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Starting Your Digital Transformation Journey

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Learning Objectives

- **Define the Problem:** Understand your current operational benchmark and identify areas for strategic improvement.
- **Develop a Strategy:** Create a clear roadmap towards the creation of a common data environment and ways to leverage it.
- **Implement Solutions:** Consolidate resources and implement new processes and tools to help you achieve and measure success.
- **Put your Data to Use:** Understand ways to utilize your facility data and leverage your deliverables to the fullest extent.

Description:

You want to exploit the benefits of common AEC industry technologies and leverage data to guide the decisions you make about your Built Environment needs but don't know where to get started?

You keep hearing about Digital Twins but you're not quite sure exactly what they are, how they could help you, and if you should "get one" yourself? Don't worry – you're not alone!

What If you could understand your current organizational state and identify major issues that are costing you a lot of time and money? What If you could develop a process for your future Built Environment needs that prevents those issues from becoming problems in the first place? Digital Transformation is a process that aligns technology and digital resources to your current business needs and future goals. Join this lecture as we break down the necessary steps to get started with your Digital Transformation journey and towards a much more efficient way of managing your complete Built Environment Lifecycle!

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Speaker:



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Marin is a Registered Architect and Innovation & Technology expert. He started his professional career nearly 20 years ago as a technical production architect and project manager. Through his personal practice and project experience, he realized how disjointed the Design and Construction industry is, and the vast amount of room for process improvement. As a result of his efforts to connect the AEC industry and improve his own projects, his career evolved towards Technology & Innovation. He led all aspects of Project Delivery from Design, Visualization and VR/AR, Integration of Reality Capture and UAS systems, to streamlining AEC Workflows from Planning, Design and Construction, into Facility Management and Operations. He is a strong advocate for the Owners, striving to eliminate the costly duplication of efforts in project execution, and move closer to the ideal Built Environment consisting of true Buildable Design followed by an IoT connected Digital Twin deliverable.

In his current role at Jacobs, Marin focuses on leveraging his extensive AECO industry experience to help global project teams discern project technology & innovation constraints and opportunities. He is passionate about developing the most suitable project execution strategies that leverage advanced Virtual Design & Construction tools and workflows in innovative ways to help streamline the Design/Construction delivery, and achieve a digital handover of the Built Environment suitable for the Owner's Asset Lifecycle Operation & Management process. He focuses his Leadership and Advocacy for enhancing the Built Environment both internally at Jacobs to raise awareness as we Challenge Today and Reinvent Tomorrow, and externally with clients enabling their beyond by leading them through their Digital Transformation journey and towards a streamlined and optimized future state.

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Discussion Leader:



Raja R. Kadiyala, Ph.D.

Vice President and Senior Technology Fellow

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Dr. Kadiyala is a Vice President and Senior Technology Fellow at Jacobs. He is currently serving as the Global Market Director for Digital. In this role, he provides leadership, direction, and oversight to services associated with Jacobs' Digital Delivery, Geospatial, and Intelligent Systems solution areas. These solution areas encompass Automated Design, Augmented and Virtual Reality, Geospatial Analytics and Integration, Geodesign, Digital Twins, Process Control Systems, Optimization, Predictive Analytics, Information Modeling, Smart Metering, Artificial Intelligence, IoT and Smart Sensing, Physical Security, Cybersecurity and Emergency Preparedness solutions for public and private sector clients worldwide.

Over his 27-year career at Jacobs, Dr. Kadiyala has worked to plan and implement information and security system solutions across the globe. He has also focused on real-time sensing, machine learning, digital twins, control, and analytics for operational optimization. Many of his current efforts are centered on the development of advanced visualization solutions to provide insight into the overwhelming amount of data generated daily.

Before joining Jacobs, Dr. Kadiyala worked in the aerospace industry and industrial process control space as a development engineer. He was also a control systems engineer within the Flight Systems Division at NASA and an R&D manager in the automotive and semiconductor manufacturing robotics arena.

Dr. Kadiyala received his Bachelor of Science, with highest distinction, from Purdue University. He subsequently received his Master of Science and Doctorate from the University of California at Berkeley, all in electrical engineering

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Background

Before diving into the journey towards Digital Transformation, it is important to understand the driving force behind the need for organizations to transform in the first place. Rapid evolution of technology has created a perfect environment for Digital Disruption, pushing organizations to evaluate their business models at the core, and make sure their goods and/or services still provide value to their clients. Regardless of the type of organization in question, there is always room for both marginal and transformational improvement. More often than not, there are organizational silos in place which are fairly set in their ways, and difficult/resistant to change. As a result, those organizations that do not evaluate the alignment of their current processes in how and what they deliver relative to the advancement of technology will find themselves in the rear-view mirror of the organizations that do.

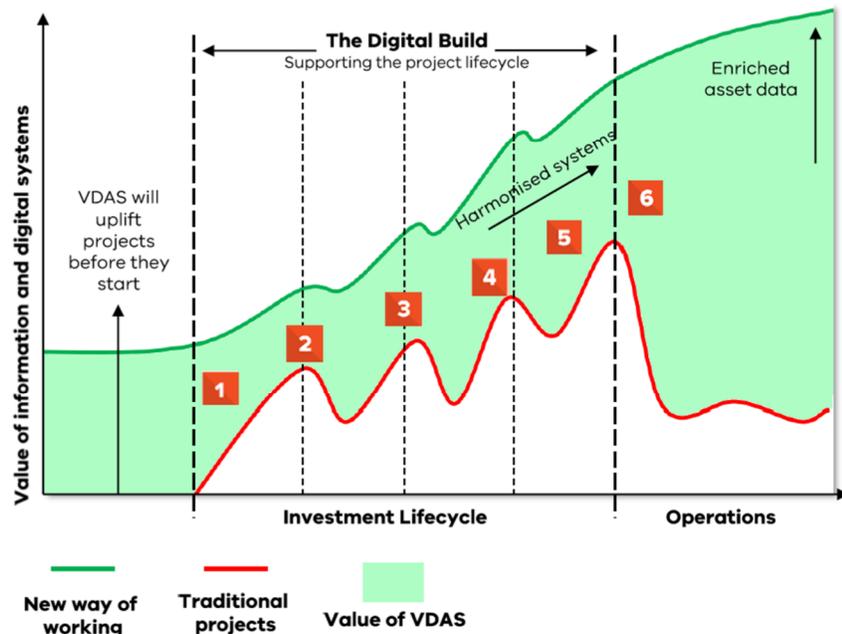
Total Cost of Ownership

When it comes to the AECO industry, one of the driving forces of Digital Transformation is the Total Cost of Ownership (TCO) of the Built Environment. Design and Construction industries have historically been fairly disjointed, resulting in tremendous amounts of duplication of effort and resource waste in the form of non-optimal activities.

Benefits across the project lifecycle

- 1 Documentation errors**
Reducing errors by 60%
- 2 Improved efficiency:**
15% saving of construction costs
- 3 Reducing rework**
40% reduction of rework
- 4 Faster projects**
Reducing durations by 22%
- 5 Less legal claims**
20% reduction
- 6 Improved efficiency:**
20-30% saving of operational costs

(Source: UK Government, Autodesk)

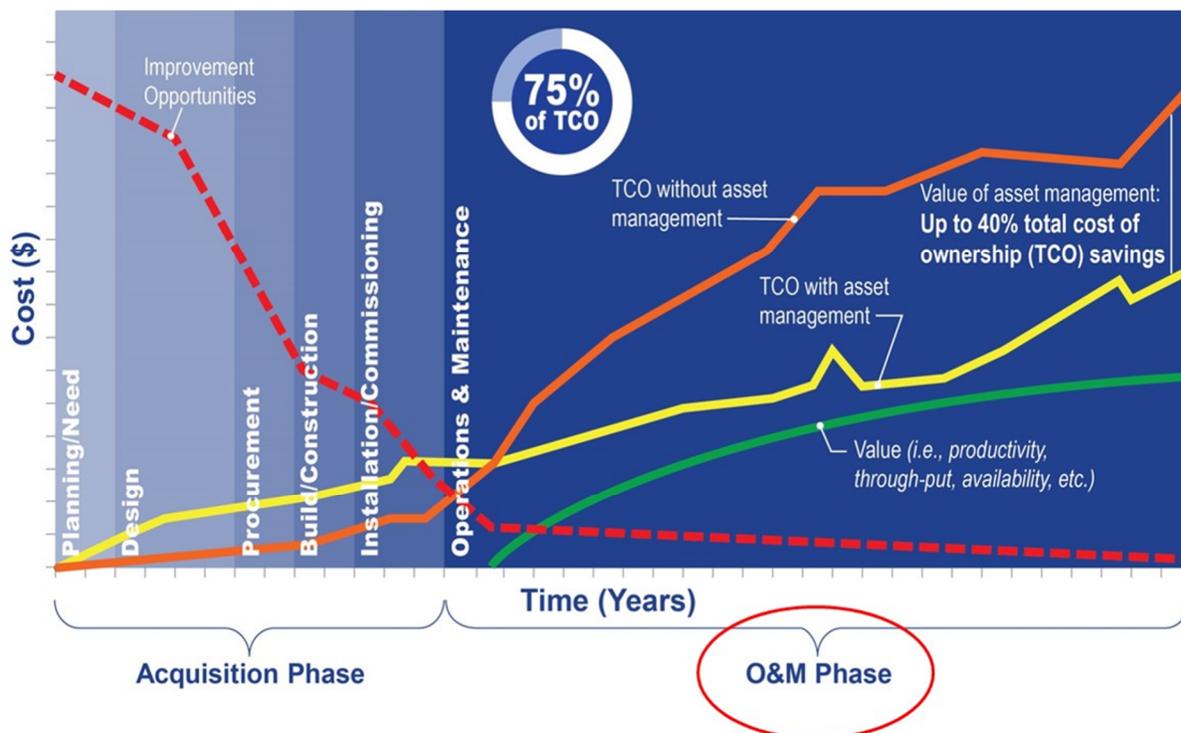


The resulting Facility Handover process is equally as disjointed and mis-aligned with Facility Owner/Manager needs. Owners are starting to realize that a lot is left on the table and they are missing out on opportunities to get **More Work** delivered with **More Value**, with **Better Quality** and **Better Deliverables**, with **Less Waste**, **Less Resources**, and in **Less Time**.

More.
Better.
With Less.



As a result, they are pushing their delivery teams to work more closely together in order to deliver more value. Considering that **75% or more** of the Total Cost of Ownership of facilities is attributed to **activities after Design & Construction**, that should clearly be the focus for operational efficiency improvement to make the most impact. However, the **ability to make Cost impact drastically declines** throughout the Design & Construction phase. We as the leaders of our industry have not only an opportunity, but almost a **responsibility to maximize resources** and bring more value to our clients by helping them reduce their TCO when it matters the most!



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Defining the Problem

Before creating a solution to any problem, we must first have a clear definition of exactly what it is that we are trying to solve. There are many challenges in our industry, and it is all too easy to lose focus without clear goals.

Most important question: Why?

Most successful Digital Transformation initiatives have one thing in common: they targeted improvements that align with the core of Why their organization exists to begin with. After developing a clear current operational state as the baseline and the desirable future state as the goal, there must be a clear answer as to **Why** that future state is desired, and that answer has to be **Aligned with the Vision** of the organization. If the proposed solutions don't directly support the vision, they are either not important enough to warrant the painful organizational change management process I will describe below, or not the right solutions to begin with.

Developing a Strategy

After determining that the proposed solutions are aligned with the organization's vision and important enough to consider implementing, an appropriate implementation strategy must be developed for it to be successful. **Who** will support and lead this change? **What** are the next tangible steps? **When** is the right time to implement? **How** are you going to accomplish this and measure success? Answers to those questions will drive the core of a successful implementation roadmap that aligns investments, intelligence and quantifiable outcomes with current and future business needs and goals.

Following Trends.

More often than not, an appetite for Digital Transformation starts with a glimpse of a potential end-product. Someone identifies a new piece of software, new functionality, or a new buzzword like "Digital Twin", and they start digging deeper into following the latest trend, as they feel "behind". Unfortunately, there are a lot of siloed solutions in the ecosystem that allow business owners to pick and choose what they want without thinking about the holistic impact to the entire organization, or how that solution supports the vision of their organization.

Simply creating and implementing solutions (i.e., Digital Twins) without enabling the organization to standardize the affected operational processes and establishing protocols for analysis and integration of data they will be receiving, will ultimately lead to overall failure of the original intent to create significant operational improvements, and likely cost more money instead due to wasting resources towards creating something they aren't ready to use yet.

Process. People. Technology.

A staggering **70% of all Digital Transformation initiatives fail**. Most of them fail due to one or more of the following reasons:

- They haven't identified the **Correct Stakeholders** they need support from.
- They attempted to do **Too Much, Too Fast**.
- They focused on **Technology First** (or even worse, *Only Technology*).

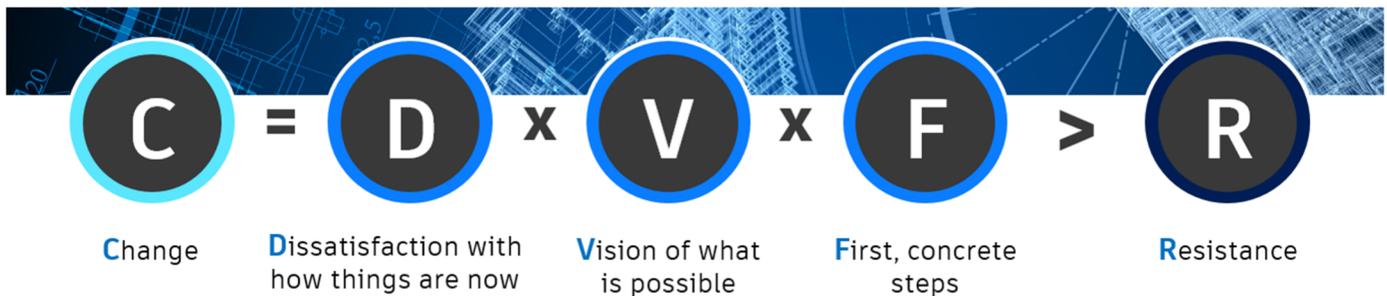
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All successful Digital Transformation initiatives will identify the Enablers, the Blockers, and the Decision Makers as Stakeholders that have the ability to impact the desired Future State. Appropriate strategies must be developed to engage all of the Stakeholders to assure transformation success. That is why a strong focus on **People and Process** is critically important before considering leveraging any Technology to drive change. It is a common pitfall to focus on Technology first and start massive implementations of software's and solutions that the organization is simply not ready for, ultimately leading to low adoption rates, tremendous waste of resources, and reverting back to the previous current state that somewhat worked.



Implementing Solutions

Any new solution inside an organization that has established ways of how they do certain things will cause significant impact and negative disruption at first. Unfortunately, most of us are creatures of habit and we don't like to change! In order for change to be successful, majority of those affected need to be **dissatisfied** with how they currently operate for one reason or another. There must be a **clear vision** of what is possible that may remedy that dissatisfaction, and they must be given manageable **first steps** towards a better future state. If the product of those three driving factors is **greater than the resistance** to change, you have a great potential for successful change implementation!

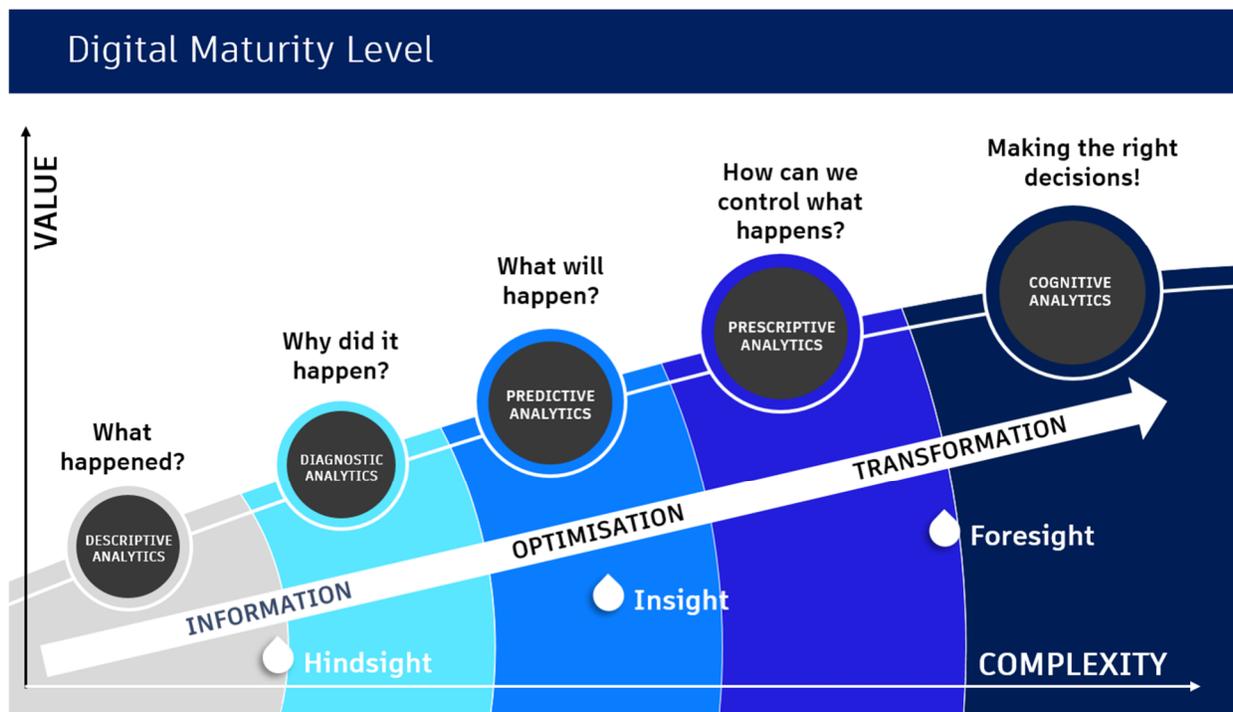


*Source: Dannemiller's formula for change

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Digital Maturity.

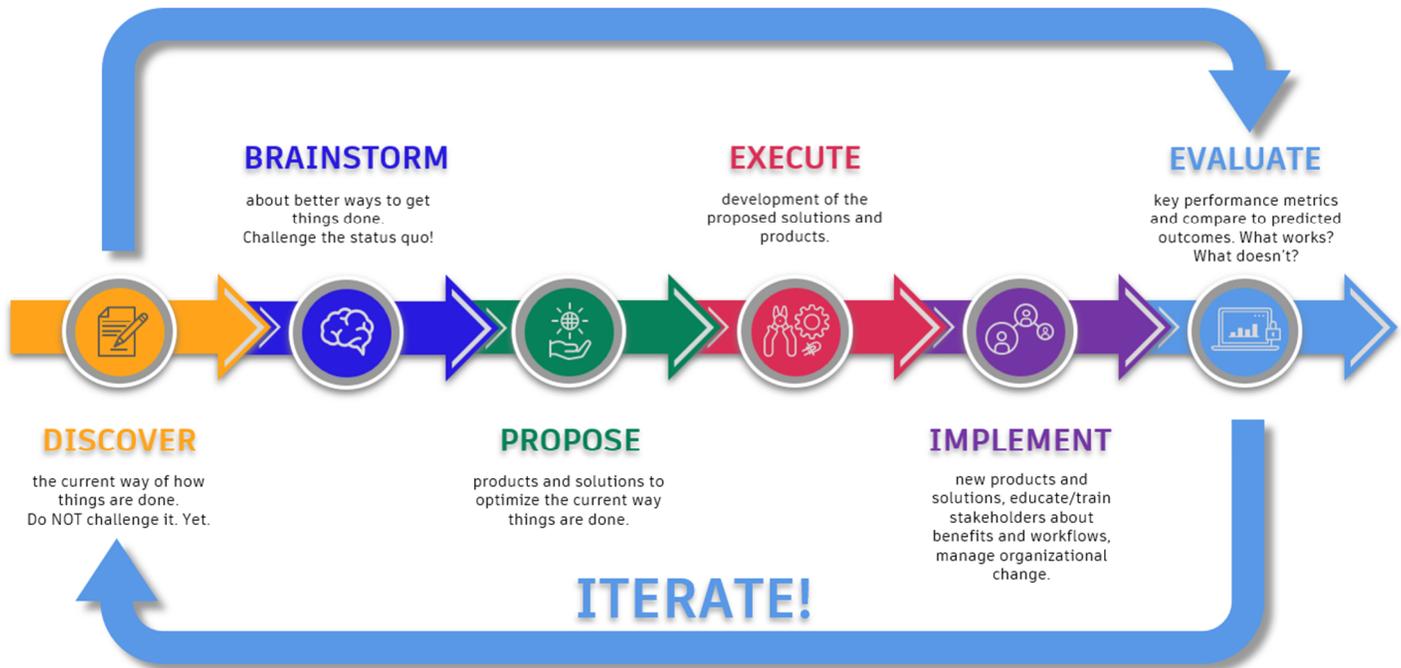
One of the first steps towards change implementation is to identify the organization's readiness to adopt change, in order to identify the **appropriate level of change** from one state to another. Common pitfall is moving too fast and attempting to skip steps along the way. A common way to assess readiness is through a **Digital Maturity Assessment** that should help in identifying current state vs. desired state and help in development of the next incremental steps of the implementation roadmap.



Change Implementation.

One of the best practices to achieve successful Change Implementation is to break down the total Scope of Work into small, clear & **manageable tasks** that support the overall Digital Transformation when combined. After identifying the current state and the incremental future state of one of those tasks, the Change Implementation process can begin. This should ideally be an iterative Sprint process in which the key stakeholders are first **discovering** how they currently operate, then **brainstorming** better ways to do it, **proposing, executing & implementing** incremental solutions, followed by **evaluating** whether the achieved outcomes align with their initial expectations. As this is an iterative process, the new and improved incremental state becomes the current state, subject to the exact same process until the initial expectations are met. After all tasks undergo this same process, the change implementation process should be well underway!

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Putting your Data to use

Depending on what type of organization is undergoing the Digital Transformation journey, there will be numerous different ways to leverage the solutions implemented. At the very core, solutions should provide uniform and centralized access to normalized data. The focus is on establishing a clear Common Data Environment and using Standard Tools and Workflows to achieve whichever goals are imperative to the organization. Some of those goals may be accessing and visualizing the right data at the right time for the right reason. Others may entail simulating different scenarios, informing optimal ways to do something, or having real-time access to monitor and modify critical assets.

Regardless of what those success goals are, it is critical to predefine KPI's that define success, then develop ways to gather & analyze performance data to evaluate them. Based on the data gathered, you should be able to not only inform your future actions, but also predict and prescribe the desired outcomes that will drive your actions, as well as develop improvements based on those potential outcomes!

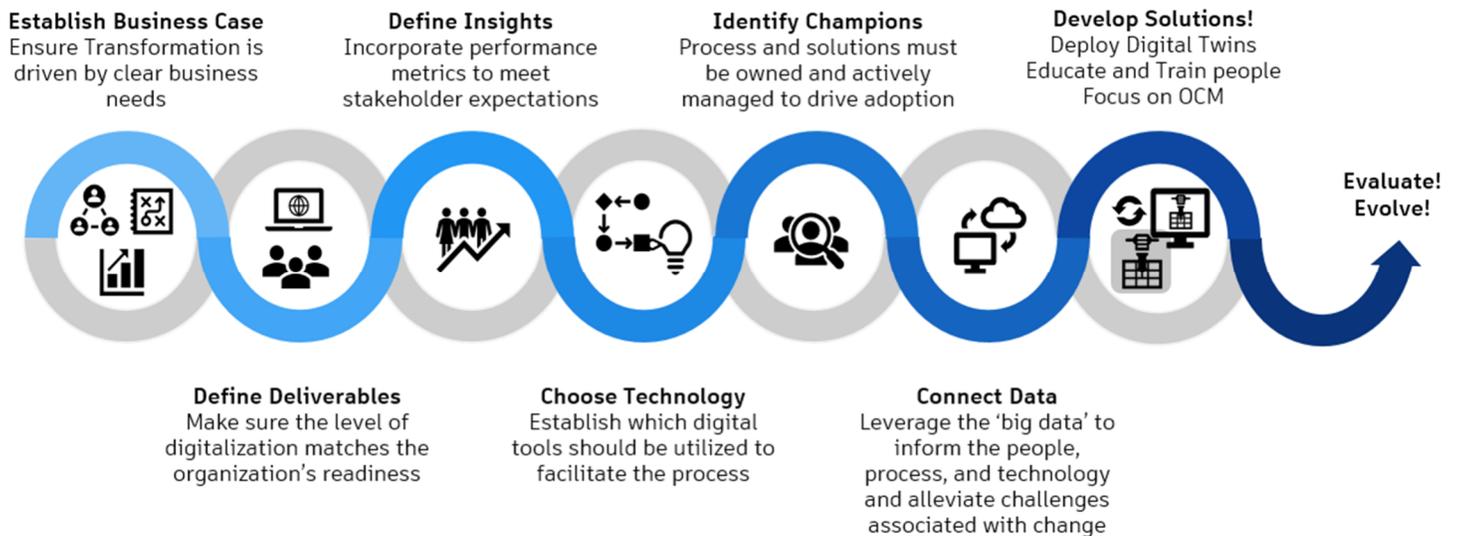
Platform vs. Product.

Transformative solutions will almost always offer more than one opportunity to leverage the same centralized subset of data. Consider an iPhone. What if it only had the built-in applications that Apple decided we need? - It would be just another cell phone! But because it has access to the App Store, the Value of the iPhone exponentially increased! It is a Platform, not just a Product. The common data environment and solutions you are proposing should be connected and capable of being leveraged for a number of different use cases, and by various types of end-users centered around your organization. Only then are those solutions going to provide the most current and future value to your organization, and be worthy of undergoing the difficult change implementation and management process described above.

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Closing Thoughts

In summary, a successful **Digital Transformation Journey** is a complex activity that requires an appropriate mix of strategy, planning, resources, patience, support, education, and discipline. Failure to identify the correct blend of those requirements or skip important steps along the journey will inevitably lead to catastrophic failure and wasted resources, which has the potential to damage an organization beyond recovery. In contrast, a successful journey will yield a new and improved future state of a flourishing agile organization that is well on their way to establishing itself as a leader in their market, attracting new talent and expertise, and disrupting the industry with their transformed take on the business they used be in.



The benefits of success most certainly outweigh the fear of failure. We have a responsibility to **Challenge** what we do today and **Reinvent** better ways to do it tomorrow. We can't keep accepting the status quo because of fear of failure! We know we can do better, and we should **Lead** the way towards the Art of the Possible and **Enable** future value far beyond what we can achieve today!