AGILIS HÁLÓZATI SZOLGÁLTATÁS-FEJLESZTÉS

VITMMA01

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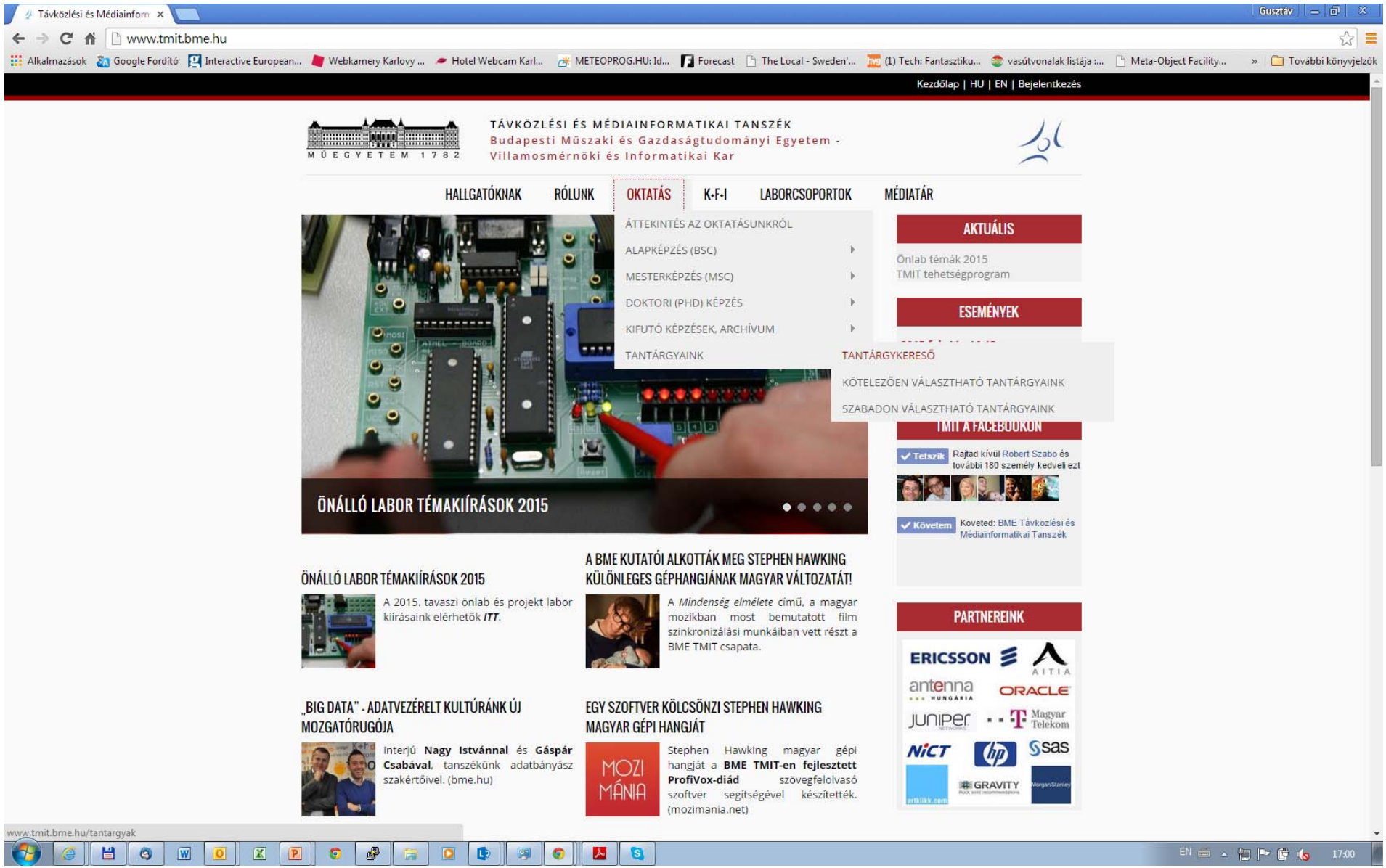
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AKTUÁLIS
Önlab témák 2015
TMIT tehetségprogram
ESEMÉNYEK
TMIT A FACEBOOKON
Tetszik
Rajtad kívül Robert Szabo és további 180 személy kedveli ezt
Követem
Követed: BME Távközlési és Médiainformatikai Tanszék
PARTNEREINK
ÖNÁLLÓ LABOR TÉMAKIÍRÁSOK 2015
A 2015. tavaszi önlab és projekt labor kiírásaink elérhetők ITT.
A BME KUTATÓI ALKOTTÁK MEG STEPHEN HAWKING KÜLÖNLEGES GÉPHANGJÁNAK MAGYAR VÁLTOZATÁT!
A Mindenség elmélete című, a magyar mozikban most bemutatott film szinkronizálási munkáiban vett részt a BME TMIT csapata.
„BIG DATA" - ADATVEZÉRELT KULTÚRÁNK ÚJ MOZGATÓRUGÓJA
Interjú Nagy Istvánnal és Gáspár Csabával, tanszékünk adatbányász szakértőivel. (bme.hu)
EGY SZOFTVER KÖLCSÖNZI STEPHEN HAWKING MAGYAR GÉPI HANGJÁT
MOZI MÁNIA
Stephen Hawking magyar gépi hangját a BME TMIT-en fejlesztett ProfiVox-diád szövegfelolvasó szoftver segítségével készítették. (mozimania.net)
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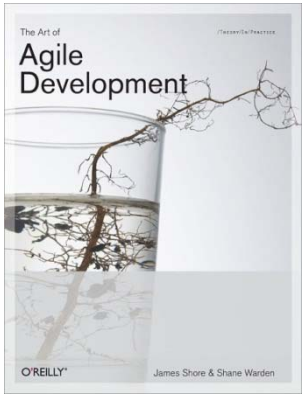
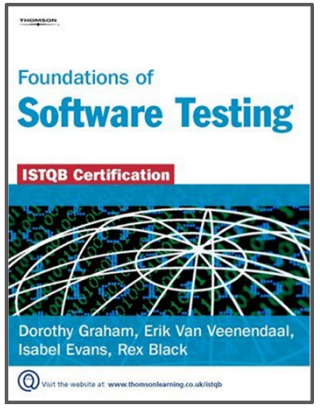


The Art of Agile Development, James Shore & Shane Warden



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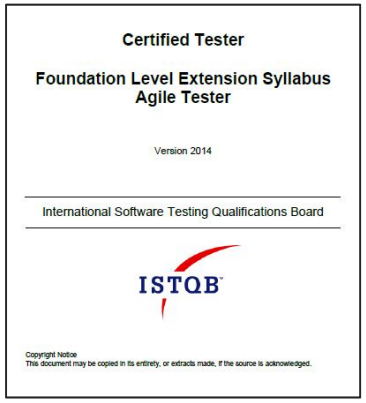

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LEAN & AGILE DEVELOPMENT

Tibor Csöndes, Honorary Associate Professor

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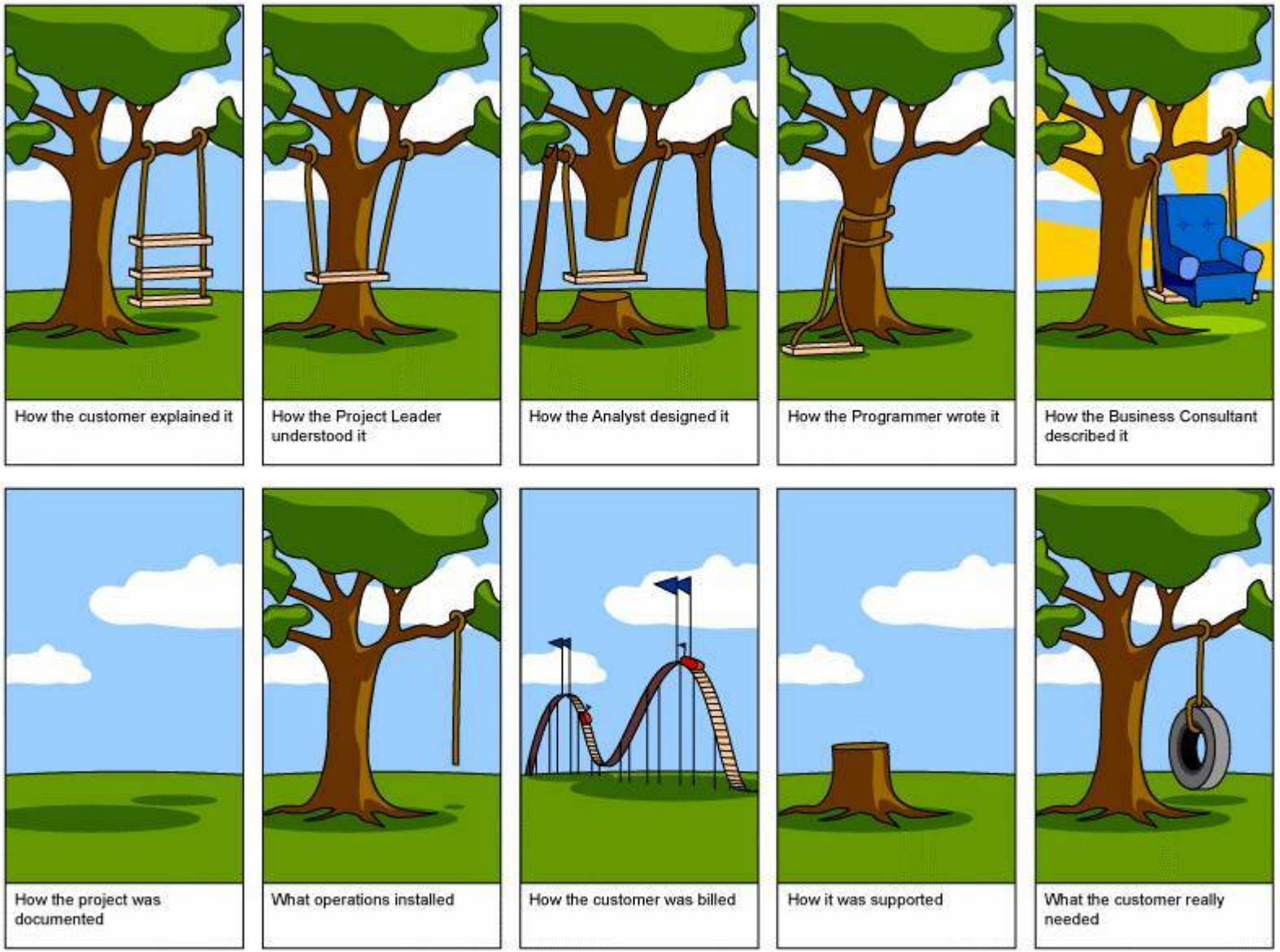
THE PROBLEM


How the customer explained it
How the Project Leader understood it
How the Analyst designed it
How the Programmer wrote it
How the Business Consultant described it
How the project was documented
What operations installed
How the customer was billed
How it was supported
What the customer really needed

INTRODUCTION

- Software development has been changed
- Need to follow fast changes requested by the customer
- Most software development is a chaotic activity, often characterized by the phrase "code and fix"
- **Requirement engineering** getting more and more important!

CHANGE FROM THIS...

Defined process control

… TO THIS

R&D-based process

SOFTWARE DEVELOPMENT PROCESS

1970s

- Structured programming since 1969

1980s

- Structured systems analysis and design method (SSADM) from 1980 onwards
- Information Requirement Analysis/Soft systems methodology

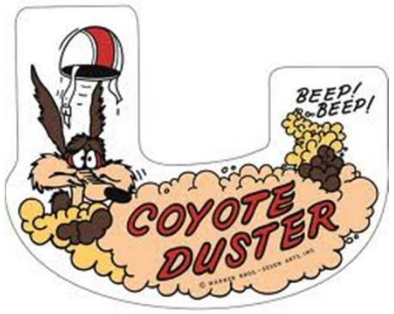
1990s

- Object-oriented programming (OOP) developed in the early 1960s, and became a dominant programming approach during the mid-1990s
- Rapid application development (RAD), since 1991
- Scrum, since 1995
- Extreme programming (XP), since 1999

2000s

- Agile Unified Process (AUP) maintained since 2005 by Scott Ambler

WHAT SPEED CAN LOOK LIKE



"New application from concept to production: 2 months"

"Every IT system fully regression-tested by the end of every iteration"

"Every IT system built & fully tested at least twice a day"

"An incident is fully resolved within 24h and the long-term improvement for addressing the root-causes handled within a week."

"All testing of integration contracts is fully automated."

"Development & test environments delivered within 30 minutes from initial order."

"A new car can be produced 20 hours after receiving the customer order.."

"A new fully automated stock trading strategy can be implemented every week."

"A stock trade can be cleared in seconds."

RAPID SOFTWARE DEVELOPMENT

Rapid development and delivery is now often the most important requirement for software systems

- Businesses operate in a fast-changing requirement and it is practically impossible to produce a set of stable software requirements
- Software has to evolve quickly to reflect changing business needs.

Rapid software development

- Specification, design and implementation are interleaved
- System is developed as a series of versions with stakeholders involved in version evaluation
- User interfaces are often developed using an IDE and graphical toolset.

SOFTWARE DEVELOPMENT LIFE CYCLE (SDLC) MODEL

There are various software development approaches defined and designed which are used/employed during development process of software, these approaches are also referred as "**Software Development Process Models**"

- Waterfall model
- V-model
- Incremental model
- Iterative model
- etc.

Each process model follows a particular life cycle in order to ensure success in process of software development.

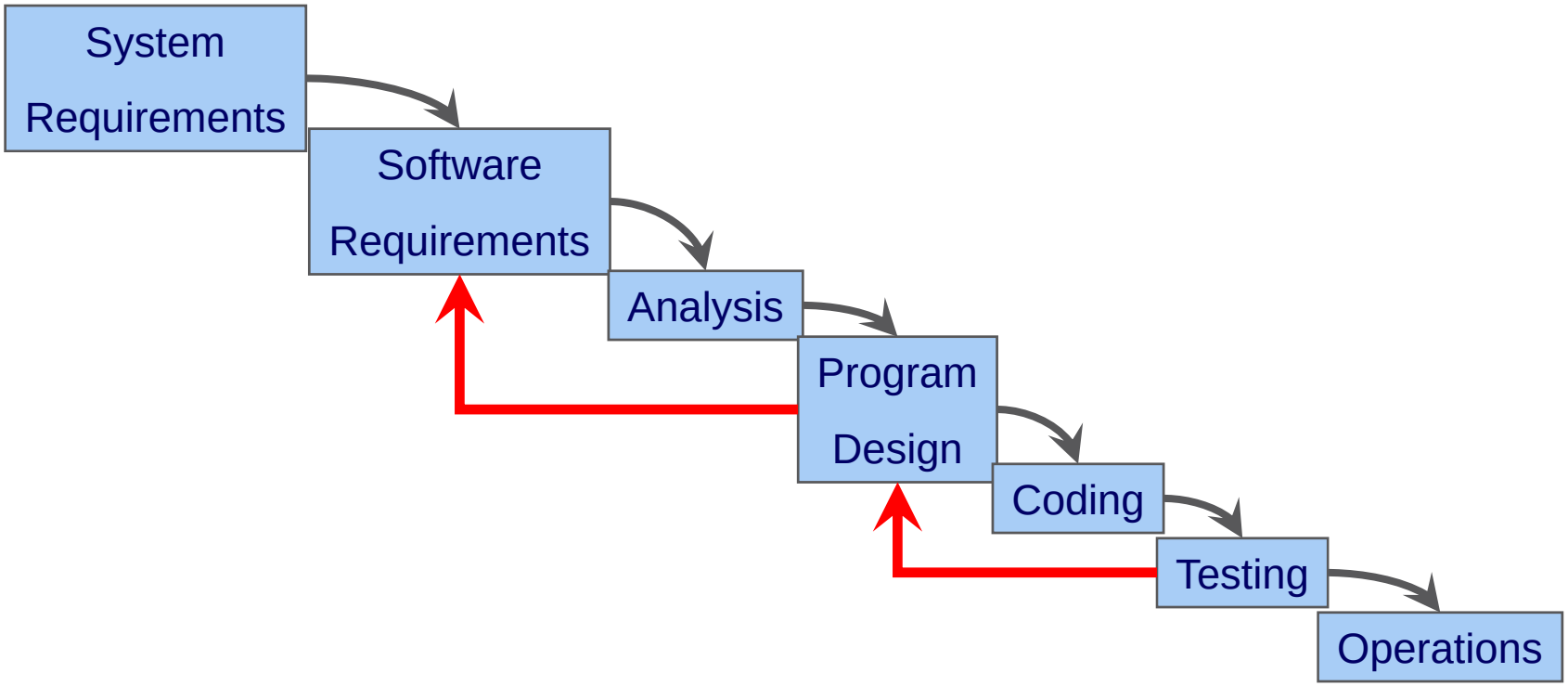
SOFTWARE DEVELOPMENT LIFE CYCLE MODEL PHASES

There are following six phases in every Software development life cycle model:

- Requirement gathering and analysis
- Design
- Implementation or coding
- Testing
- Deployment
- Maintenance

THE WATERFALL PROCESS

› The traditional development process: Sequential design!



WATERFALL MODEL

The Waterfall Model was first Process Model to be introduced. It is also referred to as a **linear-sequential life cycle model**.

It is very simple to understand and use.

In a waterfall model, each phase must be completed fully before the next phase can begin.

This type of model is basically used for the for the project which is small and there are no uncertain requirements.

At the end of each phase, a review takes place to determine if the project is on the right path and whether or not to continue or discard the project.

In this model the testing starts only after the development is complete. In **waterfall model phases** do not overlap.

WATERFALL MODEL

Advantages of waterfall model:

- This model is simple and easy to understand and use.
- It is easy to manage due to the rigidity of the model – each phase has specific deliverables and a review process.
- In this model phases are processed and completed one at a time. Phases do not overlap.
- Waterfall model works well for smaller projects where requirements are very well understood.

Disadvantages of waterfall model:

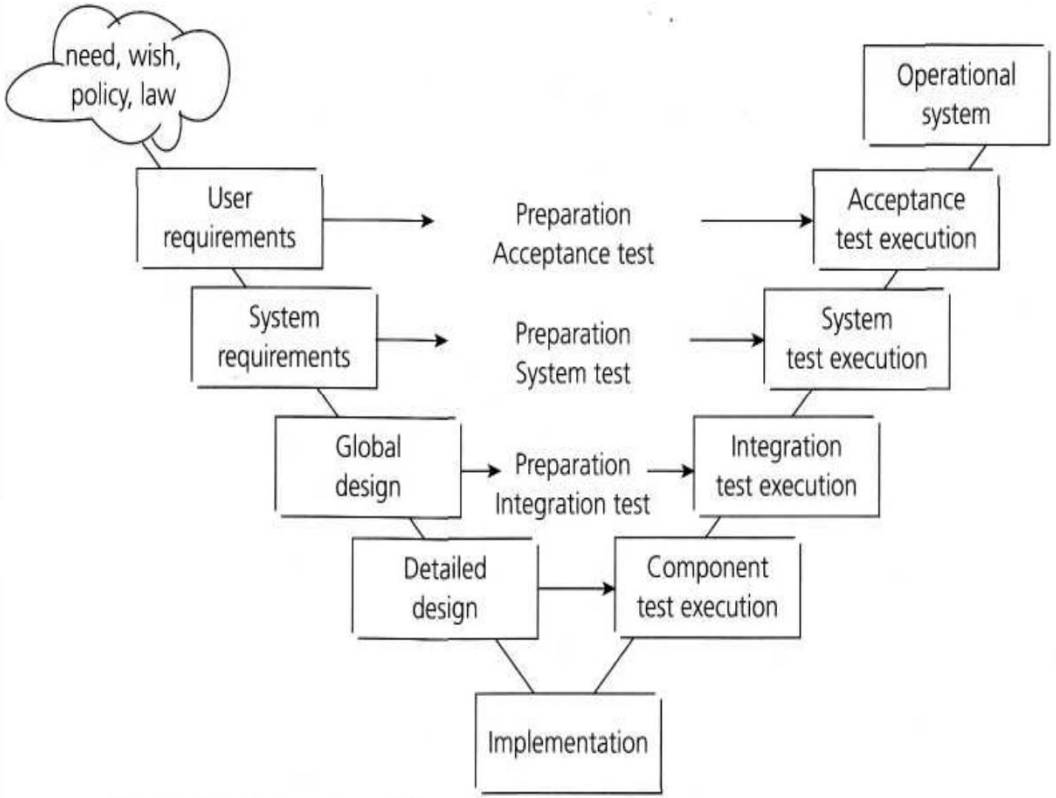
- Once an application is in the testing stage, it is very difficult to go back and change something that was not well-thought out in the concept stage.
- No working software is produced until late during the life cycle.
- High amounts of risk and uncertainty.
- Not a good model for complex and object-oriented projects.
- Poor model for long and ongoing projects.
- Not suitable for the projects where requirements are at a moderate to high risk of changing.

V-MODEL (VERIFICATION AND VALIDATION)

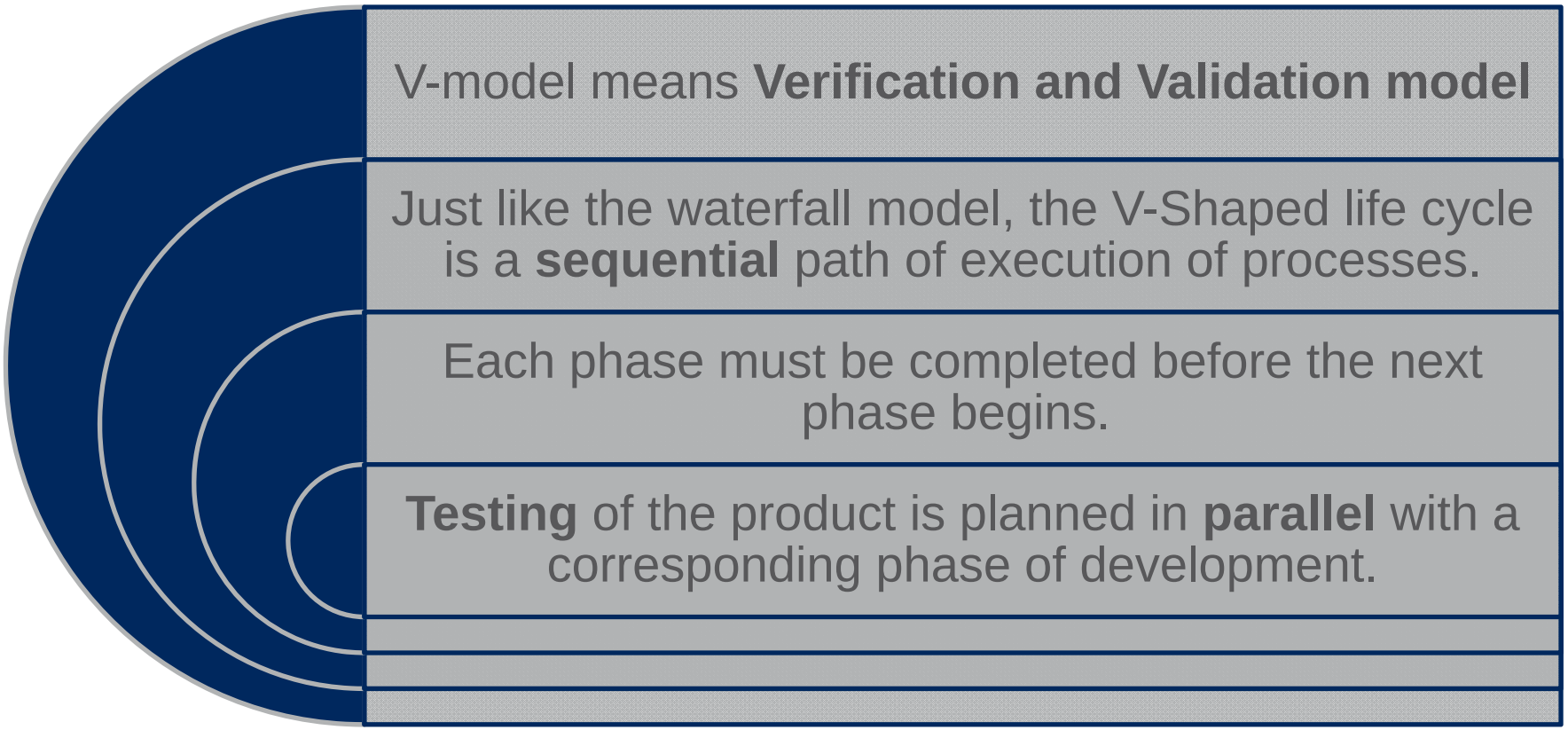
The V-model is an extension of the waterfall model.

Show the relationships between development phases and test phases

Time and project completeness vs. level of abstraction



V-MODEL


V-model means **Verification and Validation model**
Just like the waterfall model, the V-Shaped life cycle is a **sequential** path of execution of processes.
Each phase must be completed before the next phase begins.
Testing of the product is planned in **parallel** with a corresponding phase of development.

V-MODEL

Advantages of V-model:

- Simple and easy to use.
- **Testing activities** like planning, test designing happens well before coding. This saves a lot of time. Hence higher chance of success over the waterfall model.
- Proactive defect tracking – that is defects are found at early stage.
- Avoids the downward flow of the defects.
- Works well for small projects where requirements are easily understood.

Disadvantages of V-model:

- Very rigid and least flexible.
- Software is developed during the implementation phase, so no early prototypes of the software are produced.
- If any changes happen in midway, then the test documents along with requirement documents has to be updated.

INCREMENTAL MODEL

The whole requirement is divided into various builds. Multiple development cycles take place here, making the life cycle a “multi-waterfall” cycle.

Cycles are divided up into smaller, more easily managed modules.

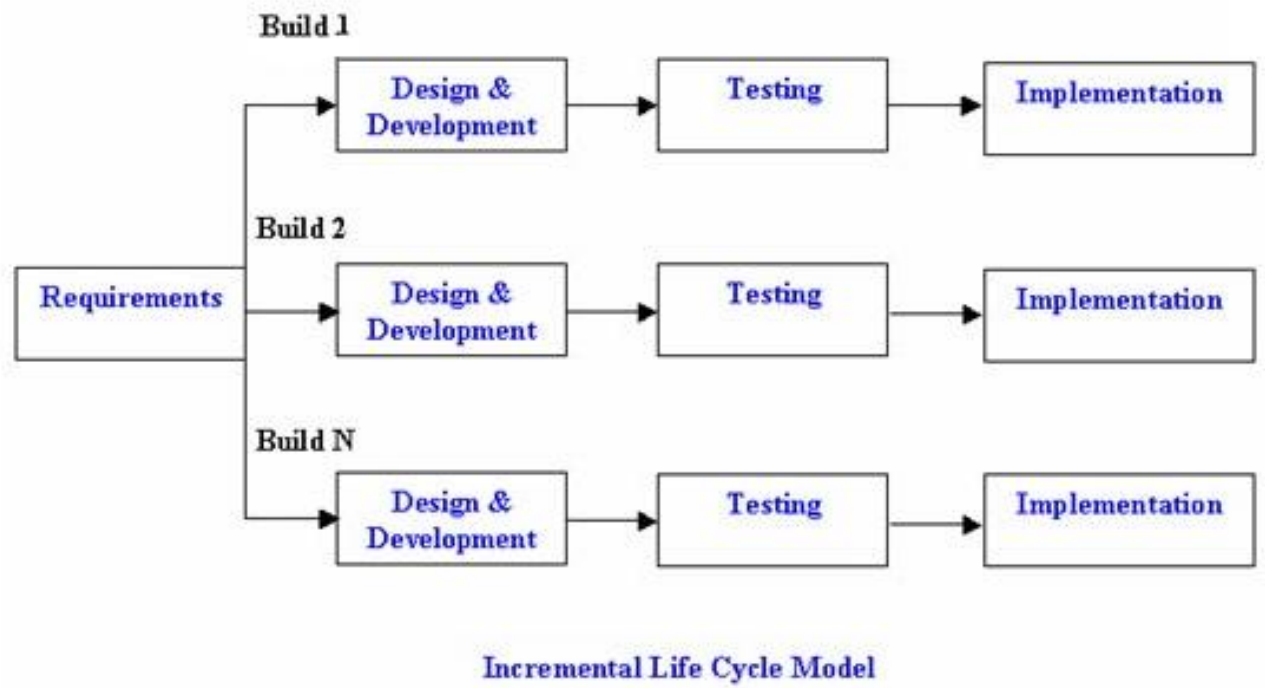
Each module passes through the requirements, design, implementation and testing phases.

A working version of software is produced during the first module, so you have working software early on during the software life cycle.

Each subsequent release of the module adds function to the previous release.

The process continues till the complete system is achieved.

INCREMENTAL MODEL



Incremental Life Cycle Model

INCREMENTAL MODEL

Advantages of Incremental model:

- Generates working software quickly and early during the software life cycle.
- This model is more flexible – less costly to change scope and requirements.
- It is easier to test and debug during a smaller iteration.
- In this model customer can respond to each built.
- Lowers initial delivery cost.
- Easier to manage risk because risky pieces are identified and handled during it'd iteration.

Disadvantages of Incremental model:

- Needs good planning and design.
- Needs a clear and complete definition of the whole system before it can be broken down and built incrementally.
- Total cost is higher than waterfall.

WHEN TO USE THE INCREMENTAL MODEL

- This model can be used when the requirements of the complete system are clearly defined and understood.
- Major requirements must be defined; however, some details can evolve with time.
- There is a need to get a product to the market early.
- A new technology is being used
- Resources with needed skill set are not available
- There are some high risk features and goals.

AGILE MODEL

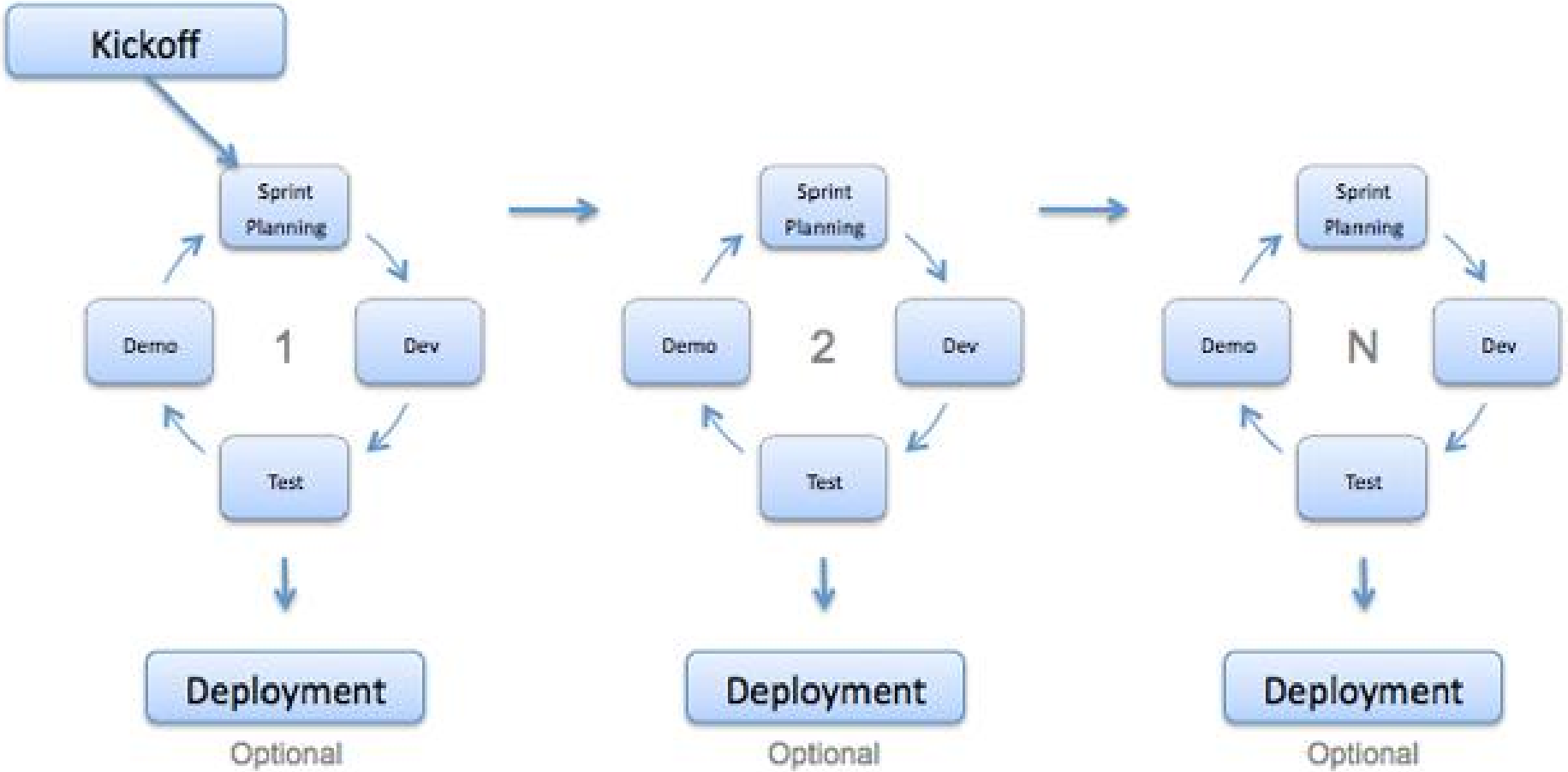
Type of Incremental model

Software is developed in incremental, rapid cycles. This results in small incremental releases with each release building on previous functionality

Each release is thoroughly tested to ensure software quality is maintained

It is used for time critical applications. Extreme Programming (XP) is currently one of the most well known agile development life cycle model

AGILE MODEL


Kickoff
Sprint Planning
Demo
1
Dev
Test
Deployment
Optional
Sprint Planning
Demo
2
Dev
Test
Deployment
Optional
Sprint Planning
Demo
N
Dev
Test
Deployment
Optional

ADVANTAGES OF AGILE MODEL

- Customer satisfaction by rapid, continuous delivery of useful software.
- People and interactions are emphasized rather than process and tools. Customers, developers and testers constantly interact with each other.
- Working software is delivered frequently (weeks rather than months).
- Face-to-face conversation is the best form of communication.
- Close, daily cooperation between business people and developers.
- Continuous attention to technical excellence and good design.
- Regular adaptation to changing circumstances.
- Even late changes in requirements are welcome

DISADVANTAGES OF AGILE MODEL

In case of some software deliverables, especially the large ones, it is difficult to assess the effort required at the beginning of the software development life cycle.

There is lack of emphasis on necessary designing and documentation.

The project can easily get taken off track if the customer representative is not clear what final outcome that they want.

Only senior programmers are capable of taking the kind of decisions required during the development process. Hence it has no place for newbie programmers, unless combined with experienced resources.

WHEN TO USE AGILE MODEL

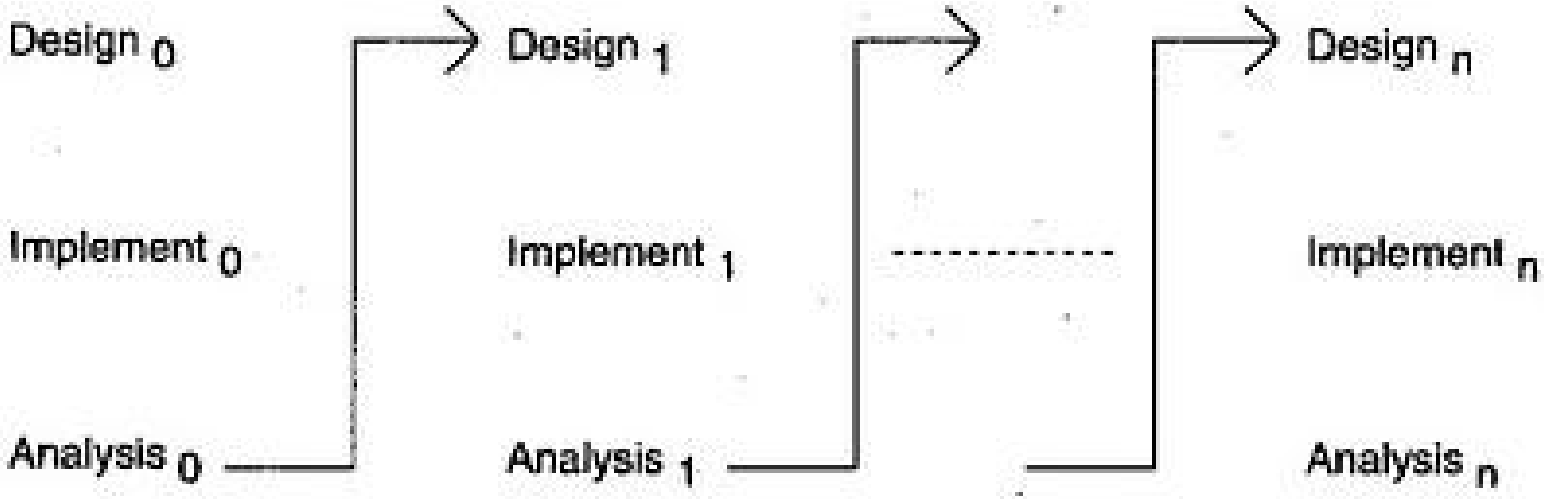
When new changes are needed to be implemented.

To implement a new feature the developers need to lose only the work of a few days, or even only hours, to roll back and implement it.

Unlike the waterfall model in agile model very limited planning is required to get started with the project.

Both system developers and stakeholders alike, find they also get more freedom of time and options than if the software was developed in a more rigid sequential way.

ITERATIVE LIFE CYCLE MODEL



ITERATIVE LIFE CYCLE MODEL

Does not attempt to start with a full specification of requirements

Instead, development begins by specifying and implementing just part of the software, which can then be reviewed in order to identify further requirements

This process is then repeated, producing a new version of the software for each cycle of the model

ADVANTAGES OF ITERATIVE MODEL

In iterative model we can only create a high-level design of the application before we actually begin to build the product.

In iterative model we are building and improving the product step by step.

In iterative model we can get the reliable user feedback.

In iterative model less time is spent on documenting and more time is given for designing.

DISADVANTAGES OF ITERATIVE MODEL

Each phase of an iteration is rigid with no overlaps

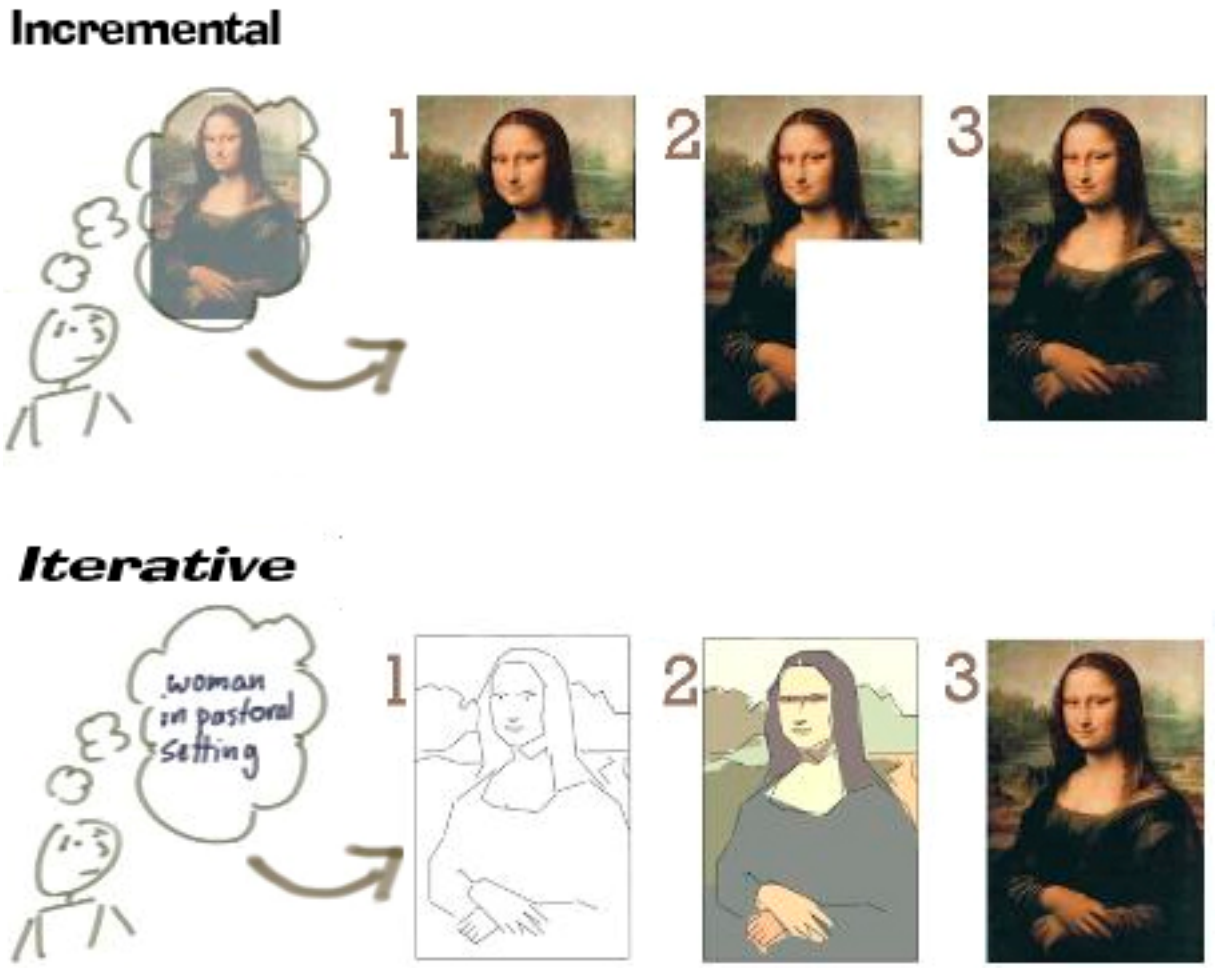
Costly system architecture or design issues may arise because not all requirements are gathered up front for the entire lifecycle

WHEN TO USE ITERATIVE MODEL

When the project is big.

Major requirements must be defined; however, some details can evolve with time.

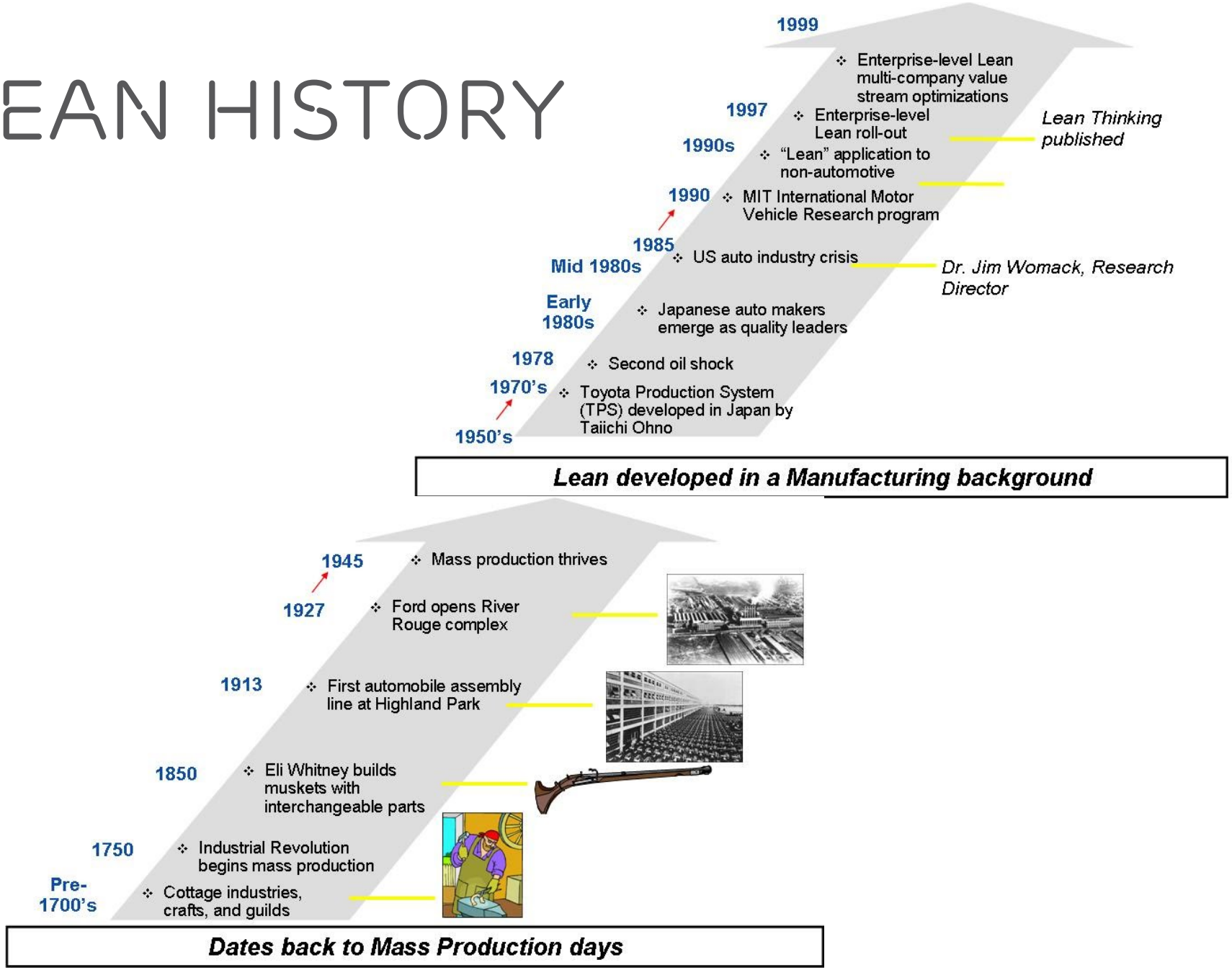
INCREMENTAL VS. ITERATIVE



LEAN

- Lean philosophy regards everything not adding value to the customer as waste

LEAN HISTORY



PRINCIPLES OF LEAN

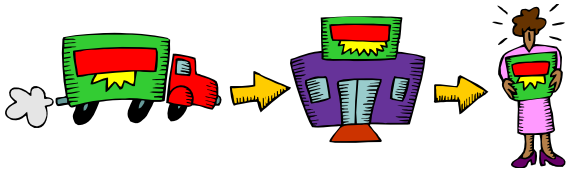
1. Eliminate Waste
2. Build Quality In
3. Create Knowledge
4. Defer Commitment
5. Deliver Fast
6. Respect People
7. Optimize the Whole

ELIMINATE WASTE

What is waste in software?

Any activity or product that does not provide value to customers – anything a customer would not pay for

7 WASTES IN SW DEVELOPMENT



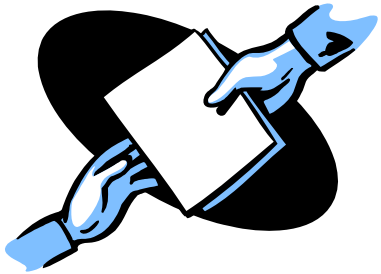
Extra Processes

Extra features

Defects

Partially done work

Task switching



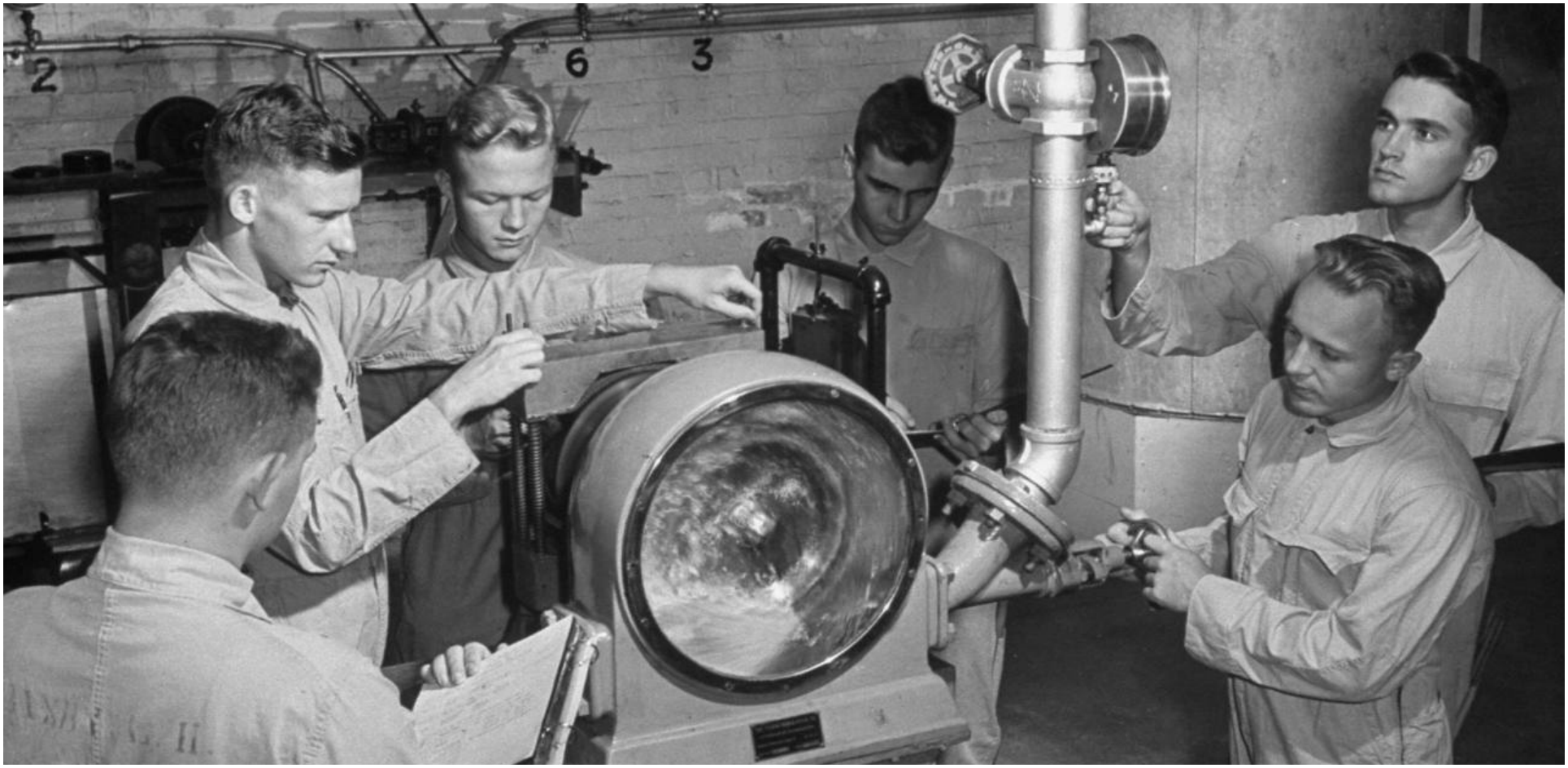
Motion and handover

Waiting & Delays

BUILD QUALITY IN

Cost of fixing a shipped product is much higher then fixing a product that is being build

Think how to test before starting



CREATE KNOWLEDGE

Amplify learning

Share knowledge gained with the whole team

DEFER COMMITMENT

Decide as late as possible

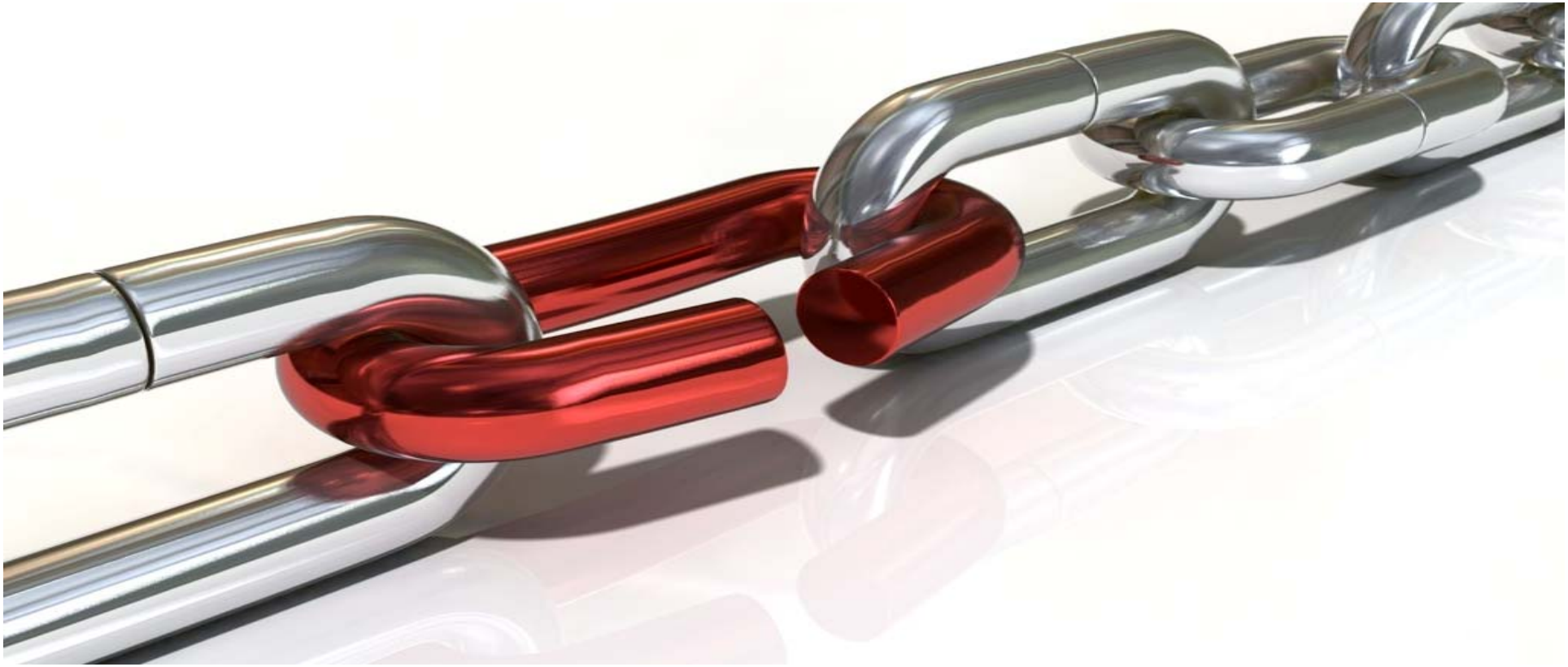
- Keep your options open up to the **last responsible minute**
- Wait until you have better information to make the decision
- Be flexible to react to the changes that will surely happen in the market and in the technology

DELIVER AS FAST AS POSSIBLE

Deliver quickly to maximize return on investment, reduce risk, and get feedback from real customers and users

RESPECT PEOPLE

Empower the team



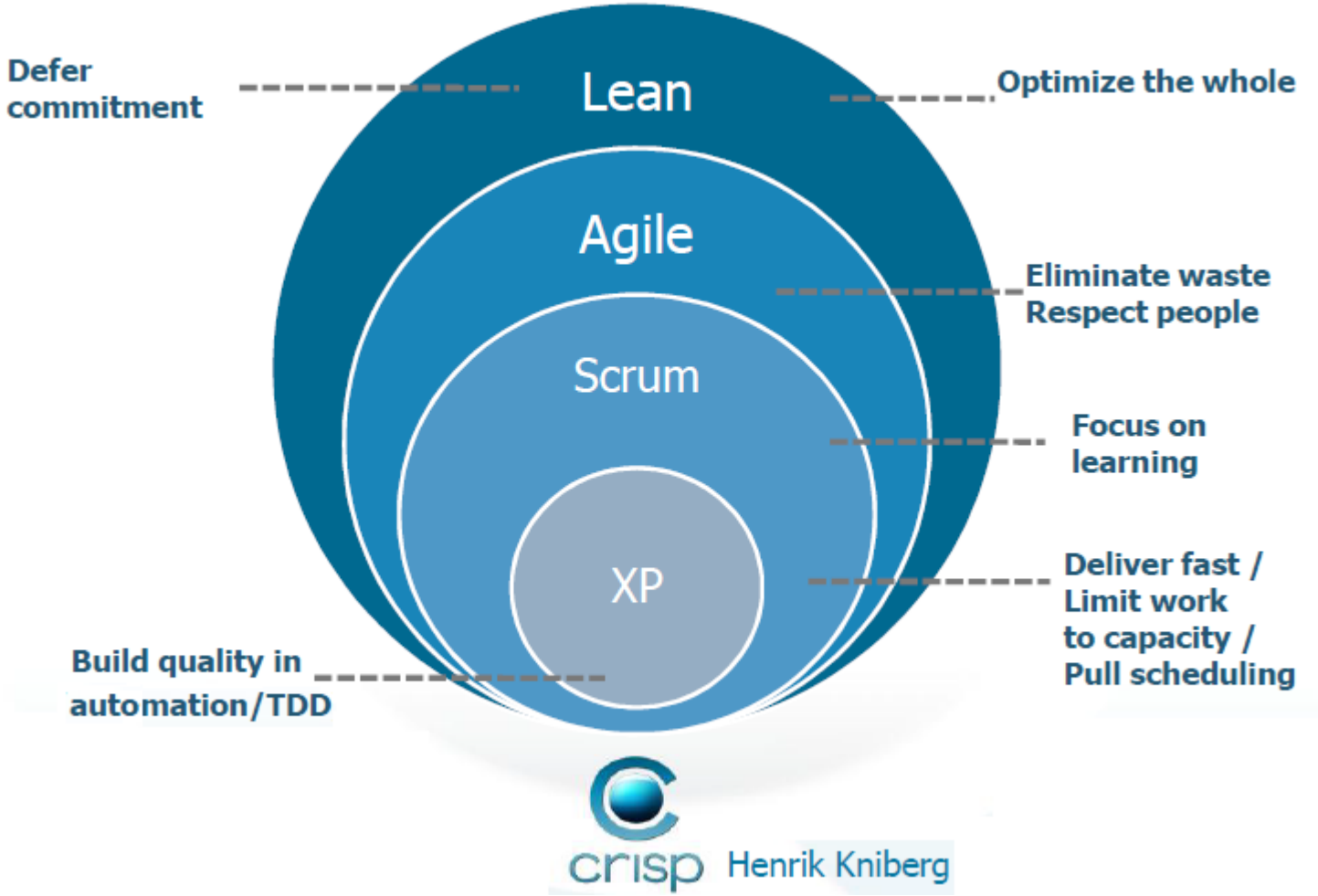
OPTIMIZE THE WHOLE

Improve the entire system

Find weakest link/biggest problem in your whole system and fix that first

More programmers – not enough testers: cannot deliver more value

HOW IT ALL FITS TOGETHER



WATERFALL, AGILE, LEAN