



Moldova

## Request for Proposal (RFP)

Ref. no. **RfP11/00398**

Date: 19 July 2011

Dear Sir/Madam,

**Subject: RFP for the development of e-Health patient appointment scheduler.**

1. You are requested to submit a proposal for information system development services, as per enclosed Terms of Reference (TOR).
2. To enable you to submit a proposal, attached are:
  - i. Instructions to Offerors (Annex I)
  - ii. General Conditions of Contract (Annex II)
  - iii. Terms of Reference (TOR) (Annex III)
  - iv. Proposal Submission Form (Annex IV)
  - v. Price Schedule/Financial Proposal (Annex V)
  - vi. System Concept Design (Annex VI)
3. Your offer comprising of technical proposal and price schedule/financial proposal, in separate sealed envelopes, marked with **“RFP: e-Health appointment system”** should reach the UNDP office no later than **19 August 2011, 16:30**, local time.

Offers can be submitted either in hard copy or electronically.

a) Documents/offers in hard copy need to be addressed to:

**UNDP Moldova,**

**131, 31 August 1989 Street, MD-2012 Chisinau, Republic of Moldova**

**Attention: Registry Office/Procurement**

b) Offers sent electronically need to be addressed to the following e-mail address:

**[tenders-Moldova@undp.org](mailto:tenders-Moldova@undp.org)**


Offers shall be clearly marked with **“RFP: e-Health appointment system”**

Contact person for clarifications: Mr. Mihail Beregoi, Project Manager – [mihail.beregoi@undp.org](mailto:mihail.beregoi@undp.org)

UNDP Moldova will organise on its premises a pre-bidding conference on **2 August 2011 at 10:00**. Representatives of all interested applicants are invited to attend. To confirm participation, please send a message to [lidia.marchitan@undp.org](mailto:lidia.marchitan@undp.org) by COB on 1 August 2011.

4. If you request additional information, we would endeavor to provide information expeditiously, but any delay in providing such information will not be considered a reason for extending the submission date of your proposal.
5. You are requested to acknowledge receipt of this letter and to indicate whether or not you intend to submit a proposal.

Yours sincerely,

  
Matilda Dimovska,  
Deputy Resident Representative

*CMU*

**Instructions to Offerors****A. Introduction****1. General**

The purpose of this Request for Proposals (RFP) is to solicit proposals from the qualified companies to develop services for “**e-Health patient appointment scheduler**”, according to TOR ANNEX III.

The offers must be composed of two parts: *technical* and *financial*. Each part is presented in sealed envelopes. The Offers from Consortia formed by foreign companies and companies registered in Moldova will be accepted for evaluation.

The Contract will be awarded to the Company (Consortia) with the proposal that will obtain the highest score according to evaluation criteria.

**2. Cost of proposal**

The Offeror shall bear all costs associated with the preparation and submission of the Proposal, the UNDP will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the solicitation.

**B. Solicitation Documents****3. Contents of solicitation documents**

Proposals must offer services for the total requirement. Proposals offering only part of the requirement will be rejected. The Offeror is expected to examine all corresponding instructions, forms, terms and specifications contained in the Solicitation Documents. Failure to comply with these documents will be at the Offeror’s risk and may affect the evaluation of the Proposal.

**4. Clarification of solicitation documents**

A prospective Offeror requiring any clarification of the Solicitation Documents may notify the procuring UNDP entity in writing at the organisation’s mailing address or fax number indicated in the RFP. The procuring UNDP entity will respond in writing to any request for clarification of the Solicitation Documents that it receives earlier than two weeks prior to the deadline for the submission of Proposals. Written copies of the organisation’s response (including an explanation of the query but without identifying the source of inquiry) will be sent to all prospective Offerors that has received the Solicitation Documents.

**5. Amendments of solicitation documents**

At any time prior to the deadline for submission of Proposals, the procuring UNDP entity may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Offeror, modify the Solicitation Documents by amendment.

All prospective Offerors that have received the Solicitation Documents will be notified in writing of all amendments to the Solicitation Documents.

In order to afford prospective Offerors reasonable time in which to take the amendments into account in preparing their offers, the procuring UNDP entity may, at its discretion, extend the deadline for the submission of Proposals.

**C. Preparation of Proposals**

## 6. Language of the proposal

The Proposals prepared by the Offeror and all correspondence and documents relating to the Proposal exchanged by the Offeror and the procuring UNDP entity shall be written in the English language. Any printed literature furnished by the Offeror may be written in another language so long as accompanied by an English translation of its pertinent passages in which case, for purposes of interpretation of the Proposal, the English translation shall govern.

## 7. Documents comprising the proposal

The Proposal shall comprise the following components:

- (a) Proposal submission form (Annex IV);
- (b) Operational and technical part of the Proposal, including documentation to demonstrate that the Offeror meets all requirements;
- (c) Price schedule/financial proposal, completed in accordance with clauses 9 and 10 (Annex V);

## 8. Operational and technical documentation

The operational and technical part of the Proposal shall contain the following documents:

- Description of the organisation (experience, human resources, technical and managerial capacity in the related field, including company's litigation and arbitration history);
- Copy of the registration certificate of the organisation and licenses to perform project activity;
- Company's portfolio regarding successfully implemented similar assignments;
- Company's list of customers/ beneficiaries of services for the past years;
- CVs and certificates of staff proposed for implementation of this project and their role, in accordance with clause 8 of the Annex III;
- Work plan and approach (detailed description of activities, timeline, agenda);
- Implementation plan and indication of the required licensing system operation throughout the contract;
- Risk Log;
- Warranty period for the proposed IT solution;
- Detailed Budget for the implementation of the assignment (presented in a separate envelope);
- Other relevant documents

## 9. Proposal form

The Offeror shall structure the operational and technical part of its Proposal as follows:

### (a) Management plan

This section should provide corporate orientation to include the year and state/country of incorporation and a brief description of the Offeror's present activities. It should focus on services related to the Proposal.

This section should also describe the organisational unit(s) that will become responsible for the contract, and the general management approach towards a project of this kind. The Offeror should comment on its experience in similar projects and identify the person(s) representing the Offeror in any future dealing with the procuring UNDP entity.

### (b) Resource plan

This should fully explain the Offeror's resources in terms of personnel and facilities necessary for the performance of this requirement. It should describe the Offeror's current capabilities/facilities and any plans for their expansion.

(c) Proposed methodology

This section should demonstrate the Offeror's responsiveness to the specification by identifying the specific components proposed, addressing the requirements, as specified, point by point; providing a detailed description of the essential performance characteristics proposed warranty; and demonstrating how the proposed methodology meets or exceeds the specifications.

The operational and technical part of the Proposal should not contain any pricing information whatsoever on the services offered. Pricing information shall be separated and only contained in the appropriate Price Schedules.

It is mandatory that the Offeror's Proposal numbering system corresponds with the numbering system used in the body of this RFP. All references to descriptive material and brochures should be included in the appropriate response paragraph, though material/documents themselves may be provided as annexes to the Proposal/response.

Information which the Offeror considers proprietary, if any, should be clearly marked "proprietary" next to the relevant part of the text and it will then be treated as such accordingly.

**10. Proposal prices**

The Offeror shall indicate on an appropriate Price Schedule/Financial Proposal, an example of which is contained in these Solicitation Documents, the prices of services it proposes to supply under the contract.

**11. Proposal currencies**

All prices shall be quoted in **US Dollars and shall be exclusive of VAT**. For comparison purposes, all other currencies shall be converted into **US Dollars** using the UN Operational Rate of Exchange on the day of the competition deadline.

**12. Period of validity of proposals**

Proposals shall remain valid for one hundred and twenty (120) days after the date of Proposal submission prescribed by the procuring UNDP entity, pursuant to the deadline clause. A Proposal valid for a shorter period may be rejected by the procuring UNDP entity on the grounds that it is non-responsive.

In exceptional circumstances, the procuring UNDP entity may solicit the Offeror's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing. An Offeror granting the request will not be required nor permitted to modify its Proposal.

**13. Format and signing of proposals**

The Offeror shall prepare two copies of the Proposal, clearly marking each "Original Proposal" and "Copy of Proposal" as appropriate. In the event of any discrepancy between them, the original shall govern.

The two copies of the Proposal shall be typed or written in indelible ink and shall be signed by the Offeror or a person or persons duly authorised to bind the Offeror to the contract. The latter authorisation shall be indicated by written power-of-attorney accompanying the Proposal.

A Proposal shall contain no interlineations, erasures, or overwriting except, as necessary to correct errors made by the Offeror, in which case such corrections shall be initialled by the person or persons signing the Proposal.

**14. Payment**

UNDP shall effect payments to the Contractor after acceptance by UNDP of the invoices submitted by the contractor, upon achievement of the corresponding milestones.

## D. Submission of Proposals

### 15. Sealing and marking of proposals

The Offeror shall seal the Proposal in one outer and two inner envelopes, as detailed below.

(a) The outer envelope shall be:

- addressed to –

**UNDP Moldova**  
**131, 31 August 1989 Street, MD-2012 Chisinau, Republic of Moldova**  
**Attention: UNDP Registry Office/Procurement**

and,

- marked with –

**“RFP: e-Health appointment system”**

(b) Both inner envelopes shall indicate the name and address of the Offeror. The first inner envelope shall contain the information specified in Clause 8 (*Operational and technical documentation*) and in Clause 9 (*Proposal form*) above, with the copies duly marked “Original” and “Copy”. The second inner envelope shall include the price schedule/financial proposal duly identified as such.

Note, if the inner envelopes are not sealed and marked as per the instructions in this clause, the procuring UNDP entity will not assume responsibility for the Proposal’s misplacement or premature opening.

(c) In case of electronic submission, the Offeror shall send two messages by e-mail to the following address: [tenders-Moldova@undp.org](mailto:tenders-Moldova@undp.org)

Having prepared the Proposal in paper format as specified in Clause “D. Submission of Proposals”, hereof, the entire Proposal should be scanned or otherwise converted into one or more electronic .pdf (Adobe Acrobat) format files and attached to two e-mail messages. The first e-mail message shall contain the information specified in Clause 8 (*Operational and technical documentation*) and Clause 9 (*Proposal form*) above and shall have the following subject: **“Technical Proposal for RFP: e-Health appointment system”**. The second e-mail message shall include the price schedule/financial proposal and shall have the following subject: **“Financial Proposal for RFP: e-Health appointment system” - DO NOT OPEN IN ADVANCE**. The opening of the financial proposal must be secured with the password protected ZIP archive by the Offeror, which will be given to the procuring UNDP entity upon its request after the completion of the technical proposal evaluation.

To assist procuring UNDP entity in the assurance of transparency, it is recommended that, prior to sending the Email(s), Offerors should open “Options”, then “Voting and Tracking Options” and select “Request a delivery receipt for this message” AND “Request a read receipt for this message”. This option path is for Microsoft Office Outlook software. Other software should offer similar options, although the path and wording might be somewhat different.

### 16. Deadline for submission of proposals

Proposals must be received by the procuring UNDP entity at the address or e-mail address specified under clause *Sealing and marking of Proposals* no later than **19 August 2011, 16:30**, local time.

The procuring UNDP entity may, at its own discretion extend this deadline for the submission of Proposals by amending the solicitation documents in accordance with clause *Amendments of Solicitation Documents*, in which case all rights and obligations of the procuring UNDP entity and Offerors previously subject to the deadline will thereafter be subject to the deadline as extended.

#### **17. Late Proposals**

Any Proposal received by the procuring UNDP entity after the deadline for submission of proposals, pursuant to clause *Deadline for the submission of proposals*, will be rejected.

#### **18. Modification and withdrawal of Proposals**

The Offeror may withdraw its Proposal after the Proposal's submission, provided that written notice of the withdrawal is received by the procuring UNDP entity prior to the deadline prescribed for submission of Proposals.

The Offeror's withdrawal notice shall be prepared, sealed, marked, and dispatched in accordance with the provisions of clause *Deadline for Submission of Proposals*. The withdrawal notice may also be sent by telex or fax but followed by a signed confirmation copy.

No Proposal may be modified subsequent to the deadline for submission of proposals.

No Proposal may be withdrawn in the Interval between the deadline for submission of proposals and the expiration of the period of proposal validity specified by the Offeror on the Proposal Submission Form.

### **E. Opening and Evaluation of Proposals**

#### **19. Opening of proposals**

The procuring entity will open the Proposals in the presence of a Committee formed by the Head of the procuring UNDP entity.

#### **20. Clarification of proposals**

To assist in the examination, evaluation and comparison of Proposals, the Purchaser may at its discretion, ask the Offeror for clarification of its Proposal. The request for clarification and the response shall be in writing and no change in price or substance of the Proposal shall be sought, offered or permitted.

#### **21. Preliminary examination**

The Purchaser will examine the Proposals to determine whether they are complete, whether any computational errors have been made, whether the documents have been properly signed, and whether the Proposals are generally in order.

Arithmetical errors will be rectified on the following basis: If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected. If the Offeror does not accept the correction of errors, its Proposal will be rejected. If there is a discrepancy between words and figures the amount in words will prevail.

Prior to the detailed evaluation, the Purchaser will determine the substantial responsiveness of each Proposal to the Request for Proposals (RFP). For purposes of these Clauses, a substantially responsive Proposal is one which conforms to all the terms and conditions of the RFP without material deviations. The Purchaser's determination of a Proposal's responsiveness is based on the contents of the Proposal itself without recourse to extrinsic evidence.

A Proposal determined as not substantially responsive will be rejected by the Purchaser and may not subsequently be made responsive by the Offeror by correction of the non-conformity.

## 22. Evaluation and comparison of proposals

A two-stage procedure will be utilised in evaluating the proposals, with evaluation of the technical proposal being completed prior to any price proposal being opened and compared. The price schedule/financial proposal of the Proposals will be opened only for submissions that passed the minimum technical score of 70% of the obtainable score of 700 points in the evaluation of the technical proposals.

The technical proposal is evaluated on the basis of its responsiveness to the Term of Reference (TOR) and the Instructions to Offerors.

In the Second Stage, the price proposal of all contractors, who have attained minimum 70% score in the technical evaluation, will be compared. The **cumulative analysis scheme** will be applied with a total score being obtained upon the combination of weighted technical and financial attributes. An Offeror's response to the solicitation document is evaluated and points are attributed based on how well they meet the defined desirable criteria. Cost under this method of analysis is rendered as an award criterion, which will be 30% out of a total score of 1000 of all the desirable factors of the RFP. The contract will be awarded to the offeror obtaining the highest cumulative score. The following formula will be applied in calculating the cumulative score:

$$B = T + \frac{C_{low}}{C} \times 300,$$

where

$T$  – is the total technical score awarded to the evaluated proposal;

$C$  – is the price of the evaluated proposal; and

$C_{low}$  – is the lowest of all evaluated proposal prices among responsive proposals.

### Technical Evaluation Criteria

Summary of Technical Proposal Evaluation Forms		Score Weight	Points Obtainable	Company / Other Entity				
				A	B	C	D	E
1.	Expertise of Firm / Organisation submitting Proposal	30%	210					
2.	Proposed Work Plan and Approach	50%	350					
3.	Personnel	20%	140					
<b>Total</b>			<b>700</b>					

Evaluation forms for technical proposals follow on the next two pages. The obtainable number of points specified for each evaluation criterion indicates the relative significance or weight of the item in the overall evaluation process. The Technical Proposal Evaluation Forms are:

Form 1: Expertise of Firm / Organisation Submitting Proposal

Form 2: Proposed Work Plan and Approach

Form 3: Personnel

Technical Proposal Evaluation Form 1		Points obtainable	Company / Other Entity				
			A	B	C	D	E
<b>Expertise of firm / organisation submitting proposal</b>							
1.1	Reputation of Organisation and Staff (Competence / Reliability)	40					
1.2	Litigation and Arbitration history	15					

1.3	General Organisational Capability which is likely to affect implementation (i.e. loose consortium, holding company or one firm, size of the firm / organisation, strength of project management support e.g. project financing capacity and project management controls)	30					
1.4	Extent to which any work would be subcontracted (subcontracting carries additional risks which may affect project implementation, but properly done it offers a chance to access specialised skills.	15					
1.5	Quality assurance procedures, warranty, ISO, certificates for IT	20					
1.6	Relevance of:						
	- Specialised knowledge and experience in related areas	20					
	- IT licences and certificates	15					
	- Experience on Similar Programme / Projects	20					
	- Experience on Projects in the Region	15					
	- ICT and healthcare development issues and relevant experience	20					
<b>Total Form 1</b>		<b>210</b>					

Technical Proposal Evaluation Form 2		Points Obtainable	Company / Other Entity				
			A	B	C	D	E
<b>Proposed Work Plan and Approach</b>							
2.1	To what degree does the Offeror understand the task?	30					
2.2	Have the important aspects of the task been addressed in sufficient detail?	20					
2.3	Are the different components of the project adequately weighted relative to one another?	20					
2.4	Is the proposal based on a survey of the project environment and was this data input properly used in the preparation of the proposal?	30					
2.5	Is the conceptual framework adopted appropriate for the task?	50					
2.6	Is the scope of task well defined and does it correspond to the TOR?	110					
2.7	Is the presentation clear and is the sequence of activities and the planning logical, realistic and promise efficient implementation to the project?	90					
<b>Total Form 2</b>		<b>350</b>					

Technical Proposal Evaluation Form 3		Points Obtainable	Company / Other Entity				
			A	B	C	D	E
<b>Personnel</b>							
3.1	Project Manager	Sub-Score	70				
	General Qualification		60				
	- ICT project management experience	20					
	- Experience in implementation of e-Health projects	30					
	- Knowledge of the region	10					
	Language Qualifications		10				
			70				
3.2	Team members	Sub-Score	70				
	General Qualification		60				
	- ICT project implementation	20					



experience									
- Experience in implementation of e-Health projects	30								
- Knowledge of the region	10								
Language Qualifications		10							
		60							
<b>Total Form 3</b>			<b>140</b>						

## F. Award of Contract

### 23. Award criteria, award of contract

The procuring UNDP entity reserves the right to accept or reject any Proposal, and to annul the solicitation process and reject all Proposals at any time prior to award of contract, without thereby incurring any liability to the affected Offeror or any obligation to inform the affected Offeror or Offerors of the grounds for the Purchaser's action.

Prior to expiration of the period of proposal validity, the procuring UNDP entity will award the contract to the qualified Offeror whose Proposal after being evaluated is considered to be the most responsive to the needs of the organisation and activity concerned.

### 24. Purchaser's right to vary requirements at time of award

The Purchaser reserves the right at the time of award of contract to vary the quantity of services and goods specified in the RFP without any change in price or other terms and conditions.

### 25. Signing of the contract

Within 30 days of receipt of the contract the successful Offeror shall sign and date the contract and return it to the Purchaser.

Failure of the successful Offeror to comply with the requirement of Clause 25 shall constitute sufficient grounds for the annulment of the award and forfeiture of the Proposal security if any, in which event the Purchaser may make the award to the next lowest evaluated Offeror or call for new Proposals.

**General Conditions of Contract****1. LEGAL STATUS**

The Contractor shall be considered as having the legal status of an independent contractor vis-à-vis UNDP. The Contractor's personnel and sub-contractors shall not be considered in any respect as being the employees or agents of UNDP or the United Nations.

**2. SOURCE OF INSTRUCTIONS**

The Contractor shall neither seek nor accept instructions from any authority external to UNDP in connection with the performance of its services under this Contract. The Contractor shall refrain from any action which may adversely affect UNDP or the United Nations and shall fulfil its commitments with the fullest regard to the interests of UNDP.

**3. CONTRACTOR'S RESPONSIBILITY FOR EMPLOYEES**

The Contractor shall be responsible for the professional and technical competence of its employees and will select, for work under this Contract, reliable individuals who will perform effectively in the implementation of this Contract, respect the local customs, and conform to a high standard of moral and ethical conduct.

**4. ASSIGNMENT**

The Contractor shall not assign, transfer, pledge or make other disposition of this Contract or any part thereof, or any of the Contractor's rights, claims or obligations under this Contract except with the prior written consent of UNDP.

**5. SUB-CONTRACTING**

In the event the Contractor requires the services of sub-contractors, the Contractor shall obtain the prior written approval and clearance of UNDP for all sub-contractors. The approval of UNDP of a sub-contractor shall not relieve the Contractor of any of its obligations under this Contract. The terms of any sub-contract shall be subject to and conform with the provisions of this Contract.

**6. OFFICIALS NOT TO BENEFIT**

The Contractor warrants that no official of UNDP or the United Nations has received or will be offered by the Contractor any direct or indirect benefit arising from this Contract or the award thereof. The Contractor agrees that breach of this provision is a breach of an essential term of this Contract.

**7. INDEMNIFICATION**

The Contractor shall indemnify, hold and save harmless, and defend, at its own expense, UNDP, its officials, agents, servants and employees from and against all suits, claims, demands, and liability of any nature or kind, including their costs and expenses, arising out of acts or omissions of the Contractor, or the Contractor's employees, officers, agents or sub-contractors, in the performance of this Contract. This provision shall extend, inter alia, to claims and liability in the nature of workmen's compensation, products liability and liability arising out of the use of patented inventions or devices, copyrighted material or other intellectual property by the Contractor, its employees, officers, agents, servants or sub-contractors. The obligations under this Article do not lapse upon termination of this Contract.

**8. INSURANCE AND LIABILITIES TO THIRD PARTIES**

- 8.1 The Contractor shall provide and thereafter maintain insurance against all risks in respect of its property and any equipment used for the execution of this Contract.
- 8.2 The Contractor shall provide and thereafter maintain all appropriate workmen's compensation insurance, or its equivalent, with respect to its employees to cover claims for personal injury or death in connection with this Contract.
- 8.3 The Contractor shall also provide and thereafter maintain liability insurance in an adequate amount to cover third party claims for death or bodily injury, or loss of or damage to property, arising from or in connection with the provision of services under this Contract or the operation of any vehicles, boats, airplanes or other equipment

owned or leased by the Contractor or its agents, servants, employees or sub-contractors performing work or services in connection with this Contract.

8.4 Except for the workmen's compensation insurance, the insurance policies under this Article shall:

- (i) Name UNDP as additional insured;
- (ii) Include a waiver of subrogation of the Contractor's rights to the insurance carrier against UNDP;
- (iii) Provide that UNDP shall receive thirty (30) days written notice from the insurers prior to any cancellation or change of coverage.

8.5 The Contractor shall, upon request, provide UNDP with satisfactory evidence of the insurance required under this Article.

## **9. ENCUMBRANCES/LIENS**

The Contractor shall not cause or permit any lien, attachment or other encumbrance by any person to be placed on file or to remain on file in any public office or on file with UNDP against any monies due or to become due for any work done or materials furnished under this Contract, or by reason of any other claim or demand against the Contractor.

## **10. TITLE TO EQUIPMENT**

Title to any equipment and supplies that may be furnished by UNDP shall rest with UNDP and any such equipment shall be returned to UNDP at the conclusion of this Contract or when no longer needed by the Contractor. Such equipment, when returned to UNDP, shall be in the same condition as when delivered to the Contractor, subject to normal wear and tear. The Contractor shall be liable to compensate UNDP for equipment determined to be damaged or degraded beyond normal wear and tear.

## **11. COPYRIGHT, PATENTS AND OTHER PROPRIETARY RIGHTS**

UNDP shall be entitled to all intellectual property and other proprietary rights including but not limited to patents, copyrights, and trademarks, with regard to products, or documents and other materials which bear a direct relation to or are produced or prepared or collected in consequence of or in the course of the execution of this Contract. At the UNDP's request, the Contractor shall take all necessary steps, execute all necessary documents and generally assist in securing such proprietary rights and transferring them to UNDP in compliance with the requirements of the applicable law.

## **12. USE OF NAME, EMBLEM OR OFFICIAL SEAL OF UNDP OR THE UNITED NATIONS**

The Contractor shall not advertise or otherwise make public the fact that it is a Contractor with UNDP, nor shall the Contractor, in any manner whatsoever use the name, emblem or official seal of UNDP or the United Nations, or any abbreviation of the name of UNDP or the United Nations in connection with its business or otherwise.

## **13. CONFIDENTIAL NATURE OF DOCUMENTS AND INFORMATION**

13.1 All maps, drawings, photographs, mosaics, plans, reports, recommendations, estimates, documents and all other data compiled by or received by the Contractor under this Contract shall be the property of UNDP, shall be treated as confidential and shall be delivered only to UNDP authorized officials on completion of work under this Contract.

13.2 The Contractor may not communicate at any time to any other person, Government or authority external to UNDP, any information known to it by reason of its association with UNDP which has not been made public except with the authorization of UNDP; nor shall the Contractor at any time use such information to private advantage. These obligations do not lapse upon termination of this Contract.

## **14. FORCE MAJEURE; OTHER CHANGES IN CONDITIONS**

14.1 Force majeure, as used in this Article, means acts of God, war (whether declared or not), invasion, revolution, insurrection, or other acts of a similar nature or force which are beyond the control of the Parties.

14.2 In the event of and as soon as possible after the occurrence of any cause constituting force majeure, the Contractor shall give notice and full particulars in writing to UNDP, of such occurrence or change if the Contractor is thereby rendered unable, wholly or in part, to perform its obligations and meet its responsibilities under this Contract. The Contractor shall also notify UNDP of any other changes in conditions or the occurrence of any event which interferes or threatens to interfere with its performance of this Contract. The notice shall include steps proposed by the Contractor to be taken including any reasonable alternative means for performance that is not prevented by force majeure. On receipt of the notice required under this Article, UNDP shall take such action as, in

its sole discretion, it considers to be appropriate or necessary in the circumstances, including the granting to the Contractor of a reasonable extension of time in which to perform its obligations under this Contract

- 14.3 If the Contractor is rendered permanently unable, wholly, or in part, by reason of force majeure to perform its obligations and meet its responsibilities under this Contract, UNDP shall have the right to suspend or terminate this Contract on the same terms and conditions as are provided for in Article 15, "Termination", except that the period of notice shall be seven (7) days instead of thirty (30) days.

## **15. TERMINATION**

- 15.1 Either party may terminate this Contract for cause, in whole or in part, upon thirty days notice, in writing, to the other party. The initiation of arbitral proceedings in accordance with Article 16 "Settlement of Disputes" below shall not be deemed a termination of this Contract.
- 15.2 UNDP reserves the right to terminate without cause this Contract at any time upon 15 days prior written notice to the Contractor, in which case UNDP shall reimburse the Contractor for all reasonable costs incurred by the Contractor prior to receipt of the notice of termination.
- 15.3 In the event of any termination by UNDP under this Article, no payment shall be due from UNDP to the Contractor except for work and services satisfactorily performed in conformity with the express terms of this Contract. The Contractor shall take immediate steps to terminate the work and services in a prompt and orderly manner and to minimize losses and further expenditures.
- 15.4 Should the Contractor be adjudged bankrupt, or be liquidated or become insolvent, or should the Contractor make an assignment for the benefit of its creditors, or should a Receiver be appointed on account of the insolvency of the Contractor, UNDP may, without prejudice to any other right or remedy it may have, terminate this Contract forthwith. The Contractor shall immediately inform UNDP of the occurrence of any of the above events.

## **16. SETTLEMENT OF DISPUTES**

### **16.1. Amicable Settlement**

The Parties shall use their best efforts to settle amicably any dispute, controversy or claim arising out of, or relating to this Contract or the breach, termination or invalidity thereof. Where the parties wish to seek such an amicable settlement through conciliation, the conciliation shall take place in accordance with the UNCITRAL Conciliation Rules then obtaining, or according to such other procedure as may be agreed between the parties.

### **16.2. Arbitration**

Unless, any such dispute, controversy or claim between the Parties arising out of or relating to this Contract or the breach, termination or invalidity thereof is settled amicably under the preceding paragraph of this Article within sixty (60) days after receipt by one Party of the other Party's request for such amicable settlement, such dispute, controversy or claim shall be referred by either Party to arbitration in accordance with the UNCITRAL Arbitration Rules then obtaining, including its provisions on applicable law. The arbitral tribunal shall have no authority to award punitive damages. The Parties shall be bound by any arbitration award rendered as a result of such arbitration as the final adjudication of any such controversy, claim or dispute.

## **17. PRIVILEGES AND IMMUNITIES**

Nothing in or relating to this Contract shall be deemed a waiver, express or implied, of any of the privileges and immunities of the United Nations, including its subsidiary organs.

## **18. TAX EXEMPTION**

- 18.1 Section 7 of the Convention on the Privileges and Immunities of the United Nations provides, inter-alia, that the United Nations, including its subsidiary organs, is exempt from all direct taxes, except charges for public utility services, and is exempt from customs duties and charges of a similar nature in respect of articles imported or exported for its official use. In the event any governmental authority refuses to recognize the United Nations exemption from such taxes, duties or charges, the Contractor shall immediately consult with UNDP to determine a mutually acceptable procedure.
- 18.2 Accordingly, the Contractor authorizes UNDP to deduct from the Contractor's invoice any amount representing such taxes, duties or charges, unless the Contractor has consulted with UNDP before the payment thereof and UNDP has, in each instance, specifically authorized the Contractor to pay such taxes, duties or charges under protest. In that event, the Contractor shall provide UNDP with written evidence that payment of such taxes, duties or charges has been made and appropriately authorized.

## **19. CHILD LABOUR**

19.1 The Contractor represents and warrants that neither it, nor any of its suppliers is engaged in any practice inconsistent with the rights set forth in the Convention on the Rights of the Child, including Article 32 thereof, which, inter alia, requires that a child shall be protected from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical mental, spiritual, moral or social development.

19.2 Any breach of this representation and warranty shall entitle UNDP to terminate this Contract immediately upon notice to the Contractor, at no cost to UNDP.

## **20. MINES**

20.1 The Contractor represents and warrants that neither it nor any of its suppliers is actively and directly engaged in patent activities, development, assembly, production, trade or manufacture of mines or in such activities in respect of components primarily utilized in the manufacture of Mines. The term "Mines" means those devices defined in Article 2, Paragraphs 1, 4 and 5 of Protocol II annexed to the Convention on Prohibitions and Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects of 1980.

20.2 Any breach of this representation and warranty shall entitle UNDP to terminate this Contract immediately upon notice to the Contractor, without any liability for termination charges or any other liability of any kind of UNDP.

## **21. OBSERVANCE OF THE LAW**

The Contractor shall comply with all laws, ordinances, rules, and regulations bearing upon the performance of its obligations under the terms of this Contract.

## **22. AUTHORITY TO MODIFY**

No modification or change in this Contract, no waiver of any of its provisions or any additional contractual relationship of any kind with the Contractor shall be valid and enforceable against UNDP unless provided by an amendment to this Contract signed by the authorized official of UNDP.

## Terms of Reference

### Table of Contents

<b>1. General</b> .....	15
<b>2. References</b> .....	15
<b>3. Terminology and Abbreviations</b> .....	15
3.1 Acronyms .....	15
3.2 Key Terms .....	16
<b>4. System Usage and Benefits</b> .....	16
<b>5. Business Model of the Object of Automation</b> .....	16
5.1 Basic Processes of the Automated Object .....	17
5.2 Business Roles .....	18
5.3 Services .....	19
<b>6. Functional Requirements for the System</b> .....	19
6.1 System's Functional Model .....	19
<b>7. Requirements for the System as a Whole</b> .....	23
7.1 Requirements for the System's Architecture.....	23
7.2 Requirements for the information security and protection .....	23
7.3 Requirements regarding the information integrity .....	23
7.4 Requirements for the system performance .....	23
7.5 Requirements for the hardware and the communication channel.....	24
7.6 System Reliability .....	25
7.7 Methods of testing and Acceptance.....	25
7.8 Documentation and training .....	26
<b>8. Additional Information</b> .....	26
8.1 Technical Proposal .....	26
8.2 Project Management Activities .....	27

## 1. General

Full Name	<b>Sistemul Informational de Programare a Pacientilor</b>
Acronym (short title or abbreviation)	<b>S.I.P.P</b>
Key Area of Intervention	<b>Development of e-Health Patient Appointment Scheduler</b>
Indicative Operation	<b>Supporting the development of e-Health Patient Appointment Scheduler for complex medical investigations</b>
Implementing Authority	<b>CNMS</b>
Lead Partner	<b>UNDP</b>

**This document should be considered in connection with the System Concept document.**

The main goal of the system is to grant patients a transparent, cost-efficient and permanent access to most sophisticated consultative and diagnostic services, upon family doctors and specialists online scheduling.

The increase in access of the population of the Republic of Moldova, especially of vulnerable and poor population from rural regions to most advanced medical services available in big municipalities like Chisinau and Balti will be realized through setting up an efficient way of electronic scheduling.

The system intervention will innovatively target vulnerable groups through the use of information and communication technologies (ICTs), including pregnant women, poverty people, people with disabilities, elderly ultimately supporting the attainment of Millennium Development Goals 5 and 6. A scalable integrated information system will be set in place to increase access to quality health care services.

e-Health Patient Appointment Scheduler (S.I.P.P) must be developed to handle online appointments for patients, by medical entities. It will be an online application appointment scheduler for Special Investigation Procedures (highly specialized). This system will provide an interactive solution for medical entities to make appointments to medical institutions through an online system. By usage of this system, patients will avoid wasting their time and unnecessary costs.

The system to be implemented aims at the creation of an environment of collaboration between medical institutions and also at uniting all subdivisions and their representatives into a unique informational scheduling system. The implementation of such a system would lead to the improvement of the operational processes within the medical institutions in Moldova.

Centrul National de Management in Sanatate (CNMS) as a leading partner will supervise the system integration between medical institutions. CNMS denotes and validates the participating entities in this project by granting rights in application management.

## 2. References

The technical requirements are elaborated according to the System Concept requested by CNMS and UNDP in Moldova. All references to the regulatory enactments and guide books of international practices and general ideas about the system are specified in the System Concept.

## 3. Terminology and Abbreviations

### 3.1 Acronyms

Acronym	Description
CNAM	Compania Nationala de Asigurari in Medicina/ National Center of Medical Insurance
CNMS	Centrul National de Management in Sanatate/ National Center of Management in Healthcare
MS	Ministerul Sanatatii / Ministry of Healthcare
RM	Republica Moldova/ Republic of Moldova

UE	Uniunea Europeana/ European Union
SIPP	Sistemul Informational de Programare a Pacientilor/ Patient Appointment Information System

### 3.2 Key Terms

**Classification** (data management) – The identification and systematic arrangement of business activities and/or the data into categories, according to the logically structured conventions, methods and procedure rules, presented in a classification system.

**Classification schemes** – Hierarchic arrangement of classes, files, sub files, volumes and data.

**Document** – Registered information or object that can be treated as a whole.

**Electronic Record** – Record presented in electronic form.

**File** – An organized unit of data grouped according to the principled of connection to the same subject, activity or transaction.

**Metadata** – Data describing the context, contents and structure of data and their management in time.

**Data** – Information created, received and kept as proof by an organization or person for the fulfillment of the legal liabilities or business transactions.

## 4. System Usage and Benefits

The S.I.P.P is elaborated for the employees of the Medical Institution in Moldova for the internal use, offering in the same time the possibility of external connection for patients. S.I.P.P is meant to implement a modern solution of collaboration between the medical institutions supervised by CNMS, aiming at the improvement of appointment scheduling for special investigation procedures, decision making, workflows definition and management, which would lead to the increase of the of the quality of public services provided and to the transparency of decision making.

Among the benefits of using e-Health Patient Appointment Scheduler, there are:

- reduction of the travelling costs for patients;
- enhanced efficiency - patients become more comfortable with scheduling;
- timely booking of appointments;
- appointment reminders;
- provide medical entities with a convenient and easy way to make appointments;
- elimination of scheduling mistakes, minimizing no-shows;
- getting instant notifications on all new appointments by e-mail;
- accessibility of schedule at anytime, from a computer connected to the Internet.

## 5. Business Model of the Object of Automation

The business model to be automated includes:

- The totality of processes and tasks that are currently defined in Medical Institutions of Moldova regarding appointment scheduling to special investigation procedures
- The staff currently engaged within CNMS
- The medical personnel, as decision makers, regarding patients appointments
- The patients that interact within the system through a dedicated external interface
- Other potential roles identified in the process of S.I.P.P implementation

The S.I.P.P system must integrate conditions of work for:

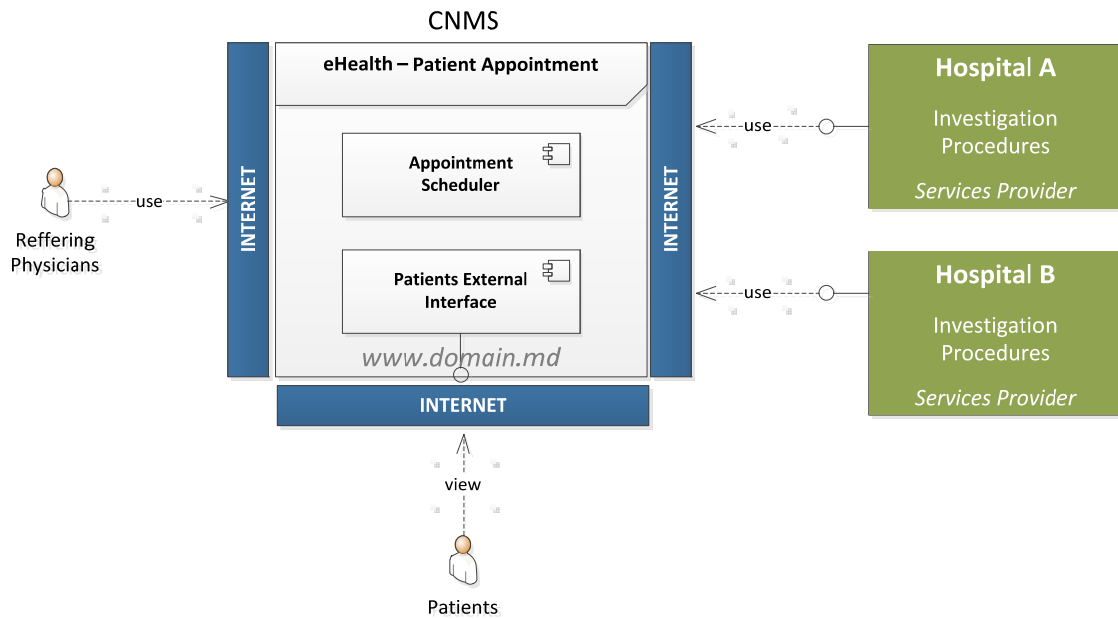
- 2-3 users in the central headquarters of CNMS (administrators)
- More than 80 Medical Institutions in Moldova (medical entities)
- More than 300 users allocated by medical institution (medical personnel)
- Up to 2.000 external users (patients) – concurrent access



### 5.1 Basic Processes of the Automated Object

The following key operational processes must be implemented in the system:

- Appointments scheduling and visualization (Fig. 1.A)



- Users/roles management (Fig. 1.B)

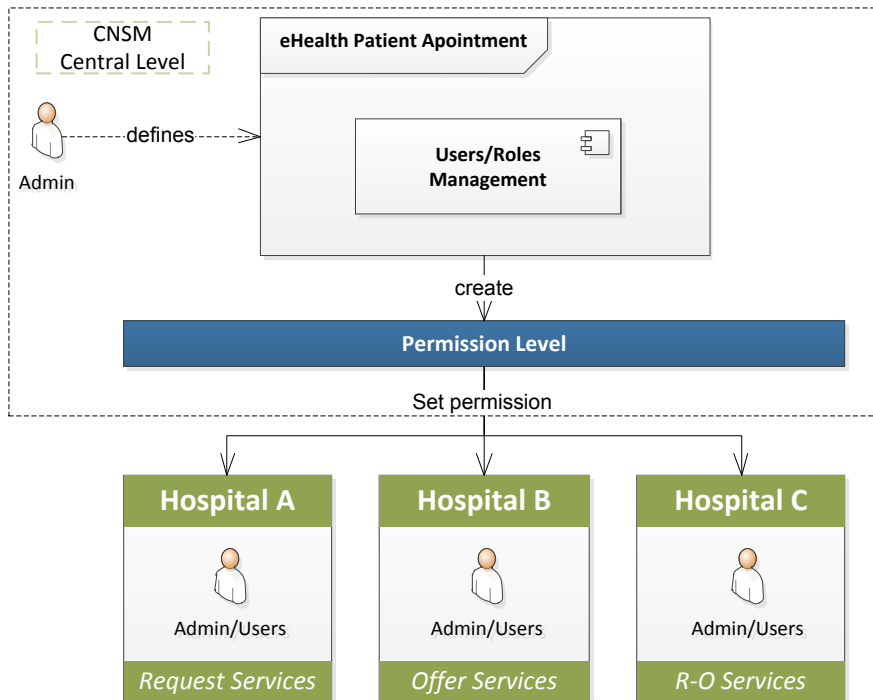
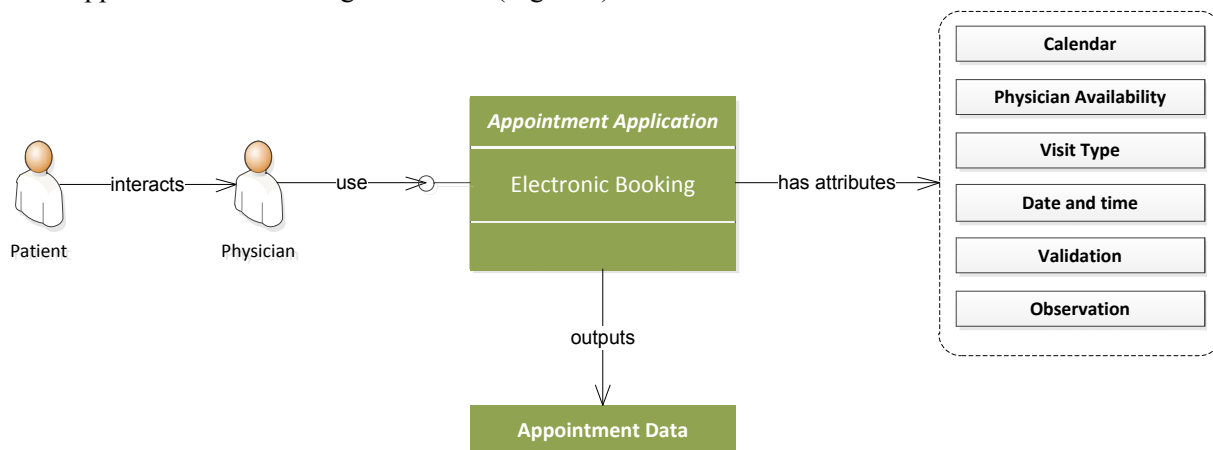


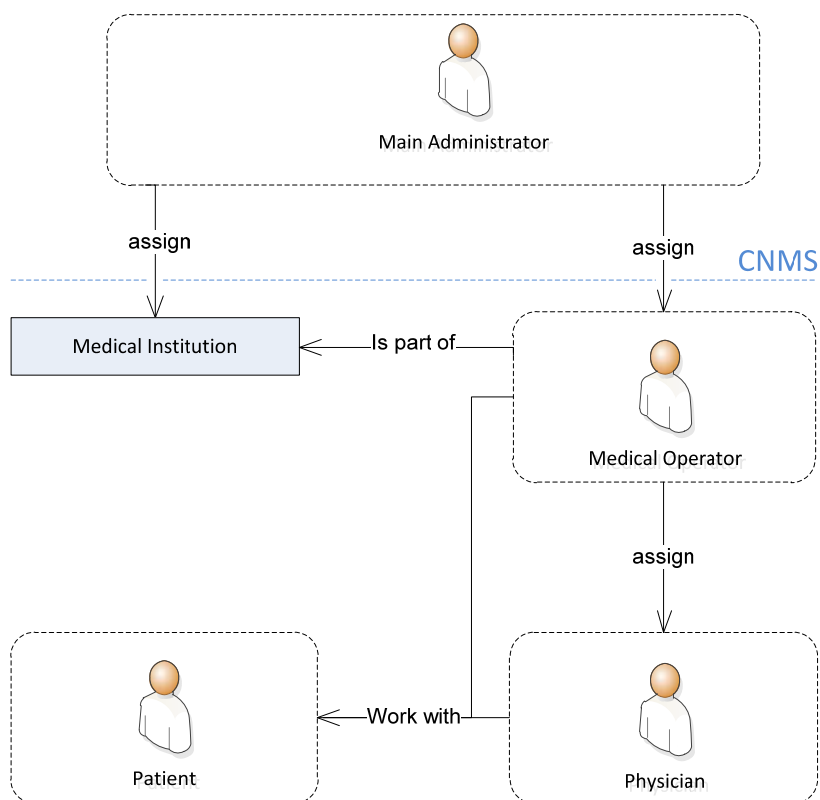
Figure 1.B

- Appointment Schedule general flow (Fig. 1.C)



## 5.2 Business Roles

Actor	Actor Description
Main System Administrator	The person with ability to approve entities such as Hospitals Institutions and roles such as Hospital Administrators. The Main System Administrator will manage Medical Entities Roles, Local Administrator, access permissions within the S.I.P.P system from CNMS. He / She has extended rights to view and intervene within the system. The Main System Administrator is part of CNMS and provides management roles within the system at informational level, part of the system entity's management and confers roles and rights.
Medical Institution	The entity allocated as primary component of the system functionality. The Medical Institution has attributes like: request services, offer services, request and offer services, includes administrator, medical operator(s), calendar, special investigation procedures, master price list and other attributes.
Medical Operator	This type of actor uses the system features: interacts with Medical Institutions Calendar, make appointments, manage appointments status, insert patients, modify patients local data, defines special investigation master file list, defines physicians correlated with Internal Medical Sections (e.g. Surgery, Cardiology) and other attributes related with this process. The Medical Operator is part of Medical Institution entity.
Physician	This type of actor uses the system features, inherits some attributes from Medical Operator like: interact with Medical Institutions Calendar, make appointments, manage appointments status, insert patients, modify patients local data and other attributes related with this process. The Physician is subordinated to Medical Operator actor.
Patient	This type of actor represents any individual related to special investigation procedures, part of S.I.P.P. This type of actor can interact with the system by accessing an external web service where he/she has the possibility to view his appointment status. The patient has limited interaction rights within the system.



### 5.3 Services

Crt	Name of Service	Description
	Authentication	The unique point of entry in the S.I.P.P system. It is preserved as a web application with internal use, available for all CNMS employees in the central office and those working in the Medical Institutions throughout the country. Authorization restrictions will be applied.
	Administration Management	This type of service is allocated for CNMS users only, the primary role is to define the authorized staff, authorized Medical Institutions, their credentials and the levels of access.
	Medical Institution Management	This type of services is allocated at local level where medical institution can define their specific attributes like: special investigation (master file list), special investigation fees (master file list), define operators and/or Physicians calendar, manage special investigations procedures and other specific attributes.
	Appointment Calendar	The appointment calendar will provide the following functions: <ul style="list-style-type: none"> <li>- access to the schedule of all medical institutions</li> <li>- real time medical appointments</li> <li>- various protocols for each of the departments or clinics</li> <li>- the individual physician's access to specific protocol(s)</li> <li>- the conditions under which the booking can take place, and in particular, the characteristics and number of free slots offered</li> <li>- the conditions for cancellation and/or rescheduling.</li> </ul>
	Monitoring and Notifications	The system will record any change of the appointment status. The involved actors will be notified at each modification of the appointment status by email or by system's messages.
	Internal Search Engine	The system will allow the Operators and/or Physicians to search available slots for one type of special investigation by filtering specific attributes.
	E-mail	This type of service allows the system to send notification to the involved actors when an appointment is accepted/cancelled or changed
	External Search Engine	This type of service allows patients to search and view their status on scheduled appointments based on unique ID's they are provided with at scheduling.
	Automated System	The automated system is a virtual role that includes all system roles, which act automatically and are guided and initiated depending on certain events taking

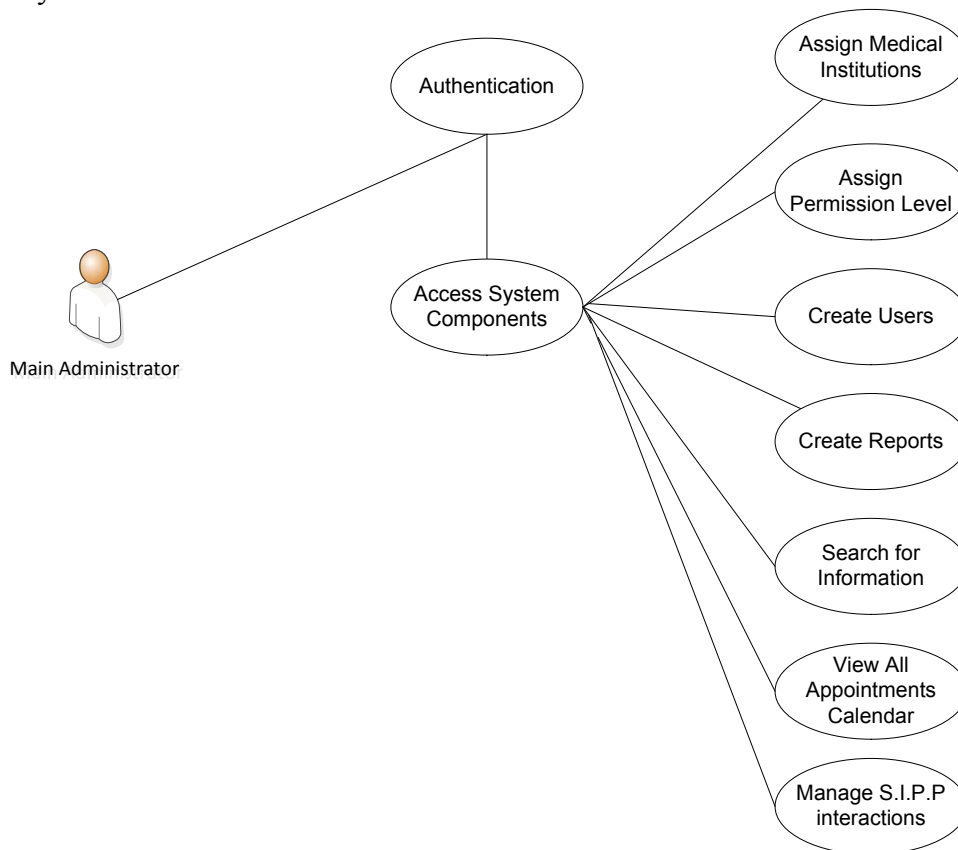
place in the system. E.g. when an appointment is due, 5 minutes before, the medic receives a notification message.

## 6. Functional Requirements for the System

The model outlined in this document will be created to meet system functional requirements. In this respect, it integrates the functions described below.

### 6.1 System's Functional Model

#### 6.1.2 Intranet System Use



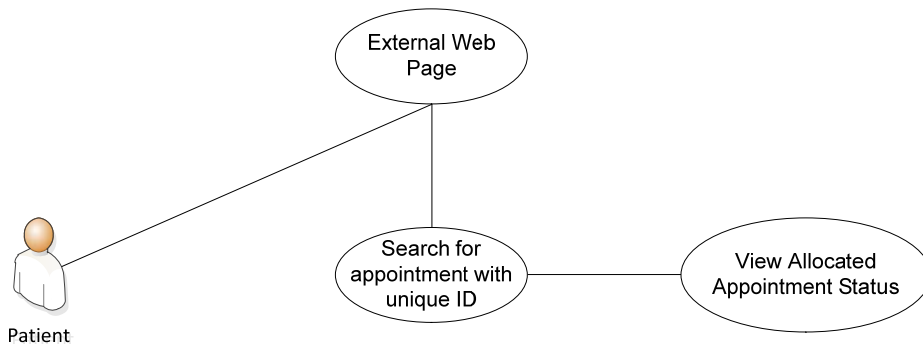
Use Case	Description
UC 01.01	<p><b>Actor:</b> Main Administrator  <b>Aim:</b> Authentication in the system, use system components  <b>Constraints:</b>  <i>Pre-condition:</i> The user must have a prior record in the system  <i>Post-condition:</i> The user accesses the informational resources within the Intranet System</p> <p>Basic script: Authentication in the Intranet System</p> <ol style="list-style-type: none"> <li>1. The user accesses the Intranet Address</li> <li>2. The user inputs the user name and password and presses the button for the confirmation</li> <li>3. The Authentication System checks the user name and the password in the Domain repository</li> <li>4. The Authentication System records the person as logged into the system and grants the credentials to the user</li> <li>5. The System Components are now available to use</li> <li>6. Success</li> </ol>

### 6.1.2 Local Operator/Physician use

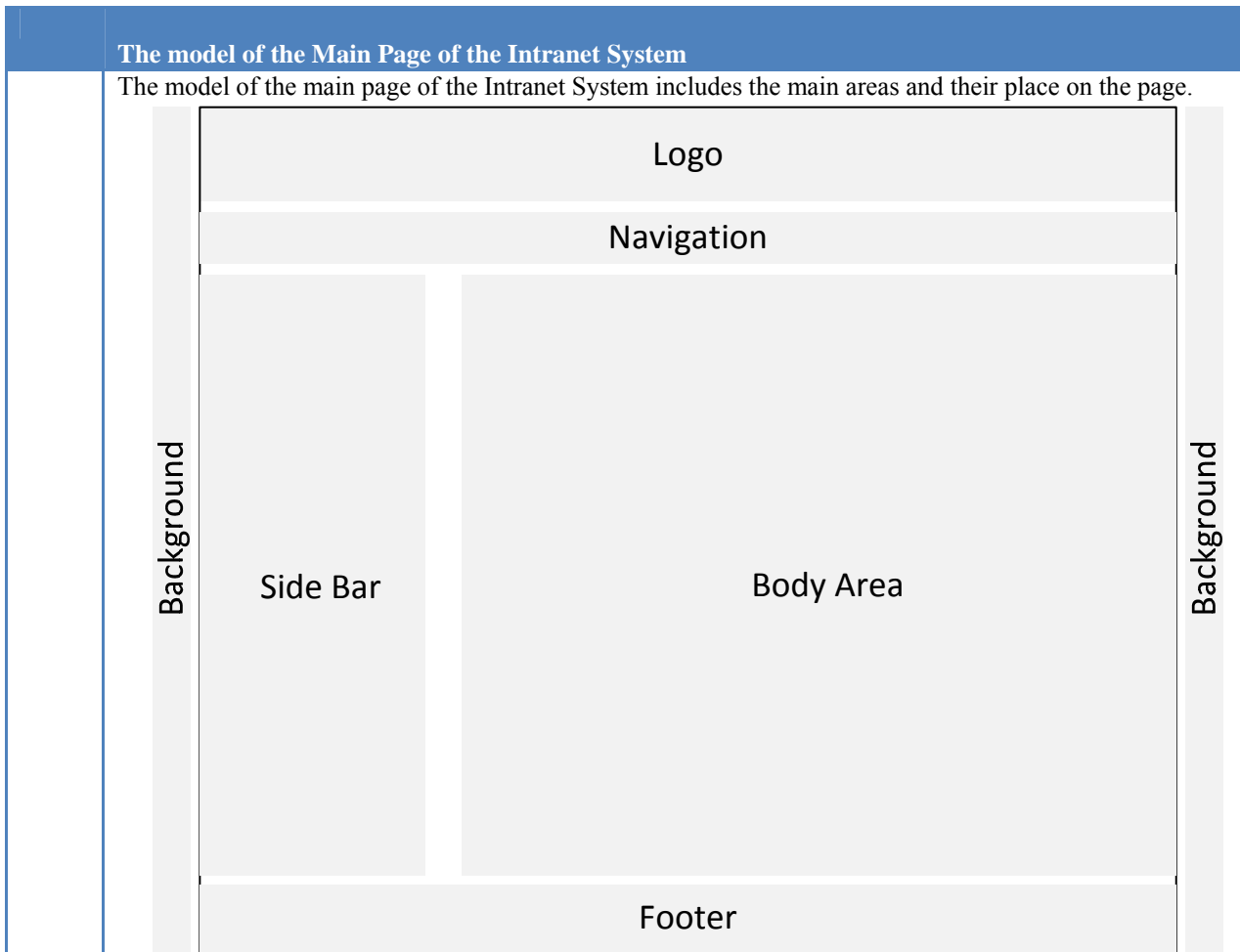


Use Case	Description
UC 01.02	<p><b>Actor:</b> Operator/Physician</p> <p><b>Aim:</b> Authentication in the system, use system components</p> <p><b>Constraints:</b></p> <p><i>Pre-condition:</i> The user must have permission level granted by main administrator</p> <p><i>Post-condition:</i> The user accesses the informational resources within the Intranet System</p> <p>Basic script: Authentication in the Intranet System</p> <ol style="list-style-type: none"> <li>1. The user accesses the Intranet Address</li> <li>2. The user inputs the user name and password and presses the button for the confirmation</li> <li>3. The Authentication System checks the user name and the password in the Data base repository</li> <li>4. The Authentication System records the person as logged into the system and grants the credentials to the user</li> <li>5. The System Components are now available to use</li> <li>6. Success</li> </ol>

### 6.1.3 Patient use



Use Case	Description
UC 01.02	<p><b>Actor:</b> Patient  <b>Aim:</b> Search allocated appointment status  <b>Constraints:</b>  <i>Pre-condition:</i> An appointment has been made, owns the unique Appointment ID  <i>Post-condition:</i> The user accesses the informational resources through Internet</p> <p>Basic script: Access the web external search engine</p> <ol style="list-style-type: none"> <li>1. The user accesses the web page i.e. <i>www.domain.md</i></li> <li>2. The user inputs the unique ID in to the search field</li> <li>3. The Appointment Scheduler checks the unique ID into data base repository</li> <li>4. The Appointment Scheduler shows the allocated appointment status</li> <li>5. Success</li> </ol>



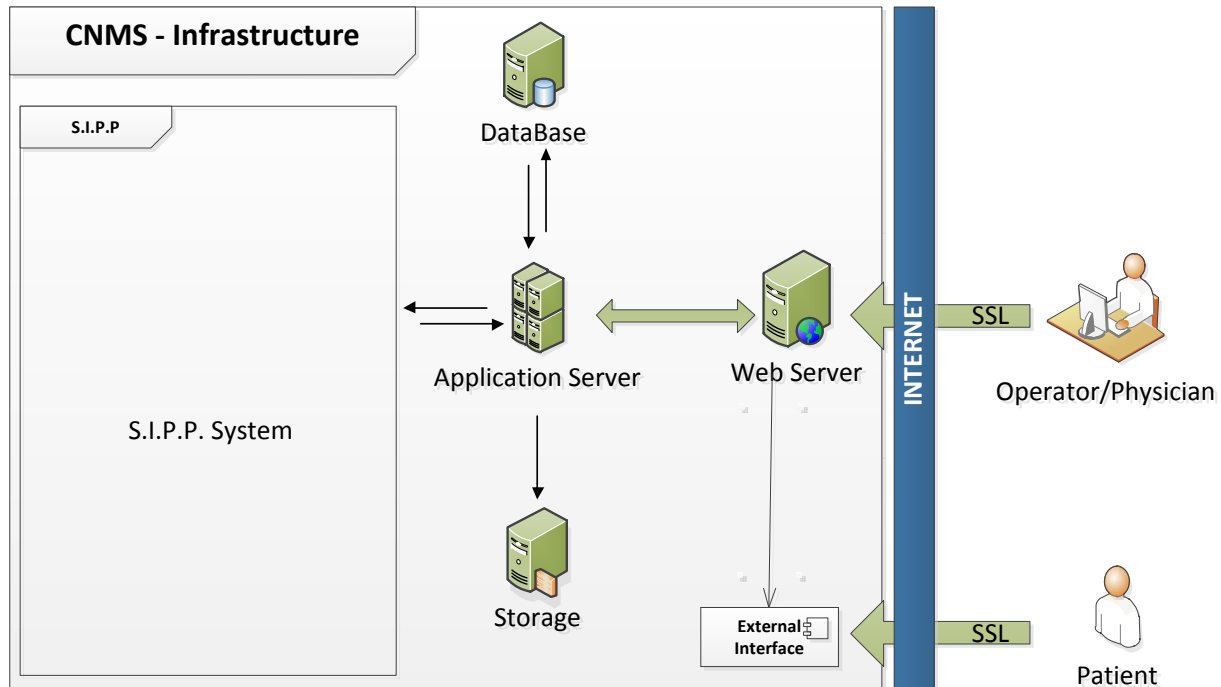
#### Area Description

- **The left column of the Main Page :** It contains a List of Components that can be accessed with useful information for all users such as: current institution calendar, access other medical institution calendar, Institution Appointment Management component, etc
- **The Central Part of the Page :** The central part of the site's page where the information and notifications will be viewed, such as create appointment, view available slots, view special investigation allocated by other medical institutions, special investigation fees etc.
- **The bottom part of the Page:** The bottom part of the Intranet page will contain information about the current system version, the contact telephone numbers of the support service and the email address of the system's administrator.
- **The upper part of the Page :** It contains general information about the Medical Centre, Logos, Welcome Messages, search engine etc.

## 7. Requirements for the System as a Whole

### 7.1 Requirements for the System's Architecture

The S.I.P.P will use the already deployed infrastructure located at central level CNMS. The current infrastructure will require a web server, which will be integrated with the infrastructure mentioned in Chapter 7.5 Requirements for the hardware and the communication channel.



### 7.2 Requirements for the information security and protection

In their activity, the employees of the Medical Institution involved in this project receive for examination and process confidential information. It is very important that the S.I.P.P system, which will collect and save a big part of this information, has an increased degree of security against external access and unauthorized access from the inner side of the system. Any action that will be fulfilled in the Intranet system will be controlled and authorized. The equipping of the S.I.P.P with authorization and authentication components is required, which will assure its informational security – the posting protection, the undesired modification or deletion of the confidential information. All users registered in the system, will be part of user groups. The user groups will be entitled to different information management rights in different system components.

### 7.3 Requirements regarding the information integrity

The information integrity is a subject covering the informational security (the application of the soft information protecting methods) and the physical security of the room in which the informational system is implemented.

CNMS currently has a room with adequate environmental conditions for hosting the S.I.P.P system servers, it has a security access system and it also has IT specialists that could overtake the maintenance and monitoring of the S.I.P.P system.

The system should include backup and restore functionalities.

### 7.4 Requirements for the system performance

The time of response desired by the users also depends on outer system factors, including:

- Width of the network band;
- Network's use;
- Network's latency;
- Configuration and use of different server recourses.

The performance requirements will be checked on a clean environment used at large scale, using modern browsers agreed with the recipient.

Reference Requirement

**PRQ001** The system must offer adequate response time to satisfy the business needs, for example:

- <50> authenticated and active internal users;

**PRQ002** The system must be capable to display the results of a simple search in a period of <5 seconds> and a complex search (which combines several terms) within <10 seconds>, regardless of the depositing capacity or the numbers of system files and records.

**PRQ003** The system must be able to overtake and display in <5 seconds> the first page of a record

**PRQ004** The system must offer comparable response even when the database scheme grows significantly in size, in order to adjust to the needs.

7.5 Requirements for the hardware and the communication channel

The Hardware equipment must allow the good functioning of the system within the limits of performance parameters exposed in this document. CNMS has already an existing infrastructure on which the intranet system could be set up, but in order the system to function in good condition, offering a better support for patients, a web server configuration should be proposed for implementation within this project, but will be procured separately by the project.

Current Server Configurations located at CNMS:

Server	Description
HP Proliant DL320 G5p	
Name	Server CNMS
System	Microsoft Windows Server 2003 Stnadrart Edition SP2
Computer	Intel(R) Xeon(R) CPU 3075 2.66GHz
RAM	3.37 GB
HD	140 GB

Server	Description
HP Proliant DL580	
Name	Mail Server
System	Microsoft Windows Server 2003 R2 Enterprise x64 Edition SP2
Computer	Intel(R) Xeon(TM)MP CPU 3.66GHz
RAM	2.00 GB
HD	146.8 GB x2

Server	Description
IBM MT-M 8085-7D6	
Name	DNS Server Mednet
System	Microsoft Windows Server 2003 R2 Enterprise Edition SP2
Computer	Intel(R) Pentium(R)4 CPU 2.8GHz
RAM	504 Mb
HD	80 GB

Server	Description
HP Proliant DL380 G4	
Name	
System	
Computer	Intel(R) Xeon(R) CPU 3.2GHz
RAM	1GB – 8GB
HD	60GB x2



Requested Web Server for the current Application, minimum requirements:

Server	Description
	Rack-mountable server with x86 CPU's and a performance demonstrate through SPEC CPU2006 benchmark of at least 230 points for SPECint®_rate2006 and 170 points for SPECfp®_rate2006
CPU	2 CPU's for a total of at least 8 cores, 12 MB of cache memory per CPU
Memory	24 GB of RAM ECC DDR3 1333 MHz, all channels populated, at least 18 DIMM slots
Storage controller	RAID controller with at least Eight internal 6 Gbps SAS ports and 256 MB of cache memory, supports RAID levels 0, 1, 5, 10, and 50
Storage	At least 4 hard disk drives with 500 GB raw space each of them, NL SAS 6 Gbps interface. Supports at least 16 hot plug disk drives
Network	4 x 1Gb Ethernet Ports (exclusive of management ports)
Expansion slots	At least 4 free PCI-Express x8 slots, at least 2 of them being able to accommodate full height and full length cards.
Ventilation	Redundant hot plug fans
Housing	Rack-mountable chassis maximum 2U with redundant hot-plug power supplies
Management	System and environmental monitoring and event recording through integrated management chip with alert capability and dedicated LAN port
Operating system	Windows Web Server 2008 R2 64Bit
UPS	Line-interactive uninterruptible power supply in rack-mountable chassis maxim 2U with at least 1500 VA capacity

**The offer shall not imply the procurement of hardware. The price quoted in the offer will include only the development of the system.**

## 7.6 System Reliability

The implementation of the S.I.P.P system will increase the dependence of the IT network users, to the extent to which these will not have the possibility to work if the system becomes unavailable. That is why measures must be taken, so that the system's availability is as high as possible.

Reference Requirements

**PRQ005** The system must be accessible by users for <16> hours during <5> working days.

**PRQ006** The planned unavailability of the system must not exceed <4> hours a day, and should be done in the period of time 22.00□7.00, or during weekends, with the preventive coordination of the CNMS's management.

**PRQ007** The unplanned unavailability of the system must not exceed <10> hours within a period of <three> months.

**PRQ008** The number of unplanned unavailability incidents must not exceed <3> hours within a period of <three> months.

**PRQ009** In case of software or hardware failure, the system recovery must be possible in a functioning condition within a term of <2 hours> at most.

## 7.7 Methods of testing and Acceptance

The system's testing will be fulfilled in two phases (methods):

- The testing in the process of system's implementation to be done by the implementing company, through specific steps according to good practices of software development care.
- The testing to be done by the CNMS employees aiming at accepting the system.(i.e. User Acceptance testing)

The CNMS must have the possibility to present their opinion about the correctness of the system's implementation by the early opinion (known as "early feedback"), this allowing to diminish the effort to correct errors or configure some components of the system at an early stage of product's implementation. This would lead to the diminishment of the total time of system's implementation.

The system's acceptance will be fulfilled as a result of User Acceptance Testing. As a result of this exercise, the implementing company, in common agreement with the persons in charge for the implementation of the S.I.P.P system within the CNMS, defines a series of critical scripts which will be run later when delivering the system and in case of their successful running, the system is considered accepted from the functional point of view. The non-functional defects will be categorized separately and the acceptance will undergo the general acceptance procedure.

The general acceptance procedure is developed by the implementing company, coordinated and approved later by CNMS.

The acceptance procedure must contain quantitative parameters for the system's quality. As a rule, these parameters must be categorized and later agreed at the level of defects (defects of 1, 2, 3 category etc). The number of accepted defects according to the categories must be mentioned in the acceptance criteria.

## **7.8 Documentation and training**

It is important to assure the persons' training concerning the information management principles at all levels, especially concerning the subject of capture of records, documents' control and management of their lifecycle.

The training is also necessary, for the elucidation of the aspects connected to the service of the relationships with clients' type (green line) and providing information and also connected to the standards of information management. This extensively involves the administrative staff at the first stages of S.I.P.P implementation.

Aiming at assuring an adequate level of competence, it is necessary to execute intensive trainings for a group of employees from different departments, including the system administrators. The training, including documents, will be made in the Romanian language. The following training sessions are necessary:

- Train the trainers – extended training for a user group (2-3 people), so that these could transfer the knowledge to the other colleagues.
- Administrators training – extended training for a group of 3-5 intern/administrative functions of the system and its components.
- Users' training – basic training to cover most of the Medical staff, regarding the basic characteristics of the system and the users' roles. (2 groups of 8-10 persons).

The training sessions, can be actually executed in one single day, so that the Medical staff could participate without disturbing their regular activities.

The documentation will include:

- User guidebooks – these will describe to the user the characteristics of the system they interact with.
- Training materials prepared for the training sessions mentioned above.
- Basic knowledge, including answers to frequent questions (FAQ)

The documentation will be prepared in Romanian language and must include an electronic format, also.

The documentation on paper mount is optional and may be included as a part of the offer. Any source code and set-up configuration developed during this project will be transferred to CNMS, so it is capable to continue the development and configuration in the future. CNMS will become the owner of the source code of the Application.

## **8. Additional Information**

### **8.1 Technical Proposal**

The technical proposal will be developed in accordance with the structure and requirements of the current Specifications and System Concept. This will include a review of technical specifications to demonstrate correspondence with those specifications.

To create and implement the S.I.P.P, applicants must provide:

- Documentation and training,
- The hardware configuration requested by CNMS
- Implementation plan and indication of the required licensing system operation throughout the contract

- Risk Log
- The tenderer shall specify the warranty period for the proposed IT solution,
- In the technical proposal, the bidder will present integration procedures and capabilities with other external systems.

The tenderer must indicate in the technical proposal the method for progress reporting on project activities. The tenderer will present in the technical proposal the acceptance plan that will be used in the project development life cycle. The plan will split the project into stages.

The offer must include an initial project plan as detailed as possible, to meet the requirements of stages and deadlines for enrollment in the project. Implementation of the entire system should cover the following steps:

- System Analysis
- System Design
- Development / configuration including internal testing
- Implementation
- Acceptance Tests
- Going live
- Technical assistance and support for the requested period
- The initial plan will be submitted within the offer and should cover all the steps mentioned above

## **8.2 Project Management Activities**

For the appropriate performance of the Project Management activities, the Supplier shall use a team of experts as follows:

### **1. Project Manager**

Minimum requirements:

- Bachelor degree in IT&C;
- At least 5 years relevant general experience in IT&C projects;
- Specific professional experience as Project Manager for IT&C projects demonstrated by presenting 2 previous e-Health projects from which at least one project shall contain all the following activities: Business and Technical Analysis (Requirements Engineering), system design, software development;
- Excellent knowledge of at least one international Project Management methodology - Project Management Professional - PMP, Projects IN Controlled Environments 2 - PRINCE2 or equivalent certification is required
- Good knowledge of at least one international framework for organizing and optimizing IT processes within organizations – ITIL Foundation Certificate or equivalent is required
- Excellent knowledge of at least one international methodology for Risk Management – Management of Risk M\_o\_R Practitioner, Risk Management Professional – RMP PMP Certificate or equivalent is required

### **2. Technical coordinator**

Minimum requirements:

- Bachelor degree in IT&C;
- At least 5 years relevant general experience in IT&C projects;
- Specific professional experience in IT&C projects demonstrated by presenting 2 previous IT&C projects in which the expert was appointed for a similar position
- Good knowledge of IT&C systems information security standards and methodologies - Certified Information Security Manager – CISM/Certified Information Systems Security Professional – CISSP or equivalent is required

- Excellent knowledge of at least one international methodology for system analysis and audit – Certified Information System Auditor – CISA Certification or equivalent is required
- Excellent knowledge of at least one international methodology for monitoring and evaluation of key performance indicators for IT&C systems - Control Objectives for Information and related Technology – COBIT Certification or equivalent is required
- Excellent knowledge (expert level) of at least one international framework for organizing and optimizing IT processes within organizations - ITIL Expert Certificate or equivalent is required
- Excellent knowledge of at least one methodology in the field of governance of IT&C systems - Certified in the Governance of Enterprise IT – CGEIT Certificate or equivalent is required
- Good knowledge of at least one international Project Management methodology - Project Management Professional - PMP, Projects IN Controlled Environments 2 - PRINCE2 or equivalent certification is required

### 3. IT System Architect

Minimum requirements:

- Bachelor degree in IT&C;
- At least 5 years relevant general experience in IT&C projects;
- Specific professional experience in IT&C projects demonstrated by presenting one previous e-Health project in which the expert was appointed for a similar position and the mentioned project contained at least all the following components: Software development services; Implementation services;
- Excellent knowledge of at least one framework for enterprise architecture – TOGAF 8 Certificate or equivalent is required
- Excellent knowledge of software solutions and application development – certificates for developing applications and solutions issued by an international software producer are required

### 4. Business analyst expert

Minimum requirements:

- Bachelor degree in IT&C;
- At least 5 years relevant general experience in IT&C projects;
- Specific professional experience as Business Analyst for IT&C projects demonstrated by presenting 2 previous e-Health projects from which at least one project shall contain all the following activities:
  - Business and Technical Analysis, system design, software development;
- Extensive business analysis experience - Certified Business Analysis Professional Certificate or equivalent is required

**The offers that will not meet the above mentioned minimum requirements will be disqualified.**



## PRICE SCHEDULE/FINANCIAL PROPOSAL

The Contractor is asked to prepare the Price Schedule/financial proposal and submit it in a separate envelope from the rest of the RFP response as indicated in Section D paragraph 15 (b) of the Instruction to Offerors.

All prices/rates quoted must be exclusive of all taxes, since the UNDP is exempt from taxes as detailed in Annex II, Clause 18. '.

The Price Schedule/financial proposal must provide a detailed cost breakdown. Provide separate figures for each functional grouping or category.

Estimates for cost-reimbursable items, if any, such as travel, and out of pocket expenses should be listed separately.

In case of an equipment component to the service provided, the Price Schedule should include figures for both purchase and lease/rent options. The UNDP reserves the option to either lease/rent or purchase outright the equipment through the Contractor.

The format shown on the following pages should be used in preparing the price schedule. The format includes specific expenditures, which may or may not be required or applicable but are indicated to serve as examples.

In addition to the hard copy, if possible please also provide the information in electronic format on CD or diskette.

<b>Price Schedule:</b>			
<b>Request for Proposals for the development of e-Health patient appointment scheduler</b>			
<b>Description of Activity/Item</b>	<b>Qty</b>	<b>Price/Rate</b>	<b>Total</b>
<b>1. Licenses</b>			
1.1 Server licenses			
1.2 Client licenses			
<b>2. Elaboration costs</b>			
2.1 Analysis			
2.2 System Design			
<b>3. Implementation costs</b>			
3.1 Development costs			
3.2 Integration costs			
3.3 Testing costs			
3.4 Deployment costs			
<b>4 Support and maintenance costs</b>			
<b>5 Training costs</b>			
5.1 Training preparation			
5.2. Training delivery			
<b>6 Other costs</b>			

**Project title:** Sistemul Informational de Programare a Pacientilor

**Document:** System Concept Design

1. Introduction .....	33
1.1 Purpose of the document .....	33
1.2 Overview .....	33
2. General.....	34
2.1 Project Identification.....	34
2.2 System Definition.....	34
2.3 System role in Unique Informational Space .....	35
2.4 System Purpose .....	35
3. Normative reference .....	36
4. Stakeholders.....	36
5. System functional area.....	37
6. Organizational structure of the system .....	38
7. System documents .....	38
8. System informational area .....	39
8.1 Conceptual Data Model.....	39
8.2 Logical Model .....	40
8.3 Logical system architecture.....	40
8.4 User Interface .....	41
8.5 Logical framework .....	42
8.6 Technological Framework.....	43
9. System Security .....	43
10. Conclusion .....	44



## Acronyms

Acronym	Description
AMP	Asistenta Medicala Primara
AT CNAM	Agentia Teritoriala a Companiei Nationale de Asigurari in Medicina
AMU	Serviciul asistenta medicala de urgenta,
AMS	Serviciul asistenta medicala spitaliceasca
APL	Administratia Publica Locala
CNAM	Compania Nationala de Asigurari in Medicina
CNMS	Centrul National de Management in Sanatate
CRDM	Centrul Republican de Diagnostica Medicala
DS	Directia sanatatii
FME	Fişa Medicala Electronica
INN	Institutul de Neurologie și Neurochirurgie
IMSP ATM	Institutia Medico - Sanitara Publica Asociatia Medicala Teritoriala
MS	Ministerul Sanatatii
PU	Programul unic
RM	Republica Moldova
UE	Uniunea Europeana
SIMI	Sistem Informational Medical Integrat

## 1. Introduction

### 1.1 Purpose of the document

This document is submitted as fulfillment of the requirements for the delivery of the System Concept in “Sistemul Informational de Programare a Pacientilor” project, Code Name: SIPP. The document provides an overview of the S.I.P.P System Concept Design. Conception is the initial document, prepared as foundation for the system to be developed and implemented, which contains the results of our research and collection of relevant information; it is the basis for further development of technical documentation.

The status of this document is draft and should be considered accordingly.

### 1.2 Overview

In Republic of Moldova, there are currently 142 hospitals under the jurisdiction of the governmental sector, and 11 hospitals in the private sector. All medical facilities benefit from having computers on site, while 75% own a local area network.

Territorially, it is mentionable that the highest degree of medical facilities owning a local area network is in the Southern area of the country – 100%, while a lower degree is in the Central area – 63%.

Of the medical specialists in the system, only 13% use computer at work. This percent is higher in the Southern area – 18%, and only 9% of the specialists in the Northern area use computer at work.

Most often, computers owned by the medical facilities are used for accounting purposes – 90%, document flow – 85%, and personnel administration – 72%.

Segmenting even further the various computer operations in medical facilities, 70% of the institutions use computers to record patient details, 67% for other operational activities, 63% for prescription of drugs, and 25% for statistical purposes.

Territorially, electronic records are mostly used in the Central area – 78%, while 86% of the medical facilities in the Northern area use computers mainly for personnel administration, which is the highest degree in the Republic. Also, in the Southern area 93% of the institutions use computers for operational activities, significantly higher than in the Northern area.

76% of the doctors use computer in their work activities. Territorially, this percent is the highest in the Central area – 84%, while the lowest is in the South – 62%.

97% of the institutions have Internet connection, this percent reaching 100% in the Southern area while the lowest degree of connectivity is in the North – 93%.

Only 25% of the doctors have access to an Internet connected computer at work. Territorially, this degree is significantly higher in the Southern area – 59%, while the lowest is in the Northern area – 12%.

Considering all the above, an information system represents an useful tool within the hospital for increasing performance, efficiency, service quality improvement process, activity and hospital structure modeling, and also for developing a management system based on results not on resources or processes.

These are some of the advantages of the Information Technology solution, which once implemented can support doctors and medical personnel. This system will represent an important tool for the medical services with respect to improving the quality of the services delivered to the patients.

Taking into account the hospitals that are already computerized, it has been observed that real-time easy access to information provide accuracy of the reported data towards state central institutions but also of information reaching doctors and patients.

The E-Health project bridges the gap between the actual offer of medical services and the expectation of the beneficiaries, namely the population of the Republic of Moldova .

Living in a highly dynamic society and in an environment dominated by change and innovation, individuals need information and quality services which respond rapidly and efficiently to their demands.

Improved quality of the medical activity offered to the individual is the main objective of the medical services providers. This can be achieved by creating a powerful IT infrastructure which sustains the development and optimization of all activities within a hospital.

For a medical institution, optimizing the services provided to the individual is an area of high interest, and within that there is a need of an integrated solution. At the same time, such a solution will offer the opportunity to align to the newest standards in medical services.

Once having an IT solution implemented at hand, the medical personnel will benefit from owning a tool which will provide added value to their activity, at the same time this being a mean for providing access for even more individuals to high quality medical services.

## **2. General**

### **2.1 Project Identification**

Full Name	<b>Sistemul Informational de Programare a Pacientilor</b>		
Acronym (short title or abbreviation)	<b>S.I.P.P</b>		
Key Area of Intervention	<b>Development of e-Medical Appointment Scheduler</b>		
Indicative Operation	<b>Supporting the development of Medical Appointment Scheduler for Chisinau and Balti</b>		
Implementig Authority	<b>CNMS</b>		
Lead Partner	<b>UNDP</b>		
<b>Project start date</b>	<b>.././2011</b>	<b>Project end date</b>	<b>.././2011</b>

### **2.2 System Definition**

The main goal of the system is to grant patients a transparent, cost-efficient and permanent access to most sophisticated consultative and diagnostic services upon family doctors and specialists online scheduling. This will contribute to an increased number of correct diagnoses at the earliest stage of disease.

The increase in access of the population of the Republic of Moldova, especially of vulnerable and poor population from rural regions to most advanced medical services available in big municipalities like Chisinau and Balti will be realized through setting up an efficient way of electronic scheduling.

e-Medical Appointment Scheduler (S.I.P.P) must be developed to handle online appointments for Patients, by Medical entities. It will be an online application appointment scheduler for Special Consulting Procedures. This system will provide a more interactive solution for Medical entities to make appointments between Medical Institution through an online system. By usage of this system, patients will avoid wasting their time and unnecessary costs.

Among the benefits of using e-Medical Appointment Scheduler, there are:

- Mitigation of the travelling costs for patients
- Provide Medical entities with a convenient and easy way to make appointments
- Elimination of scheduling mistakes, minimizing no-shows
- Getting instant notifications on all new appointments by e-mail.
- Accessibility of schedule at anytime, from a computer connected to the Internet

### **2.3 System role in Unique Informational Space**

S.I.P.P will handle medical appointments for Hospitals located in Chisinau and Balti and other cities in Moldova. The MS and all medical institutions part of this project will have access to transparent activities and data. The system will offer the possibility to be integrated with other Governmental Components in future projects.

S.I.P.P will be implemented in two stages. In the first stage, named Pilot Project, the system will be available for a limited number of counties (i.e. 3) few medical institutions providing specialized medical services and only for some specific services. After the first stage is completed, in the second stage the integration with the remaining Medical Institutions part of this project will follow. The final goal is to integrate all Medical Institutions from Republic Moldova.

### **2.4 System Purpose**

e-Medical Appointment Scheduler (S.I.P.P) implemented at central level of medical institutions will be supported in two ways:

- By using the Internet as the connection interface for medical services involved, but also for gathering feedback from medical entities / users along with various other information about themselves or e-service that can be deployed quicker and in a much more convenient way to citizens.
- By creating a powerful tool for conducting internal business scheduling, data processing and management of consulting expertise.

Motivations that determine the implementation of e-Medical Appointment Scheduler:

- the need for improvement of the quality and accessibility of information;
- increased quality of care;
- the necessity to integrate all activities of the institution operational activity flows
- the need to increase productivity of medical staff;
- the need to improve response times to citizen requests;
- the need to reduce the bureaucratic flow;
- the need to reduce the costs;
- degree of satisfaction;
- the need for more efficient resource planning of the institution.

Consequently, the implementation of e-Medical Appointment Scheduler is a necessity because it:

- provides free access to information and exchange of information;
- improves the service offered to citizens;
- provides support for decision-making and preventive measures on the state population health
- provides a way for information to be obtained in real time
- optimizes costs and resources (money, time, personnel) - both at citizen and institution level.

### **3. Normative reference**

Informational system will be developed as a part of e-Health infrastructure and have to be designed according with existing legal base, implemented at to the present ministerial and interdepartmental projects, informational and telecommunication components of e-Health infrastructure in Moldova.

- Law on telecommunications no. 241-XVI of 15.11.2007;
- Law on access to information no. 982-XIV of 11.05.2000;
- Law on information and state information resources no. 467-XV of 21.11.2003;
- Law on electronic document and digital signature no. 264-XV of 15.07.2004;
- Decision of the Government of the Republic Of Moldova on special telecommunication systems of the Republic of Moldova no. 735 of June 11, 2002;
- Decision of the Government of the Republic Of Moldova about some measures on laying the telecommunication systems for the Public Authorities no. 256 on March 9, 2005;
- Decision of the Government of the Republic Of Moldova about the laying of the telecommunication system for the Public Authorities no. 840 on July 26, 2004;
- Decision of the Government of the Republic Of Moldova about some measures on execution of the Decision of the Government no.735 on June 11, 2002 no. 1487 on December 12, 2003.
- Decision of the Government of the Republic Of Moldova on approving the Concept of
- Governmental telecommunications system no. 183-17 of 16.02.2005;
- Decision of the Government of the Republic Of Moldova about centers of public keys certification no. 945 of 05.09.2005;

### **4. Stakeholders**

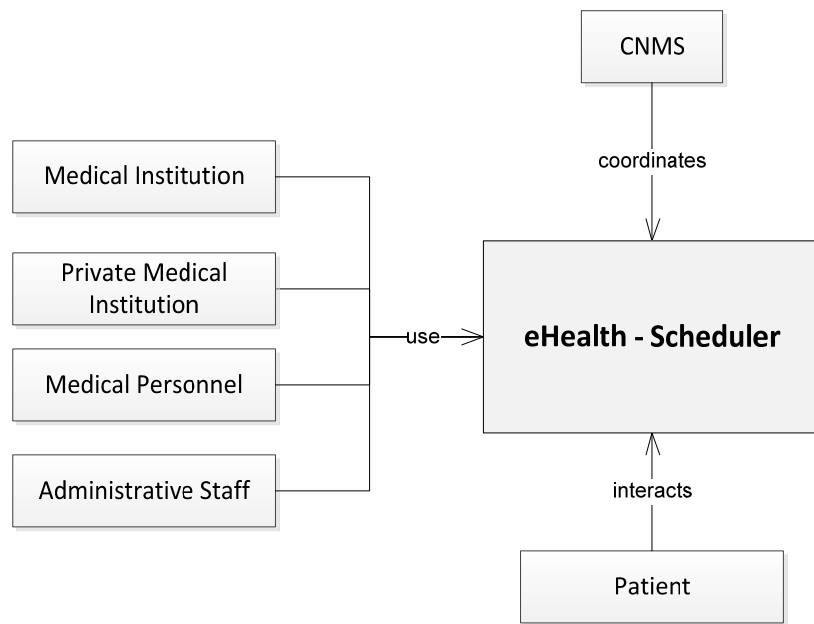
The e-Medical Appointment Scheduler is intended to facilitate real-time access to medical services. Beneficiaries of this project, considering the advantages it offers are represented by each entity in this process of medical services:

- Patient
- Medical Personnel
- Administrative Staff
- Public Medical institutions in Moldova

The number of key beneficiaries of the project exceeds 3,500,000 - the number of resident citizens who may have access to health services, directly or indirectly.

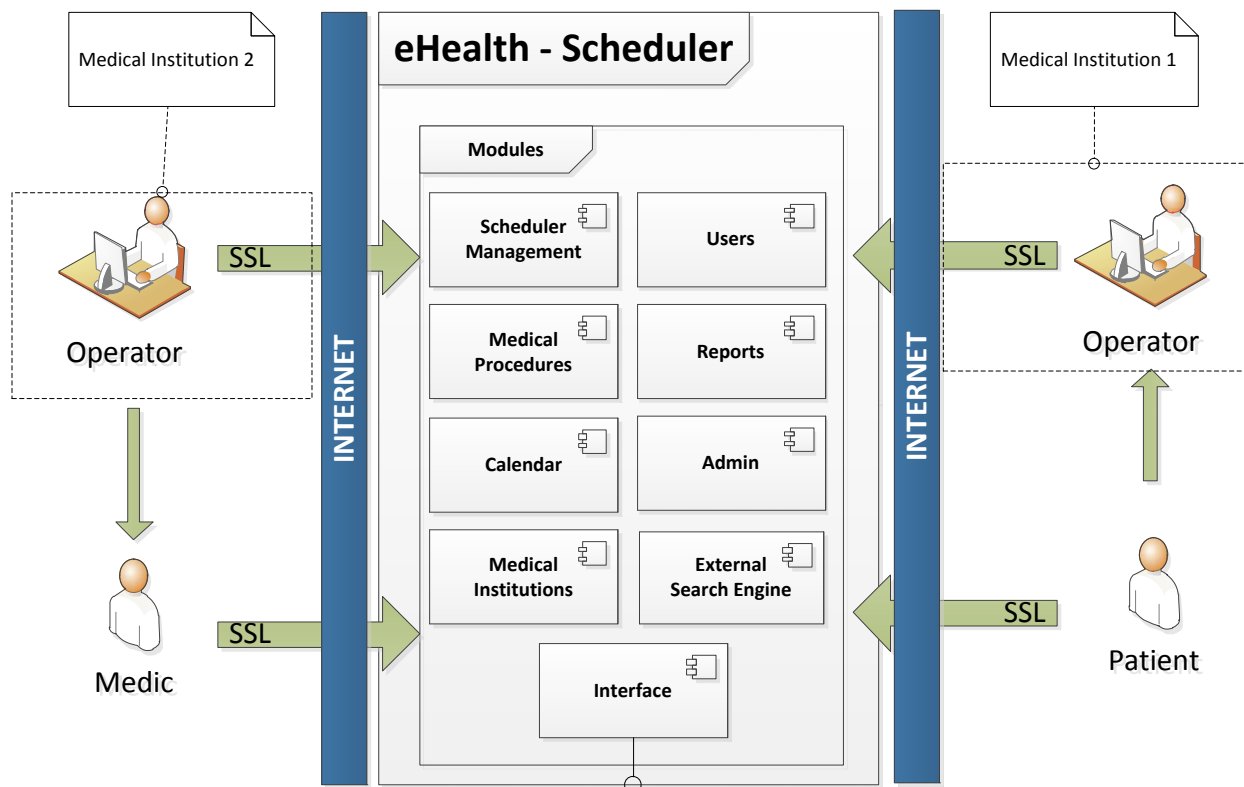
For citizens, improving the efficiency of health services is a way of increasing their life standard.

The proposed project has also indirect beneficiaries that are represented by institutions / local government and national authorities, but also companies (suppliers of consumables for the medical industry). This type of beneficiaries have access to information provided through interaction within the institutions directly involved in the project, but also through contact with citizens who are the ultimate target of this system.



### 5. System functional area

The model outlined in this document will be created to meet patient needs. In this idea, it integrates these functions generally described at higher level:



The system will be the principal mechanism for processing electronic scheduling between medical institutions.

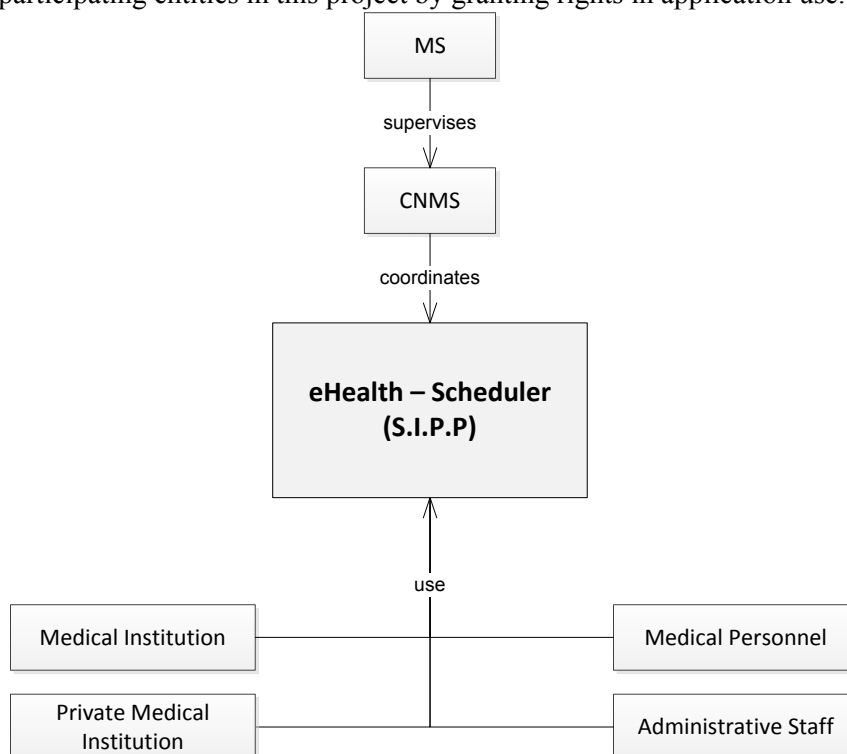
The system will manage the following operational areas:

- Real time medical appointments
- Access to all schedules for medical institutions part of this project
- Calendar view
- Administration component for CNMS
- Administration component for Medical Institutions

- The system will support compatibility with national programs, when needed, and facilitate proper integration of medical and financial data
- The system will ensure that anyone in the medical institutions to be able to access any existing information at different levels in the institution, according to rights and permissions granted by the system administrator
- The system will provide an opportunity to monitor the status of each appointment at any time by authorized users.
- The system will enable printing in a quick and easy way of the appointment made by the medical staff
- The system solution will be constructed in such a manner that to be able to quickly and easily change the user interface, so to be consistent with existing and potential future Web standards
- The system will provide a Web interface for patients, where they can visualize their appointment status
- The system will generate e-mail alerts
- Appointments status, including verified, checked-in, checked-out
- Recall notices, with the ability to send letters or reminders
- Appointment search engines
- Diagnostic master file (list)
- Procedures master file (list)
- Procedures prices by institution master file (list)

## 6. Organizational structure of the system

In the organizational structure of the system the main coordinator of the system is CNMS. CNMS denotes and validates the participating entities in this project by granting rights in application use.



## 7. System documents

Within S.I.P.P the following categories of documents are used:

- input documents, which are the basis for entering data into the system
- output documents, obtained as a result of system operation

The input documents are meant to validate the patient personal data, if the patient is insured or not, and the diagnosis based on which an appointment is required.

The output documents are meant to inform the patient and the medical entities of the appointments made.

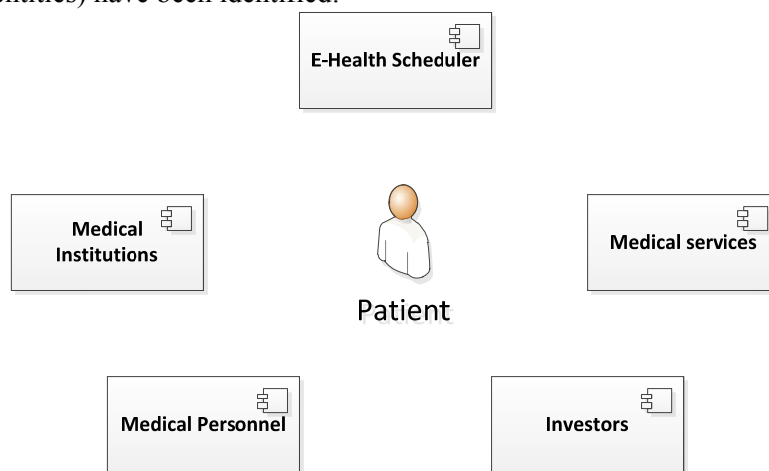
The output document will include:

- Location of the Medical Institution
- Date and Time
- The requested medical special procedure
- The operator designated by the medical unit where the appointment was made.

## 8. System informational area

Architecture of system informational area will be designed taking into account the peculiarities of internal business processes of medical institutions, the actual sphere of activity spared into business objects.

Following a review carried out internally, the following business objects (classes of business entities) have been identified:



Medical Institutions - where the patient benefits of medical care (services), they are: hospitals, laboratories, pharmacies, clinics, etc.

Medical Services – health care provided to a patient (hospital treatment, prescription receipts, medical analysis, etc.)

Medical personnel - personnel specialized in designing health services for patients (doctors, nurses)

Institutions and / or organizations entitled to support and finance the medical work of medical institutions (MS, CNMS, CNAM, etc.)

e-Appointment Scheduler (S.I.P.P) handles appointments for Medical Institutions and patients. The schedules are based on the timetable and medical activities.

### 8.1 Conceptual Data Model

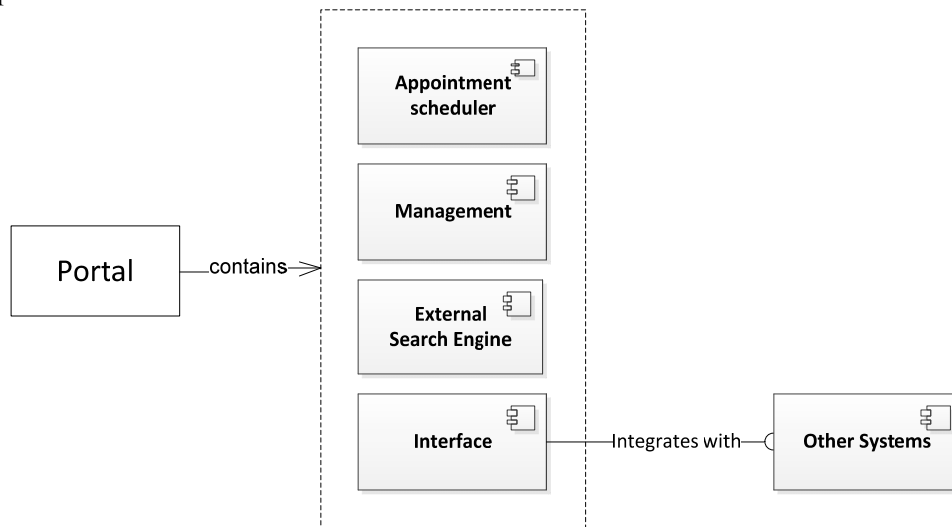
The conceptual data modeling aims at building a data model to ensure accurate implementation of the logical flow defined in business analysis.

Entity	Entity Description
Patient	Ill person
Medic	Individuals specialized and authorized in practicing medicine
Examination	Medical examination for addressing patient medical issues
Medical Scheduling (ro “trimiteri”)	Action by which a doctor (hospital) based on a document recommends a patient for consultation, treatment at another doctor (clinics, hospital)

Further details on the above entities will be explained in functional and technical specifications related to each module within the application.

## 8.2 Logical Model

### System Components



Module	Modules Description
Appointment Scheduler	<p>This module handles appointments according to date, department or medic involved. This module provides for the operator the functionality to get and set the appointment schedule of a patient according to the department's name, medical procedure, date and time, location.</p> <p>The Scheduler must have the possibility to: plan, view, update, edit, create or update the appointments.</p> <p>The Scheduler provides facilities to send e-mails within the various departments or patients personal e-mail.</p>
Management	<p>This module includes the sub modules like:</p> <ul style="list-style-type: none"> <li>• Management users, roles and Access rights</li> <li>• Management Medical institutions, configuration functions etc.</li> <li>• Management registration of patient's basic personal data</li> <li>• Management history log</li> </ul>
External Search engine	<p>This module provides an external interface for patients.</p> <p>The information displayed as a result in the external search engine will provide data among appointments status. (accepted, rejected, pending etc)</p>
Interface	<p>This module relates to the capability of the system to be integrated with other systems when needed.</p>

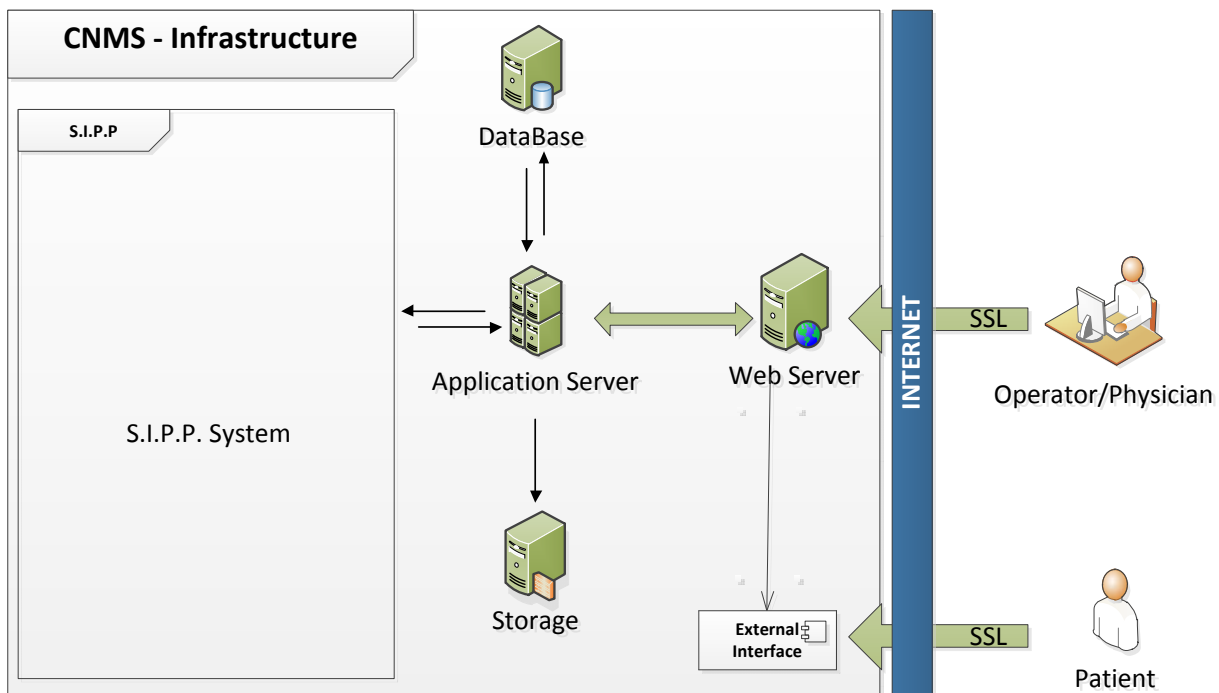
Further details on the above structure will be provided in the functional and technical specifications related to each module within the application.

## 8.3 Logical system architecture

This chapter shows the logical architecture of the system as a whole, but also the logical level of decomposition layers.

The following figure shows the components of the integrated two levels. The main system components are present at the county level can be considered centralized.





Internal users will connect into the system via a standard Internet browser from workstations within hospitals, external users will connect to web services also via Internet browser. Communication will use the HTTPS protocol (secure HTTPS). The solution must support the interaction with the application from desktop PC, mobile (laptop) and mobile phones - at least the external engine designed for patients.

#### 8.4 User Interface

The purpose of this chapter is to present the basics of user interface. This presentation is necessary to develop a guide to be followed by developers.

The system will use a web page layout that can be easily modified and adapted to future needs. Web pages that come from Portal will be developed according to current standards generally accepted in web-design, to minimize obsolescence of the system in time.

Page layout:

- Header - top of the GUI.
  - Application logo
  - Name of the application
  - Version of the application
  - Date and time

Toolbar - narrow area in the immediate vicinity of the header zone.

- Name of the user logged in
- Contextual help button
- Short messages or solicitations of application support manager or support team
- The message display area
- Close button

Application Menu - The proposal is to be displayed as a menu bar to enlarge the narrow area.

Work area - the central part of the window, the largest. It will be used by developers to create application screens. The tenderer may submit its own proposal graphical user interface, it is necessary to comply with the requirements of minimizing obsolescence of the system over time, ergonomics and ease of access to information. The solution must provide methods to upgrade and update with minimal effort.

## **8.5 Logical framework**

The proposed system architecture must be modern and scalable solution, consisting of a centralized WEB-based 3-tier architecture (database server, application server, clients).

End users will access applications through web browsers.

Regarding the client part, it should be easily to configure and the possibility must exist to have application access through Internet / Browsers.

Taking into account this architecture, end-users of the solution should only require user manuals and helpdesk access.

IT department in Institutional level (national level) CNMS - will maintain the server part (Master Administration role is allocated at CNMS).

The framework used to develop the system is divided into three layers:

These requirements have to be completed with those related to the System Architecture in Specific Functional Requirements.

It is mandatory to provide draft architecture of the proposed solution according the above requirements. The architecture will be refined during the Analysis period of implementation. The ultimate architecture has to be based on open source systems and has to be a standardized, application vendor independent technology platform. The design architecture has to be flexible in order to allow for future developments.

### 1) Presentation layer

Represents the components which are directly related to the user (internal or external). The application's presentation layer is composed of graphical user interface parts (dynamic pages, static images, style sheets etc.) and ASP.NET MVC3 Application or equivalent

### 2) Application Layer

Represents the component which includes all application logic. Will consists of several components, framed by two levels of filtering. The first level of filtration is the security filter. It will apply to any operation that comes from the presentation layer. The second level of filtering is the logging. The entire application must be based on MVC 3 framework (Model-View-Controller) or equivalent, thus separating the data and business logic from user interface. Business Objects implemented in the application will not directly access the database, but will implement a persistence level that will ensure the removal / storage of objects in the database. The main purpose of the application layer is to provide a logical view of data and execution other processes implemented in the application.

### 3) Data Layer

It is represented by the database. This level will be based on Microsoft SQL Server. Also, this layer can provide data management system in several databases installed on different servers. This part of the application suite consists of libraries that contain business logic of the application and the external services implemented by integrating servers.

Other minimal requirements:

- The system must be built from modular systems,
- Except for operating system messages, the user interface shall completely be in the Moldavian language (including all help text);
- Relevant modules must be in accordance with Moldavian accounting laws and conventions in force;
- The system and each subsystem must guarantee confidentiality and security of data;
- The system have to allow the operation with historical data
- The system have to guarantee the limit of the users responsibilities - guarantee user access to data according to a single security profile assigned to that user;
- The system have to organize data storage in such manner that data items will be stored in one single location;

- The system have to allow the future functional adaptation of the application by the beneficiary, with the possibility to administer new functions as company specific functions.

### Extension Possibility

The system should be opened to future extension and the connection of all institutions involved and their territorial entities.

Please note that the System extension and the following examples are not subject of the present tender, but the application software architecture and design must take into account the open system for further developments.

Please find below some examples of possible extensions required by each institution involved in the project:

- Local infrastructure extension
- Additional data for decision and reporting at national and County level
- Improve the integration of the local databases at institution level when needed

### **8.6 Technological Framework**

In terms of technologies that can easily meet S.I.P.P specifications logical architecture, as we have seen above, the system must support the following:

- Use of Internet browser technology. Thus, by using an Internet connection, remote locations can access the entire set of functionalities offered by the system. The system must have SOA capabilities: services, connectivity between services, consumption of services, service composition and service management. The entire system must be designed so as to meet the standards SOA, XML, XML Web Services, HTML 5, CSS3, jQuery, JavaScript.
- The application must be installed without special plugins into the browser.
- The application must be supported by mobile devices (at least the external search engine)
- The application will support drag and drop functionality.
- The development framework must have an uncoupled architecture components, such as extensibility that allows a scalable system.
- The application must have at least WEB 2.0 design interface

The architecture must allow the integration of new systems without affecting the already developed components. The framework will use Microsoft .NET technology within Microsoft Visual Studio development environment or equivalent.

### **9. System Security**

The system security must guarantee access to information and the desired functionality using a model based on roles, this security model must be implemented considering the internal organization of the Institution, allowing easy mapping of users to roles from the application. Access to specific data and functionality within each software module will be defined and managed using security model based on the identification, authentication and authorization of staff depending on the positions held by them and their duties. The system design must take into account Standards for Information Security - ISO 27001.

System security is provided from one end to another through the encryption mechanisms, as follows:

- transfer of information between the portal and the user must be done securely, using HTTPS
- transfer of information between the portal and the database will allow secure data encryption

The system will allow the possibility of securing the exchange of information between different organizations integrated with S.I.P.P, when needed.

## **10. Conclusion**

The Tenderer shall execute a detailed design for the proposed system, in compliance with the provisions of this System Concept document and the Technical Requirements in accordance with good engineering practices in Information Technology.

The Tenderer should deliver all drawings, standards and/or specific documentation of all the products, hardware and software delivered. For the products customized specifically for the Project, in addition to any standard documentation necessary to fully understand the customized products, specific detailed documentation and/or drawings (diagrams) describing the function should be delivered.

### **10.1 The Tenderer should deliver at least the following**

- Project management and execution staff
- Conclusions of analysis and the detailed description of the proposed system,
- Detailed description of network and communications facilities necessary to be provided by the Beneficiaries (i.e CNMS)
- Training program in two stages
- System Test Plan
- System Site Acceptance Program
- Support for 1 year
- Application development structure (source code)

### **10.2 Infrastructure, Database & Tools, Communication Requirements**

The Tenderer will use the Infrastructure, DataBase and servers located at central level (i.e. CNMS).

### **10.3 Development of Application Software Documentation**

The development of application software documentation is seen as a distinct service in this project due to the different types of documentation that are expected:

- Design documentation - to be used for the further development of the application software
- General use documentation - "User manual"
- System administration documentation

The tenders shall specify:

- The detailed set of documentation proposed;
- A summary description of the contents of each specific document
- The time schedule for the elaboration of each specific document (including translation into Moldavian language if the manual is first written in another language);
- The way the documentation will be distributed;
- What is the procedure followed by the Tenderer to ensure that the documentation corresponds to the latest version of the solution (before delivery and during the warranty period);
- What kind of interaction with the Implementing Authority and the Beneficiaries is necessary;
- All end-user documentation must be in Moldavian language.

### **10.4 Training**

In order to ensure the proper utilization of the system, the Tenderer, as part of the offered solution, must provide the training for both system specialists as well as end-users.

The Tenderer must provide two different types of training:

- System specialists training
- End-users training
- Train the trainers – extended training for a user group (2-3 people), so that these could transfer the knowledge to the other colleagues
- Administrators training – extended training for a group of 3-5 intern/administrative
- Functions of the system and its components
- Users' training – basic training to cover most of the Medical staff, regarding the basic characteristics of the system and the users' roles. (2 groups of 8-10 persons).

### **10.5 Support**

In order to ensure the proper utilization of the system, the Tenderer, as part of the offered solution, must provide a dedicate online application support.

- Focus on performance measures and continuous improvement besides Service Level Agreements (SLAs)
- Timely resolution of issues and root cause analysis of each issue
- Established support matrix offering Help Desk services
- Multi-level maintenance process