

ReMINE

High performances prediction, detection and monitoring platform for patient safety risk management

ReMINE (High performances prediction, detection and monitoring platform for patient safety risk management) will contribute to the risk management process through the definition of a framework architecture enabling the analysis of risk-related data through a semantic approach, allowing a fast and secure extraction of data and correlation of the information across several domains.

Objectives of the Project

According to recent studies Risks Against Patient Safety (RAPS) represent one of the most important factors of deaths in Hospitals. RAPS occurs in any stages of the patient care process: from admission to discharge and rehabilitation too, due to the lack of proper communication amongst different actors of the patients care chain.

In order to contrast the RAPS trends and the widespread care malpractices diffusion, REMINE prosecutes a number of main objectives, which can be distinguished into two categories:

- A new technological platform able to perform an automated/semi-automated RAPS management and prevention through:
 - An effective RAPS identification and analysis by means of acquisition and mining of relevant multimedia data present in an hospital care processes information boundary;
 - Use of the above results for modelling, prediction, detection and monitoring of RAPS related to single/multiple patient safety profile;
- A new care process organizational requirements which succeeds in producing new added value by means of:
 - The RAPS modelling and clinical risk management process;
 - The identification of a new way for interactions among different health care professional along patient care management process and belonging to different units in a local health care system.

Project Description

REMINE will contribute to the RAPS management process in a local health care system through the definition of a framework architecture, instantiated and validated in a proof-of-concept, enabling a collection and analysis of RAPS-related data, through a semantic approach that allows a fast and secure extraction of data and correlation of the information across several domains. In this respect the REMINE platform will promote an early RAPS detection and forecast by supporting the process of RAPS management from both the moment:

- when the RAPS is foreseen to the determination of the best possible preventive actions and the way of communicating it to the key actors of the patient care process;
- when the RAPS is detected to the determination of the best possible reaction, the secure and reliable distribution of the related action-list to all the involved parties and the monitoring of the reaction effectiveness.

This will be achieved by means of the creation of a methodology and platform for integrated RAPS description/collection/analysis/response. The overall structure assumes the presence of one or more “info broker patient safety framework”, strictly connected with the Hospital Information system which collect, aggregate, mine, assess data and distribute advise and or provide actions against RAPS occurrence. A wide set of business rules, built upon the ReMINE ontological system, triggers countermeasures and check out their correct implementation. ReMINE manages this process through real-time measurements, simulation models and knowledge exploitation, all evolving over time according to the real effectiveness of suggested countermeasures for specific categories of RAPS.

CASE STUDY / PRACTICAL EXAMPLE / SCENARIO

ReMINE case studies are focused on the following typical adverse events:

1. **Discrepancy:** Wrong clinical pathway selection; discrepancy between clinical pathway and actual implementation of the care process and staff shortage.
2. **Drugs:** Drugs management area: discrepancy between prescription and actual administration to a patient; wrong identification of patient; etc.
3. **Infections:** Nosocomial infections area: including all events of in-hospital spread of infections.
4. **Laboratory:** Laboratory area: wrong test results due to wrong identification of patient or samples; loss of test results; bad report about results; etc.

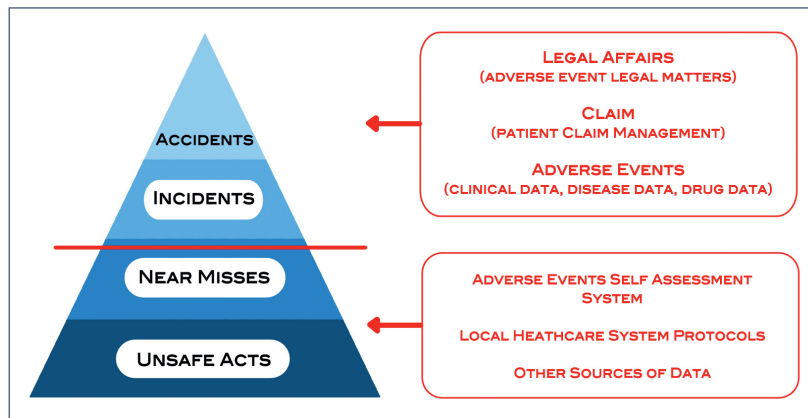
Expected Results & Impacts

In the project time scale the following objectives will be reached within REMINE pilots

- Evidence that RAPS can be reduced in significant ways.
 - minimal impairment (or recovered within one month) becomes lower than 40%
 - injury or complication becomes lower than 20%
 - moderate impairment becomes lower than 5%
 - permanent impairment becomes lower than 2%
 - contributed to death becomes lower than 1%
- Proof that the cost of care related to adverse events and administrative ones can be significantly reduced at least by 60%
- Proof that the cooperation amongst health care professionals can be improved significantly.

Main outcomes of REMINE can be summarised as follows

- drastic time reduction in collecting data and classifying RAPS from days to minutes
- sensible time reduction in carrying out RAPS analysis procedures: from hours to minutes
- definition and standardization of a common language for the RAPS description, thus promoting and enhancing the interoperability among different tools
- a reference framework leading to the proper definition and simulation of RAPS policies and environment enabling secure scenarios
- a significant patient safety improvement



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Project co-ordinator:

NoemaLife GmbH

Contact person:

Michele Carenini

Tel: +39 0514193911

Fax: +39 0514193900

Email: mcarenini@noemalife.com

Website: www.noemalife.com

Partners:

- Regione Lombardia, Direzione Generale Sanità (Italy)
- Federation of Municipalities for Economic Development in Suupohja (Finland)
- The Rotherham NHS Foundation Trust (United Kingdom)
- Hewlett-Packard Italiana Srl (Italy)
- INDRA Slovakia, a.s. (Czechoslovakia)
- Technische Universität Wien (Austria)
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- Quality & Reliability Sa – High Tech Applications Industrial & Commercial Societé Anonyme (Greece)
- Link Consulting, Tecnologias e Sistemas de Informação, S.A. (Portugal)
- Institute of Communication and Computer Systems - National Technical University of Athens (Greece)
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KEYWORDS

Risk management, Adverse Events Management, Ontologies, Knowledge management, Data mining