Today, healthcare design and construction processes are fragmented, with various stakeholders often operating in silos, even within the same organization.
Data is impacting all aspects of our lives and transforming many industries
Let’s talk about F1 Racing

Similarities between F1 Racing and Healthcare
What are the most important assets for a F1 motor racing team?
What are the most important assets for a F1 motor racing team?
What have F1 and Healthcare got in common?

Escalating Costs
Improved safety requirements
New entrants
New Locations
New technology
New viewing models

Increasing cost pressures (ACA, GPOs)
Increased safety and regulation
Amazon, Google, Apple
Medical Tourism, Remote monitoring
Robotics, PT, 3D printing, AI, IoMT
Telemedicine, Wearables, Implants
Technology in Healthcare
What are the most important assets for a healthcare provider?
Data management and advanced analytics is and will transform healthcare provision

“Artificial intelligence will not replace radiologists. Yet, those radiologists who use AI will replace the ones who don’t.”
Curtis Langlotz, Professor of Radiology and Biomedical Informatics at Stanford University
What are the most important assets for a healthcare provider?
New technologies are transforming how we build hospitals
Transforming Healthcare Design & Construction
Like many other industries, Healthcare design and construction is changing.
Healthcare design and construction is facing some considerable challenges.
Productivity issues and the fragmented construction industry structure are key underlying causal factors.

Poor organization, decision making and procurement processes

Inadequate communication

Unresolved issues caused by lack of communication and accountability

Misunderstandings and incorrect assumptions
An Integrated Project Delivery approach contains many elements which can address these issues

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Traditional Project Delivery</th>
<th>Integrated Project Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Structure</td>
<td>Fragmented/Hierarchical</td>
<td>Integrated/Collaborative</td>
</tr>
<tr>
<td>Processes</td>
<td>Linear/Silos of Knowledge and Expertise</td>
<td>Concurrent/Open sharing</td>
</tr>
<tr>
<td>Risk</td>
<td>Individually managed/Transferred</td>
<td>Collectively managed and shared</td>
</tr>
<tr>
<td>Compensation/Reward</td>
<td>Minimum effort for maximum return; first-cost based</td>
<td>Team success tied to project success</td>
</tr>
<tr>
<td>Contractual</td>
<td>Encourage unilateral effort; allocate and transfer risk</td>
<td>Foster and promote openness, collaboration and risk sharing</td>
</tr>
<tr>
<td>Technology and Information</td>
<td>Analog, proprietary, isolated</td>
<td>Digital, open, virtual and integrated</td>
</tr>
</tbody>
</table>
Managing data is critical to addressing risks, challenges, & opportunities across the project life cycle

- Design Changes
- Budget constraints
- Phasing changes and reprioritization
- Contractual and regulatory changes
- Construction delays
- Clinical decisions
- Equipment changes
- Supply timescale changes

Integrated data & processes are critical to facing these challenges
What are the key success factors to implementing Integrated Project Delivery?

**Right data, Right time**
- Access to high quality, correct data when it is needed
- Timely decision making based on reliable data
- Minimise delays and avoid incorrect assumptions

**Good communication with all stakeholders**
- Reduce overhead & delays caused by inadequate access to required data
- Control processes & structures to manage change
- Ensure only responsible authorities make changes and these are communicated

**Manage data across the project lifecycle**
- Key data relating to decisions which have major impact on design should be made available early in the design process (e.g. architecturally significant equipment)
- Data relating to your facility and equipment should be handed over and valued as a key asset
The Lifecycle Cost implications of correcting design decisions based on incorrect, incomplete or unavailable data

- Right data, Right time
- Good communication with all stakeholders
- Manage data across the project lifecycle

Costs:
- $1 Design
- $10 Construction
- $100 Activation

ATTAINIA Healthcare Enterprise Asset Management
People, process and technology must be aligned to achieve:

- Faster, more strategic decision-making
- Reduced risk
- Improved outcomes
- Reduced cost of care
Integrating solutions and standardised data sets are critical to the delivery of healthcare facility projects.

Right data, Right time

Good communication with all stakeholders

Manage data across the project lifecycle
Select the right tools for the job and End the Spreadsheet Madness – NOW!

ATTAINIA Healthcare Enterprise Asset Management
Building Information Modelling (BIM)

Building Information Modelling (BIM) is a collaborative way of working, underpinned by the digital technologies which unlock more efficient methods of designing, creating and maintaining our assets. BIM embeds key product and asset data and a 3 dimensional computer model that can be used for effective management of information throughout a project lifecycle – from earliest concept through to operation. It has been described as a gamechanging ICT and cultural process for the construction sector. A number of countries globally are starting to realise the opportunities it brings and are now investing in developing their own capability.

UK Government BIM Strategy
Regulation and core benefits are driving global BIM adoption

In 2003, the General Services Administration (GSA), through its Public Buildings Service (PBS) established the National 3D-4D-BIM Program.

Since April 2016, as part of the Government’s Construction Strategy which aims to achieve 20% savings in procurement costs, all centrally-procured construction projects in the UK are required to achieve BIM Level 2.

in 2015 the government announced the formation of the Digital Building Platform — a BIM task group created by several industry-led organizations to develop a national BIM strategy. BIM mandate expected in 2020.

UAE Updated BIM mandate in 2015 – all building over 20 floors, 200,000 sq ft, plus all government building, universities and hospitals.

BIM is widely used, is already mandated, or will be in the near future in many other countries and regions including Europe, Australia and New Zealand, Singapore, China and the Middle East.
BIM guidelines and support resources

Multiple sources of guidance and standards to support adoption and usage of BIM

Interoperability

Data standards (IFC, COBIE, JSN)

Level of Detail (LOD)

SEPS2BIM Object libraries
# Case Study

**Case study: KKMC**

King Khalid Medical City, in Dammam, KSA

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventilators</td>
<td>640</td>
</tr>
<tr>
<td>Physio Monitors</td>
<td>4878</td>
</tr>
<tr>
<td>MRIs</td>
<td>8</td>
</tr>
<tr>
<td>Surgical Robots</td>
<td>25</td>
</tr>
<tr>
<td>Lin-Acs + Tomo</td>
<td>7 + 1</td>
</tr>
<tr>
<td>Cyber-knife</td>
<td>1</td>
</tr>
<tr>
<td>Booms</td>
<td>514</td>
</tr>
<tr>
<td>Infusion Pumps</td>
<td>4943</td>
</tr>
<tr>
<td>Medical Equipt.</td>
<td>98,872</td>
</tr>
<tr>
<td>M.E. Total (USD)</td>
<td>$602,152,476</td>
</tr>
</tbody>
</table>

ATTAINIA Healthcare Enterprise Asset Management
Case Study – KKMC, Saudi Arabia
Data and process integration extends beyond project to the entire facility and equipment lifecycle.

Extended Collaboration Model for Design, Construction & Operations
BIM Level 3 Benefits Are Realized throughout the Building Lifecycle

- **DESIGN TEAM**
  - (Architects & Engineers)
  - Digital Mock-Up
  - BIM Data

- **SUPPLY TEAM**
  - (Manufacturers & Fabricators)
  - Design Review
  - IFC Data
  - Fabrication Data

- **CONSTRUCTION TEAM**
  - (General Contractors & Subcontractors)
  - Process Simulation
  - Installation Data
  - Work Packages

- **OPERATIONS TEAM**
  - (Owners & Facility Managers)
  - Project Management
  - Work Breakdown Structure
  - Virtual As-Built Models

- **Facility Management**
  - Maintenance Work Orders
Data Integration and Standards Are Key

Design and Specification
Budget & Milestone Management
Procurement Support
Installation & Transition Management
Asset Lifecycle Management

- Dept/Room Templates
- Equipment Catalogue
- Product Specifications
- Room Item Lists
- Collaboration Support

ATTAINIA Healthcare Enterprise Asset Management
Integration of components and standardised data sets are critical to the delivery of healthcare facility projects

- The owner’s role is to manage Facility Lifecycle Management data
- No single platform will handle all data sets required to design, construct and manage a facility
- Data will need to transfer among multiple databases across the project and operations lifecycle
- Solutions must be scalable across project size, software, and hardware
- Interoperability of data is required
- Interoperability of graphics is desired
Synchronisation of Attainia data with Revit projects and AutoCAD drawings
Integrating planning and procurement data with your ERP / materials systems
Managing installation, commissioning and activation with Attainia and FitUp
Managing assets across their full lifecycle

Track Asset  
Measure Performance and Relevance  
Predict Lifespan  
Control Replacement

ATTAINIA Healthcare Enterprise Asset Management
Summary

**Adopt**
Adopt an integrated project delivery strategy, identifying data requirements, ownership, standards, processes and systems across the project lifecycle.

**Collaborate**
Ensure contracts and subcontracts allow for and enforce collaborative design and implementation. Set up project structures to enable collaboration.

**Integrate**
Develop an integrated information solutions architecture to address the needs of the end to end project lifecycle.
“In God we trust. All others must bring data.”

- Dr. W. Edwards Deming
Attainia and You – The Formula for Success