Article

Saipem My Health Record: a model of an electronic health record for the management of workers' health

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Abstract. *Introduction:* Saipem is a contractor company in Oil and Gas industry. Saipem has developed an in-house medical department, whose main objective, apart the management of medical emergencies, is prevention, health protection and promotion. In order to make these principals available and applicable at all site worldwide Saipem decided to initiate and develop the implementation of e-medicine in its daily operations.

Methods: the challenging goal of the Saipem Medical Service is to make available to all employees their health data, quickly, easily accessible and secure.

The basis for achieving these objectives is the adoption of standards that allow the exchange of data between patient, public and private structures thus ensuring the interoperability of information.

My Health Records (MHR) is the program that allows the visualization, consultation and sharing of health information and data that constitute the clinical and health history of each Saipem worker.

My HR makes it possible to have secure and exclusive access to your healthcare profile, its portability and the consequent possibility to consult it and show it in case of need, even from remote extemporaneous stations from any device connected to the internet (PC, smartphone or tablet).

The digitization of health documents through MHR is aimed at ensuring a) faster and more direct communication between employer, medical staff and employee, b) immediate usability and portability of data, c) the availability of a vast amount of data in a single space, d) a reduction in costs through the dematerialization of the data.

*Results***:** in order to assess the impact of MHR on the working population, Saipem has prepared to send a satisfaction questionnaire to approximately 6.000 employees in order to understand the impact on the working population and lead to even more innovative solutions.

The purpose of the questionnaire is also to sensitize the user / employee in the autonomous and completely free of this application. The result are show and discussed.

Conclusion: MHR was created to offer all Saipem employees the opportunity to access their health records. This project represents a model to be proposed to all Italian companies that, following the dictates of Legislative Decree 81/08, apply Health Surveillance to their workers. The advantages are represented by the dematerialization of the data, the relative cost saving (shipment of health documentation, reduction of hours / work dedicated to the expiry of visits, possibility for public health to use health data without repetition of clinical and instrumental tests, vaccinations, etc) and greater attention to all Italian workers, both EU and non-EU, with a definitely positive impact on Public Health.

The strategy of the MHR launch is proving successful, and from 1 June 2017 to 1 June 2018 16,764 accesses were registered.

Keywords: Health data system, e medicine, Health records, Health Surveillance.

Introduction

The challenge of innovation in Public Health passes through the digitization, dematerialization and integration of administrative, diagnosis and treatment processes (1,2).

The "digital health" allows the adoption of new paradigms, the only ones able to respond to the changed needs by taking advantage of the technological development of the last years. It is about introducing computerized solutions that keep in mind the potential offered by new technologies. These include the total dematerialisation of processes, the delocalization of data and their sharing (Cloud) and the predictive comparison of large amounts of data (Big Data Analytics) (3).

The basis for achieving these objectives is the adoption of standards that allow the exchange of data between patient, public and private structures thus ensuring the interoperability of information (4).

All this appears in the indications received from the European Union, which has indicated in the paradigm of "digital health and personalized medicine" the main objectives to face the challenge of future sustainability on the European continent (in Italy we assume savings in the order of 20 billion annually) (5).

Information and Communication Technology is an increasingly pervasive lever in supporting processes of governance and change in the National Health System (NHS). It allows you to have a cognitive framework of the NHS based on a shared and increasingly timely and complete data and information asset. It is therefore strategically important that the implementation of information systems, at the different levels of the NHS, is consistent with the priorities that invest in health governance and the guarantee of essential assistance levels (LEA), directing the development lines towards the realization of both systems. in support of the NHS government and systems to support patient care (6,7).

In this context, the New Health Information System (NHIS) is the reference tool for the quality, efficiency and appropriateness measures of the NHS, aimed at supporting the Ministry of Health and the Regions in the exercise of their respective functions. The information assets available in the NHIS consist of a set of information flows related to management, organizational and economic aspects of the NHS structures, and to the assistance provided (LEA) to the assisted. These flows make it possible to have the basic elements to examine the satisfied demand, as well as to perform integrated and cross-cutting analysis of the different LEAs (4,8).

What has been described above does not only concern Public Health, but also those non-healthcare companies that interface with it. An example is what happens in Saipem, an Italian contracting

company, a leader in the oil and gas industry. Currently, 35,000 employees work in around seventy countries around the world, operating in the offshore, on shore and drilling sectors.

The company is structured with its own health service, with more than 100 clinics in the world where more than 500 doctors and nurses work. The Medical Service has always been attentive to the wellbeing of workers, through targeted prevention programs (WHP Lombardy Region (9), Cardiovascular disease control program (10), Obesity Control Program) (11) and clinical studies aimed at understanding and mitigating risks for health (10-year retrospective analysis of a cohort of offshore workers (12) and study of the prevalence of major cardiovascular risks in the same population) (13).

Saipem has also always invested in technological innovation to ensure the correct management of health (Telecardiology in all operating sites) (14) and the clinical history of its employees (Saipem GIPSI health file) (15).

Objectives

Initially, the health service Saipem developed an internal program called MED, which was released in 1995, on the company's sites and ships. The data transfer took place using a floppy disk to import and export data, and then send it to the company office by courier and vice versa. This method was complicated by the many variables present (shipping, travel, potential damage to the floppy, etc).

Three years later, in June 1998, the program was improved and renamed to GIPSI (Gestione Informatizzata Prestazioni Sanitarie Individuali – Computerised Management of Individual Medical Services). The transfer of information had generally been improved with the introduction of an email system to the vast majority of peripheral units, but the import and export data remained the only way to transfer information to the corporate office. It was in June 2004 when a real-time access to the program was developed that the GIPSI web was born. In 2016, the system was redesigned by incorporating the Symantec - VIP Access application to access the program (for total privacy protection). Now almost all the projects, sites and ships are connected to it (15).

The program is accessible via the Saipem network on the PC of medical personnel. The Symantec - VIP Access application is installed with the help of the Saipem ICT department. The OTP password (security code) is generated every time the medical personnel wants to access the GIPSI system. The individual user profile is created to activate only the project, site or ship with which the user is connected. The administrator is responsible for activating the user profile and determines access to the program.

The system is powered both by the company's medical unit, with data on the medical fitness of employees, and by peripheral medical personnel with data on health conditions and illnesses / injuries that an employee develops on the site. The medical data of all employees of the Saipem group (the actual ones and those who have also worked temporarily for the Company) are available and comply with the legal obligation to keep medical documents. The system allows the management of related medical costs, sanitary inspections, all access to clinics and related medical statistics. It is also able to provide complete and real-time data on the stock of medicines on each operational site.

The challenging goal of the Medical Service is to make available to all employees their health data, quickly, easily accessible and secure.

The basis for achieving these objectives is the adoption of standards that allow the exchange of data between patient, public and private structures thus ensuring the interoperability of information (4).

My Health Records (MHR) is the program that allows the visualization, consultation and sharing of health information and data that constitute the clinical and health history of each Saipem worker.

MHR makes it possible to have secure and exclusive access to your healthcare profile, its portability and the consequent possibility to consult it and show it in case of need, even from remote extemporaneous stations from any device connected to the internet (PC, smartphone or tablet) (16).

The digitization of health documents through My HR is aimed at ensuring

a) faster and more direct communication between employer, medical staff and employee,

b) immediate usability and portability of data

c) the availability of a vast amount of data in a single space

d) a reduction in costs through the dematerialization of the data.
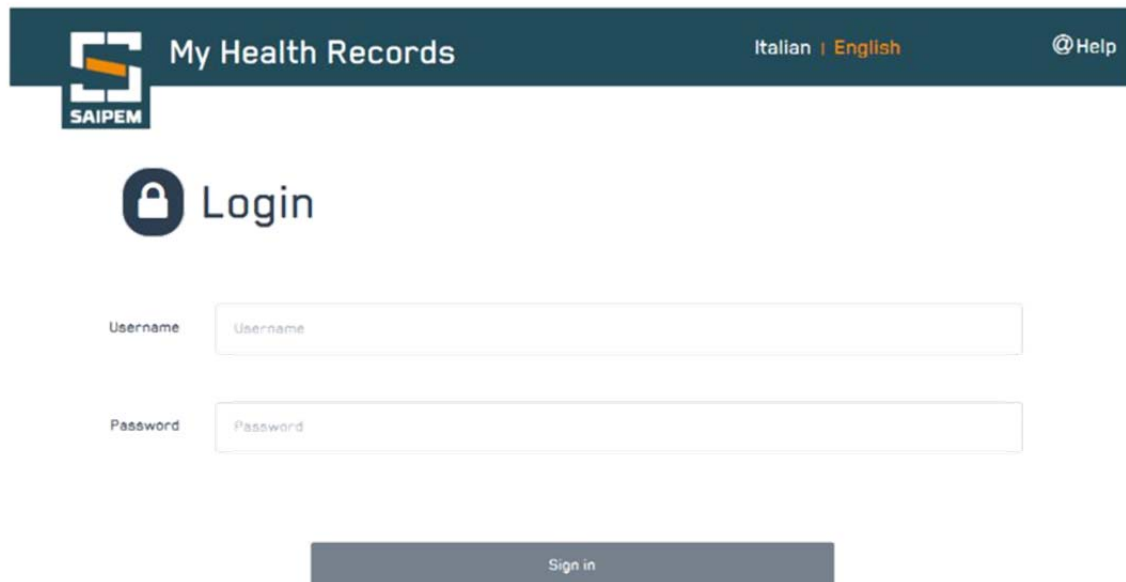

MANAGEMENT OF HEALTH DATA

Health data collection

The health data of each worker contained in MHR are collected and recorded over time in GIPSI and are kept up-to-date by the staff of the Company Medical Service of reference (15).

In case of termination of the employment relationship

In the event of termination of the employment relationship, the worker will have the possibility to access the service within 5 days from the date of termination and independently download their own health documentation. As required by current legislation, staff in discharge (retired, dismissal…) are obliged to receive a copy of the health risk file (17).

Log in to My Health Records

To access MHR, the employee types (or simply copies and pastes) the link https://myhealthrecords.saipem.com/ in the address bar of the browser of preference. Select the language and proceed with authentication by entering your credentials
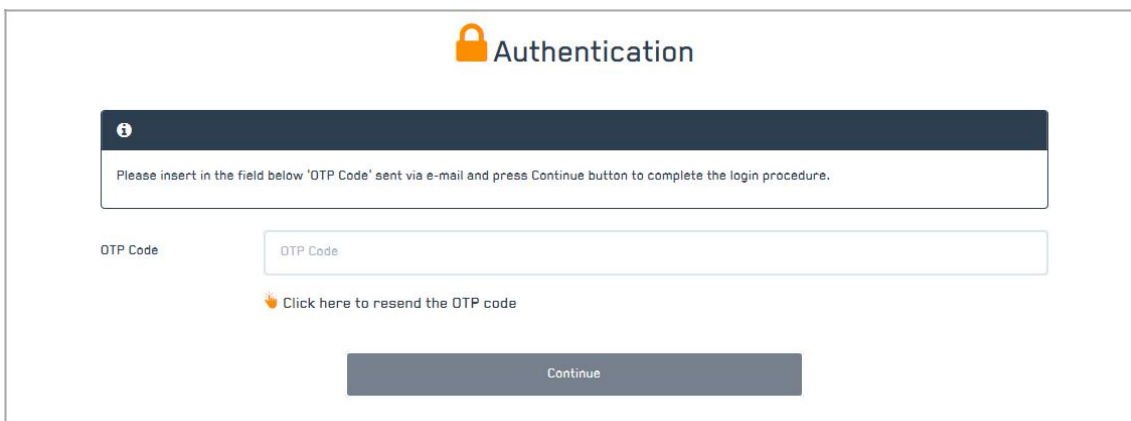
Access with Saipem network users
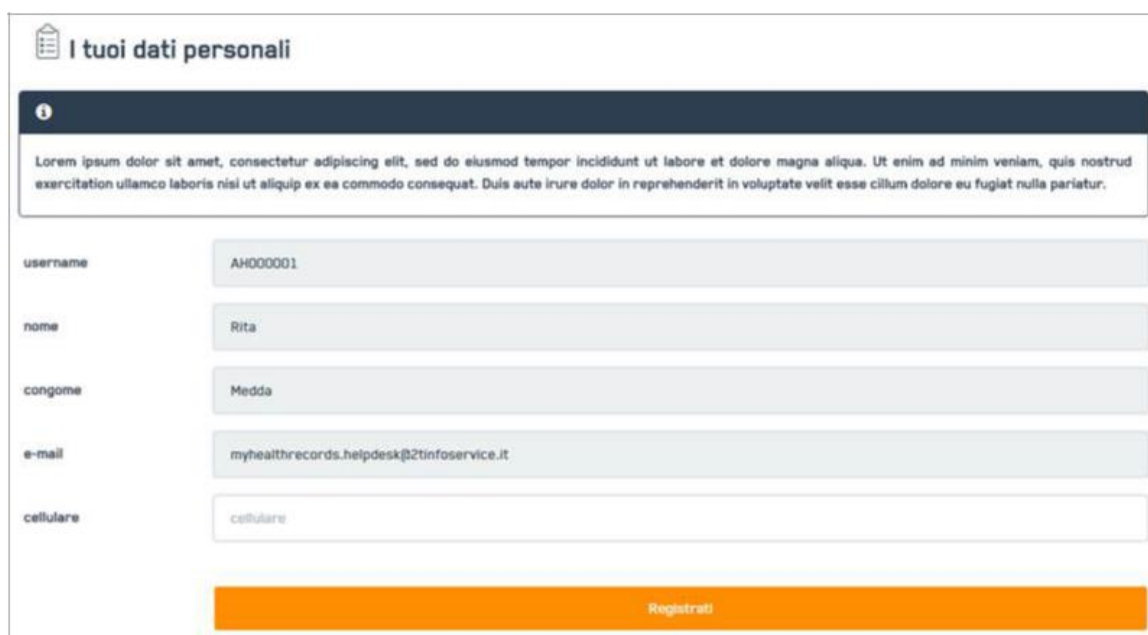
Access to MHR takes place in two steps.

Those who have a Saipem network will have to fill in the Username and Password fields by entering the company email address and the network password respectively.

The system will send an OTP (One Time Password) to the email address entered at login. Once received, the user must copy and paste it in the "OTP Code" field to continue with the access procedure.

At the first access the system will ask you to verify your personal data, to indicate a telephone number for any communications and a personal e-mail address to send the OTP.
Users who do not have or do not want to provide a personal e-mail address have said the dedicated box, since authorizing the lack of strong authentication (18).


"I declare that I do not have or do not want to provide a personal e-mail address";
"I am aware that, in the absence of an e-mail address different from the corporate one, information security is reduced, as the PIN will be sent to an e-mail box that can be accessed with the same credentials (user id e password) that must be used to access the data being processed. Therefore strong authentication will fail "(18)

Access with private mail account (for employees without Saipem network users)
Employees who do not have a Saipem network will have to authenticate themselves by accessing the Authentication Hub (https://authenticationhub.saipem.com) and register with their own private e-mail.
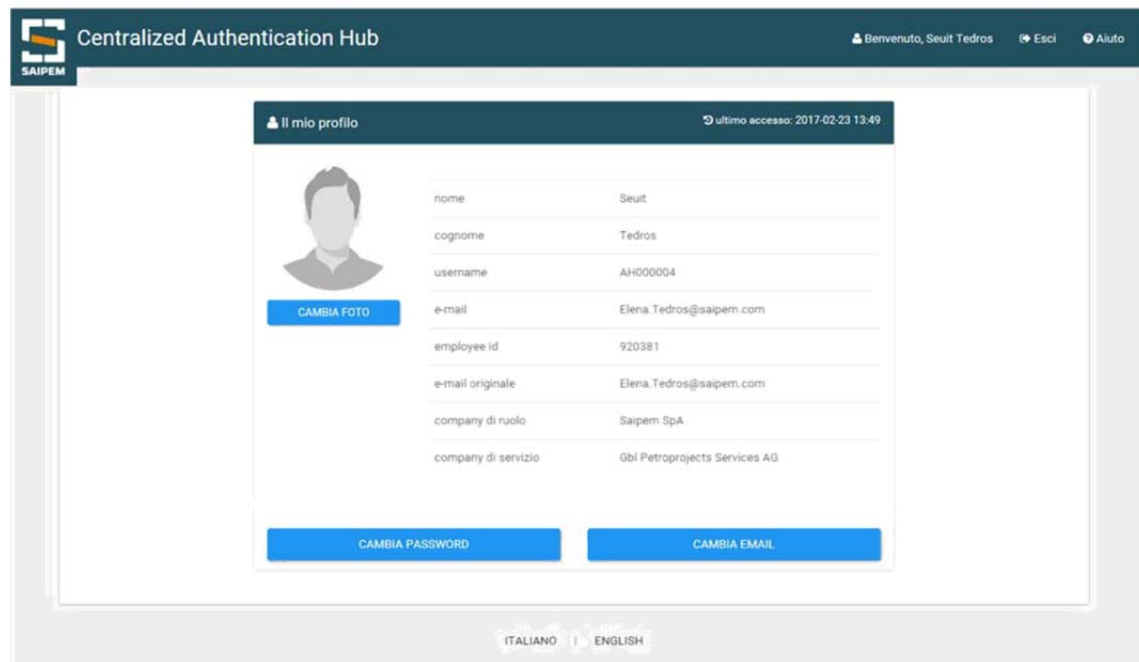
Access from smartphones and tablets

It is possible to access MHR from any mobile device connected to the internet as long as the user is provided with a username and password and thus has the opportunity to receive the OTP on that device.
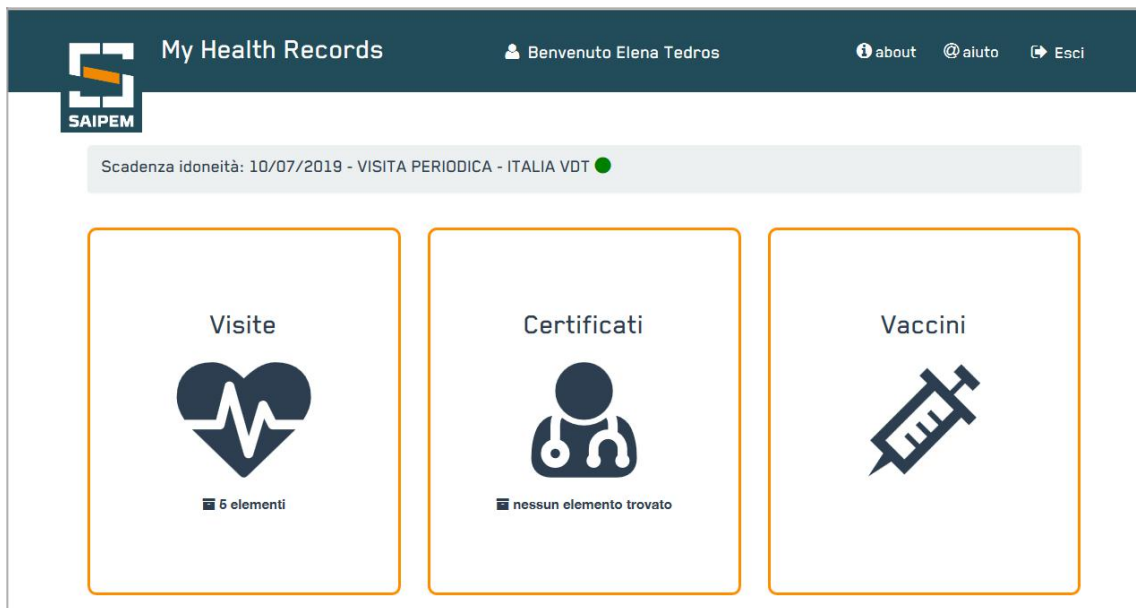
Access via Webmail

Who does not have a portable PC and does not have the company mail installed on a smartphone or tablet, can make the first access to the service through Webmail - reach them at https://owa.saipem.com/ - and then enter the own company email address.
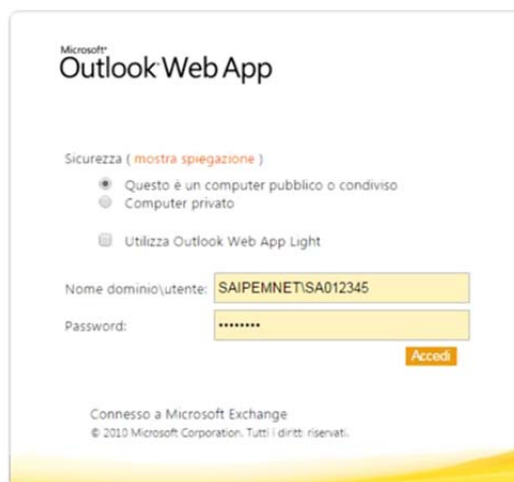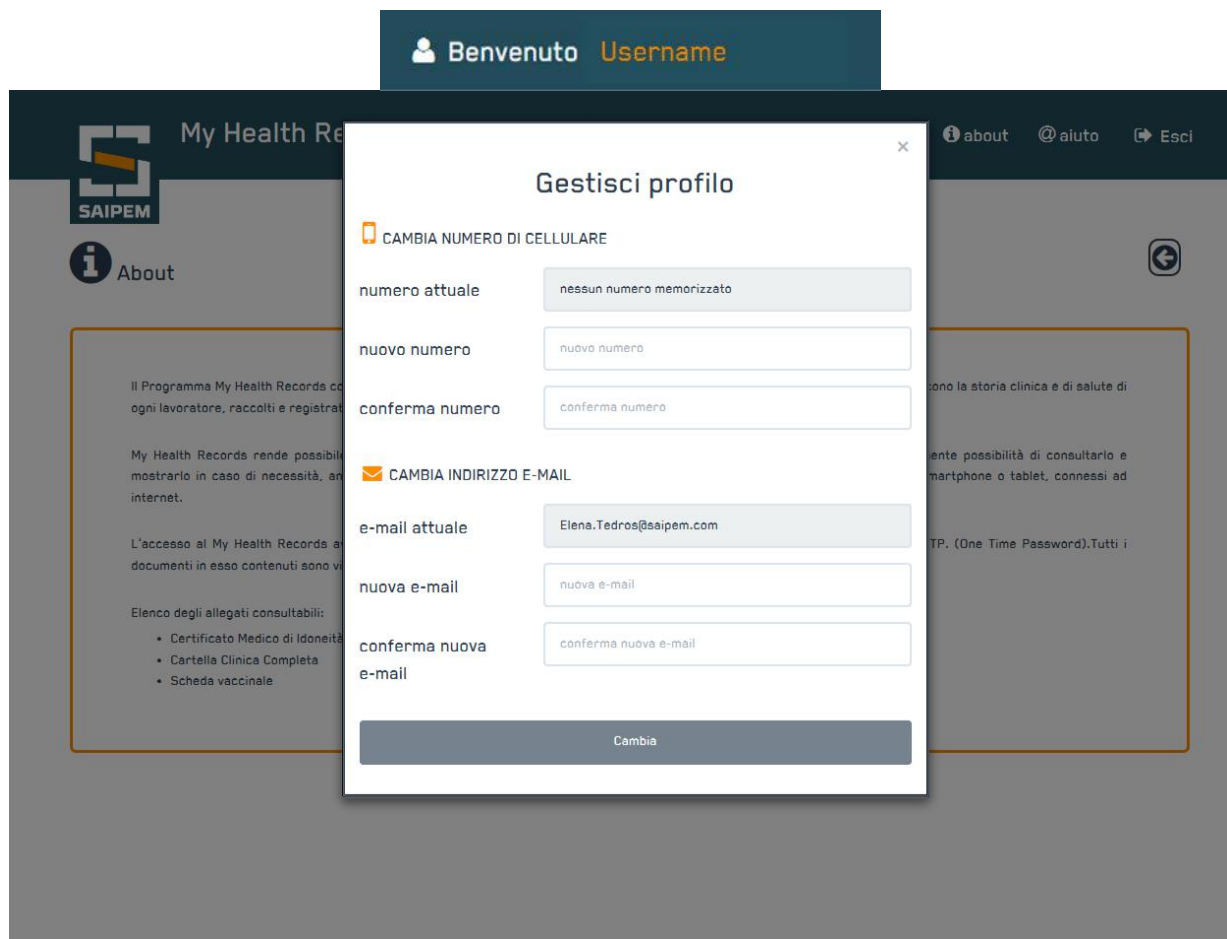
My Health Records Homepage

The main page of MHR is presented as shown here

The welcome message shows the name and surname of the user. By clicking on the button you can change your personal data (mobile number and personal e-mail address)

On the homepage you can view the status of your medical fitness. The system in fact highlights its expiry date with the following indicators.

● Regular fitness status   ● Expiring Medical Fitness

● Expired Medical Fitnes

Viewing Visits

This section contains and displays all the medical documentation relating to medical examinations, clinical and instrumental examinations, health checks and investigations.

       To open and view documents

       To send / share the document via email

       To return to the homepage

Viewing Certificates

In this section the certifications issued are inserted and viewable: Medical Fitness Certificate for the worker abroad and Judgment of suitability for the task.

Note: Certificates issued following a medical examination, if not present in the appropriate "Certificates" folder / drawer, may be attached directly to the medical examination and then viewed within that specific folder / drawer.

Vaccine Visualization

In this section all vaccinations carried out in the Saipem area and in any case communicated / transmitted and recorded by the company medical service are inserted and displayed.

Document sharing

Through MHR it is possible to send the downloaded documents via e-mail (for example to your doctor or a reference specialist) directly from the application.
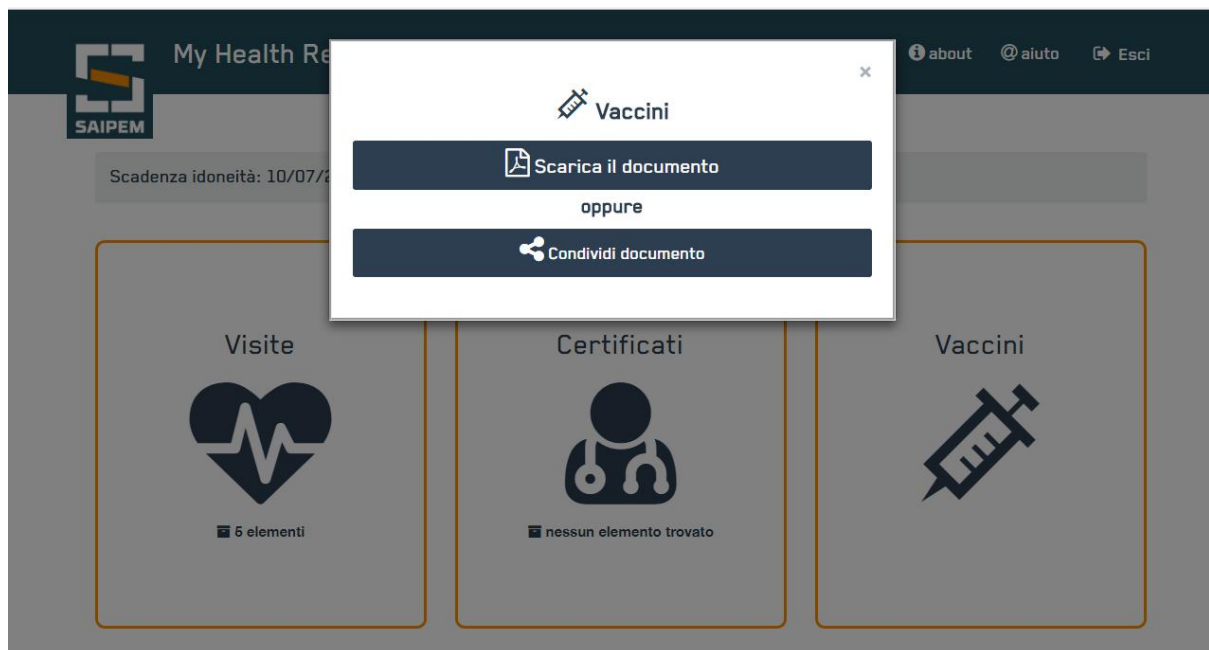
Assistance / Troubleshooting / Troubleshooting

In case of authentication problems

* If you are using a Saipem network user, contact your local IT representative.

* Who authenticates through Authentication Hub (AHXXXXXXX users) can follow the following link to retrieve the login password: https://authenticationhub.saipem.com/password/reset.

Implementations and new functionalities

With a view to developing new functionalities, "My Health Records" has recently been enriched by the program's automatic submission of the "next expiration of the Medical Fitness Certificate"

to the approach of it (about a month) . The benefits in terms of cost saving and monitoring of certifications is evident and easily quantifiable.

And the future already sees the Saipem Corporate Health Team engaged in the development, updating and implementation of the system, providing for an increasingly greater and more effective interaction between the worker and the system itself.

Results

In order to assess the impact on the working population, Saipem has prepared to send a satisfaction questionnaire to approximately 6.000 employees in order to understand the impact on the working population and lead to even more innovative solutions.

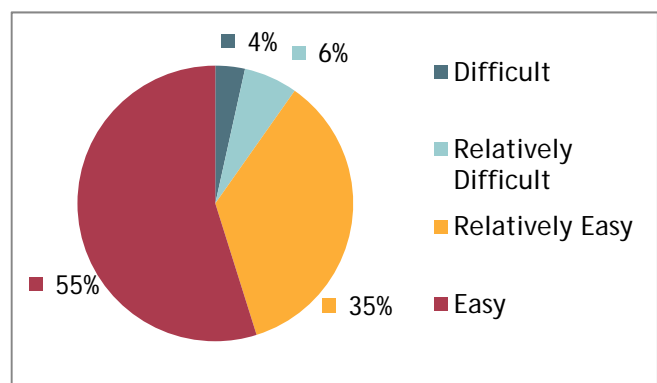The purpose of the questionnaire is also to sensitize the user / employee in the autonomous and completely free of this application.

SAIPEM "MY HEALTH RECORDS"
CUSTOMER SATISFACTION QUESTIONNAIRE
RESULTS (5273)

1. Do you know about Saipem My Health Records?

49%   51%   Yes   No
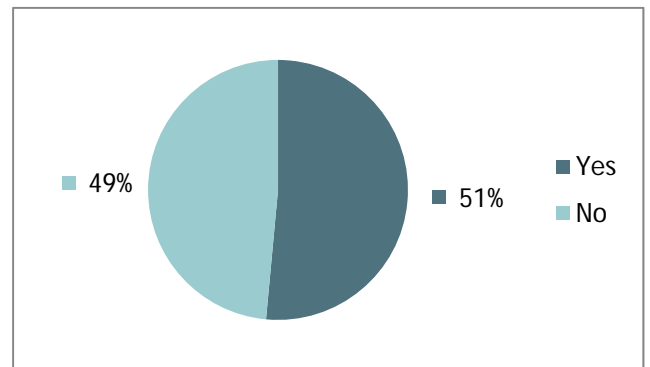
2. How did you hear about My Health Records?

4%   6%   Difficult

Relatively Difficult

Relatively Easy

55%   35%   Easy

3. **How easy is it to access the programme?**
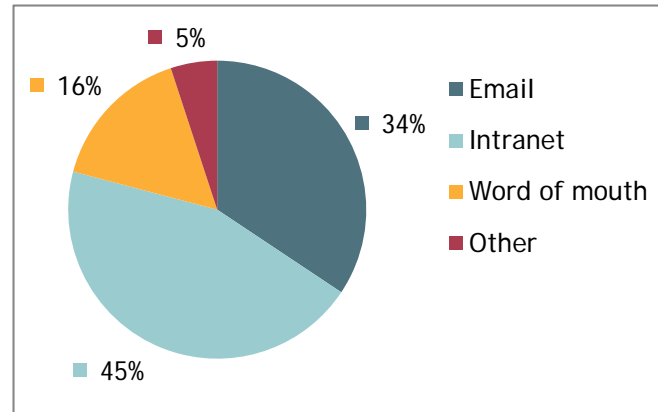
4. **How easy is it to understand the programme?**
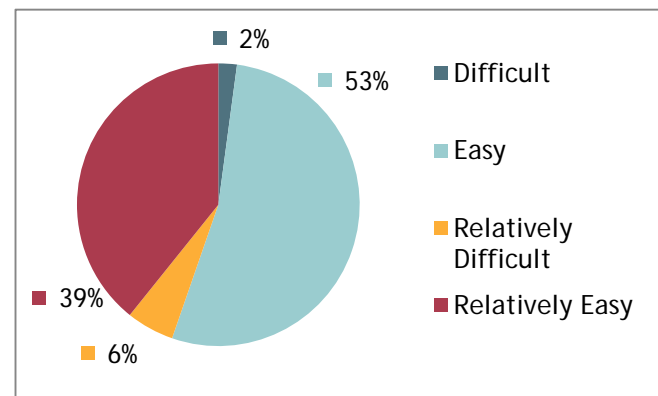
5. **How easy is it to use the programme?**

6. **How would you rate the completeness of the information?**

7. **How useful would you find the addition of a specific section dedicated to your personal health records (health services not accessed through the company)?**

8. **What is your overall opinion of the service provided?**

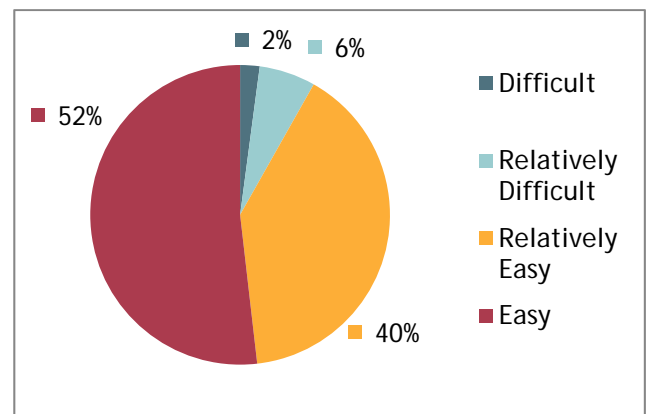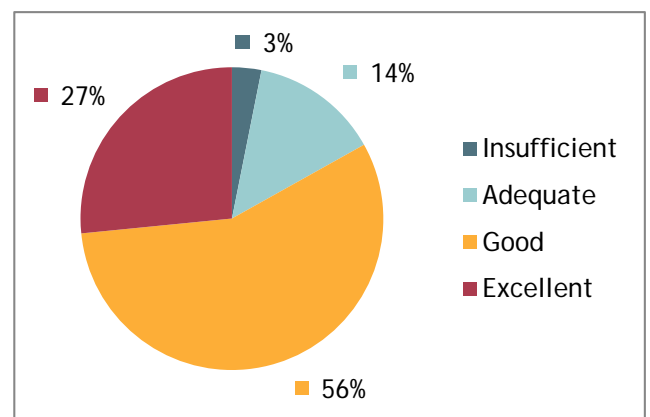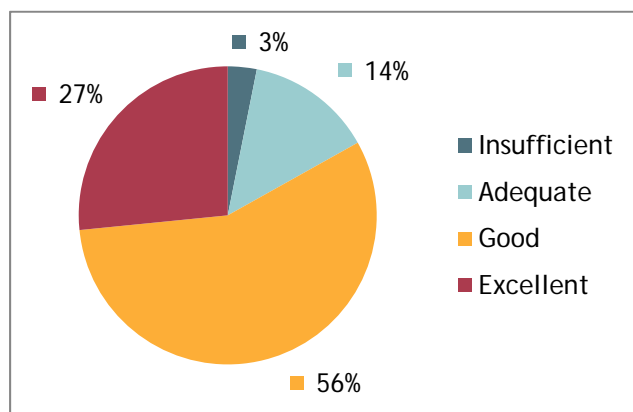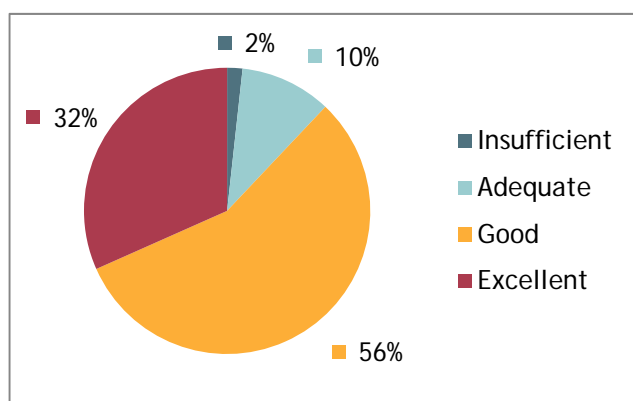**Conclusion**

Within the framework of innovation in healthcare, eHealth represents a strategic lever that can actively contribute to reconciling quality of service with control of spending. To this end it is necessary to implement a systemic action supported by a capacity for overall governance at national level that avoids fragmentation of innovation processes. The Ministry has long been a promoter in collaboration with the Regions of multiple interventions aimed at the development of eHealth at the national level, such as the Single Reservation Centers (CUP) systems, the Electronic Health Record – Fascicolo Sanitario Elettronico (FSE), the certificates of telematic illness , ePrescription, the dematerialization of health documents, telemedicine (1,2,4,19).

A particular boost to eHealth will be given by the implementation of the FSE discipline, intended as a necessary tool to manage and support the care processes, but also as an enabling factor for improving the quality of services and monitoring assistance. In order to guarantee national level governance in the implementation of the FSE, also on the basis of the various initiatives existing at the regional level, a regulatory provision governing the FSE has been adopted under the law decree on the digital agenda. the data available in the dossier as well as for the purposes of prevention, diagnosis, treatment and rehabilitation, also for the purposes of study

and scientific research in the medical, biomedical and epidemiological fields, as well as for the planning, management, control and evaluation of health care (20). The Ministry of Health has also overseen the preparation of the Decree of the President of the Council of Ministers for the detailed discipline of the FSE and, together with the Agency for Digital Italy (Agid), the Guidelines for the preparation by part of the Regions of the project plans for the implementation of the FSE (6).

Following these Guidelines (6), MHR was created to offer all Saipem employees the opportunity to access their health records. This project represents a model to be proposed to all Italian companies that, following the dictates of Legislative Decree 81/08, apply Health Surveillance to their workers. The advantages are represented by the dematerialization of the data, the relative cost saving (shipment of health documentation, reduction of hours / work dedicated to the expiry of visits, possibility for public health to use health data without repetition of clinical and instrumental tests, vaccinations, etc) and greater attention to all Italian workers, both EU and non-EU, with a definitely positive impact on Public Health.

The strategy of the MHR launch is proving successful, and from 1 June 2017 to 1 June 2018 16,764 accesses were registered.

References

1. Decreto del presidente del Consiglio dei Ministri 29 Settembre 2015, n.178. Regolamento in materia di fascicolo sanitario elettronico. (G.U. n. 263 del 11.11. 2015).
2. Decreto 4 Agosto 2017. Modalità tecniche e servizi telematici resi disponibili dall'infrastruttura nazionale per l'interoperabilità del Fascicolo Sanitario Elettronico (FSE) di cui all'art. 12, comma 15-ter del Decreto Legge 18 ottobre 2012, n.179. convertito, con modificazioni, dalla legge 17 Dicembre 2012, n.221. (GU Serie Generale n.195 del 22-09-2017.
3. Forum della Leopolda, 29 Settembre 2017 Firenze. La digitalizzazione nell'ambito della Salute, Prof. Sergio Pillon, Coordinatore Scientifico – Ospedale San Camillo Roma.
4. Decreto 07 Dicembre 2016, n. 262. Regolamento recante procedure per l'interconnessione a livello nazionale dei sistemi informativi su base individuale del Servizio Sanitario nazionale, anche quando gestite da diverse amministrazioni dello stato. GU Serie Generale, n. 32 dell'8 Febbraio 2017.
5. Piano d'azione "Sanità elettronica" 2012-2020 Una sanità innovativa per il XXI Secolo. Commissione Europea, Bruxelles, 06/12/2012.
6. Linee Guida per la presentazione dei piani di progetto regionali per il fascicolo sanitario elettronico. Ministero della Salute, Marzo 2014.
7. Conferenza permanente per i rapporti tra lo stato le regioni e le province autonome di Trento e Bolzano. Il fascicolo sanitario elettronico, Linee guida Nazionali. (G.U. Serie Generale, n. 50 del 02 Marzo 2011).
8. Nuovo Sistema Informativo Sanitario, NSIS. www.salute.gov.it.
9. Workplace health promotion (WHP) Regione Lombardia. www.promozionesalute.regione.lombardia.it.
10. V. Nicosia, S. Pignalosa, A. Mannocci, R. Saulle, M. Ortis, G. La Torre, S. Sernia. Progetto di prevenzione cardiovascolare e benessere sociale in una multinazionale Italiana. Pag. 41, VI

Seminario di Studio, Salute globale e scenari attuali: nuovi contributi di ricerca. Istituto Superiore di Sanità, Roma, 16 Aprile 2015.

11. V. Nicosia, M. Consentino, C. Gialdi, M. Ceccolini, M. Ortis, G. LA Torre, S. Sernia. Obesità e lavoro in ambito off shore, pag. 31. VII Seminario di Studio, Nuove prospettive di ricerca: l'integrazione e il confronto per un futuro migliore. Istituto Superiore di Sanità, Roma, 1 Giugno 2016.

12. Mannocci A, Pignalosa S, Nicosia V, Saulle R, Sernia S, La Torre G.Cardiovascular Diseases Risk Factors in oil and gas workers: a ten years observational retrospective cohort. Ann Ig. 2016 Mar-Apr;28(2):122-32. doi: 10.7416/ai.2016.2091.

13. Mannocci A, Pignalosa S, Saulle R, Sernia S, De Sanctis S, Consentino M, Gialdi C, Nicosia V, La Torre G. Prevalence of major cardiovascular risk factors among oil and gas and energy company workers. Ann Ist Super Sanita. 2015;51(2):148-53.

14. V. Nicosia, M. Consentino, C. Gialdi, F. Mika, M. Ortis, S. Sernia, G. La Torre. Telecardiology, an opportunity for improve medical assistance and reduce healthcare costs. Pag. 7. VIII Seminario di studio, Interdisciplinary approaches in health sciences: a bridge to the future. Istituto Superiore di Sanità, Roma, 5 Giugno 2017.

15. Saipem Gipsi, manuale d'uso.

16. Saipem, My Health Record, manuale d'uso.

17. Decreto legislativo 81/08. Art. 25, comma 1, lettera H.

18. Ministero dell'Interno. Dipartimento per le politiche del personale dell'amministrazione civile e per le risorse strumentali e finanziarie. FAD, Autenticazione Forte. Politichepersonale.interno.it.

19. Linee di indirizzo Nazionale sulla telemedicina, 17 marzo 2014, Ministero della Salute.

20. Agenzia per l'Italia Digitale, Agenda Digitale italiana, 26/02/2016. www.agid.gov.it.