



HEALTHY  
SYSTEMS



**YOUR  
PROBLEM  
IS OUR  
PROBLEM**



# ÍNDICE

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# HEALTHYSYSTEMS

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HealthySystems was created in 2013 and has as main objective to support its customers to achieve Healthy Information Systems.

It is focused in cybersecurity systems optimization and development of security and integrations technologies, as well as Information Systems consultancy and audit services, in terms of data quality and data protections laws.

We deserve the trustiness of our customers to whom we dictate all of our operationalization capacity and quality of our implemented solutions.

# OUR VISION

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Trust partner to add Security and Value in Information Systems.

# OUR MISSION

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Provide cybersecurity, interoperability, and data quality solutions that enable organizations to achieve greater confidence in the information and systems they use.



# CO-FOUNDERS

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Luis Filipe Antunes, PhD. Associate Professor, Department of Informatics, Faculty of Sciences of University of Porto (FCUP), senior researcher at INESC TEC. Positions held: Direction of the Department of Informatics of FCUP; Direction of the Center of competences in Cyber Security and Privacy of the University of Porto; member of the Scientific Council of FCUP; member of the Electronic Directors Board of the University of Porto. He has worked as a consultant in the area of computer security for the Ministry of Health, Portuguese Data Protection Commission (CNPD) and Portuguese National Security Agency.



Manuel Eduardo Correia, PhD. Pro-Rector of the University of Porto - Coordination of the University of Porto Digital. He is a researcher in the field of computer security in the CRACS group of INESC TEC Porto where he is responsible for research projects related to anomaly detection and identity management and security aspects of various sector contracts. Positions held: Director of the master's degree in Computer Security at the Faculty of Sciences of the University of Porto (FCUP); consultancy in some Portuguese public agencies (Health and Education) in computer security; member of the Executive Committee of the Department of Computer Science of the Faculty of Sciences.



Ricardo João Cruz-Correia, PhD. Assistant Professor at the Faculty of Medicine of the University of Porto (FMUP). Researcher at CINTESIS - Centre for Research in Health Technologies and Services, Research and Development Unit (R & D). Active collaborator in the implementation of several health information systems. Positions held: Member of the Scientific Committee of the Master degree in Medical Informatics and of several normative organizations of informatics in health (HL7, openEHR, IPQ CT199, ABNT) and Associations (API, E-MAIS). Founding member of HL7 Portuguese Affiliate Chapter.



## CHALLENGES

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We intend to be seen in the market as the confident key player in the delivery of Information Systems, Security and Data Protection for public sector, taking advantage of our large experience in health sector.

This attitude lead us wanting to be a secure partner in Information Technology key-areas with innovated and differentiated solutions, applying distinguished competencies and experiences, keeping the capacity for the development of new products through research activities and technological development (R&D).

# TECHNOLOGY

The development of our products is based on the most advanced technologies to implement reliable solutions, of high availability and performance.

We invest, continuously, in the security of information to guarantee the market's leadership in different activity's sector and, specifically, in health sector.





## QUALITY

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HLTSYS counts, in its staff, with specialized technicians and certified in:

**Mirth Corp (Quality Systems, Inc)**, which enables us to assist our customers in the choice, acquisition, parameterization and maintenance of highly available Mirth server clusters capable of meeting the most demanding interoperability challenges (HL7 in particular).

**ISO/IEC 27001 Lead Implementor Standard.** Produced to provide a model that allows to establish, implement, operate, monitor, analyse critically, maintain and improve an Information Security Management System.

**ITIL® 2011 Foundations in IT Management.** Through ITIL structure we obtain a set of recommended practices for IT services management (ITSM), which focuses in the alignment of IT services with business needs.

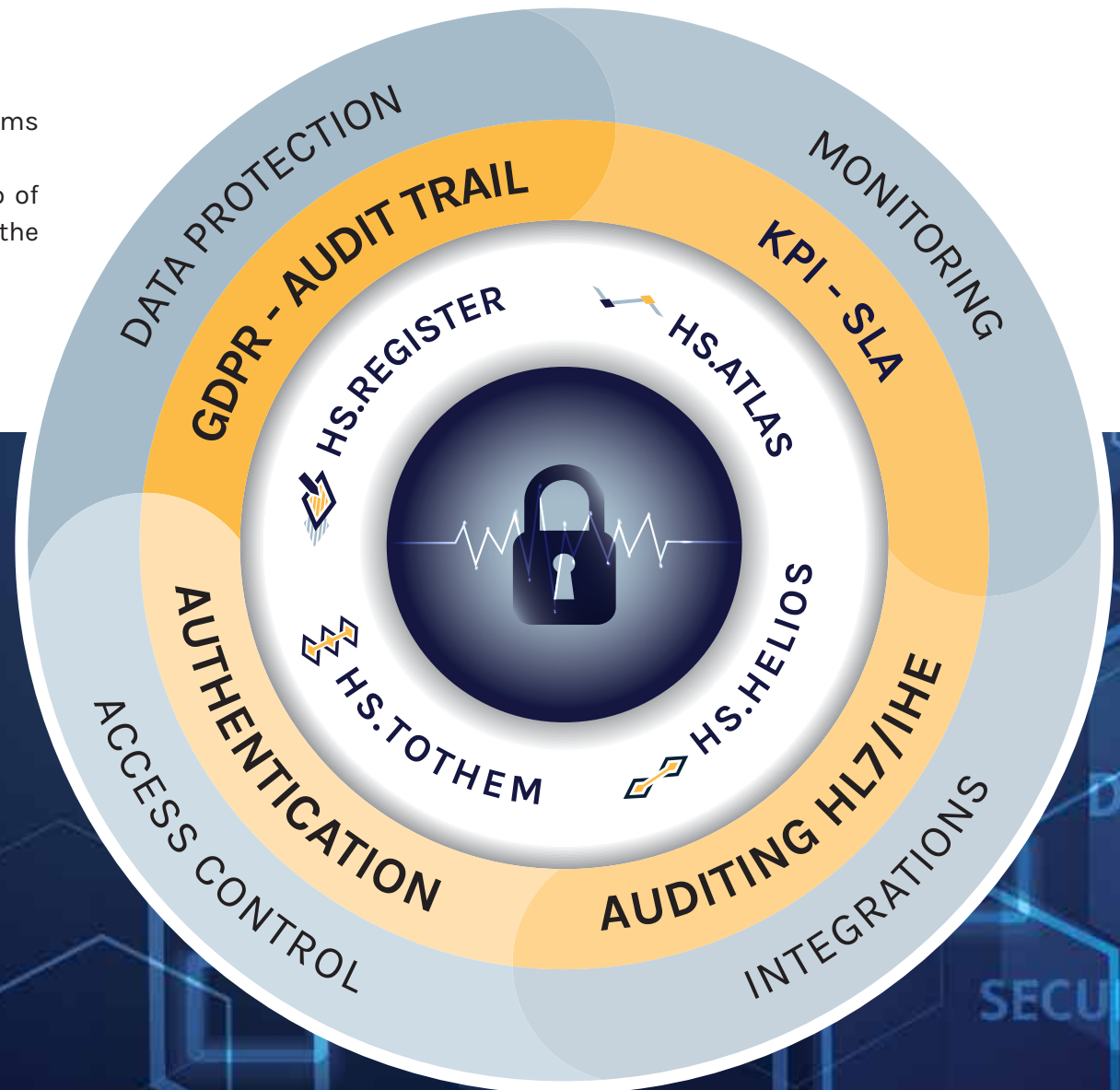
**HL7 Portuguese Affiliate Chapter**, which has as main goal stimulate de the global interoperability in Portugal, in the health sector, through the development of standards and mobilizing its adoption and implementation in the sector.

We guarantee the best practices of management in terms of efficiency, traceability and responsibility of all internal processes and with clients.

# PRODUCTS AND SERVICES

Our offer is differentiated in the market.

The focus of our offer is based on Information Systems Security and Interoperability.  
We believe that we add value through our portfolio of differentiated products and services that assure the needs of our customers.





## PRODUCTS

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Our products are the result of innovative Research and Technological Development projects carried out by our team, whose knowledge and experience were at the origin of its conceptualization.

They are an open space in constant evolution that is translated into the quality required by our customers.

Over the last few years HealthySystems has been developing and maintaining a solid set of relationships with Scientific and Technological entities, of the public and private business sector and the associative sector. These relationships also result in contributions to our solutions.



# HS.REGISTER

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## Audit | Traceability | Integrity

The best solution for analysis and problem tracking. This unique data repository enables the management of the main events relevant to the proper functioning of each organization.

We centralize the collection of logs from multiple Information Systems, Network Systems and infrastructures with the unequivocal guarantee of information integrity (Blockchain).

It relies on a non-relational, scalable and responsive ElasticSearch database, thus enabling rapid searches on a large volume of data.





**HS.HELIOS**

## Interoperability | Centralization | Communication

It is the ideal IT solution to guarantee Interoperability in hospitals or regional health administrations, which consists of centralizing the integrations between the various Information Systems.

It is a technology based on the Mirth solution in which a proprietary brand has been developed and uses differentiation tools from the standpoint of available functionalities, such as real-time data quality analysis.

Through the high availability integration platform, we provide a differentiated service with regard to the real-time monitoring of the traffic present in the hospital network.



# HS.ATLAS

## Monitoring | Alarmistic | Control

Oriented to critical Information Systems environments, this software enables remote monitoring and real-time problem identification, not only in terms of hardware performance, but also operating systems, hosts, services and networks.

It is a solution that enables the reduction of service downtime and the prevention of breaks from custom sensors.

It is the solution for those who want to have control of the performance of their Information Systems without additional work. We provide control dashboards and service grids with all sensors configured, as well as their status.





QR-CODES

SMARTCARD

TOKEN-USB



**HS.TOTHEM**

## Security | Access Control | Secure Authentication

For those looking for the implementation of Single-Sign-On this is the ideal solution. Our extensive experience in implementing complex access control policies, including setting the level and type of authentication to access critical resources, allows us to recommend this solution as the Secure Authentication reference service for Web applications.

This digital signature and authentication system can be easily incorporated into third-party solutions, allowing to maintain existing implementations of the various Information Systems installed.

We provide authentication mechanisms in isolation or in combination (factor 2 or factor 3), the following authentication methods: Login / Password; Smartcard (Citizen Card and Professional Order Cards, such as the Card of the Physicians' Order); X509 Certificates; USB tokens (such as yubikeys, U2F tokens); NFC Cards (Mifare) and QR Codes.



## Pseudo-anonymization | Privacy| Data Protection

Platform of excellence, which provides an automated pseudo-anonymization service, for the most diverse types of data with support for Big Data. It is accompanied by an audit service specialized in Data Privacy Impact Assessments (DPIA's) in accordance with the new General Data Protection Regulation (GDPR).

With this product we aim to promote "Privacy by design" for customers who wish to fully exploit the research and market potential of large volumes of interactive data that guide the user through the process itself, facilitating access to the latest techniques in the field of pseudo-anonymization.

The entire pseudo-anonymization process is based on an interactive process, consisting of analysis and processing of repeatable operational data, until the whole process converges to a good, measurable, acceptable and possible relationship between data privacy and its contextual utility and economic value.





**HS.FARMALERTA**

## Mobile | Information Management| Security

Mobile application for patients and their caregivers that allows the management of medication at home context and the its monitoring by the prescribing physician in a consultation environment.

This is the perfect shots' schedule, supplemented with notifications and alerts, for any patient in the context of a medication regimen at home.

It also allows the collection of statistical data by caregivers regarding adherence to medication, adverse reactions and indicators of patients' quality of life.

# SERVICES

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## Consulting

Large experience in the survey of work processes, information flows and support in the definition of improvement processes based on best practices.

Technical specifications in the different components of implementation of our products (eg support in the creation of integration channels in Mirth systems).

Our services provided at the level of computer security include support in the definition and implementation of security policies.

## IT Services

Development of customer-oriented functionalities (such as specific monitoring sensors for different platforms, key performance indicators - KPIs or service level agreements - SLAs).

We support the implementation of authentication mechanisms in use, as well as the implementation of public key infrastructure (PKI).

Development of pseudo-anonymization algorithms.

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## Audit

We provide audit services at the Interoperability level, namely: audits on the communication of HL7 and DICOM messages; Assessment and compliance of IHE (Integrating the Healthcare Enterprise) profiles.

At the level of information security we perform: audits of computer security policies and performance of network infrastructure; Pen-testing to Information Systems, network infrastructure and servers.

We perform compliance assessments of the General Data Protection Regulation (GDPR), as well as Data Privacy Impact Assessments (DPIA's) and their respective analyzes, evaluations and reassessments of risk.

## Project Management

We apply the PMBOK (Project Management Body of Knowledge) methodology, developed by PMI (Project Management Institute). The PMBOK is a guide to knowledge and best practices for project management and has been approved as standard by the American National Standards Institute (ANSI).

We provide our clients with a governance model based on continuous interaction, supported by communication and reporting methodology, between Top Management, Project Technical Management and Operational Teams.



# I&D

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Throughout its existence HealthySystems has developed several research projects in the security and interoperability scope. With these projects he won several national and international awards.

The relevance of developed R&D activities led to the creation of an R&D core in HLTSYS in 2015, whose projects have been certified by ANI, IAPMEI and FCT under the System and Tax Incentives for Enterprise R&D.

Therefore, HealthySystems plans to continue to grow, sustainably, and in an innovative and natural way.

Recently it was approved by the NORTE2020 program the project of Research and Technological Development under the acronym "DiAS - De-identification as a Service" that aims the development of a platform of anonymization of data as a service.

Cofinanciado por:



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## HS.HELIOS Demonstrator

HealthySystems is the Lead Promoter of Project nr. 34017 in co-promotion with the Center for Research in Health Technologies and Services (Cintesis), which includes the implementation of HS.HELIOS Integration Bus, enabling interoperability and centralization of integrations between hospital Information Systems (SI).

Its end-users of the North Region - Centro Hospitalar Entre Douro and Vouga, EPE (CHEDV) and the Central Region - Centro Hospitalar Tondela Viseu, EPE (CHTV) will validate the latest developments of the integrator HS.HELIOS in line with the compliance of GDPR and contribute to the study of the impact analysis of this solution to obtain health gains.

Cofinanciado por:



UNIÃO EUROPEIA  
Fundo Europeu  
de Desenvolvimento Regional

## HS.REGISTER Demonstrator

HealthySystems is the Lead Promoter of the project nr. 33756, which will allow the HS.REGISTER central repository to be implemented in the Unidade Local de Saúde de Matosinhos, E.P.E (ULSM) where all important events to the proper functioning of Information Systems are recorded and audited.

In co-promotion with the Faculty of Sciences of the University of Porto, the project will allow the end-users to validate the development of new privacy risk mitigation measures in the monitoring of information traceability, reinforcing the value of this solution to the alignment of the organizations with the RGPD.

Cofinanciado por:



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de Desenvolvimento Regional

# CLIENTS

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# TEAM

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Our team counts with specialized employees and offices in Porto and Mealhada. We continuously strength our workforce to achieve our strategic objectives, especially in the area of Services. We have extensive experience accumulated in the study, implementation and evaluation of information systems cyber security and Data Protection in different sectors of activity.

Our co-founders and collaborators have various scientific publications in international journals, congresses and book chapters. They are responsible for curricular units and courses on security and their visibility leads them to be periodically invited as speakers in national and international lectures and events, and has already given some lectures, by invitation, at events organized by the National Commission for the Data Protection (CNPd).

Some members of our team additionally integrate and collaborate with the national standards body (health informatics group IPQ - CT199) and are current PhD fellows in the health area.

# AWARDS

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**"João Cordeiro - Innovation in Pharmacy" award.** This is the first edition of the Award promoted by ANF - National Association of Pharmacies whose award distinguished the project DigitalPharma, a mobile solution that allows the user to interact with the pharmacy facilitating (for mobility and portability) drug access, adherence to therapy and to drug surveillance.



**CIO Awards 2015** - Implementation Award of the Integration Router & Audit (IRA) solution, currently the HS. HELIOS. It is a system integration solution developed to support the management and integration of Information Systems. Its first implementation was in the IPO Porto, allowing, among other functionalities, the real-time monitoring of the exchange of data between the different services and departments.



**HL7 FHIR® DataThon na VITALIS & MIE2018** - Duarte Ferreira and João Almeida Researchers from the CINTESIS NanoStima project and HealthySystems collaborators won the HL7 FHIR® DataThon at VITALIS & MIE2018 (Sweden) with its SARD application Sniffing. This application uses the HL7 FHIR standard to communicate with an asthma patient's database and collect information about the medicine. Uses the medication information to access the Vigibase database and obtain data on the ADRs for each drug the patient takes. It then processes the data and displays it on a simple web page, listing the respiratory RAMs found for each medication.

# WE ARE THE SOLUTION



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