



UNIONE EUROPEA

Fondo europeo di sviluppo regionale



Regione
Lombardia



POR FESR 2014-2020 / INNOVAZIONE E COMPETITIVITÀ

OPEN CONSULTATION WITH MAIN STAKEHOLDERS to develop the procedure of PRE-COMMERCIAL PROCUREMENT

**Innovation need: “TECHNOLOGICAL DEVELOPMENT OF THE
IMAGING IN SURGICAL ASSISTANCE AND SUPPORT SYSTEM”**

IRCCS – Fondazione Istituto Nazionale dei Tumori

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S.C. Chirurgia Epato-gastro-pancreatica Director

13 dicembre 2019 – ore 11.45-14.30

Sala Convegni di Palazzo Sistema di Regione Lombardia, Milano

ISSUE AND INNOVATION NEED DEFINITION

ISSUE

During any surgical operation, the surgeon and his team work in a sterile field. As a result, they have very limited visual access to any external monitors and can not have tactile access to anything outside. Therefore, the surgeon can not personally access all the relevant patient information without having to detach himself from the sterile field and make a subsequent re-sterilization.



INNOVATION NEED

The desired technological solution should:

- Integrate in a **single system** all the pre and intra operative information related to a specific patient during a specific operation;
- Allow **easy access** to all the information acquired by the surgeon, who can select the useful information, at any time and firsthand;
- Fund its functioning on techniques, such as **Augmented Reality**, capable of enriching reality with additional and interactive information;
- Be applicable in **any field** of surgery.

DEEPENING ON THE PROBLEM

- **Very limited visual access** to monitors outside the sterile field
 - **No tactile access** to anything outside the sterile field

IMPLY THAT:

1

The patient's clinical history and his diagnostic tests must be acquired before the intervention itself and the recovery of these information during the intervention may be difficult.

2

All the physiological parameters, continuously monitored during the intervention, are displayed only on the anesthesiologist's monitor and are not visible to the operating surgeon.

3

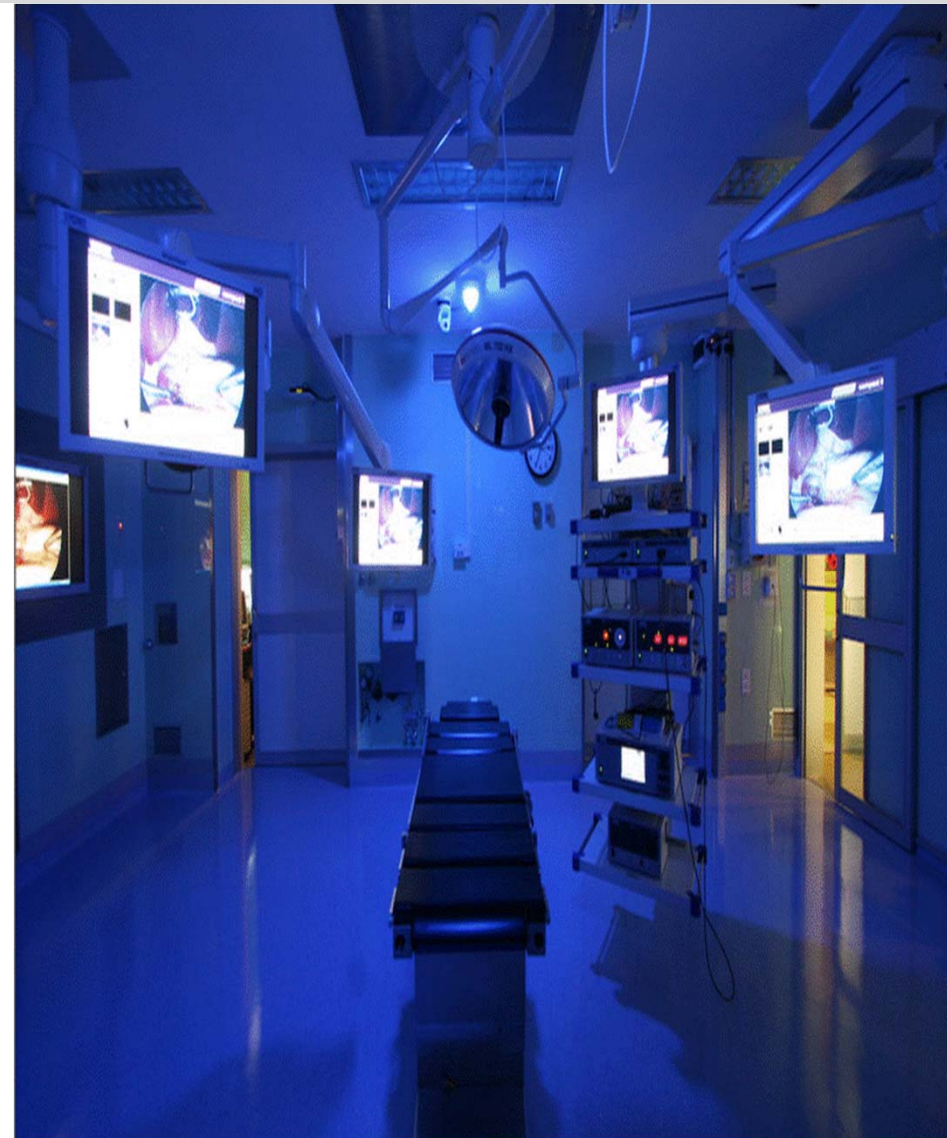
Any additional diagnostic procedure, performed during a surgical procedure, is displayed only on a monitor outside the surgical field.

STATE OF ART: THE INTEGRATED OPERATING ROOM

Definition: complex, autonomous and standardized organism in which devices and technologies are integrated in a single computerized system that amplifies and optimizes their functionalities

An integrated room currently allows to:

- Control the equipments inside the operating room;
- Control ambient lighting and scialitic lamps;
- Record, save and attach the intervention video to the patient's electronic health record.



STATE OF ART: THE INTEGRATED OPERATING ROOM

EQUIPMENTS CURRENTLY MANAGEABLE IN A CENTRALIZED MANNER

Operating table:
Tilt and height
adjustment

01



Laparoscopic column
Video-surgical
instruments

03



02

Electical instruments:
Activation / deactivation
and adjustment of the
parameters
(e.g.electrosurgical knife)



04

Scialitic lamps:
Switch on / off and
adjustment of the
intensity

FROM THE STATE OF ART TO THE INNOVATION NEED

The technological possibilities of an integrated operating room are undoubted but still focused on room management.

The **DEVICE** should:

optimize the functionality of the integrated operating room and direct them towards the patient

PATIENT-CENTERED

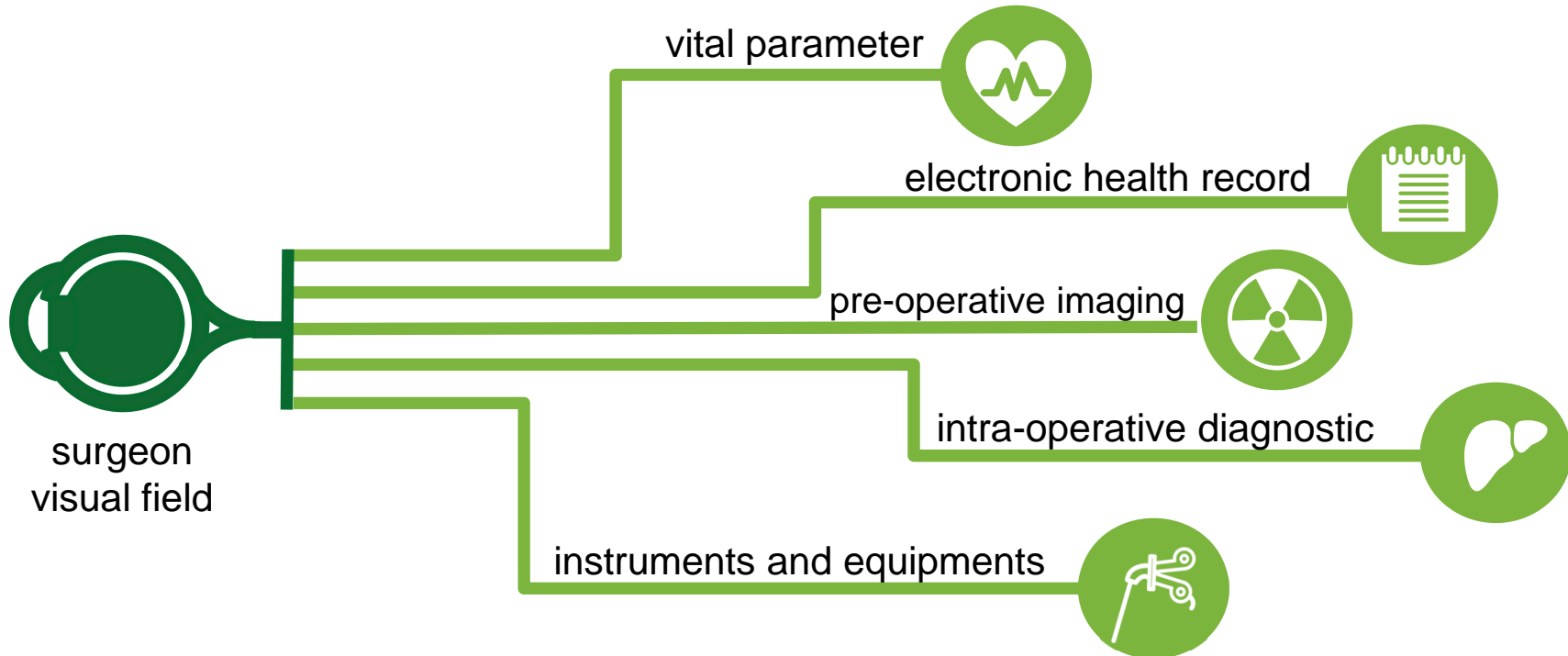
&

Facilitate the clinical practice of surgeons to improve the effectiveness and efficiency of interventions

USER-CENTERED

INNOVATION NEED DEFINITION: INTEGRATION

WHICH INFORMATION MUST BE INTEGRATED BY THE DEVICE?



USABILITY' & ACCESSIBILITY

The surgeon must be able to interact with the system without having to leave the sterile field and access all the information in an immediate and optimized way

INNOVATION NEED DEFINITION: DISPLAY

TO COMPLY WITH USABILITY AND ACCESSIBILITY REQUIREMENTS:

- **Augmented Reality** Head-Mounted Displays that project information in the surgeon's visual field
- **Touchscreen** monitor to be placed within the sterile field
- **Voice command**, platform or virtual keyboard to recall information

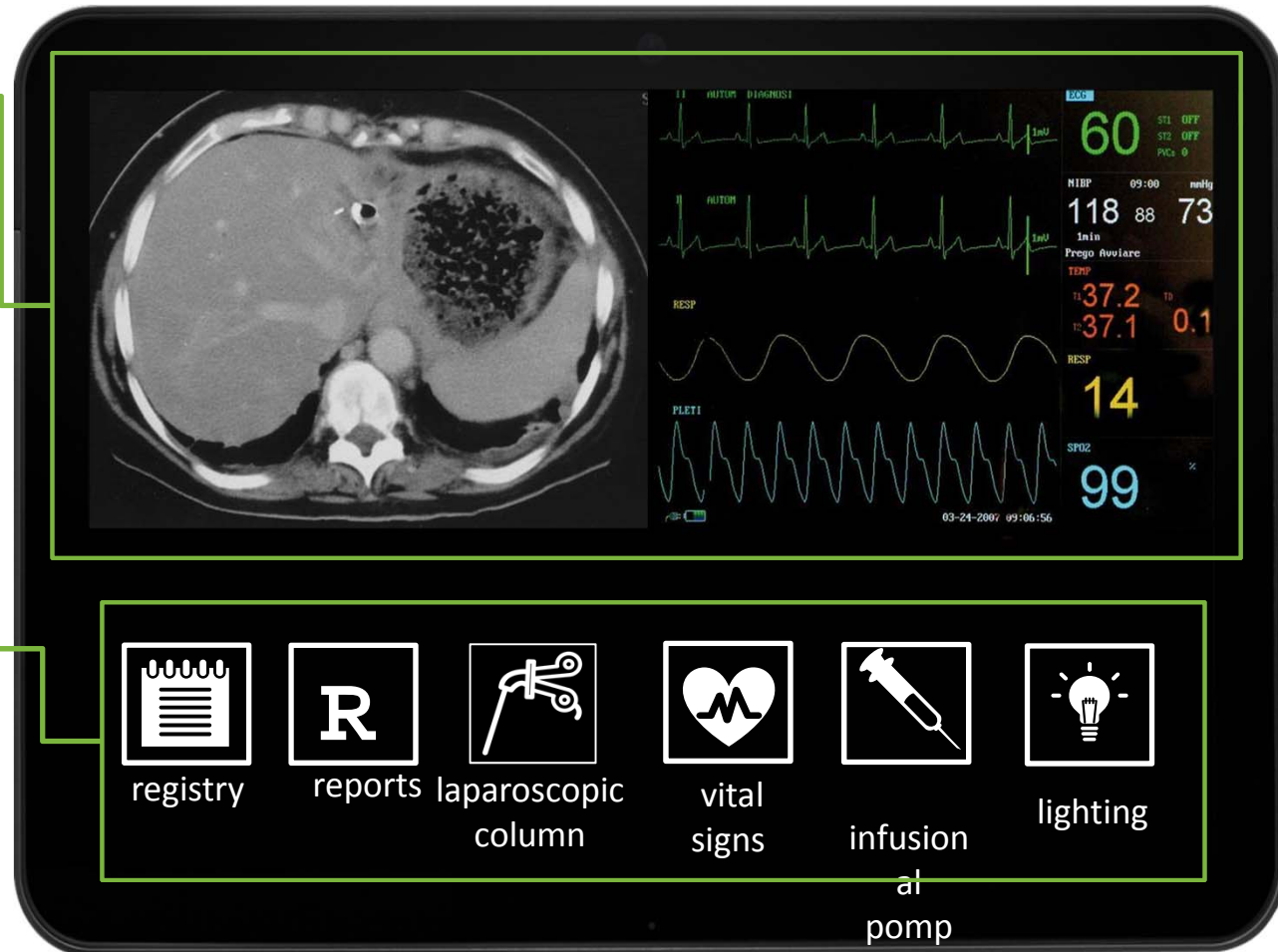


INNOVATION NEED DEFINITION: **DISPLAY**

Example: **TOUCHSCREEN MONITOR**

DISPLAY SYSTEM

the information selected through icons are displayed in real-time

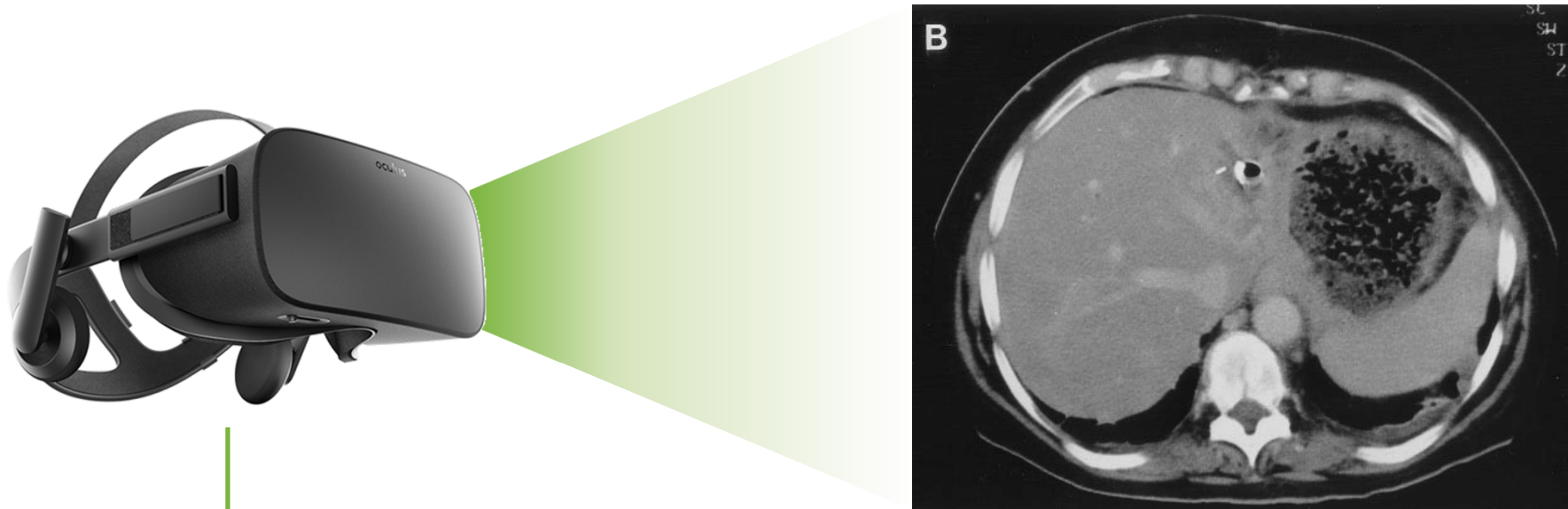


SISTEMA DI ICONE

accesso *smart* ed immediato alle informazioni

INNOVATION NEED DEFINITION: **DISPLAY**

Example: **AUGMENTED REALITY HEAD-MOUNTED DISPLAY**



**DISPLAY IN THE SURGEON
VISUAL FIELD**



VOCAL COMMAND
to recall all the information

INNOVATION NEED DEFINITION

FUNCTIONAL AND PERFORMANCE REQUIREMENTS

THE DEVICE:

- Must be testable on site, easily transportable, easy to handle, wearable and light-weight;
- Must include an easily understandable user interface;
- Must be integrated with the various hospital softwares and with all the high-resolution imaging systems;
- Must be easily linkable to wireless transmission systems (e.g. Wi-Fi, Bluetooth);
- It must be possible to easily and cheaply replace the components in the maintenance phase and to activate in-house interventions and remote assistance;
- Have disposable components.

CONTACTS

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