



**LEAN PRODUCT & PROCESS
DEVELOPMENT EXCHANGE INC.**

LPPD and Agile, Hardware / Software Interaction

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Active and interested learners of
ways of improving faster and
increasing customer value



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The Lean Product and Process Development Exchange, Inc. is a nonprofit organization created to foster opportunities to grow and share the knowledge, expertise and experiences that help organizations use lean product development to dramatically improve product development performance.

LPPDE North America 2023 Ann Arbor - LPPDE

www.lppde.org

Virtual Summit 2023 Exchange in a Digital World

- 7 September
- 19 October
- 2 November
- 14 December (12am-4pm)

LPPDE Europe 2024 in April

How to increase the speed of innovation

April 2024

Send ideas to:

Chair: Peter Palmér
peter.palmer@scania.com

More information on: www.lppde.org
and LinkedIn: The Science of Improving Innovation <https://www.linkedin.com/company/lppde> <https://www.linkedin.com/groups/1898827/>

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The designer's dilemma


The graph illustrates the 'designer's dilemma' where knowledge about the product increases over time (green curve), while the effect of decisions on the result decreases over time (red curve). The y-axis represents the level of these factors, ranging from 'Low' to 'High', and the x-axis represents 'Time'.

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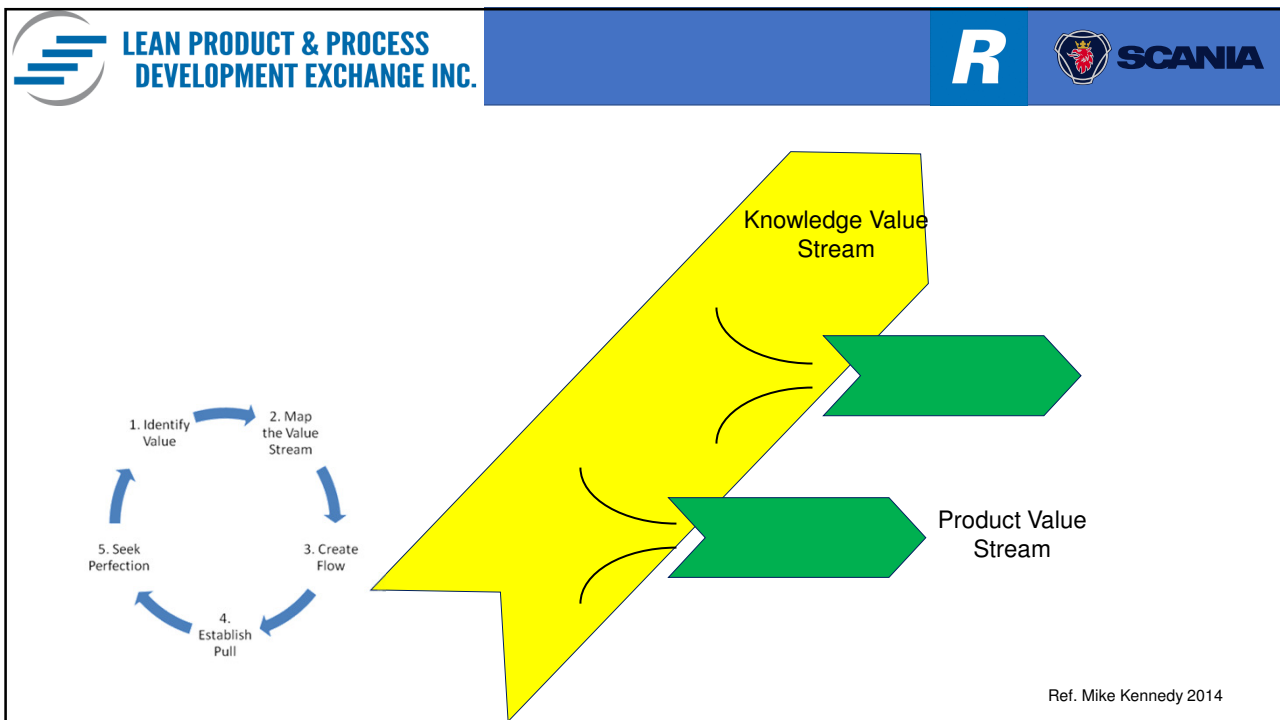
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Different schools


- Assure that new products are adapted to Lean Manufacturing
- Apply methods for Lean Manufacturing on PD
- Toyota Product Development System (everything Toyota does is correct and the best)
- Principle based view (new methods are checked against lean product development principles if they are applicable)
- Problem based view (new methods are introduced if needed)
- Good methods (which already exist) are called lean to empathize them more




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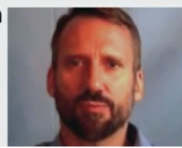





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Lean Development Principles

- Focus on creating usable knowledge
 - Eliminate waste
 - **Synthesize knowledge into trade-off curve pages**
- Lead with entrepreneur system designers
- Create teams of responsible experts
- Practice set-based innovation
- Create flow



- Visual Management and Planning



True north
Always
fulfilling
customer
needs

Source: Allen Ward

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Manifesto for Agile Software Development

We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

Individuals and interactions over processes and tools

Working software over comprehensive documentation

Customer collaboration over contract negotiation

Responding to change over following a plan


That is, while there is value in the items on the right, we value the items on the left more.

Kent Beck Mike Beedle Arie van Bennekum Alistair Cockburn Ward Cunningham Martin Fowler	James Grenning Jim Highsmith Andrew Hunt Ron Jeffries Jon Kern Brian Marick	Robert C. Martin Steve Mellor Ken Schwaber Jeff Sutherland Dave Thomas
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Lean Development Principles

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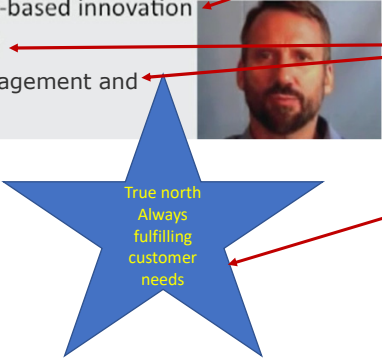
Agile Principles

Working Software

Individuals and Interactions

Responding to Change


Customer Collaboration



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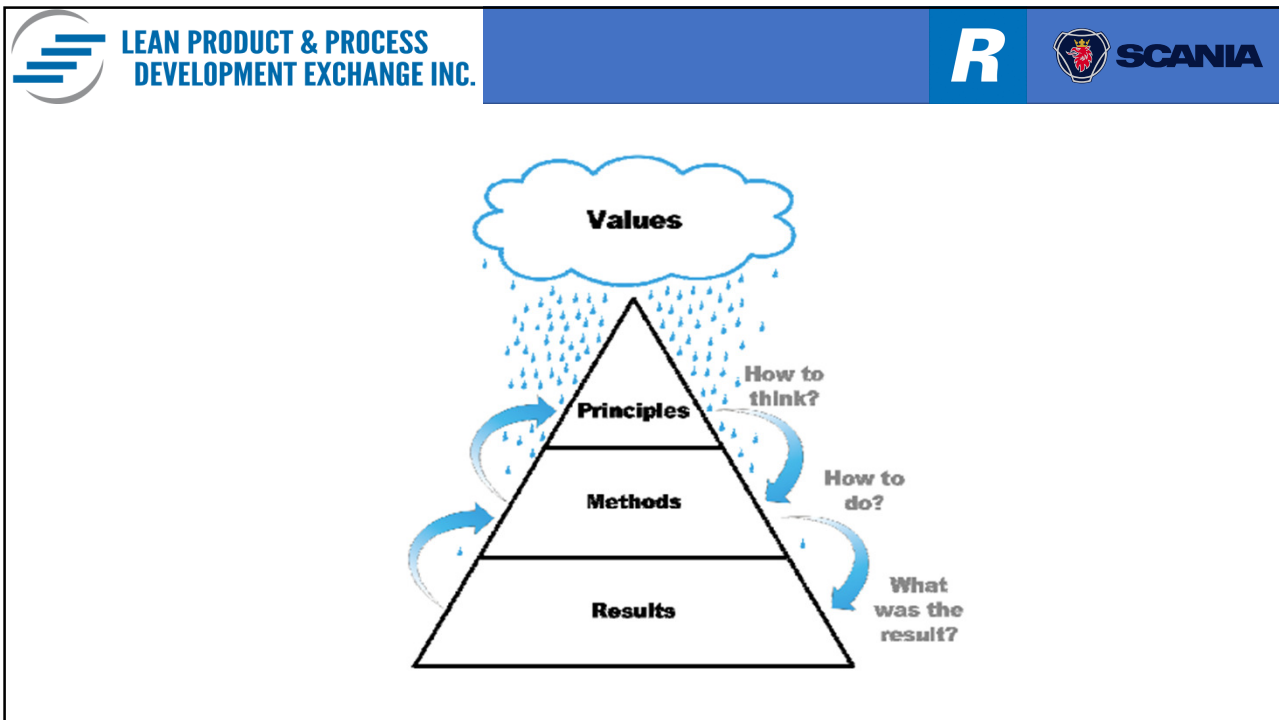


Which is the best method / tool to use?





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Values

Principles How to think?


Methods How to do?


Results What was the result?

Visualization of product development planning

- Visual Planning
- Scrum
- Kanban

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The principles of visual planning

- Work visible
- Prioritize
- Focus on deliveries and workload
- Manage deviations

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Visualization of Product Development

PRODUCT BACKLOG

SPRINT BACKLOG

DAILY SCRUM MEETING


24 HOURS

2-4 WEEKS

POTENTIALLY SHIPPABLE PRODUCT INCREMENT


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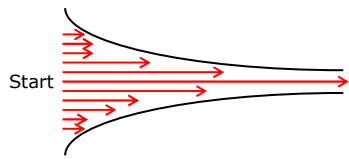
Knowledge gaps

Set-based Concurrent Engineering MVP


- Try to come up with as many alternative solutions as you can
- Successively eliminate inferior alternatives
- Make all necessary decisions as late as possible

Rapid learning cycles

Work close to the customer




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Practical application: Leaking Vault

Problem: Water is leaking into Detector Vault causing failures

Current Situation:

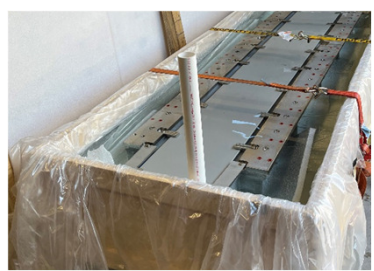
- Drawings, part specs, procedures.
- Pictures, interviews, testimonials
- Real environmental conditions

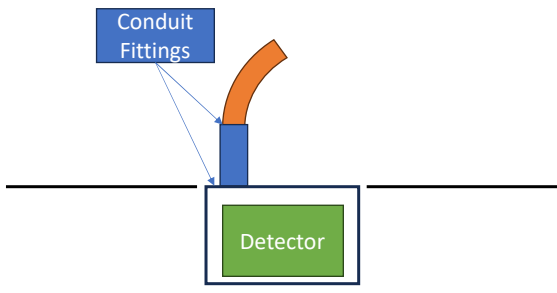
Analysis:

- Drawings, part specs, procedures.
- Pictures, interviews, testimonials
- Testing


Countermeasures:

- Sealing rings, pipe sealant
- Drawing adjustment on tapped holes.






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Visual Management

Problem: Errors in selecting "Item Template" cause database failures/delay/rework

Current Situation:

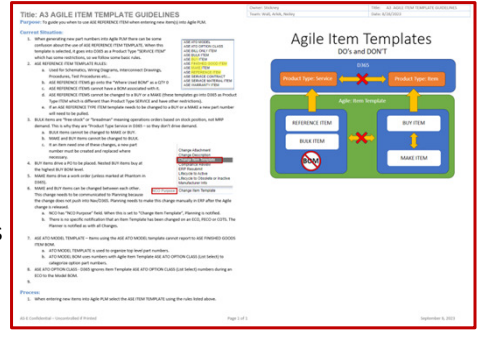
- Limited training
- Limited documentation
- Non-intuitive language

Analysis:

- Current documentations
- Interview users

Countermeasures:

- A3 consolidating language
- Visual graphic of situation




Lean Principles:

- Create usable Knowledge, Set Based Innovation
- Chief Engineer
- Responsible Experts
- Flow
- Visual Principles


Agile Principles:

- Individuals and interactions
- Working software/hardware
- Customer collaboration
- Responding to change

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Design Maturity Matrix

Problem: Large, unpredictable design reviews result in design release delays

Current Situation:

- Design review checklists
- ISO procedures written by Quality managers
- Days preparing slides

Analysis:

- Those at the meetings imparting non-value messaging.
- Meets delayed due to scheduling conflict.
- Meeting attendees unfamiliar with subject matter.

Countermeasures:

- Cadenced technical meetings
- Team members only (invited peers)
- Ownership with subject matter experts.
- No presentations. Review working documents (A3)

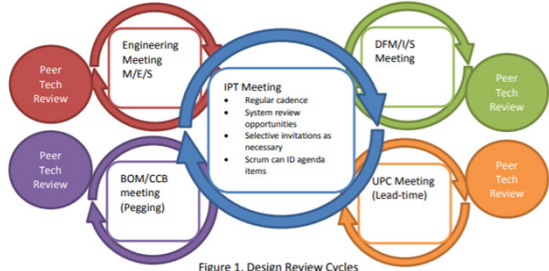


Figure 1. Design Review Cycles

Subject	Design Maturity Board							
	Concept	Preliminary	Critical	Doc Check	Release	Build	Verify	Validate
System	●	●	●	IPT	IPT			
Module 1	●	●	●	IPT	IPT			
Module 2	●	●	●	IPT	IPT			
Manf Plan	●	●	●	IPT	IPT			
BOM	●	●	●	IPT	IPT			

Table 1: Design Maturity Board – Examples shown above.


Design Maturity Board Guidelines:

- Populate the Board at the beginning of Phase I for concepts and Update at the beginning of Phase II.
- Continue to adjust the board as the project progresses
- Use sticky tags to ID How, Who and When to conduct the reviews
- Transpose Review milestones to the Level III task planning board.
- How each subject will be reviewed
 - IPT – Review with cross-functional IPT
 - Peer – Discipline review for technical feasibility
 - Focus – Review at a weekly focus meeting (DFM, UPC, Eng, BOM)
 - X – Review not necessary
- Who is responsible for the review
- When the review will be conducted – Task transposed to Level III task tracking board
- Record status with green dot stickers as reviews occur


Module 2 Critical Review

How: IPT
Who: John Smith
When: 4/1/15

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Design Maturity Matrix

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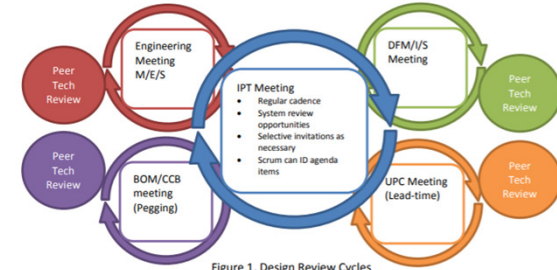


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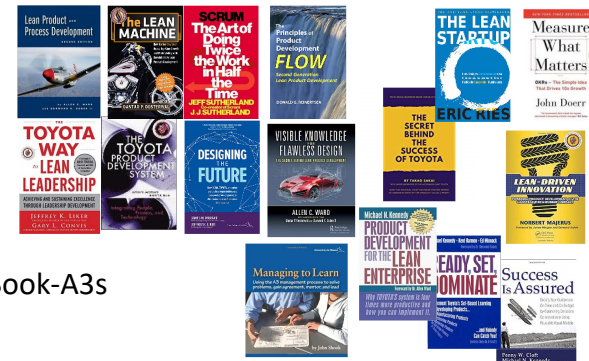
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Lean Agile

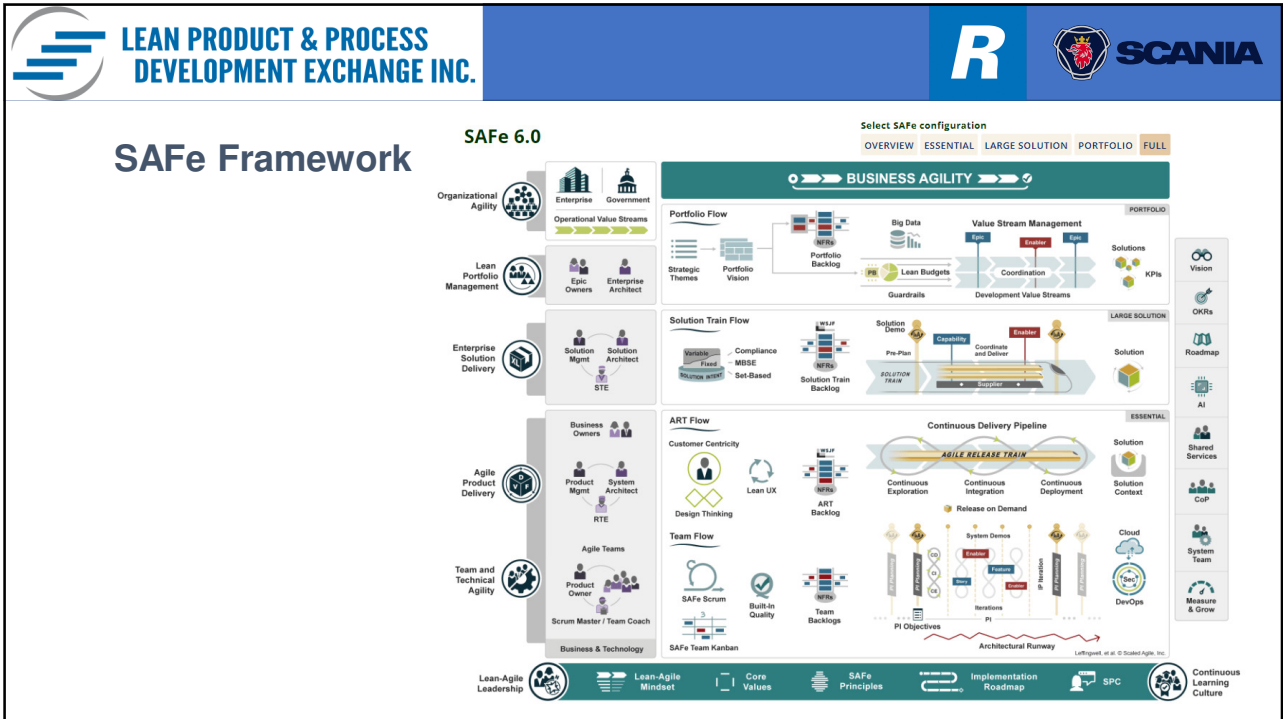
Lean agile is an including term, meaning we will look at principles and methods that are interesting for us and the problems we need to solve within:

- Agile
- Lean production
- Lean product development
- more

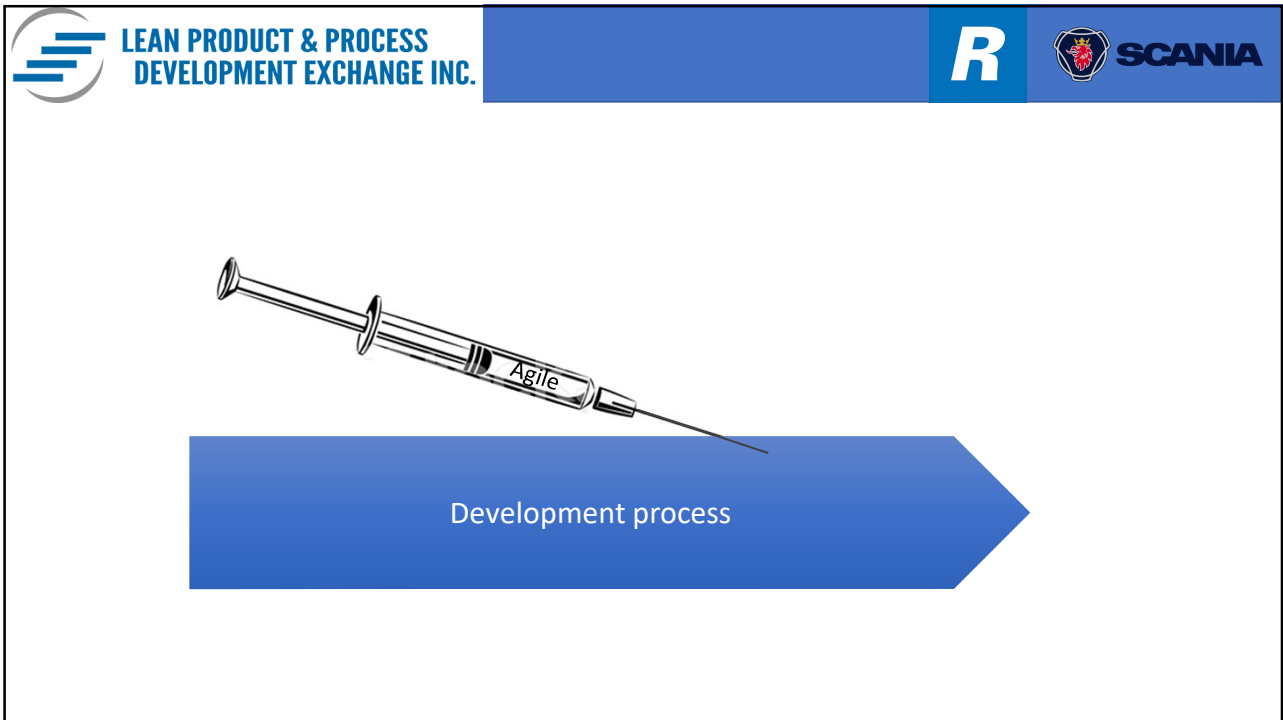


We use books / presentations and write Book-A3s


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*If you keep on doing
what you've always done,
you will get the same result
you've always got.*

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Principles for the transformation - Team, T-shaped

- Work in teams and strive for T-shaped individuals, but start with T-shaped teams



Team saw



Team wrench



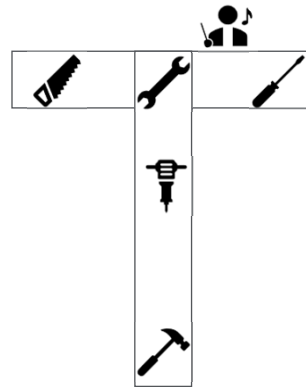
Team drill



Team hammer



Super special team skrew driver



6 September 2021

Info class internal HW, UF / Palskog, Skarped, Dansk, Rudberg, Palmér / The Scania Way Culture & Lean Agile

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Principles behind the Agile Manifesto

We follow these principles:

- Our highest priority is to satisfy the customer through early and continuous delivery of valuable software.
- Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage.
- Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale.
- Business people and developers must work together daily throughout the project.
- Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.
- The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
- Working software is the primary measure of progress.
- Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely.
- Continuous attention to technical excellence and good design enhances agility.
- Simplicity—the art of maximizing the amount of work not done—is essential.
- The best architectures, requirements, and designs emerge from self-organizing teams.
- At regular intervals, the team reflects on how to become more effective, then tunes and adjusts its behavior accordingly.

[Return to Manifesto](#)

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