

# How Can You Support Your Software Development Method with Essence?



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# Agenda

- Part 1: Introduction
  - SEMAT and Essence
  - Essence Kernel
- Part 2: Using the Kernel
  - Scenario on Solving Pain Points
- Part 3: Exercising the Kernel
- Part 4: The value of the Kernel
- Part 5: Kernel cont. & Kernel Extensions

# Acknowledgements

This material has been developed by the following SEMAT members:

- Paul E. McMahon, PEM Systems, USA
- Maria Augusta Nelson, Pontifical Catholic University of Minas Gerais, Brazil
- Cecile Peraire, Carnegie Mellon University
- Mira Kajko-Mattsson, KTH Royal Institute of Technology
- Barry Myburgh, Johannesburg Centre for Software
- Winnifred Menezes, Addalot Consulting AB
- Bob Palank, St. Louis Community College
- Ivar Jacobson, IJI
- PanWei NG, IJI
- Ian Spence, IJI

# SEMAT: Software Engineering Method and Theory

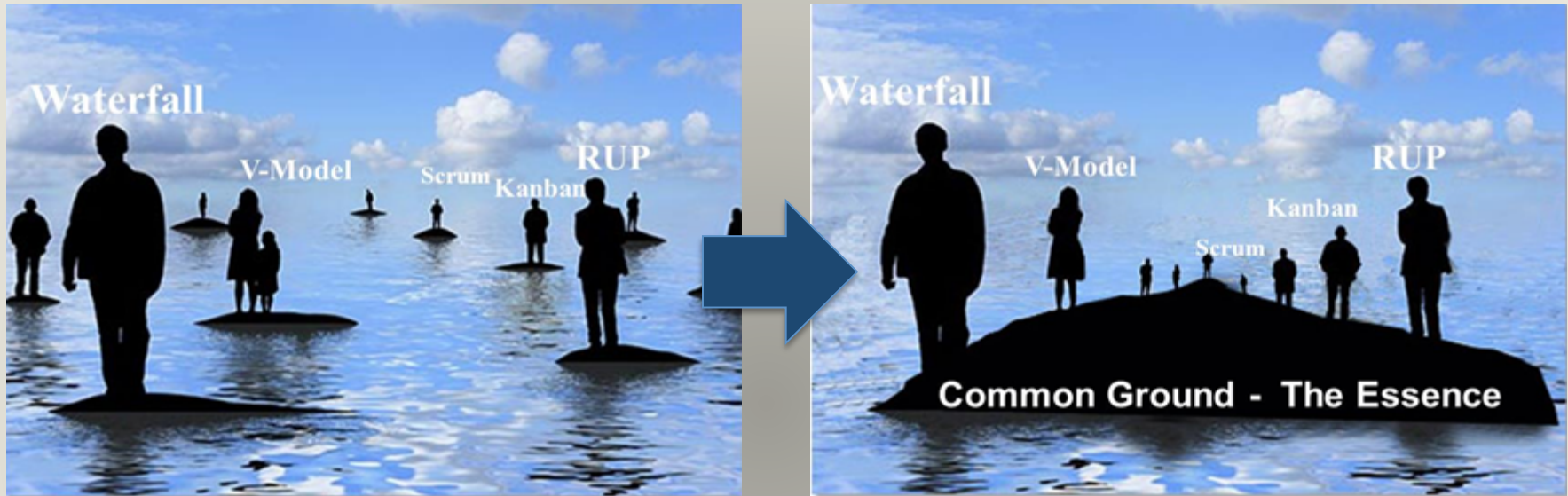


**Founded by** Ivar Jacobson, Bertrand Meyer, Richard Soley in 2009



Re-founded software engineering as a rigorous discipline based on a general theory of software engineering and a unifying process framework

# Common Ground



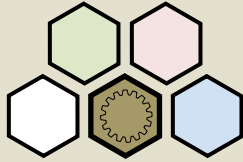
Everyone of us knows how to develop our own software, but as a community we have no widely accepted common ground

# Measures

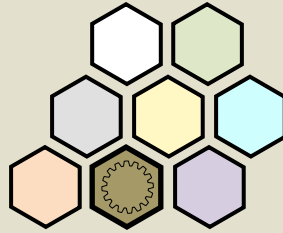
**Find a kernel of  
widely agreed  
elements**

# What is Essence?

## Methods

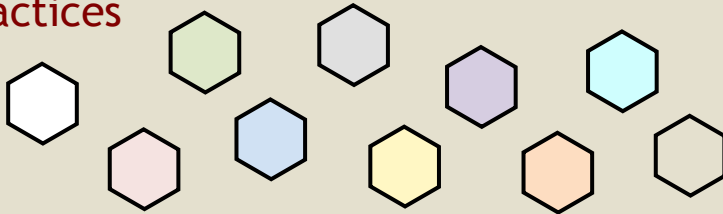


Custom Method M



Custom Method N

## Practices



## Kernel

Essence Kernel



## Language

Essence Language



**Essence - Kernel and Language for  
Software Engineering Methods**

<http://www.omg.org/spec/Essence/Current>

**Method Architecture**

# Mira and SEMAT

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**India Chapter is on its way**

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### Web Site Track

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### User Guide Track

### Practice Development Track



# SEMAT Newsletter

semat.org

**SEMAT**

Welcome Newsletter

01/09/2014 2014-3

In this issue:

- Use of the Kernel Has Become a Real Success
- Semat Area Reports
  - Education Area
  - User Guide Track in the Practice Area
- Chapter Reports
  - Japan Chapter
  - Korea Chapter
  - South Africa Chapter
  - Latin America Chapter

**SEMAT**

Welcome Newsletter

**Use of the Kernel Has Become a Real Success**

The field study of the SEMAT Essence framework investigates the final software development projects. The study was conducted at Carnegie distributed graduate student teams working on different industrial projects generally accepted practices, mostly from Scrum and XP.

The result of the study was very positive. Since the kernel is method agnostic different teams' states could be understood and projects at risk identified program managers, with a standardized way of understanding the state of

Eighty percent of all participants said they would use the SEMAT kernel provides a structured way of thinking about critical aspects of the project, of these aspects: "Essence is great for team reflection and risk management of the practitioners course noted "such better early project organization will

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- Chapter Reports
  - Japan Chapter
  - Russian Chapter
  - South Africa Chapter
  - Latin America Chapter
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  - User Guide Track in the Practice Area
  - Education Area

The study was presented during the LACKEST 2014 key at: <http://www.student.org/aircraft/w/semat-se-education-lackest-2014-key/>

**Moving Forward Semat**

Moving forward SEMAT should address some new areas. We laid out by Essence, the emerging standard, and thus develop you believe that the supporters wish us to both broaden and deepen

**Education Area**

The Education Area is in the process of creating hands-on exercises to be used by the novice learners. So far, it has created the first version of an exercise called "Lady Bug". The exercise deals with a private kindergarten, Lady Bug, that has commissioned a small software company to develop a kindergarten administrative tool. The exercise is already available for use and may be retrieved at <http://semat.org/wp-content/uploads/2014/02/Lady-Bug-exercise-RELEASE-1.pdf>

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**Broader means that areas other than software engineering w engineering, high-school education. In other words, areas deals**

Right now, we continue working on the area of software engine have submitted for publication a paper titled "Scrum Powered by practice is enabled and enhanced using the Essence kernel and foundation for defining software engineering practices. These potential gaps, make needed practice improvements, and assist team. In addition, by providing practical checklists, as opposed something the team uses on a daily basis. This is a fundamental method description seems to dominate as opposed to method us

June Sung Park, Ivar Jacobson, Barry Myburgh and Ponnus Jola Tomorrow-An Industrial Perspective". The paper was presented paper provides an historical overview of where SEMAT started, future. The paper is aimed primarily at readers from Industry, theory, the paper does little to develop discussion about theory.

The first meeting of the Board of Directors (BoD) of SEMAT Inc. BoD members - Drs. Ivar Jacobson, Paul Nielsen and Martin G Secretary Paul McMahon and Treasurer Cecile Praire. The BoD SEMAT Inc.

The OMG Essence Finalization TF is currently going through v world. The final revised version is likely to be approved by the becomes a formal standard specification for the Kernel and Lan

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**OMG Board of Directors Announce**

On June 16, 2014, the Object Management Group (OMG) announced the formation of the Object Management Group (OMG) Board of Directors (BoD) to oversee the development of the Object Management Group (OMG) Standard Specification for the Kernel and Language for Software Development (KLS).

"We're very excited that Essence has found a home in the OMG and language, Essence allows practitioners to get it through the OMG technology adoption process."

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Welcome Newsletter

**SEMAT Newsletter**

In this issue:

- Breaking News! Essence has become an OMG Standard
- SEMAT Events
  - Inauguration of India SEMAT Chapter
  - Initial Essence Training Certification Process Announced
  - GTSE and Essence Tutorial at ICSE 2014
- SEMAT Chapter Reports

**BRN**

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Welcome Newsletter

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**Industry discovers Essence**

Until the Essence standard was adopted in June it was hard for the industry to get any concrete value out of SEMAT. Now, however, many large and well-known companies are getting more and more engaged and are introducing Essence in their teams at different levels. Typically for these engagements, there is interest both at the team level and at the executive level. The executives see great value in the lightweight governance that Essence provides and in being able to accommodate the teams with a practice library from which they can mix and match practices that work for them. The developers are interested in being able to independently measure progress of the practices they use and in being able to learn from other teams in a systematic way.

We are now working with a rather large set of potential adopters. Some of them are:

- A company owning one of the most popular web sites in the world. The task is to evaluate Essence and SEMAT in a team.
- A national transportation company. It is about agile but not just as a craft but as an engineering discipline.
- A large service provider who has invested in the practice-based approach over several years is now seeing great progress and is going to scale up.
- One of the largest outsourcing companies in the world. The team to start is the company's process organization interested in the lightness of Essence and its support for agility in an engineering manner.
- A global telecom equipment vendor is using the practice-based approach supported by Essence.
- One of the most innovative product companies in the world, which is, in particular, interested in Industrial internet.
- One of the largest financial institutions in the world.

Most likely several of these critical engagements will turn into adoption.

Mira Kajko-Mattsson

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# Essence Cards



- What types of cards can you see?
- What do you think they are for?
- Is there any type missing?
- Does the colour of the cards indicate anything?

# Some essential things to work with - Alphas

## Requirements

Requirements	Requirements	Requirements	Requirements	Requirements	Requirements
<p><b>Conceived</b></p> <ul style="list-style-type: none"> <li>The need for a new system is clear</li> <li>Users are identified</li> <li>Initial sponsors are identified</li> </ul> <p>1 / 6</p>	<p><b>Bounded</b></p> <ul style="list-style-type: none"> <li>The purpose and extent of the system are agreed</li> <li>Success criteria are clear</li> <li>Mechanisms for handling requirements are agreed</li> <li>Constraints and assumptions identified</li> </ul> <p>2 / 6</p>	<p><b>Coherent</b></p> <ul style="list-style-type: none"> <li>The big picture is clear and shared by all involved</li> <li>Important usage scenarios explained</li> <li>Priorities are clear</li> <li>Conflicts are addressed</li> <li>Impact is understood</li> </ul> <p>3 / 6</p>	<p><b>Acceptable</b></p> <ul style="list-style-type: none"> <li>Requirements describe a solution acceptable to the stakeholders</li> <li>The rate of change to agreed requirements is low</li> <li>Value is clear</li> </ul> <p>4 / 6</p>	<p><b>Addressed</b></p> <ul style="list-style-type: none"> <li>Enough requirements are implemented for the system to be acceptable</li> <li>Stakeholders agree the system is worth making operational</li> </ul> <p>5 / 6</p>	<p><b>Fulfilled</b></p> <ul style="list-style-type: none"> <li>The system fully satisfies the requirements and the need</li> <li>There are no outstanding requirements items preventing completion</li> </ul> <p>6 / 6</p>

## Software System

Software System	Software System	Software System	Software System	Software System	Software System
<p><b>Architecture Selected</b></p> <ul style="list-style-type: none"> <li>Architecture selected that address key technical risks</li> <li>Criteria for selecting architecture agreed</li> <li>Platforms, technologies, languages selected</li> <li>Buy, build, reuse decisions made</li> </ul> <p>1 / 6</p>	<p><b>Usable</b></p> <ul style="list-style-type: none"> <li>System is usable and has desired quality characteristics</li> <li>System can be operated by users</li> <li>Functionality and performance have been tested and accepted</li> <li>Defect levels acceptable</li> <li>Release content known</li> </ul> <p>3 / 6</p>	<p><b>Demonstrable</b></p> <ul style="list-style-type: none"> <li>Key architecture characteristics demonstrated</li> <li>Relevant stakeholders agree architecture is appropriate</li> <li>Critical interface and system configurations exercised</li> </ul> <p>2 / 6</p>	<p><b>Ready</b></p> <ul style="list-style-type: none"> <li>User documentation available</li> <li>Stakeholder representatives accept system</li> <li>Stakeholder representatives want to make system operational</li> </ul> <p>4 / 6</p>	<p><b>Operational</b></p> <ul style="list-style-type: none"> <li>System in use in operational environment</li> <li>System available to intended users</li> <li>At least one example of system is fully operational</li> <li>System supported to agreed service levels</li> </ul> <p>5 / 6</p>	<p><b>Retired</b></p> <ul style="list-style-type: none"> <li>System no longer supported</li> <li>Updates to system will no longer be produced</li> <li>System has been replaced or discontinued.</li> </ul> <p>6 / 6</p>

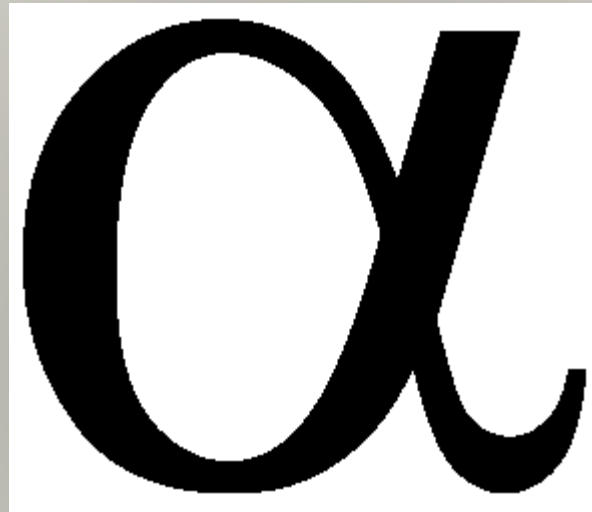
## Work

Work	Work	Work	Work	Work	Work
<p><b>Initiated</b></p> <ul style="list-style-type: none"> <li>Work initiator known</li> <li>Work constraints clear</li> <li>Sponsorship and funding model clear</li> <li>Priority of work clear</li> </ul> <p>1 / 6</p>	<p><b>Prepared</b></p> <ul style="list-style-type: none"> <li>Cost &amp; effort estimated</li> <li>Funding and resources to start work in place</li> <li>Acceptance criteria understood</li> <li>Governance procedures agreed</li> <li>Risk exposure understood</li> <li>Dependencies clear</li> </ul> <p>2 / 6</p>	<p><b>Started</b></p> <ul style="list-style-type: none"> <li>Development work has started</li> <li>Work progress is monitored</li> <li>Work broken down into actionable items with clear definition of done</li> <li>Team members are accepting and progressing work items</li> </ul> <p>3 / 6</p>	<p><b>Under Control</b></p> <ul style="list-style-type: none"> <li>Work going well, risks being managed</li> <li>Unplanned work &amp; re-work under control</li> <li>Work items completed within estimates</li> <li>Measures tracked</li> </ul> <p>4 / 6</p>	<p><b>Concluded</b></p> <ul style="list-style-type: none"> <li>Work to produce results has started being finished</li> <li>Work results are being achieved</li> <li>The client has accepted the resulting software system</li> </ul> <p>5 / 6</p>	<p><b>Closed</b></p> <ul style="list-style-type: none"> <li>All remaining housekeeping tasks completed, and work officially closed</li> <li>Everything has been archived</li> <li>Lessons learned and metrics made available</li> </ul> <p>6 / 6</p>

## Team

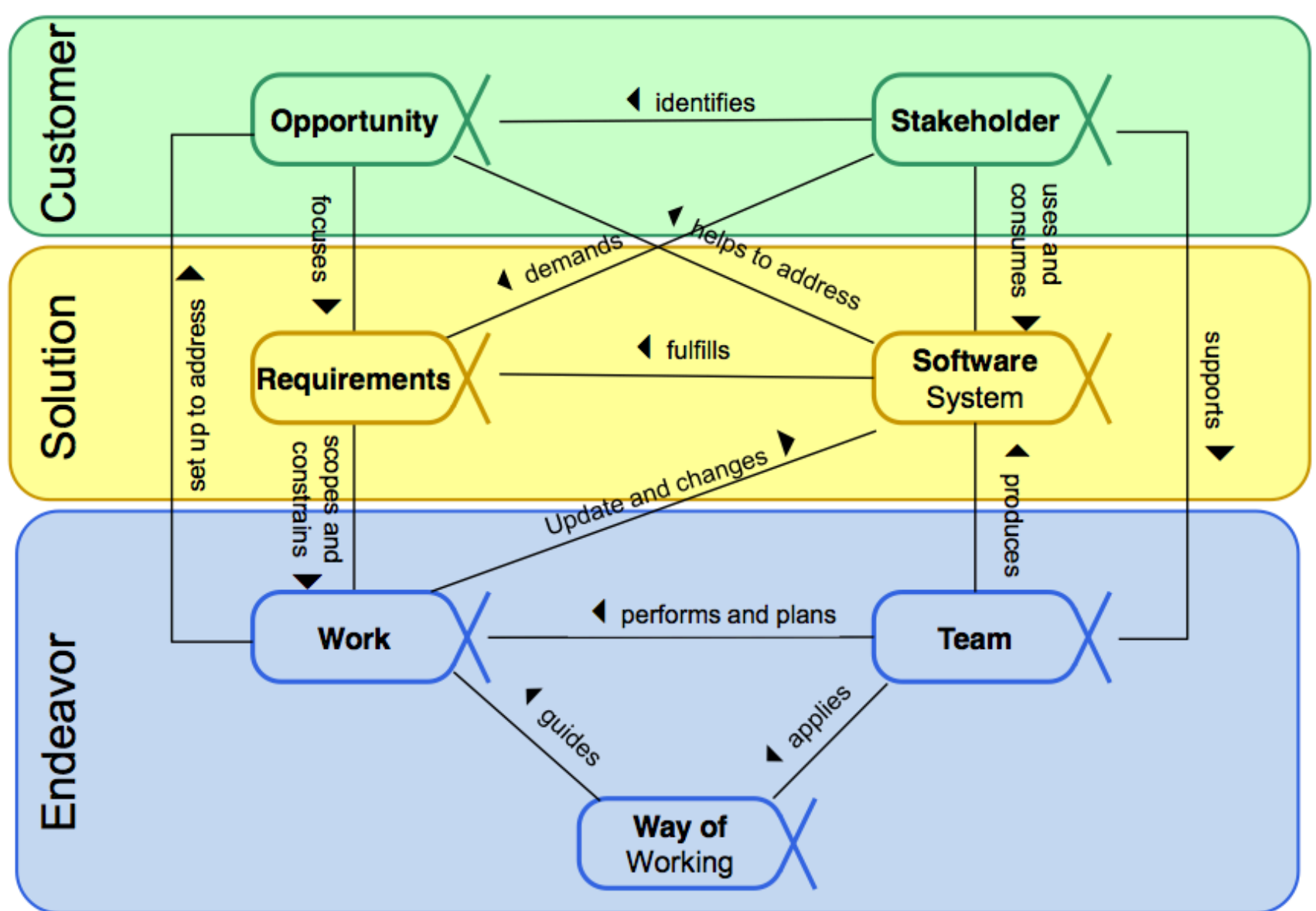
Team	Team	Team	Team	Team
<p><b>Seeded</b></p> <ul style="list-style-type: none"> <li>Team's mission is clear</li> <li>Team knows how to grow to achieve mission</li> <li>Required competencies are identified</li> <li>Team size is determined</li> </ul> <p>1 / 5</p>	<p><b>Formed</b></p> <ul style="list-style-type: none"> <li>Team has enough resources to start the mission</li> <li>Team organization &amp; individual responsibilities understood</li> <li>Members know how to perform work</li> </ul> <p>2 / 5</p>	<p><b>Collaborating</b></p> <ul style="list-style-type: none"> <li>Members working as one unit</li> <li>Communication is open and honest</li> <li>Members focused on team mission</li> <li>Success of team ahead of personal objectives</li> </ul> <p>3 / 5</p>	<p><b>Performing</b></p> <ul style="list-style-type: none"> <li>Team working efficiently and effectively</li> <li>Adapts to changing context</li> <li>Produce high quality output</li> <li>Minimal backtracking and re-work</li> <li>Waste continually eliminated</li> </ul> <p>4 / 5</p>	<p><b>Adjourned</b></p> <ul style="list-style-type: none"> <li>Team no longer accountable</li> <li>Responsibilities handed over</li> <li>Members available for other assignment</li> </ul> <p>5 / 5</p>

# What is an Alpha?



- Alpha is an acronym for an Abstract-Level Progress Health Atttribute.
- An essential element of the software engineering endeavor that is relevant to an assessment of the progress and health of the endeavor.

# Essence Kernel Alphas





# Peeking into the Alphas

## Requirements

**Conceived**

**Bounded**

**Coherent**

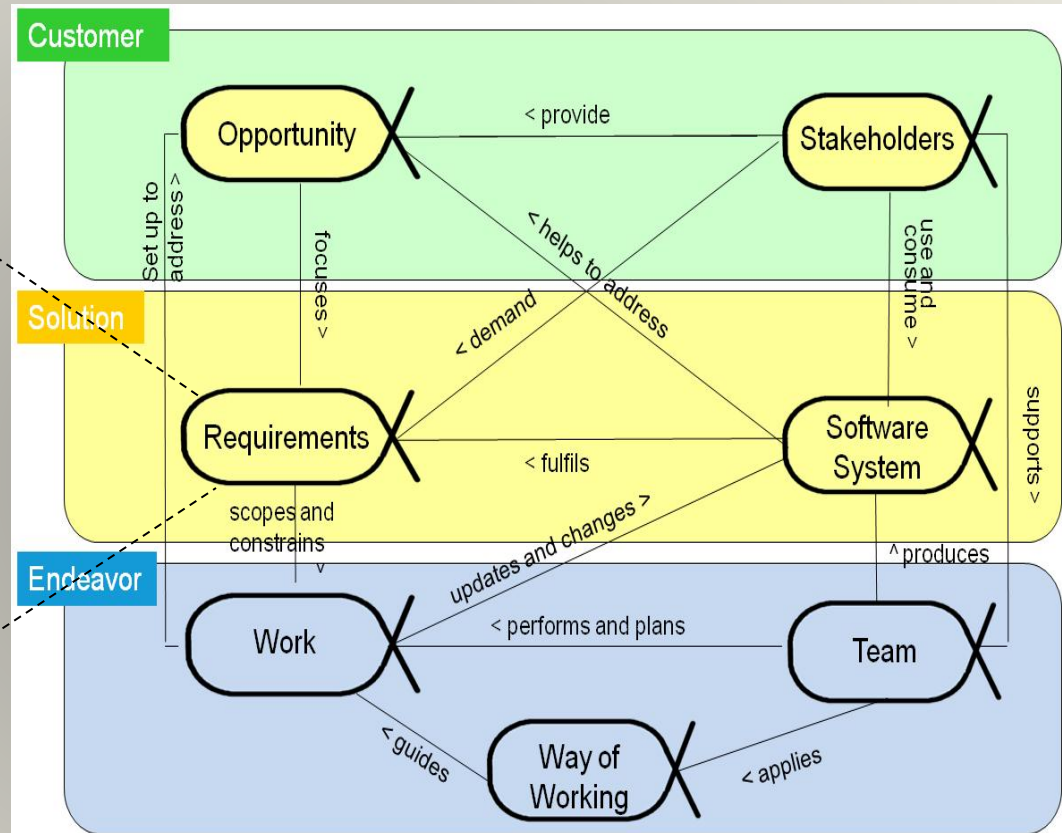
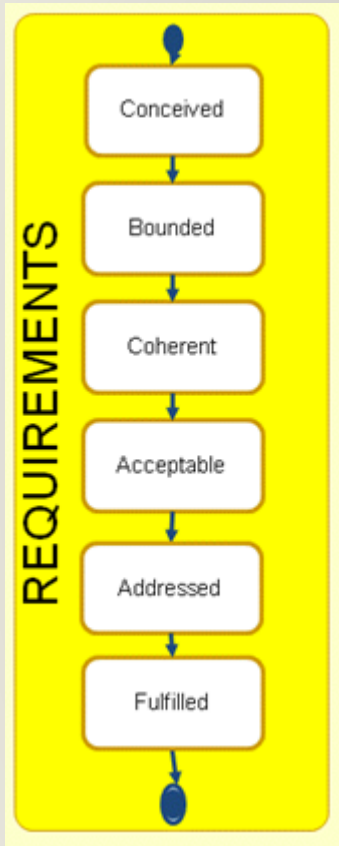
**Acceptable**

**Addressed**

**Fulfilled**

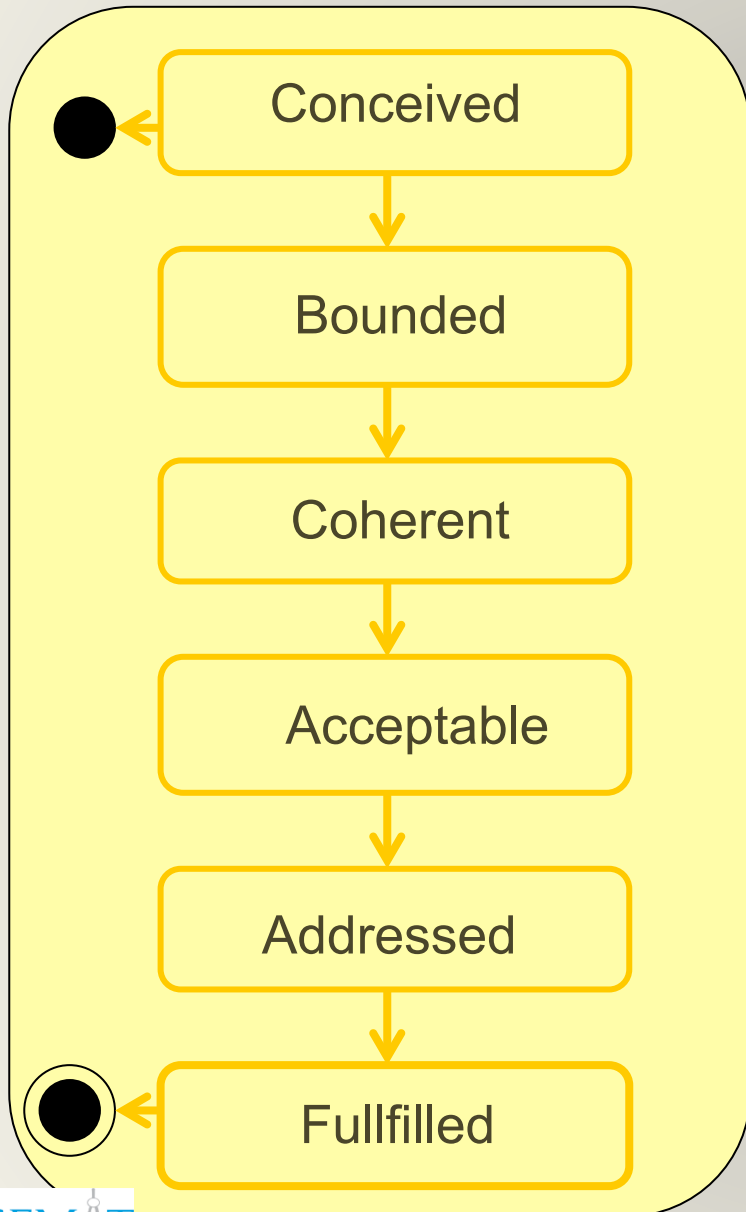
- There are several cards for each Alpha. What does each cards stand for?
- What is included in each card?

# Requirements- one of the Alphas



**Requirements Definition:** What the software system must do to address the opportunity and satisfy the stakeholders.

# 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.

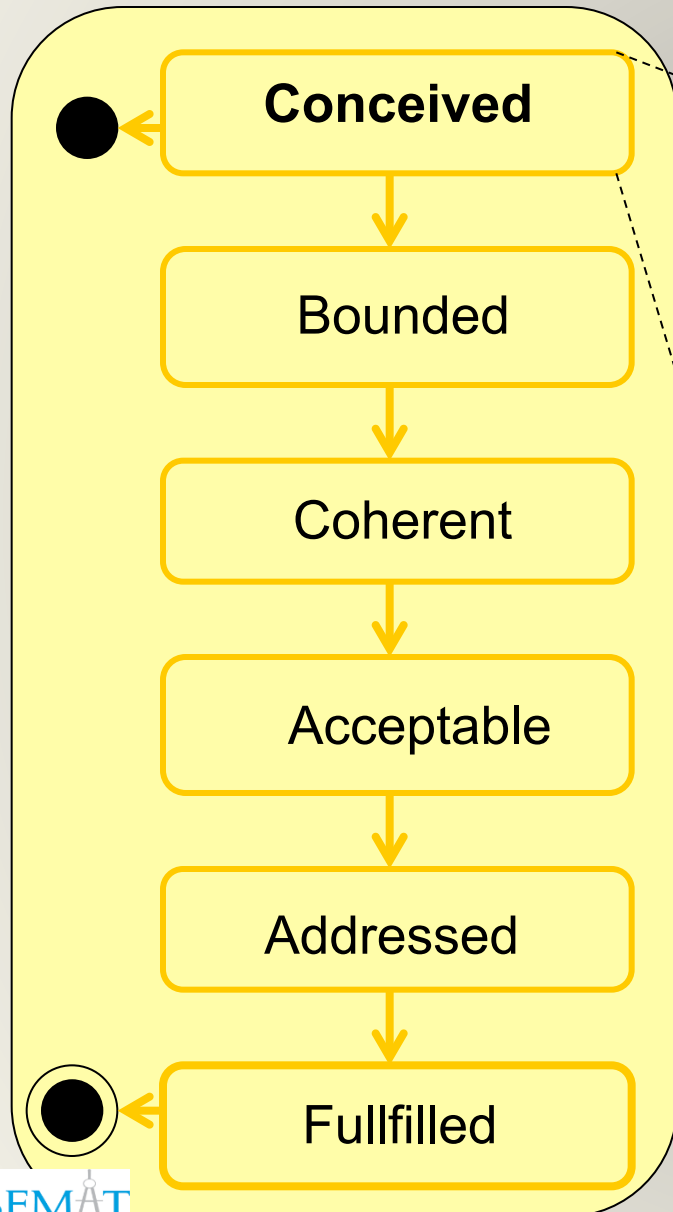
The requirements describe a system that is acceptable to the stakeholders.

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.

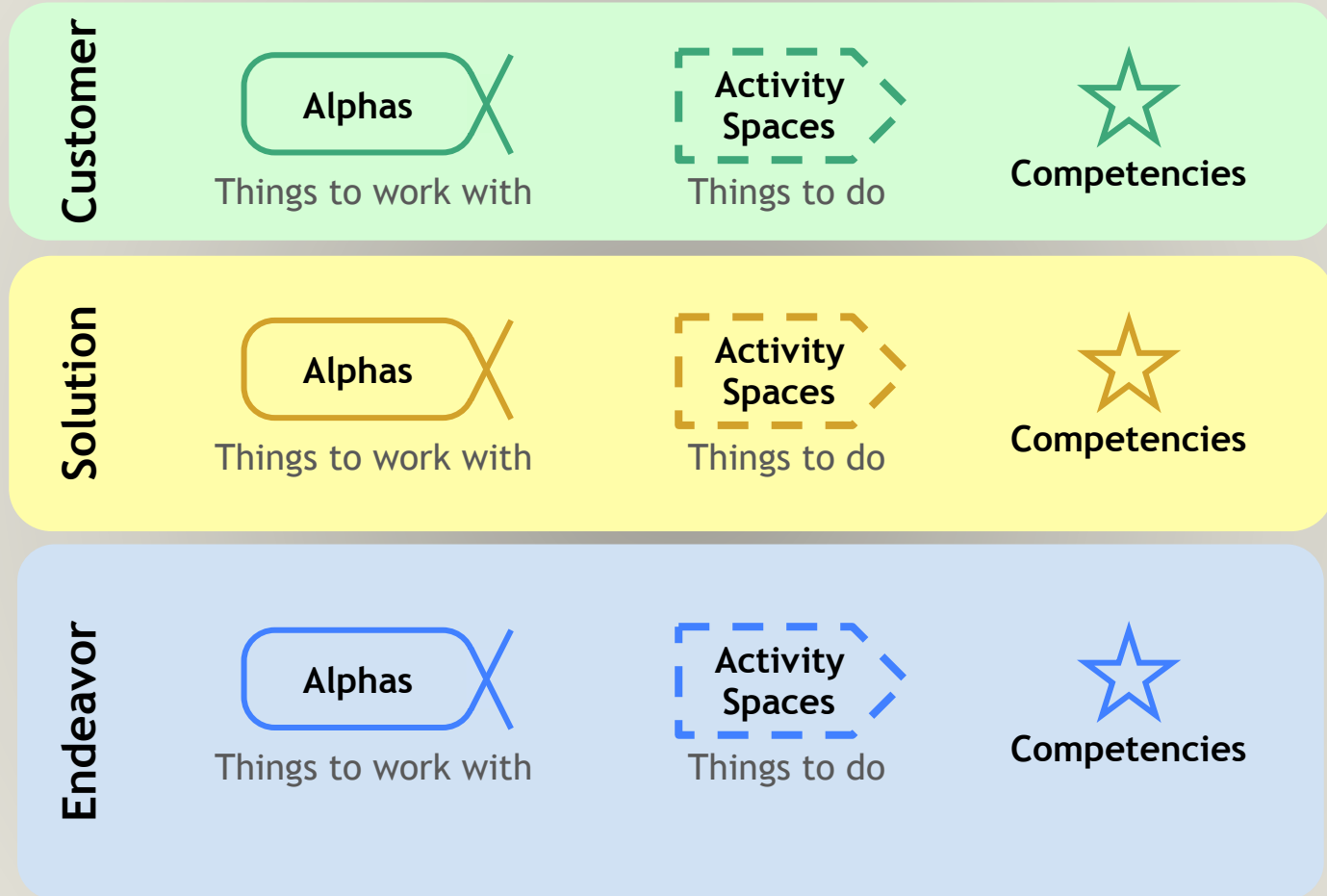


# Checklist for requirements states

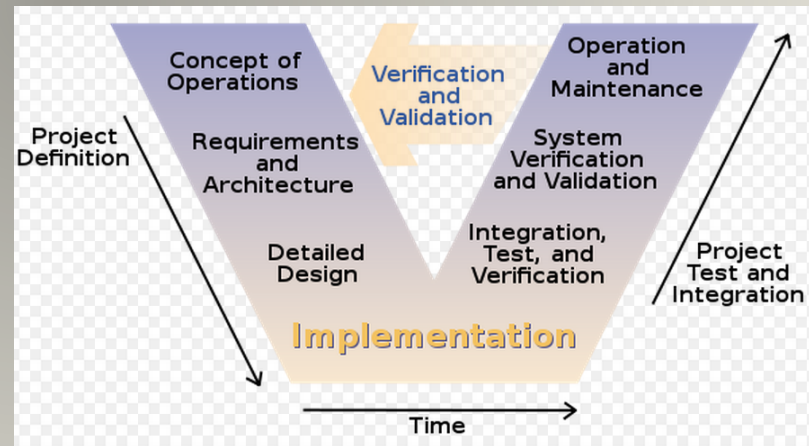
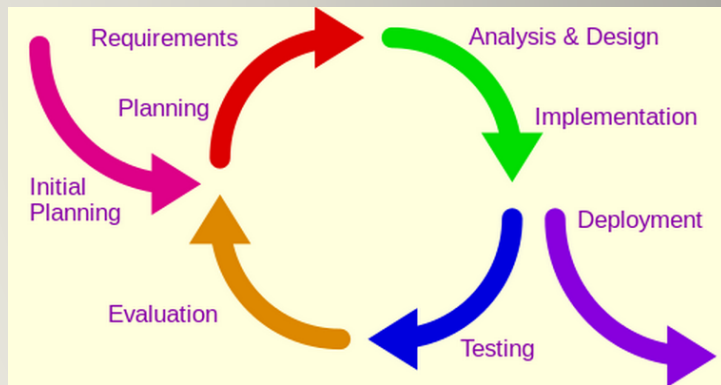
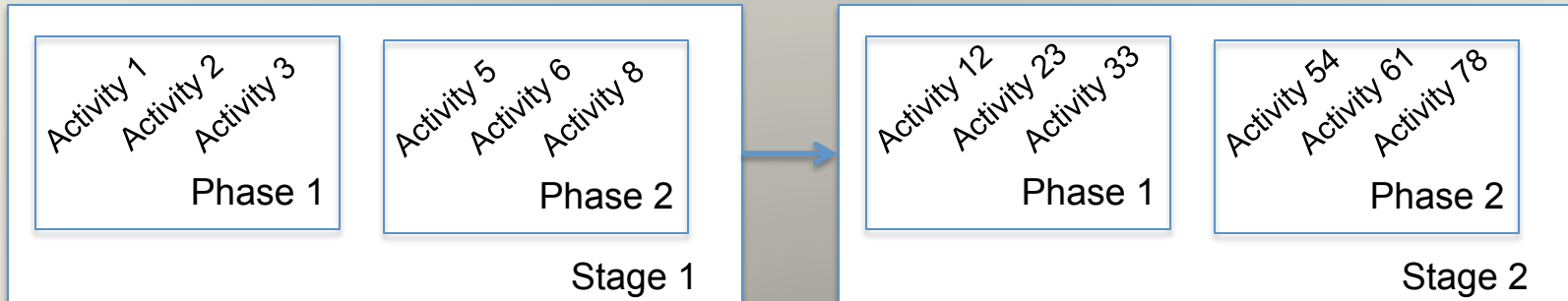


- The initial set of stakeholders agrees that a system is to be produced.
- The stakeholders that will use the new system are identified.
- The stakeholders that will fund the initial work on the new system are identified.
- There is a clear opportunity for the new system to address.

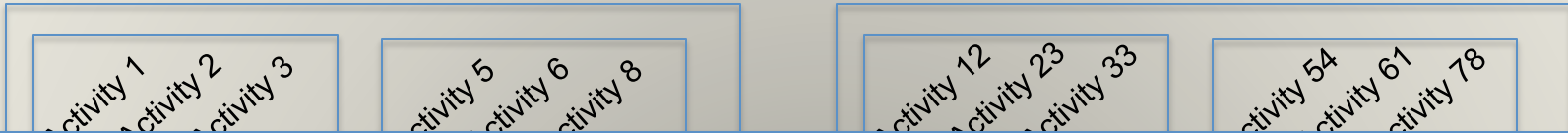
# Essence Kernel



# Software development methods today



# Software development methods today



Focus on activities in two essential things:

- Way of working
- Work



Iterative



V-Model

# Four of the seven essential things

## Requirements

<input type="checkbox"/> <b>Requirements</b> <b>Conceived</b> <ul style="list-style-type: none"> <li>Need for system agreed by initial stakeholders</li> <li>Users and customers identified</li> <li>Expected benefit of system agreed</li> </ul> <p>1 / 6</p>	<input type="checkbox"/> <b>Requirements</b> <b>Bounded</b> <ul style="list-style-type: none"> <li>Theme, scope, success criteria of system is clear</li> <li>Mechanisms for managing requirements in place</li> <li>Constraints and assumptions considered</li> </ul> <p>2 / 6</p>	<input type="checkbox"/> <b>Requirements</b> <b>Coherent</b> <ul style="list-style-type: none"> <li>Described requirements provide coherent picture of the system</li> <li>Conflicting requirements separated</li> <li>Important usage scenarios explained</li> <li>Priority of requirements clear</li> </ul> <p>3 / 6</p>	<input type="checkbox"/> <b>Requirements</b> <b>Sufficient</b> <ul style="list-style-type: none"> <li>Requirements adequately describe solution and acceptable to stakeholders</li> <li>Rate of change to agreed requirements is low and under control</li> </ul> <p>4 / 6</p>	<input type="checkbox"/> <b>Requirements</b> <b>Satisfactory</b> <ul style="list-style-type: none"> <li>System implementing requirements is worth making operational</li> <li>Enough requirements are implemented</li> </ul> <p>5 / 6</p>	<input type="checkbox"/> <b>Requirements</b> <b>Fulfilled</b> <ul style="list-style-type: none"> <li>System implementing requirements is accepted as fully satisfying the need</li> <li>No outstanding requirement items prevent system from being accepted</li> <li>Stakeholders accept requirements as accurate</li> </ul> <p>6 / 6</p>
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## Software System

<input type="checkbox"/> <b>Software System</b> <b>Architecture Selected</b> <ul style="list-style-type: none"> <li>Architecture selected that address key technical risks</li> <li>Criteria for selecting architecture agreed</li> <li>Platforms, technologies, languages selected</li> <li>Buy, build, reuse decisions made</li> </ul> <p>1 / 6</p>	<input type="checkbox"/> <b>Software System</b> <b>Demonstrable</b> <ul style="list-style-type: none"> <li>Executable version of system demonstrates architecture is fit for purpose</li> <li>Supports functional and non-functional testing</li> <li>Critical interface and system configurations exercised</li> </ul> <p>2 / 6</p>	<input type="checkbox"/> <b>Software System</b> <b>Usable</b> <ul style="list-style-type: none"> <li>System is usable and has desired quality characteristics</li> <li>System can be operated by users</li> <li>Functionality and performance have been tested and accepted</li> <li>Defect levels acceptable</li> <li>Release content known</li> </ul> <p>3 / 6</p>	<input type="checkbox"/> <b>Software System</b> <b>Ready</b> <ul style="list-style-type: none"> <li>System (as a whole) has been accepted for deployment in operational environment</li> <li>Sponsors, users, stakeholders accept system as fit for purpose</li> <li>Installation and other documents available</li> <li>Operational support in place</li> </ul> <p>4 / 6</p>	<input type="checkbox"/> <b>Software System</b> <b>Operational</b> <ul style="list-style-type: none"> <li>System in use in operational environment</li> <li>System available to intended users</li> <li>At least one example of system is fully operational</li> <li>System supported to agreed service levels</li> </ul> <p>5 / 6</p>	<input type="checkbox"/> <b>Software System</b> <b>Retired</b> <ul style="list-style-type: none"> <li>System no longer supported</li> <li>Updates to system will no longer be produced</li> <li>System has been replaced or discontinued.</li> </ul> <p>6 / 6</p>
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## Work

<input type="checkbox"/> <b>Work</b> <b>Initiated</b> <ul style="list-style-type: none"> <li>Work initiator and client known</li> <li>Work goal and constraints clear</li> <li>Sponsorship and funding model clear</li> <li>Priority of work clear</li> </ul> <p>1 / 6</p>	<input type="checkbox"/> <b>Work</b> <b>Prepared</b> <ul style="list-style-type: none"> <li>Cost &amp; effort understood</li> <li>Funding in place</li> <li>Resource availability and risk exposure understood</li> <li>Governance model is clear</li> <li>Integration and delivery points defined</li> </ul> <p>2 / 6</p>	<input type="checkbox"/> <b>Work</b> <b>Started</b> <ul style="list-style-type: none"> <li>Development work has started</li> <li>Work progress is monitored</li> <li>Work broken down into actionable items with clear definition of done</li> <li>Team members are accepting and progressing work items</li> </ul> <p>3 / 6</p>	<input type="checkbox"/> <b>Work</b> <b>Under Control</b> <ul style="list-style-type: none"> <li>Work going well, risks being managed, productivity levels acceptable</li> <li>Unplanned work &amp; re-work under control</li> <li>Work items completed within estimates</li> <li>Measures tracked</li> </ul> <p>4 / 6</p>	<input type="checkbox"/> <b>Work</b> <b>Concluded</b> <ul style="list-style-type: none"> <li>Work to produce results have been finished</li> <li>Work results are being achieved</li> <li>The client has accepted the resulting software system</li> </ul> <p>5 / 6</p>	<input type="checkbox"/> <b>Work</b> <b>Closed</b> <ul style="list-style-type: none"> <li>All remaining housekeeping tasks completed, and work officially closed</li> <li>Everything has been archived</li> <li>Lessons learned and metrics made available</li> </ul> <p>6 / 6</p>
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## Team

<input type="checkbox"/> <b>Team</b> <b>Seeded</b> <ul style="list-style-type: none"> <li>Team's mission is clear</li> <li>Team knows how to grow to achieve mission</li> <li>Required competencies are identified</li> <li>Team size is determined</li> </ul> <p>1 / 5</p>	<input type="checkbox"/> <b>Team</b> <b>Formed</b> <ul style="list-style-type: none"> <li>Team has enough resources to start the mission</li> <li>Team organization &amp; individual responsibilities understood</li> <li>Members know how to perform work</li> </ul> <p>2 / 5</p>	<input type="checkbox"/> <b>Team</b> <b>Collaborating</b> <ul style="list-style-type: none"> <li>Members working as one unit</li> <li>Communication is open and honest</li> <li>Members focused on team mission</li> <li>Success of team ahead of personal objectives</li> </ul> <p>3 / 5</p>	<input type="checkbox"/> <b>Team</b> <b>Performing</b> <ul style="list-style-type: none"> <li>Team working efficiently and effectively</li> <li>Adapts to changing context</li> <li>Produce high quality output</li> <li>Minimal backtracking and re-work</li> <li>Waste continually eliminated</li> </ul> <p>4 / 5</p>	<input type="checkbox"/> <b>Team</b> <b>Adjourned</b> <ul style="list-style-type: none"> <li>Team no longer accountable</li> <li>Responsibilities handed over</li> <li>Members available for other assignment</li> </ul> <p>5 / 5</p>
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# Plan: Determine Current State

<input type="checkbox"/> <b>Requirements</b> <b>Conceived</b> <ul style="list-style-type: none"> <li>Need for system agreed by initial stakeholders</li> <li>Users and customers identified</li> <li>Expected benefit of system agreed</li> </ul> <p>1 / 6</p>	<input type="checkbox"/> <b>Requirements</b> <b>Bounded</b> <ul style="list-style-type: none"> <li>Theme, scope, success criteria of system is clear</li> <li>Mechanisms for managing requirements in place</li> <li>Constraints and assumptions considered</li> </ul> <p>2 / 6</p>	<input type="checkbox"/> <b>Requirements</b> <b>Coherent</b> <ul style="list-style-type: none"> <li>Described requirements provide coherent picture of the system</li> <li>Conflicting requirements separated</li> <li>Important usage scenarios explained</li> <li>Priority of requirements clear</li> </ul> <p>3 / 6</p>	<input type="checkbox"/> <b>Requirements</b> <b>Sufficient</b> <ul style="list-style-type: none"> <li>Requirements adequately describe solution and acceptable to stakeholders</li> <li>Rate of change to agreed requirements is low and under control</li> </ul> <p>4 / 6</p>	<input type="checkbox"/> <b>Requirements</b> <b>Satisfactory</b> <ul style="list-style-type: none"> <li>System implementing requirements is worth making operational</li> <li>Enough requirements are implemented</li> </ul> <p>5 / 6</p>	<input type="checkbox"/> <b>Requirements</b> <b>Fulfilled</b> <ul style="list-style-type: none"> <li>System implementing requirements is accepted as fully satisfying the need</li> <li>No outstanding requirement items prevent system from being accepted</li> <li>Stakeholders accept requirements as accurate</li> </ul> <p>6 / 6</p>
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<input type="checkbox"/> <b>Software System</b> <b>Architecture Selected</b> <ul style="list-style-type: none"> <li>Architecture selected that address key technical risks</li> <li>Criteria for selecting architecture agreed</li> <li>Platforms, technologies, languages selected</li> <li>Buy, build, reuse decisions made</li> </ul> <p>1 / 6</p>	<input type="checkbox"/> <b>Software System</b> <b>Demonstrable</b> <ul style="list-style-type: none"> <li>Executable version of system demonstrates architecture is fit for purpose</li> <li>Supports functional and non-functional testing</li> <li>Critical interface and system configurations exercised</li> </ul> <p>2 / 6</p>	<input type="checkbox"/> <b>Software System</b> <b>Usable</b> <ul style="list-style-type: none"> <li>System is usable and has desired quality characteristics</li> <li>System can be operated by users</li> <li>Functionality and performance have been tested and accepted</li> <li>Defect levels acceptable</li> <li>Release content known</li> </ul> <p>3 / 6</p>	<input type="checkbox"/> <b>Software System</b> <b>Ready</b> <ul style="list-style-type: none"> <li>System (as a whole) has been accepted for deployment in operational environment</li> <li>Sponsors, users, stakeholders accept system as fit for purpose</li> <li>Installation and other documents available</li> <li>Operational support in place</li> </ul> <p>4 / 6</p>	<input type="checkbox"/> <b>Software System</b> <b>Operational</b> <ul style="list-style-type: none"> <li>System in use in operational environment</li> <li>System available to intended users</li> <li>At least one example of system is fully operational</li> <li>System supported to agreed service levels</li> </ul> <p>5 / 6</p>	<input type="checkbox"/> <b>Software System</b> <b>Retired</b> <ul style="list-style-type: none"> <li>System no longer supported</li> <li>Updates to system will no longer be produced</li> <li>System has been replaced or discontinued.</li> </ul> <p>6 / 6</p>
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## Completed

## Pending

<input type="checkbox"/> <b>Team</b> <b>Seeded</b> <ul style="list-style-type: none"> <li>Team's mission is clear</li> <li>Team knows how to grow to achieve mission</li> <li>Required competencies are identified</li> <li>Team size is determined</li> </ul> <p>1 / 5</p>	<input type="checkbox"/> <b>Team</b> <b>Formed</b> <ul style="list-style-type: none"> <li>Team has enough resources to start the mission</li> <li>Team organization &amp; individual responsibilities understood</li> <li>Members know how to perform work</li> </ul> <p>2 / 5</p>	<input type="checkbox"/> <b>Team</b> <b>Collaborating</b> <ul style="list-style-type: none"> <li>Members working as one unit</li> <li>Communication is open and honest</li> <li>Members focused on team mission</li> <li>Success of team ahead of personal objectives</li> </ul> <p>3 / 5</p>	<input type="checkbox"/> <b>Team</b> <b>Performing</b> <ul style="list-style-type: none"> <li>Team working efficiently and effectively</li> <li>Adapts to changing context</li> <li>Produce high quality output</li> <li>Minimal backtracking and re-work</li> <li>Waste continually eliminated</li> </ul> <p>4 / 5</p>	<input type="checkbox"/> <b>Team</b> <b>Adjourned</b> <ul style="list-style-type: none"> <li>Team no longer accountable</li> <li>Responsibilities handed over</li> <li>Members available for other assignment</li> </ul> <p>5 / 5</p>
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# Plan: Determine Next State

**Requirements**

**Conceived**

- Need for system agreed by initial stakeholders
- Users and customers identified
- Expected benefit of system agreed

1 / 6

**Requirements**

**Bounded**

- Theme, scope, success criteria of system is clear
- Mechanisms for managing requirements in place
- Constraints and assumptions considered

2 / 6

**Requirements**

**Coherent**

- Described requirements provide coherent picture of the system
- Conflicting requirements separated
- Important usage scenarios explained
- Priority of requirements clear

3 / 6

**Requirements**

**Sufficient**

- Requirements adequately describe solution and acceptable to stakeholders
- Rate of change to agreed requirements is low and under control

4 / 6

**Requirements**

**Satisfactory**

- System implementing requirements is worth making operational
- Enough requirements are implemented

5 / 6

**Requirements**

**Fulfilled**

- System implementing requirements is accepted as fully satisfying the need
- No outstanding requirement items prevent system from being accepted
- Stakeholders accept requirements as accurate

6 / 6

**Software System**

**Architecture Selected**

- Architecture selected that address key technical risks
- Criteria for selecting architecture agreed
- Platforms, technologies, languages selected
- Buy, build, reuse decisions made

1 / 6

**Software System**

**Demonstrable**

- Executable version of system demonstrates architecture is fit for purpose
- Supports functional and non-functional testing
- Critical interface and system configurations exercised

2 / 6

**Software System**

**Usable**

- System is usable and has desired quality characteristics
- System can be operated by users
- Functionality and performance have been tested and accepted
- Release content known

3 / 6

**Software System**

**Ready**

- System (as a whole) has been accepted for deployment in operational environment
- Sponsors, users, stakeholders accept system as fit for purpose
- Installation and other documents available
- Operational support in place

4 / 6

**Software System**

**Operational**

- System in use in operational environment
- System available to intended users
- At least one example of system is fully operational
- System supported to agreed service levels

5 / 6

**Software System**

**Retired**

- System no longer supported
- Updates to system will no longer be produced
- System has been replaced or discontinued.

6 / 6

**Work**

**Initiated**

- Work initiator and client known
- Work goal and constraints clear
- Sponsorship and funding model clear
- Priority of work clear

1 / 6

**Work**

**Prepared**

- Cost & effort understood
- Funding in place
- Resource availability and risk exposure understood
- Governance model is clear
- Integration and delivery points defined

2 / 6

**Work**

**Started**

- Development work has started
- Work progress is monitored
- Work broken down into actionable items with clear definition of done
- Team members are accepting and progressing work items

3 / 6

**Work**

**Under Control**

- Work going well, risks being managed, productivity levels acceptable
- Unplanned work & re-work under control
- Work items completed within estimates
- Measures tracked

4 / 6

**Work**

**Concluded**

- Work to produce results have been finished
- Work results are being achieved
- The client has accepted the resulting software system

5 / 6

**Work**

**Closed**

- All remaining housekeeping tasks completed, and work officially closed
- Everything has been archived
- Lessons learned and metrics made available

6 / 6

**Team**

**Seeded**

- Team's mission is clear
- Team knows how to grow to achieve mission
- Required competencies are identified
- Team size is determined

**Team**

**Formed**

- Team has enough resources to start the mission
- Team organization & individual responsibilities understood
- Members know how to perform work

2 / 5

**Team**

**Collaborating**

- Members working as one unit
- Communication is open and honest
- Members focused on team mission
- Success of team ahead of personal objectives

3 / 5

**Team**

**Performing**

- Team working efficiently and effectively
- Adapts to changing context
- Produce high quality output
- Minimal backtracking and re-work
- Waste continually eliminated

4 / 5

**Team**

**Adjourned**

- Team no longer accountable
- Responsibilities handed over
- Members available for other assignment

5 / 5

# Plan: Determine How to Achieve Next State

**Requirements**

**Satisfactory**

- System implementing requirements is worth making operational
- Enough requirements are implemented

**5 / 6**

**Software System**

**Usable**

- System is usable and has desired quality characteristics
- System can be operated by users
- Functionality and performance have been tested and accepted
- Defect levels acceptable
- Release content known

**3 / 6**

**Work**

**Under Control**

- Work going well, risks being managed, productivity levels acceptable
- Unplanned work & re-work under control
- Work items completed within estimates
- Measures tracked

**4 / 6**

**Team**

**Performing**

- Team working efficiently and effectively
- Adapts to changing context
- Produce high quality output
- Minimal backtracking and re-work
- Waste continually eliminated

**4 / 5**

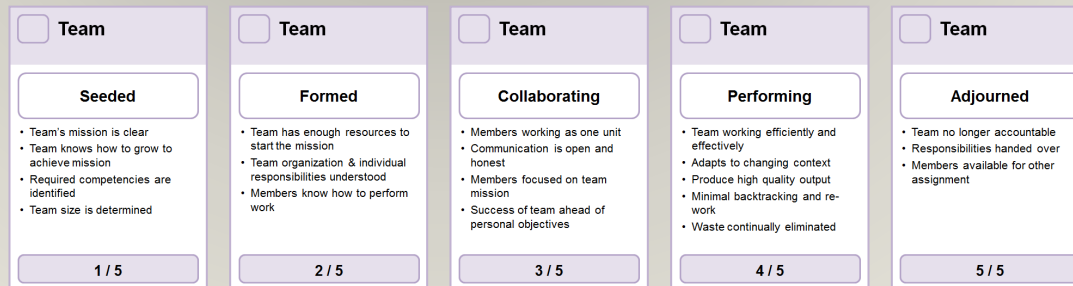
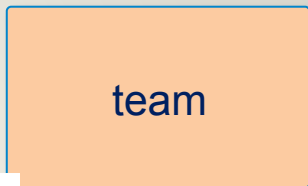


# Essence Kernel



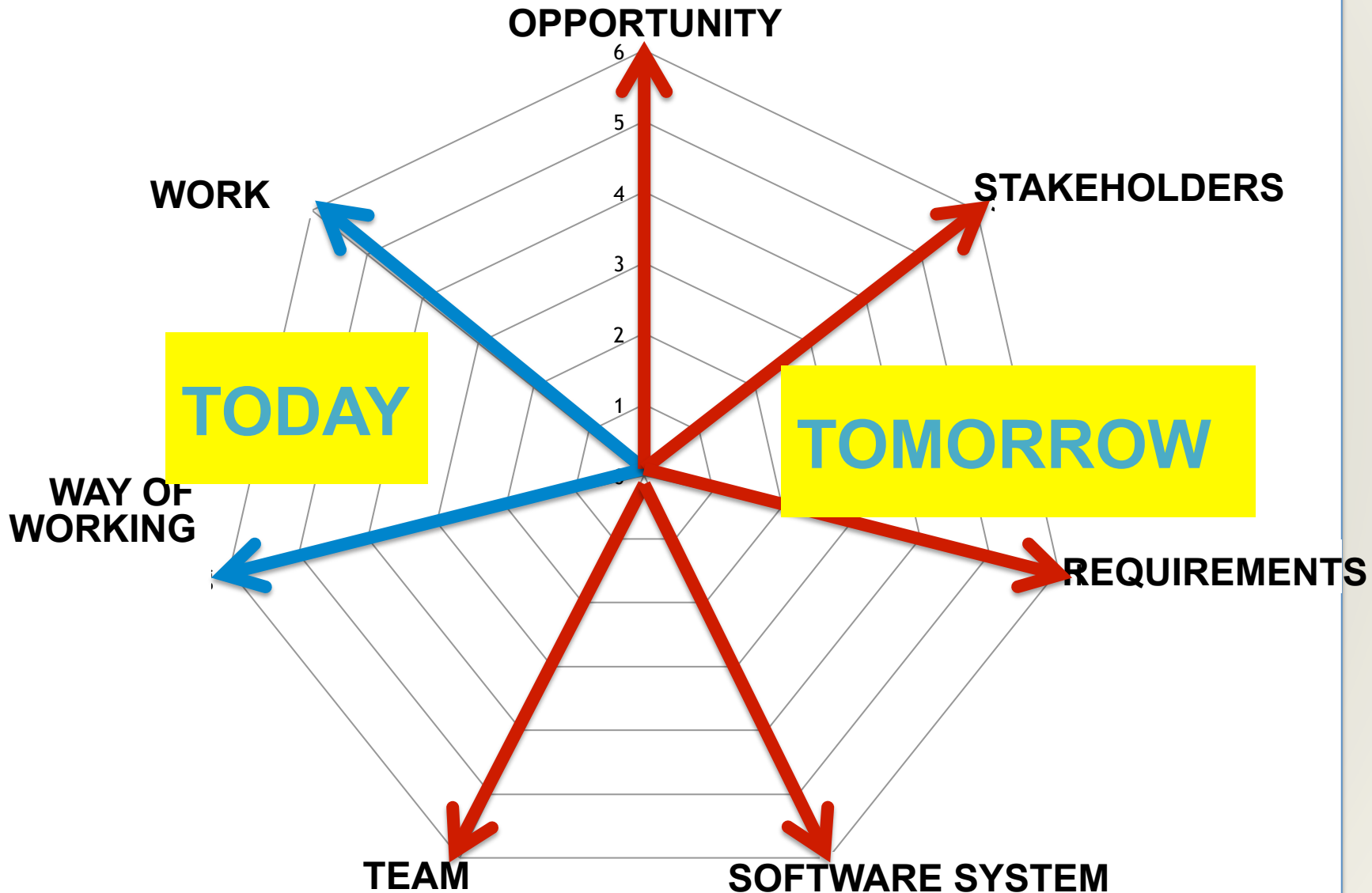
Focus on states in seven essential things:

- Way of working
- Work
- Stakeholder
- Opportunity
- Requirements
- Software System
- Team





# Following essential things



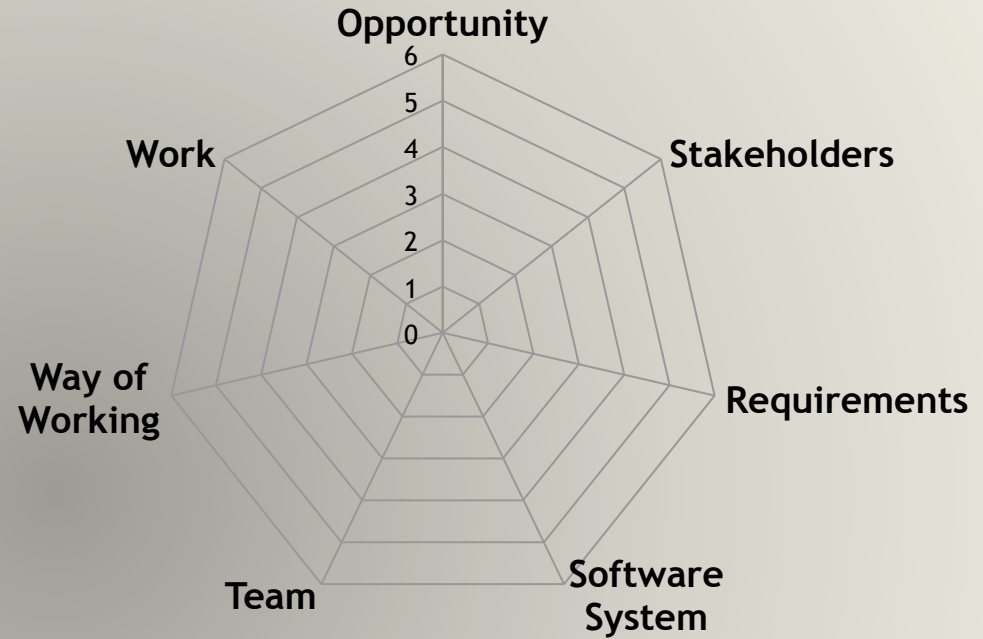


# You do not need to use cards! You may use checklists!

State	Checklist
Recognized	<p>All the different groups of stakeholders that are, or will be, affected by the development and operation of the software system are identified.</p> <p>There is agreement on the stakeholder groups to be represented. At a minimum, the stakeholder groups that fund, use, support, and maintain the system have been considered.</p> <p>The responsibilities of the stakeholder representatives have been defined.</p>
Represented	<p>The stakeholder representatives have agreed to take on their responsibilities.</p> <p>The stakeholder representatives are authorized to carry out their responsibilities.</p> <p>The collaboration approach among the stakeholder representatives has been agreed.</p> <p>The stakeholder <u>representatives</u> support and respect the team's way of working.</p>
Involved	<p>The stakeholder representatives assist the team in accordance with their responsibilities.</p> <p>The stakeholder representatives provide feedback and take part in decision making in a timely manner.</p> <p>The stakeholder representatives promptly communicate changes that are relevant for</p>

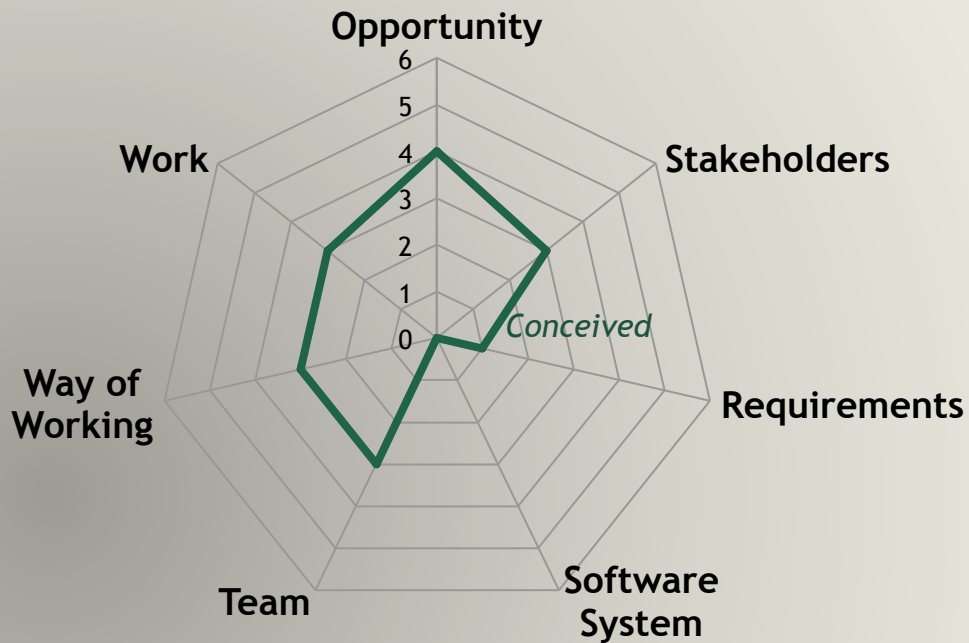
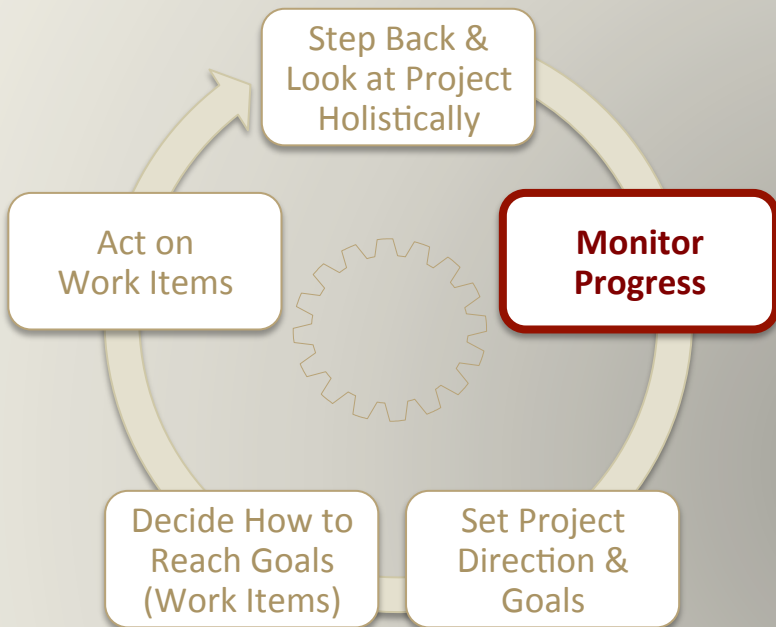


# How does the Essence Kernel Work?





# How does the Essence Kernel Work?

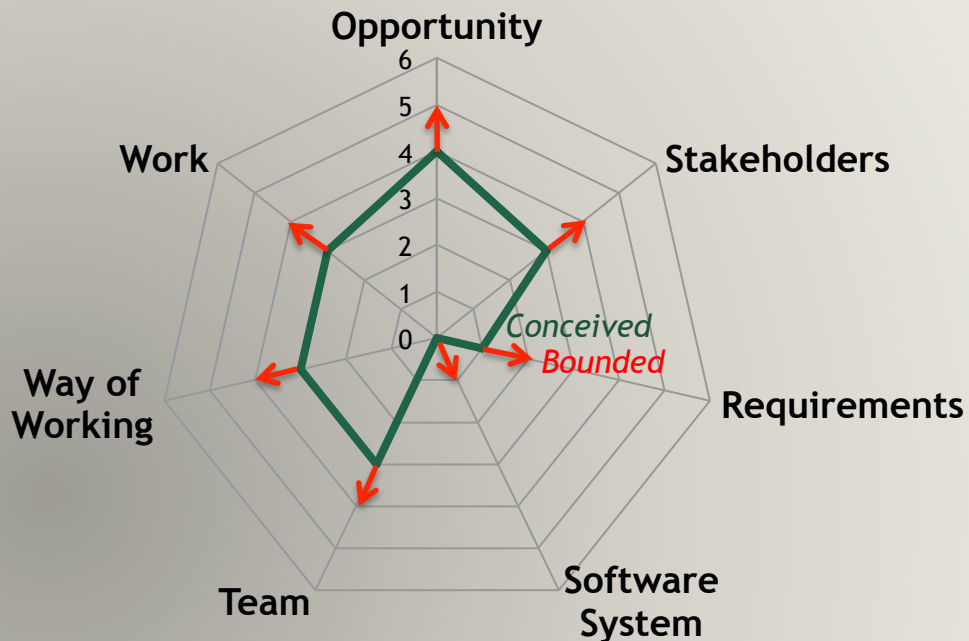
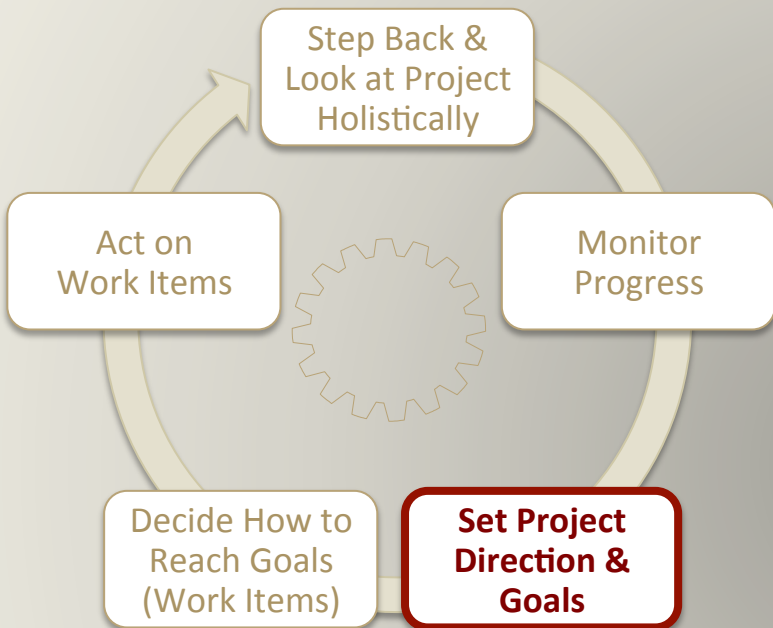


## Current State

Requirements	Requirements	Requirements	Requirements	Requirements	Requirements
<b>Conceived</b>	<b>Bounded</b>	<b>Coherent</b>	<b>Acceptable</b>	<b>Addressed</b>	<b>Fulfilled</b>
<ul style="list-style-type: none"> <li>The need for a new system is clear</li> <li>Users are identified</li> <li>Initial sponsors are identified</li> </ul>	<ul style="list-style-type: none"> <li>The purpose and extent of the system are agreed</li> <li>Success criteria are clear</li> <li>Mechanisms for handling requirements are agreed</li> <li>Constraints and assumptions identified</li> </ul>	<ul style="list-style-type: none"> <li>The big picture is clear and shared by all involved</li> <li>Important usage scenarios explained</li> <li>Priorities are clear</li> <li>Conflicts are addressed</li> <li>Impact is understood</li> </ul>	<ul style="list-style-type: none"> <li>Requirements describe a solution acceptable to the stakeholders</li> <li>The rate of change to agreed requirements is low</li> <li>Value is clear</li> </ul>	<ul style="list-style-type: none"> <li>Enough requirements are implemented for the system to be acceptable</li> <li>Stakeholders agree the system is worth making operational</li> </ul>	<ul style="list-style-type: none"> <li>The system fully satisfies the requirements and the need</li> <li>There are no outstanding requirements items preventing completion</li> </ul>
1 / 6	2 / 6	3 / 6	4 / 6	5 / 6	6 / 6



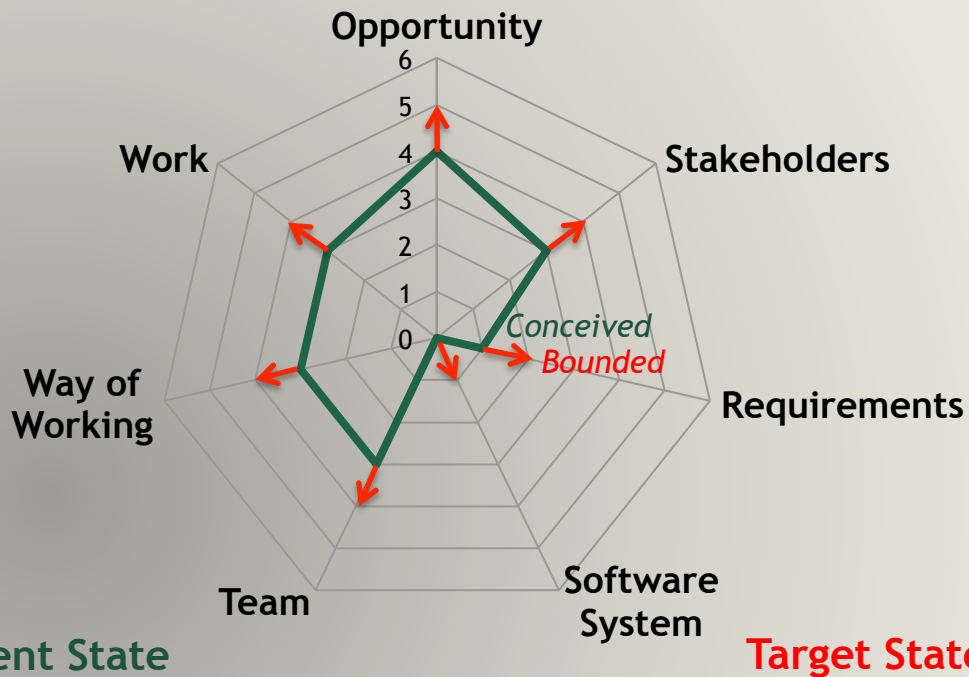
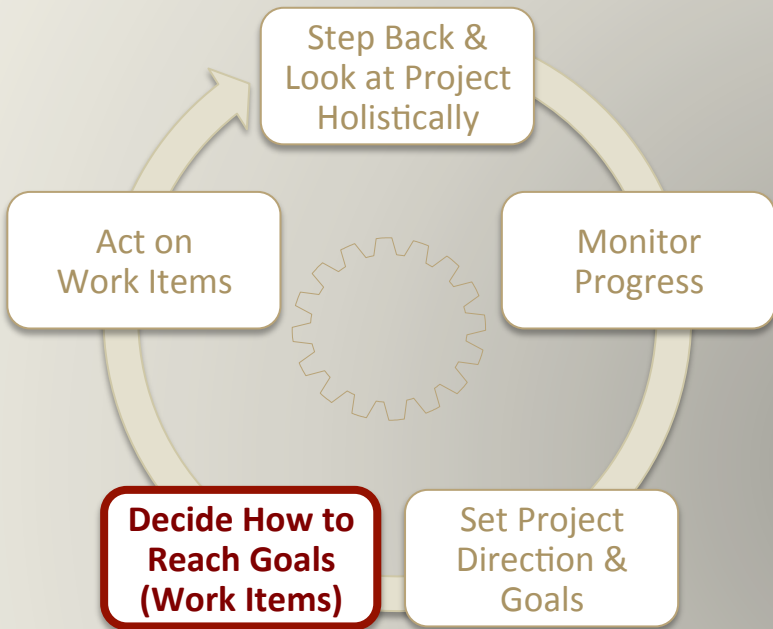
# How does the Essence Kernel Work?



Current State	Target State	Requirements	Requirements	Requirements	Requirements	Requirements
Conceived	Bounded	Coherent	Acceptable	Addressed	Fulfilled	
<ul style="list-style-type: none"> <li>The need for a new system is clear</li> <li>Users are identified</li> <li>Initial sponsors are identified</li> </ul>	<ul style="list-style-type: none"> <li>The purpose and extent of the system are agreed</li> <li>Success criteria are clear</li> <li>Mechanisms for handling requirements are agreed</li> <li>Constraints and assumptions identified</li> </ul>	<ul style="list-style-type: none"> <li>The big picture is clear and shared by all involved</li> <li>Important usage scenarios explained</li> <li>Priorities are clear</li> <li>Conflicts are addressed</li> <li>Impact is understood</li> </ul>	<ul style="list-style-type: none"> <li>Requirements describe a solution acceptable to the stakeholders</li> <li>The rate of change to agreed requirements is low</li> <li>Value is clear</li> </ul>	<ul style="list-style-type: none"> <li>Enough requirements are implemented for the system to be acceptable</li> <li>Stakeholders agree the system is worth making operational</li> </ul>	<ul style="list-style-type: none"> <li>The system fully satisfies the requirements and the need</li> <li>There are no outstanding requirements items preventing completion</li> </ul>	
1 / 6	2 / 6	3 / 6	4 / 6	5 / 6	6 / 6	



# How does the Essence Kernel Work?



**Current State**

Requirements

**Conceived**

- The need for a new system is clear
- Users are identified
- Initial sponsors are identified

1 / 6

**Work Items:**

- Define Project Scope
- Clarify Success Criteria

**Target State**

Requirements

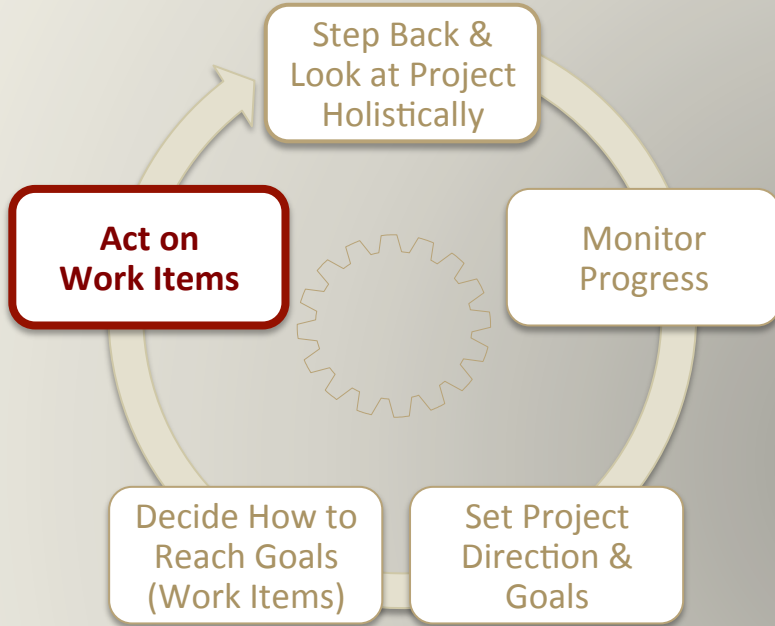
**Bounded**

- The purpose and extent of the system are agreed **Goals**
- Success criteria are clear
- Mechanisms for handling requirements are agreed
- Constraints and assumptions identified

2 / 6



# How does the Essence Kernel Work?



## Work Items

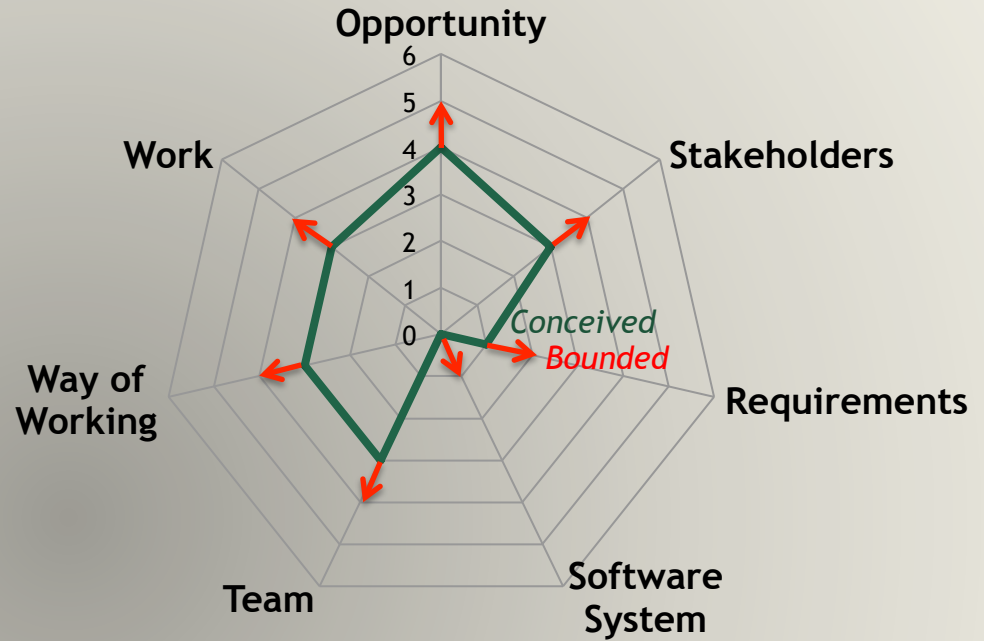
- Define Project Scope
- Clarify Success Criteria
- ...
- ...
- ...
- ...







# Time has passed





# Agenda

- Part 1: Introduction
  - SEMAT and Essence
  - Essence Kernel
- Part 2: Using the Kernel
  - Scenario on Solving Pain Points
- Part 3: Exercising the Kernel
- Part 4: The value of the Kernel?
- Part 5: Kernel cont. & Kernel Extensions

# Scenario on Solving Pain Points

Education Stream



# Terminology used



- Endeavor
- Pain Points (PPs)
- Pain Point Intervention (PPI) Meetings

# Scenario Introduction

- **Purpose of the scenario**
  - How to accelerate the progress of a software development endeavor by identifying and solving pain points
- **Pre-conditions**
  - Background knowledge of Essence and its structure
- **When to Apply**
  - While experiencing problems in a software endeavor
- **Essence Scope**
  - Leveraging use of Alphas only
  - Activity Spaces and Competencies don't feature in this scenario

# Read on your own Scenario on Solving Pain Points pp. 2-9



# Context

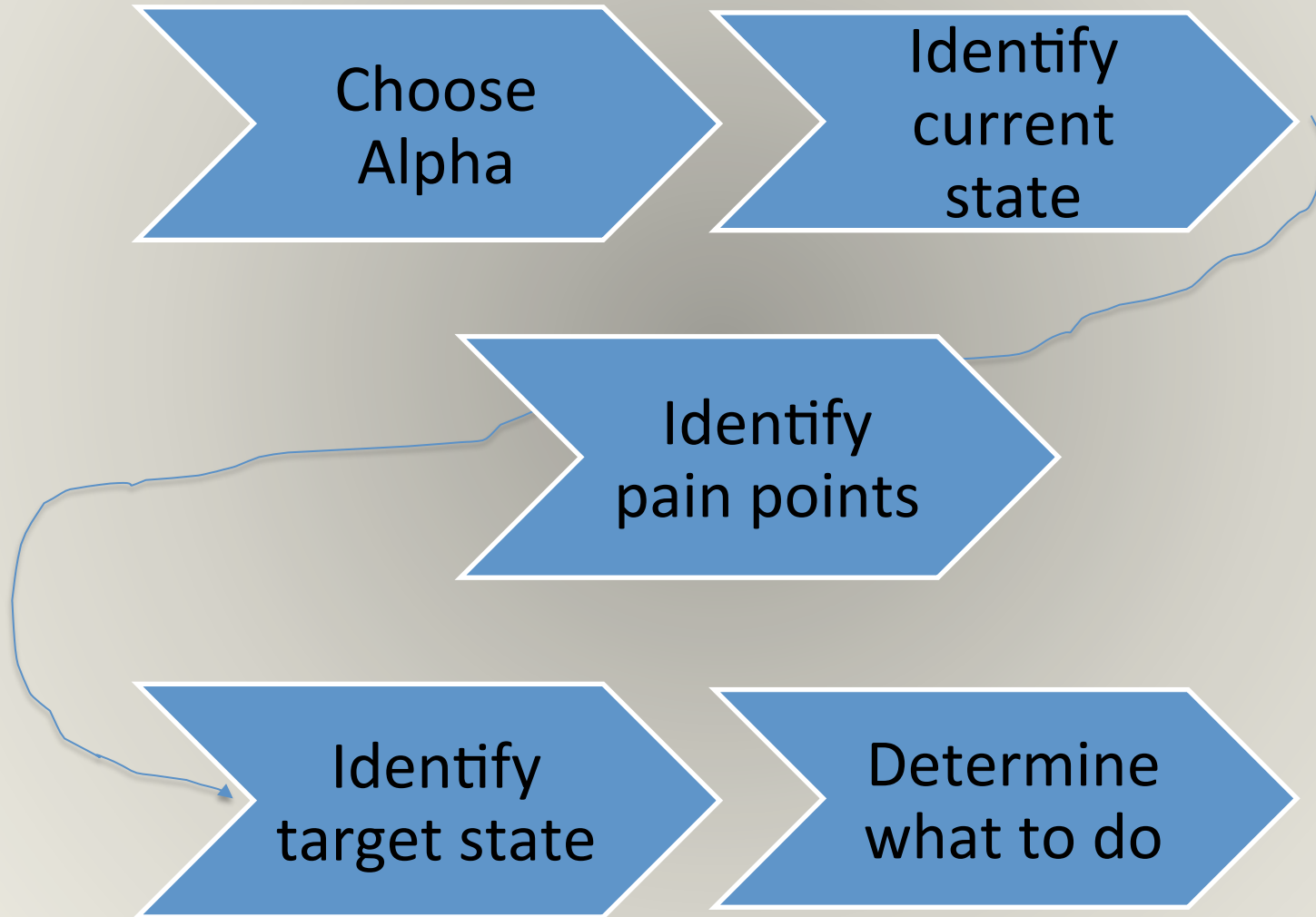


Five-member team is in charge of developing an online university course management system

- The team
  - works on the system's second release
  - identifies pain points during Pain Point Intervention Meetings (PPIM)
  - determines the current and target states of the endeavor by using Essence cards
  - identifies appropriate tasks for remedying the pain points



# Steps in PPI Meetings



# 1<sup>st</sup> Pain Point Identification



- The team brainstorms the overall progress & health of the endeavor
  - Some faculty members resist migration to new system.
  - Lack of constructive user feedback.
- What should they do?
- Which Alpha should they choose first?

# 1<sup>st</sup> PPI: Selection of Cards



Stakeholders: The people, groups, or organizations who affect or are affected by a software system.

- One team member suggests that the *Stakeholder Alpha* be investigated first.

# 1<sup>st</sup> PPI: Selection of Cards

Stakeholders	Stakeholders	Stakeholders	Stakeholders	Stakeholders	Stakeholders
<b>Recognized</b>	<b>Represented</b>	<b>Involved</b>	<b>In Agreement</b>	<b>Satisfied for Deployment</b>	<b>Satisfied in Use</b>
<ul style="list-style-type: none"><li>❑ All the different groups of stakeholders that are, or will be, affected by the development and operation of the software system are identified.</li><li>❑ There is agreement on the stakeholder groups to be represented. At a minimum, the stakeholders groups that fund, use, support, and maintain the system have been considered.</li><li>❑ The responsibilities of the stakeholder representatives have been defined.</li></ul>	<ul style="list-style-type: none"><li>❑ The stakeholder representatives have agreed to take on their responsibilities.</li><li>❑ The stakeholder representatives are authorized to carry out their responsibilities.</li><li>❑ The collaboration approach among the stakeholder representatives has been agreed.</li><li>❑ The stakeholder representatives support and respect the team's way of working.</li></ul>	<ul style="list-style-type: none"><li>❑ The stakeholder representatives assist the team in accordance with their responsibilities.</li><li>❑ The stakeholder representatives provide feedback and take part in decision making in a timely manner.</li><li>❑ The stakeholder representatives promptly communicate changes that are relevant for their stakeholder groups.</li></ul>	<ul style="list-style-type: none"><li>❑ The stakeholder representatives have agreed upon their minimal expectations for the next deployment of the new system.</li><li>❑ The stakeholder representatives are happy with their involvement in the work.</li><li>❑ The stakeholder representatives agree that their input is valued by the team and treated with respect.</li><li>❑ The team members agree that their input is valued by the stakeholder representatives and treated with respect.</li><li>❑ ...</li></ul>	<ul style="list-style-type: none"><li>❑ The stakeholder representatives provide feedback on the system from their stakeholder group perspective.</li><li>❑ The stakeholder representatives confirm that the system is ready for deployment.</li></ul>	<ul style="list-style-type: none"><li>❑ Stakeholders are using the new system and providing feedback on their experiences.</li><li>❑ The stakeholders confirm that the new system meets their expectations.</li></ul>
1 / 6	2 / 6	3 / 6	4 / 6	5 / 6	6 / 6

- The team members arrange all the *Stakeholders Alpha* cards in sequences.



# Stakeholders

**Recognized**: Stakeholders have been identified.

## Recognized

- All the different groups of stakeholders that are, or will be, affected by the development and operation of the software system are identified.
- There is agreement on the stakeholder groups to be represented. At a minimum, the stakeholders groups that fund, use, support, and maintain the system have been considered.
- The responsibilities of the stakeholder representatives have been defined.

**The Recognized state has been achieved**

1 / 6



# Stakeholders

## Represented

- The stakeholder representatives have agreed to take on their responsibilities.
- The stakeholder representatives are authorized to carry out their responsibilities.
- The collaboration approach among the stakeholder representatives has been agreed.
- The stakeholder representatives support and respect the team's way of working.

2 / 6

**Represented:** The mechanisms for involving the stakeholders are agreed and the stakeholder representatives have been appointed.

## The Represented state is the next Target state

- the faculty group is not represented.

# Result



## Stakeholders

### Recognized

- All the different groups of stakeholders that are, or will be, affected by the development and operation of the software system are identified.
- There is agreement on the stakeholder groups to be represented. At a minimum, the stakeholder groups that fund, use, support, and maintain the system have been considered.
- The responsibilities of the stakeholder representatives have been defined.

1 / 6

We are here

Our target



## Stakeholders

### Represented

- The stakeholder representatives have agreed to take on their responsibilities.
- The stakeholder representatives are authorized to carry out their responsibilities.
- The collaboration approach among the stakeholder representatives has been agreed.
- The stakeholder representatives support and respect the team's way of working.

2 / 6



# Tasks- *Stakeholders Alpha*

- **Task 1:** Appoint stakeholder representatives for the faculty group, including supportive and unsupportive faculty members.
- **Task 2:** Agree on or modify existing definition of responsibilities and collaboration approaches of the faculty representatives. Because of the iterative nature of the endeavor, the stakeholder need to agree on providing feedback on a regular basis.



# As a result. . .

- Tasks 1 and 2 receive attention
- In addition:
  - Engagement with other stakeholder groups continues
    - Administrators
    - Students
  - Work on the endeavor continues
  - To avoid over-burdening the team, additional alphas are introduced incrementally during future pain point intervention meetings



# 2<sup>nd</sup> PPI Meeting: Identify Current State - Stakeholders Alpha



## Stakeholders

### Represented

- The stakeholder representatives have agreed to take on their responsibilities.
- The stakeholder representatives are authorized to carry out their responsibilities.
- The collaboration approach among the stakeholder representatives has been agreed.
- The stakeholder representatives support and respect the team's way of working.

- *Represented* state has been achieved.
  - Four faculty representatives have been appointed: two supportive and two unsupportive
  - Agreement has been reached about their responsibilities and collaboration approach

# 2<sup>nd</sup> PPI Meeting: Identify Target State - Stakeholders Alpha



## Stakeholders

### Involved

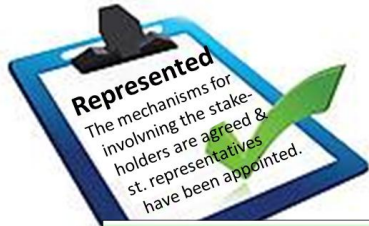
- The stakeholder representatives assist the team in accordance with their responsibilities.
- The stakeholder representatives provide feedback and take part in decision making in a timely manner.
- The stakeholder representatives promptly communicate changes that are relevant for their stakeholder groups.

3 / 6

**Involved**: The stakeholder representatives are actively involved in the work and fulfilling their responsibilities.

- Despite receiving feedback from one faculty representative, this state has not yet been reached
  - Team has not been able to fully engage all faculty representatives

# 2<sup>nd</sup> PPI Meeting: Identify Target State - Stakeholders Alpha



## Stakeholders

### Represented

- The stakeholder representatives have agreed to take on their responsibilities.
- The stakeholder representatives are authorized to carry out their responsibilities.
- The collaboration approach among the stakeholder representatives has been agreed.
- The stakeholder representatives support and respect the team's way of working.

2 / 6

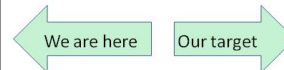


## Stakeholders

### Involved

- The stakeholder representatives assist the team in accordance with their responsibilities.
- The stakeholder representatives provide feedback and take part in decision making in a timely manner.
- The stakeholder representatives promptly communicate changes that are relevant for their stakeholder groups.

3 / 6



# 2<sup>nd</sup> PPI Meeting: Identify Tasks - *Stakeholders Alpha*



– **Task 3:** Prepare for short interviews with Faculty representatives

– **Task 4:** Carry out interviews with all Faculty representatives

# 2<sup>nd</sup> PPI Meeting Continues



- Negative feedback received from the unsupportive faculty member reveals that he does not see the value of the new system
- What should they do?
- Which Alpha should they choose next?

# 2<sup>nd</sup> PPI Meeting Continues



**Opportunity:** The set of circumstances that makes it appropriate to develop or change a software system.

- Team decides to study the *Opportunity* alpha

# 2<sup>nd</sup> PPI Meeting Continues

Opportunity	Opportunity	Opportunity	Opportunity	Opportunity	Opportunity
<b>Identified</b>	<b>Solution Needed</b>	<b>Value Established</b>	<b>Viable</b>	<b>Addressed</b>	<b>Benefit Accrued</b>
<ul style="list-style-type: none"><li><input type="checkbox"/> An idea for a way of improving current ways of working, increasing market share or applying a new or innovative software system has been identified.</li><li><input type="checkbox"/> At least one of the stakeholders wishes to make an investment in better understanding the opportunity and the value associated with addressing it.</li><li><input type="checkbox"/> The other stakeholders who share the opportunity have been identified.</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> The stakeholders in the opportunity and the proposed solution have been identified.</li><li><input type="checkbox"/> The stakeholders' needs that generate the opportunity have been established.</li><li><input type="checkbox"/> Any underlying problems and their root causes have been identified.</li><li><input type="checkbox"/> It has been confirmed that a software-based solution is needed.</li><li><input type="checkbox"/> At least one software-based solution has been proposed.</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> The value of addressing the opportunity has been quantified either in absolute terms or in returns or savings per time period (e.g. per annum).</li><li><input type="checkbox"/> The impact of the solution on the stakeholders is understood.</li><li><input type="checkbox"/> The value that the software system offers to the stakeholders that fund and use the software system is understood.</li><li><input type="checkbox"/> The success criteria by which the deployment of the software system is to be judged are clear.</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> A solution has been outlined.</li><li><input type="checkbox"/> The indications are that the solution can be developed and deployed within constraints.</li><li><input type="checkbox"/> The risks associated with the solution are acceptable and manageable.</li><li><input type="checkbox"/> The indicative (ball-park) costs of the solution are less than the anticipated value of the opportunity.</li><li><input type="checkbox"/> The reasons for the development of a software-based solution are understood by all members of the team.</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> A viable system that demonstrably addresses the opportunity is available.</li><li><input type="checkbox"/> The stakeholders agree that the available solution is worth deploying.</li><li><input type="checkbox"/> The stakeholders are satisfied that the solution produced addresses the opportunity.</li></ul>	<ul style="list-style-type: none"><li><input type="checkbox"/> The solution has started to accrue benefits for the stakeholders.</li><li><input type="checkbox"/> The return-on-investment profile is at least as good as anticipated.</li></ul>
1 / 6	2 / 6	3 / 6	4 / 6	5 / 6	6 / 6

- *Opportunity* alpha cards are arranged in sequence
- Examination of the cards helps the team uncover any issue related to the opportunity and its value to users



# 2<sup>nd</sup> PPI: Identify Current State - *Opportunity Alpha*



## Opportunity

### Identified

- An idea for a way of improving current ways of working, increasing market share or applying a new or innovative *software system* has been identified.
- At least one of the stakeholders wishes to make an investment in better understanding the opportunity and the value associated with addressing it.
- The other stakeholders who share the opportunity have been identified.

# 2<sup>nd</sup> PPI Meeting: Identify Target State - Opportunity

There is clearly a need for articulating and communicating the solution value to all faculty members.



## Opportunity

### Solution Needed

- The stakeholders in the opportunity and the proposed solution have been identified.
- The stakeholders' needs that generate the opportunity have been established.
- Any underlying problems and their root causes have been identified.
- It has been confirmed that a software-based solution is needed.
- At least one software-based solution has been proposed.

2 / 6



## Opportunity

### Value Established

- The value of addressing the opportunity has been quantified either in absolute terms or in returns or savings per time period.
- The impact of the solution on the stakeholders is understood.
- The value that the software system offers to the stakeholders that fund and use the *software system* is understood.
- The success criteria by which the deployment of the *software system* is to be judged are clear.
- The desired outcomes required of the solution are clear and quantified.

3 / 6

# 2<sup>nd</sup> PPI Meeting: Identify Tasks - *Opportunity Alpha*



- **Task 5:** Prepare a short demonstration of the new solution key features while articulating their value (including value over the wiki-based solution)
- **Task 6:** Present solution value to faculty during weekly faculty meeting

# Moving forward . . .

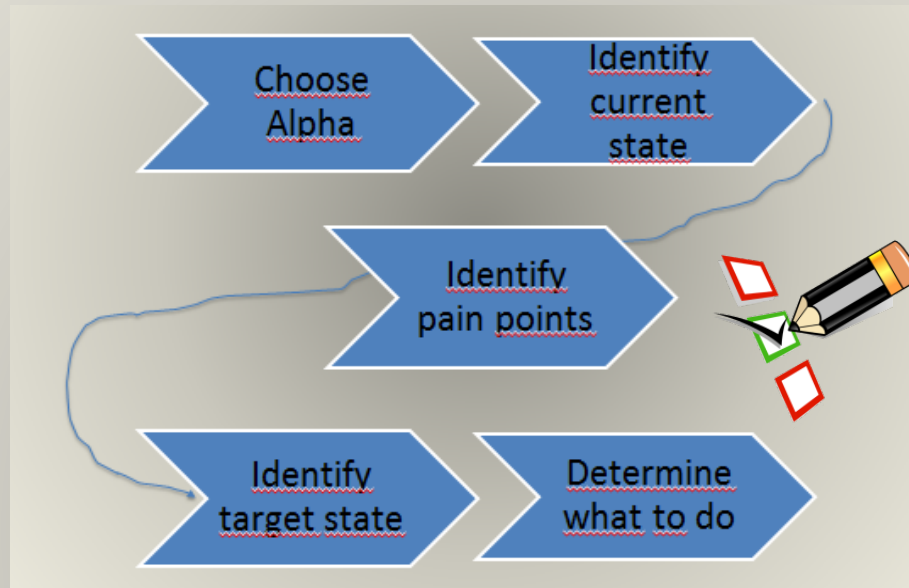


- The team briefly reviews alphas that have been identified as candidates for pain point identification
- New alphas are introduced incrementally as needed, to address new pain points or simply check the state of the endeavor

# Agenda

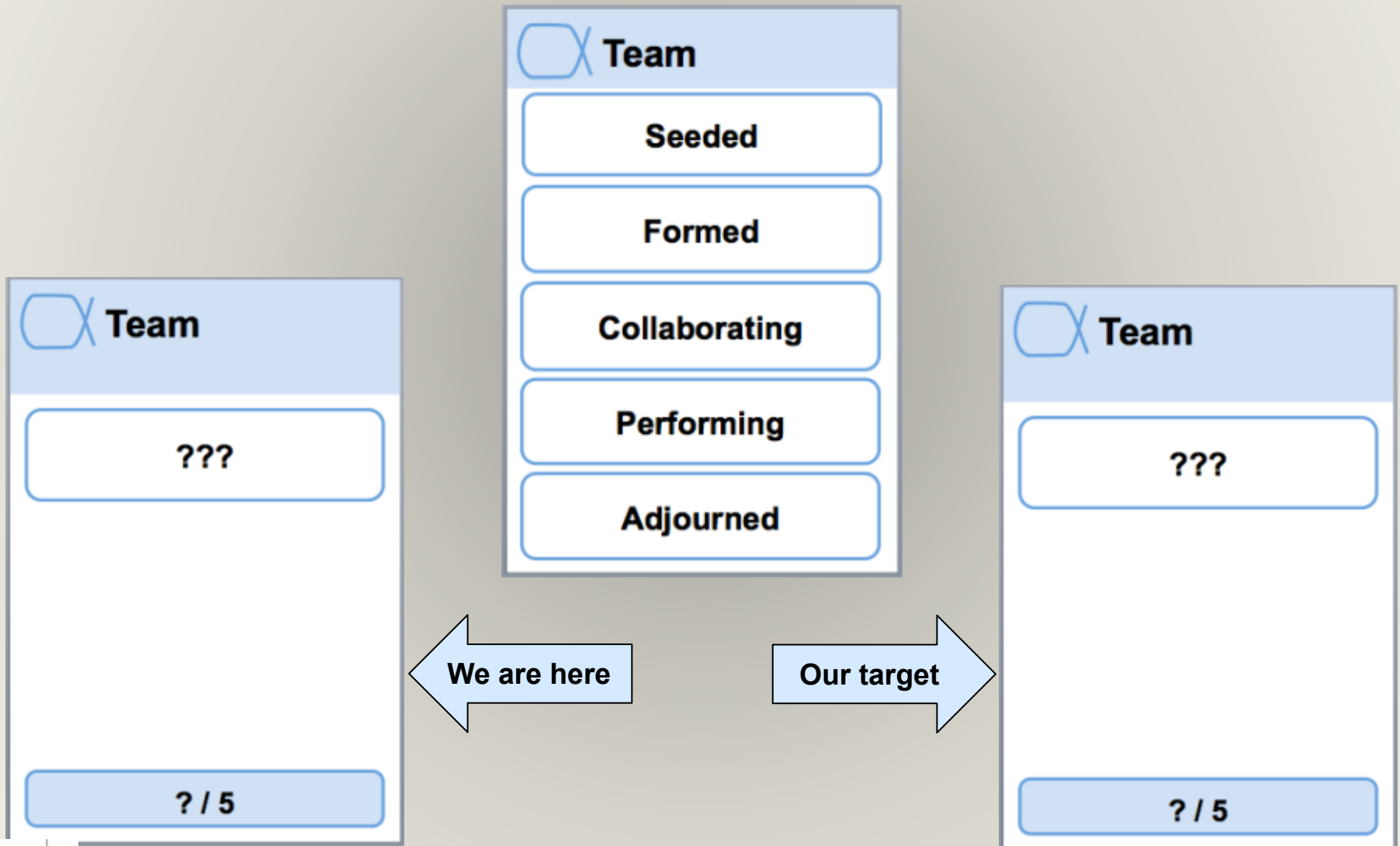
- Part 1: Introduction
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  - Essence Kernel
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- Part 4: The value of the Kernel?
- Part 5: Kernel cont. & Kernel Extensions

# Your turn!

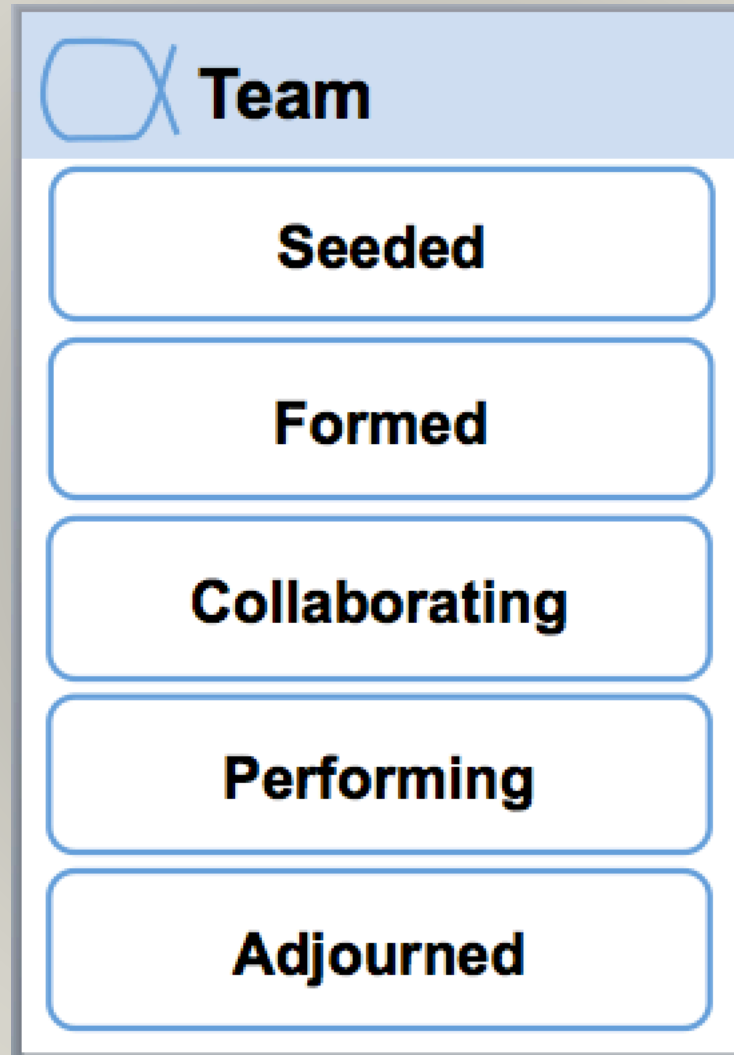


- Create a discussion group
- Read the handout for Scenario 2
- Assess the *Team* alpha
- Assess the *Requirements* alpha

# Directions for the discussion




# Let us share what we have found





# One possible finding to share



## Team


### Seeded

- The team mission has been defined in terms of the opportunities and outcomes.
- Constraints on the team's operation are known.
- Mechanisms to grow the team are in place.
- The composition of the team is defined.
- Any constraints on where and how the work is carried out are defined.
- The team's responsibilities are outlined.
- The level of team commitment is clear.
- Required competencies are identified.
- The team size is determined.
- Governance rules are defined.
- Leadership model is selected.

### 1 / 5

### Action Items:

- Team needs to establish communication mechanisms
- Put a tool in place to track issues
- Team needs to work on how they deal with problems related to acceptance of stakeholders viewpoints
- Setup a session to talk about how to react to negative feedback



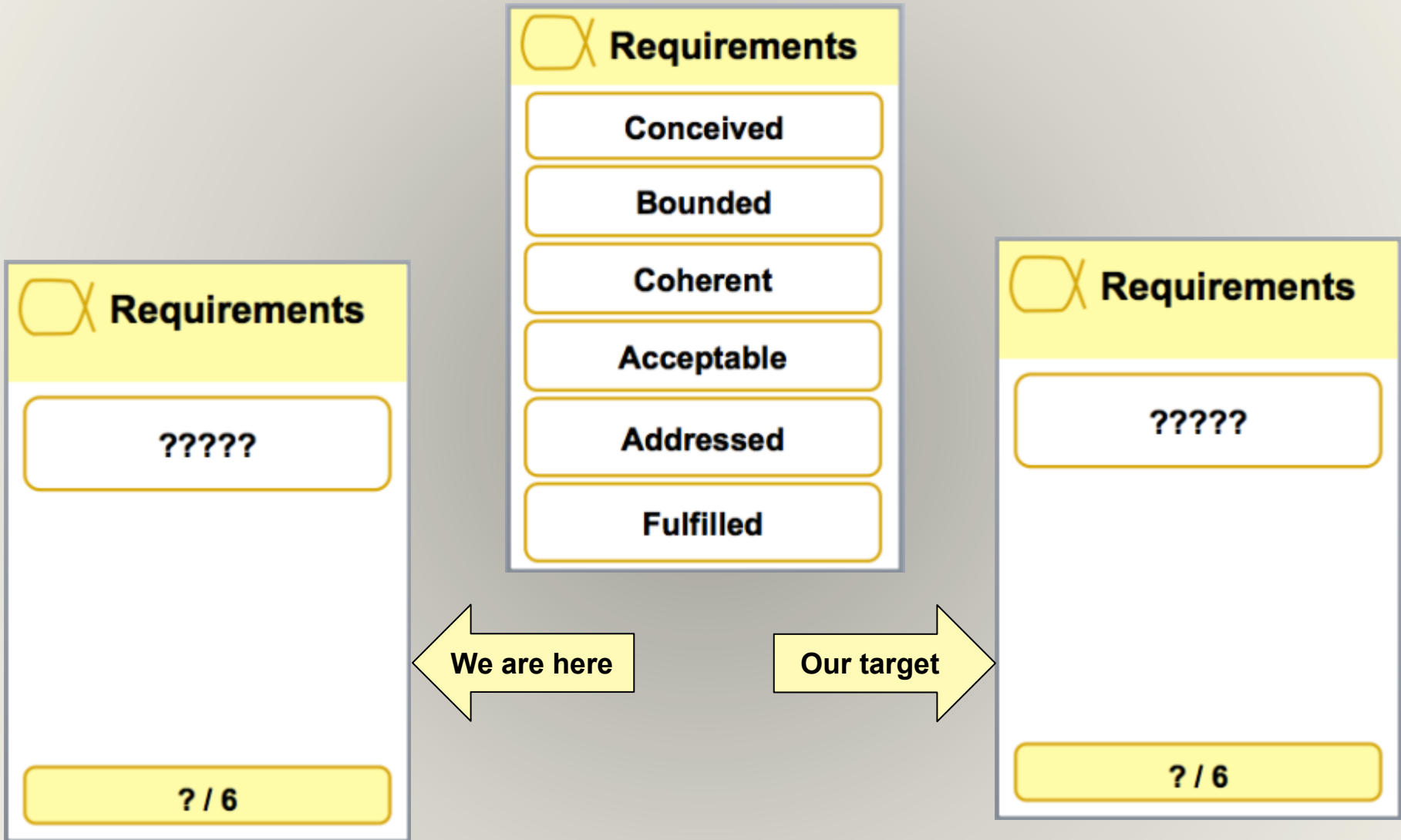
## Team

### Formed

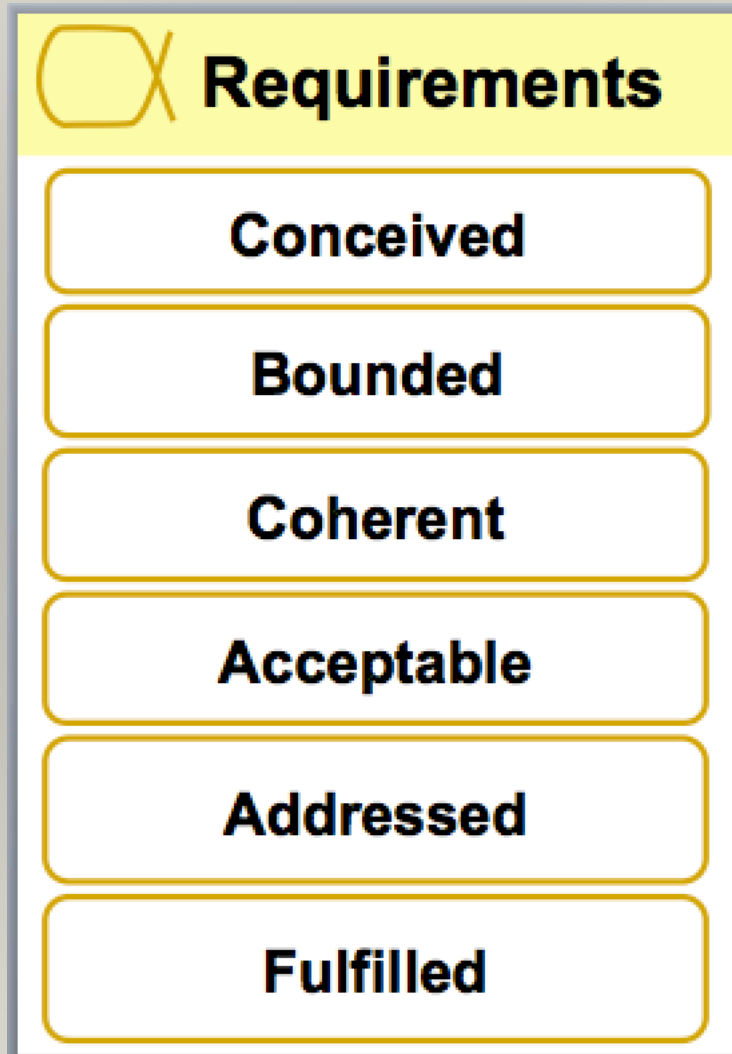
- Individual responsibilities are understood.
- Enough team members have been recruited to enable the work to progress.
- Every team member understands how the team is organized.
- All team members understand how to perform their work.
- The team members have met (perhaps virtually) and are beginning to get to know each other
- The team members understand their responsibilities and how they align with their competencies.
- Team members are accepting work.
- Any external collaborators (organizations, teams and individuals) are identified.
- Team communication mechanisms have been defined.
- Each team member commits to working on the team as defined.

### 2 / 5

# Directions for the discussion



# Let us share what you have found



# One possible finding to share

## Requirements

### Coherent

- The requirements are captured and shared with the team and the stakeholders.
- The origin of the requirements is clear.
- The rationale behind the requirements is clear.
- Conflicting requirements are identified and attended to.
- The requirements communicate the essential characteristics of the system to be delivered.
- The most important usage scenarios for the system can be explained.
- The priority of the requirements is clear.
- The impact of implementing the requirements is understood.
- The team understands what has to be delivered and agrees to deliver it.

**3 / 6**

#### Action Items:

- Redefine requirement related to grading
- Obtain acceptance from faculty representatives

## Requirements

### Acceptable

- The stakeholders accept that the requirements describe an acceptable solution.
- The rate of change to the agreed requirements is relatively low and under control.
- The value provided by implementing the requirements is clear.
- The parts of the opportunity satisfied by the requirements are clear.
- The requirements are testable.

**4 / 6**

# Summary: In this scenario ...



- We have acquainted ourselves with the Kernel Alphas
- We have learned
  - how to use the Alpha states to identify pain points and current and target states
  - how to identify action items to achieve target states and alleviate pain points

# Summary: In this scenario ...



- we have also learned that
  - problems that are usually common to many software projects can be avoided through the use of the Essence kernel

# Summary: In this scenario ...



- we have also learned that
  - the Essence kernel provides a holistic approach to assess the health and the progress of a software project

# Agenda

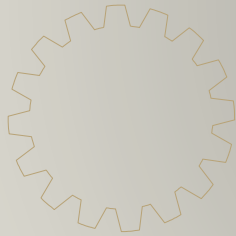
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# Essence Kernel Value

How does the approach provide value to the project team?



**Value comes primarily  
from team discussions**



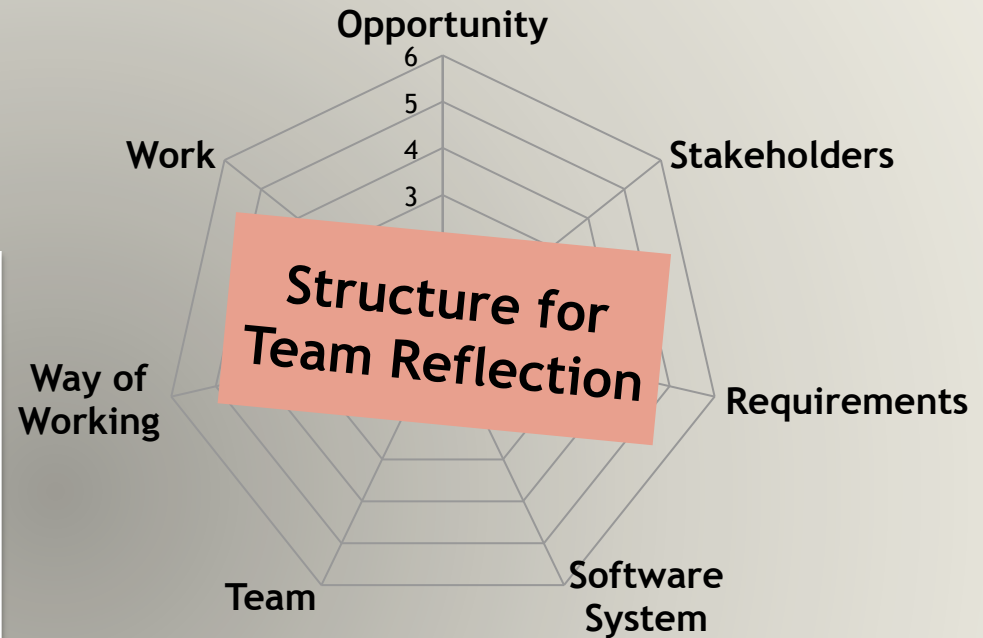
# Essence Kernel Value

**Step Back &  
Look at Project  
Holistically**

## Quotes from CMU Students:

*“Essence gives us a chance to back up and look at the project as a whole, from the birds point of view.”*

*“Essence provides a structured way of thinking about critical aspects of the project. Without Essence, our team could have overlooked some of these aspects.”*





# Essence Kernel Value

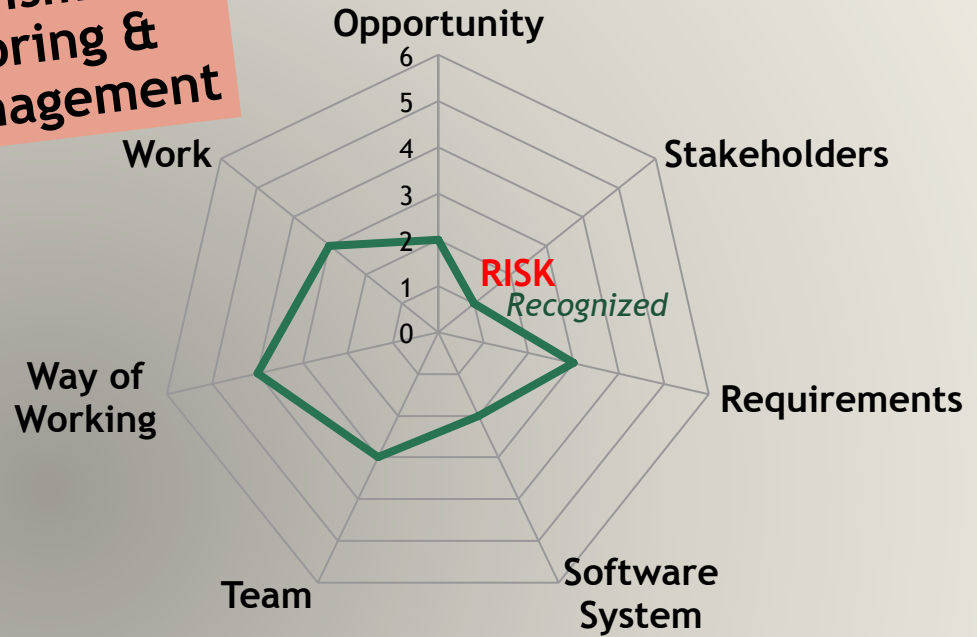
Monitor Progress

Mechanism for Monitoring & Risk Management

Quotes from CMU Students:

*“The alphas seem to be exactly the right areas to monitor to promote project success.”*

*“Essence is great for team reflection & risk management.”*



**RISK: Opportunity & Requirements defined without proper stakeholders involvement**

Current State

Stakeholders	Stakeholders	Stakeholders	Stakeholders	Stakeholders	Stakeholders
<p><b>Recognized</b></p> <ul style="list-style-type: none"> <li>Stakeholders have been identified</li> <li>There is agreement on stakeholder groups to be represented</li> <li>Responsibilities of stakeholder representatives defined</li> </ul> <p>1 / 6</p>	<p><b>Represented</b></p> <ul style="list-style-type: none"> <li>Stakeholder representatives appointed</li> <li>Stakeholder representatives agreed to take on responsibilities &amp; authorized</li> <li>Collaboration approach agreed</li> <li>Representatives respect team way of working</li> </ul> <p>2 / 6</p>	<p><b>Involved</b></p> <ul style="list-style-type: none"> <li>Stakeholder representatives carry out responsibilities</li> <li>Stakeholder representatives provide feedback &amp; take part in decisions in timely way</li> <li>Stakeholder representatives promptly communicate to stakeholder group</li> </ul> <p>3 / 6</p>	<p><b>In Agreement</b></p> <ul style="list-style-type: none"> <li>Stakeholder representatives agree their input is valued and respected by the team</li> <li>Stakeholder representatives agree with how different priorities balance</li> <li>Stakeholder representatives have agreed upon minimal expectations for deployment</li> </ul> <p>4 / 6</p>	<p><b>Satisfied for Deployment</b></p> <ul style="list-style-type: none"> <li>Stakeholder representatives provide feedback on system from their stakeholder group perspective</li> <li>Stakeholder representatives confirm system ready for deployment</li> </ul> <p>5 / 6</p>	<p><b>Satisfied in Use</b></p> <ul style="list-style-type: none"> <li>System has met or exceed minimal stakeholder expectations</li> <li>Stakeholder needs and expectations are being met</li> </ul> <p>6 / 6</p>



# Essence Kernel Value

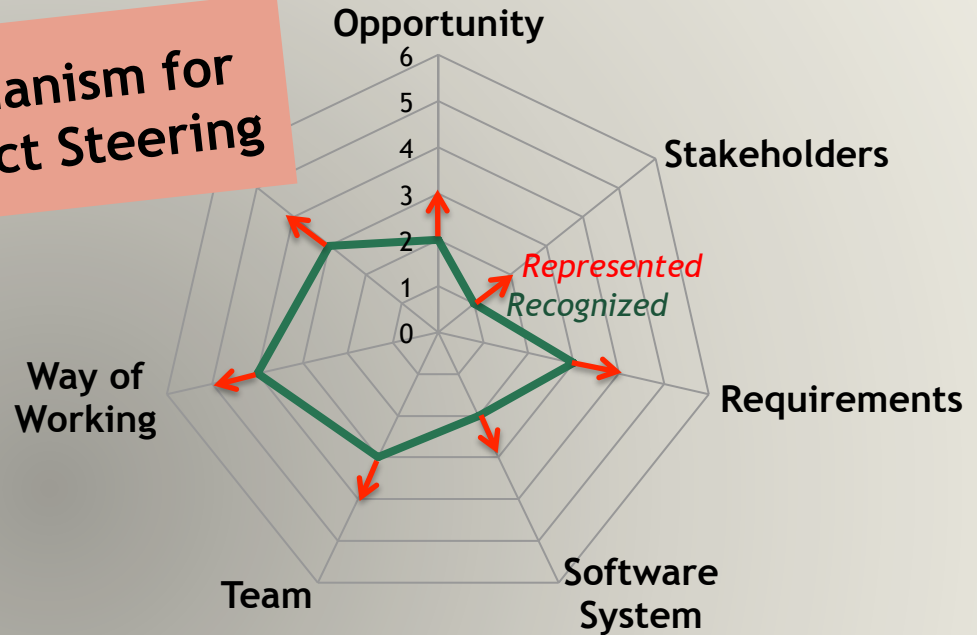
Set Project  
Direction &  
Goals

Mechanism for  
Project Steering

Quotes from CMU Students:

*“Essence gives us structure and direction.”*

*“Essence is useful, as it gives you an agenda or checklist based on various dimensions.”*



Current  
State

Target  
State

Current State	Target State	Current State	Current State	Current State	Current State
<p><input checked="" type="checkbox"/> Stakeholders</p> <p><b>Recognized</b></p> <ul style="list-style-type: none"> <li>Stakeholders have been identified</li> <li>There is agreement on stakeholder groups to be represented</li> <li>Responsibilities of stakeholder representatives defined</li> </ul> <p>1 / 6</p>	<p><input checked="" type="checkbox"/> Stakeholders</p> <p><b>Represented</b></p> <ul style="list-style-type: none"> <li>Stakeholder representatives appointed</li> <li>Stakeholder representatives agreed to take on responsibilities &amp; authorized</li> <li>Collaboration approach agreed</li> <li>Representatives respect team way of working</li> </ul> <p>2 / 6 <b>Goals</b></p>	<p><input checked="" type="checkbox"/> Stakeholders</p> <p><b>Involved</b></p> <ul style="list-style-type: none"> <li>Stakeholder representatives carry out responsibilities</li> <li>Stakeholder representatives provide feedback &amp; take part in decisions in timely way</li> <li>Stakeholder representatives promptly communicate to stakeholder group</li> </ul> <p>3 / 6</p>	<p><input checked="" type="checkbox"/> Stakeholders</p> <p><b>In Agreement</b></p> <ul style="list-style-type: none"> <li>Stakeholder representatives agree their input is valued and respected by the team</li> <li>Stakeholder representatives agree with how different priorities balance</li> <li>Stakeholder representatives have agreed upon minimal expectations for deployment</li> </ul> <p>4 / 6</p>	<p><input checked="" type="checkbox"/> Stakeholders</p> <p><b>Satisfied for Deployment</b></p> <ul style="list-style-type: none"> <li>Stakeholder representatives provide feedback on system from their stakeholder group perspective</li> <li>Stakeholder representatives confirm system ready for deployment</li> </ul> <p>5 / 6</p>	<p><input checked="" type="checkbox"/> Stakeholders</p> <p><b>Satisfied in Use</b></p> <ul style="list-style-type: none"> <li>System has met or exceed minimal stakeholder expectations</li> <li>Stakeholder needs and expectations are being met</li> </ul> <p>6 / 6</p>

Cécile Péraire

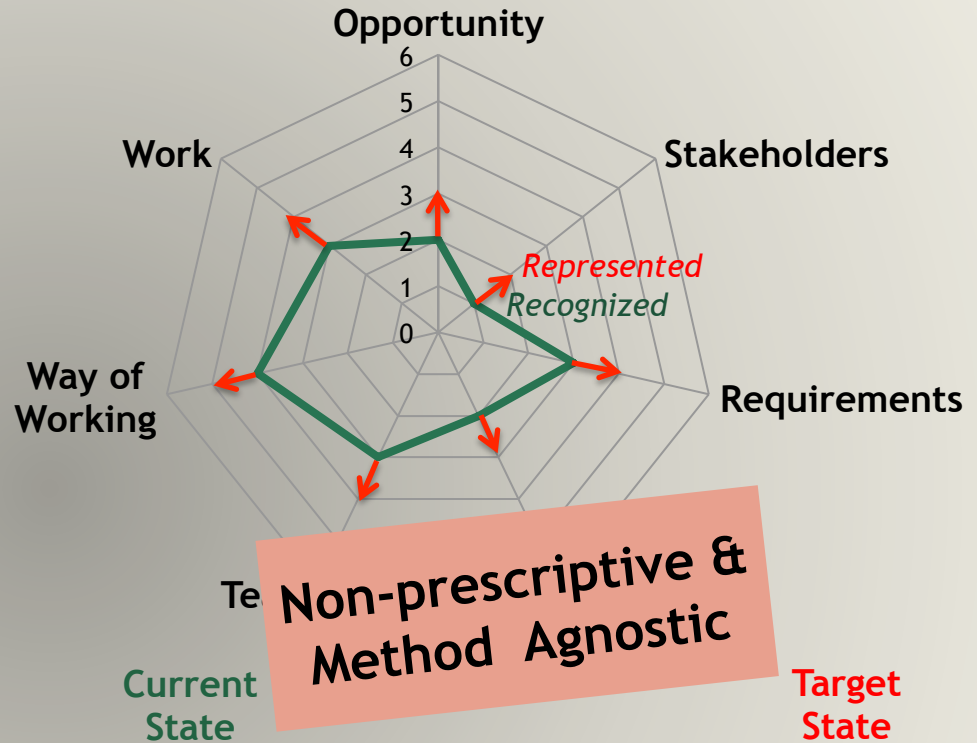


# Essence Kernel Value

**Decide How to Reach Goals (Work Items)**

**Quote from CMU Student:**

*“I will use Essence on my next project, especially with a team that is not used to the same software engineering process. In that case Essence is a backdrop at the basis of the communication about all the considerations for the success of the project.”*



**Current State**

Stakeholders

**Recognized**

- Stakeholders have been identified
- There is agreement on stakeholder groups to be represented
- Responsibilities of stakeholder representatives defined

1 / 6

**Work Items:**

- ...
- ...
- ...

**Up to the team!**

**Target State**

Stakeholders

**Represented**

- Stakeholder representatives appointed
- Stakeholder representatives agreed to take on responsibilities & authorized
- Collaboration approach agreed
- Representatives respect team way of working

2 / 6 **Goals**

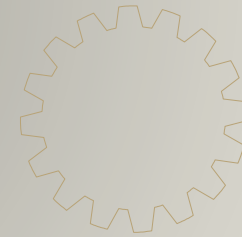


# Essence Kernel Value

How does the approach provide value to the project team?

**The Essence kernel provides  
a structure and mechanism for:**

- **Progress monitoring**
- **Team reflection**
- **Risk management**
- **Project steering**



**In a holistic, simple, lightweight,  
non-prescriptive and method-agnostic fashion**

# Usage

Grasp  
holistically  
the SE Scope

Query for  
guidance

Assess  
strengths and  
weaknesses of the  
methods

Plan  
work

Identify  
gaps in  
competencies

Determine  
current  
project status

Design  
methods

Determine  
project health  
& state

Assess  
risks

Compare  
methods/prac-  
tices

Support  
tool building

Improve  
methods

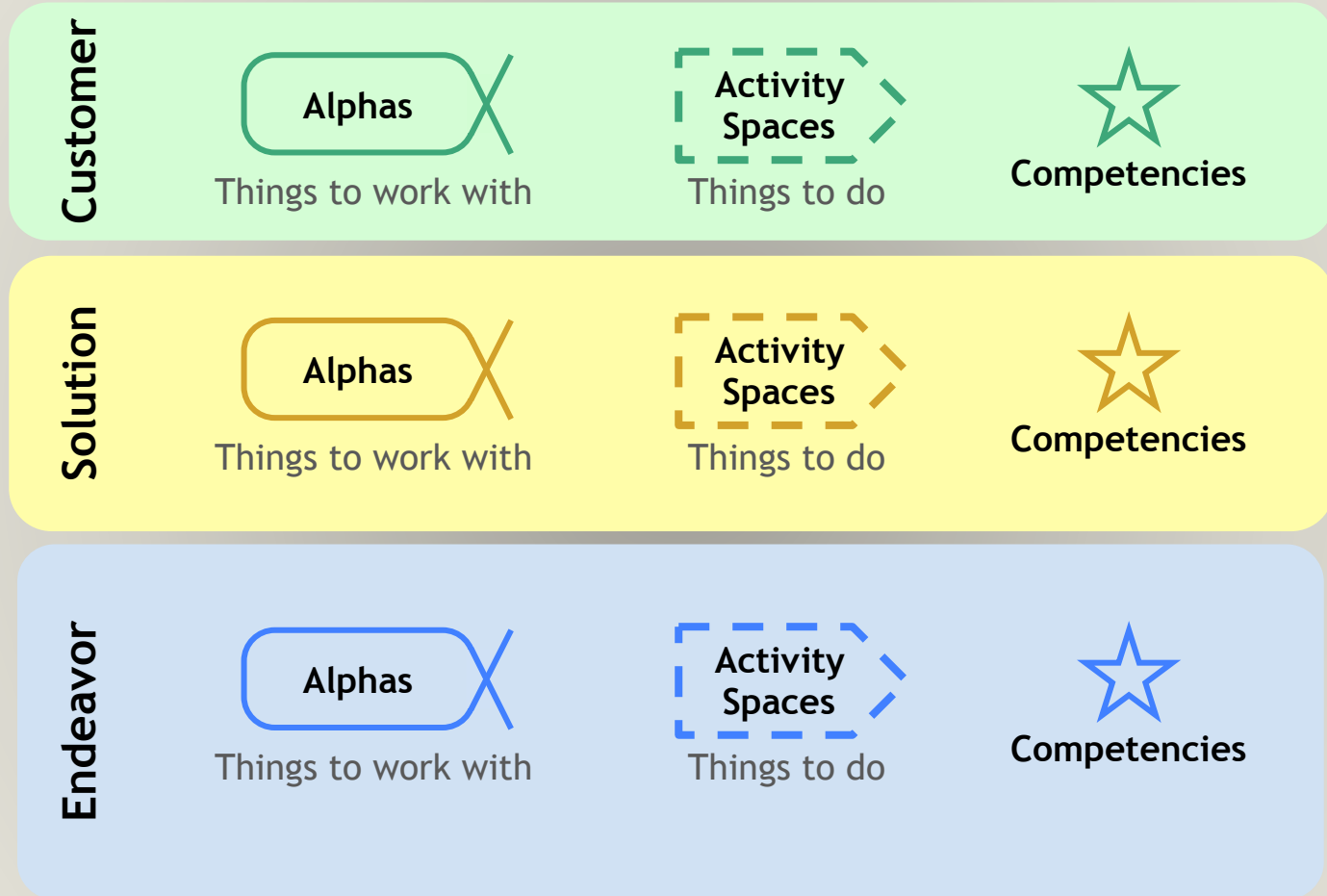
# Agenda

- Part 1: Introduction
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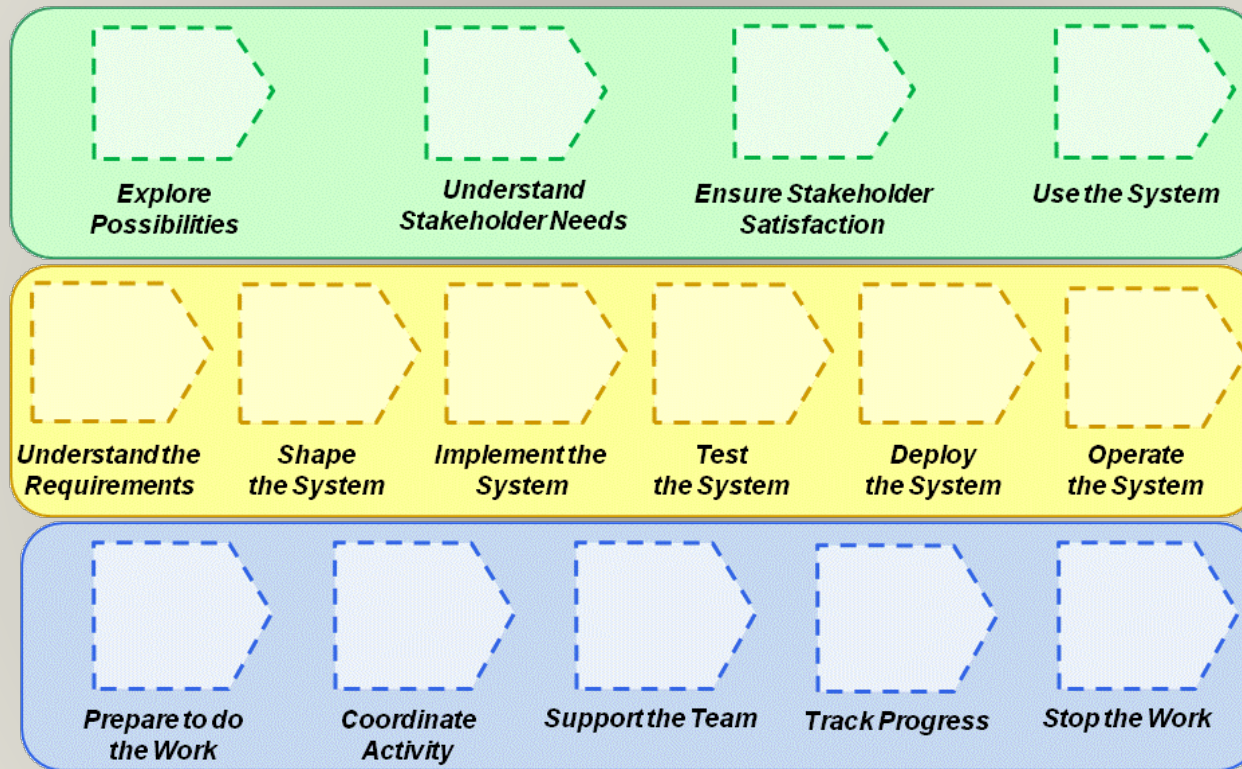




# Essence Kernel

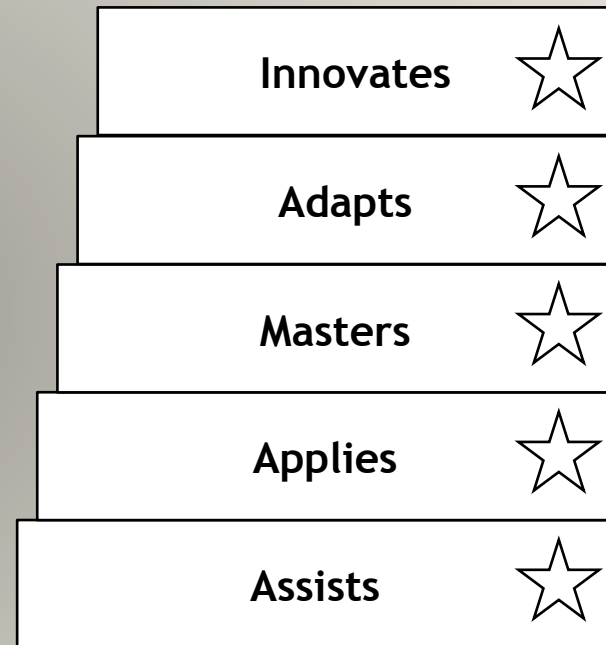


# Activity Spaces – Things To Do



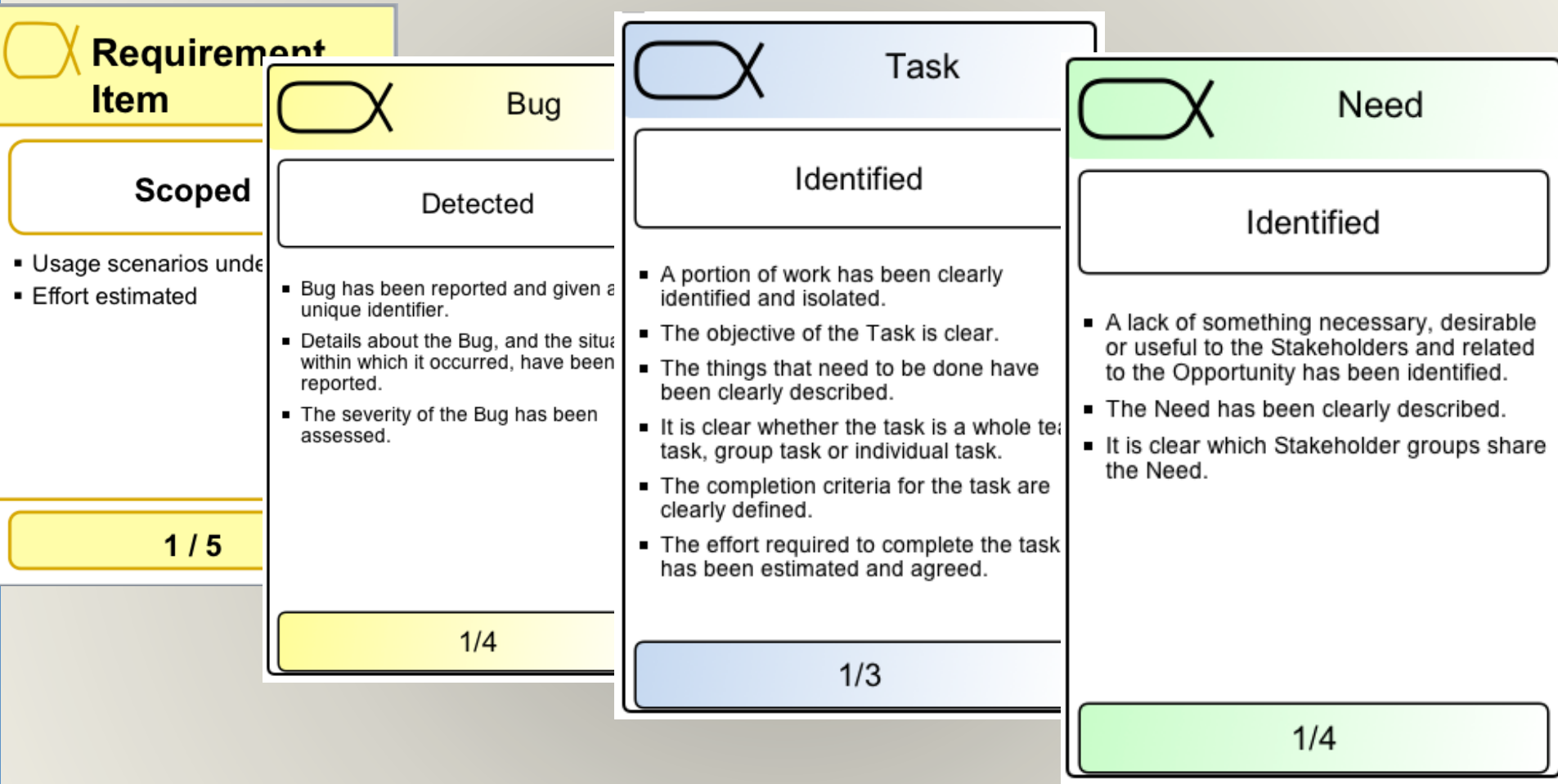
Activity based view of software engineering

# Competencies



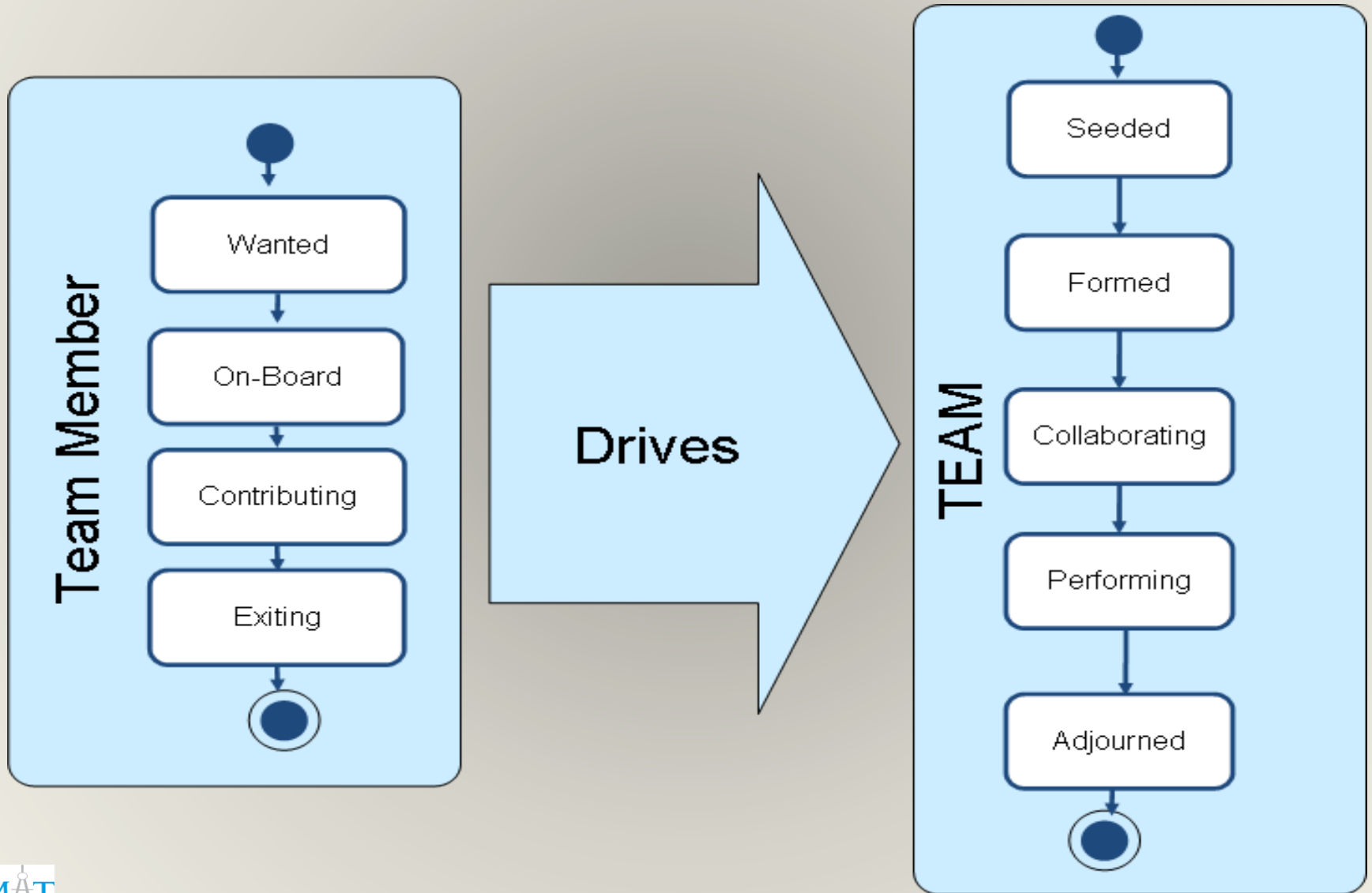
View of key competencies needed in software engineering

# Sub-Alphas

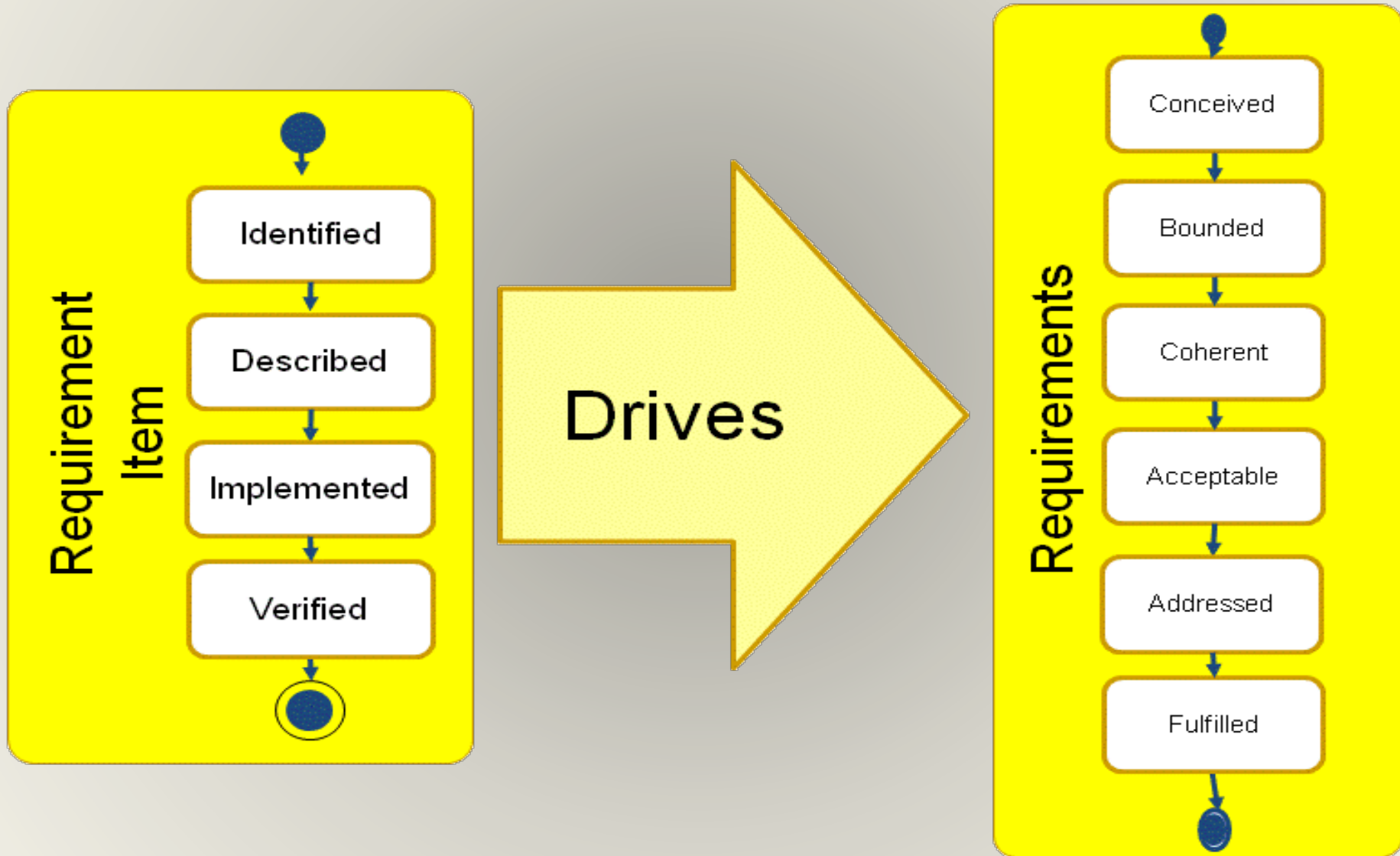


Sub-alphas could be added to the Kernel's alphas to monitor and steer other aspects of the project as needed (like user stories, bugs, tasks, etc.)

# Sub-Alpha: Team Member



# Sub-Alpha: Requirements Item



# References

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- Ivar Jacobson and all. The Essence of Software Engineering: The SEMAT Kernel, acmqueue, 2012.
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- Cécile Péraire and Todd Sedano. State-based Monitoring and Goal-driven Project Steering: Field Study of the SEMAT Essence Framework, ICSE'14, 2014.  
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- SEMAT Essence Kernel Tool, <http://essence.sv.cmu.edu>

