

LS502400

# Why BIM Can Be a Digital Transformation Cornerstone?

Anne BARD  
GSK

Giovanni GIORGIO  
GSK

Shakeel MIRZA  
Autodesk

## Learning Objectives

- 1. Understand the Lifecycle of a Pharma Plant
- 2. Foundations of Pharma Digital Transformation
- 3. Design a digital strategy & execute on it
- 4. How to build the vision of a solution
- 5. Scaling a limited impact pilot to enterprise level

## Description

Sources of digital transformation in pharmaceutical industry are twofold.

- BIM process with federated 3D models and centralized CDEs are now well-accepted norms. Yet, the benefit balance derived from this digitalization stays in favor of the engineering companies.
- The owner digital transformation's focus has been on digitizing drug release (batch, maintenance, and calibration records) and manufacturing performance at the process or equipment level.

Converging these two digital approaches is not often seen as a priority. Yet it may be a foundational step toward a successful digital transformation for the businesses and their people. This class will explain how to make the case for data convergence between digital assets (descriptive digital twins) and manufacturing data and analytics.

1. Problem definition
2. How did the human centric approach help to make visible the foundational benefit of BIM by linking objects to information
3. What technology: combination of BIM Collaborate (CDE platform) with Data Convergence and linkages across multiple data platform (existing and new).
4. Business outcome & value & KPIs

## Speaker(s)

### **Anne BARD – Design Lead Front End Engineering & design - GSK**

I am an inspiring and passionate design & transformation leader driven by relentless curiosity and by the pursuit of hidden business value.

I believe in connecting people, trends and data to find patterns and transform this understanding into actionable plans.

My passion is to catalyze people chemistry to enable sustainable collaboration and engagement using innovative digital solutions and new ways of working



### **Giovanni GIORGIO Senior Digital Engineer – Front End Engineering and Design GSK**

Chemical Engineer by background with a strong passion for decision support systems using data, modelling and simulation.

Driven by the vision to simplify design and operation decisions through the implementation of industrial digital twin.



### **Shakeel MIRZA Autodesk**

For the last twenty years, I've been working in the engineering software industry in different roles focused at helping the early adopters be successful with the latest technology. I've worked for market leading engineering software MCAD, PLM & BIM providers such as Autodesk, Dassault Systèmes, Unigraphics (now Siemens PLM), ANSYS and Robobat. I'm helping the engineering design industry in their digital transformation through my deep engineering knowledge complemented with strong strategic analysis, leadership skills and business acumen, thanks to my vision broadening experience of an executive EMBA at HEC #1 worldwide by FT with Major in "Innovation Management & Entrepreneurial Leadership".



## Introduction

### GSK Mission

Important to note that the initial GSK has been demerged in two new companies in July 2022. Haleon for consumer healthcare and New GSK where Pharma & Vaccine are more integrated

The mission statement of New GSK is :

*Uniting science, talent and technology to get ahead of disease together.*

### Front End Engineering and Design introduction

Front End Engineering and Design (FEED) is an Engineering Group in Global Capital Projects focusing on the Front-End Engineering phases of CAPITAL PROJECTS from business analysis, to feasibility and concept.

Our job is to Design Assets i.e factories. And to do so we do simulation, capacity models, business models and of course 3D models of assets that we then hand over to our colleagues in charge of project delivery.

## 1. Pharma Industry: Challenges vs Opportunities

### The Limitations of Traditional Digital Delivery

From Front End Engineering to detailed design and construction, 3D models are put together to ensure that all the geometries coming from all the trades and disciplines fit together, and also can be reviewed, approved and then build.

But digital delivery is not only about geometry and 3D.

During design, execution and commissioning, a comprehensive set of information is also put together:

- engineering information (documentation and data)
- meta data coming from all the the approval workflows (necessary to ensure that the facility is built for its intended purpose and compliant to pharmaceutical regulations)

Digital delivery today is about 3D and digital engineering data and meta-data.

The output should be a data rich model that is then easy to consume for operational purposes post handover.

But the reality is quite different from this ideal state.

Post handover this data set is at best left on a shelf accumulating dust and becoming obsolete or at worse simply thrown into a data bin.

Today there is no digital asset life cycle that parallels the physical asset life cycle.

### **BIM value is not captured by the owner but by its suppliers**

The value coming from building a comprehensive data set (geometry & engineering data) is not transferred to the operations.

The value is stuck in the engineering and construction phase and captured by our engineering and construction partners.

As a consequence the pharma owner is blind to the potential value and has no real incentive to invest in the ownership of these data post delivery, thus maintaining the status quo.

The construction industry has witnessed the adoption of BIM by the architects & engineers as the early adopters. But Why Engineering first & only Engineering?

The simple explanation is that design is where the information is created & BIM is the perfect method to capture that design information in digital.

The owners like GSK, who traditionally have been focused on operations as their core competence & who relied on their engineering partners to deliver detailed design felt unconcerned when the first impression was that BIM only delivers value for design.

## **2. Human Centric Approach to Transformation**

### **A User Need to Democratise the Data**

In addition, it is also clear that a data set as produced by engineering, design and construction, resulting in a 3D model full of detail is of no use to get the product out of the door.

Moreover, the data set (3D in particular) is delivered today in an environment that is highly complex and made only for designers. It is not a practical nor scalable solution to train an operation population (even maintenance) to use design tools such as Revit or similar.

On the other hand, some transformative solutions using digital assets (3D and 2D) have been put on the consumer market without anyone asking for it in the first place, and are delivering every day huge value for millions of users. From google Maps, Uber, Waze, City Mapper to name only a few.

That's why transforming the complex 3D asset & complex meta data set into something simple to consume was our first research.

## A Minimum Viable Demonstrator

With the contribution of Autodesk and Microsoft we demonstrated that a complex digital asset (3D + component data base) could be read on a smartphone to reading, search and comment just using Microsoft Power App.

Thinking about the CityMapper or Smartphone analogy we wanted to experiment the benefits of an intuitive spatial information navigation.

Like in Google Maps we demonstrated that we could use the physical (3D and geometry) to find digital information extracted from multiple data sources, using Power App as a user interface.

We learned that a fusion between space and data from multiple sources could be possible relatively easily. This “fusion” is called data convergence and it is the foundation for what we call the digital twin.

It can be enabled only if all the data sources are stored on accessible systems, accessible through API layers and connectors.

Moreover, this experiment allowed us to learn that using an App platform is an opportunity to scale this accessibility and access democratisation in a much cheaper way, without locking us to big proprietary data platform(s) that we might not use at their full potential anyway.

## 4. Connecting the Sources of Truth

Legacy systems and legacy data or document platform are here to stay in pharmaceutical industry. It is therefore important that a digital transformation strategy is build with this systems rather than against them.

### The legacy systems in the asset life-cycle

We as GSK need to own the data and set up our organisation for this ownership right from the beginning.

And the ownership will start with setting up what we call a Common Data environment platform (or CDE) which will aggregate in one place the geometry (3D) and the engineering documentation coming from the whole supply chain (equipment suppliers, system integrators, engineering partners, etc).

But currently this common data environment aggregating a single version of the truth during delivery could be broken twice during the life cycle.

The first point of break takes place after handover where each owner of the legacy systems are going to do a ONE-OFF extract of the data they need to populate their stand alone systems, making the CDE “obsolete” just after delivery.

The second breaking point is at the end of the asset life cycle. When we need to upgrade the asset, because of a new product for example. Because the digital asset and set of data have

been broken and distributed among multiple systems during the life cycle, the first activity is to re-put the data together and rebuild the data model almost from scratch.

## Build Connectivity

It's important here to realise what are the main challenges of "Digital Transformation" in the current technological landscape.

It's no more about paperless operations. The core of the problem is not digitizing the information, as data is readily available & the digitizing analogue information is cheaper & faster.

A consumer grade smart phone can come with LiDAR today making it very cheap & quick to digitize the assets.

Digital Transformation today is about how we enable a user extract insights quicker from the existing piles of data for higher efficiencies.

In today's industrial landscape the operations team is already using data to do so across multiple silos such as P&ID drawings, technical manuals, images, emails, ... so it's not about the unavailability of data, it's about how to reduce this overhead of looking across multiple sources of data manually.

According to a McKinsey study typical collaborative workers spent 59% of their time looking for information.

This is where BIM deliverables brings the engineering design data in a well structured, easy to query data that can be connected to two other big sources of information namely ERP & MES.

## Build the foundations

The aim is to link the 3D geometry to documentation delivered by a new project.. But also try to link our 3D model to the documentation already sitting in existing legacy platforms such as our Quality Vault for GMP documentation, Maybe existing Share Points that cannot yet be replaced, and our existing legacy system for engineering drawings

The core of the foundation is the common data environment platform, the CDE, put in place during the design phase where both the federated 3D model and the engineering documentation delivered by the capital project team is put together.

The next step is to create this linkage.

The idea is to establish a data link using the Unique TAG of any object or component part of the 3D model (the physical part) and any documentation where this TAG will appear.

Should it be a data sheet, a list, a P&ID etc. By doing so, we transform the 3D model into an intuitive SEARCH engine, where by 3D or 2D navigation, can allow to find the information in hopefully less than 5 min.

Moreover, this linkage could be established after delivery, by using smart data ingestion and knowledge graph technology.

## 5. From MVD to PoC to Standard Practice

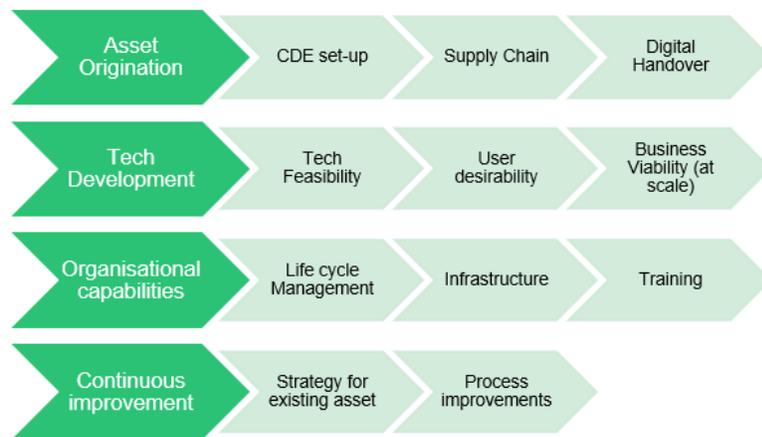
### Ambidextrous strategy

To continue the transformation we need to have a parallel approach or a dual strategy.

On one side we need to continue to leverage in flights capital project in which we have already managed to implement common data environment platforms (CDE) to test the “linkage layer” and learn bit by bit, key elements related to the 4 workstreams.

On the other side we need to develop the below 4 workstreams at a strategic and global level.

The local/tactical and the global/strategy combined together will allow to set up the full life cycle and the ecosystem for our asset information model.



## Conclusion

It might not come as surprise to people but in “Technology Scaling ie Adoption” the key word is adoption not technology, as technology is mature & in some cases much more advanced than what is being used or usable in the industry.

The key takeaways are around the organizational aspect of this change and the key steps that helped accelerate the process.

They key factor for digital transformation (and adoption) is how easy we can access and use data (Data consumption) but also what we do with the data then how we can manipulate them and aggregate them to improve decision making (from the shopfloor to the company`s strategy)

BIM now is helping to orchestrate digital delivery... because of the structured data that becomes easy to leverage, then through simple and intuitive interfaces, as owner, we are finally able to consume the data.. But the journey has just started ....