



Opportunity

Benefit Accrued

- Solution accrues benefits
- ROI acceptable



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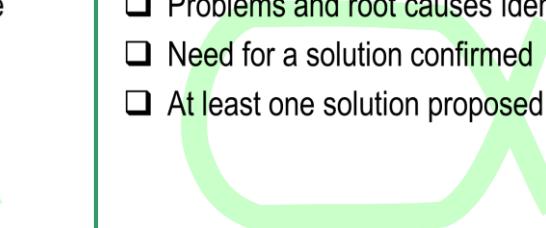
Opportunity

Viable

- Solution outlined
- Solution possible within constraints
- Risks acceptable & manageable
- Solution profitable
- Reasons to develop solution understood
- Pursuit viable



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Opportunity

Solution Needed

- Solution identified
- Stakeholders' needs established
- Problems and root causes identified
- Need for a solution confirmed
- At least one solution proposed



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Opportunity

Identified

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

Solution Needed

The opportunity:

- Unites and motivates the stakeholders
- Has tangible benefit for the stakeholders
- Provides the justification for the system's development
- Establishes the value of the proposed system
- Represents the team's shared understanding of the stakeholder's needs

Value Established

Viable

Addressed

Benefit Accrued



Opportunity

Addressed

- Opportunity addressed
- Solution worth deploying
- Stakeholders satisfied



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Opportunity

Value Established

- Opportunity value quantified
- Solution impact understood
- System value understood
- Success criteria clear
- Outcomes clear and quantified



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Opportunity

Identified

- Idea behind opportunity identified
- At least one investing stakeholder interested
- Other stakeholders identified



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Requirements

Fulfilled

- Stakeholders accept requirements
- No hindering requirements
- Requirements fully satisfied

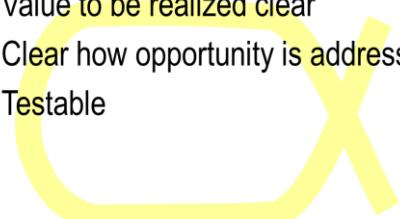


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Requirements

Acceptable

- Acceptable solution described
- Change under control
- Value to be realized clear
- Clear how opportunity is addressed
- Testable

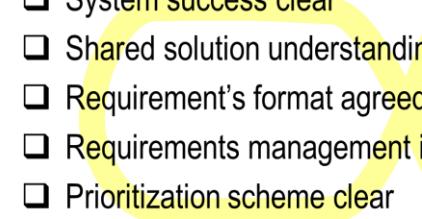
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Requirements

Bounded

- Development stakeholders identified
- System purpose agreed
- System success clear
- Shared solution understanding exists
- Requirement's format agreed
- Requirements management in place
- Prioritization scheme clear
- Constraints identified & considered
- Assumptions clear

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Requirements

Conceived

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

The requirements:

- Establish a shared understanding of what the software system must do
- Communicate the intent of the software system to be produced
- Define the capabilities, services and qualities that the stakeholders desire from the system
- Are organized to allow the scope of the software system to be managed
- Drive the development and testing of the system

Bounded

Coherent

Acceptable

Addressed

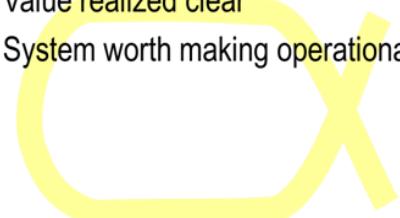
Fulfilled



Requirements

Addressed

- Enough addressed to be acceptable
- Requirements and system match
- Value realized clear
- System worth making operational

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Requirements

Coherent

- Requirements shared
- Requirements' origin clear
- Rationale clear
- Conflicts addressed
- Essential characteristics clear
- Key usage scenarios explained
- Priorities clear
- Impact understood
- Team knows & agrees on what to deliver

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Requirements

Conceived

- Stakeholders agree system is to be produced
- Users identified
- Funding stakeholders identified
- Opportunity clear

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Stakeholders

Satisfied for Deployment

- Stakeholder feedback provided
- System ready for deployment



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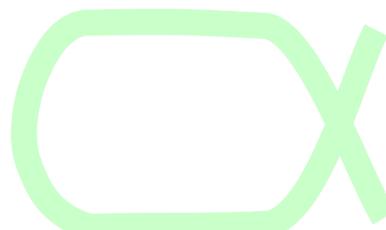
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Stakeholders

Satisfied in Use

- Feedback on system use available
- System meets expectations



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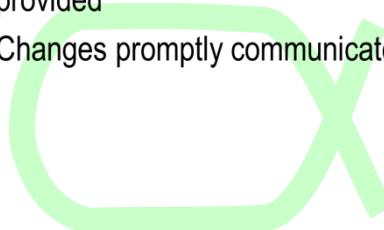
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Stakeholders

Involved

- Representatives assist the team
- Timely feedback and decisions provided
- Changes promptly communicated



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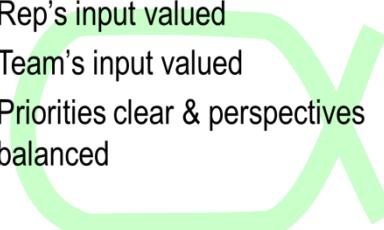
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Stakeholders

In Agreement

- Minimal expectations agreed
- Rep's happy with their involvement
- Rep's input valued
- Team's input valued
- Priorities clear & perspectives balanced



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Stakeholders

Recognized

- Stakeholder groups identified
- Key stakeholder groups represented
- Responsibilities defined



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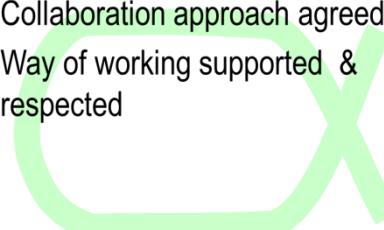
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Stakeholders

Represented

- Responsibilities agreed
- Representatives authorized
- Collaboration approach agreed
- Way of working supported & respected



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Recognized

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

Represented

The stakeholders:

- Provide the opportunity and are the source of the requirements
- Use and consume the software system
- Fund the development of the software system
- Actively represent the groups and organizations affected by the software system
- Are actively involved all the way through the endeavor
- Have representatives that collaborate with the team to reach agreement on an acceptable system

Involved

In Agreement

Satisfied for Deployment

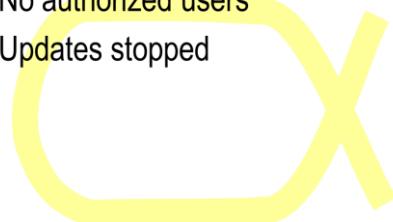
Satisfied in Use

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Software System

Retired

- Replaced or discontinued
- No longer supported
- No authorized users
- Updates stopped



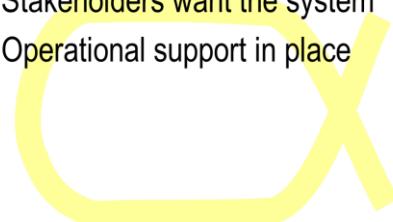
6 / 6



Software System

Ready

- User documentation available
- System accepted as fit-for-purpose
- Stakeholders want the system
- Operational support in place



SEM@T

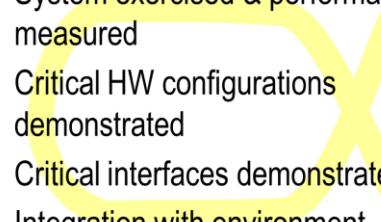
4 / 6



Software System

Demonstrable

- Key architectural characteristics demonstrated
- System exercised & performance measured
- Critical HW configurations demonstrated
- Critical interfaces demonstrated
- Integration with environment demonstrated
- Architecture accepted as fit-for-purpose



SEM@T

2 / 6



Software System

Architecture Selected

A system made up of software, hardware, and data that provides its primary value by the execution of the software.

Demonstrable

Useable

Ready

Operational

Retired

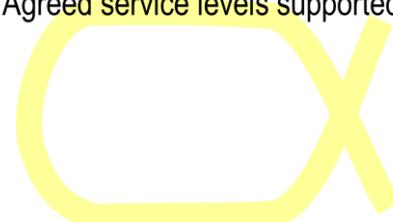
- The software system:
- Is the primary product of any software engineering endeavor
 - Is structured, designed and implemented to fulfil the requirements
 - Is architected to be maintainable, extensible and testable
 - Provides value to its users and other stakeholders
 - Should be kept bug free and easy to use
 - Can be part of a larger software, hardware or business solution



Software System

Operational

- System available for use
- System live
- Agreed service levels supported



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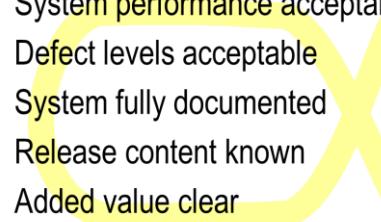
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Software System

Usable

- System can be operated
- System functionality tested
- System performance acceptable
- Defect levels acceptable
- System fully documented
- Release content known
- Added value clear



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Software System

Architecture Selected

- Architecture selection criteria agreed
- HW platforms identified
- Technologies selected
- System boundary known
- Decisions on system organization made
- Buy, build, reuse decisions made
- Key technical risks agreed to



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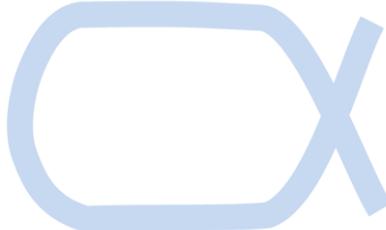
<h2>Team</h2> <div style="border: 1px solid #0070C0; padding: 5px; text-align: center;"> Performing </div> <ul style="list-style-type: none"> <input type="checkbox"/> Consistently meeting commitments <input type="checkbox"/> Continuously adapting to change <input type="checkbox"/> Addresses problems <input type="checkbox"/> Rework and backtracking minimized <input type="checkbox"/> Waste continuously eliminated <div style="display: flex; justify-content: space-around; align-items: center;"> SEMAT 4 / 5  </div>	<h2>Team</h2> <div style="border: 1px solid #0070C0; padding: 5px; text-align: center;"> Formed </div> <ul style="list-style-type: none"> <input type="checkbox"/> Individual responsibilities accepted and aligned to competencies <input type="checkbox"/> Enough members recruited <input type="checkbox"/> Roles understood <input type="checkbox"/> How to work understood <input type="checkbox"/> Members introduced <input type="checkbox"/> Members accepting work <input type="checkbox"/> External collaborators identified <input type="checkbox"/> Communication mechanisms defined <input type="checkbox"/> Members commit to team <div style="display: flex; justify-content: space-around; align-items: center;"> SEMAT 2 / 5  </div>	<h2>Team</h2> <div style="border: 1px solid #0070C0; padding: 5px; text-align: center;"> Seeded </div> <div style="border: 1px solid #0070C0; padding: 5px; text-align: center;"> Formed </div> <div style="border: 1px solid #0070C0; padding: 5px; text-align: center;"> Collaborating </div> <div style="border: 1px solid #0070C0; padding: 5px; text-align: center;"> Performing </div> <div style="border: 1px solid #0070C0; padding: 5px; text-align: center;"> Adjourned </div> <p>The group of people actively engaged in the development, maintenance, delivery or support of a specific software system.</p> <p>The team:</p> <ul style="list-style-type: none"> • Is formed to complete a mission • Is made up of one or more team members who collaborate together to complete their shared mission • Is responsible for completing its work to an acceptable standard • Supports its stakeholders in exploiting the opportunities and addressing the requirements • Owns and continually improves its way-of-working <div style="display: flex; justify-content: space-around; align-items: center;"> SEMAT 1 / 5  </div>
<h2>Team</h2> <div style="border: 1px solid #0070C0; padding: 5px; text-align: center;"> Adjourned </div> <ul style="list-style-type: none"> <input type="checkbox"/> Responsibilities fulfilled <input type="checkbox"/> Members available to other teams <input type="checkbox"/> Mission concluded <div style="display: flex; justify-content: space-around; align-items: center;"> SEMAT 5 / 5  </div>	<h2>Team</h2> <div style="border: 1px solid #0070C0; padding: 5px; text-align: center;"> Collaborating </div> <ul style="list-style-type: none"> <input type="checkbox"/> Works as one unit <input type="checkbox"/> Communication open and honest <input type="checkbox"/> Focused on mission <input type="checkbox"/> Members know each other <div style="display: flex; justify-content: space-around; align-items: center;"> SEMAT 3 / 5  </div>	<h2>Team</h2> <div style="border: 1px solid #0070C0; padding: 5px; text-align: center;"> Seeded </div> <ul style="list-style-type: none"> <input type="checkbox"/> Mission defined <input type="checkbox"/> Constraints known and defined <input type="checkbox"/> Growth mechanisms in place <input type="checkbox"/> Composition defined <input type="checkbox"/> Responsibilities outlined <input type="checkbox"/> Required commitment level clear <input type="checkbox"/> Required competencies identified <input type="checkbox"/> Size determined <input type="checkbox"/> Governance rules defined <input type="checkbox"/> Leadership model selected <div style="display: flex; justify-content: space-around; align-items: center;"> SEMAT 1 / 5  </div>



Way of Working

Retired

- No longer in use
- Lessons learned shared



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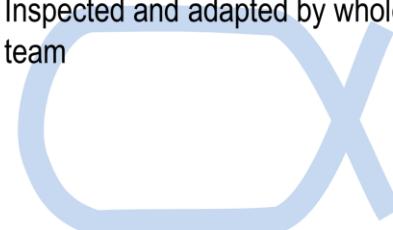
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Way of Working

In Place

- Used by whole team
- Accessible to whole team
- Inspected and adapted by whole team



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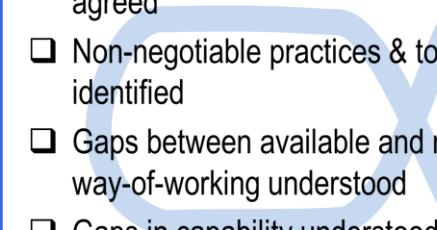
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Way of Working

Foundation Established

- Key practices & tools selected
- Practices needed to start work agreed
- Non-negotiable practices & tools identified
- Gaps between available and needed way-of-working understood
- Gaps in capability understood
- Integrated way of working available



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2 / 6



Way of Working

Principles Established

The tailored set of practices and tools used by the team members to guide and support their work.

Foundation Established

In Use

In Place

Working Well

Retired

The way of working:

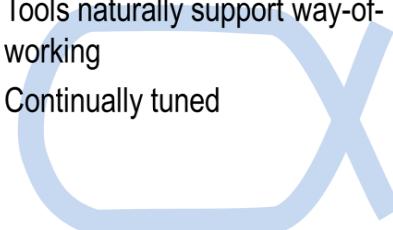
- Helps the team be effective and work well together
- Evolves as the team understands its mission and environment, and undertakes its work
- Is continually inspected, adapted and improved
- Is owned and agreed by the team
- Reflects organizational policies and standards
- Reduces risk and helps to eliminate waste

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Way of Working

Working Well

- Predictable progresses being made
- Practices naturally applied
- Tools naturally support way-of-working
- Continually tuned



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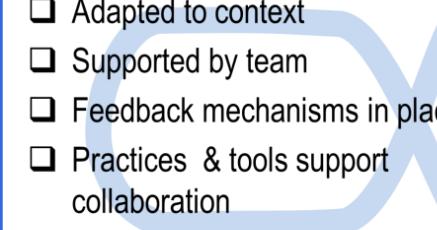
5 / 6



Way of Working

In Use

- Practices & tools in use
- Regularly inspected
- Adapted to context
- Supported by team
- Feedback mechanisms in place
- Practices & tools support collaboration



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Way of Working

Principles Established

- Team actively support principles
- Stakeholders agree with principles
- Tool needs agreed
- Approach recommended
- Operational context understood
- Practice & tool constraints known

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Work

Closed

- Lessons learned
- Metrics available
- Everything archived
- Budget reconciled & closed
- Team released
- No outstanding, uncompleted tasks



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Work

Under Control

- Tasks being completed
- Unplanned work under control
- Risks under control
- Estimates revised to reflect performance
- Progress measured
- Re-work under control
- Commitments consistently met



4 / 6



Work

Prepared

- Commitment made
- Cost and effort estimated
- Resource availability understood
- Risk exposure understood
- Acceptance criteria established
- Sufficiently broken down to start
- Tasks identified and prioritized
- Credible plan in place
- At least one team member ready
- Integration points defined



2 / 6



Work

Initiated

Activity involving mental or physical effort done in order to achieve a result.

Prepared

The work:

- Is everything that the team does to produce a software system
- Is planned and performed by the team
- Is guided by the practices that make up the team's way-of-working
- Is sizeable, estimable and track-able
- Is broken up to minimize dependencies and reduce risk

Started

Under Control

Concluded

Closed



Work

Concluded

- Only admin tasks left
- Results achieved
- Resulting system accepted



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Work

Started

- Development started
- Progress monitored
- Definition of done in place
- Tasks being progressed



3 / 6



Work

Initiated

- Required result clear
- Constraints clear
- Funding stakeholders known
- Initiator identified
- Accepting stakeholders known
- Source of funding clear
- Priority clear



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Stakeholder Representation



Analysis



Innovates



The ability to gather, communicate and balance the needs of other stakeholders, and accurately represent their views.

Adapts



People with this competency help:

- The team to understand:
 - the business opportunity
 - the complexity and needs of the customers, users and other stakeholders
 - how well the system produced addresses the stakeholders' needs
- Negotiate and prioritize the requirements
- Interact with the stakeholders and developers about the solution to be developed

Masters



Applies



Assists



Innovates



The ability to understand opportunities and their related stakeholder needs, and transform them into an agreed and consistent set of requirements.

Adapts



People with this competency help:

- Identify and understand needs and opportunities
- Identify the root causes of problems
- Capture, understand and communicate requirements
- Create and agree on specifications and models
- Visualize solutions and understand their impact

Masters



Applies



Assists



Development



Innovates



The ability to design and program effective software systems following the standards and norms agreed by the team.

Adapts



People with this competency help:

- Design and code software systems
- Formulate and/or evaluate strategies for choosing an appropriate design pattern or for combining design patterns
- Design and leverage technical solutions
- Troubleshoot and resolve coding problems

Masters



Applies



Assists



Innovates



The ability to test a system, verifying that it is usable and that it meets the requirements.

Adapts



People with this competency help:

- Validate that the requirements and user needs are met
- Test the system
- Create the correct tests to efficiently verify the requirements
- Decide what, when and how to test
- Find defects and understand the quality of the system produced



Leadership



Innovates



The ability to inspire and motivate a group of people to achieve a successful conclusion to their work and to meet their objectives.

Adapts



People with this competency help:

- Resolve conflicts
- Inspire people to do their work
- Make sure that all team members are effective in their assignments
- Make and meet commitments
- Resolve any impediments or issues holding up the team's work
- The team to interact with stakeholders to shape priorities, report progress and respond to challenges

Masters



Applies



Assists



Innovates



The ability to coordinate, plan and track the work done by a team.

Adapts



People with this competency help:

- Plan and coordinate activities over a defined period of time
- Track work completed and compare to plan
- Replan the work if necessary
- Proactively manage risks
- Account for time and money spent
- Interact with stakeholders to report progress



Generic Competency

Level 5: Innovates

- Has many years of experience and is currently up to date in what is happening within the domain
- Is recognized as an expert by peers
- Supports others in working on a complex professional level
- Knows when to innovate or do something different and when to follow normal procedure
- Develops innovative and effective solutions to the current challenges within the domain



5 / 5



Generic Competency

Level 4: Adapts

- Is able to satisfy complex demands and work requirements
- Is able to communicate with others working outside the domain
- Can direct and help others working within the domain
- Is able to adapt his/her way-of-working to work well with others, both inside and outside their domain



4 / 5



Generic Competency

Level 2: Applies

- Is able to collaborate within the Team
- Is able to satisfy routine demands and simple work requirements
- Can handle simple challenges with confidence
- Is able to perform tasks under minimal supervision
- Can handle simple work requirements but needs help guidance in handling any complications or difficulties
- Is able to reason about the context and draw sensible conclusions



2 / 5



Generic Competency

Level 3: Masters

- Is able to satisfy most demands and work requirements
- Is able to speak the domain language with ease and accuracy
- Is able to communicate and explain his/her work
- Is able to give and receive constructive feedback
- Knows the limits of his/her capability and when to call on more expert advice
- Works at a professional level with little or no guidance



3 / 5



Generic Competency

Level 1: Assists

- Has a basic understanding of the concepts
- Is able to act in a professional manner
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- Is able to follow instructions and complete basic tasks
- Is able to perform tasks under supervision



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