INTERIM REPORT NO. 3

Strengthening of Statistics Health Information System and its Harmonization with EU Requirements

Information System of Health Indicators

Contract No. 200300499503-0601-0003

Elaborated by:

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SOFTEC

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Contents

Used abbreviations

Abbreviation	Description
ASCII	American Standard Code for Information Interchange
AU	Announced Unit
CCTA	Central Computer and Telecommunications Agency
CFCU	Central Finance and Contract Unit
CRHCP	Central Register of Health Care Providers
CRMS	Central Register of Medical Staff
CSV	Comma Separated Value

Abbreviation	Description
DMZ	Demilitarized zone
DRY	Don't Repeat Yourself
EU	European Union
GUI	Graphical User Interface
HCP	Health Care Provider
HCSA	Healthcare Supervision Authority
NHIC	National Health Information National Centre
IHIS	Institute of Health Information and Statistics, since 01. 03. 2005 transformed into National Health Information Centre.
ISO	International Organisation for Standardisation
ISHI	Information System of Health Indicators
J2EE	Java 2 Platform Enterprise Edition
LAN	Local Area Network
MIS	Management Information System
MS	Microsoft
ODBC	Open DataBase Connectivity
OECD	Organisation for Economic Co-operation and Development
OLAP	Online Analytical Processing
OMG	Object Management Group
PPN	Public Private Network
RU	Reporting Unit
SAD	Small Auxiliary Database
SR-MH	Ministry of Health of the Slovak Republic
SR	Slovak Republic
SRU	Set of Reporting Units
STN EN ISO	Slovak Technical Standard for the Quality Management System
SW	Software
UML	Unified Modelling Language
WHO	World Health Organisation
XLS	Microsoft Excel File Format
XML	Extensible Markup Language

1. Introduction

1.1.   Document objectives

The submitted document contains the Interim solution status report of the project **Information System of Health Indicators** (hereinafter referred to as ISHI) as compared to the goals and project schedule approved within *the Inception Report* of the project after the closing of the project stage **Implementation and testing.**

Formally, delivery with ID 2 under *2.4 Project outcomes* is concerned.

1.2.   Document contents

In the first document chapter, document specification, its contents, references to other documents and the list of terms and abbreviations are provided.

The second chapter contains goals, stages, detailed working plan and overview of project deliveries according to the approved Inception Report.

The third chapter provides the description of the closed stage **Implementation and testing**, summarizes results of the stage, describes major issues being solved within the stage as well as resulting modifications in the project scope and working plan.

The fourth chapter provides the time schedule of the last project stage related to the project handover.

1.3.   Document references

This document refers to the documents listed in the following table:

Document ID	Document name
CR	Competition requisites
CON	Contract
OFR	Offer of the company SOFTEC s.r.o.
INREP2	Inception Report of the ISHI project, version 2.0
Mi	Minutes of the i-th analytical meeting, i being 1 to 16
DesignV2	Design of the ISHI system, version 2.0 – referred to in the document as the approved Design of the ISHI system.
IR1	Interim Report No. 1 of the ISHI project , version 2.0
IR2	Interim Report No. 2 of the ISHI project , version 2.0

1.4.   Terms and abbreviations

The following list of terms provides the terms in alphabetical order which may be differently interpreted. For each term the detailed explanation is provided. Abbreviations with definitions are also included. In the definition part, single standing terms are indicated in bold.

For the sake of completeness, the list contains terms and abbreviations defined in the requirements analysis and new terms and abbreviations used in this document are added.

Term	Definition
Announced Unit	Part of RU about which RU gives reports according to its reporting duty to the given statistical survey.
Application function	Named part of the programming code with defined inputs and outputs providing specific functionality of software system for the respective application / objective field, as opposed to technologic functionality.
ASCII	American Standard Code for Information Interchange
Attribute	Basic element of the class.
AU	Abbreviation for Announced Unit.
CCTA	Central Computer and Telecommunications Agency
CFCU	Central Finance and Contract Unit
Class	Complex data type with structure consisting of basic elements. Basic elements are attributes (synonym for items). Database table is the mostly used data entity in conventional relational database. In more modern technologies, data structure can be more complex and may include functionality.
Component	Term introduced in SAD. Statistical data serving for the calculation of statistical indicator. Majority of HI is represented by just single component.
Cost centre	Part of the organization being monitored and evaluated for economic data.
CRHCP	Abbreviation for the Central Register of Health Care Providers. It contains licence data for healthcare provision completed by data resulting from statistical survey.
CRMS	Abbreviation of the Central Register of Medical Staff.
CSV	Comma Separated Value – type of a text file containing items separated by agreed separator. Following separators are assumed within this project - comma, semicolon or tabulator.
Data diagram	Diagram containing data entities and relations between them. In the UML language it is called class diagram (or static structure diagram).
Data element	Status of data entity within the given attribute, individual data for a statistical unit; this can be also sorting character, e.g. items in reports.
Demilitarized zone	Part of computer network separated from the internal organization network as well as from the internet. It shall provide safe separation of internal computer network from the internet.
Design	Stage of the software system development. In the RUP methodology, it follows after the stage *Analysis.* The goal of this stage is to specify the system architecture in detail as well as use cases for the selected programming environment.
Diagram of activities	UML language diagram. Often used for graphic presentation of *Process*.
DMZ	Abbreviation for demilitarized zone.
DRY	Don't Repeat Yourself – a slogan being principle of WAFT framework which is applied for the design of ISHI web application.
EPIS	Infectious Disease Monitoring Information System for Public Health Offices
EU	European Union

Term	Definition
External Interface	Interface to the other software system. In the case of conventional software systems, data structure for sending data from the one system to the other was assumed. For modern systems, also another aspects can be added such as the name of called service / function etc.
FAAST (FAAST C++)	Framework developed by the company Softec for the design of client/server applications featuring thick client.
FK	Foreign Key.
Framework	Supporting structure applicable for the development of software systems. Typically its consists of code libraries, auxiliary software and scripting languages helping the developer to design and interconnect software system components.
GUI	Graphical User Interface
HCP	Abbreviation for Health Care Provider
HCSA	Healthcare Supervision Authority
Health Care Provider	a) NP or LP providing healthcare based on permission under the Act No. 578/2004 § 3 Section 4 b) or b) NP, providing licensed healthcare under the Act No. 578/2004 § 3 Section 4 c) or the Act No. 578/2004 § 3 Section 4 d).
Health Indicator	Numeric data item of the ISHI system being object of outputs which are provided to various users.
HI	Abbreviation for Health Indicator.
NHIC	National Health Information Centre. The organization, the original project recipient ISHI – IHIS was transformed into.
HTU	Higher territorial unit. Self-governing body with the competence to approve operation of the medical facility.
IDMIS	Infectious Disease Monitoring Information System for Public Health Offices (also abbreviated as EPIS)
IHIS	Institute of Health Information and Statistics
Indicator	Aggregated statistical data.
ISO	International Organization for Standardization
ISHI	Information System of Health Indicators
Item	Synonym for attribute.
J2EE	Java 2 Platform Enterprise Edition
LAN	Local Area Network
Logical collection	It is defined by single form – and by reporting duty of the RU towards the form.
LP	Legal Person
Manager information system	Software technology based on data storage in the form of multidimensional cubes. It is primarily applied for complex or ad hoc data analyses.
ME	Abbreviation for Medical Employee.
Medical Employee	Physician, dentist, pharmacist, nurse, midwife, laboratory technician, assistant, technician, other medical staff.
Medical Facility	Facility in which healthcare is provided on the basis of licence granted by SR-MH or HTU. Field of activities provided in the respective facility shall be specified in the licence. Relation between medical facility and its special departments is not exactly regulated.

Term	Definition
MF	Abbreviation for Medical Facility
MIS	Abbreviation for Management Information System
MS	Microsoft
Notified Unit	Part of RU, about which RU is giving report according to its reporting duty for a given statistical survey
NP	Natural Person
NUTS	Categorization system of regional and statistical units (according to the French name Nomenclature des Unités Territoriales Statistiques) elaborated by Eurostat which serves for purposes of social, economic and structural analyses of territorial units.
ODBC	Open DataBase Connectivity
OECD	Organisation for Economic Co-operation and Development
OLAP	Online Analytical Processing
OMG	Object Management Group
Permission holder	NP or LP granted permission by competent administration body to operate health facility.
PGSS	Abbreviation for Program of Governmental Statistical Surveys.
Physical collection	For the respective RU it is defined by any forms having reporting duty to RU.
PK	Primary Key
VPN	Virtual Private Network
Process	Sequence of work activities applied in the respective organization/enterprise in line with the mission of the organization/enterprise usually leading to production or provision of services. Activities can be both non-automatized and automatized (supported by software system).
Rational Unified Process (RUP)	Methodology developed by the company Rational (at present, part of IBM) for the development of software systems. This methodology is based on the application of UML language for the specification of system architecture, utilization of use cases and iterative/incremental system design.
Report	Status of statistical unit provided by reporting unit within single collection. It contains cumulated statistical data.
Reporting (report or message)	It includes data of a single person – patient or insured person or HCP, ME.
Reporting Unit	Person (natural person or legal person) (e.g. HCP, drug dealer, HCSA, Statistical Office of the SR etc.) or ME's employer. Only a person (natural person or legal person) can be obliged to reporting duty. RU is regulated by the following Acts: the Act No. 540/2001 Coll. on State Statistics and the Act No. 576/2004 Coll. on healthcare, services related to healthcare provision and on amending and supplementing certain acts.
Role (user's role)	Type of the software system user. Usually, it is equivalent to the working position in the organization. In the case the working position comprehends several different types of activities, multiple roles are being created. With the organization, one role can be assigned to more employees.
RU	Abbreviation for Reporting Unit
SAD	Abbreviation for Small Auxiliary Database. Database of health indicators which was part of procurement documents.
SD	Abbreviation for Special Department

Term	Definition
Set of Reporting Units	Set of reporting units which are obliged to submit report/message within the respective collection.
SGML	Standard Generalized Markup Language
Specialized department	Part of medical facility providing specialized activity which is the object of statistical monitoring (e.g. ward, outpatients, workplace, etc.). The term has not its own legislative definition.
SR	Slovak Republic
SR-MH	Ministry of Health of the Slovak Republic
SSU	Abbreviation for Set of Statistical Units
Statistical Unit	Elementary unit, element of statistical survey
STN EN ISO	Slovak Technical Standard for the Quality Management System
SW	Software
SU	Abbreviation for Statistical Unit
Testing procedure	Sequence of steps to verify certain system functionality.
UML	Abbreviation for Unified Modelling Language
Unified Modelling Language	System of graphical languages for the specification of software systems from various perspectives. It is standardized by the OMG consortium and is applied de facto as an industrial standard for software graphic specification.
Use case	Sequence of activities exercised by system user and software system during system utilization by user.
Variable	Within this document, it has the meaning of the synonym to data entity item.
W3C	World Wide Web Consortium
WAFT	Framework developed by the company Softec for the development of web applications.
WHO	World Health Organization
XLS	Microsoft Excel File Format
XML	Extensible Markup Language – standard of the W3C consortium representing simplification of the markup language SGML. Due to its extensibility, XML language is mainly applied for defining interfaces between software systems. Definition of parameters of flexible systems represents another common XML language application.

2. Project goal, stages, plan and deliveries

In this Chapter, project goal, stages, plan and deliveries are specified as they were approved according to the Interim report No. 2 to this project.

2.1.   Project goal

The goal of the project *Information System of Health Indicators* (hereinafter referred to as ISHI) is the development of the information system supporting standardized solution process of requirement of new health indicators. ISHI shall standardize and automatize the whole process, from the collection of necessary data via statistical reports and messages, appropriate data storage, calculation of health indicators up to the availability of indicators data in the form required by international and domestic institutions and analysts in respective fields.

2.2.   Project stages

According to the *Inception report No. 2*, project goals shall be attained in the following stages (after completion of the stage *Training*)[1]:

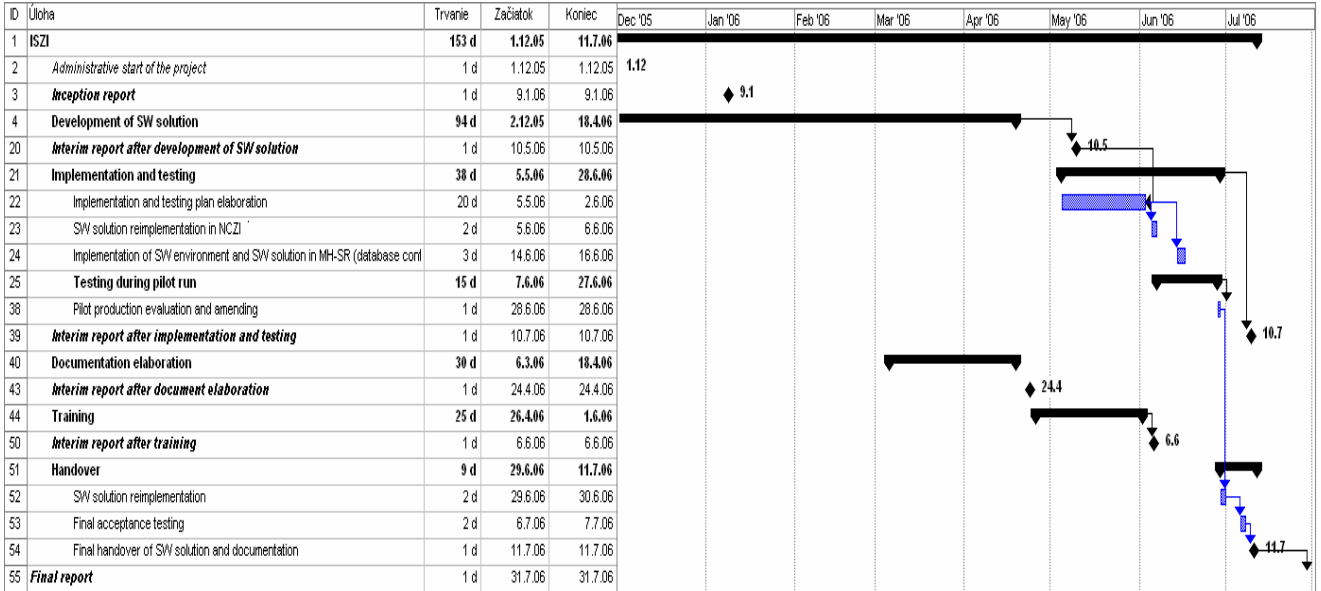|	
Development of SW solution:	Development of the information system in the following steps: requirements analysis, system design, programming and internal testing in the environment of the company Softec.
Implementation and testing:	Implementation of developed information system in the recipients environment (NHIC and SR-MH) as well as acceptance testing of the information system functionality during pilot run in the recipients environment.
Documentation elaboration:	Delivery of system and user documentation to the information system.
Trainings:	Training of administrators, operators and advisers to the information system.
Handover:	Project handover.

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[1] Completed stages are marked in colour.

2.3. Detailed project working plan

ID	Úloha	Trvanie	Začiatok	Koniec	Dec '05	Jan '06	Feb '06	Mar '06	Apr '06	May '06	Jun '06	Jul '06
1	ISZI	153 d	1.12.05	11.7.06								
2	Administrative start of the project	1 d	1.12.05	1.12.05	1.12							
3	Inception report	1 d	9.1.06	9.1.06		◆ 9.1						
4	Development of SW solution	94 d	2.12.05	18.4.06								
20	Interim report after development of SW solution	1 d	10.5.06	10.5.06						◆ 10.5		
21	Implementation and testing	38 d	5.5.06	28.6.06								
22	Implementation and testing plan elaboration	20 d	5.5.06	2.6.06								
23	SW solution reimplementation in NCZI	2 d	5.6.06	6.6.06								
24	Implementation of SW environment and SW solution in MH-SR (database conf	3 d	14.6.06	16.6.06								
25	Testing during pilot run	15 d	7.6.06	27.6.06								
38	Pilot production evaluation and amending	1 d	28.6.06	28.6.06								
39	Interim report after implementation and testing	1 d	10.7.06	10.7.06								◆ 10.7
40	Documentation elaboration	30 d	6.3.06	18.4.06								
43	Interim report after document elaboration	1 d	24.4.06	24.4.06					◆ 24.4			
44	Training	25 d	26.4.06	1.6.06								
50	Interim report after training	1 d	6.6.06	6.6.06							◆ 6.6	
51	Handover	9 d	29.6.06	11.7.06								
52	SW solution reimplementation	2 d	29.6.06	30.6.06								
53	Final acceptance testing	2 d	6.7.06	7.7.06								
54	Final handover of SW solution and documentation	1 d	11.7.06	11.7.06								11.7
55	Final report	1 d	31.7.06	31.7.06								

The stage *Implementation and testing* the results of which are discussed in the present report and the stage *Handover*, not yet realized, are provided in detail.

2.4.   Project outcomes

2.4.1. Overview of deliveries

ID	Name[2]	Contents	Deadline
1	Inception report (document)	Detailed working plan including list of activities and time schedule of the contract performance. Identification of potential risks, limits, requirements and list of persons intended for the contract performance by Softec, if already known. Conclusions resulting from the analysis of current state. Clear defined functions of designed system of the software application of health indicators according to the Softec's offer to ISHI. Detailed design of working plan of the contract performance including detailed description of project stages, procedures, rules and methods applied during the contract performance with exact definition of contents and acceptance of processes for each provided procurement object.	09.01.2006
2	Interim report (document)	Important information of works progress allowing check of tasks fulfilment resulting from the working plan of the inception report. Identification of important modifications, problems and ways of solutions arisen in the course of contract performance.	Within 5 workdays after closing of each stage
3	Final report (document)	Realization summary of the contract performance. Strong and weak points of the project. Effectiveness of project application and project efficiency. List of seminars and meetings (if appropriate). Critical study of main problems (also operation-related) with recommendation how to avoid future similar situations.	Within 30 days after the contract performance handover
4	Requirements analysis (document)	Reconsidering of system requirements, requirements for international reporting, identification and description of relevant processes, data formats and tools, information resources and contents, future system users with their specific needs and abilities, evaluation of available infrastructure of hardware environment.	09.01.2006
5	Requirements analysis after amendment procedure (document)	Same as ID 4	16.01.2006
6	System design (document)	ISHI architecture design including design of databases replication between IHIS and SR-MH, elaboration of data model which will include health indicators data, as well as necessary metadata. Functional description, Web application screen flows, menu system of internal application, definition of interfaces, defining the control set of indicators and its subset whose metadata will be filled by Softec, fulfilling requirements of the requirements analysis by designed system functionality and initial metadata filling.	31.01.2006
7	System design after amendment procedure (document)	Same as ID 6	08.02.2006

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[2] Administrative delivery with ID 1 has been realized, objective delivery ID 9 has been realized within closed project stages which are being evaluated in the present report.

ID	Name[2]	Contents	Deadline
8	Implementation and testing plan (document)	Time schedule of SW solution installation, databases and metadata filling. Testing scenarios, acceptance criteria of SW solution, plan of acceptance testing during pilot run.	26.05.2006
9	Training of administrators, analysts and officers	Training of all types of staff including delivery of related documentation. Technical documentation will include: ✓ architecture description, ✓ description of conceptual and physical system design, ✓ description of database structure, ✓ description of metadata and mechanism of application, ✓ technical description of defined indicators and OLAP cubes. Administrator documentation will include system administration manual and manual of system filling by other metadata, new indicators, new input forms and interfaces. User documentation will include system user manual also available on-line when using the application.	17.05.2006 – 02.06.2006
10	Handover of the contract performance object to customer.	In the presence of recipient's project manager and customer, Softec performs acceptance and control tests. Upon handover of the contract performance objective Softec shall submit results of executed tests providing fulfilment of requirements of realized contract performance to recipient's project manager.	07.07.2006
11	Protocol handover of project solution (SW product + documentation)	Developed SW solution on CD carrier in two identical copies. Developed SW solution shall be delivered in the form allowing eventual further modification. Installation tools for the developed SW solution shall be part of the delivery. System (operational) documentation in two identical printed copies and in two identical electronic copies for any partial documentation. User (instruction) documentation in two identical printed copies and in two identical electronic copies for any partial documentation.	11.07.2006

Reports are project administration deliveries, other deliveries are of objective character.

Takeover and approval of administration project delivery including items 10 and 11 shall be confirmed by recipient's and provider's project manager upon signing the reports and completion certificate with indication of takeover and approval date.

Takeover of other project deliveries shall be confirmed by recipient's and provider's project leader upon signing the completion certificate with indication of handover date. One copy of completion certificate of other project deliveries shall be given to recipient's project manager (SR-MH).

Completion certificates shall be elaborated in three copies: one copy is given to customer, recipient and provider.

2.4.2. Process of deliveries acceptance

ID	Delivery name	Process of delivery acceptance
1	Inception report (document)	By approval of recipient's project manager. Comments on the report shall be submitted within 15 days. Should no opinion on the report be submitted within 45 days since the date of report submission, the report shall be regarded as approved.
2	Preliminary report (document)	Same as ID1
3	Final report (document)	Same as ID1 but the period for submission of project manager's opinion on the report is 30 days instead of 15 days.
4	Requirements analysis (document)	Provider presents the contents of the document Requirements analysis to recipient's project solvers at a special meeting being a place of discussion of respective document issues, and makes an agreement on those issues. Recipient shall deliver comments to provider within terms set out in the detailed project working plan.
5	Requirements analysis after amendment procedure (document)	Upon signature of completion certificate by the recipient's project leader.
6	System design (document)	Provider presents the contents of the document System design to recipient's project solvers at a special meeting being a place of discussion of respective document issues, and makes an agreement on those issues. Recipient shall deliver comments to provider within terms set out in the detailed project working plan.
7	System design after amendment procedure (document)	Upon signature of completion certificate by the recipient's project leader.
8	Implementation and testing plan (document)	Upon signature of completion certificate by the recipient's project leader.
9	Training of administrators, operators, trainers and system users	Upon signature of completion certificate of delivery of training attendance lists.
10	Protocol acceptance of the contract performance object.	Upon signature of acceptance protocol by recipient's project leader immediately after fixing all registered critical issues of the contract performance objective (those preventing the product from utilization). Other issues shall be removed within warranty period not later than 30 days since protocol acceptance of the contract performance objective.
11	Protocol handover of project solution (SW product + documentation)	Upon signature of handover protocol.

Acceptance protocols shall be elaborated in three copies: one copy is given to customer, recipient and provider.

3. Project solution status

This Chapter provides information on the plan of the stage **Implementation and testing**, the way of its realization, identification of issues which emerged in the course of the stage.

Within the first phase, the document *Implementation and testing plan* was elaborated and agreed after having been consulted with recipients. The stated document defined the dates of the environment preparation for the pilot run at recipients, the objective of the ISHI pilot run, participants in the pilot run on recipients' side and the scope of acceptance testing during the pilot run. At the same time, provider's staff was debugging the solution provided and implementing some significant improvements which were detected during the stage **Training**.

In the second phase of the stage, the ISHI pilot run was implemented at recipients' workplaces by recipients authorized employees supported by the provider's staff in terms of *Implementation and testing plan*.

3.1.   Implementation and testing plan

3.1.1. Objective of the pilot run

Objective of the pilot run was to accomplish the acceptance testing of SW solution and ISHI documentation in the presence of providers and recipients staff.

Should a discrepancy between the user manual and ISHI functionality, unexpected or faulty ISHI behaviour occur, input of the level *serious incident* is to be made in the Softec's issuse tracking application ECHO:

Urgent	-	The fault prevents from further system operation, function can not be used.
High	-	System function provides false results.
Medium	-	Function can be used, however, with large obstructions from user's perspective.
		There is a discrepancy between system documentation and system functionality or architecture.
Low	-	Means only small design imperfection, not a functionality fault.

Any registered issue of the type *incident* of the level higher than *low* shall be regarded as a **fault**.

3.1.2. Recipients environment preparation for the pilot run

For the sake of the pilot run, the following preparation of SW environment at NHIC and SR-MH workplaces was planned:

Preparation of SW environment

NHIC

Tomcat web server installation remains the same as that used in the training.

Softec shall provide:

- installation of ISHI new versions on respective NHIC servers. Two versions of the application will be installed: pilot version and testing version.

NHIC shall provide:

- installation of a web browser and MS Office on PCs of NHIC staff: MS Excel with OLAP functions for analysts and MS Access for standard output administrators.

SR-MH

Softec shall provide:

- Oracle system and Tomcat web server installation on the server for ISHI (identical with that at NHIC).

Database installation

NHIC

Installation of database server Oracle remains the same as that used in the training.

Softec shall provide:

- development of new database schemes for the pilot run (*iszi, isziTest*)
- initial loading of both schemes by metadata from HCP register being in force for the year 2004 and from surveys realized by forms L1-01 (hereinafter referred to as L1) and Z1-01 (hereinafter referred to as Z1) within the collection for the year 2004.

NHIC shall provide:

- installation of Oracle client and ODBC for connection with the database from installation CD provided by Softec on PCs of employees authorized to participate in the pilot run.

SR-MH

Softec shall provide:

- database loading by taking data from schemes of the pilot run.

SR-MH shall provide:

- installation of Oracle client and ODBC for connection with the database from installation CD provided by Softec on PCs of employees authorized to participate in the pilot run.

3.1.3. Acceptance testing scenarios

During the testing, NHIC a SR-MH authorized users should have implemented the following basic *operating procedures* of the ISHI *User documentation* in the time schedule specified in the part *3.1.4 Time schedule of implementation and testing*:

Operating manual	Basic operating procedures
Metadata administration	Requirement of new survey
Metadata administration	Requirement of new indicator output
Metadata administration	Requirement of storing the new data type in administrative registers
Web application	Providing web application for the RU
Web application	Input of RU report in the web application
Web application	Realization of survey by collection for single year
Web application	Register update
Excel analysis	Data analysis of output views in MS Excel
MS Access reports	Creation of reports in MS Access by using output views data
System administration	Registration of new user
System administration	Change in calculation frequency of output views
System administration	Installation of Oracle client and ODBC on client PC
System administration	Installation of the new ISHI version (exe, war, db)
System administration	Database backup (by export).
System administration	Database recovery from the backup (by import).
System administration	Data replication from NHIC to SR-MH

Provider's and recipients staff should participate in the above-mentioned operating procedures for functions of the application of metada management (ISHI-meta) and web application (ISHI-web) as follows:

Softec shall provide

Prior to the pilot run:

- filling of the system by metadata and data for the HCP register, survey by using L1 and Z1 forms for the 2004 collection and outputs from the *Verification set of indicators* of these

collections. Data created in the Softec's development environment will be loaded within the installation database for the pilot run at NHIC and SR-MH (initial state).

During the pilot run:

- modification of definition of output views and their recalculation when checked by the authorized NHIC staff,

- data replication from NHIC database into SR-MH database by using replication mechanism (without VPN-based connection) – in the presence of NHIC staff.

NHIC shall provide

During the pilot run:

- Recording of ISHI users and their classification into user groups.

- Input data to the HCP register to allow:

  o Completion of generation of reporting duty to the reports of surveys by L1 and Z1 forms for the 2004 collection after the manual update of HCP register.

  o Generation of reporting duty for the collection by A3-01 form (hereinafter referred to as A3) in compliance with reporting duty registers actually applied for the 2005 collection.
  Note
  According to the document *System design,* NHIC staff should fill metadata for the forms by means of which the indicators of the collection 2004 from the *Verification set of indicators* are being collected, except for metadata for the L1 a Z1 forms, which were filled by Softec. Due to the high workload of NHIC staff as well as the planned modification of the mentioned forms, the 2005 collection by A3 form, realized by instruments outside NHIC, was selected to test in the pilot run by the NHIC staff.
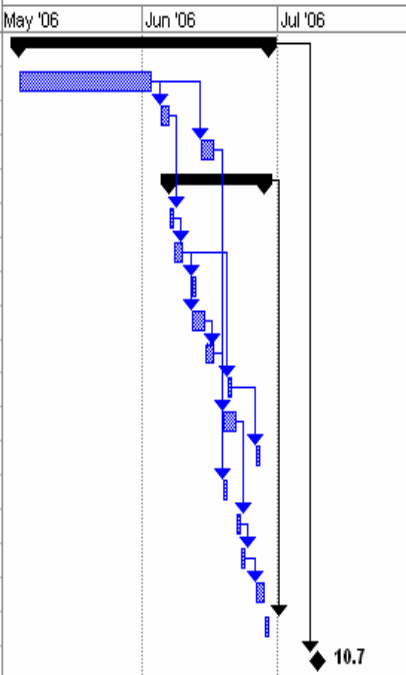
- Definition of collection metadata for the A3 form-based 2005 survey.

- Definition of outputs metadata from A3 form-based surveys realized by collection for the year 2005.

- Execution of collection for the A3 form-based survey realized by collection for the year 2005 (reports already received as xls files at NHIC will enter ISHI through import, other reports will enter through the web form).

- Design and calculation of outputs from A3 form-based surveys realized by collection for the year 2005.

- Data views analysis.

- Creation of standard reports from A3-01 form-based data received by collection for the year 2005.

- Validity verifying of the of output views definitions from surveys by L1 and Z1 forms received by collection for the year 2004.

- Installation of client PCs.

- Database backup and related recovery.

- Installation of new database system.

- Export of data for the SR-MH replication.

SR-MH shall provide

During the pilot run:

- Recording of SR-MH users and their classification into user groups. (if they intend to view ISHI-meta application data).

- Views data analysis.

- Creation of standard reports from collection data of A3 form-based survey for the year 2005.

- Installation of client PCs.

- Database backup and related recovery.

- Installation of new system version.

- Import of data for replication from NHIC.

3.1.4. Time schedule of implementation and testing

ID	Úloha	Trvanie	Začiatok
21	**Implementation and testing**	**38 d**	**5.5.06**
22	Implementation and testing plan elaboration	20 d	5.5.06
23	SW solution reimplementation in NCZI	2 d	5.6.06
24	Implementation of SW environment and SW solution in MH-SR (database conf	3 d	14.6.06
25	**Testing during pilot run**	**15 d**	**7.6.06**
26	01 - NHIC: Pilot run kick-off: schedule, users registration	1 d	7.6.06
27	02 - NHIC: ORACLE client and ODBC on usres PC are installed, Code lsit	2 d	8.6.06
28	03 - NHIC: Examined code lists, data elements and indicators from L1, Z	1 d	12.6.06
29	04 - NHIC: Defined record type and reporting duty for A3, regsiter data	3 d	12.6.06
30	05 - NHIC: Defined mudules, checks for A3. defined collection and gene	2 d	15.6.06
31	06 - NHIC: Examined indicators of views form L1 and Z1 data.	1 d	20.6.06
32	07 - NHIC: Executed collection of A3 data (reports written by RU, by imp	3 d	19.6.06
33	08 - NCZI: Verified outputs from L1 and Z1 data	1 d	26.6.06
34	09 - SR-MH: Registered users, completed Oracle client and ODBC install	1 d	19.6.06
35	10 - NHIC: Database back up and recovery executed, new version ISHI	1 d	22.6.06
36	11 - Data replication form NHIC to SR_MH completed	1 d	23.6.06
37	12 -SR-MH: Outputs from A3, L1 and Z1 analysed in Excel and reports	2 d	26.6.06
38	Pilot production evaluation and amending	1 d	28.6.06
39	*Interim report after implementation and testing*	1 d	10.7.06

To facilitate monitoring of the pilot run, NHIC allowed providers a safe access to the system server at NHIC from the Softec's workplace.

During the pilot run, 12 (all-day) meetings should have been organized, within the framework of which Softec's experts should have verified the solution ways of tasks given to recipients staff (A3 form) through discussions and consultations or recipients staff should have verified Softec's solutions (L1 and Z1 forms).

The following table provides detailed plan of meetings. For each meeting, the meeting topic, the recipients' staff tasks to be fulfilled by the respective meeting beginning and the roles of recipients staff required for the respective meeting are included.

Item	Contents	Carried out by:	Date	Participants roles
01	Start of the pilot run. Time schedule.	NHIC	07.06.2006	All
02	ORACLE client and ODBC installed on user PCs. Registered users Designed code lists, data elements and open A3 modules.	NHIC	09.05.2006	system administrator metadata collection administrator code lists administrator data elements administrator
03	Examination of code lists, L1, Z1 data elements	NHIC	12.06.2006	data elements administrator
04	Definition of the type record and reporting duty for A3. Updated register for A3, L1. Z1. Designed metadata register extension for HCP traders	NHIC	14.06.2006	metadata collection administrator register administrator metadata register administrator code lists administrator
05	Defined modules and checks of A3 form. For the A3 form-based survey, collection defined in the year 2004 and reporting duty generated. Defined A3 outputs and indicators. Extended register metadata for HCP traders	NHIC	16.06.2006	metadata collection administrator output views administrator metadata register administrator
06	Examination of output indicators from L1 and Z1	NHIC	20.06.2006	data elements and indicators administrator
07	Realized collection for A3 (input of reports such as reporting unit, by import, manual input by typing). Output views calculated from A3. Analysis in Excel. MS Access reports.	NHIC	21.06.2006	collection administrator contac person output views administrator analyst standard outputs administrator
08	Verified outputs from L1 and Z1.	NHIC	26.06.2006	output views administrator
09	Registered users. Installation of Oracle client and ODBC on client PCs.	SR-MH	19.06.2006	system administrator
10	Database backup Database recovery from backup Installation of the new ISHI version Modified frequency of views calculation	NHIC	22.06.2006	system administrator
11	Replication from SR-MH to NHIC	NHIC, SR-MH	23.06.2006	system administrator
12	Excel analysis, MS Access reports made of A3, L1, Z1	SR-MH	27.06.2006	output views administrator

3.1.5. Participants of the pilot run

Of the trained NHIC and SR-MH stuff, the following employees were authorized by their workplaces to participate in the pilot run in the following roles:

Employee	Recipient	Role
Baranovič Jozef, Ing.	NHIC	metadata collection administrator, contac person
Bobovská Michaela, Ing.	NHIC	metadata register administrator, register administrator
Hinterschusterová Mária	NHIC	metadata collection administrator, collection administrator

Employee	Recipient	Role
Horváth Kamil, RNDr.	NHIC	metadata registers administrator , administrator
Hudecová Viera	NHIC	metadata registers administrator , registers administrator
Kiss Roman, Ing.	NHIC	administrator, data import administrator, standard outputs administrator
Kopanicová Jana, RNDr.	NHIC	output views administrator, data import administrator, standard outputs administrator
Kozma Gabriel, Ing.	NHIC	code lists administrator, data elements administrator
Lesay Peter, RNDr.	NHIC	registers administrator
Lesayová Jana, Ing.	NHIC	code lists administrator, data elements administrator
Slovík Ján, Ing.	NHIC	administrator
Vallová Zuzana, Mgr.	NHIC	output views administrator , standard outputs administrator, analyst
Kríž Radovan, Ing.	SR-MH	administrator, analyst, standard outputs administrator
Bernátová Alena	SR-MH	administrator

3.2. Process of the pilot run

3.2.1. Participants approach to the recipients pilot run

Trained NHIC employees showed great interest to participate in the pilot run. Due to the high workload of NHIC staff resulted from the processing of annual collections for the year 2005, NHIC decided on the minimum number of employees participating in the pilot run.

According to the time schedule, 12 meetings should have taken place. During the first two weeks of the pilot run, the meetings were practically continuous where Softec staff supported NHIC employees by consultations, showed them faster procedures, provided informal additional trainings, discussed conditions, suggested or approved issues. Main emphasis was laid on the own activity and decision-taking of NHIC employees, to be sure that they understand any step of realized procedure with the support of system functions and are aware of incorrect metadata implications.

In case of input of **collection metadata** through A3 form for the year 2005, the role of individual metadata layers, necessity to use basic code lists and specification of their required subsets for individual surveys by classification dimensions of code lists, requirement of minimum set of data elements as well as the approach to the creation of codes, names and numbering of record items, which was agreed in advance, were repeatedly elucidated and emphasized. When defining the form, it was found that users experience serious difficulties with the implemented recursive way of descriptive texts input in rows and columns of the forms. Therefore, the text input was simplified so that each descriptive text is handled by single entry. Also, descriptive error in the interpretation of these texts was removed when displaying the form for filling in the web application. Users were trained to enter checks for the report data, some of checks were defined by more ways. Output views administrators practised definition of the database views for the generation of reporting duty, they gained knowledge of physical structure of administrative registers and of mapping of logical structure of administrative registers to the physical structure. Prior to the confirmation of the input type of the record by which completion of collection metadata definition and possibility to start collection are declared, data elements administrator checked and confirmed data elements and code lists administrator checked code lists and   defined hierarchical relations between items of new code lists. Due to the first actual active application of the system by recipients' staff, metadata were

continuously completed and modified on the basis of their utilization by functions of the web application – i.e. based on displaying the form of the report and entering test data in it as well as realizing defined checks above its data. Even in this phase, many faults or imperfections in definition of metadata collection were detected and they had to be additionally modified and supplemented. To allow collection metadata administrators to modify confirmed collection metadata, new feature requests for the improvement of metadata management application were implemented in the course of the pilot run, allowing modification and extension of the most of metadata types also in the confirmed record type.

Within the collection process, collection administrator defined a collection in the web application and the contact person imported reports from Excel files sent to NHIC by reporting units. In the software solution of the web application, the ability to recover after failed import of report from the file was consolidated following the experience from real application of import function. In the case of import of an Excel file containing report, code lists items are accepted not only by code but also by descriptive text as well as items calculated by using formula are also accepted.

For data collected by record type of the report A3 report, output views administrators defined **metadata** of multiple **output views**, standard output administrators created MS Access reports of them and analysts analyzed them in MS Excel.

Views administrators checked also the definition of output views over record types of L1 and Z1 reports valid in the year 2004 which were defined for the pilot run by provider's staff. It was found that some output numerical items (indicators) were not interpreted correctly. Therefore, provider's staff defined output views over the mentioned data again during the pilot run and recipients' staff checked them for the correctness.

When calculating views of Z1 record type reports (Hospital) containing around million reports, it was necessary to optimize calculation procedure of views data from the source data with large number of reports. Therefore, service of views calculation was optimized. The option of recalculation of the selected view as well as deletion of view including data and metadata definition was added to the application of metadata management.

For **administrative registers** metadata administrators, it took a longer time to understand the source data items of initial filling of HCP register items and the procedure of input data of medical facility approvals into administrative registers. Following their comments, new feature requests were formulated, which would reduce the input time. Some of them were solved in the course of the pilot run. NHIC employees were also looking for such logical structure of administrative registers with which the operation run could start while real data being available at NHIC and still being sufficient for the definition of reporting duty. Solution of this task is assumed to be realized in the longer term, exceeding the framework of the pilot run.

NHIC and SR-MH system administrators tested practically the installation of client PC for ISHI, input of new users and their classification into groups according to the roles, database backup procedure and database recovery procedure, data export for the replication at NHIC and implementation of data replication at SR-MH by importing replication data from NHIC.

In the course of the pilot run, time delay occurred in the completion of collection metadata input for the A3 form-based survey. This resulted in subsequent shift of the completion of input of other types of data during the pilot run. The reason for the delay is believed to be the need to master new approach of survey planning and design, including decision-taking on new circumstances, e.g. which data elements, classification and sorting code lists are to be used. It was also important to gain skills when operating the new application of metadata management and navigation in metadata layers.

Delay also occurred in the installation of the SR-MH environment for ISHI.

During the pilot run, acceptance tests of all ISHI functions applied in the main working procedures stated in the *Implementation and testing plan* were performed.

3.2.2. Issues resulting from the pilot run

Recipient's employees continuously entered user issues of the pilot run of the type *incident* and *feature requests* into the issues tracking application ECHO. All incidents of the priority higher than *low* (i.e. all faults) were fixed within 5 days since the end of the pilot run. A few feature requests seriously improving user-friendliness of the system, were implemented as well. The user and system documentation were also modified and supplemented. The user documentation (instruction and reference manual) is available in ISHI applications in full wording.

Following 22 issues of the type *incident* were registered. All faults (i.e. *incidents* of the priority higher than *low*) were solved:

Unit number	Abridged text	Author (external)	Type	Priority	Date of identification	Date of solution
235	Output view administrator can not Confirm, Delete confirmation and Delete view.	Kiss	6 Incident	4 Urgent	3.7.2006	3.7.2006
234	Output views administrator can not create item of view record	Kopanicová	6 Incident	4 Urgent	3.7.2006	3.7.2006
226	Recovery after import error of Excel reports	Kiss	6 Incident	3 High	27.6.2006	28.6.2006
220	Change the number of decimal places in A3 report from 7 to 2	Baranovič	6 Incident	2 Medium	23.6.2006	23.6.2006
215	Reduce input time of code list items	Baranovič	6 Incident	3 High	23.6.2006	28.6.2006
212	During checks, allow NULL values in cells over which will be summed.	Baranovič	6 Incident	4 Urgent	23.6.2006	28.6.2006
211	Creation of participant	Bobovská	6 Incident	4 Urgent	23.6.2006	27.6.2006
210	Selection from the SU list using filter failed	Ambrošová	6 Incident	4 Urgent	22.6.2006	30.6.2006
209	Automated filling of description during input of code list items using the code	Baranovič	6 Incident	4 Urgent	22.6.2006	3.7.2006
207	Incorrect rendering of the form with multilevel descriptions	Baranovič	6 Incident	4 Urgent	22.6.2006	23.6.2006
205	When creating code list, code list data element is not created	Baranovič	6 Incident	1 Low	21.6.2006	21.6.2006

Unit number	Abridged text	Author (external)	Type	Priority	Date of identification	Date of solution
199	Correction of user role: date of creation and date of expiry can not be corrected	Ambrošová	6 Incident	4 Urgent	20.6.2006	23.6.2006
194	Print function in the upper bar	Ambrošová	6 Incident	4 Urgent	19.6.2006	3.7.2006
193	Register / New user, New relation	Ambrošová	6 Incident	3 High	16.6.2006	3.7.2006
190	Selection from code lists – mostly ending indicating critical error	Ambrošová	6 Incident	4 Urgent	16.6.2006	26.6.2006
189	Access to the first page of the list – same as the click on "Stale link"	Ambrošová	6 Incident	4 Urgent	15.6.2006	26.6.2006
187	Check DP range during the import of records	Červeň	6 Incident	2 Medium	14.6.2006	6.7.2006
171	Filter for View planned reports status – error	Ambrošová	6 Incident	3 High	2.6.2006	6.6.2006
164	Checks for report blank items	Ambrošová	6 Incident	3 High	31.5.2006	6.6.2006
163	Export of View status of reports exported to Excel does not export number of reports	Ambrošová	6 Incident	4 Urgent	31.5.2006	30.6.2006
154	Web application does not display all generated views. Inspect the reason.	Červeň	6 Incident	4 Urgent	30.5.2006	1.6.2006
146	Allow more user-friendly way of code list items input	Ambrošová	6 Incident	2 Medium	30.5.2006	26.6.2006

Following 24 comments of the type *Incentive for the improvement* being regarded as requirement of change not a fault, were also registered. Prior to acceptance testing, 8 of them were solved.

Unit number	Abridged text	Author (external)	Type	Priority	Date of identification	Date of solution
240	Closing of participants of closed relation	Bobovská	4 Feature request	2 Medium	3.7.2006	
239	Creation of role – initialization. Date of creation date of expiry	Ambrošová	4 Feature request	2 Medium	3.7.2006	
237	Comments on reports	Baranovič	4 Feature request	2 Medium	3.7.2006	
236	When defining output view by a wizard allow reversing	Kiss	4 Feature request	2 Medium	3.7.2006	

Unit number	Abridged text	Author (external)	Type	Priority	Date of identification	Date of solution
	to previous window					
233	Data import administrator does not have the right to access Web application	Kopanicová	4 Feature request	4 Urgent	3.7.2006	
232	On recalculation of views, explicitly delete data of temporary tables	Červeň	4 Feature request	2 Medium	3.7.2006	
230	Methodical instruction to the report	Ambrošová	4 Feature request	2 Medium	2.7.2006	
228	Allow additional bulk update of reports status	Červeň	4 Feature request	2 Medium	28.6.2006	
219	Narrow the set of OKEČ in A3 report	Baranovič	4 Feature request	2 Medium	23.6.2006	23.6.2006
218	Position action buttons in the report form (also) in the upper screen part	Baranovič	4 Feature request	1 Low	23.6.2006	
217	align right numbers in reports	Baranovič	4 Feature request	1 Low	23.6.2006	
216	Assign the function "Duplicate record" to the mouse right button	Baranovič	4 Feature request	1 Low	23.6.2006	
206	Allow to modify the code of confirmed data element	Lesayová	4 Feature request	3 High	21.6.2006	6.7.2006
204	Record tree structure of descriptions of rows and columns by parsed string	Červeň	4 Feature request	3 High	21.6.2006	23.6.2006
203	Facilitate input of new HCP permission in administrative registers	Ambrošová	4 Feature request	3 High	21.6.2006	
202	Administrative registers: input of addresses	Hudecová	4 Feature request	3 High	20.6.2006	
200	Initialisation of required Date of expiry in administrative registers	Hudecová	4 Feature request	4 Urgent	20.6.2006	26.6.2006
197	Add types of use in code lists	Ambrošová	4 Feature request	3 High	20.6.2006	
195	Remove the limitation that module can be defined only for the confirmed record type (TZ)	Červeň	4 Feature request	4 Urgent	19.6.2006	5.7.2006
191	Add function of view calculation to Data flow	Ambrošová	4 Feature request	4 Urgent	16.6.2006	6.7.2006
188	Automatically provide analysts with access rights	Šoltís Ján	4 Feature request	3 High	14.6.2006	

Unit number	Abridged text	Author (external)	Type	Priority	Date of identification	Date of solution
	to new views tables					
186	Add the required item Regional context to code list	Ambrošová	4 Feature request	3 High	12.6.2006	
185	Add link to SU and AU to the Detail of planned report in the same way as it is in the report	Ambrošová	4 Feature request	3 High	8.6.2006	26.6.2006
184	Generate reporting duty – item of SP view	Ambrošová	4 Feature request	4 Urgent	8.6.2006	30.6.2006

4. Handover of contract objective

The remaining project stage is:

- ✓ Project handover

In line with the plan under *2.3 Detailed project working plan,* following steps are to be implemented:

- ✓ On 07. 07. 2006, acceptance testing of the product. Successful acceptance testing will be affirmed by signing the acceptance protocol.

- ✓ On 11. 07. 2006, protocol handover of objective of the contract *Development of Information System of Health Indicators* provided that the acceptance protocol was signed.

Two year warranty period for handed over contract objective will begin on 12. 07. 2006.

Concluding seminar to the project *Strengthening of Statistics Health Information System and Its Harmonization with EU Requirements* is planned on 14. 07. 2006. At the seminar, the whole project shall be presented to the invited public, especially its part *Development of Information System of Health Indicators*.