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**Dynamic Solutions. Precise Results.**

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# Model-Based Design Approach

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Automotive Summit 2017  
21 June 17

# #NO 1. Computer Software Solutions

The Language Technical Computing in Southeast Asia.

At **TechSource**, we empower the engineering and **R&D** community. More than **1 million engineers and scientists worldwide** rely on the **MATLAB® & SIMULINK®**

**MATLAB® & SIMULINK®** are the tools of the inspiration and innovation used at more than **5,000 universities worldwide.**

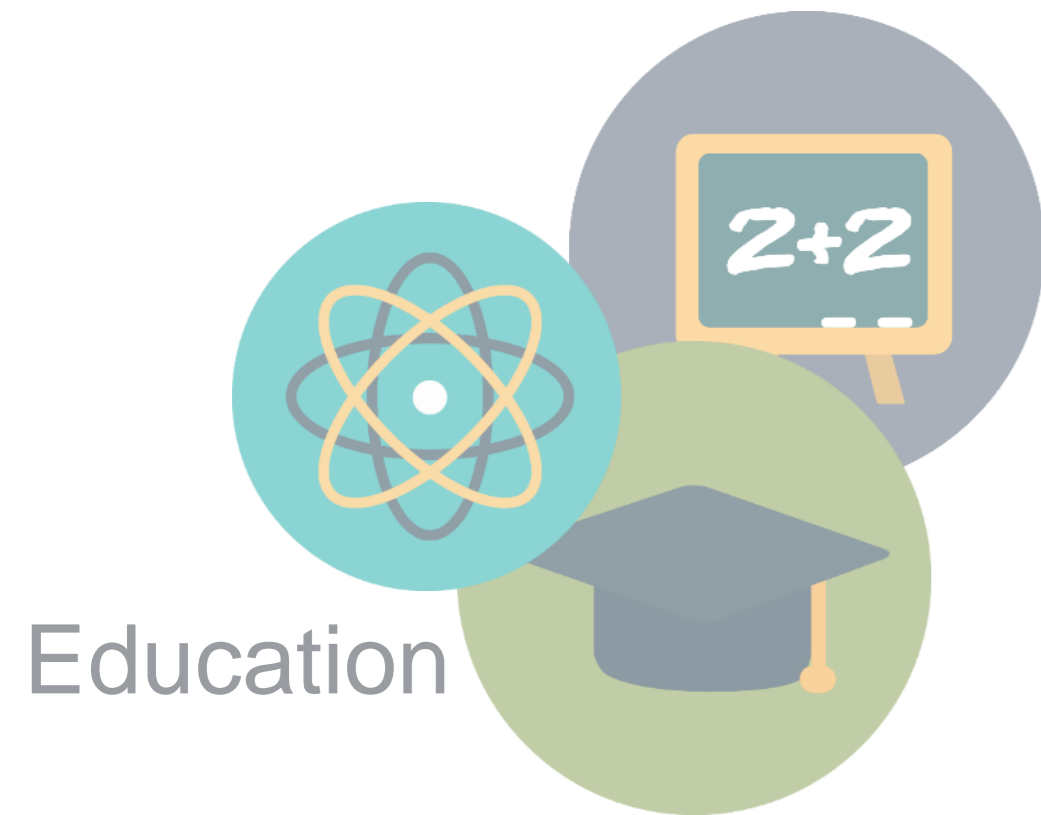
To continue adding support to our customers especially in the area of development of embedded systems for the automotive industry, we have established a partnership with **ETAS** to be their exclusive distributor covering ASEAN and Australia.

**ETAS** excel in providing innovative solutions that drive the development of embedded systems for the Automotive industry and related sectors. **ETAS** offers a comprehensive portfolio of integrated tools and solutions as well as engineering services, consulting, training, and support.

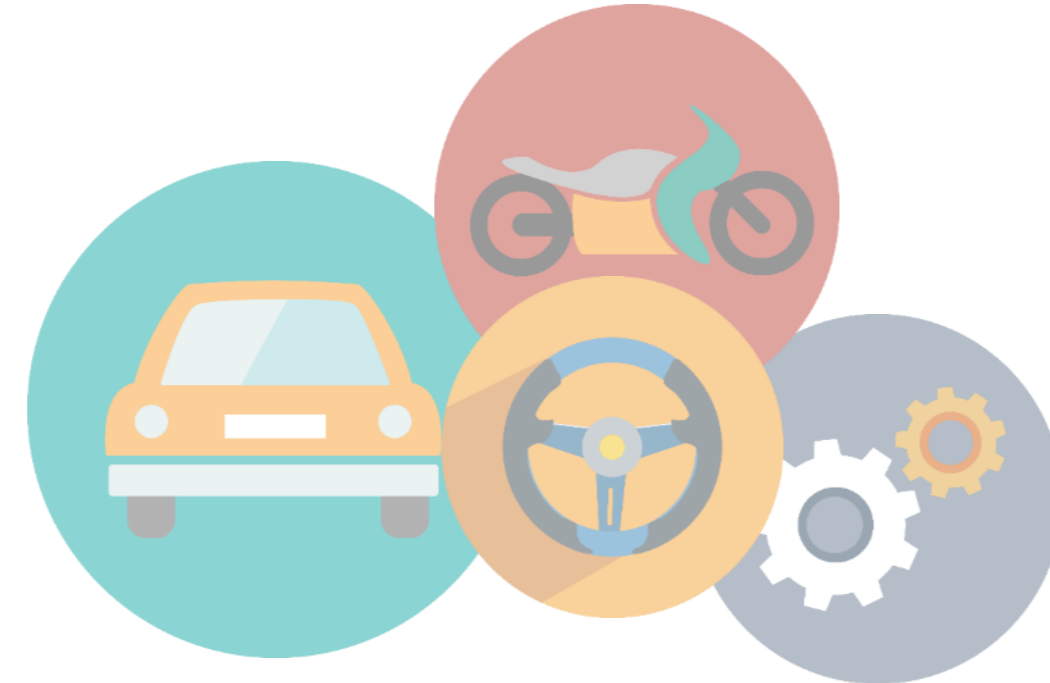


# OUR PRODUCTS

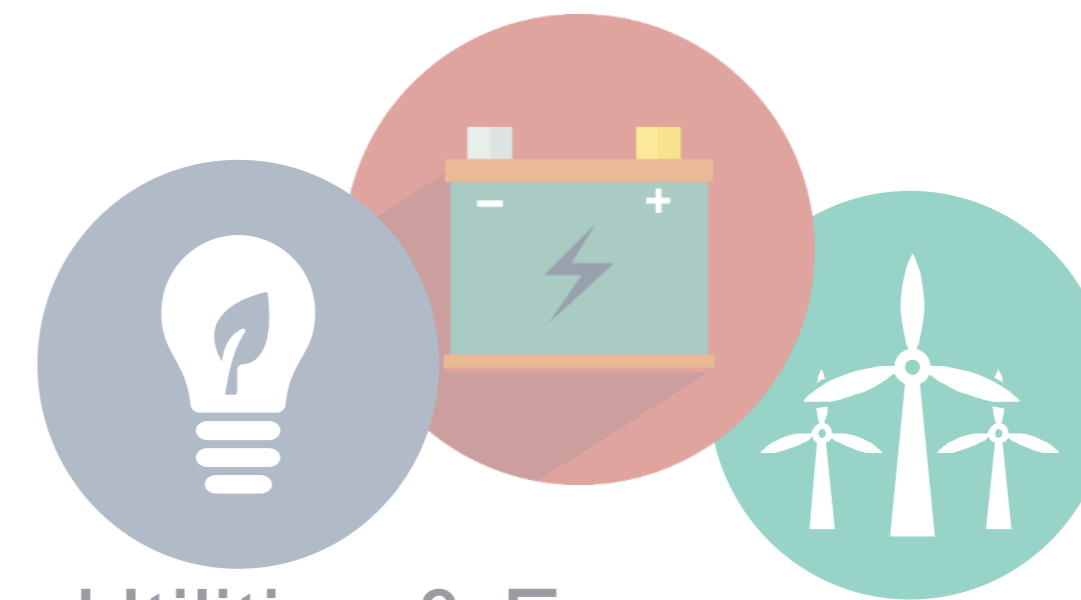
Distributor with close support (Consult, Training, On-site)



Education



Automotive



Utilities & Energy



Government

# ETAS



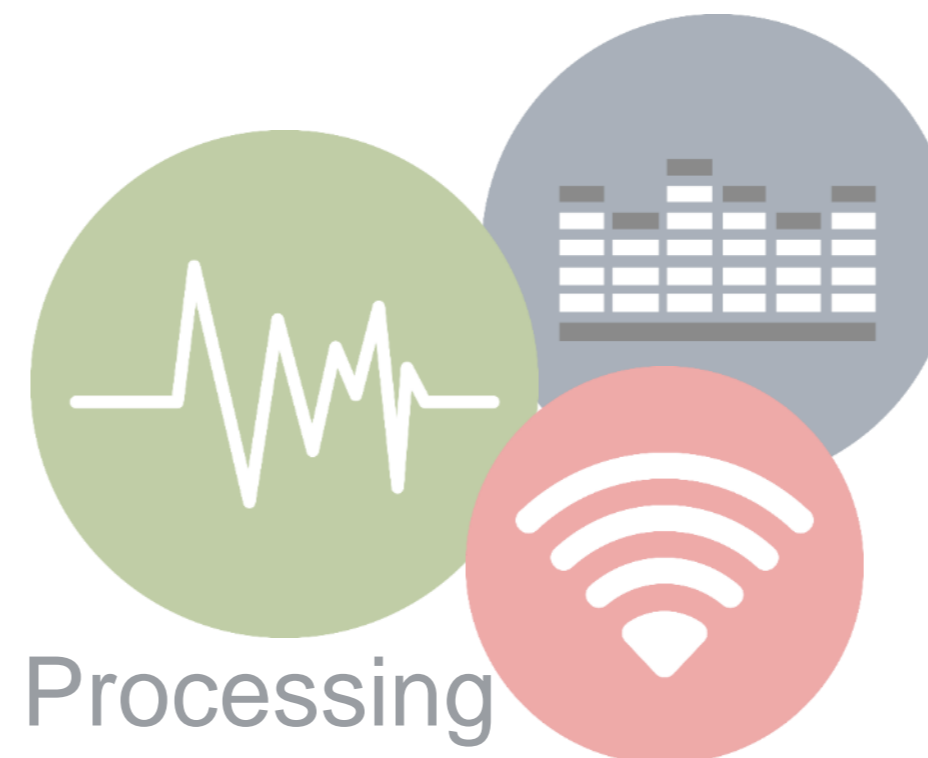
MATLAB<sup>®</sup>  
& SIMULINK<sup>®</sup>



Finance  
& Economics



Aerospace  
and Defense



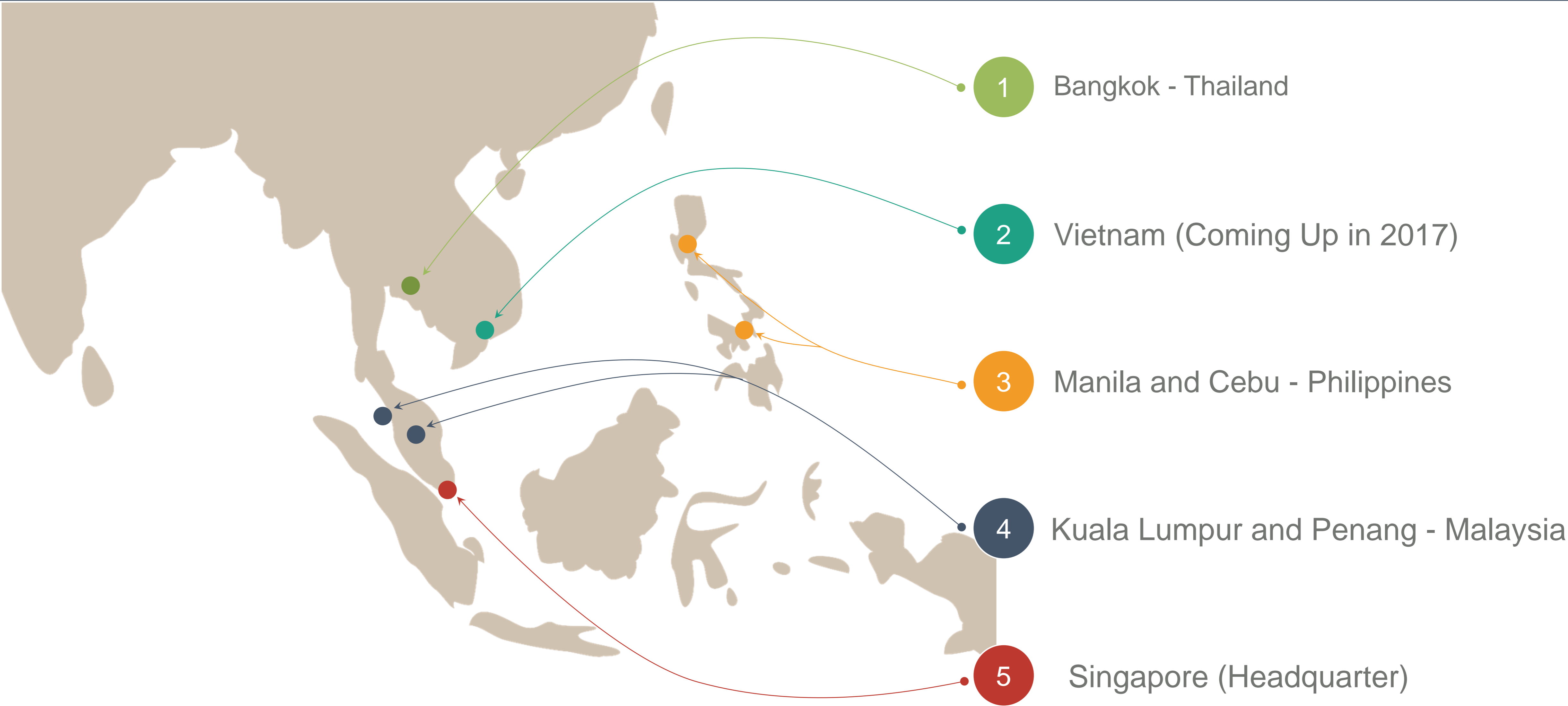
Signal Processing  
& Communications



Control &  
Instrumentation

# OUR TEAM

Our regional team - Southeast Asia & Pacific





# Model-Based Design Approach

Faster step from idea to product



## Kenneth Koh

Chief Executive Officer  
Techsource Systems Pte Ltd.

## Agenda

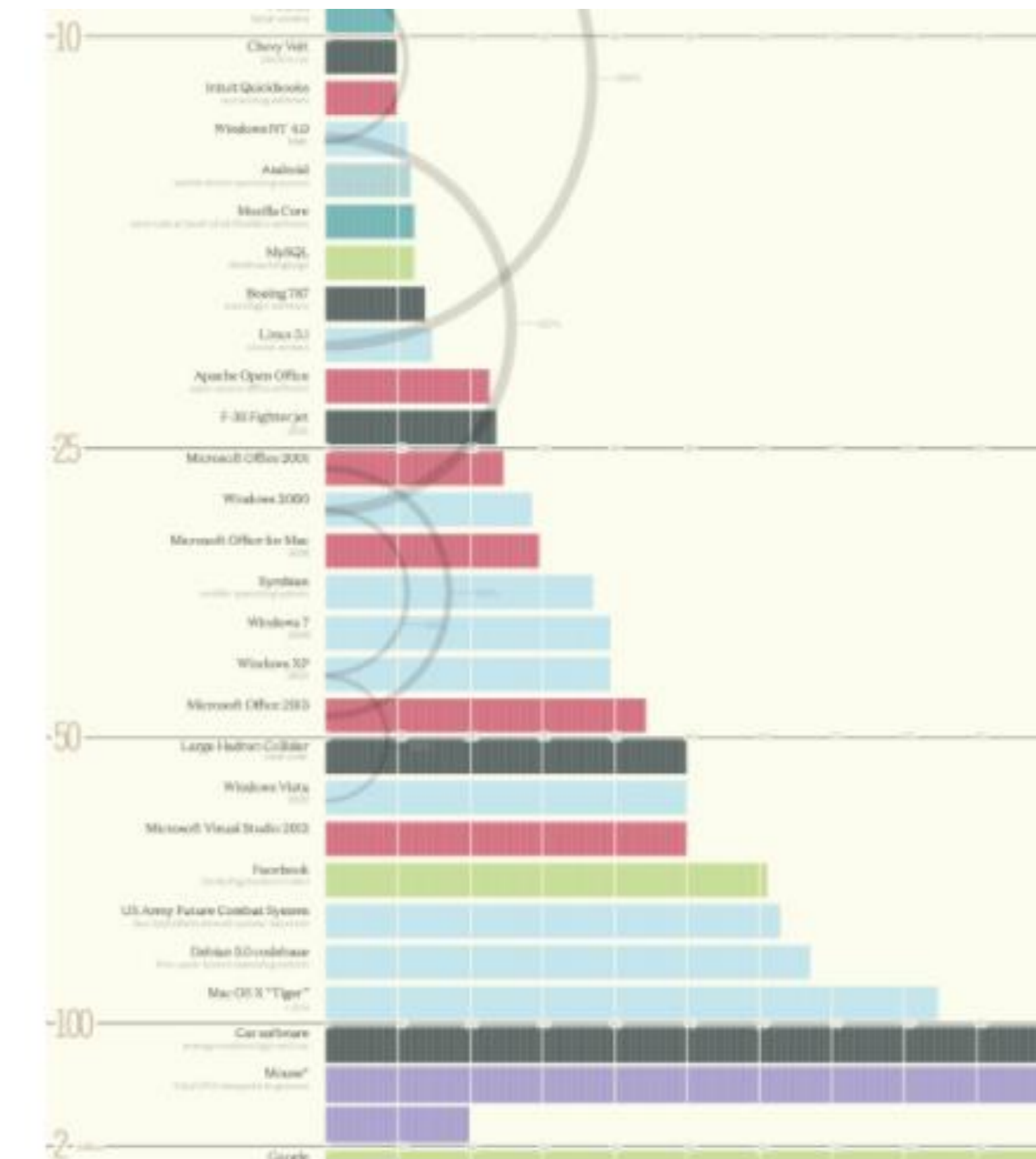
- Managing Change, Complexity, and Innovation
- Inside Model-Based Design (MBD)
- Improving Methodology with MBD
- Creating and Managing Knowledge
- Managing the Shift to MBD



# Model-Based Design Approach

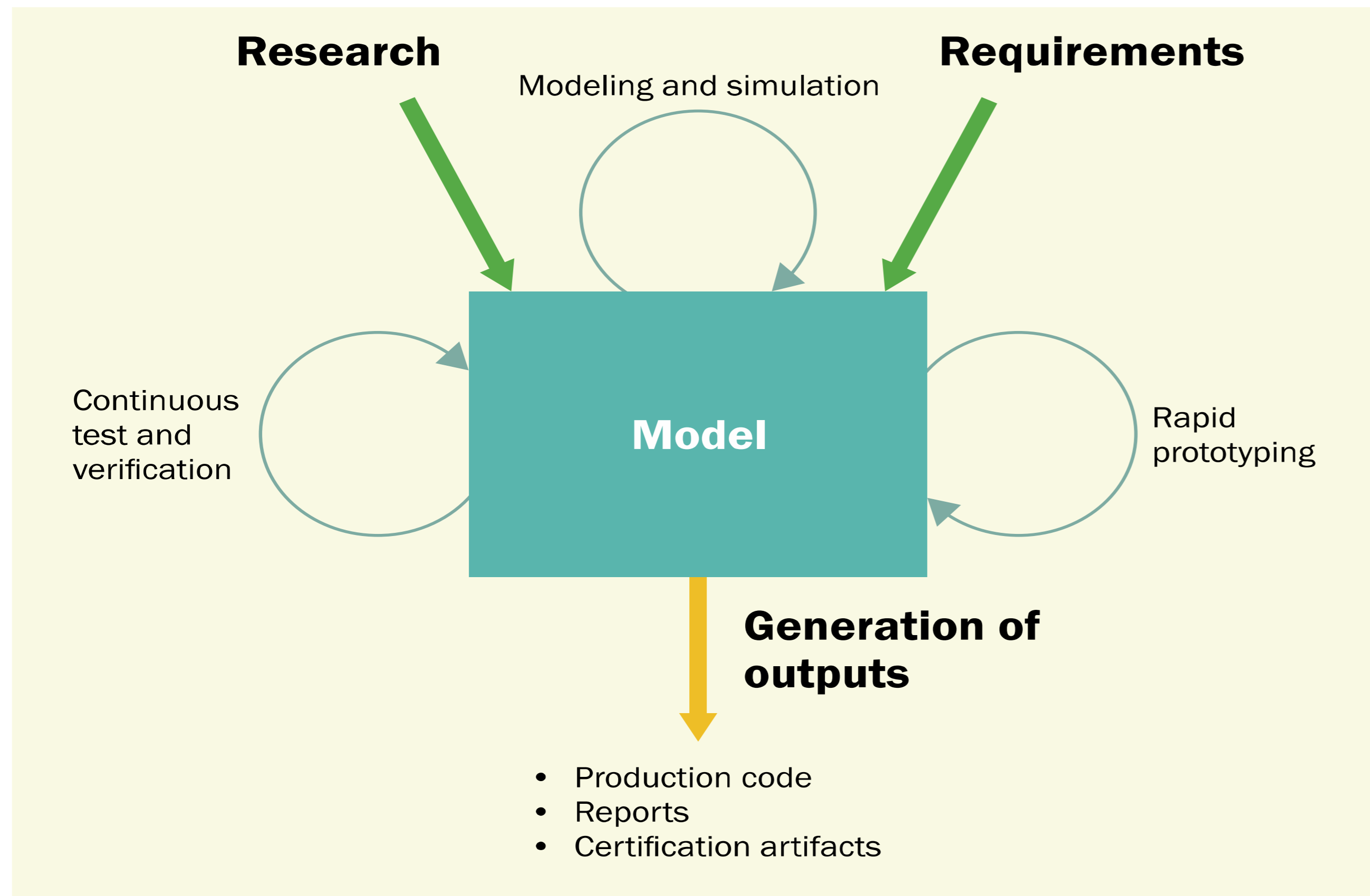
The Solution for Innovation Development

## Managing Change, Complexity, and Innovation





## Inside Model-Based Design



*An overview of Model-Based Design can be describe by eight core concepts.*

- Executable specification
- System-level simulation
- What-if analysis
- Model elaboration
- Virtual prototyping
- Continuous test and verification
- Automation
- Knowledge capture and management



## Inside Model-Based Design

### Executable specification

- Includes more information than a text document.
- Models are unambiguous

### System-level simulation

- Investigating system performance and component interactions.
- Investigated early
- Simulations are safe

### What-if analysis

- Quickly explore and evaluate multiple design ideas

### Model elaboration

- Iterative process that uses simulation to turn a low-fidelity system model into a high-fidelity implementation.

*An overview of Model-Based Design can be described by eight core concepts.*

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## Inside Model-Based Design

### Virtual Prototyping

- uses simulation to validate a design before hardware is available.
- Save development time

### Continuous test and verification

- The practice of simulating a design at every stage of development.
- It is used to identify faults as soon as they are introduced into the design

### Automation

- the practice of using scripts and tools to perform repetitive tasks or tasks that are error-prone when performed manually

### Knowledge capture and management

- Models become a common language for the transfer of information within teams and with customers and suppliers

*An overview of Model-Based Design can be describe by eight core concepts.*

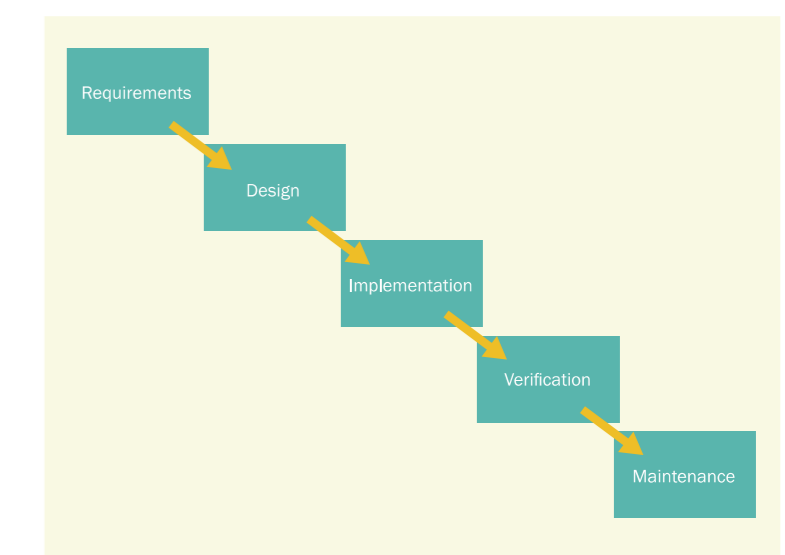
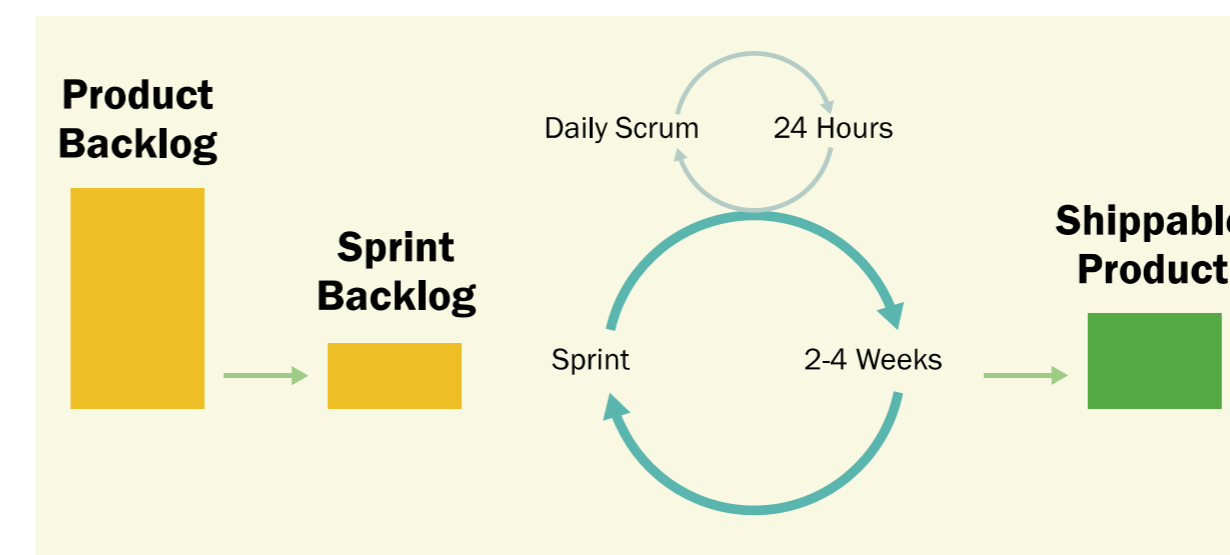
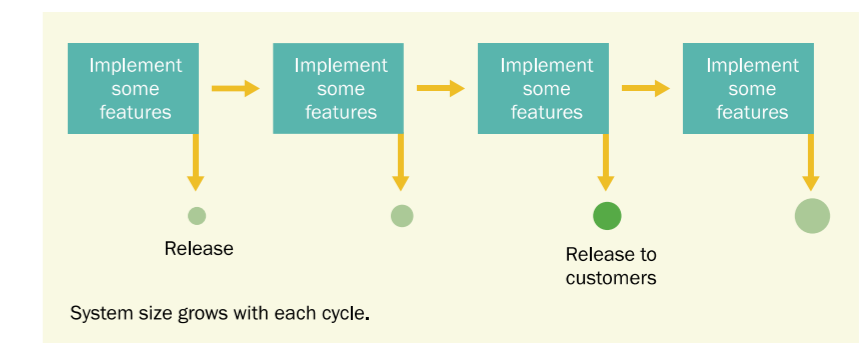
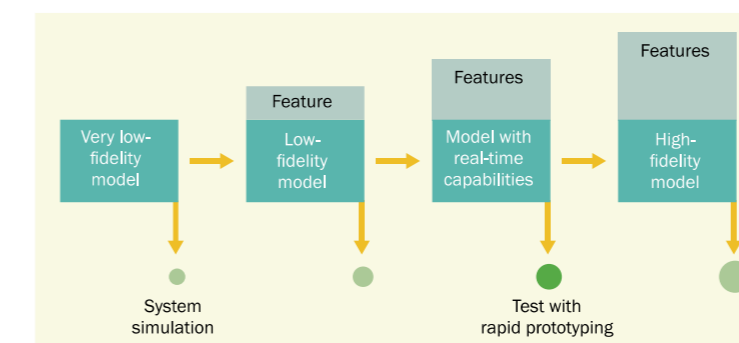
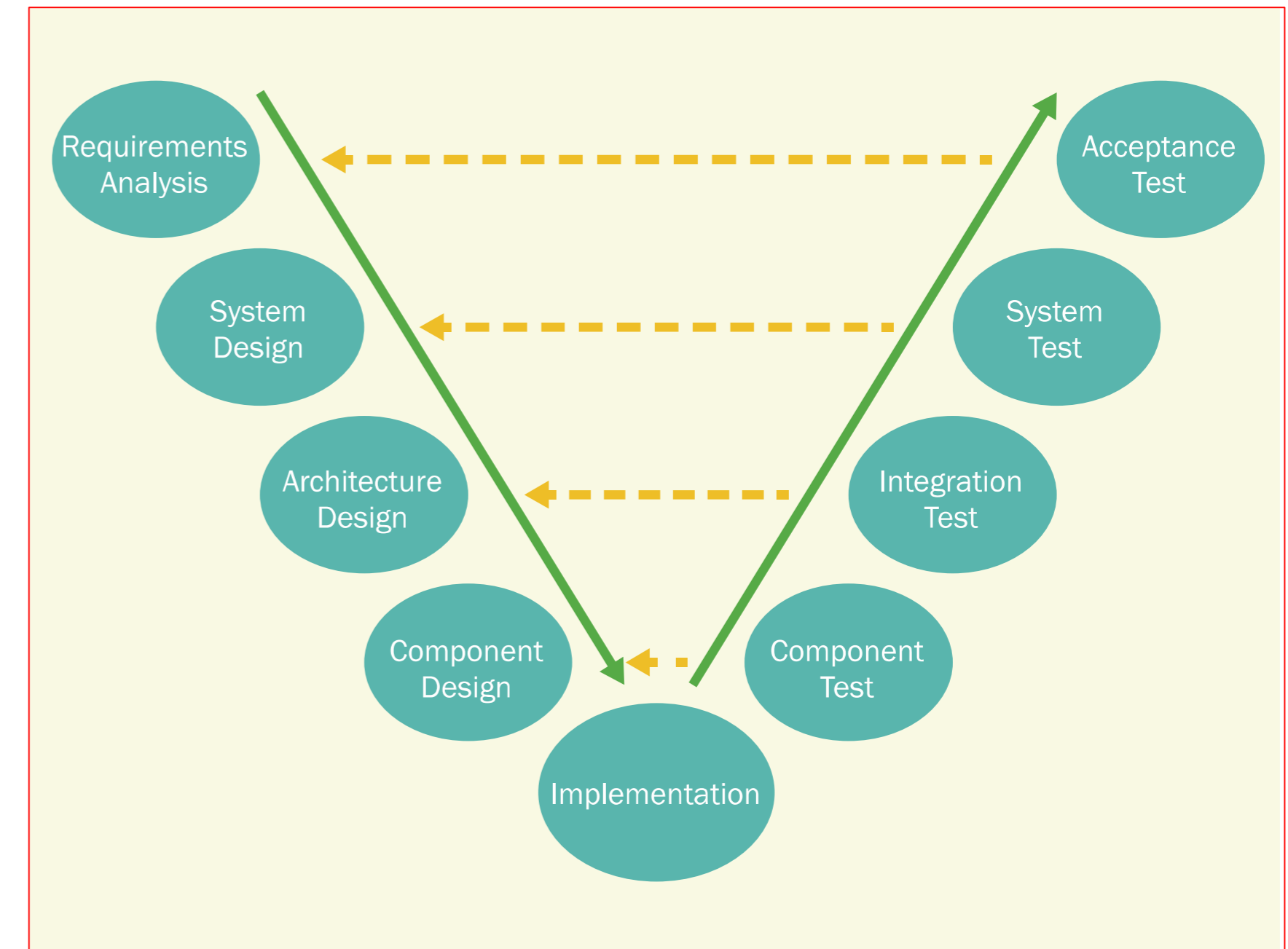
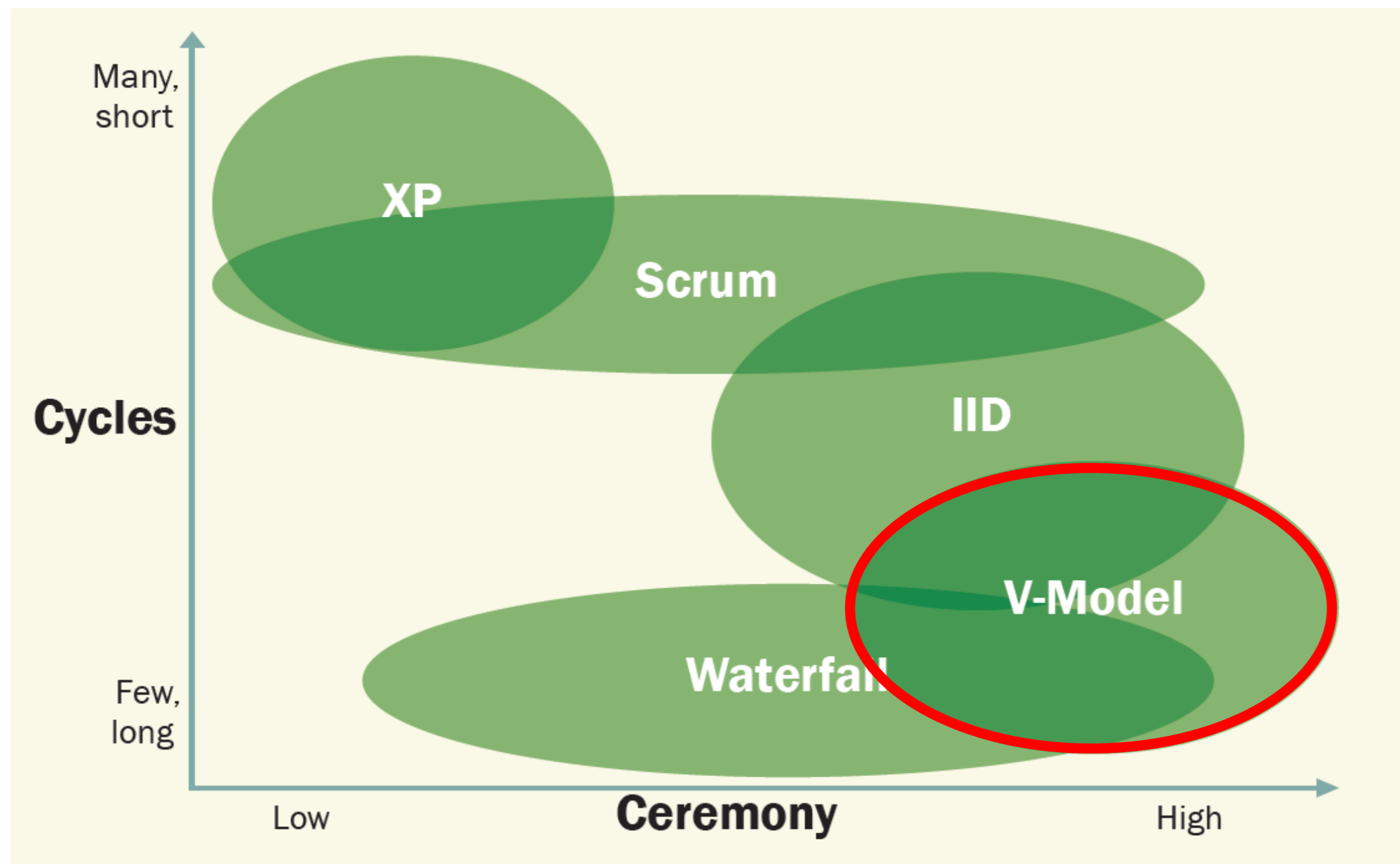
- Executable specification
- System-level simulation
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- Automation
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# Model-Based Design Approach

Improving with Model-Based Design

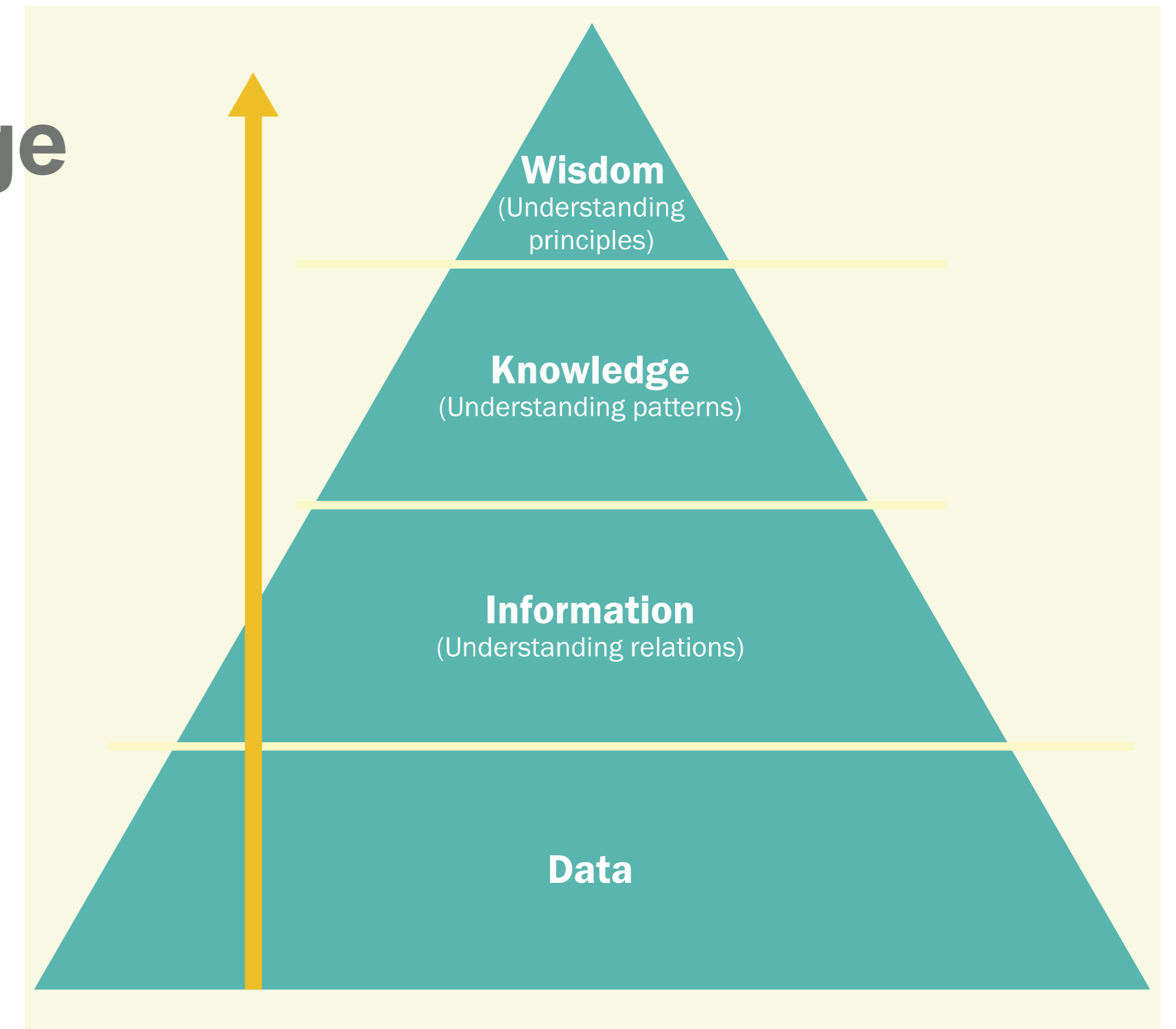
## Improving Development Methodologies with Model Based Design



## Creating and Managing Knowledge

*“When markets shift, technologies proliferate, competitors multiply, and products become obsolete almost overnight, successful companies are those that consistently create new knowledge, disseminate it widely throughout the organization, and quickly embody it in new technologies and products.”*

– Ikujiro Nonaka



*The progression from data to information, knowledge and wisdom*



## Managing the Shift to Model-Based Design



**Individual User** - Some individuals use Model-Based Design for their own work.

**Individual Project** - Model-Based Design is used for specific projects. Models are shared between project members.

**Department** - One department has adopted Model-Based Design. Models are shared across projects.

**Corporate** - Several departments have adopted Model-Based Design. They share models for efficient communication at the department or corporate level.

**Supply Chain** - Model-Based Design is used by several companies in the supply chain. They share models for efficient communication between companies.

**Full Industry** - Model-Based Design is the de facto standard in the industry. It is widely accepted, and common practice to use models for communication.

# Model-Based Design Approach

## Summary



## Summary

- Innovation support Thailand 4.0
- Embedded System drive innovation, link to mega-trend
- Model-Based Design accelerate development process
  - Management level
  - Supply chain



# Q&A

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# THANKS FOR COMING

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