

<h1>Opportunity</h1>	<h2>Opportunity</h2> <p><input checked="" type="checkbox"/> Opportunity</p> <table border="1"> <thead> <tr> <th>Opportunity</th> <th>Solution Needed</th> <th>Viable</th> <th>Value Established</th> <th>Benefit Accrued</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> Solution identified</td><td><input type="checkbox"/> Stakeholders' needs established</td><td><input type="checkbox"/> Problems and root causes identified</td><td><input type="checkbox"/> Need for a solution confirmed</td><td><input type="checkbox"/> Reasons to develop solution understood</td></tr> <tr> <td><input type="checkbox"/> Stakeholders' needs established</td><td><input type="checkbox"/> Stakeholders' needs established</td><td><input type="checkbox"/> Stakeholders' needs established</td><td><input type="checkbox"/> Stakeholders' needs established</td><td><input type="checkbox"/> Stakeholders' needs established</td></tr> <tr> <td><input type="checkbox"/> At least one solution proposed</td><td><input type="checkbox"/> At least one solution proposed</td></tr> </tbody> </table>	Opportunity	Solution Needed	Viable	Value Established	Benefit Accrued	<input type="checkbox"/> Solution identified	<input type="checkbox"/> Stakeholders' needs established	<input type="checkbox"/> Problems and root causes identified	<input type="checkbox"/> Need for a solution confirmed	<input type="checkbox"/> Reasons to develop solution understood	<input type="checkbox"/> Stakeholders' needs established	<input type="checkbox"/> At least one solution proposed	<p>The set of circumstances that makes it appropriate to develop or change a software system.</p> <p><input checked="" type="checkbox"/> Opportunity</p> <ul style="list-style-type: none"> • Units 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 								
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<h1>Opportunity</h1>	<h2>Value Established</h2> <p><input type="checkbox"/> Opportunity value quantified</p> <p><input type="checkbox"/> Solution impact understood</p> <p><input type="checkbox"/> System value understood</p> <p><input type="checkbox"/> Success criteria clear</p> <p><input type="checkbox"/> Outcomes clear and quantified</p>	<p><input checked="" type="checkbox"/> SEMAT 3 / 6</p>																				



Requirements

Requirements

Requirements

Requirements

Requirements	
	Conceived
	What the software system must do to address the opportunity and satisfy the stakeholders.
	The requirements:
	<ul style="list-style-type: none"> 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	<input type="checkbox"/> Conceived <input type="checkbox"/> Bounded <input type="checkbox"/> Coherent <input type="checkbox"/> Acceptable <input type="checkbox"/> Addressed <input type="checkbox"/> Fulfilled

Bounded	
	<input type="checkbox"/> Development stakeholders identified <input type="checkbox"/> System purpose agreed <input type="checkbox"/> System success clear <input type="checkbox"/> Shared solution understanding exists <input type="checkbox"/> Requirement's format agreed <input type="checkbox"/> Requirements management in place <input type="checkbox"/> Prioritization scheme clear <input type="checkbox"/> Constraints identified & considered <input type="checkbox"/> Assumptions clear

Acceptable	
	<input type="checkbox"/> Acceptable solution described <input type="checkbox"/> Change under control <input type="checkbox"/> Value to be realized clear <input type="checkbox"/> Clear how opportunity is addressed <input type="checkbox"/> Testable

Fulfilled	
	<input type="checkbox"/> Stakeholders accept requirements <input type="checkbox"/> No hindering requirements <input type="checkbox"/> Requirements fully satisfied

Requirements	
	Conceived
	What the software system must do to address the opportunity and satisfy the stakeholders.
	The requirements:
	<ul style="list-style-type: none"> 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
Conceived	<input type="checkbox"/> Conceived <input type="checkbox"/> Bounded <input type="checkbox"/> Coherent <input type="checkbox"/> Acceptable <input type="checkbox"/> Addressed <input type="checkbox"/> Fulfilled

Requirements	
	<input type="checkbox"/> Stakeholders agree system is to be produced <input type="checkbox"/> Users identified <input type="checkbox"/> Funding stakeholders identified <input type="checkbox"/> Opportunity clear

Requirements	
	<input type="checkbox"/> Requirements shared <input type="checkbox"/> Requirements' origin clear <input type="checkbox"/> Rationale clear <input type="checkbox"/> Conflicts addressed <input type="checkbox"/> Essential characteristics clear <input type="checkbox"/> Key usage scenarios explained <input type="checkbox"/> Priorities clear <input type="checkbox"/> Impact understood <input type="checkbox"/> Team knows & agrees on what to deliver

Addressed	
	<input type="checkbox"/> Enough addressed to be acceptable <input type="checkbox"/> Requirements and system match <input type="checkbox"/> Value realized clear <input type="checkbox"/> System worth making operational



Stakeholders

Stakeholders

Stakeholders

Stakeholders

Stakeholders	Stakeholders	Stakeholders	Stakeholders	Stakeholders
Satisfied for Deployment	Recognized	Involved	In Agreement	Satisfied in Use
<input type="checkbox"/> Stakeholder feedback provided <input type="checkbox"/> System ready for deployment	<p>The people, groups, or organizations who affect or are affected by a software system.</p> <p>The stakeholders:</p> <ul style="list-style-type: none"> 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 	<input type="checkbox"/> Stakeholder groups identified <input type="checkbox"/> Key stakeholder groups represented <input type="checkbox"/> Responsibilities defined	<input type="checkbox"/> Minimal expectations agreed <input type="checkbox"/> Rep's happy with their involvement <input type="checkbox"/> Rep's input valued <input type="checkbox"/> Team's input valued <input type="checkbox"/> Priorities clear & perspectives balanced	<input type="checkbox"/> Feedback on system use available <input type="checkbox"/> System meets expectations
	SEM <small>A</small> T 1 / 6			SEM <small>A</small> T 2 / 6
Satisfied for Deployment	Represented	Stakeholders	Stakeholders	Stakeholders
<input type="checkbox"/> Stakeholder feedback provided <input type="checkbox"/> System ready for deployment	<input type="checkbox"/> Responsibilities agreed <input type="checkbox"/> Representatives authorized <input type="checkbox"/> Collaboration approach agreed <input type="checkbox"/> Way of working supported & respected	<input type="checkbox"/> Stakeholders	<input type="checkbox"/> In Agreement	<input type="checkbox"/> Satisfied in Use
	SEM <small>A</small> T 3 / 6	SEM <small>A</small> T 5 / 6	SEM <small>A</small> T 4 / 6	SEM <small>A</small> T 6 / 6

 Software System

Software System

Software System

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		The software system:
Usable		<ul style="list-style-type: none">• Is the primary product of any software engineering endeavor• Is structured, designed and implemented to fulfill 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
Ready		
Operational		
Retired		

Demonstrable

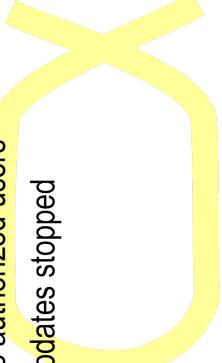
- Key architectural characteristics demonstrated
- System exercised & performance measured
- Critical HW configurations demonstrated
- Critical interfaces demonstrated
- Integration with environment demonstrated
- Architecture accepted as fit-for-purpose

SEMANTIC

Ready
<ul style="list-style-type: none"><input type="checkbox"/> User documentation available<input type="checkbox"/> System accepted as fit-for-purpose<input type="checkbox"/> Stakeholders want the system<input type="checkbox"/> Operational support in place

Retired

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



SEMANTIC
SCIENCE

6 / 6

Software System	
	<h2>Architecture Selected</h2> <ul style="list-style-type: none"><input type="checkbox"/> Architecture selection criteria agreed<input type="checkbox"/> HW platforms identified<input checked="" type="checkbox"/> Technologies selected<input type="checkbox"/> System boundary known<input type="checkbox"/> Decisions on system organization made<input type="checkbox"/> Buy, build, reuse decisions made<input type="checkbox"/> Key technical risks agreed to

Software System	
	Usable
<input type="checkbox"/>	System can be operated
<input type="checkbox"/>	System functionality tested
<input checked="" type="checkbox"/>	System performance acceptable
<input type="checkbox"/>	Defect levels acceptable
<input type="checkbox"/>	System fully documented
<input type="checkbox"/>	Release content known
<input type="checkbox"/>	Added value clear

Software System	Operational
	<input type="checkbox"/> System available for use
	<input type="checkbox"/> System live
	<input type="checkbox"/> Agreed service levels supported



Team

Team

Performing

- Consistently meeting commitments
- Continuously adapting to change
- Addresses problems
- Rework and backtracking minimized
- Waste continuously eliminated

SEMAT 4 / 5

Formed

- Individual responsibilities accepted and aligned to competencies
- Enough members recruited
- Roles understood
- How to work understood
- Members introduced
- Members accepting work
- External collaborators identified
- Communication mechanisms defined
- Members commit to team

SEMAT 2 / 5

Seeded

The group of people actively engaged in the development, maintenance, delivery or support of a specific software system.

The team:

Collaborating

- 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

SEMAT

Team

Seeded

- Mission defined
- Constraints known and defined
- Growth mechanisms in place
- Composition defined
- Responsibilities outlined
- Required commitment level clear
- Required competencies identified
- Size determined
- Governance rules defined
- Leadership model selected

SEMAT 3 / 5

Team

Collaborating

- Works as one unit
- Communication open and honest
- Focused on mission
- Members know each other

SEMAT 5 / 5

Adjourned

- Responsibilities fulfilled
- Members available to other teams
- Mission concluded

1 / 5

SEMAT

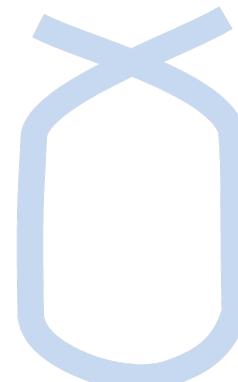
Way of Working

Way of Working

Way of Working

Retired

- No longer in use
- Lessons learned shared

SEMAT 6 / 6

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

SEMAT 2 / 6

Principles Established

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

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

SEMAT

Foundation Established

In Use

In Place

Working Well

Retired

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

Foundation Established

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

SEMAT 3 / 6

In Use

Way of Working

Working Well

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

SEMAT 4 / 6



Work

Work

Work

Work

Closed

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

SEMAT

6 / 6

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

SEMAT

2 / 6

Initiated

- Activity involving mental or physical effort done in order to achieve a result.
- 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 trackable
 - Is broken up to minimize dependencies and reduce risk

Work

Work

Work

Work

Initiated

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

Work

Work

Work

Started

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

SEMAT

4 / 6

Concluded

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

SEMAT

6 / 6

Stakeholder Representation



Analysis



Innovates



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

Adapts



Masters



Applies



Assists



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

Innovates



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

Adapts



Masters



Applies



Assists



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

Development



Innovates



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

Adapts



Masters



Applies



Assists



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

Innovates



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

Adapts



Masters



Applies



Assists



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



Management



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

Masters



Applies



Assists



<h2>Generic Competency</h2>	<h3>Generic Competency</h3>	<h3>Level 2: Applies</h3>	
	<ul style="list-style-type: none"> <input type="checkbox"/> Is able to collaborate within the Team <input type="checkbox"/> Is able to satisfy routine demands and simple work requirements <input type="checkbox"/> Can handle simple challenges with confidence <input type="checkbox"/> Is able to perform tasks under minimal supervision <input type="checkbox"/> Can handle simple work requirements but needs help guidance in handling any complications or difficulties <input type="checkbox"/> Is able to reason about the context and draw sensible conclusions 	 2 / 5	
<h2>Generic Competency</h2>	<h3>Level 4: Adapts</h3>		
	<ul style="list-style-type: none"> <input type="checkbox"/> Is able to satisfy complex demands and work requirements <input type="checkbox"/> Is able to communicate with others working outside the domain <input type="checkbox"/> Can direct and help others working within the domain <input type="checkbox"/> Is able to adapt his/her way-of-working to work well with others, both inside and outside their domain 	 4 / 5	
<h2>Generic Competency</h2>	<h3>Generic Competency</h3>	<h3>Level 1: Assists</h3>	
		<ul style="list-style-type: none"> <input type="checkbox"/> Has a basic understanding of the concepts <input type="checkbox"/> Is able to act in a professional manner <input type="checkbox"/> Is able to correctly respond to basic questions within his/her domain <input type="checkbox"/> Is able to perform most basic functions within the domain <input type="checkbox"/> Is able to follow instructions and complete basic tasks <input type="checkbox"/> Is able to perform tasks under supervision 	 1 / 5
<h2>Generic Competency</h2>	<h3>Level 5: Innovates</h3>	<h3>Level 3: Masters</h3>	
	<ul style="list-style-type: none"> <input type="checkbox"/> Has many years of experience and is currently up to date in what is happening within the domain <input type="checkbox"/> Is recognized as an expert by peers <input type="checkbox"/> Supports others in working on a complex professional level <input type="checkbox"/> Knows when to innovate or do something different and when to follow normal procedure <input type="checkbox"/> Develops innovative and effective solutions to the current challenges within the domain 	<ul style="list-style-type: none"> <input type="checkbox"/> Is able to satisfy most demands and work requirements <input type="checkbox"/> Is able to speak the domain language with ease and accuracy <input type="checkbox"/> Is able to communicate and explain his/her work <input type="checkbox"/> Is able to give and receive constructive feedback <input type="checkbox"/> Knows the limits of his/her capability and when to call on more expert advice <input type="checkbox"/> Works at a professional level with little or no guidance 	 5 / 5

Generic Competency

Generic Competency

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

SEM^{AT} 5 / 5

Level 3: Masters

- Is able to satisfy most demands and work requirements
- Is able to speak the domain language with ease and accuracy
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- 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

SEM^{AT} 3 / 5

Level 1: Assists

- Has a basic understanding of the concepts
- Is able to act in a professional manner
- Is able to correctly respond to basic questions within his/her domain
- Is able to perform most basic functions within the domain
- Is able to follow instructions and complete basic tasks
- Is able to perform tasks under supervision

SEM^{AT} 1 / 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

4 / 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

2 / 5

Generic Competency

Generic Competency

Generic Competency

Level 5: Innovates

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SEM / T
5 / 5

Level 3: Masters

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SEM / T
3 / 5

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SEM / T
1 / 5

Generic Competency

Level 2: Applies

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SEM / T
4 / 5

Generic Competency

Level 4: Adapts

- Is able to satisfy complex demands and work requirements
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SEM / T

2 / 5

Generic Competency

Generic Competency

Generic Competency

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SEM\AT

5 / 5

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SEM\AT

3 / 5

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SEM\AT

1 / 5

Generic Competency

Generic Competency

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SEM\AT

4 / 5

2 / 5

