The Evolution of a Digital Factory

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About the speakers

**Sanjeev Ghosh**

A mechanical engineer by training, Sanjeev has an experience in design in manufacturing packaging products for FMCG, Agro Chemicals, Healthcare and Lubricant industry functions. At Autodesk, Sanjeev is member of the Technical Specialists team and supports sales efforts with MMA and D&M territory customers.

**Veera Pandian**

Senior Technical Specialist at Autodesk for India & SAARC countries with 20 years of experience in the Manufacturing Industry. In his current role at Autodesk, he works with Manufacturing OEMs and Vendors to assess their current Design, Engineering & Manufacturing processes and put together the right set of solutions to help them improve and implement best practices.

**Keerti Malavooru**

Keerti is a mechanical engineer graduate with 15+ years of Industry experience in design and thermal management. At Autodesk, he is responsible for the overall technical strategy to support sales effort in ensuring customer success.
A stepwise approach to creating true Digital factory. This course intends to showcase the journey right from concept to the commissioning of the factory.

**Areas covered**

- Site Planning
- Building design integration
- Factory Layout
- Coordination and Review
- Interactive Visualisation of the Digital Factory
Factory Facilities Model – Desired State

- Civil Engineering
- Land Development
- General Contractor
- Arch. Engg. Firm
- Mfg Engineering
- Systems Integration

Approach / Internal Roads

Building and Building Support Equipment

Mfg Equipment

Manufacturing Facility
The Journey

- Site Planning
- Building Model Integration
- Factory Layout
- Coordination & Review
- Interactive Visualisation

Factory Layout image courtesy - Vimek
Coordination and Installation image courtesy - Packaging Automation layout provided by Barry-Wehmiller Design Group, Inc.
The Journey

Site Planning

Building Model Integration

Factory Layout

Coordination & Review

Interactive Visualisation

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Site Planning

Why

• A Factory is not just a building and a collection of equipment. It is a facility connected to the ecosystem around it.

How

• InfraWorks® civil infrastructure conceptual design software lets AEC professionals model, analyse and visualise their design concepts within a real-world context of the built and natural environment —improving decision making and project outcomes.
• Using Infraworks we locate the area where we want to set up our factory.
The Journey

- Site Planning
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Building Design integration

Why
- Building model needs to be referenced for custom manufacturing of building components
  - chimneys, railings, staircases, awnings, etc
- Enables integrated, connected and configurable design elements

How
- Reference Revit Project files into Inventor through AnyCAD
- 3D views created within Autodesk® Revit® models can be used for import into Inventor.
- Users can use these views to filter out non-essential data.
- Ensures the mechanical design can be built in-context and reference a common building origin.
- AnyCAD for Revit enables changes made in Revit model to update inside of Inventor
The Journey

Site Planning

Building Model integration

Factory Layout

Coordination & Review

Interactive Visualisation

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Factory Layout

Why

• Easy communication of layout concepts
• Avoid common factory line change issues
• Ability to respond quickly to changing customer requirements
• Existing technologies are Discrete

How

• Leverage Smart Assets rich with metadata
• Reference Revit Building model for Factory Layout
• Easy drag and drop placement of factory components on the factory floor
• Convert 2D layouts into 3D layouts with a single click
  o Ensure form & fit
  o Sync Inventor - Interoperable 2D-3D layout workflows with 1:1 bidirectional associativity
The Journey

Site Planning

Building Model integration

Factory Layout

Coordination & Review

Interactive Visualisation

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Coordination & Review

Why
- Enable efficient Collaboration and Communication across various stakeholders
- Robust Design review of the Factory
- Detect clashes and collisions before project starts
- Pre-construction planning and sequencing

How
- Integrate equipment, production line layouts, building designs, and reality capture data as a single database of project information.
- Real-time navigation
- Review & Clash management
- Construction Planning
The Journey

Site Planning → Building Model integration → Factory Layout → Coordination & Review → Interactive Visualisation

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Interactive Visualisation

Why

• Design review in an immersive environment with life-size elements giving an opportunity to interact with the factory before it is built.

How

• Leverage data from multiple sources such as REVIT, INVENTOR and also 3rd party formats in 3DS Max Interactive.
• 3DS Max Interactive allows you to create output where you can interact with the factory similar to a video game.
• Use the same output for an immersive Virtual Reality experience.
Summary

Site Planning

Building Model Integration

Factory Layout

Coordination & Review

Interactive Visualisation

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