



IGH - Infoclinic Hospital Management

Technical Description

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The Company

TW is a company specialized in hospital management software, clinics and offices in general, especially oncology clinics, (public and private), with extensive experience in the health segment.

Continually investing in healthcare solutions, our technology connects people and systems in 14 states in Brazil, meeting the clinical, financial and operational needs of offices and hospitals of all sizes. Together with our customers, we are creating a future where the health system works to improve the well-being of healthcare professionals and with a focus on the patient.

With the development of software adhering to the needs of the market, we offer strategies that allow organizations to manage their processes in order to improve their operational results with tangible gains. Our solutions are tailored to the needs of healthcare professionals so they can focus on patients.

Our vision is to be the best Company in integrated technological solutions, interacting with the entire production chain in the health segment, quantitatively, qualitatively and having the well-being of health professionals and focusing on the patient.

Denilson Felipe Borges & Marcelo Felipe de Sousa CEO

Denílson Felipe Borges is founder and current CEO of TW, with over 30 years of experience, is an Accountant and Economist with a postgraduate degree in Accounting and Controllershship from UFU - Federal University of Uberlândia - with solid experience in controllership and tax recovery in Hospitals and large companies, Member of AMCHAM - American Chamber Commerce - Uberlândia - MG, Director of the Commercial and Industrial Association of Uberlândia - ACIUB. Marcelo Felipe de Sousa, with 7 years of experience in the USA, studied at California Lutheran University, in the Information Science course and in Brazil, 2018/2019, took the Marketing and Business course and, in 2020, specialization at INSPER at the same. area. He has worked at TW since 2016, being responsible for Marketing and Quality.

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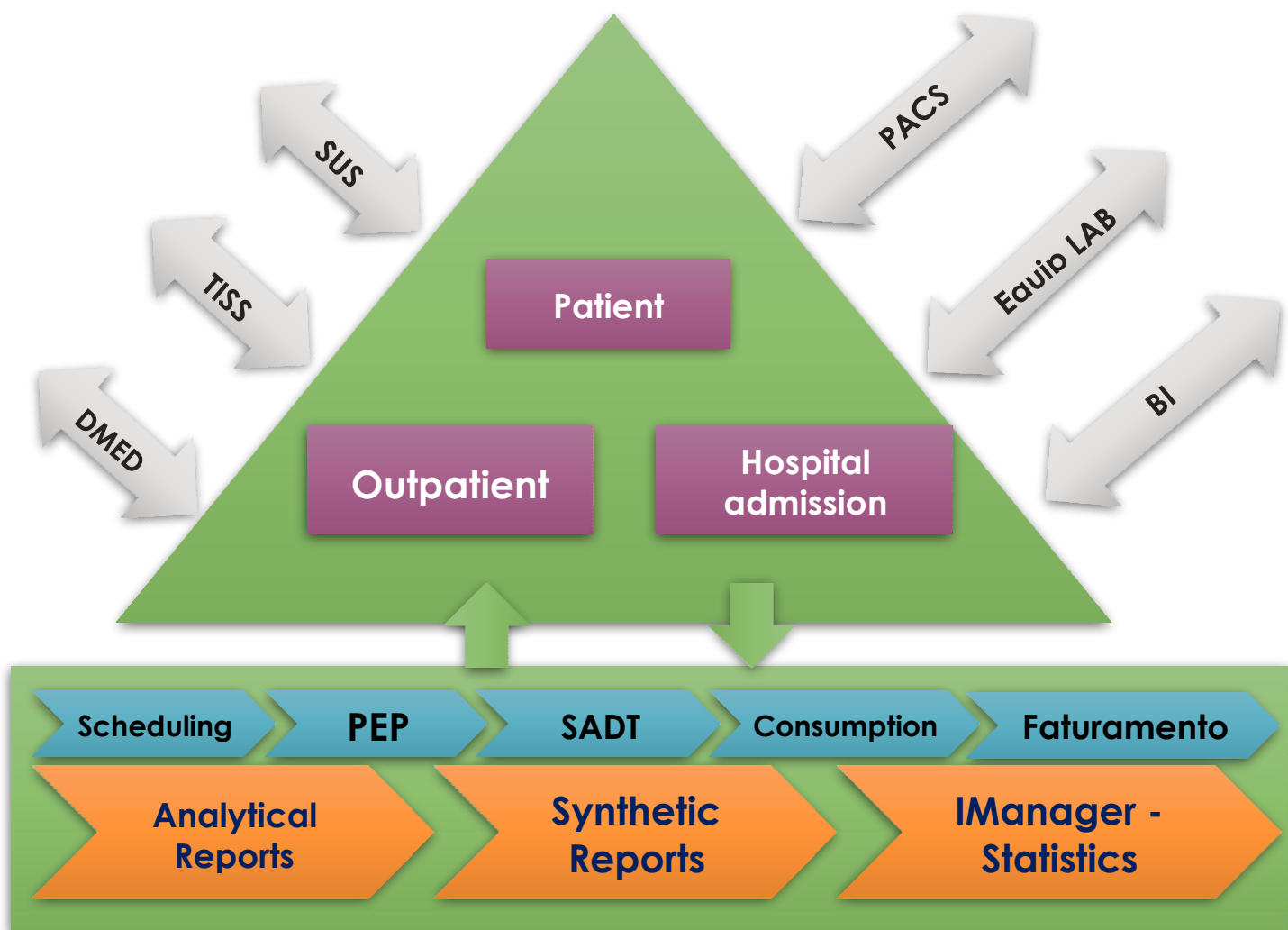
The management of SUS procedures is optional and is fully integrated through APAC, AIH and BPA. All of these modules synthesize data that are automatically exported to SUS electronic media.

The Product

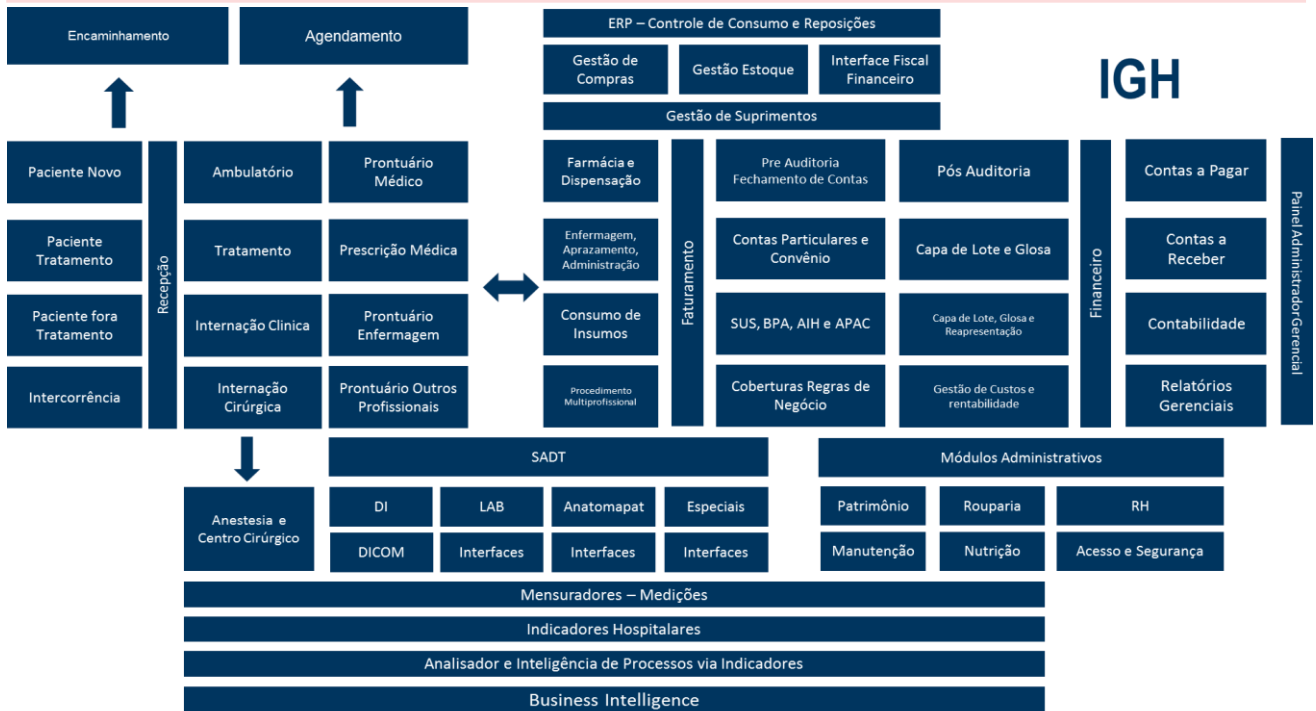
IGH - Infoclinic Hospital Management, our solution, computerizes and integrates all areas of the hospital, whether with its own and / or interfaced modules, with outpatient procedure modules, reception, appointment scheduling, electronic medical record (PEP), medication prescriptions and solutions, SADT, Image Bank (DICOM and commercial images), Supply Management, Purchasing Management, Pharmacy, Blood Bank, Transfusion Agency, Surgical Center, Billing (private, health insurance and SUS), among others.

The IGH system is fully configurable, making its use flexible in small to large, private or SUS hospitals, in addition to having specific modules for Pediatric, Maternity and Oncology Hospitals.SUS

Processes - Macro View



System Structure



Tecnology

TW uses, in its products (IGH), the best technologies available in the market, beginning in 2018 the migration to a new platform, that is, [DELPHI RAD STUDIO 10](#) - cutting edge technology with availability for the Web, as well as multi use devices (IOS, Android, tablets and others)

Development:

The development tool used at IGH is Delphi. IGH also has extensions of its modules developed in ASP.NET and JAVA.

Delphi is marketed by Embarcadero and has been on the market for over 20 years. It is a development tool that brings security and productivity to software factories, mainly in the [DELPHI RAD STUDIO 10](#) version, which is the most up-to-date in terms of competitive market technology.

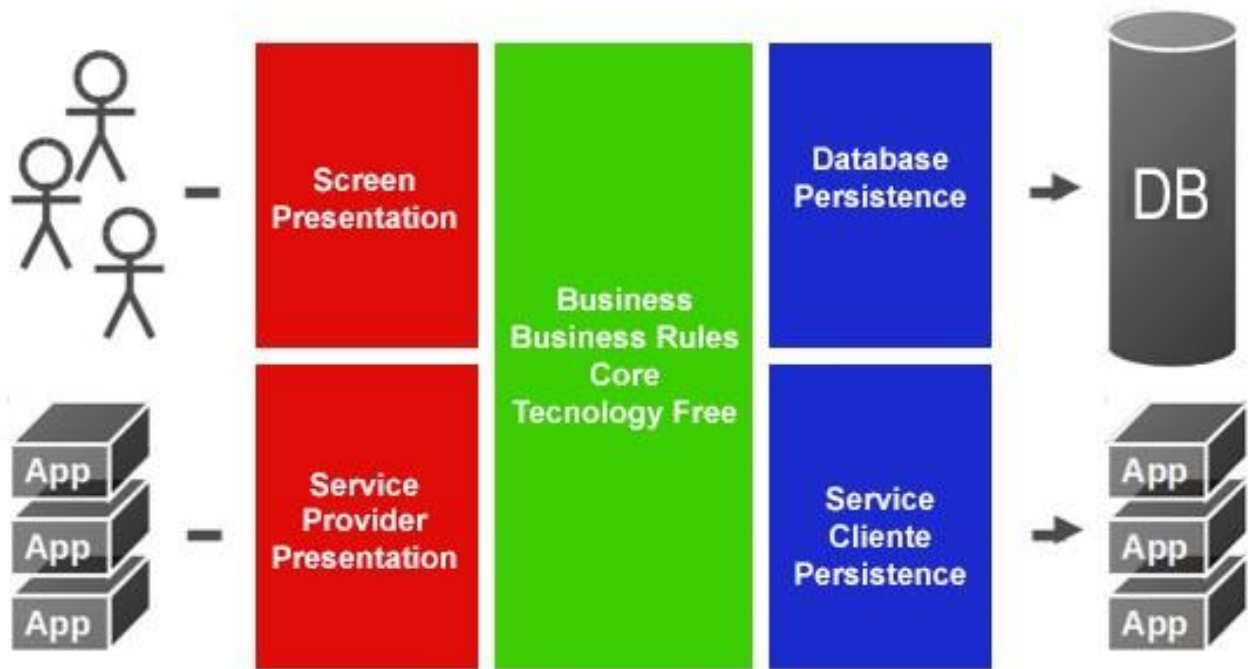
Delphi is widely used in the development of desktop applications, multilayer applications and client / server, compatible with the most well-known databases on the market. Delphi can be used for several types of project development, ranging from Services to Web Applications and CTI.

Data Storage

IGH currently works with the two main databases available on the market: Microsoft [SQL SERVER](#) and [ORACLE](#).

While Microsoft SQL Server provides ease of use, flexibility and low cost, Oracle has a more robust and performance structure.





3.tier architecture is an architectural pattern that describes how the three layers of development relate to each other. This architecture provides a way to divide the functionalities involved in maintaining and presenting an application. It was developed with the objective of mapping the input, processing and output tasks to the user interaction model, thus making it easier to map the concepts in the application domain.

The layers are:

Presentation Layer: its function is to display information. Used to receive inputs and present the result, that is, it is the user interface.

Business Rule Layer: responsible for controlling the entire flow of information. Intermediate between the presentation layer and data access. In this layer, the business rule (system intelligence) is executed.

Data Access Layer: is responsible for the persistence and access to application data.

Advantages of the 3-layer model:

- Modularization
- Centralized business rule
- Ease of redistribution
- Light executables (.exe)
- Saving a database access license
- Scalability
- Saving access with the server
- Flexible location

Technological evolution

- Web/Cloud

Since it is a desktop system, currently operating, TW has been investing since June 2018 in a Technological Migration Project, so that current and future customers can have more performance in their operational processes, whether assistance and / or BackOffice.

Thus, with delivery scheduled for December 2020, TW will provide its customers with another System option, that is, a Web / Cloud environment, with operational capacity in accordance with the best market practices.

This investment, with its own resources, will give TW the conditions of greater competitiveness in a highly demanding market.

- Digital Signature

TW offers in its solution, the Signature with Digital Certification, which is directly linked to the electronic medical record of the patient. This resource is available to health professionals who operate the modules and who need to register and document more safely the processes performed with the patient.

- **Telemedicine**

TW invested in the 1st semester of 2020 in the construction of the Telemedicine Platform, following the Health market in its trends. A complete solution, reaching the entire cycle of patient care, combined with the latest technology and data security, in accordance with legislation and LGPD.

System modules

Registration module

1. Patient Registration

- a. Complete and simplified registration with photo
- b. Distinction of organ donors, blood donors, prevention and external
- c. Documents list
- d. Address list
- e. Registration of those responsible
- f. Indications for patients
- g. Control of homonyms
- h. CEP registration interface

2. Registration of Professionals

- a. Doctors

- b. Nurses
- c. Other professionals (Nutritionists, pharmacists, physiotherapists, psychologists and others)
- d. List of professionals' documents
- e. List of professionals' addresses

3. Other entries

- a. CNES (National Register of Health Facilities)
- b. Covenants and Covenants Plans
- c. Manufacturers
- d. Providers
- e. Other hospitals and clinics
- f. Laboratories
- g. Service providers
- h. Cost centers
- i. Exams
- j. External entities
- k. Types of queries
- l. Procedures, materials, medicines and other packages
- m. Drug prescription protocols
- n. Intravenous prescription protocols
- o. Drugs
- p. Chemotherapy prescription protocols
- q. Nursing station
- r. Services and kits

SAME module (Statistical Medical Analytical Service)

1. SAME

- a. Barcode paper medical record control
- b. Service statistics by date, city, type of reception x PA x PS.
- c. Statistics of attendance by ICD x Gender
- d. Generating and configuring general purpose labels
- e. Patient Referral Report
- f. Patient return report
- g. Return report of patients received

2. Medical records management

- a. Sending medical records
- b. Management of medical records by barcode
- c. Integration of sending medical records with scheduled patients

3. Accessory Module

- a. Notices, debts and documents
- b. Viewing basic information
- c. Viewing PEP history
- d. Phone book with patient, doctors, suppliers etc.
- e. Requesting covenant guides
- f. Management of covenant guides

4. Patient History Summary

- a. Summary - medical history and medical and administrative diagnosis
- b. Diagnostic copy (of medical evolution)
- c. Alerts (medical information)

Bed Management Module

1. Bed

- a. Registration and management of beds and nursing posts

2. Operational

- a. Hospitalization
- b. High
- c. Death
- d. Transfer
- e. Cross Transfer
- f. Bed map with report
- g. Declaration of sanitized room
- h. Hospital reporting, terms of responsibility and standards
- i. Occupation indicators (spreadsheets and graphs), daily and monthly (Hospital Manager).

Reception Module

1. PS and PA

- a. Attendance

- b. Issuance of worksheet - label
- c. Forwarding
- d. FAA Issuance (SUS) or Service (Private)

Services and procedures module

1. Requests

- a. Request for SUS procedures and fees
- b. Request for procedures and fees Agreement - integrated with the management of guides.
- c. Configuration by cost center

Scheduling Module

1. Scheduling

- a. Daily schedule
- b. Default week setting
- c. Exception setting per day
- d. Appointment change log management
- e. Availability
- f. Map of rooms - macro view (Example: Ultrasound Rooms x Schedules).
- g. Notices and comments for a given date
- h. Heparinization control

- i. Arrival control and “on request”
- j. First time control
- k. Control patient with appointment on the day.
- l. Appointment limit control, permission rules for docking
- m. Surgical schedule
- n. Chemotherapy schedule
- o. Therapies schedule
- p. Follow-up
- q. Agenda plan
- r. Day schedule
- s. Weekly pattern programming
- t. Scheduling by accommodation
- u. Schedule status record

2. Centralized agenda

- a. Electronic Agenda - Examination Scheduling Center (SADT)

3. Rooms

- a. Room type definition
- b. Room x user access security (access rules)
- c. Clinical, chemotherapy, radiotherapy, SADT exams, review rooms.

4. Reports

- a. Agenda day
- b. Chronological Agenda
- c. Agenda by Patient
- d. List of Patients and Rooms
- e. Agenda by professional
- f. Summary schedule by room type (market, arrived and attended)
- g. Delay quantification - wait.
- h. Statistics

Supply Module, Inventory Control

1. Stock

- a. Architecture for multiple stocks
- b. Stock parameters: potential level, safety stock, average consumption, ABC and XYZ
- c. Central and satellite inventory
- d. Online Stock
- e. Price management - PMF (average fiscal price), PMG (average managerial price) and PMU (single average price in the month)
- f. Registration of medicines and materials
- g. Classification by type, group and subgroup (TGS)

- h. Batch traceability and validity
- i. Bond with Brasínde and SIMPRO
- j. Enable and disable providers
- k. Integration with Bionexo
- l. Security control of altered record changes

2. Purchasing management

- a. Purchase request: automatic or manual, sending e-mail to the central office in an automated way
- b. Quotation: ordered products, suppliers, automation and automatic purchase order generation
- c. Purchase order integrated with finance (accounts payable)

3. Supply management

- a. Delivery: control of pending deliveries and management of manufacturers and batches
- b. Smash
- c. Transfer request
- d. Transfer
- e. Consumption (per patient and cost center)
- f. Inventory
- g. Chargeback request
- h. Chargeback (manual or barcode)

- i. Loans
- j. Devolution
- k. Stock replenishment. Central (generates purchase requests automatically managing virtual inventory). Satellite (generates transfer request automatically). Automatic process by replacement point
- l. Historical series (purchase, suppliers, deliveries, prices and discounts, latest purchases in quotation)
- m. Input analyzer
- n. Supply analyzer: inputs with stock below the safety stock, inputs x expiration date, view of what is being purchased, expected deliveries, partial purchases and deliveries, purchase requests without quotation and open quotations.
- o. Online inventory report
- p. Monthly inventory closing
- q. Consumption report by cost center and per patient
- r. ABC curve report
- s. Item movement statement report (time sequence of events per hour, user and operation performed with traceability).
- t. Analytical and accounting stock position report
- u. Batch and patient tracking report
- v. Material profitability report - medicine
- w. Comparative application and dispensation report

Pharmacy Module

1. Management
 - a. Inventory management
 - b. Medication management, interactions and dosages
 - c. Production control
 - d. Issuance of chemotherapy labels: bracelets, bags and doses.
 - e. Production of chemotherapeutic drugs: dose optimization, inclusion of kits and batch control to be dispensed
 - f. Barcode chemotherapy dispensing automation and management
 - g. Management of chemotherapy drugs produced, not produced or partially produced
 - h. Control of medication consumption - Ordinance 344
 - i. Consumption control per patient
 - j. Service queue

Input Handling Module

1. Creation of new input
2. New batch creation with automatic expiration date recalculation
3. Use of the input created in other parts of the system
4. Manufacturer as own entity
5. Manipulation report

Drug Scheduling and Production Module

1. Postponement

- a. Map of patient X medications X schedules
- b. Scheduling confirmation
- c. Suspension of doses / medication schedules
- d. Control of medication schedules
- e. Configurable automatic scheduling
- f. Reports of completed and pending schedules

2. Production

- a. Production of medicines from the pharmacy integrated with the schedule
- b. Management of daily doses
- c. Daily medication management
- d. Label issuance
- e. Consumption with double checking of label, streamlining the process of effecting the production of medicines.
- f. Report of doses produced
- g. Batch control

Billing Module

1. Structure

- a. Systemic operational. Regardless of paying source.
- b. SUS
- c. Various Agreements
- d. It includes several commercial tables (AMB, CBHPM, Brasíindex, Simpro and others).
- e. Private account management
- f. SUS and private with integration of multiprofessional teams

2. SUS (Health Unified System)

- a. APAC (Chemotherapy, Radiotherapy, request exporter and integration with PEP)
- b. Individualized BPA (SADT Exams and Integration with PEP)
- c. AIH (Billing and integration with PEP)
- d. BPA (Laboratory of clinical analysis, radiology, special exams, procedures). Exam request integration
- e. Management: Billing Control, Digital Issuance, Management Reports, Unified SUS confirmation made available
- f. Training in TISS

3. Private and Private Billing

- a. Insurance Coverage (By insurance plan, copy of coverage, SADT cascade discount, inclusion of cascade procedures).
- b. Management of hospitalization fees
- c. Management of extra fees for covenants
- d. Preparation of patient accounts (auditor, staff declaration, guides)
- e. Batch cover
- f. Digital exporter (TISS and TUSS)
- g. Gloss Control
- h. Billing control per patient - month.
- i. Control of open payments
- j. Management of health insurance plans, TISS and TUSS (Fees, SADT, SADT Therapies, Hospitalization, Exceptional Medications, Prostheses and Orthoses).

Electronic Patient Record Module (PEP)

1. PEP

- a. Clinical evolution and configurable hospitalization
- b. Configurable background
- c. Medication in use "at home"
- d. Configurable physical exam
- e. Medical Printing and Conduct
- f. Forwarding

- g. Vital signs
- h. Medical - Nursing Integration

2. Diagnosis

- a. Multidiagnosis: ICD10, ICD-M, ICD-O
- b. Toxicity (CCT - Common Toxicity Criteria)
- c. UICC / AJCC standard adult staging
- d. Oncopediatric diagnosis (as Cure4Kids)

3. Security

- a. Security of access to PEP
- b. Restriction of change after medical signature
- c. Dual XML for certification

4. Reports

- a. Medical record
- b. Issuing of receipts, certificates and hospitalizations
- c. Examination Request
- d. Examination Results: Manual, Automatic and Integrated to PEP.
- e. Intelligent (phonetic) researcher. By diagnosis, medication, protocol - treatment.

5. Medical Record

- a. JPEG Image Capture
- b. PACS interface (Philips, special design)
- c. Image Mosaic
- d. Capture and storage of any types of documents.

6. Request for complementary exams (SADT)

- a. Clinical analysis exams
- b. Diagnostic imaging exams
- c. Special exams (not LAB, not RAD).

7. Others

- a. Results and reports with security system
- b. Possibility of interface with clinical analysis equipment
- c. Possibility of DICOM interface

8. Multi-professional

- a. Therapy manager (QT x Pharmacy x Nursing)
- b. Electronic nursing record
- c. Multiprofessional electronic medical record

Blood Bank and Transfusion Agency Module

1. Blood bank

- a. Donor Registration
- b. Reception and sorting
- c. Barcode collection check
- d. Collection and complications
- e. Serology
- f. Release
- g. Transformation - irradiated, washed, filtered
- h. Transfer
- i. Discard
- j. Stock Exchange History
- k. Fractionation (aliquoting)
- l. Blood Component Stock

2. Transfusion Agency

- a. Blood Component Request
- b. Integration with surgery request
- c. Reception and sorting
- d. Immunophenotyping

e. Compatibility test

f. Transfusion

3. Reports

a. Donation and transfusion movement reports.

b. HEMOPROD

Tissue Bank Module

1. Solicitation

a. Orthopedics

b. Dentistry

2. Processing

3. Capture

4. Stock Management

a. Storage

b. By fabric type

c. Online Stock

d. Barcode process

e. Fabric history (traceability)

f. Processing II (Aliquot and Poll)

g. Inventory

h. Disposal with SVO billet

5. Fabric shipping process
 - a. Reservation
 - b. Dispensing
 - c. Transplant
 - d. Adverse Reaction Statement
 - e. Declaration of non-conformities

6. Transplant queue (Orthopedics)
 - a. By surgical groups (hip, shoulder, knee, etc.)
 - b. By fabric type

Prescriptions Module

1. Outpatient prescription
 - a. Acute and chronic prescription
 - b. Aid for medications most used by the doctor

2. Inpatient prescription
 - a. Type of prescriptions: Inpatient, day hospital, PS (emergency room), pre and post hospitalization.
 - b. Diet
 - c. Vital signs
 - d. Intravenous
 - e. Medicines

- f. Formulations
- g. Parenteral nutrition
- h. Nursing notices
- i. Copy of prescription (safely and considering CCIH times)
- j. Standardization of drugs and their controls
- k. Standardization of schedules
- l. Automatic dose calculation by KG, SC and others
- m. Drug interaction
- n. Blocking medications
- o. Times and dosages
- p. CCIH
- q. Adverse reactions
- r. Drug information
- s. Reports
 - Individual or unit doses, post control, patient, bed, sterile, non-sterile, type of medication and schedule
 - Intravenous production
 - Parenteral nutrition production
 - Production of formulations
 - CCIH Map
 - Drug map with changed prescription
 - Mapa de dietas

3. Chemotherapy Prescription and Production

- a. Prescription
- b. Registration of chemotherapy protocols
- c. Automatic calculations and AUC
- d. Institutional liability protocols
- e. Schedule of cycles and days of treatment.
- f. Technical data and dosages
- g. Daily prescription report and cycle summary
- h. Support for chemotherapy dilution center
- i. Information on doses generated by the oncology prescription module
- j. Kit's for drugs and procedures
- k. Automatic withdrawal of stock by lot and expiration date
- l. Automated consumption billing via Brasínde, Simpro, etc.
- m. Clinical and administrative data of the patient available at the time of production (body surface, day of treatment, venous access, visualization of Kits by medication, health insurance, coverage, etc.).
- n. Charging per commercial presentation unit or technical unit
- o. Label and CB generation: bracelet, treatment and medication
- p. Barcode checking
- q. Stability control

4. Radiotherapy Prescription

- a. Tele and Brachytherapy Prescription
- b. Registration of injury sites and their fields, regarding teletherapy
- c. Standardization of doses and equipment
- d. Dosage control
- e. Radiotherapy report
- f. Automated scheduling

Operating Room Module

1. Surgery request
2. Blood Component Request
3. Surgical schedule
4. Authorization management
5. Inpatient Guide
6. Surgical panel
7. Equipment collection
8. Surgical checklist
9. Surgery management
10. Management of additional surgery procedures
11. Surgical safety

SADT module

1. Manager of examinations performed, signed and collected
2. LIS - Laboratory
 - a. Examination request
 - b. Collect
 - c. Receiving samples
 - d. Production and interface
 - e. Results
 - f. Laundry
 - g. signature
 - h. LIS production management
 - i. Interface with equipment - separate contracting
3. DI - Diagnostic imaging
 - a. Examination request
 - b. Technician worksheet
 - c. Report doctor's worksheet
 - d. Laundry - with DICOM and PACS interface
 - e. Data dictionary
 - f. signature
 - g. DI Production Management

h. PACS - contracted separately

4. Special exams

- a. Examination request
- b. Technician worksheet
- c. Worksheet of the doctor who performs the report
- d. Report tool - with image interface (DICOM and JPEG)
- e. signature
- f. Special production management

Prostheses and Orthoses Module

- 1. Stock with serial control
- 2. Reports
- 3. AIH integration
- 4. Integration with Private Billing

Financial Module

- 1. Control by entity
- 2. Restricted access
- 3. Control of current accounts
- 4. Bills to pay
- 5. Bills to receive

6. Others

- a. Check issuance management
- b. Interbank transactions (transfer between accounts)
- c. Payment authorization
- d. Bank reconciliation
- e. Monthly closing of balances
- f. Current Account Position
- g. Duplicate management
- h. Supplier management
- i. Budget control
- j. Account management
- k. RPS (Provisional Service Receipt) Map

7. Reports

- a. Chronological with several filters
- b. By Supplier
- c. Duplicates
- d. Cash flow
- e. Managerial flow

Visitor Access Control Module

1. Registration of Visitors

2. Access control for visitors, companions, suppliers, administrative, service providers and others.
3. Control of length of stay.
4. Visitor destination control
5. Badge issuance with barcode.
6. Download or close access by barcode or manual.
7. Analytical report of visitors (open or closed controls, per patient, per company, per profile, etc).

Special Modules

1. Statistic
 - a. Managerial statistics: schedule, procedures, exams (SADT), inpatient prescription - theoretical view of prescription by medication, occupation statistics - only for hospitals (hospitalization)
 - b. Epidemiological - distribution of pathologies by ICD
 - c. Outpatient Production
 - d. Hospital Census
 - e. Medical Production: by agenda or by medical record (PEP)
2. Business Intelligence
 - a. Extraction of data from multiple databases
 - b. Online views, with the possibility of extracting data into spreadsheets or images (.xls, .xlsx and .jpg).

- c. Open system to support multiple information cubes (OLAP)
- d. Hiring separately - Microsoft SQL Server database

3. PCMSO

- a. Occupational medicine and health control program

4. Telemedicine – RAP (Remote Assistance Program)

- a. Scheduling, via mobile, by the patient, directly on the doctor's agenda;
- b. Consultation, guidance and referral of the patient carried out remotely with the help of technology;
- c. Remote monitoring of health and / or disease parameters;
- d. Prior assessment, with application of protocols, for pandemics and other chronic diseases and follow-up care;
- e. Conversation / communication between multiprofessionals to assess medical conduct and patient evolution;
- f. Issuance of electronic prescription, with electronic signature through digital certificate;
- g. Audio / video recording, with cloud storage, recording the beginning and end of care and later storage in the Electronic Patient Record, digitally signed by the doctor;
- h. All systemic processes are within the norms established by ANS, ANVISA and CFM.

Necessary infrastructure

	Recommended Settings				
	Operation System	Up to 10 Clients	Up to 40 Clients	Up to 100 Clients	100 + Clients
Database/ Server	Windows Server 2008 / 2012	Intel i5	Pentium Xeon (Quad)	Pentium Xeon (Quad)	Pentium Xeon (Quad)
		3.0 GHz	4 GHz	4 GHz	4 GHz
		Memory 6 GB	Memory 8 GB	Memory 16 GB	Memory 32 GB
		HD 500 Gb	HD (2) 500 Gb	HD (4) 500 Gb	HD (4) 1Tb
		Domain	Domain	Domain	Domain
Work Station	Operation System	Recommended Configuration		Minimum	
	Windows XP Windows Professional 7 or above 32 or 64 Bits	Processor i5		Processor i3	
		Memory 4 Gb		Memory 2 Gb	
		Disk Space of 500 Gb		Disk Space of 250 Gb	
		Network Ethernet 10/100 Kbps		Network Ethernet 10/100 Kbps	
Internet Connection for Remote Access	Remote access software	Recommended Support Settings		Minimum	
	Terminal Service, VNC, Showmypc o Logmein	Boradband: 40 mb		Broadband: 20 mb	

Database
:

- SQL Server,
 - SQL Express (free – Limit of 10GB).
 - Other SQL versions must be purchased License
- Oracle,
 - Oracle 10g Express Edition (free – Limit of 10GB).
 - Other Oracle versions must be purchased License