SMARTER AND SAFER HOSPITALS
When Innovative Technologies Embrace GS1 Standards for Staff well-being and Patient Safety

GS1 HEALTHCARE WEBINAR - 20 January 2022

Dr. Alberto Sanna, Director of Research Center for Advanced Technology in Health and Well-Being, San Raffaele Hospital

Dr. Adriano Fusco, Director of Digital Healthcare Department, Antares Vision Group
Participants on GS1 activities must always remember the purpose is to enhance the ability of all industry members to compete more efficiently and effectively to provide better value to the consumer or end user. Because GS1 activity almost always involves the cooperation of competitors, great care must be taken to assure compliance with anti-trust laws.

This means:

- Participation must be voluntary, and failure to participate shall not be used to penalise any company.
- There shall be no discussion of prices, allocation of customers or products, boycotts, refusals to deal, or market share.
- If any participant believes the group is drifting toward impermissible discussion, the topic shall be tabled until the opinion of counsel can be obtained.

- For more details: please see https://www.gs1.org/standards/development/how-we-develop-standards/gs1-anti-trust-caution
Welcome to our GS1 Healthcare webinar

Thank you to our guests speakers:
Dr. Alberto Sanna, San Raffaele Hospital and Dr. Adriano Fusco, Antares Vision Group

Some housekeeping for today

• Please make sure that you identify yourself properly (use the rename function)

• You are automatically on mute and your video is off;

• For any quick message or reaction: please use the “Raise hand” function;

• For all Q&A: use the Q&A function, questions will be monitored and addressed as much as we can;

• Through the session, we’ll conduct some polls: please participate: your opinion matters!
Welcome to our GS1 Healthcare webinar

After the webinar:

• Within a week, the recording will be posted here: http://www.gs1.org/healthcare/hpac_webinars

• All previous webinars are posted there also; please feel free to use this resource library and share the link
GS1 Healthcare Webinars

Create a forum for the global clinical providers to share experiences on using GS1 Standards in healthcare. The final goal: improve patient safety, cost efficiency and staff productivity through the implementation of GS1 standards with the support of innovative technologies.

- The practical realities of implementation of GS1 Standards in the care giving environment in regards to the impact on clinical care and patient interaction
- Supporting the adoption of GS1 Standards in healthcare providers and retail pharmacies
- For publication, presentation and sharing
- To those involved in GS1 standards development, the wider healthcare stakeholder community and senior executives/decision-makers to gain their buy-in and support for implementation of GS1 Standards
Specific GS1 Healthcare Activities

### Webinars
- Bimonthly webinars open to all stakeholders interested in learning about GS1 standards implementation in the care giving environment.
- [http://www.gs1.org/healthcare/hpac_webinars](http://www.gs1.org/healthcare/hpac_webinars)

### Awards
- At each F2F global GS1 Healthcare Conference
- Provider Implementation Best Case Study Award
- Provider Recognition Award
- The prize: travel & accommodation to attend the next GS1 Healthcare conference
- [http://www.gs1.org/healthcare/hpac](http://www.gs1.org/healthcare/hpac)

The Global GS1 Healthcare conferences moved due to the pandemic in 2020 and 2021 to Virtual Events.
The next GS1 Healthcare conference will be a hybrid event and is scheduled from 15-17 November 2022. More information will be shared at a later stage.
Smarter and Safer Hospitals: When innovative technologies embrace GS1 Standards for staff well-being and patient safety

GS1 standards adoption in the San Raffaele Hospital

Dr. Adriano Fusco
Director of Digital Healthcare Department, Antares Vision Group

Dr. Alberto Sanna
Director of Research Center for Advanced Technology in Health and Well-Being, San Raffaele Hospital
AGENDA

❖ THE SAN RAFFAELE HOSPITAL INNOVATIVE PROJECTS
❖ THE MEDICATION MANAGEMENT PLATFORM PROJECT
❖ TEST RESULTS
❖ CONCLUSIONS
❖ Q & A SESSION
ABOUT SAN RAFFAELE HOSPITAL

San Raffaele Smarter and Healthier City in Milano
A Living Lab for Open Innovation in Health & Well-Being
RESEARCH CENTER ADVANCED TECHNOLOGIES IN HEALTH & WELL-BEING. RESEARCH PROGRAM

Smart\textit{er} & Health\textit{i}er City

Smart\textit{er} & Health\textit{i}er Life

Smart\textit{er} & Saf\textit{er} Hospital

European Network of Living Labs
POLL 1: Knowing you more

What category does your organisation belong to?

- Hospital
- Retail pharmacy
- Manufacturer
- Solution provider
- University
- Wholesaler/distributor
- Logistic provider
- Sectoral association
- GS1 Member Organisation
- GS1 Global Office
POLL 1: Knowing you more

In which area have you applied digital transformation/healthcare 4.0 for your company/hospital?

- Logistics and supply chain management
- Health information systems (ERP/EHR/EMR...)
- Automation in drugs dispensing
- Robotics for patient assistance and operational theaters
- Telecare
- Scanning at bedside for medication administration
- Personalized and Preventive medicine
PERSONALISED, PREVENTIVE AND PREDICTIVE MEDICINE... IN SOCIO-TECHNOLOGICAL ECOSYSTEMS

SOCIO-DEMOGRAPHIC TRENDS

✓ Ageing of Population
  • Health
  • Societal structure
  • Workforce
  • Welfare
  • Silver economy

✓ Lifestyles, at all ages
  • Diet & Physical Activity, a public health priority
  • Kids Overweight & Obesity

✓ Urbanisation

✓ ...

TECHNOLOGICAL TRENDS

✓ Digital Connectivity (5G) & Cloud Computing

✓ Electronics Miniaturization
  (IoT, Environmental and Wearable Sensors)

✓ Ultra High Definition digital content

✓ Natural Language Interfaces (HCI-HRI)

✓ Big Data and Artificial Intelligence

✓ Robotics (Social, Process, Surgical, Rehabilitative, Exoscheletric, Nanobotics...)

✓ Smart Urban Infrastructures and buildings

✓ ...

The Global Language of Business © GS1 2022
HEALTHCARE 4.0
SOCIAL, SERVICE AND PROCESS ROBOTICS & IOT

Smart er & Healthier City

Smart er & Healthier Life

Smart er & Healthier Hospital

❖ Healthcare Process Re-engineering
❖ Social & Cognitive
❖ Surgical
❖ Rehabilitative
❖ Exoschelectric
❖ Dro(ne)botics
❖ Nanobotics
❖ Assistive
❖ Architectural
MARKET PREDICTION INTERNET OF MEDICAL THINGS FROM 41 BILLION USD WORTH IN 2017 TO 158.07 BILLION USD BY 2022

Health care is facing numerous challenges

Global healthcare spending is expected to grow from $7.1 trillion in 2019 to $8.7 trillion by 2020.

Is medtech ready for the IoT?

- 71% believe that medtech (data and devices) is not ready to use data generated from connected medical devices.
- 67% believe that the regulatory framework will not catch up with what is possible today for another 5 years.

Significant IoT market growth predicted

- The overall IoT market is expected to grow from $11 billion in 2017 to $150 billion by 2021.
- North America: From $4 billion to $84 billion
- Europe: From $4 billion to $64 billion
- South America: From $2 billion to $8 billion
- Middle East & Africa: From $2 billion to $9 billion
- Asia-Pacific: From $15 billion to $51 billion

Medtech is becoming more than an innovative product supplier...

- 31% are implementing new funding models for data as a service for organizations.
- 39% are adopting a risk-based approach to innovating in a regulatory environment.
- 43% ensuring that their business can be a long-term revenue stream.

To an insightful partner

For patients and health care providers, a partner for improving health care performance.
La svolta di Internet superveloce «Milano sarà capitale europea del 5G»

Il Ceo: è un'infrastruttura che cambierà tutti i business, dall'educazione alle smart cities

© Nicola SaidtuttI

Milano. Milano che ad Aldo Busia, amministrato re delegato di Vodafone Italia, proclamò i nuovi ti. Il 5G è una svolta nella realizzazione del 5G, un mondo nel quale gli oggetti parlano tra di loro, di un'identità progettuale con gli oggetti, e gli oggetti acquistano intelligenza, e ci con un concorso di domani che supera il mondo, non men la linea di evoluzione, per far nascere un mondo che potrebbe essere al di là di come ne pensiamo oggi. E tuttavia, a causa di Milano. «Sembra che le cose stiano cambiare», invece di un passaggio ineluttabile. Il 5G di Milano, dal quale emerge la questione di quali sono i cardinali della politica. La svolta industriale, da cui nasce, è che si tratta di un passaggio che non è semplice, ma è una strada che deve essere percorso. Ecco perché la svolta è importante per un Paese come l'Italia, che ha bisogno di essere un'area di operazioni, per un futuro dove è fondamentale essere al centro del mercato e diventare una potenza. Non si può pensare a ciò senza considerare la politica economica. Ecco perché la svolta è importante per un Paese come l'Italia, che ha bisogno di essere al centro del mercato e diventare una potenza. Non si può pensare a ciò senza considerare la politica economica.
AI FOR SMARTER & SAFER HOSPITAL TO ORCHESTRATE PROCESSES
PATIENT SAFETY, QUALITY OF CARE, OUTCOMES, EFFICIENCY, COSTS

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<th>Medical</th>
<th>Procedure</th>
<th>Outcome</th>
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<td>Discovery of Medical Knowledge</td>
<td>Discovery of Process Knowledge</td>
<td>Best Outcome</td>
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SMARTER & SAFER HOSPITAL
AI, ROBOTICS, MEDIOT, IOT TO SUPPORT PATIENT SAFETY, QUALITY OF CARE, AND PROCESS EFFICIENCY
SMARTER & SAFER HOSPITAL
AI, ROBOTICS, MEDIOT (IOMT), TRACK & TRACE, QUALITY OF CARE & PROCESS EFFICIENCY
THE MEDICATION MANAGEMENT PLATFORM PROJECT

Dr. Adriano Fusco
PROJECT OBJECTIVES

Deliver the best global solution for medication management:

❖ Enable healthcare operators to focus on patient care rather than been forced to search, sort, pick, check drugs to administrate to patients

❖ Maintain End to End traceability of the overall medication process to eliminate dispensing errors, diversions, non compliances, inventory stockout and waste,

❖ Create a zero-error, efficient, fully automated environment, 100% integrated with EHR and hospitals’ IT infrastructure

❖ Deliver visibility and insights to hospital staff to make more informed, faster and actionable decisions, to finally achieve:

THE RIGHT DOSE, TO THE RIGHT PATIENT, AT THE RIGHT TIME
THE MEDICATION MANAGEMENT PROJECT TIMELINE

2018
STARTING COOPERATION WITH HSR

2019
Project selected by MISE (Italian Department for Economical Development):
MEDICATION MANAGEMENT PLATFORM

2020
SPECS, DESIGN, HW & SW DEVELOPMENT

2021
PROTOTYPE TESTING
• Impact on medication administering
• Acceptance by nurses

PLATFORM AVAILABILITY TO HOSPITALS

2022
DESIGN REVIEW AND INDUSTRIALIZATION
THE MEDICATION MANAGEMENT PLATFORM

TRACKING AND AUTOMATION ACROSS THE HOSPITAL
PLATEFORM FUNCTIONALITIES AND COMPONENTS

**Automation - Traceability – Planning**

**KPIs** (Real time/historical)

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**AUTOMATED SMART TROLLEY**
- Loads automatically the drugs required for the round
- Manages and tracks the dispensing cycle
- Assisted motion

**AUTOMATED SMART CABINET**
- Automatically loads the Trolleys
- Semi-automated loading of drugs from the central pharmacy
- Full stock control and management of the content
- Automatic drugs dispensing
- Controlled access to drugs

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MAIN BENEFITS

- TRACEABILITY
- AUTOMATION
- PROCESS SAFETY AND TRANSPARENCY
- OVERALL EFFICIENCY
- ERGONOMY AND USABILITY
EXTENSIVE USE OF GS1 STANDARDS

- **Real time verification** at patient bedside that the drug is correct, not expired, not subject to recall
- **Perfect association** of drug administration to patient’s EHR (who, when...)
- **Global synchronization** with suppliers
- **Optimization in stock management** (ie. Managing expiry date)
- **Perfect location of stocks** across the different points of storage within central pharmacy and the wards
- **Parent-child relationship and change of ownership management**
POLL 2: GS1 implementation

What are the key factors for a successful implementation of GS1 standards?

- Change management
- Secure the staff (nurses, surgeons, etc...)
- Find the relevant technology partner who will accompany you during the journey
- Define clear measurements of success
- Others
POLL 2: GS1 implementation

Why is the GS1 standards implementation so important within healthcare providers?

- Increase patient safety
- Leverage supply chain data for clinical processes
- Improve patient-level costing
- Support interoperability
- Drive efficient, precise recalls
- Enable asset traceability
- Supply a key element of big data to applications
TEST RESULTS

Dr. Alberto Sanna
Dr. Adriano Fusco
TESTING PHASE AT SAN RAFFAIELLE HOSPITAL

Medication Management Platform

ANTARES VISION GROUP

I.R.C.C.S. Ospedale San Raffaele
Gruppo San Donato

Advanced Technology in Health and Well-Being
CONTINUOUS EDUCATION AND TRAINING ON SITE

- Master's Degree in Nursing and Midwifery
- Course of design and management of innovation processes in healthcare
- 43 students (nurses)
OBJECTIVES OF THE TESTS AT SAN RAFFAELE HOSPITAL

1. Evaluate the **usability** of the new automated trolley.

2. Compare **the user experience and performance** of the TRADITIONAL and AUTOMATED solutions
TEST METHODOLOGY

1. Creation of the test environment on a real ward (without real patient): we used a ward in the new ICEBERG building

2. Selection of a panel of nurses representing different clusters of experience, age, ergonomics...

3. Performing Usability tests:
   • Shadowing
   • Training on the use of the trolley
   • Task execution (a full cycle of medication dispensing to a set of 3 patients)
   • Execution of the same task with a traditional trolley

4. User experience evaluation
THE PANEL OUTCOME (SURVEY CONDUCTED ON 11 NURSES*)

SYSTEM PERFORMANCE ASSESSMENT (SPA)

Each nurse was asked to evaluate the medication dispensing with the automated and the traditional trolley in several aspects segmented in 4 main topics:

1. **Effectiveness in tracking** the operations and recording results to the patient EHR
2. **Safety and reliability** of the operations
3. **Ergonomics of use** for the operators
4. Overall **efficiency** of the process
The automated solution obtained higher average scores (rank from 1 to 5) in each topic with **safety and efficiency** scoring the largest gap.
OTHER ONGOING TESTS (AT ANTARES VISION LAB)

- Automatic refill of the trolley from the automated cabinet
- Autonomy
- Reliability tests (FMEA, MTBF, W&T...)
- Disaster recovery
- Planning capabilities
- Drugs management improvement (planning, inventory reduction, stock out, waste reduction, recall management...)
Regardless the very different background, age and confidence with IT, the great majority is in favor of the new way of working in all the investigated areas.

Several interesting improvement suggestions were pointed out both in hardware and software: we are currently evaluating them in order to introduce into the final product.

The vast majority of the panel considers the new automated system a real breakthrough in medication management and would be happy to adopt it immediately.

Although executed on a limited number of nurses, the test provided a very clear picture of the four investigated areas (tracking, safety, ergonomics, efficiency).
CONCLUSIONS
TAKEAWAY MESSAGES & NEXT STEPS

The pressure posed by the Covid19 emergency on the healthcare providers requires improvements both in the quality and efficiency of the services.

The platform we described has been conceived as a tool to help the hospital staff in several aspects of their day-to-day tasks.

The level of automation introduced is unprecedented and we expect setting a new benchmark in efficiency, safety and ergonomics of these practices.

We are now working on the next steps to industrialize the new concept, make it available and affordable, including new outbreaking features.

...STAY TUNED!
Q&A SESSION

Q&A
CONTACT INFORMATION

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