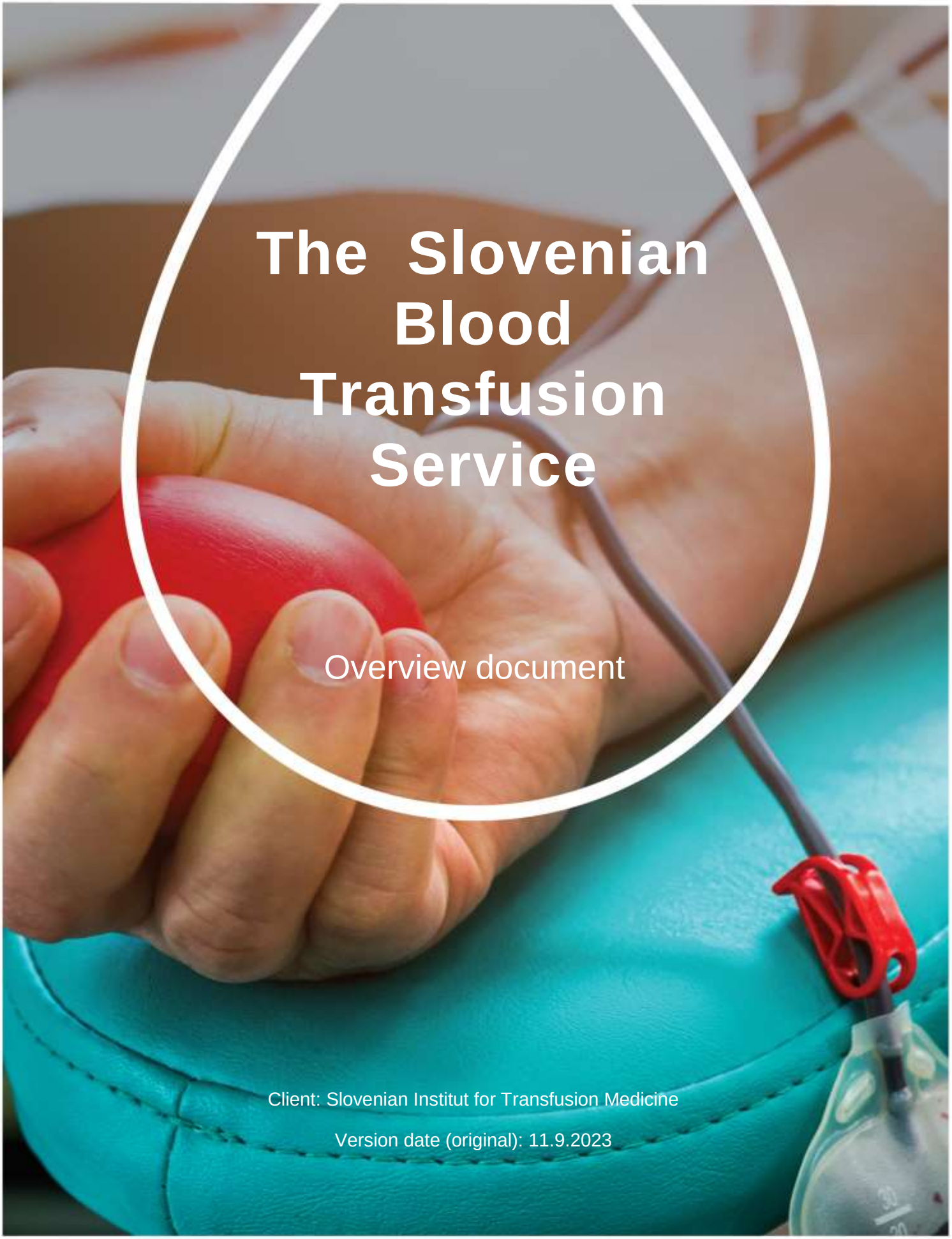


The Slovenian Blood Transfusion Service

Overview document

Client: Slovenian Institut for Transfusion Medicine

Version date (original): 11.9.2023

XLAB

Zavod Republike Slovenije za transfuzijsko medicino
Slovenian Institute for Transfusion Medicine

Purpose of the documentation:	Functional requirements to prepare and conduct public procurement for information system to digitally support The Slovenian Blood Transfusion Service Network (Slovenian eTransfusion (SET)).
Purpose of the document:	Description of the structure and organization of the Slovenian national transfusion network.
Version:	1.0 (revised version by the SET project group) – translated from SLO to ENG
Version date (original):	11.9.2023, revised June 2024
Author:	XLAB d.o.o.
Validity:	Final version

PURPOSE OF THE DOCUMENT

The document describes the organization and activities of the blood transfusion service in Slovenia. The document is prepared to support the process of public procurement of a new information system (SET) as additional information to potential information solution providers.

ORGANIZATION OF THE TRANSFUSION SERVICE IN SLOVENIA

The Slovenian blood transfusion service is organized regionally: Ljubljana, Celje and Maribor.

Slovenian Institute for Transfusion Medicine (ZTM), based in Ljubljana, is a public healthcare institution that supplies blood and blood products or plasma, renders diagnostic and therapeutic services within the transfusion and transplantation fields, manages the Registry of bone marrow donors. Speaking symbolically, the areas of its operations spans from the donor's vein to the recipient's vein and beyond.

Blood Transfusion Centre of Slovenia (ZTM) has six pertaining transfusion departments spread across regional general hospitals (Novo mesto, Trbovlje, Slovenj Gradec, Izola, Jesenice and Nova Gorica).

ZTM acts as the National Reference Centre for transfusion medicine, exercising control of the quality of procedures and products related to its area of operations. It is a central body that develops the doctrines, monitors their implementation and professionally integrates the blood transfusion services into a national transfusion network. It also manages the hemovigilance system, unified information system, professional education and development and research activities, and liaises with the relevant international organizations, associations and related institutes in other countries.

The Centre for Transfusion Medicine (CTM) Maribor operates within the University Medical Centre Maribor (UKC MB). CTM Maribor also consists of the transfusion department of the General Hospital (SB) Ptuj and the transfusion department of the General Hospital (SB) Murska Sobota. Both are working as pertaining transfusion departments (ETD) within CTM UKC MB.

Centre for Transfusion Medicine (CTM) in Celje operates within the Celje General Hospital and has no additional locations.

The transfusion service is complemented by the Hospital Blood Bank in Brežice (issue of blood products and basic pre-transfusion testing) and four hospital blood depots at the University Clinical Centre (UKC) Ljubljana and hospitals in Kranj, Postojna and Valdoltra Orthopaedic Hospital. Organizationally they are part of their parent hospitals. Depots in UKC Ljubljana, Kranj and Postojna store only urgent blood supply, the depot in the Valdoltra Orthopaedic Hospital is supplied by the CTD Izola with blood components to be issued to their patients on the wards. All this additional institutions are part of the Ljubljana region.

The figure below shows the regional organization of the transfusion service. Organizations comprising Ljubljana region have a green badge, the Celje region has a yellow badge, and the Maribor region has a purple badge.

Picture 1: The Slovenian Blood Transfusion Service Network

Source: Internal documentation

TRANSFUSION NETWORK ACTIVITIES

The activity of the Slovenian national transfusion network is very diverse, covering blood supply, diagnostic and therapeutic services.

BLOOD SUPPLY - BLOOD DONATION AND PROCESSING

Blood supply covers the following areas:

- blood donations, ensuring a sufficient number of blood donors;
- blood collection;
- blood processing and distribution of blood products across blood banks;
- and supply of blood components to hospitals.

Activities of blood donation are carried out by the blood transfusion service network together with the Slovenian Red Cross (RKS) and their 56 regional associations. The Slovenian Red Cross, which is also the national organizer of blood donation campaigns, is responsible for obtaining and ensuring a sufficient number of blood donors. It carries out all the activities of organizing, informing, motivating, recruiting and educating blood donors for the purposes of the national blood supply.

RKS has its own application eKaplja, covering the needs of blood donors' registry and managing SMS invitations to blood donation drives. SET and eKaplja shall be integrated – SET must regularly share data on actual visits and withdrawals of blood donors with eKaplja in order to effectively target blood donors and number of their donations.

In recent years, there has been a noticeable trend of moving from "general blood donor invitation" to the so-called "targeted invitation", where, depending on the daily state of stocks and orders, blood donors are invited in a targeted manner. Targeted invitations are carried out by the transfusion service network or in cooperation with the regional unit of the Red Cross (RC).

Donations take place in a:

- fixed locations (fixed days of the week) – all transfusion centres
- mobile locations (the schedule is known for the calendar year) - various places across Slovenia.

Mobile blood donation drives are jointly organized by the transfusion centres and RC. RC takes care of the donation venues, while the transfusion service sends a professional team to each location to take care of the collections. Regional centre supports all field campaigns within their region. Blood collected in the region is also processed regionally.

Picture 2: Blood collection - stationary and field locations across Slovenia

Source: Internal documentation

Whole blood collections are done at mobile and fixed locations, while apheresis are done solely in Ljubljana and Maribor.

The information system must support blood donors' management, invitations and visit scheduling, as well as the entire process of pre-collection (survey) and collection. This requires integration with the national systems (the Central Population Register or Health Insurance Institute of Slovenia) for obtaining and confirming the demographic data of blood donors and issuing blood donor participation certificates with the system of the Health Insurance Institute of Slovenia.

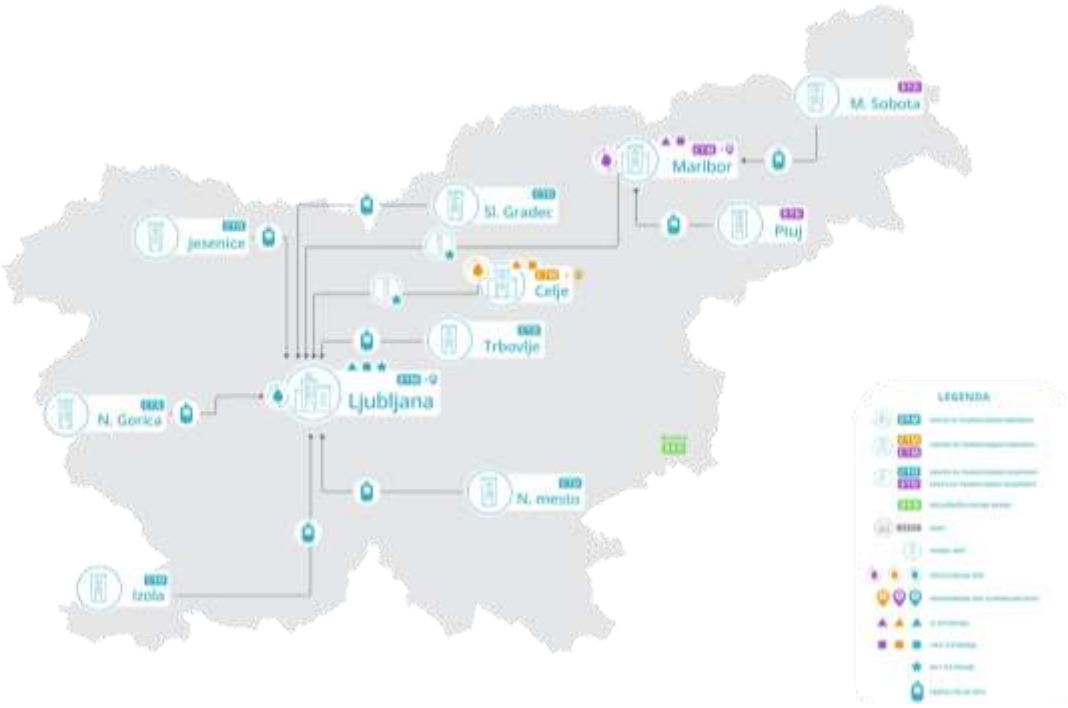
Appointments are currently scheduled via a phone call. Some locations manage their schedules autonomously, in some cases it is done centrally within the region (for example the team in Ljubljana arranges appointments for Jesenice). Scheduling by phone will remain, the wish is to expand the possibility of additional tools to be used for donors' invitations (currently SMS and direct call) as well as scheduling (call).

Currently, the call is also used for initial screening of the blood donor's suitability, the on-site rejection has been greatly reduced since the introduction of the phone screening. Scheduling via app with screening questioner is also option.

Collected blood from the region is transported to the regional processing site.

New information system must provide "vein-to-vein" traceability, including the relevant transportation information (handed over to transport, received at location - key transport information from temperature monitoring system has to be recorded in the core IS). Transportation includes transportation from field locations and satellite centres (picture 3 below).

Picture 3: Transport of the whole blood and tubes from satellite units and departments to regional processing centres



Source: Internal documentation

Information system must support the entire blood processing:

- recording the reception of blood bags at the processing site (via transport or hand over from an internal collection site);
- preparation of products from whole blood or the apheresis process (centrifugation and separation of whole blood, quarantine management, managing lab testing requests to virology (VIRO), immuno-haematology (IH) and NAT testing, phased receipt of test results and product finalization and product release);
- product re-finalization (split doses, pooling);
- support for additional product manipulation (pathogen inactivation, irradiated doses, washing);
- discarding of blood components at any stage.

The IS must support appropriate labelling and coding of blood components, samples or documentation at each processing stage.

A distinctive feature within the laboratory process is nucleic acid test (NAT). While virology and IH testing is performed at each processing centre, NAT is centralized. Samples from Maribor and Celje are transported to ZTM in Ljubljana for NAT testing. Irradiation of blood units is also perform just in ZTM for whole country.

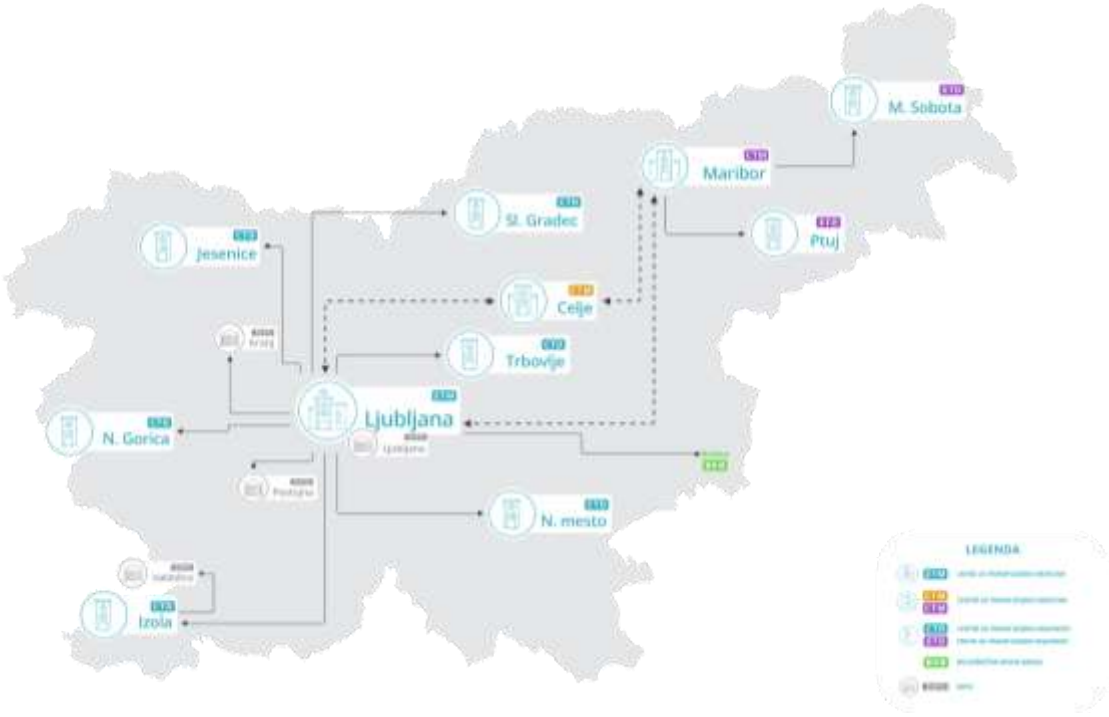
Collected plasma is sent for processing to a fractionation contractor. Units for fractionation are collected at each of the three processing sites. At ZTM, a single shipment is prepared and transported to fractionation contractor. The IS system must support the process of shipment preparation, supporting documentation, dispatch and transport of plasma.

After the processing of the blood components is concluded, the blood products are distributed to individual transfusion department. Claim policy management, claim processing, the preparation of the shipment and the dispatch and transport of the blood components to each location must be fully supported by the IS system.

System must also support:

- transfers of blood products between locations within the region,
- transfers of blood products between regions,
- inventory management of blood products at hospital depots.

Picture 4: Distribution of blood products from the processing site to blood banks and hospital depots



Source: Internal documentation

For the purposes of quality control of blood products, system users must be able to obtain information about each blood product from vein to vein, including information about the donor and the recipient, at any time. Automated queries must be enabled.

The software manufacturer can offer support for comprehensive blood products quality control monitoring.

BLOOD SUPPLY - TESTING OF BLOOD DONORS

The software manufacturer can offer a separate module for collection and processing of blood components and a module for blood donor testing with laboratory information system (LIMS) capabilities. The key is to ensure real-time data transfer and to exchange all the data necessary for rapid, efficient and safe work in both processes.

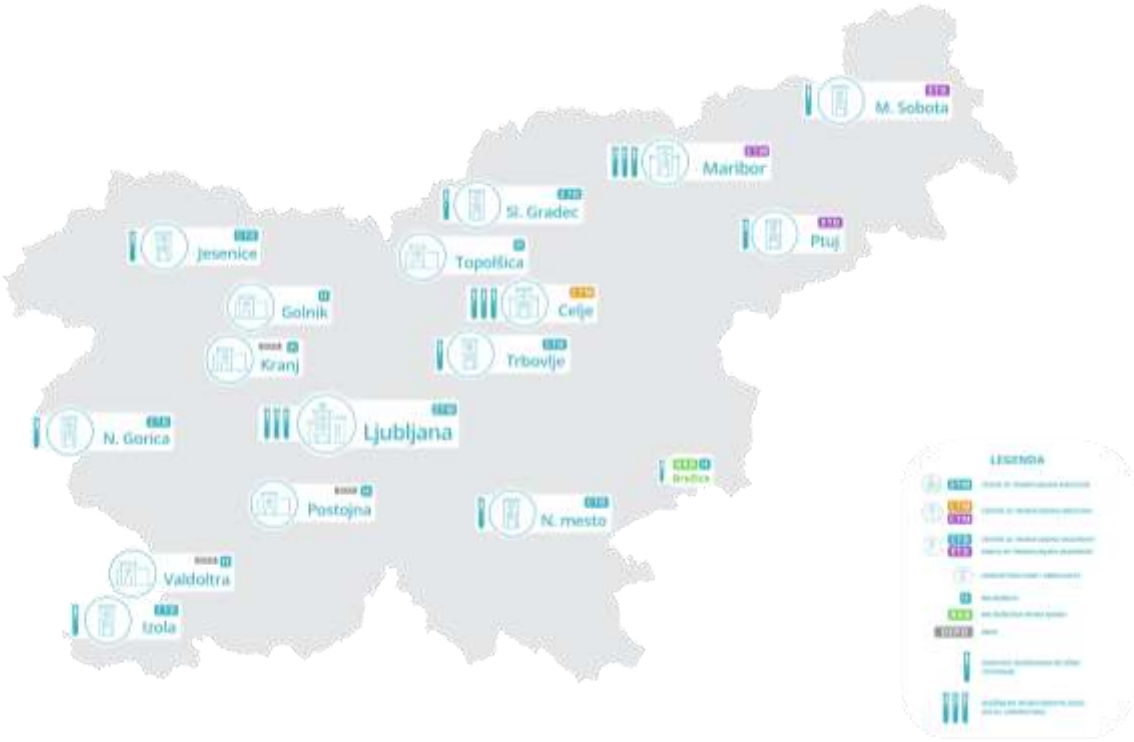
The module for blood testing must have all the features of a laboratory information system, from receiving the order and blood sample to performing the test, issuing the report, and storing up-to-date information about the sample archive (integration with the archiving device). Most of the tests at all the centres are performed automatically according to pre-defined algorithms. Some confirmatory tests, especially for the virology laboratory, are done by the microbiology laboratory, which has its own information system. An integration will be required.

BLOOD SUPPLY - CLINICAL USE OF BLOOD PRODUCTS

The field of clinical use of blood products covers the dispensing of blood products and the provision of diagnostic services for health care providers.

Transfusion network clients are all hospitals in Slovenia (various departments in university clinical centres, general and specialized hospitals) as well as other clients (medical homes, sole practitioners).

Picture 5: Distribution of blood products and diagnostic services with major clients



Source: Internal documentation

Issuing of blood products is performed by all centres, departments and units for their local hospital and other clients in vicinity. ZTM Ljubljana also supplies blood for patients to hospitals in Golnik, Kranj and Postojna, CTD Izola to Valdoltra hospital, CTM Celje to Topolšica hospital.

Transfusion network services include blood products supply and the necessary diagnostic testing. Diagnostic testing includes patient testing, additional tests on blood donors, as well as cross-matching between the patient and the blood donor.

All locations, including Brežice hospital blood bank, accept the order (currently in paper form) and the patient's sample, execute the order together with basic/extended IH testing, and issue a report together with blood products and test results to the external system of the client. Digitalisation and integration with hospital wards for this process is a must.

Automatization levels differ across sites. Some locations are fully automated, some are equipped with semi-automatics, and some locations perform all IH testing manually. All locations are regionally connected with TeleTransfusion platform, which enables validation of pre-transfusion and prenatal results in case the location does not have a transfusion specialist present. Integration will be required.

If individual site cannot perform IH testing, the request for the blood products is redirected to the regional reference IH centre.

In addition to external clients, ZTM also provides services for departments within ZTM, namely therapeutic services department and tissue typing centre.

The software manufacturer can offer independent modules for blood donation, processing and testing of blood donors, as well as a module covering the field of blood components issuing for clinical use.

A vertical division is also allowed, i.e. a part that covers work with blood products (from collection to processing and issuing) and a part that covers all laboratory testing (blood donors and patients).

Regardless of the composition of the solution, users must have all the necessary information available for efficient, optimal and safe work with individuals, which also includes data exchange between the blood donor database and the recipient database.

Ideally, solution has a single database for every individual who enters the system, either as a blood donor or as a recipient/patient, so that system users have access to a single record of the individual. The clear distinction from an end user perspective shall be done between the donor and patient record.

The IS must support appropriate labelling and coding of blood components, samples or documentation at each stage of the issuing process.

For the purposes of quality control of blood products, system users must be able to obtain information about each blood product from vein to vein, including information about the donor and the recipient, at any time. Automated queries must be enabled.

The software manufacturer can offer support for comprehensive blood products quality control monitoring.

The information system must be integrated with the business accounting system (each region has a different system).

OTHER DIAGNOSTIC SERVICES

In addition to basic and extended IH testing (to various degrees), which is performed at each location, The Blood Transfusion Centre of Slovenia (ZTM) provides additional diagnostic services within the following laboratories:

- laboratory for pre-natal diagnostics,
- laboratory for platelet and granulocyte diagnostics,
- laboratory for molecular-biological tests,
- Centre for Tissue Typing (CTT), where they test tissue compatibility before organ, tissue or cell transplants and provide support for the diagnosis of autoimmune diseases.

CTT covers the following areas:

- tissue compatibility testing before kidney transplants,
- tissue compatibility testing in hematopoietic stem cell (HSC) transplantation,

- determination of tissue antigens in voluntary KMC donors, members of the Slovenia-Donor Registry, for the umbilical cord blood bank,
- determination of HLA as support for the diagnosis of autoimmune diseases.

IS must also support these, additional laboratories. Laboratories support external and internal clients.

CLIENT SERVICE REQUEST - OPTIONAL

Transfusion network clients currently request blood components and diagnostics services in paper form. It is crucial that the service requests and medical reports (issuing of blood components) towards the clients are digitalized.

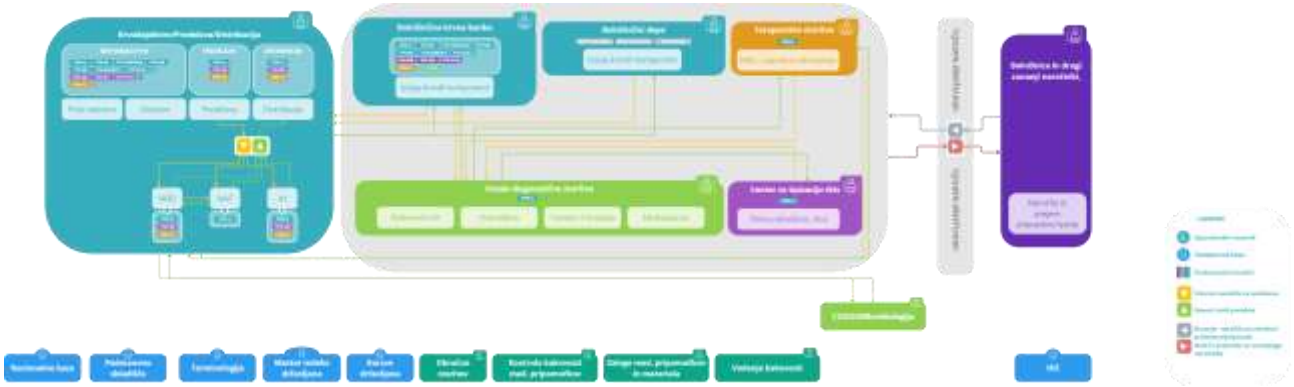
Providers of the information system can offer a module that covers the application level – ability of the end customer to send requests and receive results and blood products (embedded within local health information systems) and/or full subscription platform that will manage the requests of the entire transfusion network.

INVENTORY MANAGEMENT AND MEDICAL EQUIPMENT REGISTRY - OPTIONAL

Optionally, the software can support the departmental management of reagents, blood bags and other medical device products directly used within the transfusion or laboratory processes. The software shall be integrated with the centralized inventory management system.

The IS can also offer support to manage and track medical equipment registry.

Picture 6: Overview of functional units of the Slovenian national transfusion network



Source: Internal documentation

SCOPE – NUMBER OF USERS AND BASIC STATISTICS

The table below shows the basic parameters - number of users and the range of services provided by the Slovenian transfusion network.

SYSTEM USERS	
Number of users (jointly all institutions)	375
- Ljubljana	275
- Celje	30
- Maribor	70
COLLECTION	
Number of registered blood donors (annually, Slovenia)	94.000
PREPARATION OF BLOOD COMPONENTS	
Erythrocytes - total (annually, Slovenia)	81.831
Platelets - total (annually, Slovenia)	10.764
Fresh frozen plasma for clinical use - total (annual)	14.485
ISSUING OF BLOOD COMPONENTS	
Erythrocytes - total (annually, Slovenia)	80.339
Platelets - total (annually, Slovenia)	10.614
Fresh frozen plasma for clinical use - total (annual)	11.733

Source: Transfuzijska_dejavnost_v_Sloveniji_2022_final_web.pdf (ztm.si), Transfusion activity report - accompanying form