number of population in the reference year.</li> </ul>	IDNP Birth date Newborn's status Mother's domicile Gender Citizenship Death date Date of crossing the state border Division of State Border Crossing Internal migration
IDC 012	The number of deaths by gender and year of birth broken down by residence area, region, municipality and district	The total number of deaths broken down by: <ul style="list-style-type: none"> <li>date of birth;</li> <li>gender;</li> <li>residence area;</li> <li>development region;</li> <li>municipality;</li> <li>district.</li> </ul>	IDNP Birth date Death date Domicile Gender
IDC 013	Distribution of deaths by gender and age broken down by residence area, region, municipality, district, town and sector	The total number of deaths broken down by: <ul style="list-style-type: none"> <li>gender;</li> <li>residence area;</li> <li>development region;</li> <li>municipality;</li> <li>district.</li> </ul>	IDNP Birth date Death date Domicile Gender
IDC 014	Distribution of deaths by civil status and age group broken	The total number of deaths broken down by: <ul style="list-style-type: none"> <li>gender;</li> <li>residence area;</li> </ul>	IDNP Birth date Death date

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


ID	Indicator	Calculation or Display Peculiarities	Primary Data Used for Calculation
	down by residence area, region, municipality and district	<ul style="list-style-type: none"> <li>development region;</li> <li>municipality;</li> <li>district.</li> </ul>	Domicile Gender Civil status
IDC 015	Child mortality by gender and age (days and months) broken down by residence area, region, municipality and district	<p>The total number of children who died before reaching one year broken down by:</p> <ul style="list-style-type: none"> <li>each month;</li> <li>gender;</li> <li>residence area;</li> <li>development region;</li> <li>municipality;</li> <li>district.</li> </ul>	IDNP Birth date Death date Mother's/Father's domicile Gender
IDC 016	Children who died before reaching five years by gender, age and year of birth broken down by residence area	<p>The total number of children who died before reaching five years broken down by:</p> <ul style="list-style-type: none"> <li>gender;</li> <li>residence area;</li> <li>development region;</li> <li>municipality;</li> <li>district.</li> </ul>	IDNP Birth date Death date Mother's/Father's domicile Gender
IDC 017	Overall mortality rate by gender and broken down by residence area	<p>The total number of deaths reported to the average number of population broken down by:</p> <ul style="list-style-type: none"> <li>gender;</li> <li>residence area;</li> <li>development region;</li> <li>municipality;</li> <li>district.</li> </ul>	IDNP Birth date Death date Domicile Gender Citizenship Date and direction of state border crossing Internal migration
IDC 018	Child mortality rate by gender and broken down by residence area	<p>The total number of children who died before reaching one year per 1000 live births broken down by:</p> <ul style="list-style-type: none"> <li>gender;</li> <li>residence area;</li> <li>development region;</li> <li>municipality;</li> <li>district.</li> </ul>	IDNP Birth date of the deceased person Date of live birth Death date Mother's/Father's domicile Gender Newborn's status
IDC 019	Child mortality rate broken down by residence area, region, municipality and district	<p>The total number of children who died before reaching one year per 1000 live births broken down by:</p> <ul style="list-style-type: none"> <li>gender;</li> <li>residence area;</li> <li>development region;</li> <li>municipality;</li> <li>district.</li> </ul>	IDNP Birth date of the deceased person Date of live birth Death date Mother's/Father's domicile Newborn's status Gender
IDC 020	Mortality rate of children who died before reaching five years by gender and	<p>The total number of children who died before reaching five years per 1000 live births broken down by:</p> <ul style="list-style-type: none"> <li>gender;</li> </ul>	IDNP Birth date of the deceased person Date of live birth

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


ID	Indicator	Calculation or Display Peculiarities	Primary Data Used for Calculation
	broken down by residence area	<ul style="list-style-type: none"> <li>residence area;</li> <li>settlement.</li> </ul>	Death date Mother's/Father's domicile Newborn's status Gender
IDC 021	Maternal mortality rate broken down by residence area	<p>The total number of women who died due to complications during pregnancy or when giving birth per 1000 live births broken down by:</p> <ul style="list-style-type: none"> <li>residence area;</li> <li>settlement.</li> </ul>	IDNP Birth date of the deceased person Date of live birth Death date Mother's domicile Gender Newborn's status
IDC 022	Mortality rate by age group, gender and broken down by residence area	<p>The total number of deaths per 1000 de people broken down by:</p> <ul style="list-style-type: none"> <li>gender;</li> <li>residence area;</li> <li>settlement.</li> </ul>	IDNP Birth date Death date Domicile Gender Newborn's status Citizenship Date and direction of state border crossing Internal migration
IDC 023	Number of deceased people by main categories of death causes by gender, age and broken down by residence area	<p>The total number of deaths broken down by:</p> <ul style="list-style-type: none"> <li>causes of death;</li> <li>gender;</li> <li>age;</li> <li>residence area;</li> <li>settlement.</li> </ul>	IDNP Birth date Death date Cause of death Domicile, Gender
IDC 024	Number of deceased people by main categories of death causes by gender and district	<p>The total number of deaths broken down by:</p> <ul style="list-style-type: none"> <li>causes of death;</li> <li>gender;</li> <li>district.</li> </ul>	IDNP Birth date Death date Cause of death Domicile Gender
IDC 025	Mortality rates by main categories of death causes by age and gender	<p>The total number of deaths per 100 000 people broken down by:</p> <ul style="list-style-type: none"> <li>causes of death;</li> <li>gender;</li> <li>age.</li> </ul>	IDNP Birth date Death date Cause of death Domicile Gender Citizenship Date and direction of state border crossing Internal migration
IDC 026	The number of deceased people by settlement	<p>The total number of deaths broken down by:</p> <ul style="list-style-type: none"> <li>gender;</li> <li>settlement.</li> </ul>	IDNP Birth date Death date Domicile

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

ID	Indicator	Calculation or Display Peculiarities	Primary Data Used for Calculation
			Gender
IDC 027	Marriages by civil status of spouses before marriage broken down by residence area	The total number of marriages, legal status before marriage broken down by: <ul style="list-style-type: none"> <li>• residence area;</li> <li>• settlement.</li> </ul>	IDNP Date of marriage Civil status of Groom Civil status of Bride Domicile Gender
IDC 028	Marriages by civil status of spouses before marriage and age group broken down by residence area, region, municipality and district	The total number of marriages, legal status before marriage broken down by: <ul style="list-style-type: none"> <li>• age;</li> <li>• residence area;</li> <li>• development region;</li> <li>• municipality;</li> <li>• district.</li> </ul>	IDNP Birth date of Groom Birth date of Bride Date of marriage Civil status of Groom Civil status of Bride Domicile Gender
IDC 029	Marriages by age group of spouses (marriages concluded for the first time) broken down by residence area	The total number of marriages, legal status before marriage broken down by: <ul style="list-style-type: none"> <li>• residence area;</li> <li>• settlement.</li> </ul>	IDNP Birth date of Groom Birth date of Bride Date of marriage Civil status of Groom before marriage Civil status of Bride before marriage The number of marriages Domicile Gender
IDC 030	The number of marriages and the age of spouses broken down by residence area, region, municipality and district	The total number of marriages broken down by: <ul style="list-style-type: none"> <li>• residence area;</li> <li>• development region;</li> <li>• municipality;</li> <li>• district.</li> </ul>	IDNP Birth date of Groom Birth date of Bride Date of marriage Date of divorce Domicile Gender
IDC 031	Nuptiality rate broken down by residence area, region, municipality and district	The total number of marriages per 1000 people broken down by: <ul style="list-style-type: none"> <li>• residence area;</li> <li>• development region;</li> <li>• municipality;</li> <li>• district.</li> </ul>	IDNP Date of marriage Domicile Gender Citizenship Date and direction of state border crossing Internal migration
IDC 032	Divorces by age group of spouses broken down by residence area, region, municipality and district	The total number of divorces by the age of spouses broken down by: <ul style="list-style-type: none"> <li>• residence area;</li> <li>• development region;</li> <li>• municipality;</li> <li>• district.</li> </ul>	IDNP Date of divorce Date of marriage Birth date of Groom Birth date of Bride Domicile Gender
IDC 033	Divorces as per the	The total number of divorces, and marriage	IDNP


	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

ID	Indicator	Calculation or Display Peculiarities	Primary Data Used for Calculation
	duration of marriage by residence area	duration broken down by: <ul style="list-style-type: none"> <li>• residence area;</li> <li>• settlement.</li> </ul>	Date of divorce Date of marriage Birth date of Groom Birth date of Bride Domicile Gender
IDC 034	Vital statistics by month and region	The total number of live births, deaths, marriages, divorces, broken down by: <ul style="list-style-type: none"> <li>• each month and day;</li> <li>• development region;</li> <li>• municipality;</li> <li>• district;</li> <li>• settlement.</li> </ul>	IDNP Birth date Death date Date of divorce Date of marriage Domicile Gender
IDC 035	Distribution of newborns, deceased people, marriages and divorces by gender and citizenship broken down by residence area	The total number of live births, deaths, marriages, divorces, broken down by: <ul style="list-style-type: none"> <li>• gender;</li> <li>• citizenship;</li> <li>• residence area;</li> <li>• settlement.</li> </ul>	IDNP Birth date Death date Date of divorce Date of marriage Domicile Gender Citizenship
IDC 036	Vital statistics generalized data	The total number of live births, deaths, marriages, divorces, broken down by: <ul style="list-style-type: none"> <li>• gender;</li> <li>• citizenship;</li> <li>• residence area;</li> <li>• settlement.</li> </ul>	IDNP Birth date Death date Date of divorce Date of marriage Gender Citizenship Domicile Type of birth Newborn's status
IDC 037	Live births by Mother's educational background and occupational status	The total number of live births broken down by Mother's: <ul style="list-style-type: none"> <li>• educational background;</li> <li>• occupational status.</li> </ul>	IDNP Birth date Gender Domicile Newborn's status Birth order Educational background Occupational status
IDC 038	Distribution of deaths by age and citizenship	The total number of deaths broken down by: <ul style="list-style-type: none"> <li>• age;</li> <li>• citizenship.</li> </ul>	IDNP Birth date Gender Death date Domicile Citizenship
IDC 039	Deceased people by age, gender and occupational status	The total number of deaths broken down by: <ul style="list-style-type: none"> <li>• age;</li> <li>• gender;</li> <li>• occupational status.</li> </ul>	IDNP Birth date Gender Death date Domicile

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

ID	Indicator	Calculation or Display Peculiarities	Primary Data Used for Calculation
			Occupational status
IDC 040	Deceased people by age, gender and educational background	The total number of deaths broken down by: <ul style="list-style-type: none"> <li>• age;</li> <li>• gender;</li> <li>• educational background.</li> </ul>	IDNP Birth date Gender Death date Domicile Educational background




	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


## Annex 4. Statistical Indicators related to Migration

**Table A4.1. Peculiarities of calculating the statistical indicators related to migration.**

ID	Indicator	Calculation or Display Peculiarities	Primary Data Used for Calculation
IDC 041	Distribution of immigrants by citizenship, nationality/ethnicity and purpose of arrival	The total number of immigrants broken down by: <ul style="list-style-type: none"> <li>• age;</li> <li>• gender;</li> <li>• country of emigration (citizenship);</li> <li>• purpose of arrival to the Republic of Moldova.</li> </ul>	IDNP Birth date Gender Date and direction of state border crossing Citizenship Ethnicity Country of emigration Purpose of arrival
IDC 042	Repatriated people by country, nationality, gender and category (children and pensioners)	The total number of repatriated people, broken down by: <ul style="list-style-type: none"> <li>• age;</li> <li>• gender;</li> <li>• category;</li> <li>• country of origin.</li> </ul>	IDNP Date of repatriation Citizenship Nationality/ethnicity, Birth date Gender Country of repatriation
IDC 043	Emigrants by country of destination broken down by gender, age group, civil status, educational background	The total number of emigrants broken down by: <ul style="list-style-type: none"> <li>• age;</li> <li>• gender;</li> <li>• country of destination;</li> <li>• civil status;</li> <li>• educational background.</li> </ul>	IDNP Birth date Date and direction of state border crossing Country of destination Gender Date of marriage Date of divorce Date of graduation from the education institution Number of the Graduation Document Date of Graduation Document issuance Civil status
IDC 044	Migration of population abroad to be engaged under labor agreement, by gender, territorial aspect	The total number of emigrants for work, broken down by: <ul style="list-style-type: none"> <li>• age;</li> <li>• gender;</li> <li>• country of destination;</li> <li>• territorial aspect.</li> </ul>	IDNP Birth date Date and direction of state border crossing Country of destination Gender Number and date of concluded labor agreement Domicile
IDC 045	Distribution of refugees, beneficiaries of humanitarian protection and	The total number of refugees, beneficiaries of humanitarian protection and seekers of asylum by country of origin, broken down by: <ul style="list-style-type: none"> <li>• age;</li> <li>• gender.</li> </ul>	IDNP Birth date Gender Citizenship Date and direction of

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


ID	Indicator	Calculation or Display Peculiarities	Primary Data Used for Calculation
	seekers of asylum by country of origin, gender and age group		state border crossing Date of applying for refugee status Date of receiving the refugee status
IDC 046	Distribution of emigrants and immigrants on the basis of crossing the state border, by gender, age group, broken down by settlement, district, municipality, region and residence area.	The total number of immigrants and emigrants since the beginning of the last year broken down by: <ul style="list-style-type: none"> <li>• gender;</li> <li>• age;</li> <li>• settlement;</li> <li>• district;</li> <li>• municipality;</li> <li>• region;</li> <li>• residence area.</li> </ul>	IDNP Surname Last Name Birth date Gender Citizenship Date and direction of state border crossing Domicile
IDC 047	Internal migration by age, gender broken down by settlement, district, municipality, region and residence area.	Internal migrants determined to change their domicile (number of arrivals, number of departures) broken down by: <ul style="list-style-type: none"> <li>• gender;</li> <li>• age;</li> <li>• type of settlement.</li> </ul>	IDNP Citizenship Birth date Gender Previous temporary domicile/residence Current temporary domicile/residence Date of changing the temporary domicile/residence Lack of domicile

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use


## Annex 5. Statistical Indicators related to demographic calculations

**Table A5.1. Peculiarities of demographic calculations.**

ID	Indicator	Calculation or Display Peculiarities	Primary Data Used for Calculation
IDC 048	Population ageing coefficient by gender (broken down by district, municipality, region and residence area)	People aged 60 years and above per total number of population at the beginning of the reference year broken down by: <ul style="list-style-type: none"> <li>• district;</li> <li>• municipality;</li> <li>• region;</li> <li>• residence area;</li> <li>• gender.</li> </ul>	IDNP Birth date Death date Gender Domicile Date and direction of state border crossing
IDC 049	Average age of population by gender (broken down by district, municipality, region and residence area)	The number of population at the beginning of the reference year by: <ul style="list-style-type: none"> <li>• age;</li> <li>• gender;</li> <li>• district;</li> <li>• municipality;</li> <li>• region;</li> <li>• residence area.</li> </ul>	IDNP Birth date Death date Gender Domicile Date and direction of state border crossing
IDC 050	Median age of population by gender (broken down by district, municipality, region and residence area)	The number of population at the beginning of the reference year by age, gender broken down by: <ul style="list-style-type: none"> <li>• districts;</li> <li>• municipality;</li> <li>• regions;</li> <li>• residence areas.</li> </ul>	IDNP Birth date Death date Gender Domicile Date and direction of state border crossing
IDC 051	Overall demographic dependence	The number of population at the beginning of the reference year by: <ul style="list-style-type: none"> <li>• age;</li> <li>• gender.</li> </ul>	IDNP Birth date Death date Gender Domicile Date and direction of state border crossing
IDC 052	Demographic dependence ratio (broken down by district, municipality, region)	The number of population at the beginning of the reference year by age and gender broken down by: <ul style="list-style-type: none"> <li>• district;</li> <li>• municipality;</li> <li>• region.</li> </ul>	IDNP Birth date Death date Gender Domicile Citizenship Date and direction of state border crossing
IDC 053	Overall fertility rate (broken down by district, municipality, region and residence area)	The number of female population aged 15-49 years, live births by Mother's age broken down by: <ul style="list-style-type: none"> <li>• district;</li> <li>• municipality;</li> <li>• region;</li> <li>• residence area.</li> </ul>	IDNP Birth date Death date Gender Domicile Citizenship Newborn's status Birth order

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

ID	Indicator	Calculation or Display Peculiarities	Primary Data Used for Calculation
IDC 054	Gross reproduction rate of population broken down by residence area	The number of female population aged 15-49 years, live births by Mother's age broken down by residence area, share of girls born in the total live births	IDNP Birth date Death date Gender Domicile Date and direction of state border crossing Newborn's status Birth order
IDC 055	Net reproduction rate of population broken down by residence area	The number of female population aged 15-49 years, live births by Mother's age broken down by residence area, average life duration of women in their childbearing age	IDNP Birth date Death date Gender Domicile Date and direction of state border crossing Newborn's status Birth order
IDC 056	Female fertility by age group (broken down by district, municipality, region and residence area)	The number of female population aged 15-49 years, live births by Mother's age broken down by: <ul style="list-style-type: none"> <li>• districts;</li> <li>• municipality;</li> <li>• region;</li> <li>• residence area.</li> </ul>	IDNP Birth date Death date Gender Domicile Date and direction of state border crossing Newborn's status Birth order
IDC 057	Average age of Mother at all births (broken down by district, municipality, region and residence area)	The number of female population aged 15-49 years, live births by Mother's age broken down by: <ul style="list-style-type: none"> <li>• districts;</li> <li>• municipality;</li> <li>• regions;</li> <li>• residence area.</li> </ul>	IDNP Gender Child's date of birth Mother's/Father's domicile Newborn's status Birth order Mother's date of birth Child's order Date and direction of state border crossing
IDC 058	Average age of Mother at first birth (broken down by district, municipality, region and residence area)	The number of female population aged 15-49 years, live births (first order) broken down by: <ul style="list-style-type: none"> <li>• Mother's age;</li> <li>• district;</li> <li>• municipality;</li> <li>• region;</li> <li>• residence area.</li> </ul>	IDNP Gender Child's date of birth Mother's/Father's domicile Newborn's status Birth order Mother's date of birth Child's order
IDC 059	Average age at the first marriage (broken down by	The average number of population married for the first time, the average age at the first marriage broken down by:	IDNP Date of marriage, Birth date

	<b>Information Subsystem "Population and Migration Statistics"</b>	Security Classification
		C2 – Internal Use

ID	Indicator	Calculation or Display Peculiarities	Primary Data Used for Calculation
	district, municipality, region, residence area and gender)	<ul style="list-style-type: none"> <li>district;</li> <li>municipality;</li> <li>region;</li> <li>residence area.</li> </ul>	Gender Domicile
IDC 060	Average age at divorce (broken down by district, municipality and gender)	The number of divorces by the age of the spouse (male, female)	IDNP Date of divorce Birth date Gender Domicile
IDC 061	Life expectancy by gender (broken down by district, municipality, region and residence area)	The average number of population, the number of deaths by age, the number of live births broken down by: <ul style="list-style-type: none"> <li>district;</li> <li>municipality;</li> <li>region;</li> <li>residence area;</li> <li>gender.</li> </ul>	IDNP Death date Birth date Gender Domicile Newborn's status Net migration
IDC 062	Life expectancy at birth and certain ages broken down by gender and residence area	The average number of population/the number of deaths for certain age groups, the number of live births broken down by: <ul style="list-style-type: none"> <li>district;</li> <li>municipality;</li> <li>region;</li> <li>residence area;</li> <li>gender.</li> </ul>	IDNP Death date Birth date Gender Domicile Newborn's status Net migration
IDC 063	Standardized mortality rates by causes of death, broken down by gender and age group	The average number of population, the number of death d by age group, causes of death (European Standard Population) by: <ul style="list-style-type: none"> <li>district;</li> <li>municipality;</li> <li>gender.</li> </ul>	IDNP Death date Birth date Gender Domicile Newborn's status Citizenship Net migration Cause of death