How does digital transformation contribute to reinventing organizations in the largest European hospital (AP-HP)?

Martin HIRSCH, CEO, AP-HP

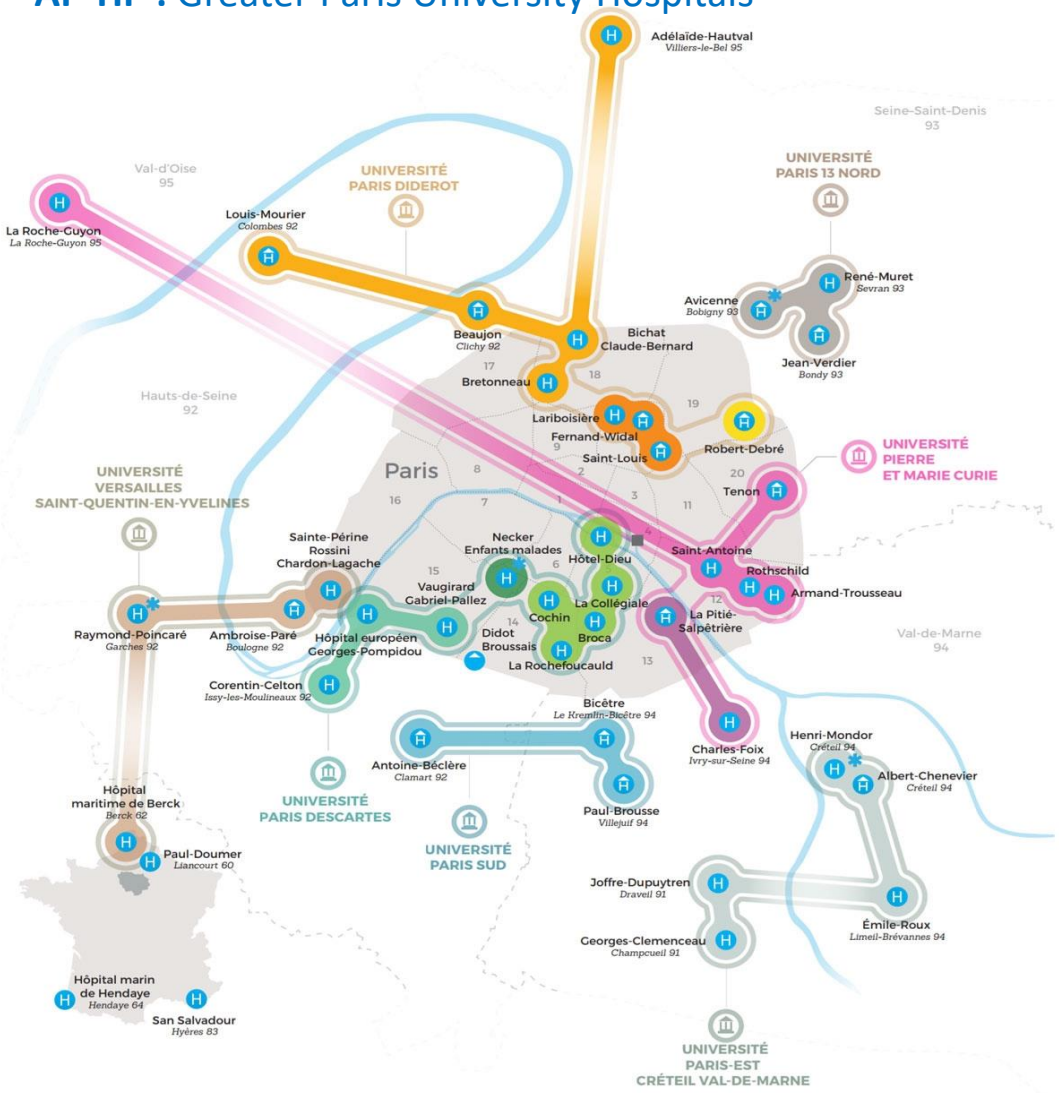
HIMSS Global Conference & Exhibition

FEBRUARY 12th, 2019

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

AP-HP, a European world-renowned university hospital

AP-HP : Greater Paris University Hospitals



39 hospitals
A public health service for everyone, **24/7**
Operating budget of **€7,5 billion**

100,000 staff members including **23 500** doctors (mostly highly specialized, associating hospital practice with university research).

21 190 beds : 12 000 for acute diseases and 9 190 for rehabilitation, psychiatry & long-term care
1,3 million admissions per year : 335 000 surgeries, 2 400 transplants, 38 000 births

178 reference centers “rare diseases” (out of 363 on national level, 49%)

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

Our medical expertise

AP-HP is a reference for specialized and excellent care in many fields. The 23,500 AP-HP doctors are mostly highly specialized, with an advanced level of qualification obtained through hospital practice associated with university research.

For them, working at AP-HP, also guarantees access to cutting-edge biological laboratories and high-performance technical platforms.

Medicine at AP-HP is a special state of mind – a symbol of the French school of medicine and surgery – acquired during residency. It promotes leadership, initiative and progress in medical knowledge. With its multidisciplinary hospital teams, the AP-HP provides recognized expertise in every medical and surgical field.

All AP-HP hospitals are committed to guaranteeing maximum safety in patient care and are accredited by the French National Authority for Health (Haute Autorité de Santé).

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

- AP-HP professionals account for more than 8 000 publications in peer-reviewed journals every year, especially in the field of clinical research.
- AP-HP led more 3,400 research projects, of witch over 100 were of international range, accounting for 40% of medical research publications in France.
- It maintains almost 500 international patents, with a comprehensive licensing policy with strong outreach towards small or large businesses. It has strong partnerships with French universities and research bodies.

A deep transformation is needed in the context of major challenges

- **Reorganization of the whole hospital system in France**
  - Concertation challenges
  - Creation of public hospital groups

- Maintaining a **high level of attractiveness** in a very competitive environment for healthcare professionals as well as patients

- **A highly constrained environment** in financial and organizational terms : the desired improvement of services must come to fruition while **controlling the costs**

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

Digital transformation is a major axis of our global transformation plan

AP-HP transformation plan 2019-2023

Conduct major new operations changing structures and organization

Adapt our organizations to care and research evolutions

Regain attractiveness among patients and in the territories

Strengthen teamwork and human resources management

Strengthen health product costs control and optimize our purchasing, logistics and technical sectors

Accelerate digital transformation

Secure, build and diversify our revenues

4 objectives :

Fluidify
Secure
Optimize
Innovate (datas)

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

The hospital is transformed, the IS is centralized through robust solutions such as ERP: SAP, Orbis ...

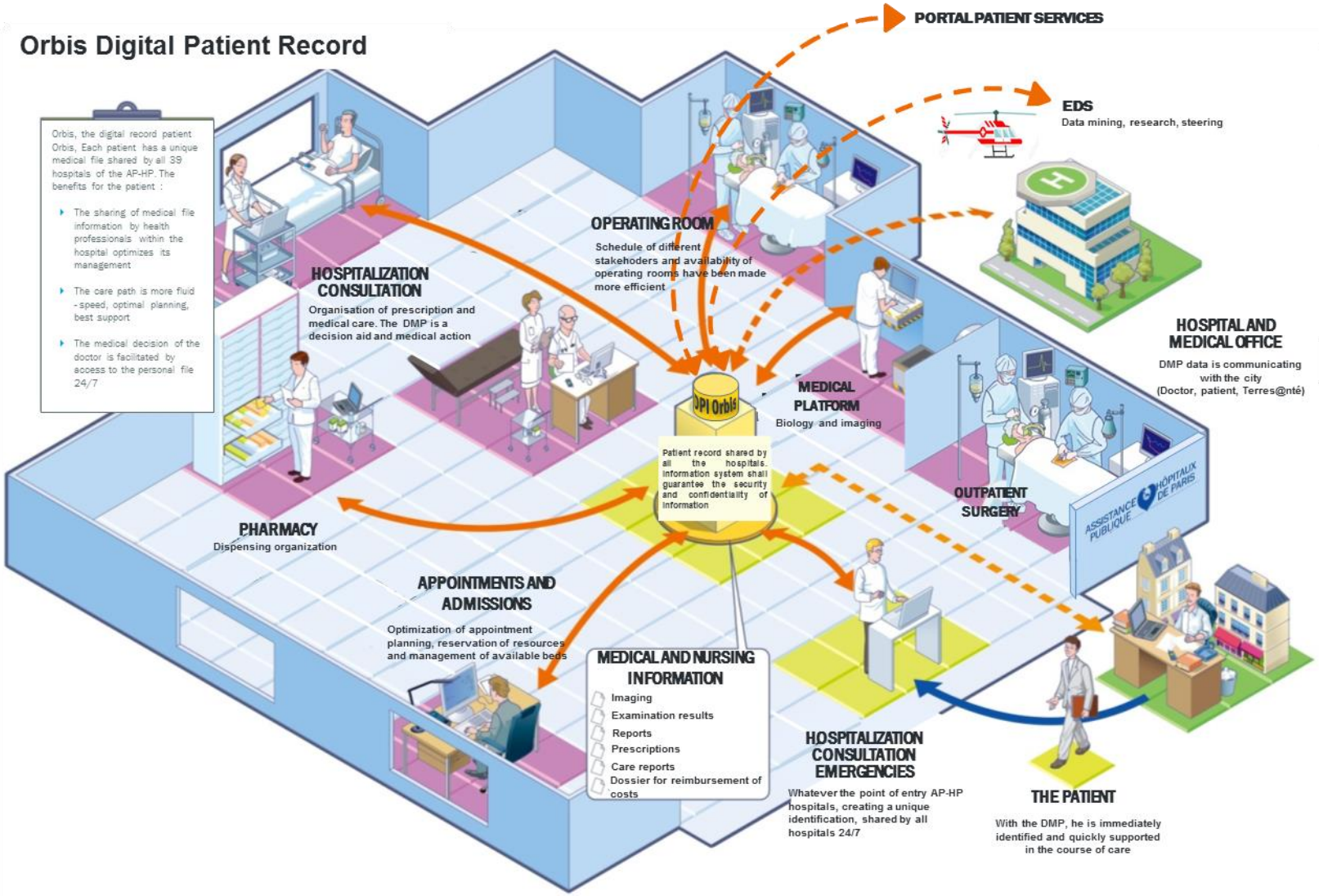
- **Hospital world confronted with profound transformations for several decades**
  - Improvement of services rendered to the patient in a constrained environment in financial and organizational terms
  - Requirement of continuous improvement of performance
  - Establishment of regional hospital groups

Transformation plan = reorganizations, governance changes, mergers between health institutions

- **Digital = strong innovation vector**
  - the hospital is in deep technological transformation on its uses

The hospital IS lives its mutation through a light computing - independent software for some in hospitals

This mutation requires the implementation of a solid and agile information system because all actions performed in hospitals call on the IS


Orbis Digital Patient Record
Orbis, the digital record patient Orbis, Each patient has a unique medical file shared by all 39 hospitals of the AP-HP. The benefits for the patient :
The sharing of medical file information by health professionals within the hospital optimizes its management
The care path is more fluid - speed, optimal planning, best support
The medical decision of the doctor is facilitated by access to the personal file 24/7
PORTAL PATIENT SERVICES
EDS
Data mining, research, steering
OPERATING ROOM
Schedule of different stakeholders and availability of operating rooms have been made more efficient
HOSPITALIZATION CONSULTATION
Organisation of prescription and medical care. The DMP is a decision aid and medical action
HOSPITAL AND MEDICAL OFFICE
DMP data is communicating with the city (Doctor, patient, Terres@nté)
DPI Orbis
MEDICAL PLATFORM
Biology and imaging
Patient record shared by all the hospitals. Information system shall guarantee the security and confidentiality of information
OUTPATIENT SURGERY
PHARMACY
Dispensing organization
APPOINTMENTS AND ADMISSIONS
Optimization of appointment planning, reservation of resources and management of available beds
MEDICAL AND NURSING INFORMATION
Imaging
Examination results
Reports
Prescriptions
Care reports
Dossier for reimbursement of costs
HOSPITALIZATION CONSULTATION EMERGENCIES
Whatever the point of entry AP-HP hospitals, creating a unique identification, shared by all hospitals 24/7
THE PATIENT
With the DMP, he is immediately identified and quickly supported in the course of care

At AP-HP, the Patient is at the heart of this digital mutation …

Digital transformation through innovative technologies and evolving processes to:

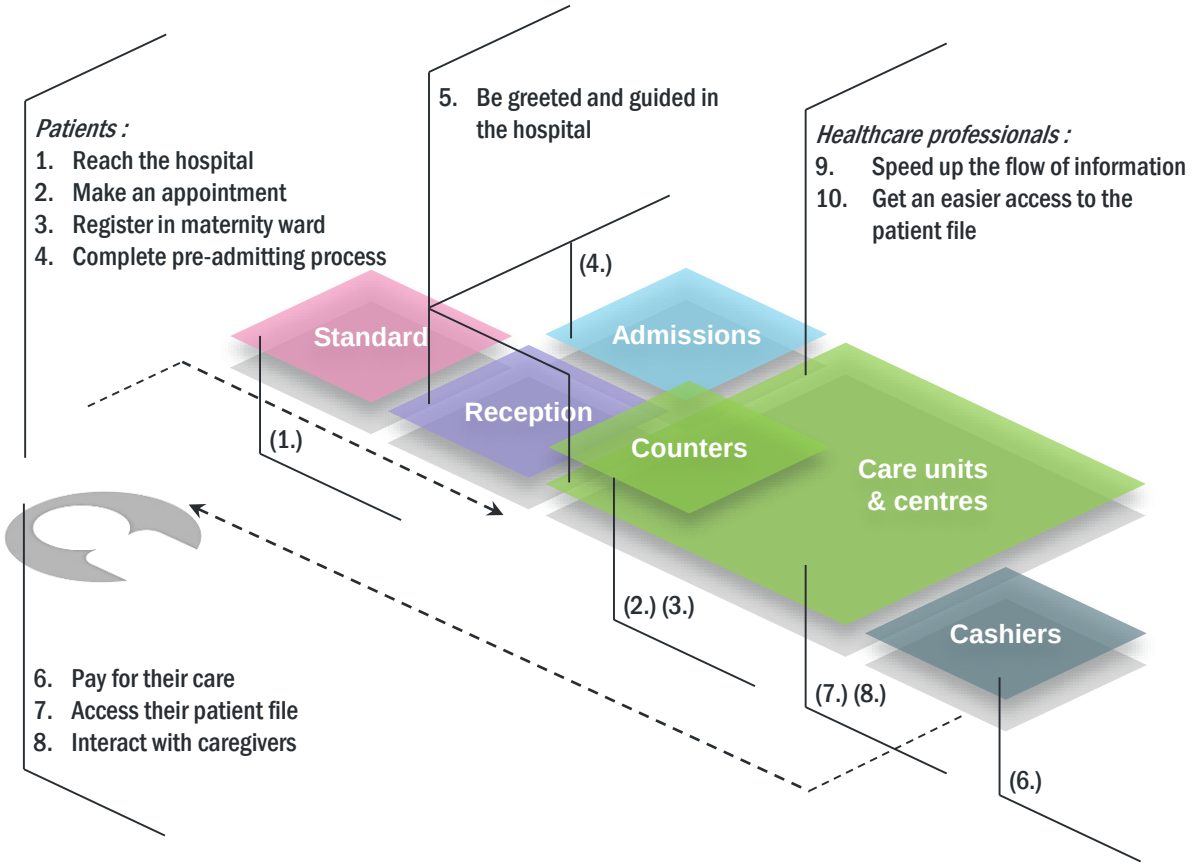
- Facilitate access and management of the patient in the hospital
- Simplify your care path, streamline the administrative circuit
- Support the evolution of medical and hospital care organizations for the purpose of efficiency while ensuring the medical safety of the patient

Implementation of ambitious projects, while taking into account the security of health data

- Health Data Warehouse
- Information Portal for Patients and Healthcare Professionals
- Computerized Patient File that groups all medical data for all hospitalizations, consultations and emergency calls to the AP-HP based on a unique identifier for each patient
  - *Better reliability of information, better fluidity for the AP-HP medical teams concerned thanks to innovative and powerful tools*
- Connected machine
- Computerized prescriptions, computerized care
- Security (video, SIEM, intrusions, …)
- Management of patient meal trays
- Management of computerized appointments
- Robotic pharmacy, computerized labs and imaging
- Communications to hospitals outside the fluidized APHP, from city offices, laboratories outside the AP-HP

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

Digital transformation : rethinking 10 experiences for patients and healthcare professionals



ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

For each project :

Service commitments

A positive view of digital transformation, firstly driven by service commitments towards patients and professionals. Key figures are defined to set goals and reach them.

Better work conditions

Our professionals' work conditions must benefit from these new tools that enable them to refocus on their core activities and free time up for high added value tasks, closer to patients and their relatives.

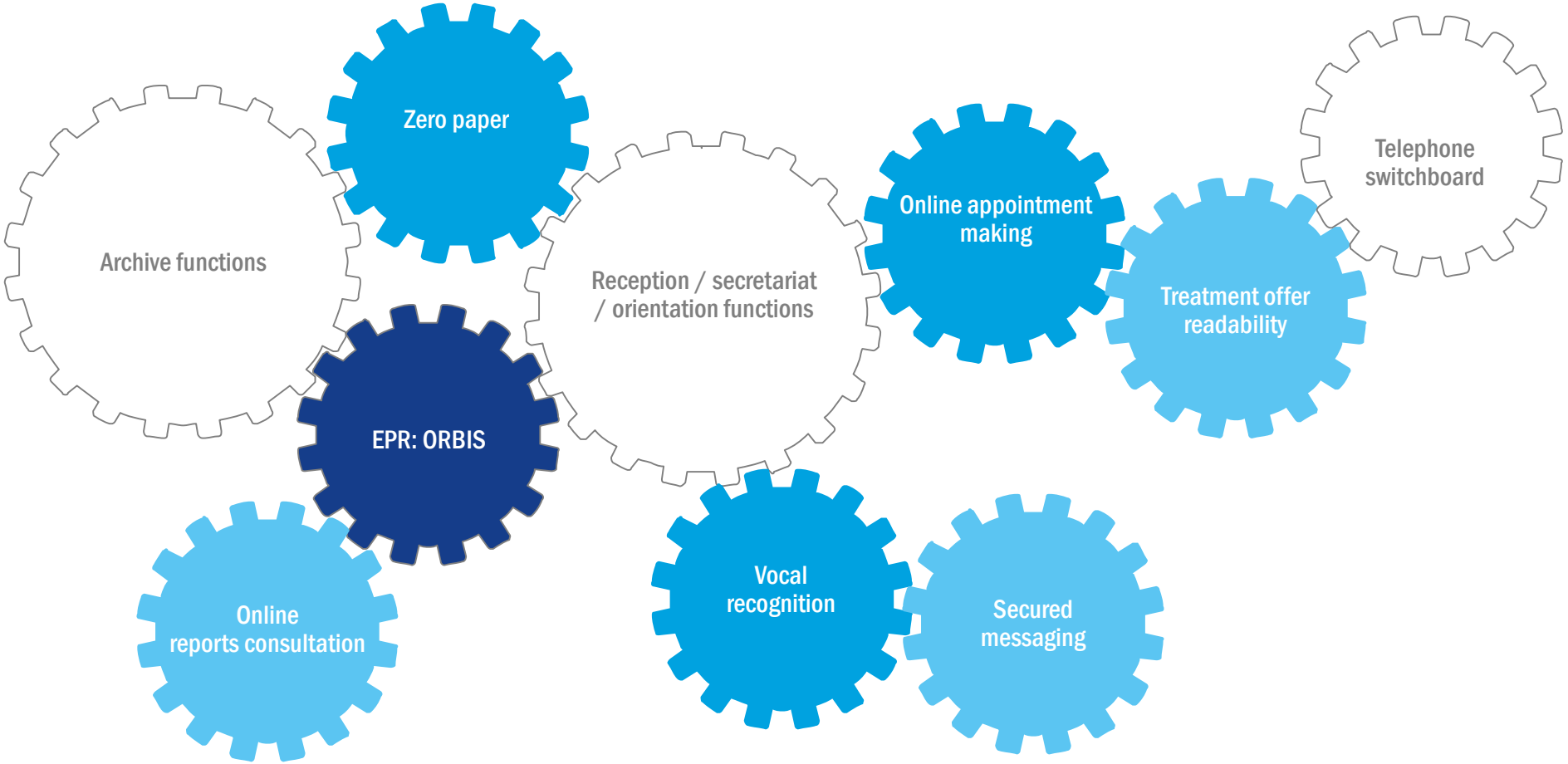
Economic performance

The projects ensure their viability and respect the institution's economic constraints. Notably, each project must anticipate and guarantee its return on investment.

PUBLIQUE

More than a list of projects, we are designing a global and integrated program

Interconnected projects that need one another to happen : Numeric tools serving the work organization



ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

Teleservices diffusion on diverse media is ready or under development

The patient portal

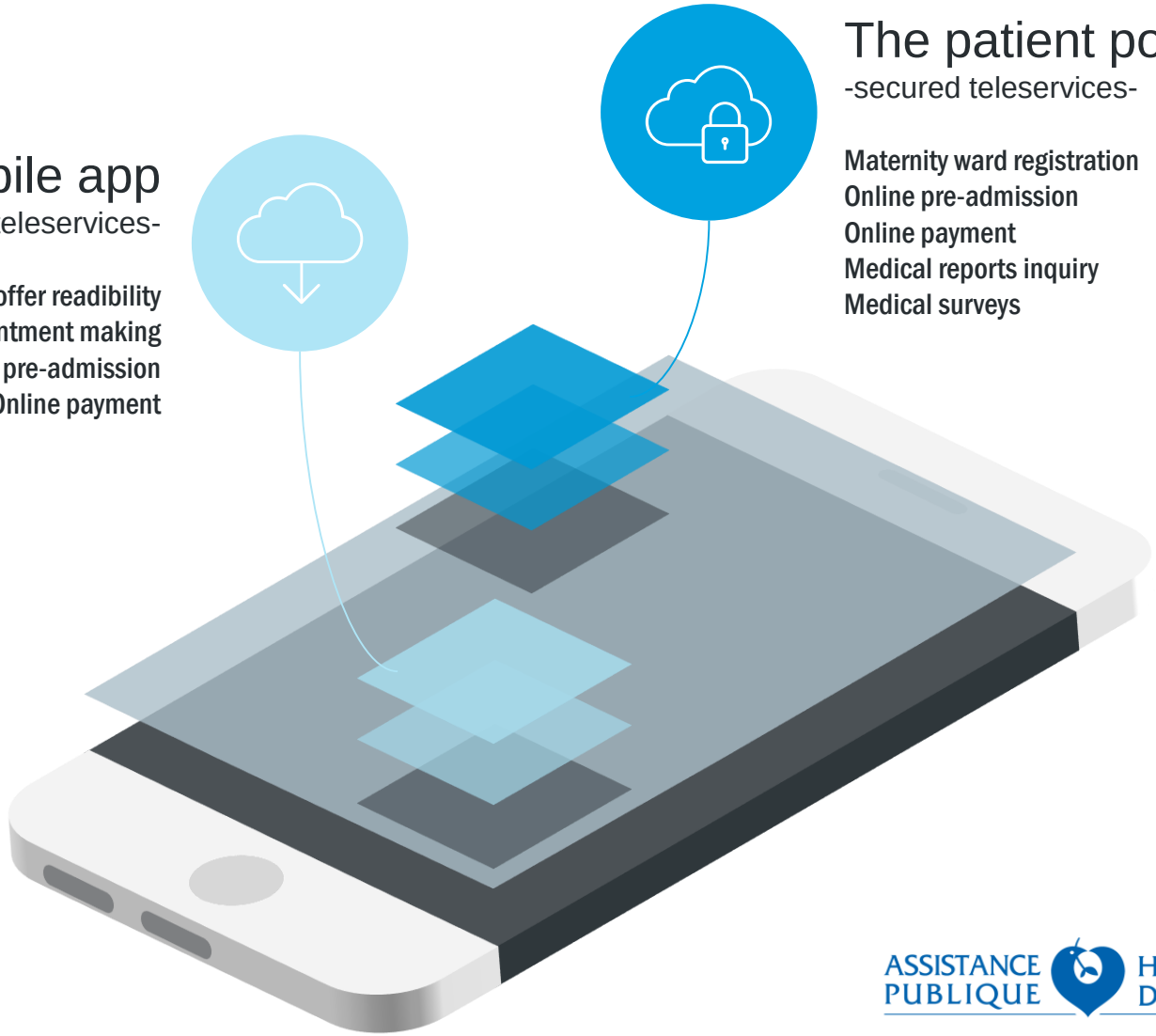
-secured teleservices-

Maternity ward registration
Online pre-admission
Online payment
Medical reports inquiry
Medical surveys

The mobile app

-mainstream teleservices-

Treatment offer readibility
Online appointment making
Online pre-admission
Online payment



ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

Digital transformation induces a better attractivity

For caregivers

For our 39 hospitals and their professionals :

- Better work conditions
- Time saving, tasks optimization, productivity
- Refocus on core activities, renewed motivation
- Sharing and securing information
- Research development

Connexion with other stakeholders in the city (Caregiver portal under development)

- Fluent and secured information flow

For patients

- Higher treatment offer readability (website redesign)
- Time gain (patient portal for online procedures)
- Simplified care pathway
- Smoother administrative circuit
- Easier access to the hospital and care
- Better patient experience (better caregiver-patient relationship, less anxiety…)
- Shorter time spent in the hospital

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

Data Driven Strategy and value creation

Research

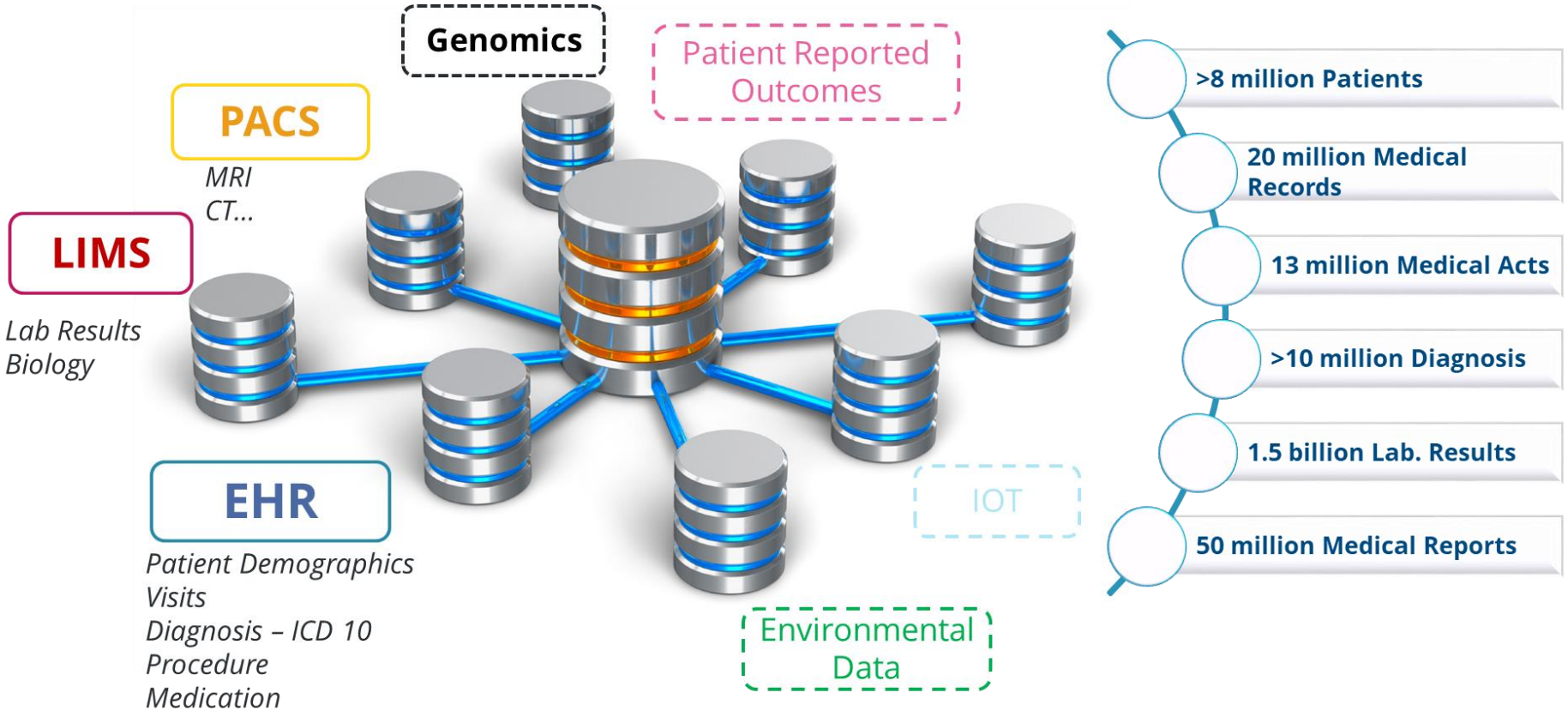
- Epidemiological research on hospital cohorts
- Interventional research support

- Artificial Intelligence & Innovation
- Partnerships

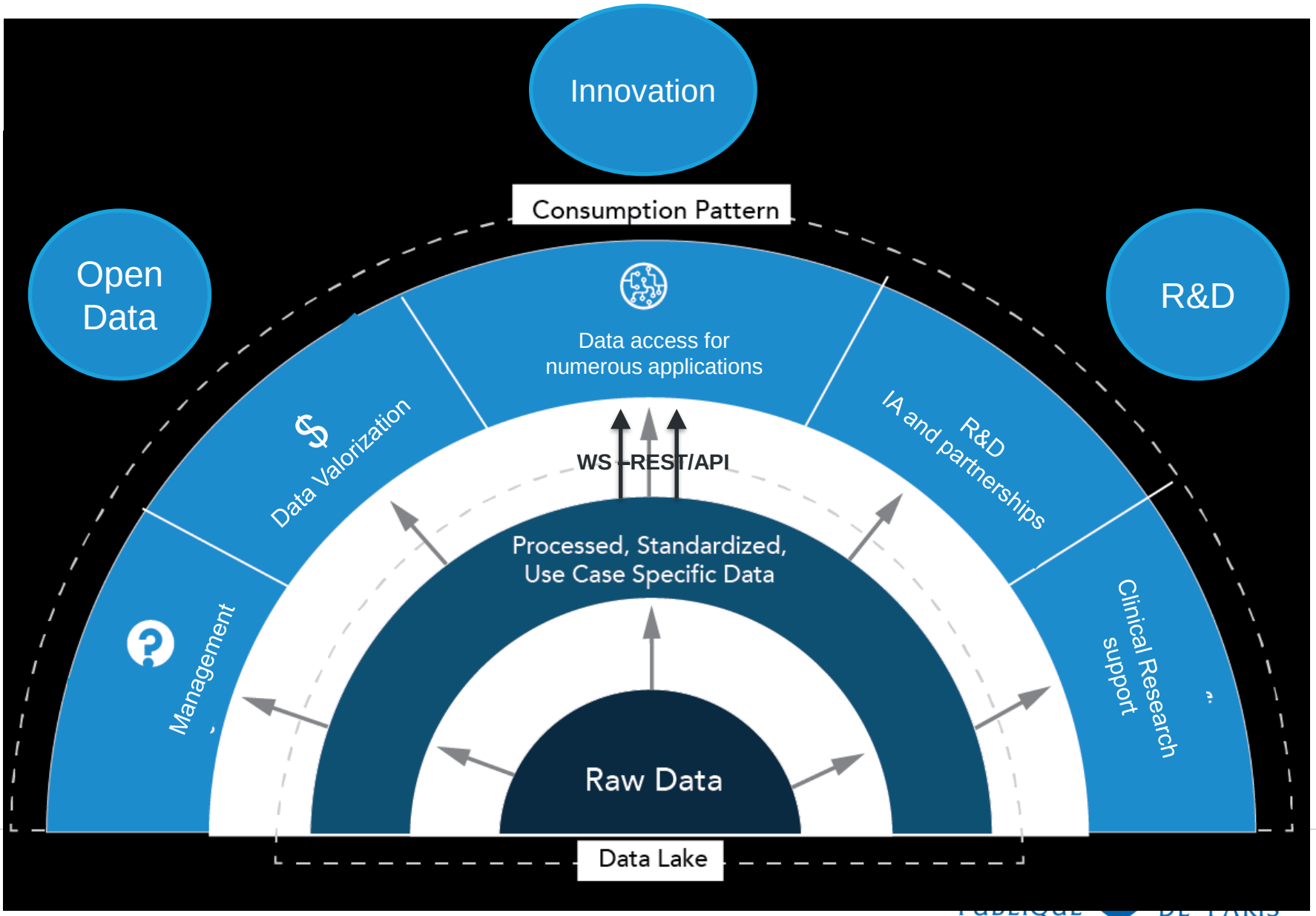
Management

- Hospital Management - KPI dashboards
- *Safety (drug safety, patients' adverse events …)*
- *Training*

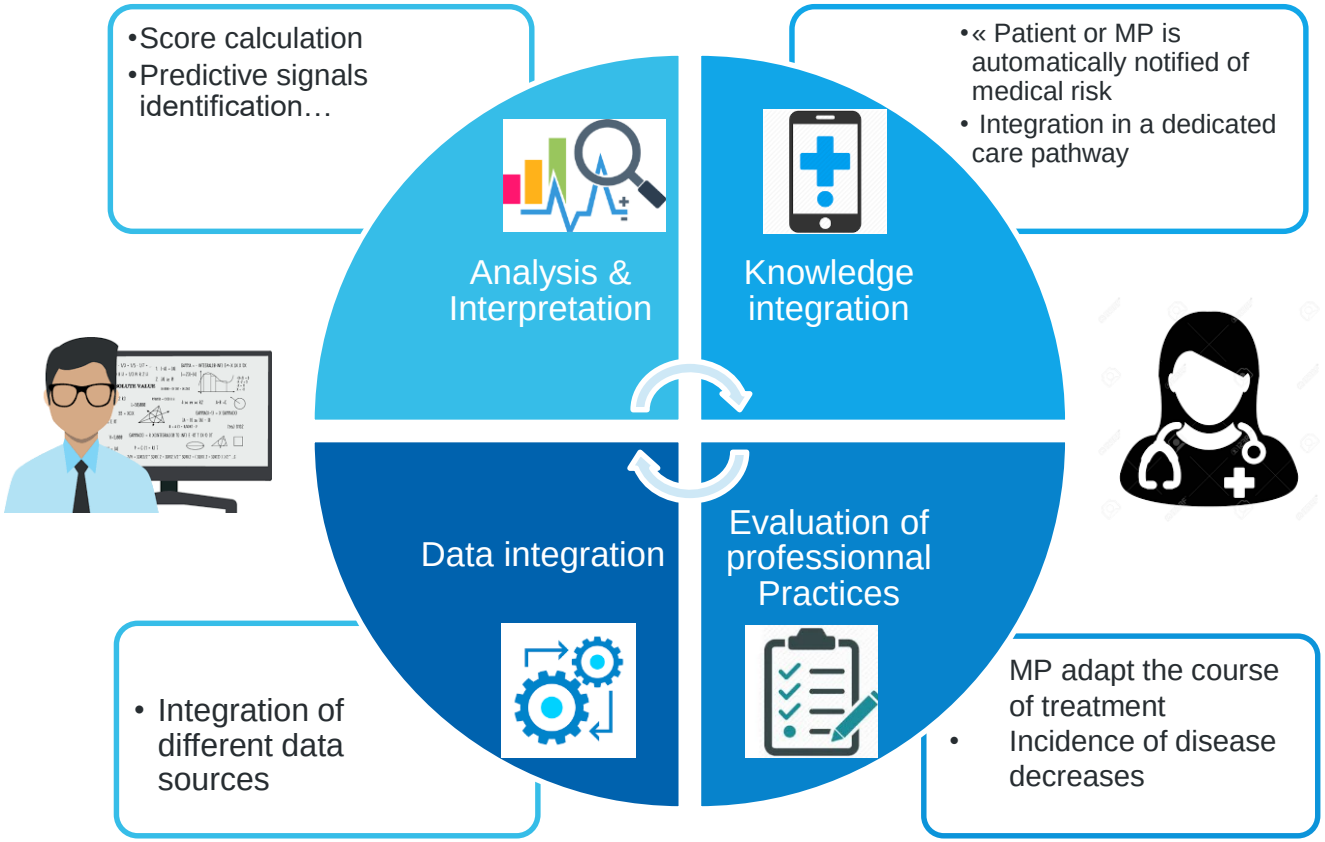
A translational an unique Data Lake



Value Creation and Digital transformation socle



Data-driven innovation for value-based care



Ambitious projects following the same trends as the CIO's of the private sector

- **Information System (IS) without borders :**
  - Implementation of Agile & Scrum methodologies, Devops …
  - Integration, deployment, monitoring of our applications
  - Switch from monolithic architectures to microservices
  - Open Data initiatives
  - Implementation of a patient portal to give access to medical records and on-line administrative procedures (pre-admission, appointment booking, payment, PRO…)

- **An exploitation of Dark analytics – big data**
  - Use of big data technologies and construction of a data analytics plaform with high computation technologies
  - More than 40 on-going research projets focused on the implementation of 4P medicine :
    - *Fracture prediction for osteoporosis patients at 3 years by analyzing bone densitometry scores during routine abdominal scans*
    - *NLP extraction pipelines for medical reports*
    - *Work on deep learning algorithms for imaging analysis (tumor detection in breast cancers)*
    - *Emergency Room attendance prediction for hospital management*
  - Working at the national level to build a National Rare Disease Databank to improve the management of rare diseases

The Digital Department to ensure the success of these mutations must be able to:

- **Guarantee the solidity of the entire IS, urbanize the IS, adapt the IS to meet the needs of the hospital's professions**
  - Diminish the number of solutions
  - IT flexible and agile
- **Rely on solid and secure architectures for its infrastructures**
  - Set up industrial devices to cover an operational IS at any time without disrupting the use of the IS by the hospital
  - Consolidating data center
- **Rely on the rules and best practices**
  - Processes are fundamental to the construction of a professional and efficient IS through proven methods: CobIT, ITIL, CMMI, Lean six sigma, Iso27001 ...
  - Up-to-date software licenses - do not wipe down with the latest versions but manage obsolescence
- **Measure IS performance, implement effective monitoring**
  - Indicators of availability, activity, infrastructure performance, Application Performance Indicators, Critical Flows
- **Measure the performance of the IT department through the processes**

Implementation of transformation plan within the Digital Department

Cost control, often the first goal of Digital department transformation plans

- Control of operating expenses by better visibility, exit of investments - induced by the evolution of the business model of the builders and the publishers towards a rental mode "As a Service"
  - *Migration to the Cloud*
  - *Outsourcing of services with lower added value - office support, management, operation of infrastructures, hosting*

Identification of projects contributing to the transformation plan on the various identified areas of earnings *(cost control, provision of new uses, commitment and communication on performance indices)*

Cost

Use

...

- Optimize the management of IS obsolescence
- Lead technological transformations
- Reduce application and infrastructure assets, and better manage demand (commissioning, commissioning)
- Implement new solutions and adopt new uses
- Set up service contracts - measure, engage

Digital transformation requires a substantial investment…

But a significant return on investment by 2023 is expected

Efficiency

About 37 M€ payout by 2023

Research & Innovation

Database enrichment

Reinforced strategic management

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

Martin HIRSCH

CEO, AP-HP

aphp.fr

facebook.com
/assistancepubliquehopitauxdeparis

@APHP

3 avenue Victoria, 75004 Paris, France

+33.1.40.27.30.00

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS