Lean Software Factories and Digital Transformation

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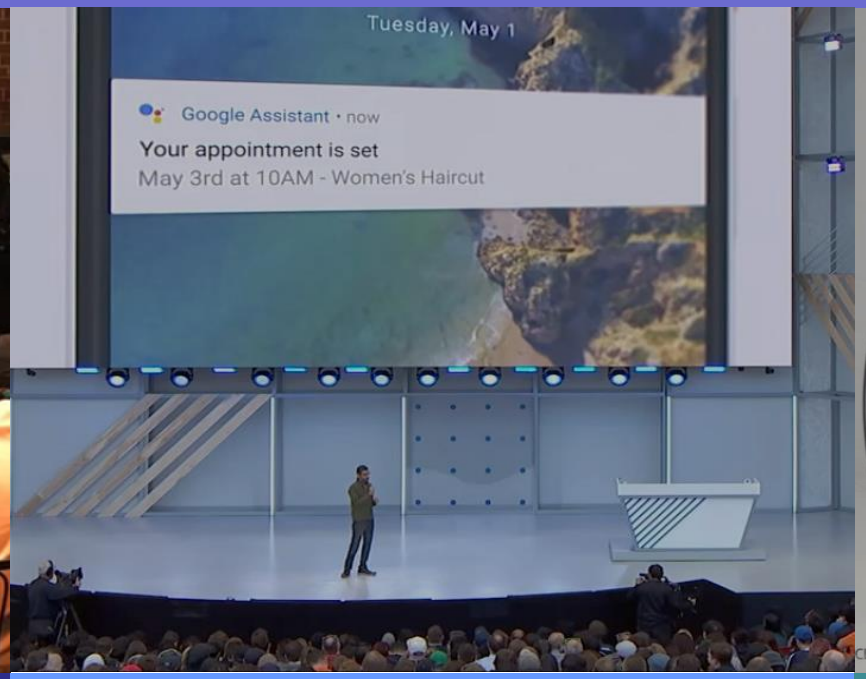
Outline

- Part 1 : Lean Digital Transformation
  From customer to code, from code to customer
- Part 2: Software Factories
  Automation & Excellence to Deliver Change and Quality
- Part 3: Software Craftmanship and Tests
  Lean Discipline and Love for the Code

Digital Transformation

Markets are conversations

- In the world of content abundance, to grab attention, you must listen
- Sharing a conversation with the customer requires a content strategy



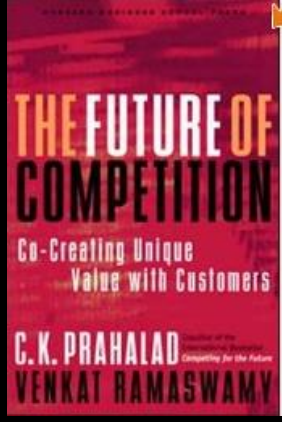
Digital Homeostasis

- Digital change is pushed from outside (customers and technology)
- Leverage vibrant service ecosystems
  to deliver the best experience.

Continuous Discovery

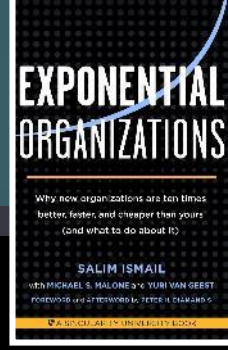
- Innovation is grown, not designed
- Minimum Viable Product :
  How to collect feedback as early as possible, but not earlier ☺

“Software is eating the world”



- “The customer is the architect of his experience” … Customers picks theirs (software) environment (B2C & B2B)
- User Experience Design is a critical skill for the 21st century
- The acceleration of change requires new & iterative ways ….
- … iterative methods (e.g., Agile) produce technical debt

Exponential Information Systems



- Customer-centric & outside-in thinking: constantly adapt to its environment
- Leverage the best of exponential technologies (AI, ML, …)
- Architected for constant refresh
- Antifragile : Organic growth from successive experiments

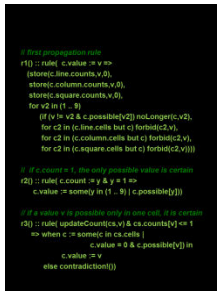
From Customer to Code, From Code to Customer

Embedded cycles, not linear processes

Lean Startup Product Development Cycle

Growth Hacking	Minimum Viable Product	Design Thinking
• Satisfaction & Retention • Virality • Scaling	• Agile Team • Lean UX • Focus+Excellence	• Painstorming • Problem focus • Prototyping • UVP

Cross-functional teams from two processes



(software) code

team

Product

Customer

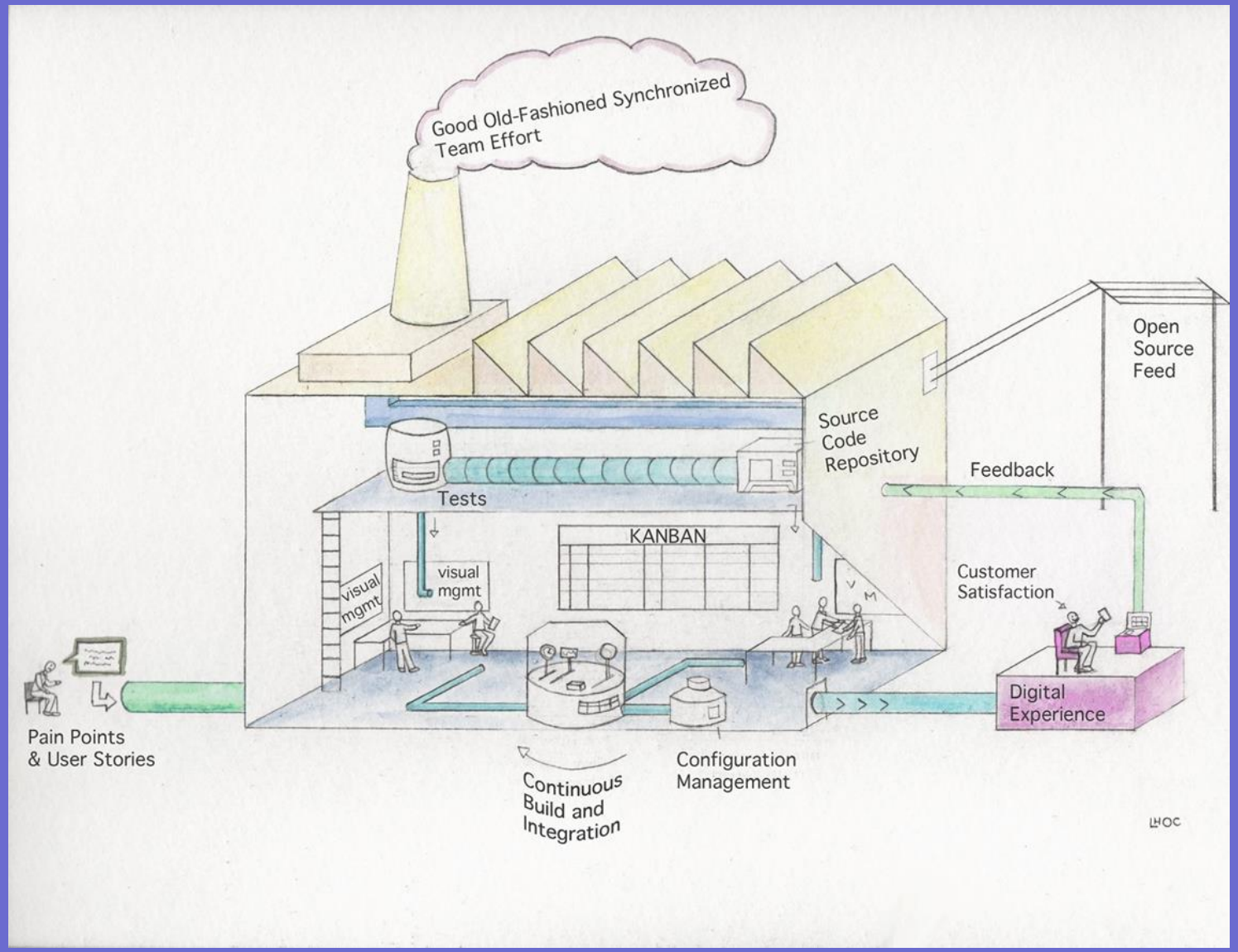
Lean Software Factory / Devops

Agile Teams	Software Factory	Continuous process
• SCRUM • Extreme Programming • Lean Software	• Configuration • Automation • Infrastructure as code	• Build • Test • Delivery

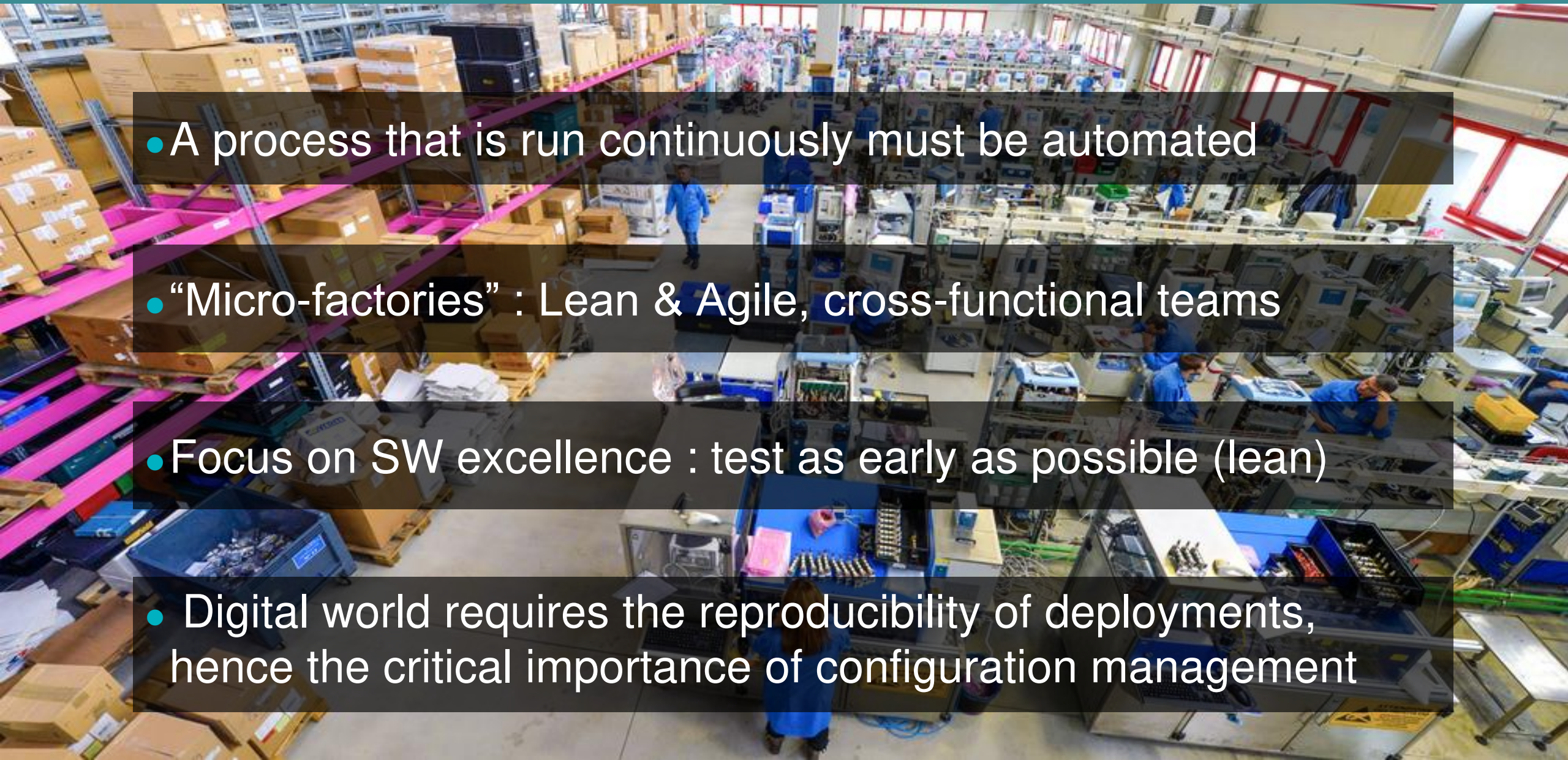
Common artefacts: UVP, User Stories and Product

Part II

Software Factories

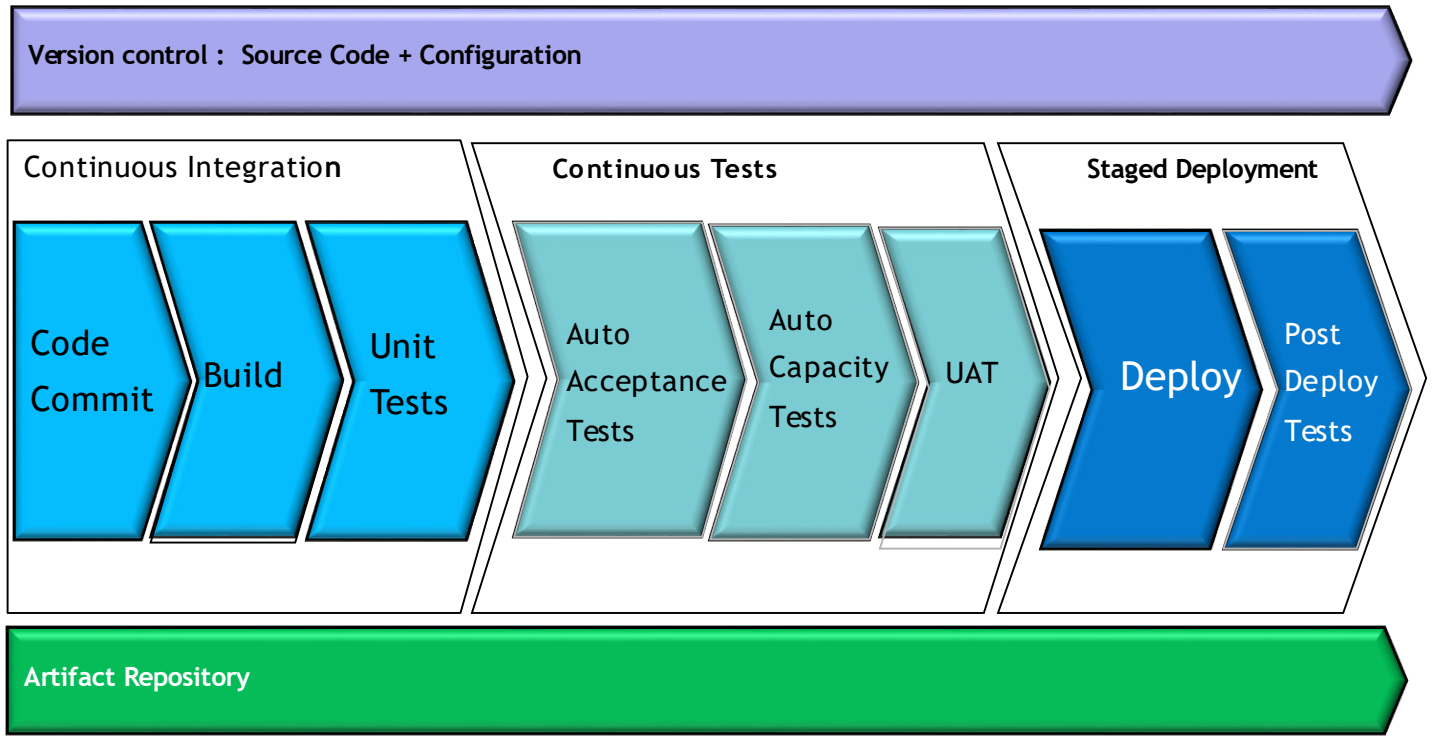


“Factories”: Focus on Discipline & Automation



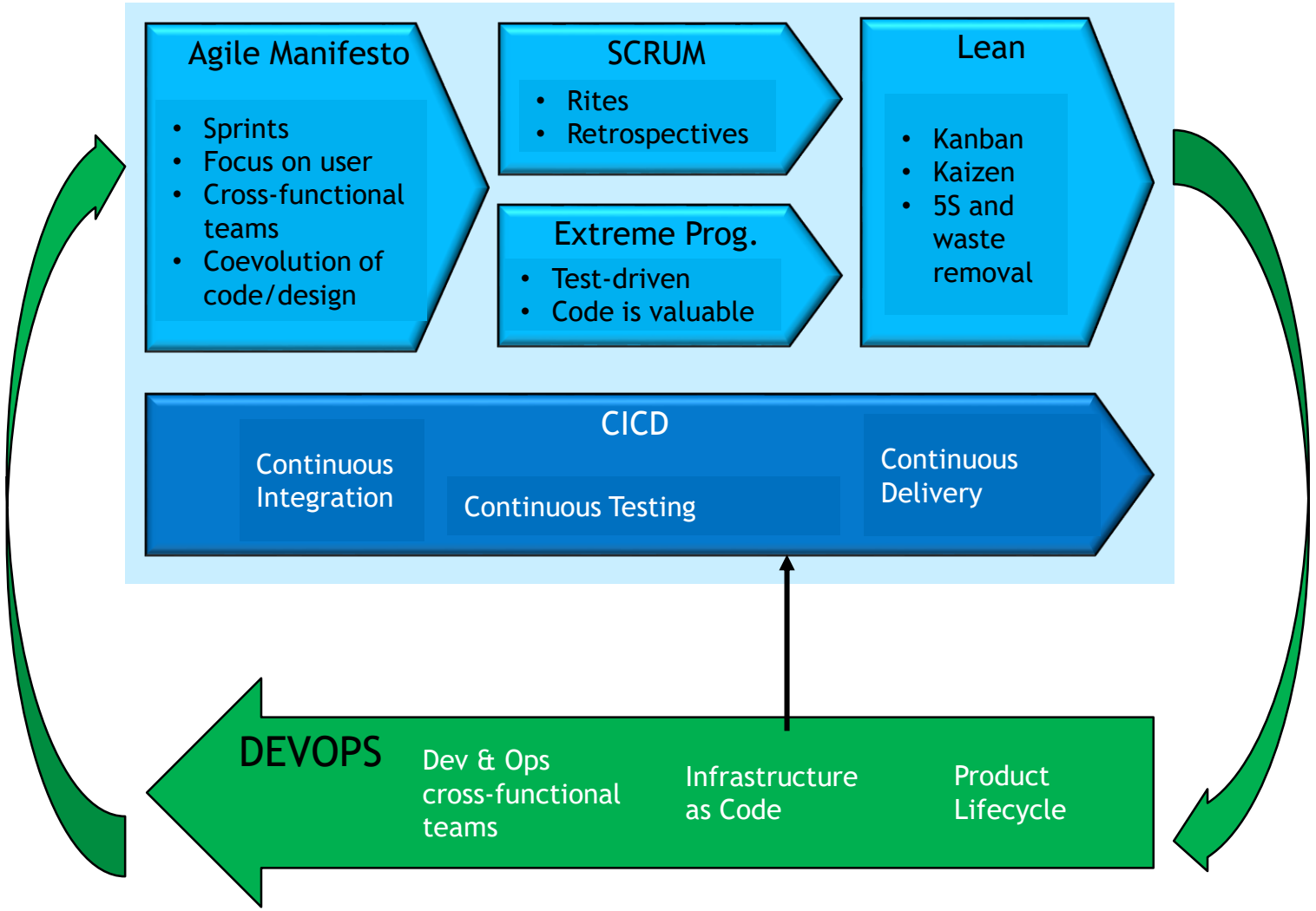
- A process that is run continuously must be automated
- “Micro-factories” : Lean & Agile, cross-functional teams
- Focus on SW excellence : test as early as possible (lean)
- Digital world requires the reproducibility of deployments, hence the critical importance of configuration management

CICD Pipeline



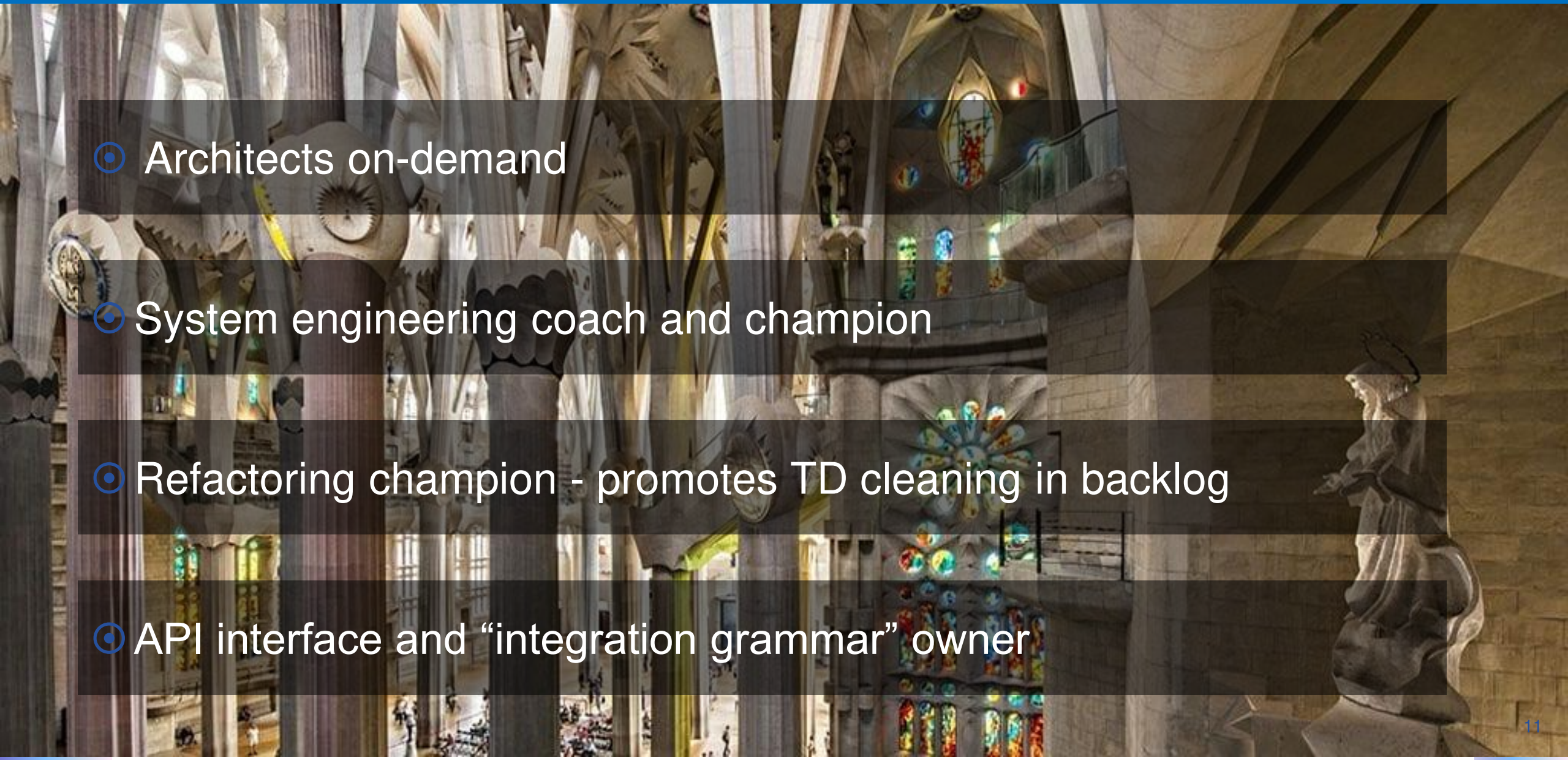
- **Test as early as possible**
  Do not let the integration debt grow
- **Automation** to reduce takt time and to improve quality (CICD & Testing) –
  "If the pipeline is nor working well, run it more frequently and highlight the difficulties" (Jezz Humble)
- Short steps and automated rollbacks, from build to delivery
- **Automation requires industrial configuration management – Tools matters !**

Lean Software Factories



- **Lean & Agile**: short-term delivery of small value increments, long-term iterative learning
- **Lean thinking** : continuous management of technical debt to develop « situation potential » (tomorrow's agility)
- **Lean practices** : right on the first time, continuous learning through kaizen
- **Product mode** : short-term delivery of small value increments, long-term iterative learning

The Role of Lean Architecture



- Architects on-demand
- System engineering coach and champion
- Refactoring champion - promotes TD cleaning in backlog
- API interface and “integration grammar” owner

Part III

Software Craftmanship

Software Craftmanship – Embedded Agility

- "Show & Share" : Develop and value software excellence through peer reviews
- Make Code Reviews more pleasurable and more efficient: Coding standards and Pair-programming
- "Love your code" : code elegance as a support for business agility (code that one likes to modify)
- Elegant code is reusable code : open-source culture & communities (e.g., Stack Overflow)

Testing Lifecycle

Build

- Unit tests
- Some acceptance tests, performance tests
- Test automation is the name of the game (long list of benefits ☺)

Delivery

- User Acceptance Tests
- Some global system integration tests
- Stress capacity tests, reversibility tests

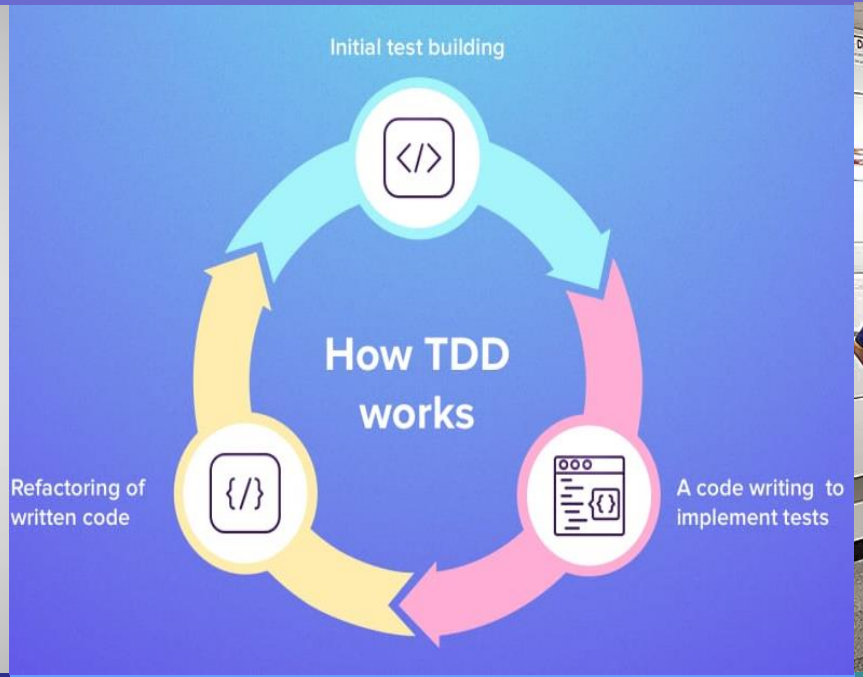
Post Deployment

- Error Analytics : detect errors before users
- AI4Ops : Predictive Maintenance Smart monitoring
- Product Discovery (e.g. A/B testing) – continuous UI testing

Lean Software Standards

Five S

- **Sort**: reduce code base, eliminate dead code, refactor
- **Systematize**: organize, code standards
- **Shine**: pass quality tests, clean up, code reviews, improve test coverage rates
- **Standardize** : continuously improve the teams' standard
- **Sustain** : Make software excellence a habit



Test-Driven Development

- Write Unit Tests first
- Relate tests to user stories
- Treat unit tests with same care as source code

Visual Management

- Voice of Customer
  Always on display for developers
- System Engineering :
  "*See how the system works*"
- Kanban : limit WIP

Digital Era Testing Practices

- Test generation and randomization

  One of the untold benefits of process models & term algebra

- Antifragile test collection

  Age-old practice coupled with the discipline of post-mortem

  Assign each issue with the earliest test phase

- Capacity Planning models and performance testing

  AI4ITOps : train ML from performance logs

Conclusion

- *Software is eating the world* … the expected level of experience excellence has changed in the digital era

- Lean Software Factories : combining Lean & Agile with DevOps and Product approach

- "*From customer to code, from code to customer*" a *lean* mindset and culture, based on tools, discipline and software craftsmanship