Essence Kernel

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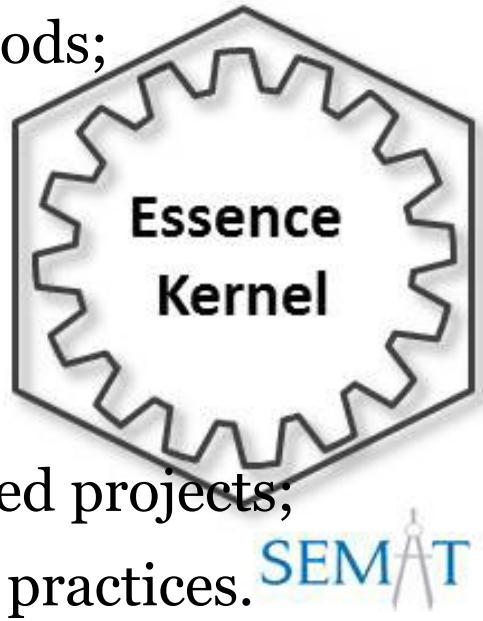
Software Engineering Method And Theory

- A common ground for software engineering
- Moving away from SE methods “fashion” industry.
- Founded in 2009 by:
  - Ivar Jacobson
  - Bertrand Meyer
  - Richard Soley
- OMG Standard under the name Essence
- The SEMAT Kernel – manifestation of the common ground

The Kernel

- comprises the central elements for all SE methods;
- provides a common language for comparing, applying, and improving methods;
- supports progress monitoring;
- works in small- and large-scale projects;
- works for well documented and less documented projects;
- comes with a language and tool for developing practices.
- Uptake in China, Russia, South Africa, Japan, Silicon Valley, Florida, Mexico, Germany



What's in it for us?

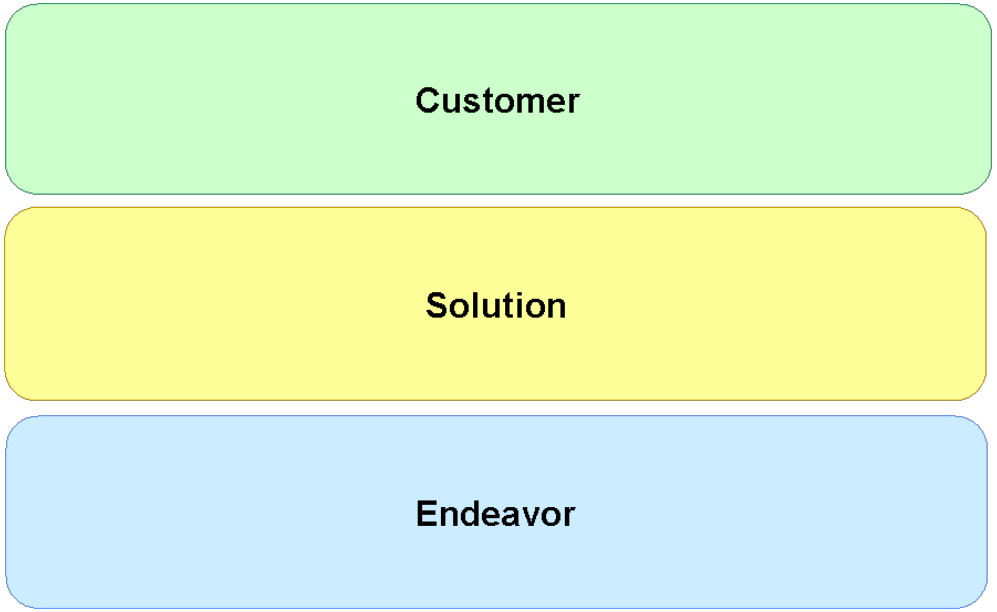
- It is highly probable that this will be used much more in the future.
- By focusing on the Essentials, the project groups have more freedom and responsibility.
- Our students will not become "methodists".
- Taught in TDDE46 Software quality.

Areas of concern

Use and exploitation of the system

Specification and development

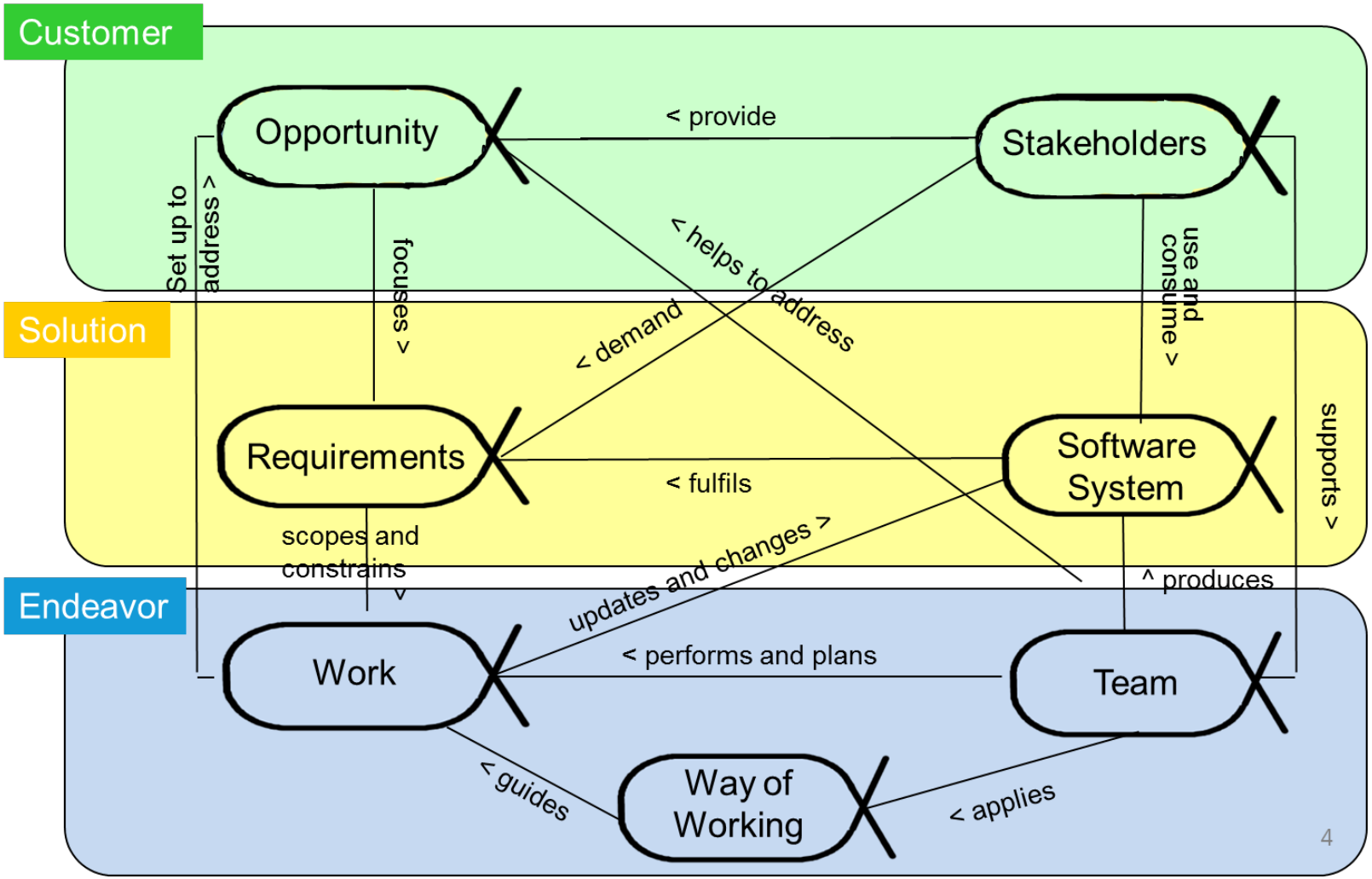
The team and approach of work



What is an ALPHA?

- Alpha is an acronym for an **A**bstract-**L**evel **P**rogress **H**ealth **A**ttribute.
- A critical indicator of things that are most important to monitor and progress.

The Kernel ALPHAs

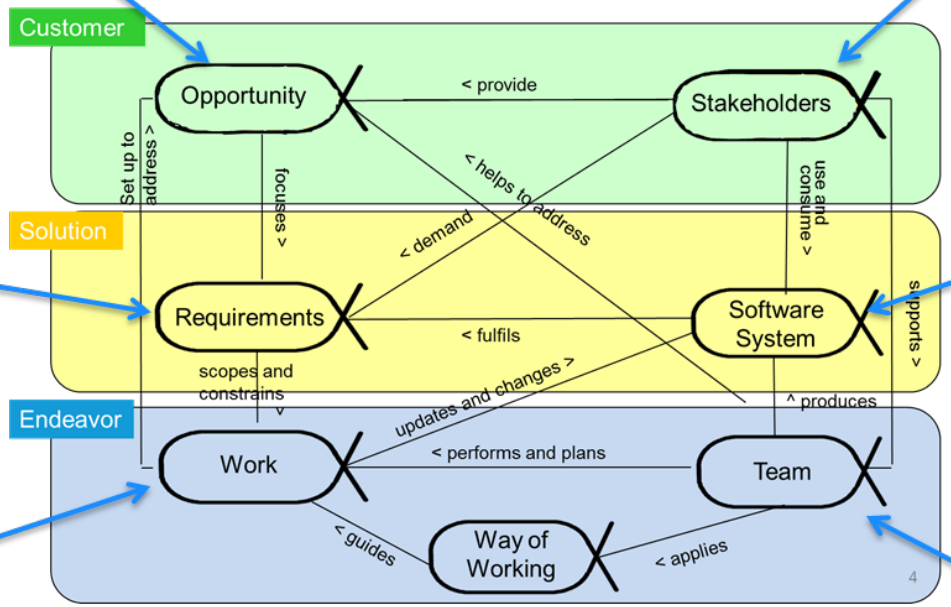


Source of picture: Ivar Jacobson International

Brief explanation

A reason for developing the system. Ex: user need

An agent affected by the system Ex: Customer, project team



What the system must do. Ex: Store data, be usable

The system of hardware, data, and software items. Ex: a TV

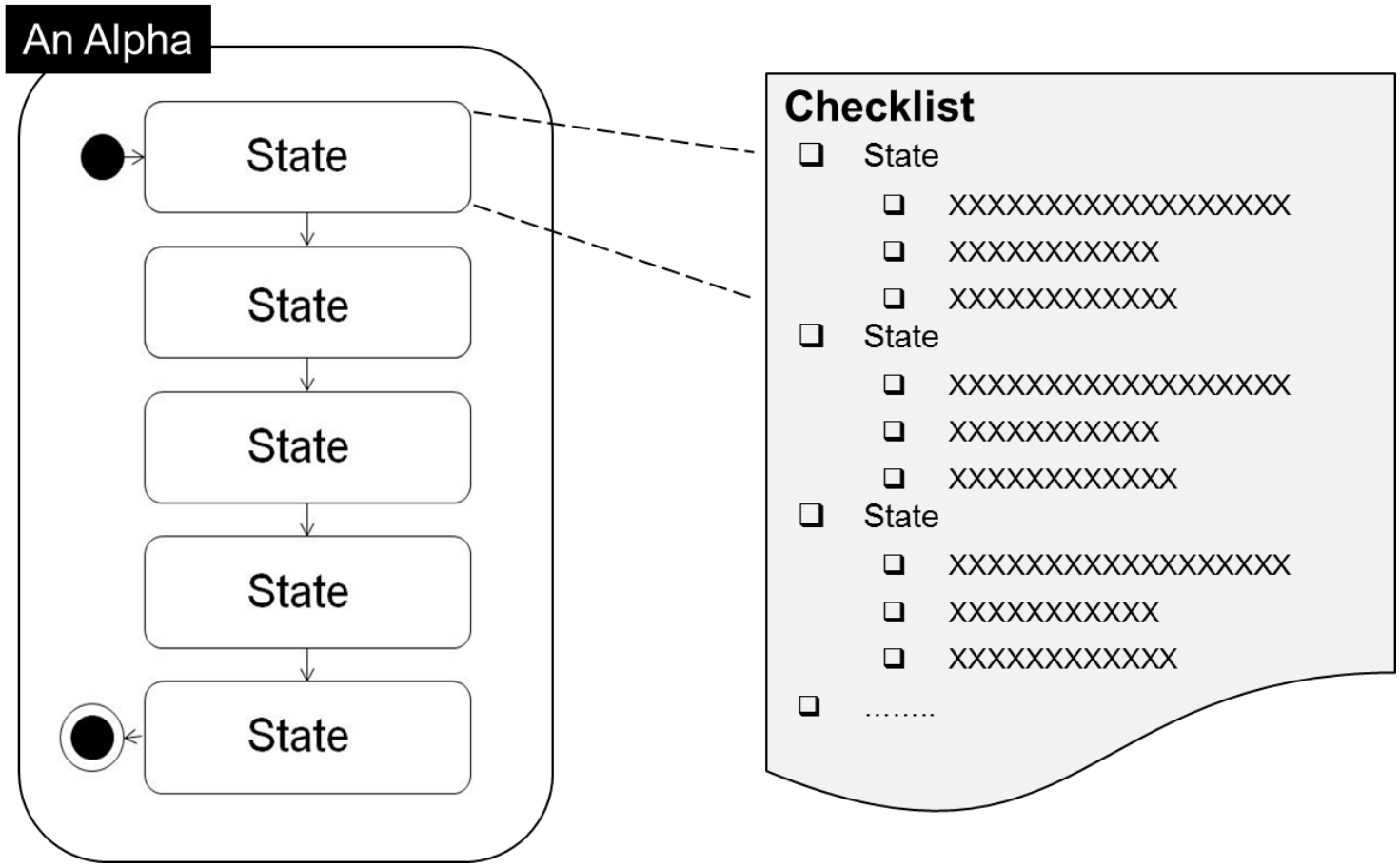
Activity performed. Ex: Test a GUI.

The people engaged in the project. Ex: group 4

Tailored set of practices. Ex: TDD, Kick-off meeting

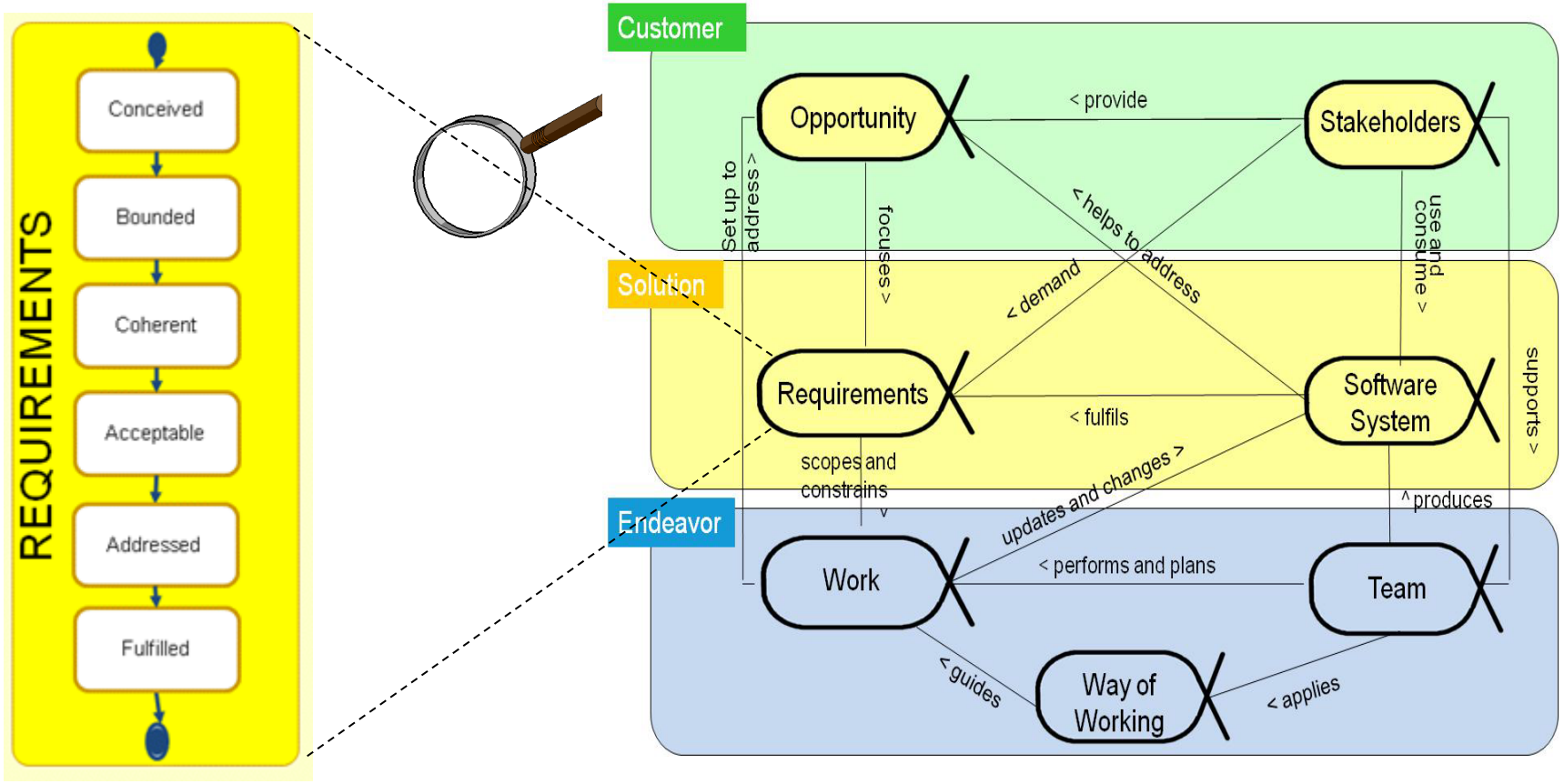
Source of picture: Ivar Jacobson International

The structure of an ALPHA



Source of picture: Ivar Jacobson International

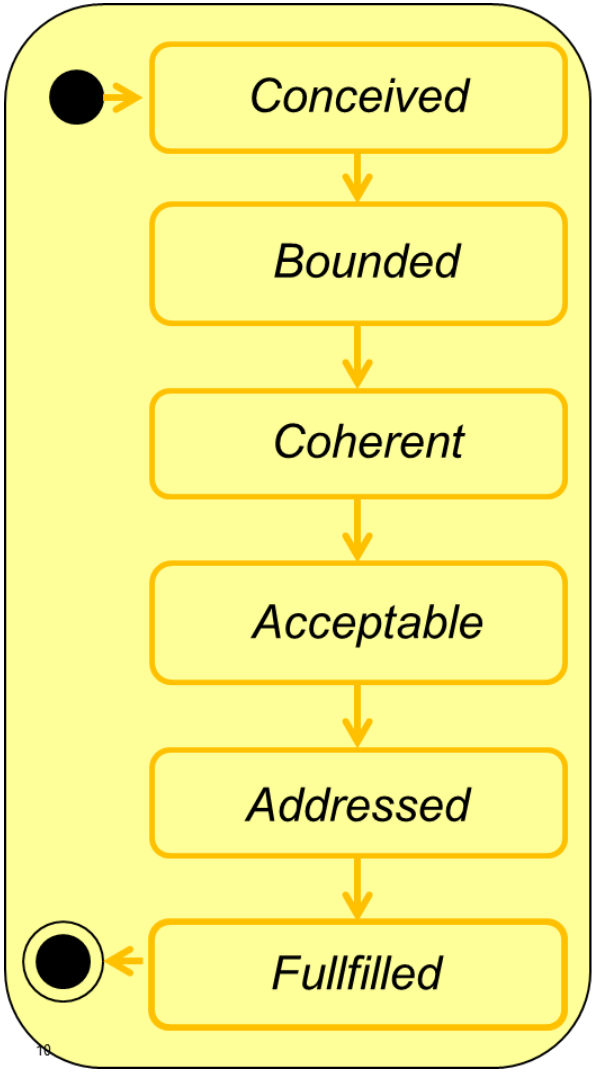
Requirements– one of the alphas



What the software system must do to address the opportunity and satisfy the stakeholders.

Source of picture: Ivar Jacobson International

Requirements – states



The need for a new system has been agreed.

The purpose and theme of the new system are clear.

The requirements provide a coherent description of the essential characteristics of the new system.

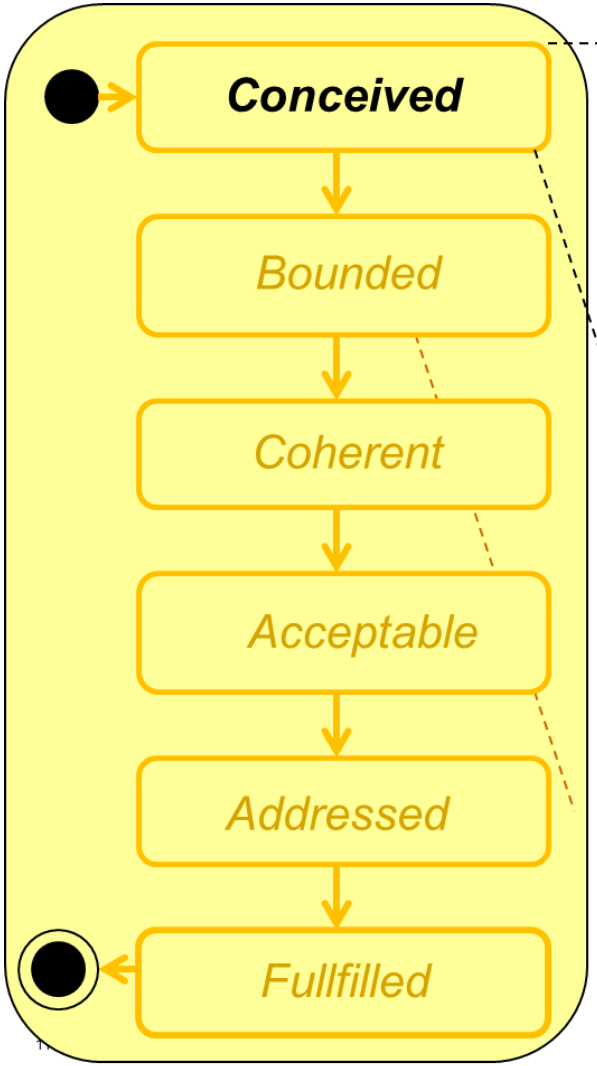
The requirements describe a system that is acceptable to the stakeholders.

Enough of the requirements have been addressed to satisfy the need for a new system in a way that is acceptable to the stakeholders.

The requirements have been addressed to fully satisfy the need for a new system.

Source of picture: Ivar Jacobson International

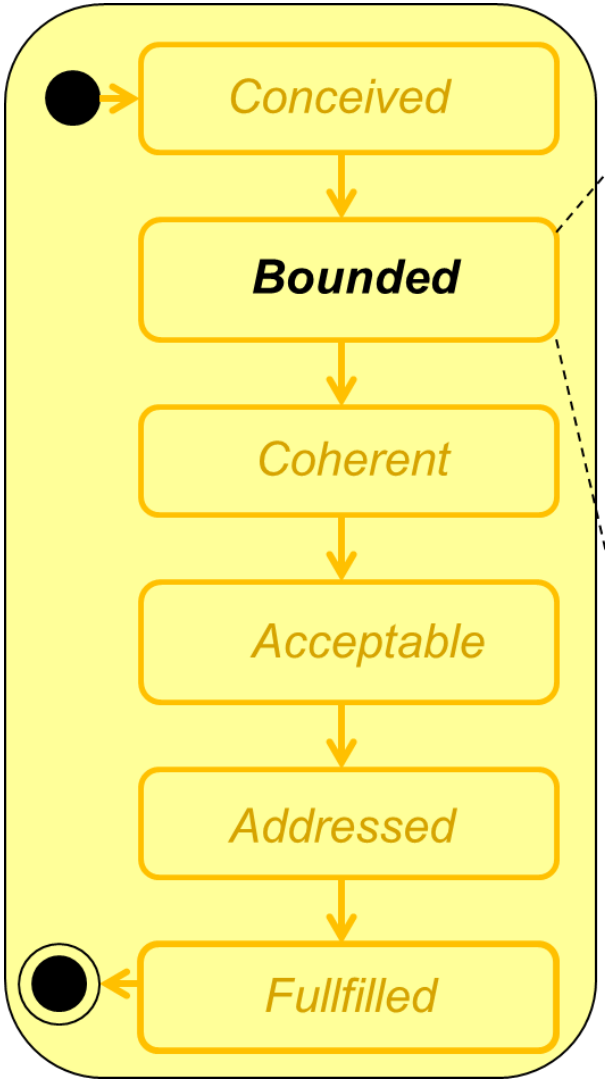
Checklist for requirements states



- *The initial set of stakeholders agrees that a system is to be produced.*
- *The stakeholders that will use the new system are identified.*
- *The stakeholders that will fund the initial work on the new system are identified.*
- *There is a clear opportunity for the new system to address.*

Source of picture: Ivar Jacobson International

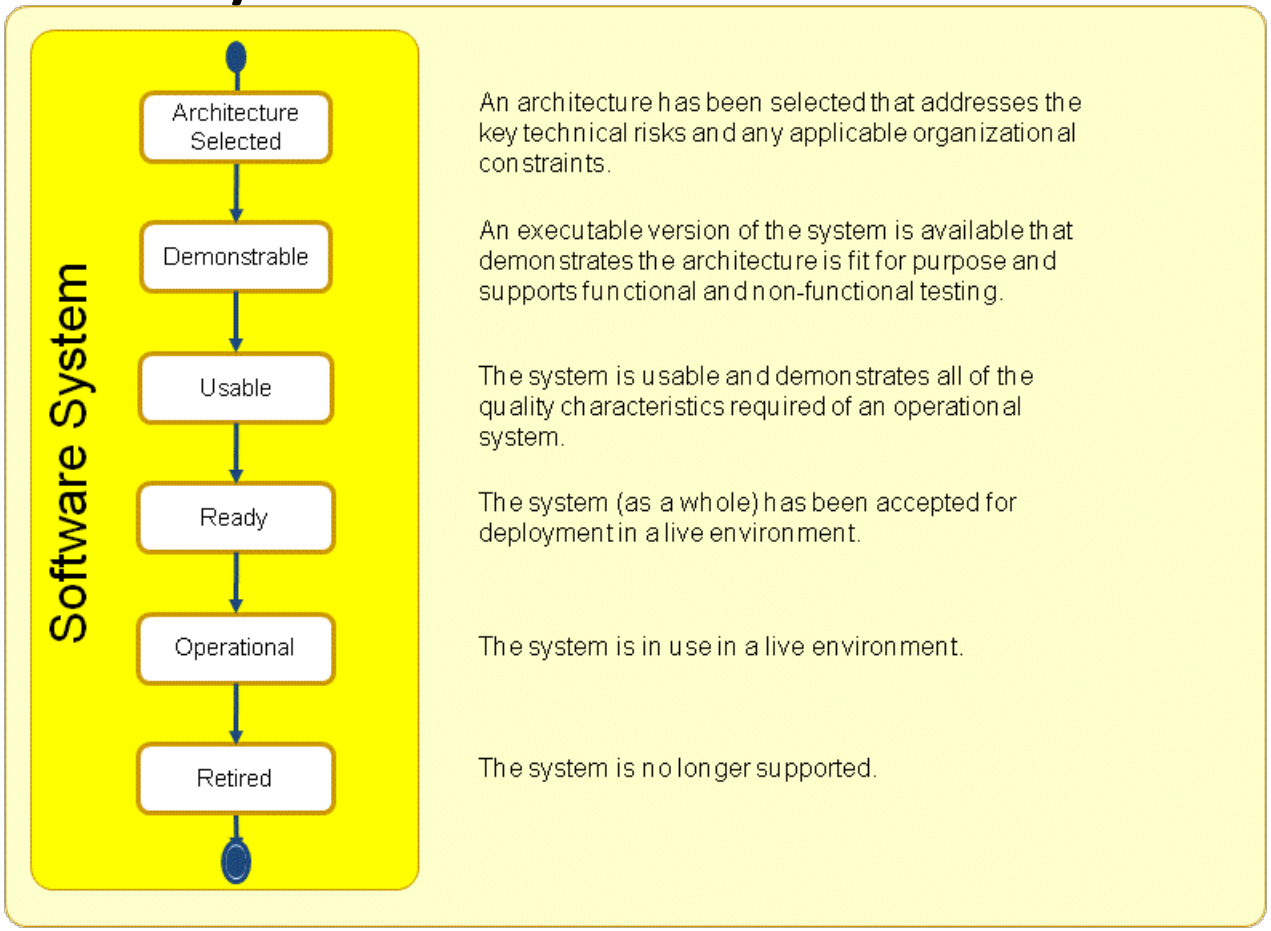
Checklist for requirements states



- *The stakeholders involved in developing the new system are identified.*
- *The stakeholders agree on the purpose of the new system.*
- *It is clear what success is for the new system.*
- *The stakeholders have a shared understanding of the extent of the proposed solution.*
- *The way the requirements will be described is agreed upon.*
- *The mechanisms for managing the requirements are in place.*
- *The prioritization scheme is clear.*
- *Constraints are identified and considered.*
- *Assumptions are clearly stated.*

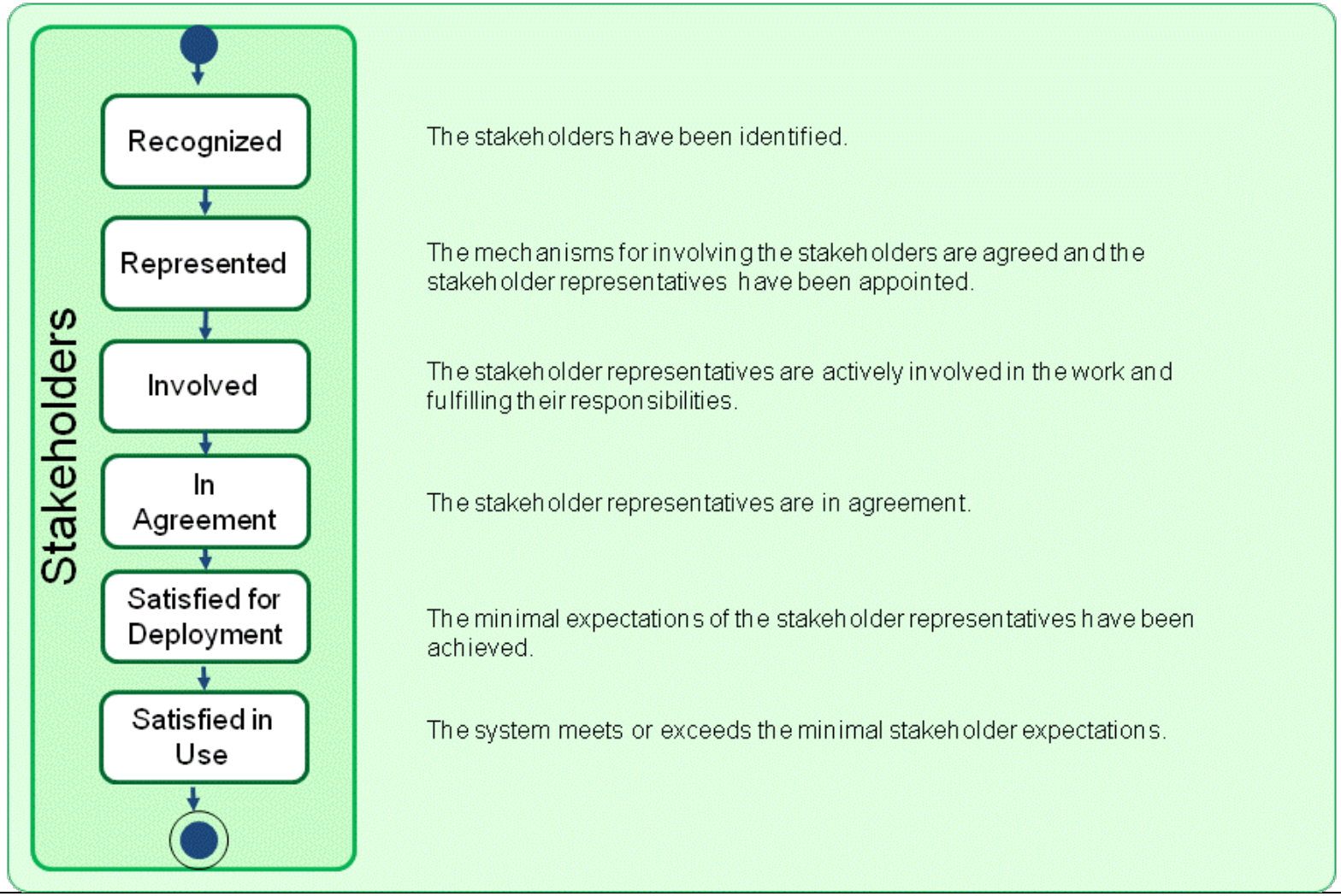
Source of picture: Ivar Jacobson International

Software system



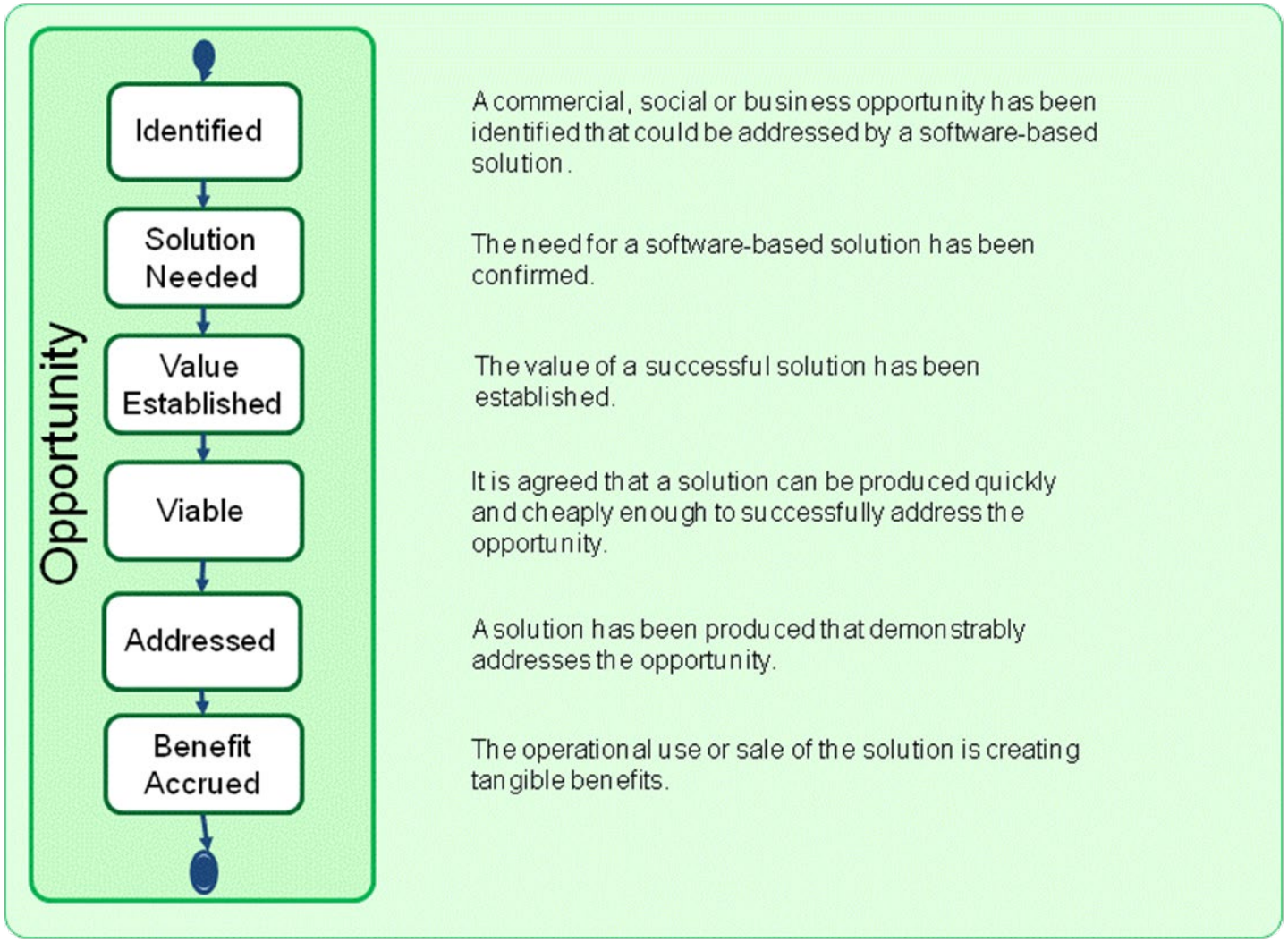
Source of picture: Ivar Jacobson International

Stakeholders



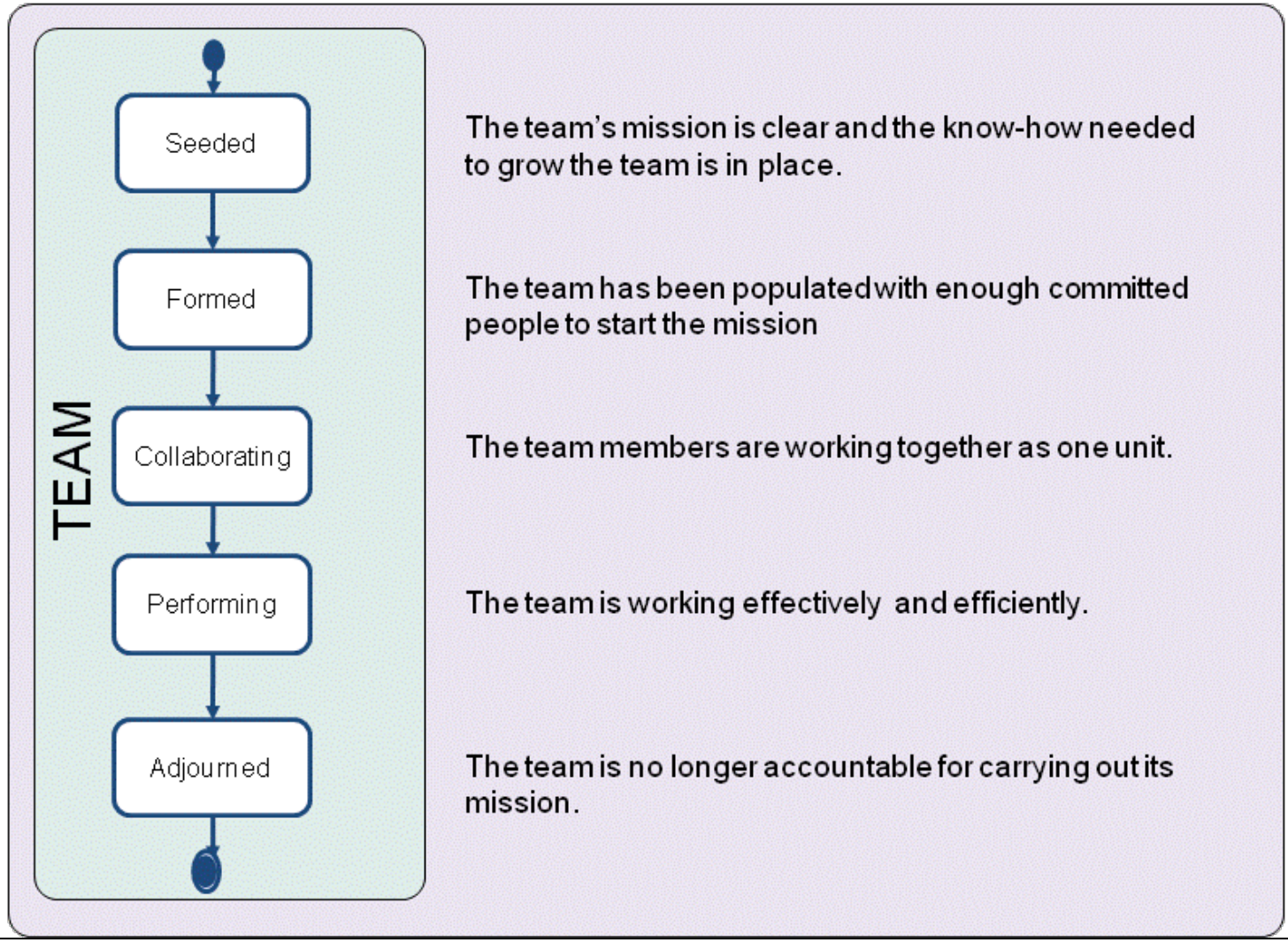
Source of picture: Ivar Jacobson International

Opportunity



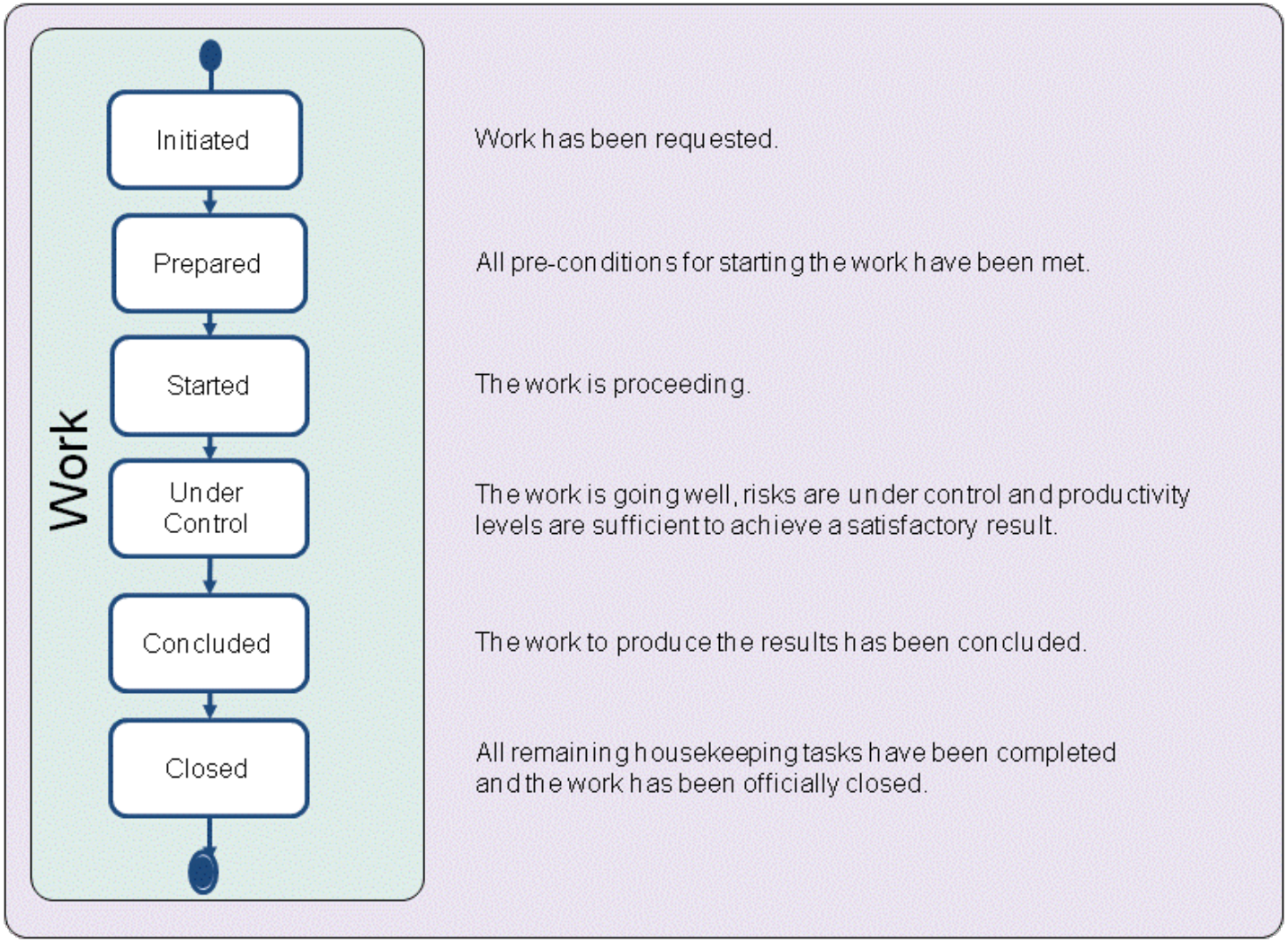
Source of picture: Ivar Jacobson International

Team



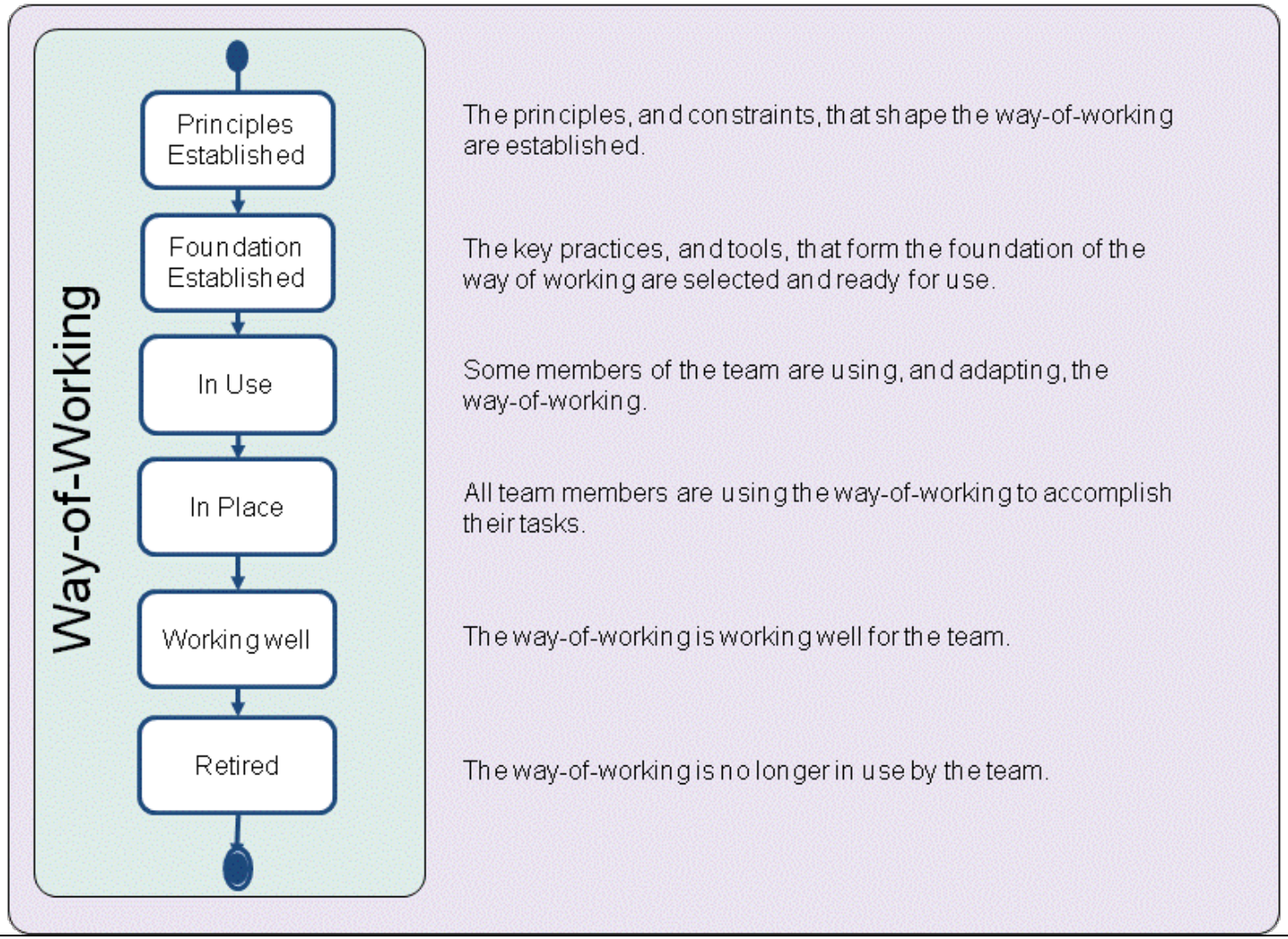
Source of picture: Ivar Jacobson International

Work



Source of picture: Ivar Jacobson International

Way of Working



Source of picture: Ivar Jacobson International

2022-02-14

What is the real situation

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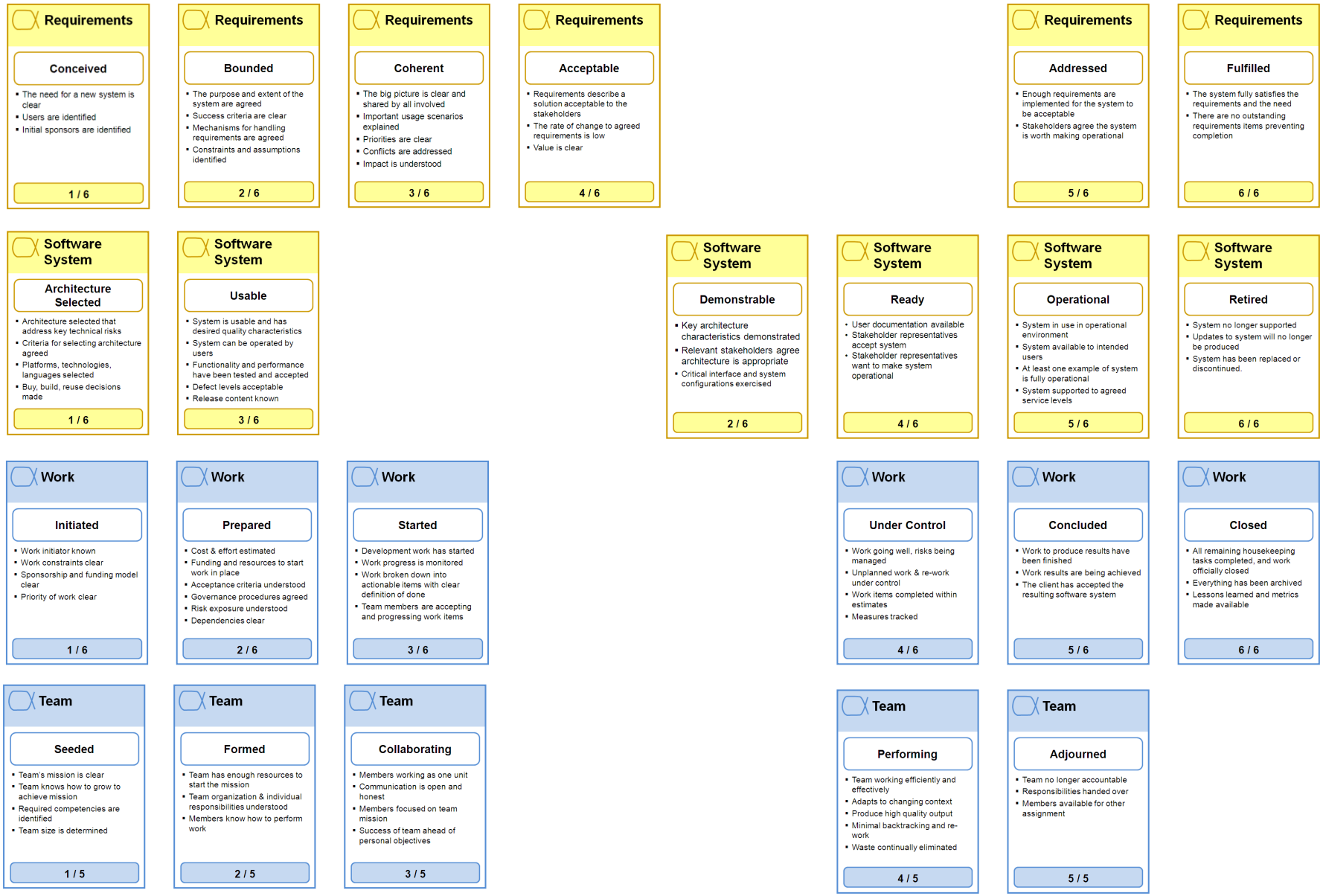
Plan: Determine Current State

Identify States by Applying State Cards



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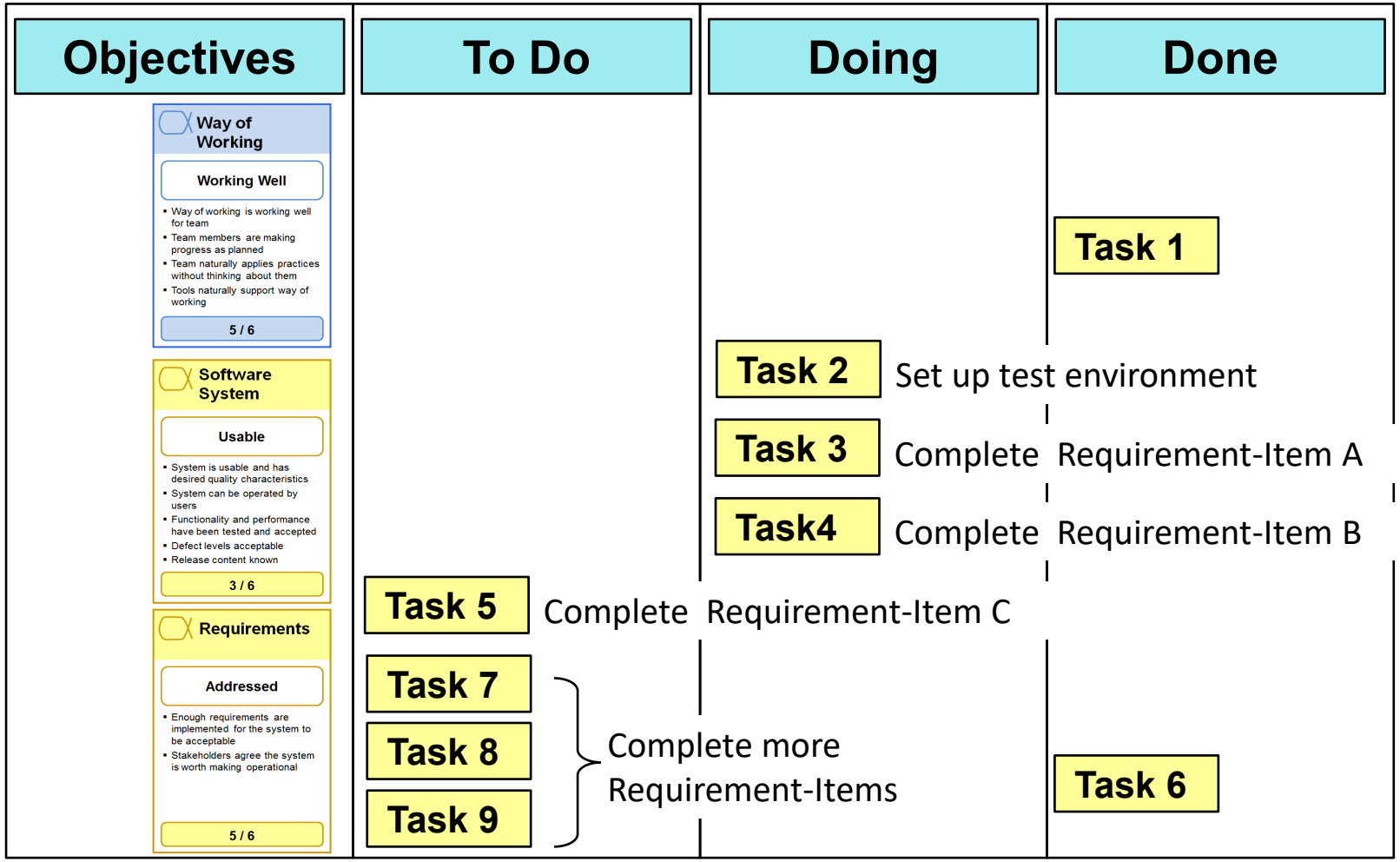
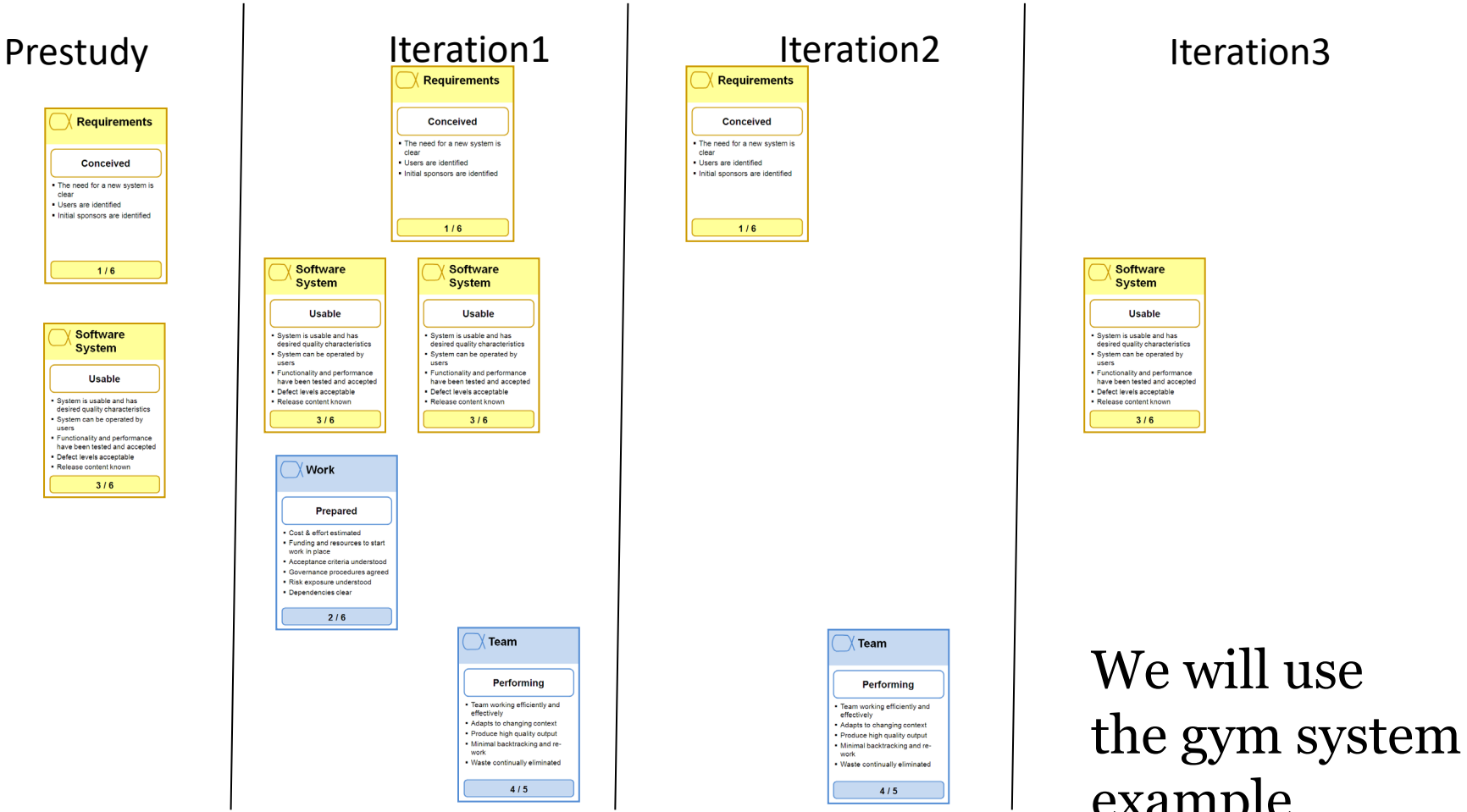
Tasks and Sub-Alphas

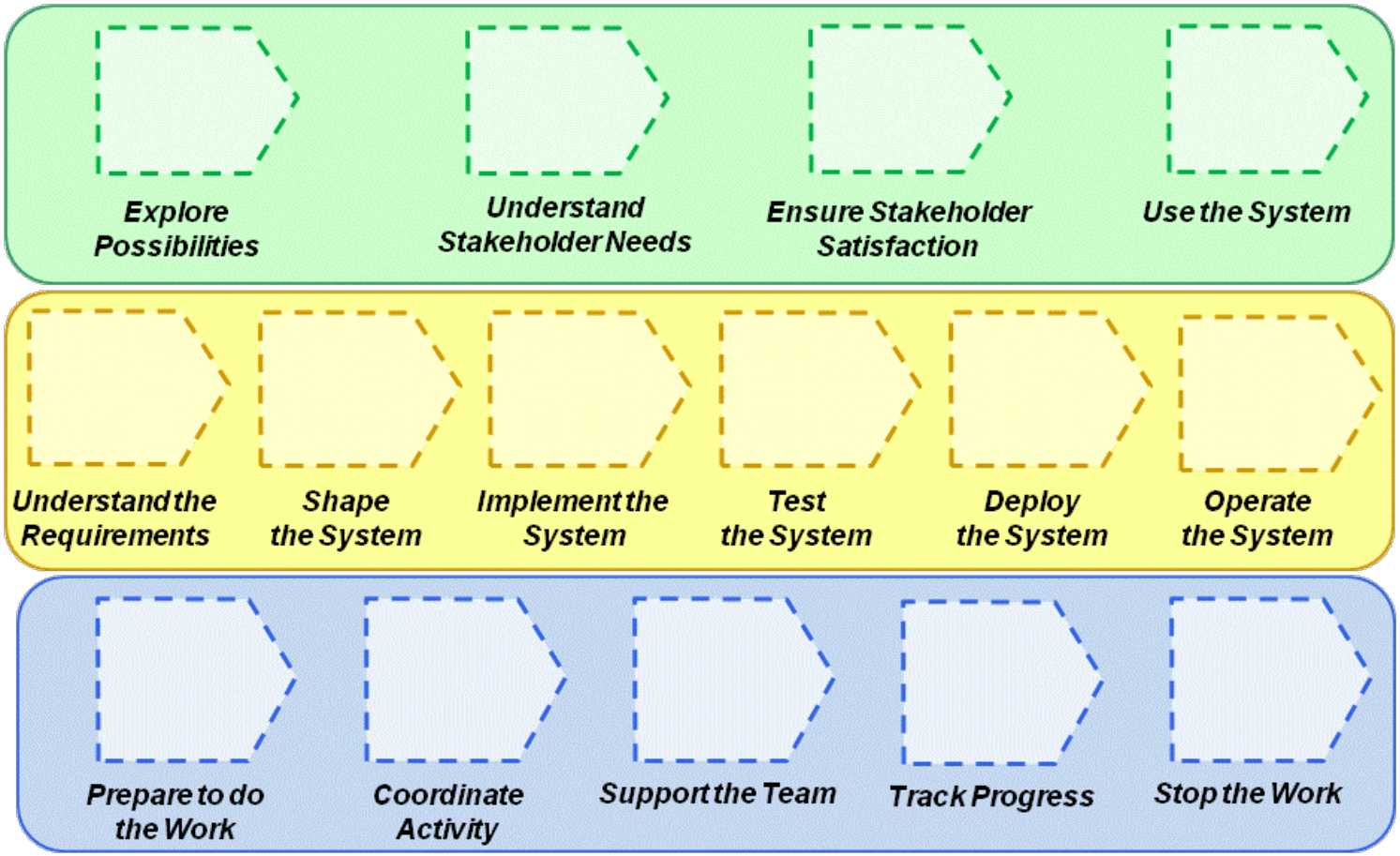


Exercise: How would you like your life-cycle?



We will use the gym system example

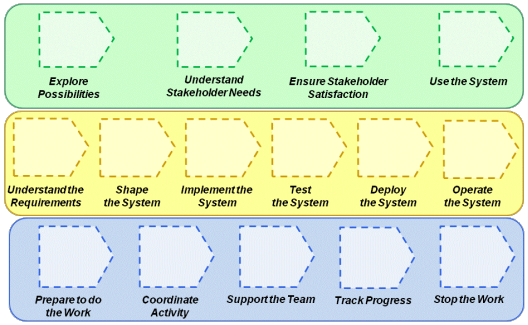
Activity spaces: things to do

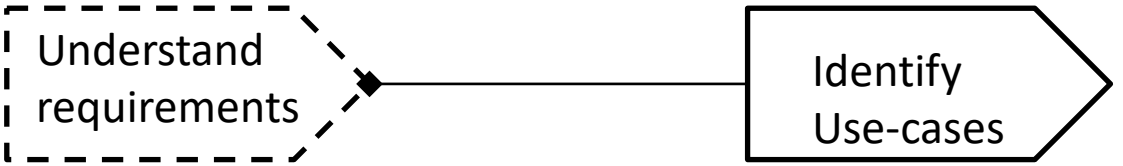


Source of picture: Ivar Jacobson International

Classification of concrete Activities

- From earlier practice and/or theoretical studies





- Some are specified in a document
- Some are specified on a card
- Some are just mentioned
- Some are unspoken, common-ware

Kernel competencies

Source of picture: Ivar Jacobson International

Levels of competencies

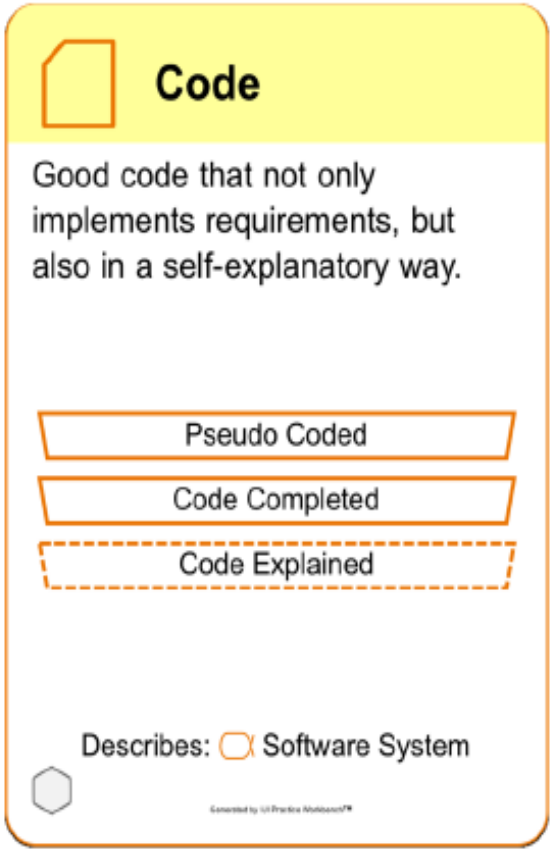
Assists Demonstrates a basic understanding of the concepts and can follow instructions.
Applies Able to apply the concepts in simple contexts by routinely applying the experience gained so far.
Masters Able to apply the concepts in most contexts and has the experience to work without supervision.
Adapts Able to apply judgment on when and how to apply the concepts to more complex contexts. Can enable others to apply the concepts.
Innovates A recognized expert, able to extend the concepts to new contexts and inspire others.

From: Software Engineering Essentialized, rev 2

Practical usage

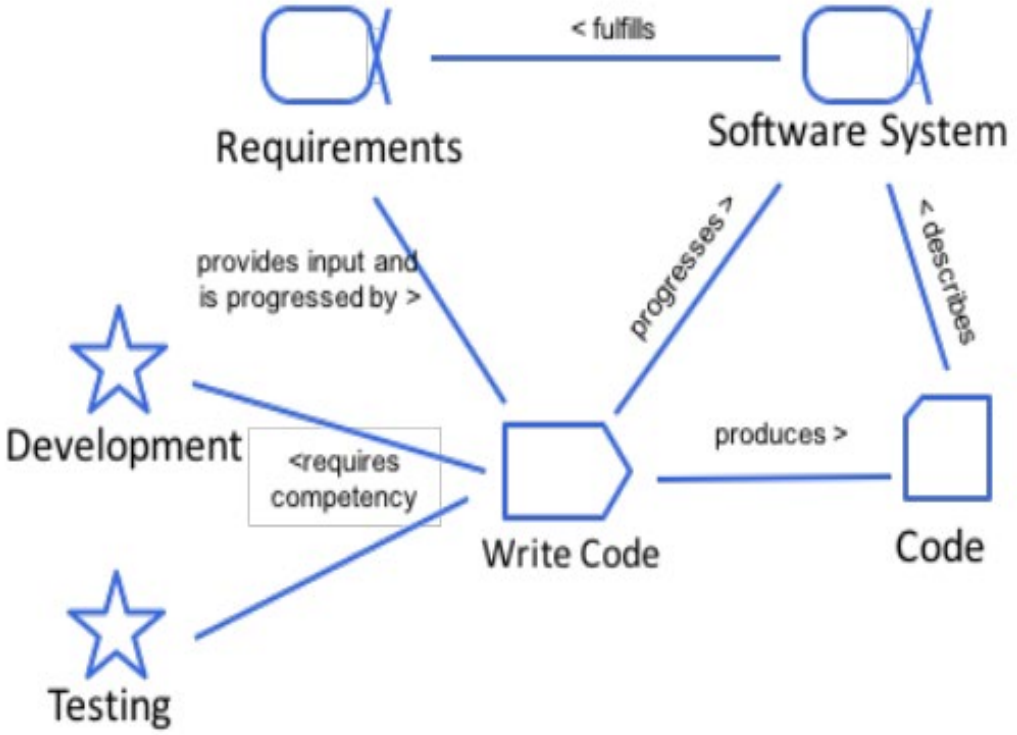
- Make a rating of competency levels needed for the roles
- Make an (honest) individual rating
- Assign the best-fit roles
- Make a gap analysis
- Develop an education plan

Work product



From: Software Engineering Essentialized, rev 2

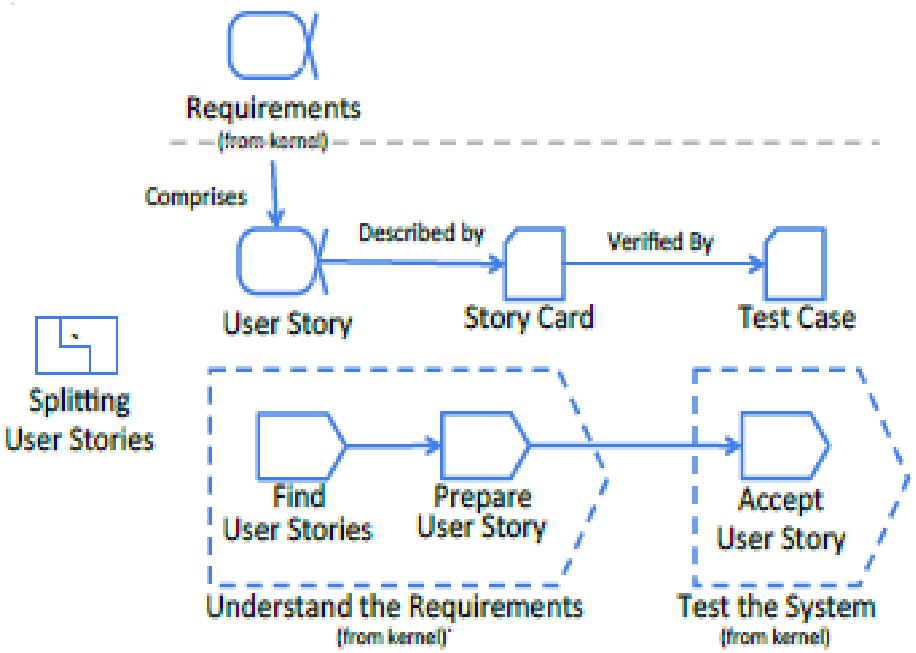
Snap-shot of relations between elements



Exercise: Essentializing a practice

- *A repeatable approach to doing something with a specific purpose in mind*
- Identify elements
- Identify things to watch, the alphas
- Draft relationships
- Add details
- Produce cards

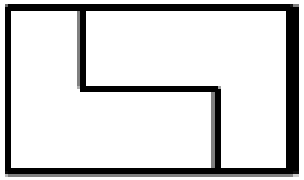
Example: User story



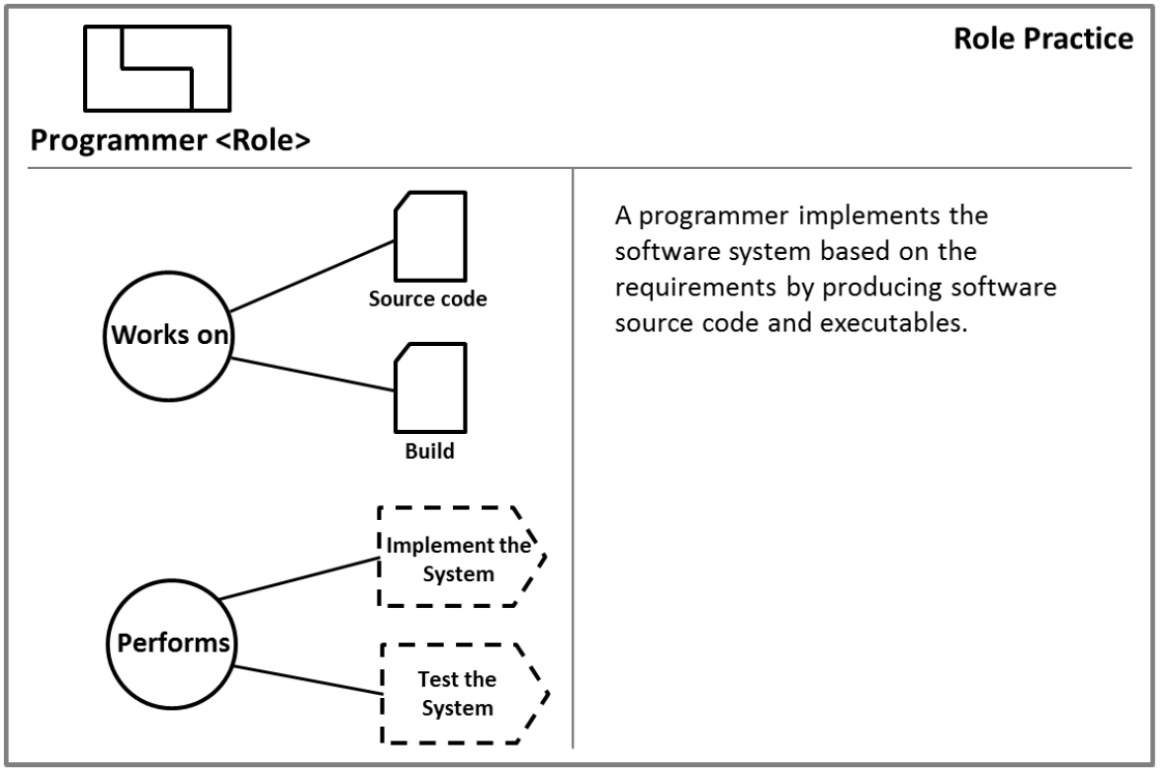
From: Software Engineering Essentialized, rev 2

Patterns describe (complex) solutions to typical problems

- Structure, e.g. organization of working space
- Resources, e.g. tools
- Roles, e.g programmer
- Checkpoints, e.g. a mile stone



Example of a role pattern card



Exercise: Describe the practice of having a kick-off meeting

Exercise: Describe the practice of automated unit testing

Good links

- Material:

http://www.software-engineering-essentialized.com/home

The standard:

https://www.omg.org/spec/Essence/

- Browse the library of Essence 365:

https://practicelibrary.ivarjacobson.com/start

(read-only, requires login)

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