



LIVEWORX 23



TRACK SPOTLIGHT

CAD

Steven Epeinger

*Professor of Management Science
and Innovation*

**EMBRACING AGILE PRODUCT DEVELOPMENT:
MAKING ADJUSTMENTS FOR SUCCESS
BEYOND SOFTWARE**

LIVEWORX.COM | #LIVEWORX

STEVEN EPPINGER

General Motors Leaders for Global Operations Professor
Professor of Management Science and Innovation

Massachusetts Institute of Technology

Educational Background

- SB, SM, and ScD in Mechanical Engineering, MIT

Research Areas

- Product development processes and methods
- Complex system development
- Engineering project management
- Agile methods

Industry Experience

Aerospace
Automotive
Consumer Electronics
Telecommunications
Software
Manufacturing
Energy Systems
Medical Devices
Capital Equipment

SOFTWARE TEAMS ARE USING AGILE.



*How can
we develop
hardware
this way?*

WHY AGILE NOW?

Software + Hardware



We develop software
and hardware

Digital Workforce



Our workers are
digital natives

Responding to Change



Change is the
new **normal**

The Right Tools



Workflows are
fully digital

MIT PRODUCT DESIGN AND DEVELOPMENT CLASS PROJECTS: TIME-BOXED SPRINTS

PDD2023
Product Design & Development



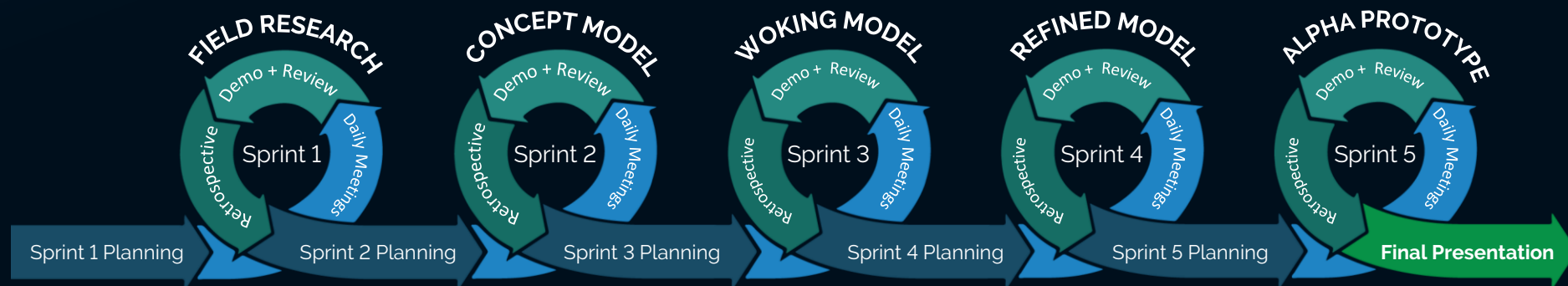
Smart Mirror



AR for Bicyclists



Infant Monitor



WHY BOTHER WITH AGILE?

Agile is Fast



Deliver value
in each sprint

Agile is Friendly



Goals replace
detailed planning

Agile is Flexible



Response to
uncertainty and
changes

Agile is Familiar



You already use
many of the methods

AGILE SPRINT PROCESS



SOME AGILE EXPERIENCE

BOSE



Whirlpool



Sigma



ocado
TECHNOLOGY



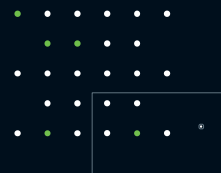
Ford



Ministry of Supply°



Cubii

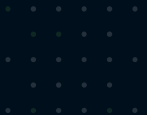


swisscom



**WHAT'S THE SECRET TO APPLICATION OF AGILE
OUTSIDE OF SOFTWARE TEAMS?**

ADJUSTMENT



ADJUSTMENT: SPRINT CADENCE

Decoupling Sprints



Alternating Sprints



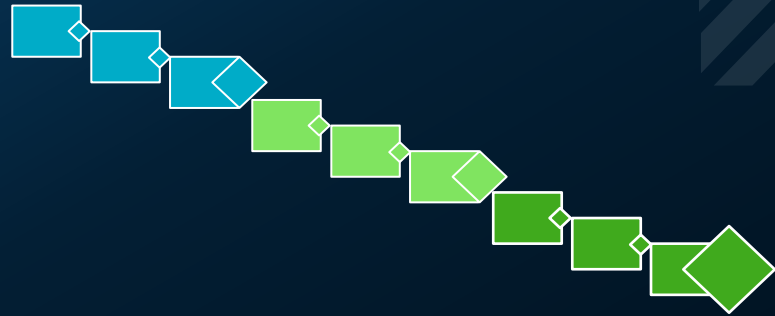
- Hardware teams may need longer sprints
- Decouple sprint timing across teams, with occasional sync
- Alternate development sprints and operational sprints



Ministry of Supply^o



ADJUSTMENT: GOAL DECOMPOSITION



- Software teams “roll up” high-value stories to define sprint goals
- Instead, decompose major milestones to sprint goals, sprints to tasks
- Prioritize, solve problems and reduce risk in each sprint



ADJUSTMENT: REVIEWABLE INCREMENTS



- Most software teams attempt to ship “usable code” in each sprint
- Hardware teams plan to achieve a “reviewable increment” in each sprint
- Results feed into next sprint(s)

BOSE



Sigma



CLOUD-BASED TOOLS SUPPORT AGILE DEVELOPMENT



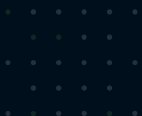
Cloud and Agile are not directly linked, but highly complementary



Agile development relies upon communication, information sharing, and transparency



Cloud-native platforms enable frictionless collaboration by reducing barriers and confusion



CLOUD-BASED TOOLS BEING USED TODAY



Google Workspace



Canva



Microsoft Teams



Joe
Supplier

Share



Mandy
Designer

Mandy Designer@gmail... Can edit
Link document, Export, Comment

Individuals Teams Invite guests Application Link sharing

Mandy Designer@gmail... Can edit Share

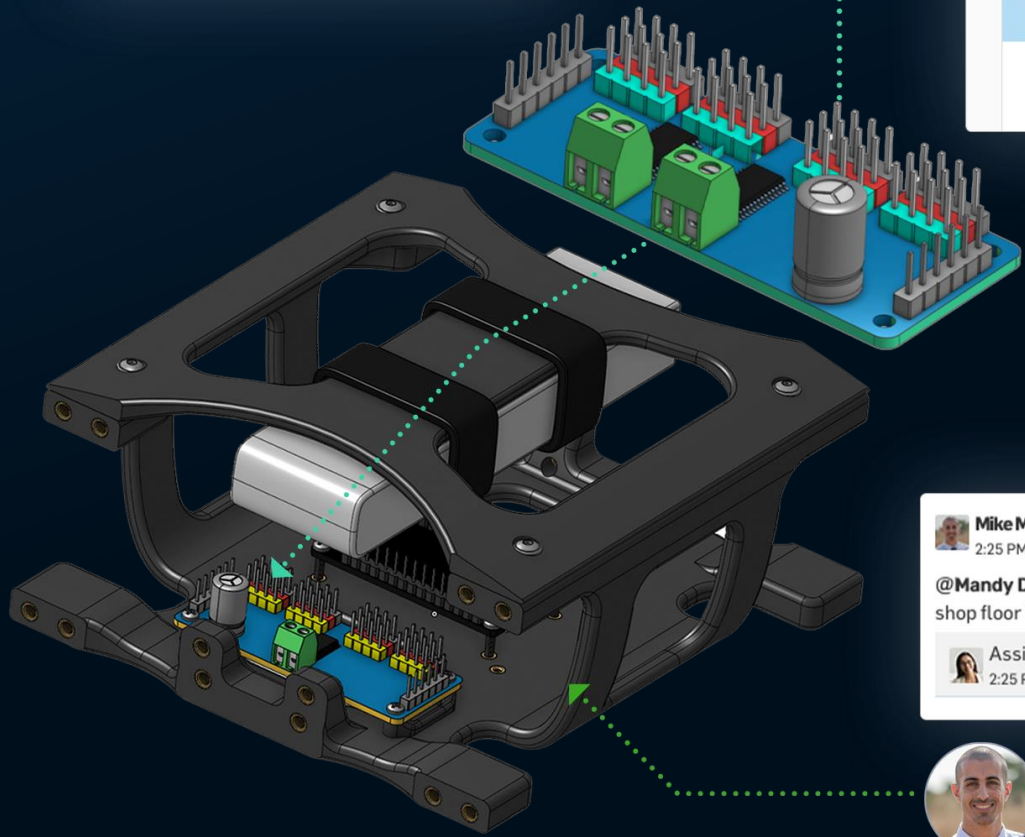
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Start	Mike Manager 4:15 PM Today



onshape®

Mike Manager
2:25 PM Nov 12 2019

@Mandy Designer can we fit this in the NE corner of the shop floor in the Chicago plant?

Assigned to Mandy Designer
2:25 PM Nov 12 2019



Mike
Manager

NEW WHITEPAPER AVAILABLE ONLINE

Transitioning to Agile Development: How to Develop Hardware Like Software

Steven Eppinger, MIT
Jon Hirschtick, PTC
April 2023



What's in the paper?

- Overview of Agile product development
- Explanation of the ways Agile methods can improve product development beyond software
- Step-by-step guide to broader Agile adoption

CALL TO ACTION





LIVEWORX 23

A NEW ERA IN PRODUCT LIFECYCLE INNOVATION

THANK YOU

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