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REVOLUTIONIZE YOUR PROCESS

Beyond Integration:
A Solutions Approach to Industry 4.0

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THE ASSEMBLY SHOW SOUTH

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Overview

Remove Industry 4.0 implementation anxiety and sprint to return on your investments with a new process and a strategic partner.

Joel’s Background

- 20+ Years working with Manufacturing leaders to improve Operations
- Senior Level Engineering and Operations Leader
- Operational Technology Development and Implementation
- Responsible for specifying lots of capital
- Product Development
- Educator and speaker

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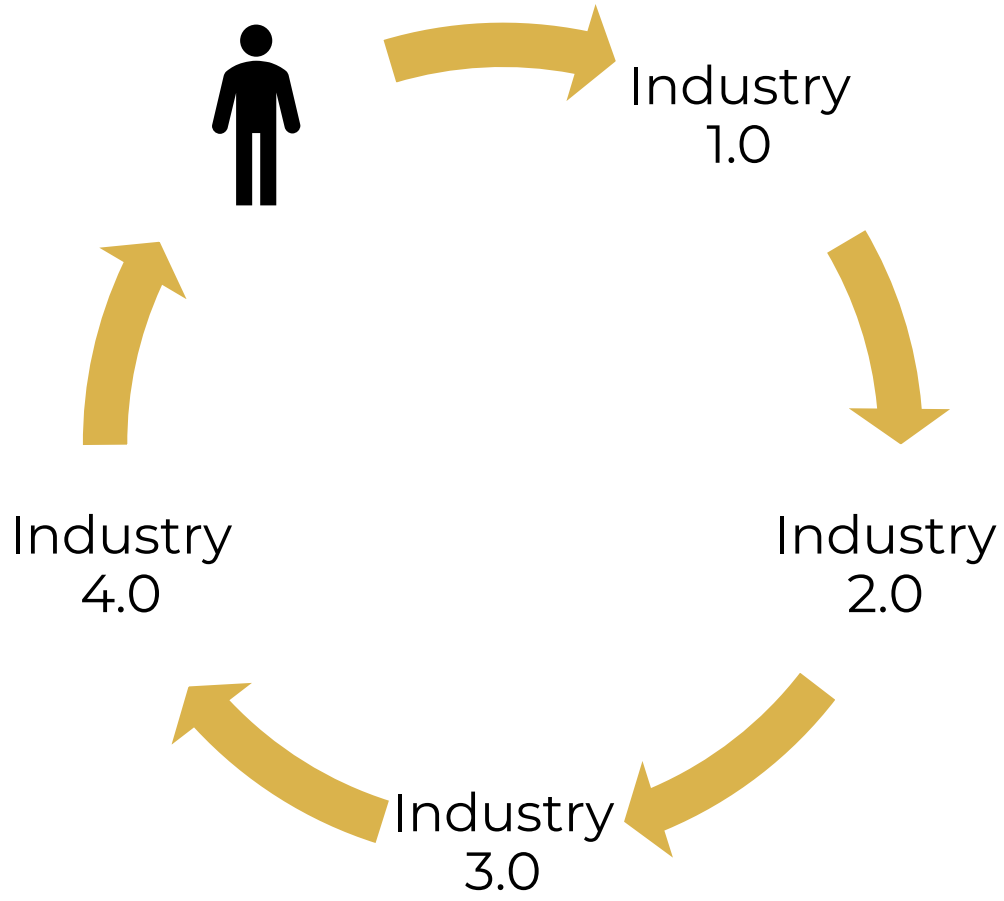
What is Industry 4.0?

and how is it Different?

What is Industry 4.0 and how is it Different?

- Industry was once entirely human based, and it is coming full circle.
- With Industry 4, focusing on enhancement of human ability and performance is the best strategy.



What is Industry 4.0 and how is it Different?

- Lots of discourse about how to differentiate Industry 3.0 vs 4.0:
  - Cyber-physical systems (intelligent computers able to control themselves)
  - Cloud Computing
  - Machine Learning
  - IIoT
- I offer a simplified version:
  - Data availability is prioritized and is readily accessible to gain insights
    - Insights may be made and presented by the machines themselves
  - Manifestation as opposed to digitization
    - In Industry 3 we digitized the physical world. In Industry 4 we work in a hybrid metaphysical world and can create real things from it.

What is Industry 4.0 and how is it Different?

- Industry 4 is different because it's not people working to automate things that other people would have done.
  - This change is a very human-centric thing. Industry 3 focused on removing routine tasks from our productivity chain and making it possible to do certain things.
  - Industry 4 focuses on improving the ENTIRE productivity chain for the benefit of users and their customers.
    - Allowing people to spend their time thinking about the things that truly matter.
    - Enabling computers to help us find those things on their own.
    - Making data extensible and usable between people and systems.
  - The systems are often self-contained and far more granular.
    - ***This enables a new approach***

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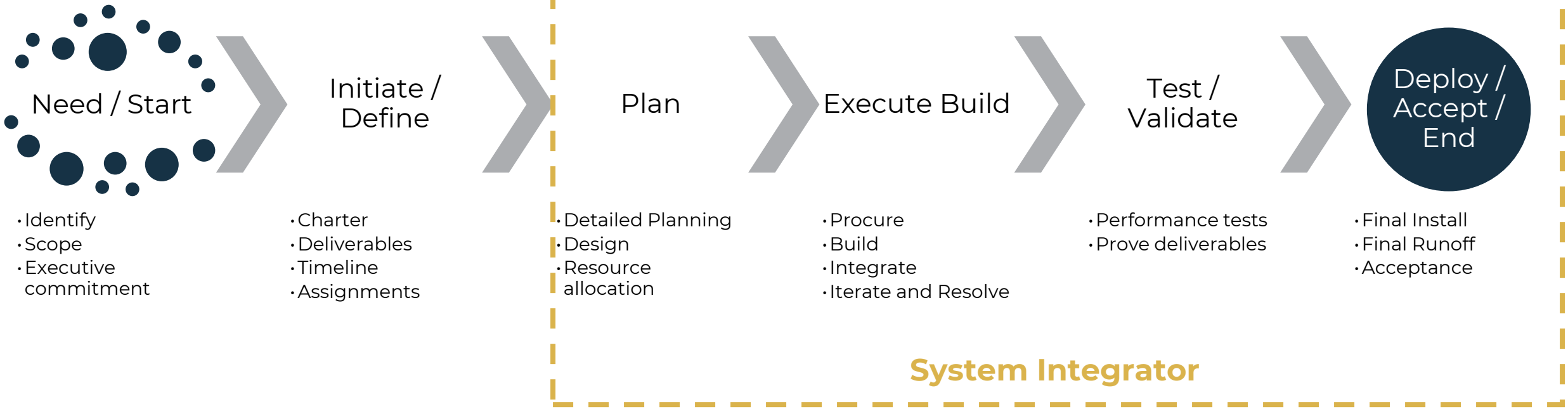
Successful Implementations

Take a different path

Industry 3.0 projects were process based

- A manufacturer identified a process they wanted to automate
- As the subject matter experts, they drafted a requirements set based on:
  - Capabilities
  - Cost
  - Performance
  - Etc.
- They bid this as a project with several vendors, usually system integrators
- They selected the best proposal
- They worked through a long, expensive, complicated project before anything materialized

Traditional Integration Project



Industry 4.0 projects can be more solutions based

- Products are more modular, self-contained, and cross-compatible enabling you to identify an end goal
  - % improvement
  - A new capability or capability baseline
  - A new level of productivity
  - Just having enough labor…
- Then you may solve for that goal and move to the next improvement or iterative cycle
  - Just like you may hire a new employee with specific skills or more employees with relevant skills.
  - Much like Continuous Improvement, this solutions-oriented approach is ***Continuous Integration***.

Industry 4.0 and the MVP Solution

- Agile uses this Continuous Integration concept to perpetually improve hardware and software in development. It's a tech-forward version of Continuous Improvement.
- Industry 4 technology enables this approach in manufacturing solutions deployment.
- We're going to borrow the concept of Minimum Viable Product (MVP) from Agile, then use Continuous Improvement from Lean to successfully implement Industry 4 projects quickly.

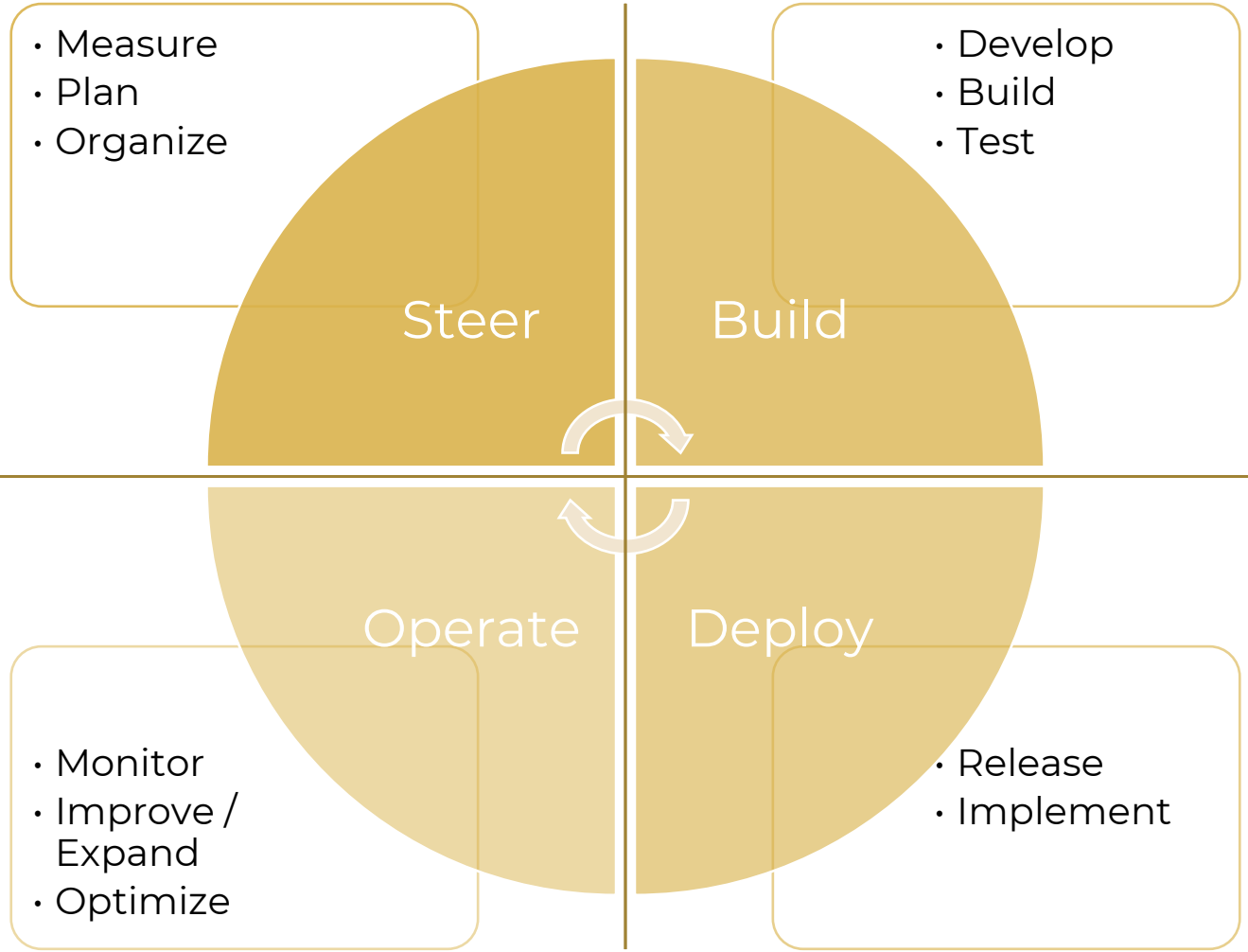
Industry 4.0 and the MVP Solution

- Think about all the users that will interact with the solution. In Agile, these would be personas.
- Think about the user stories for these personas:
  - As an Operator:
    - I need to know how to assemble this part without a paper Work Instruction
    - I need to assemble this quickly and easily without making errors
  - As an Engineer:
    - I need an efficient process to create Work Instructions
    - I need an efficient process to maintain Work Instructions.
- Once you have a good idea what these are, review those specific goals we discussed earlier and collect the minimum performance requirements to reach them (and get your capability or ROI)

Industry 4.0 and the MVP Solution

- The MVP will be a solution that satisfies your users needs and allows you to get to the next level and realize your ROI or new capability.
  - An MVP can exceed basic needs. You can still hit a home run; you just don't have to.
  - The MVP must be expandable and extensible. It can be significantly replaced to make an improvement, but the foundational work and elements of the solution should endure.
- You will likely come up with features and user stories along the way that are "nice to haves". These are important. They drive that next level of improvement.
  - The next level of performance, ROI, or capability.
  - Part of your Continuous Improvement and Continuous Integration process.
  - Part of your cost savings and Operational Excellence program.

Continuous Integration Project



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Finding a solution with your Strategic Partner

An Example of putting this into practice:

- We have a customer with an existing AGV system that delivers large transmission housings to their assembly cells.
  - This was a traditional Integration project that took a long time to implement
  - The isn't working well and replacing the AGV requires replacing hardware and software
  - It's not interconnected today
  - Monitoring and repair is manual and intensive
  - The physical conveyor infrastructure is working well
- This has never worked well but the investment was high, and the replacement was also assumed to be too challenging.

An Example of putting this into practice:

- Instead of starting a traditional integration project to replace the system, they asked us to help.
- We walked the line and followed the existing process.
  - We understood the users as operators and logistics
- We identified the MVP as a working Autonomous Mobile Robot to replace the AGV
  - With the measure of success and ROI based on uptime and labor reduction
- We proposed an extensible technology stack that:
  - Leveraged the existing infrastructure
  - Connected those systems
  - Provided a reliable, autonomous delivery mechanism (the AMR)
  - Replaced 3 proprietary pieces of software with extensible, connected software
  - Builds a foundation that will allow for rapid solution deployment in other areas

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The people who make this possible are at Booth 115

Come introduce yourself!

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Thank you!

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