

**MICHIGAN STATE**  

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**U N I V E R S I T Y**

**Project Plan**  
**2020 Business in a Box**  
**The Capstone Experience**

**Team DRIVEN-4**

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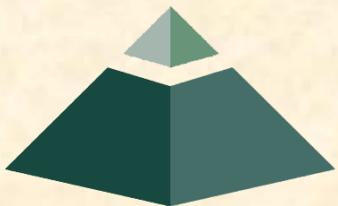
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*From Students...*  
*...to Professionals*

# Functional Specifications

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- Showcase for future IoT-driven business environment
- Create a use case for product that contains an accelerometer and is connected through Wi-Fi
- Show manufacturing process for creating the product
- Visualize product service using AR technology
- Visualize product and its parts for engineers



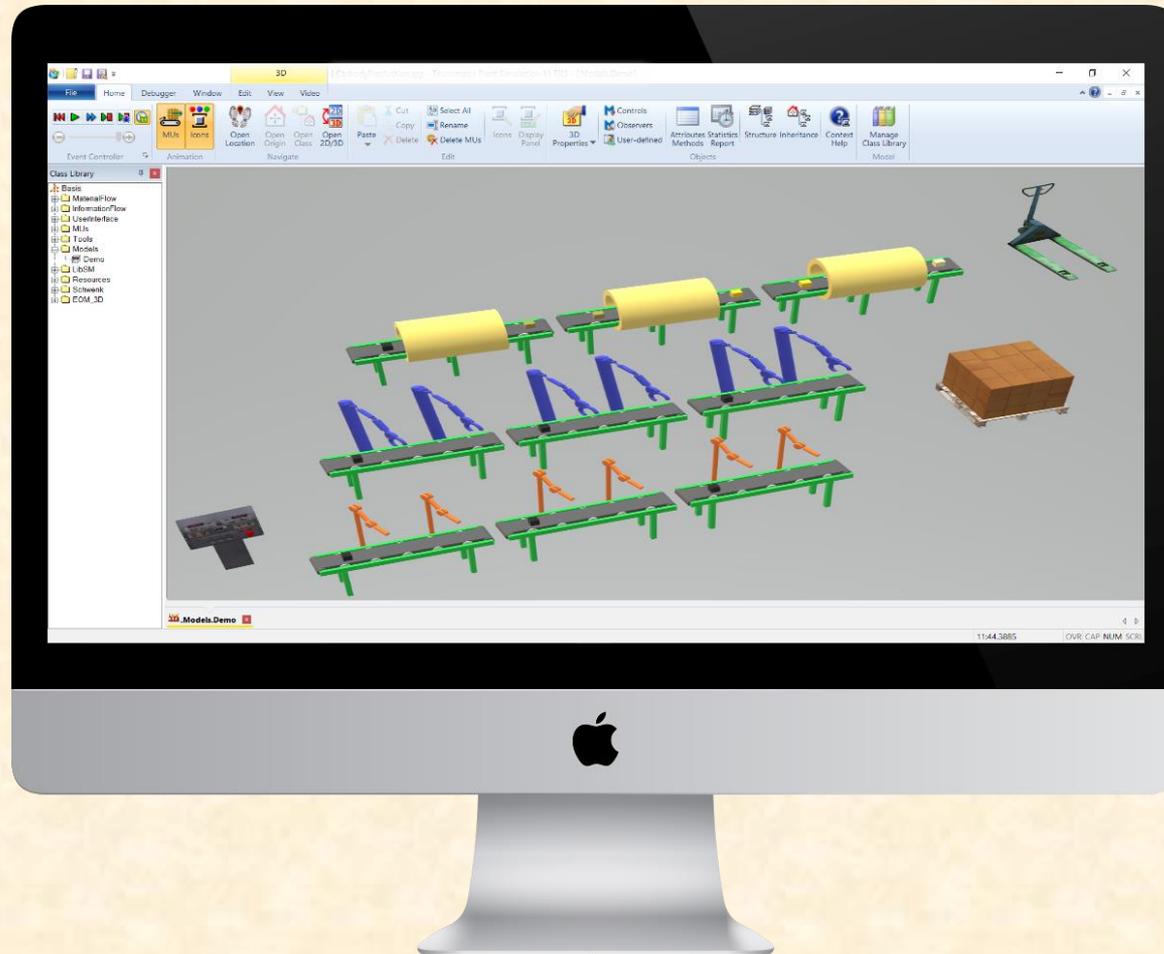
# Design Specifications

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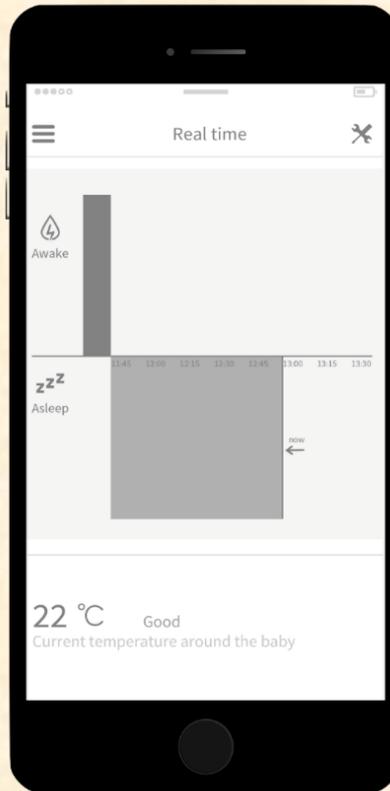
- Connect Devices via IoT Technologies
- Develop Visualizations Using ThingWorx
- Design the Product Using CREO & NX
- Factory Simulation
- Develop Use Case: Baby Sleep Cycle Monitor
- iOS Application



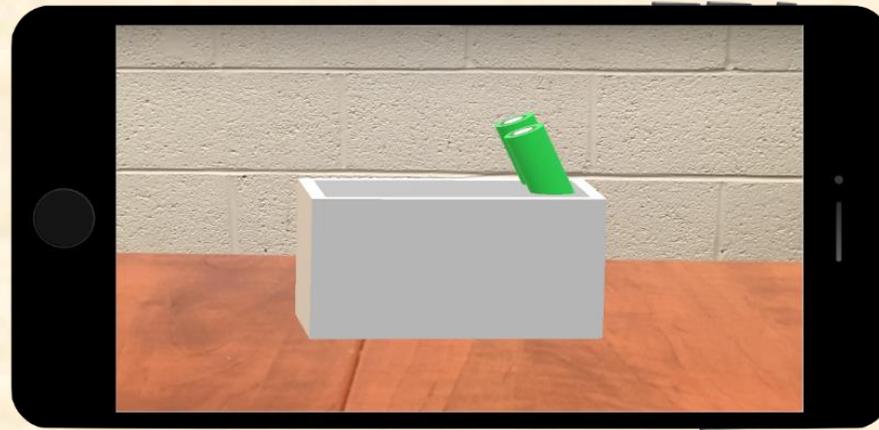
# Screen Mockup: Manufacturing



# Screen Mockup: Mobile Application



# Screen Mockup: AR Service



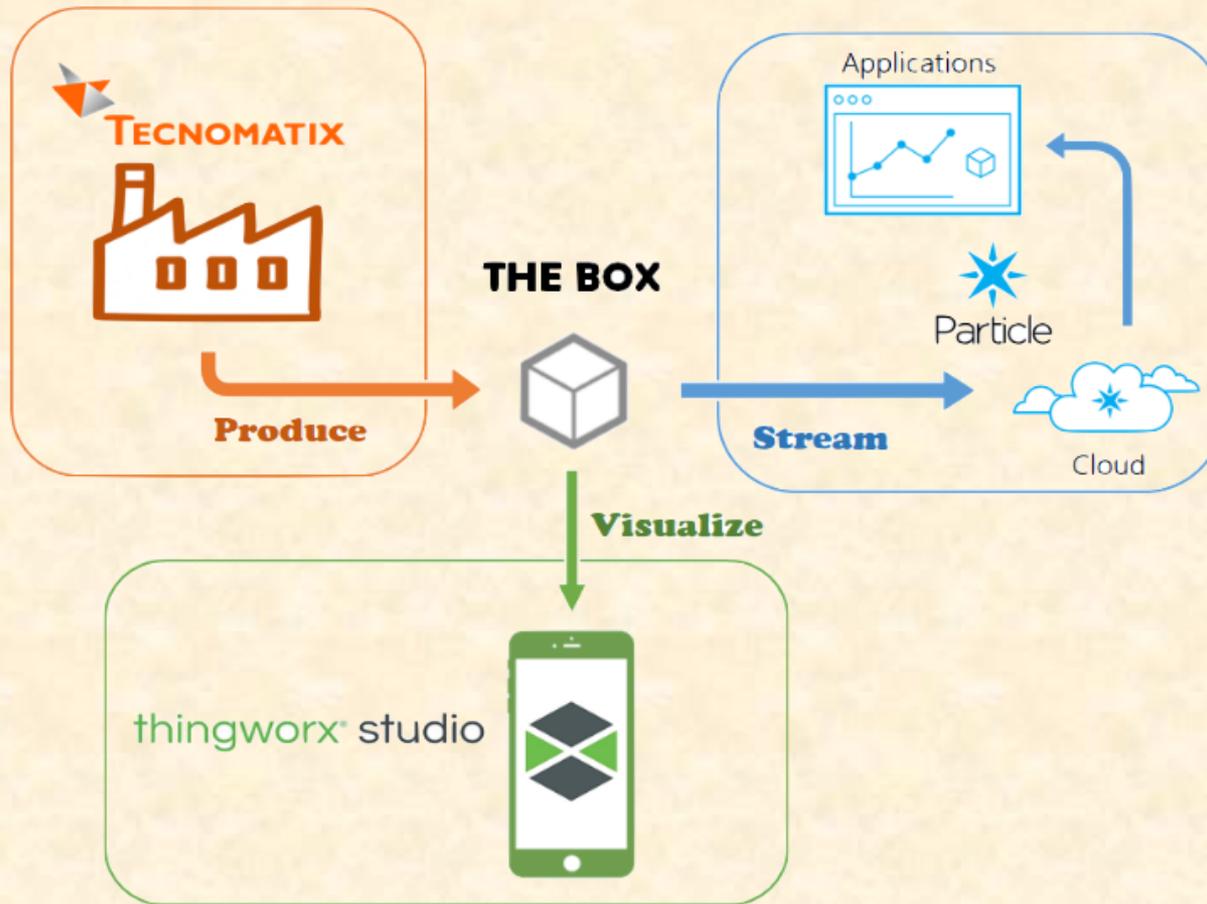
# Technical Specifications

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- **ThingWorx** – Manufacturing & IoT Visualization
- **CREO & NX** – Physical Product Design
- **Photon** – IoT Hardware
- **Accelerometer** – Temperature Detection & Motion Detection
- **Tecnomatix** – Manufacturing Design & Simulation



# System Architecture



# System Components

- Hardware Platforms
  - Photon
  - Accelerometer
- Software Platforms / Technologies
  - ThingWorx 8
  - ThingWorx Studio
  - NX & CREO
  - Tecnomatix
  - Particle Cloud



# Risks

- **Incorporation of ThingWorx AR with iOS App**
  - Cannot ask users to download ThingWorx and a mobile application, would hurt user experience.
  - Mitigation: Research and test ThingWorx and ARKit integration.
- **Sensor Data Calibration**
  - Determination of notable thresholds to analyze human sleep patterns.
  - Mitigation: Determine sensor sensitivity to reduce false positives and accurately interpret collected data.
- **Time Management**
  - Several time-intensive sections, cannot spend too much time on mobile application since visualizations are the core aspect of project.
  - Mitigation: Achieve minimum viable product for application, add more functionalities as necessary. Focus on IoT connectivity.
- **Single & Multiple User Device Registration**
  - Users must be able to register multiple boxes in multiple beds, and we need to sync all data from mobile app.
  - Mitigation: Test multiple scenarios for user-to-box registration. After testing iterations, additional user inputs added to the setup process on application.



# Questions?

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