Lean Startup Method (LSM) and Agile (Scrum) for Collaborative Initial Project Planning

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LSM/Agile Talk Information

Slides are posted:

- In **INCOSE CONNECT**:
  - on the Object-Oriented Systems Engineering Method (**OOSEM**) Working Group site.

- **In Dropbox**:
https://www.dropbox.com/sh/95lvyo07vcif7cc/AAD8wvU7XPPImx95BdjgXyY3a?dl=0

# The 'Real' Motivation For This IPP Approach

Topics

- Introduction to the "Micro-Grid (**uGrid**) Reference Model (**RM**)" MBSE Project.

- Introduction of Specific Processes and Process Steps used in this Hybrid Approach to Collaborative Initial Project Planning (**IPP**).

Micro-Grid (uGrid) Reference Model (RM) MBSE Project

- Initial coordination between **INCOSE** Critical Infrastructure Protection and Recovery (**CIPR**) Working Group, Object-Oriented Systems Engineering Method (**OOSEM**) Working Group, **IEEE**, and **FBI/InfraGard**.

- Ideas discussed to develop a CIPR-related product or service.

- Ideas refined into, "Model Based Systems Engineering (**MBSE**) to develop a Micro-Grid (**uGrid**) Reference Model (**RM**)."

- Initial **uGrid RM MBSE Project** IPP Workshop facilitated at JHU/APL on July 8, 2017.
    - Objective: uGrid RM MBSE Project Initial Work Items.
    - Three total IPP Workshops held (July to September 2017) to develop Initial Work Items for the uGrid RM MBSE project.

- **Reference Model (RM) Definition Used:** Overarching logical framework model, for shared modeling of mission or business-specific logical and physical architectures.

uGrid RM MBSE Project Roadmap
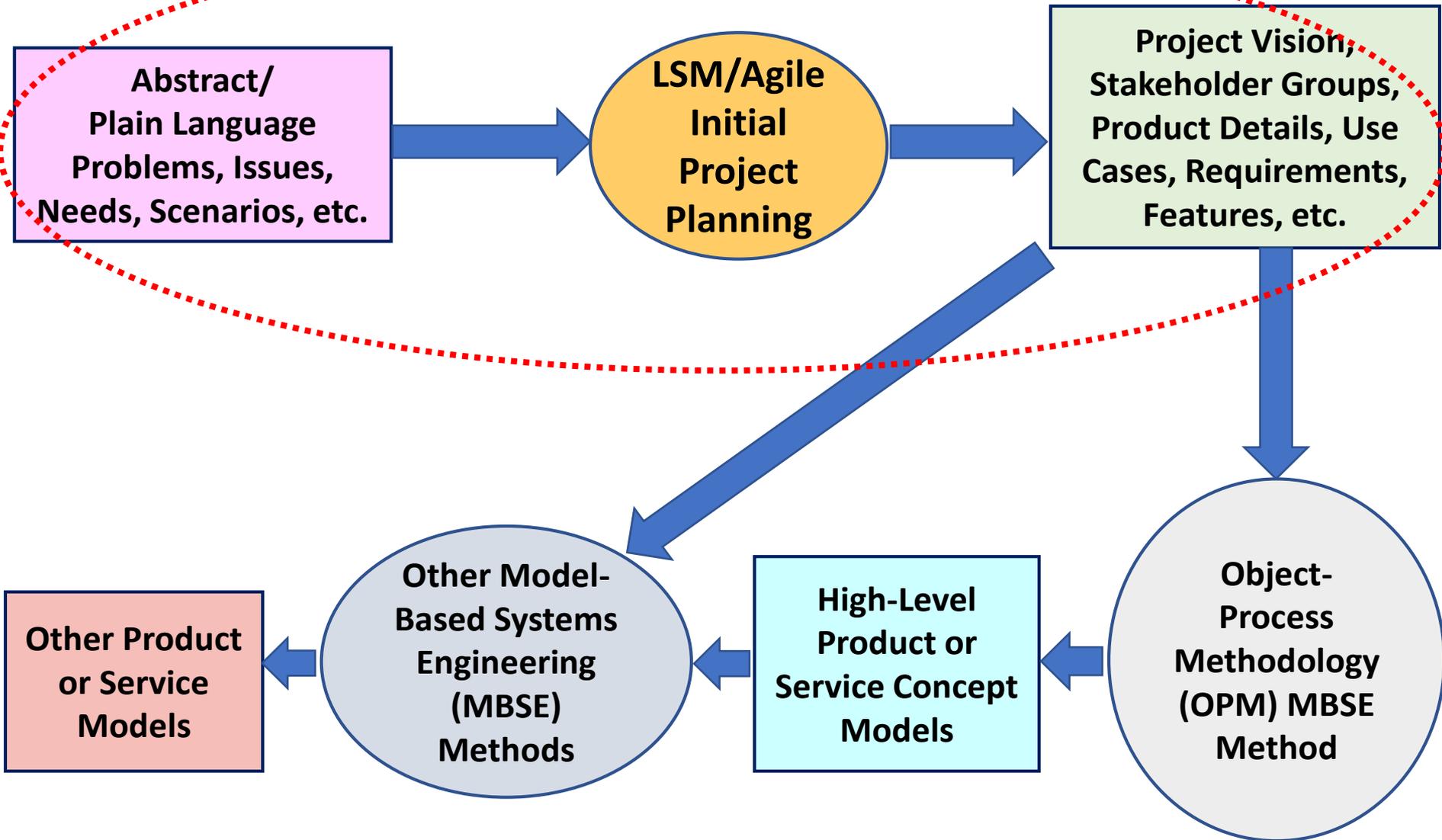
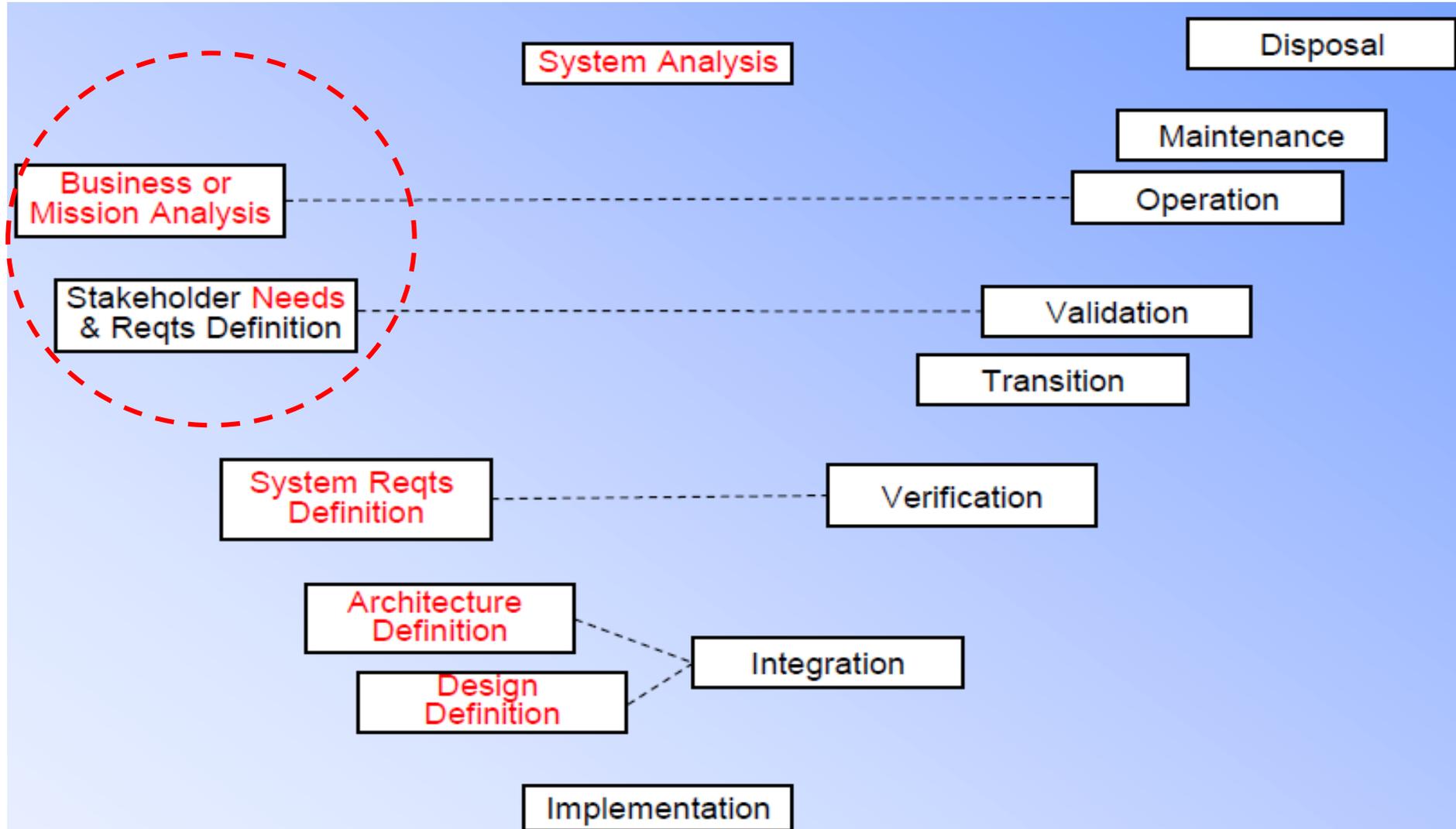# Introduction: Lean Startup Method (LSM)

- Also called, **"Lean Launchpad"**

- A philosophy and methodology based on 1980s **Lean Manufacturing.**

- A learnable and shareable stakeholder-centric method to quickly, collaboratively, and iteratively develop a new product or service, or update existing products or services.

- Developed in its current form by American entrepreneur **Eric Ries**, founder and CEO of the Long Term Stock Exchange (LTSE).
    - Former student of **Steve Blank**, who pioneered the Lean Startup Movement with his Customer Development concept.

- **Understanding the Customer and their Feedback is at the center of this Initial Project Planning approach.**

Who's Using LSM for Initial Project Planning?

- **National Science Foundation (NSF) Innovation Corps (I-Corps)**
  - https://www.nsf.gov/news/special_reports/i-corps/index.jsp

- **National Geospatial Intelligence Agency (NGA)**
  - https://federalnewsradio.com/fed-access/2017/10/innovation-at-the-nga/

- **National Security Agency (NSA)**
  - https://www.acast.com/leanstartup/7-season-3-how-lean-startup-co-coaches-support-department-of-defense-innovation

- **Office of Naval Research (ONR)**
  - https://steveblank.com/2017/10/10/office-of-naval-research-onr-goes-lean/

- **U.S. State Department**
  - https://steveblank.com/2016/10/31/the-state-department-gets-schooled-hacking-for-diplomacy/

- **U.S. Government "FedTech"**
  - https://www.fed-tech.org/

- **Dropbox, Wealthfront, Grockit, imvu, Votizen, Aardvark**
  - http://theleanstartup.com/casestudies#dropbox

IPP in the System Development Life Cycle

Copyright by John Clark based on INCOSE SE Handbook V4.0, February 15, 2016.

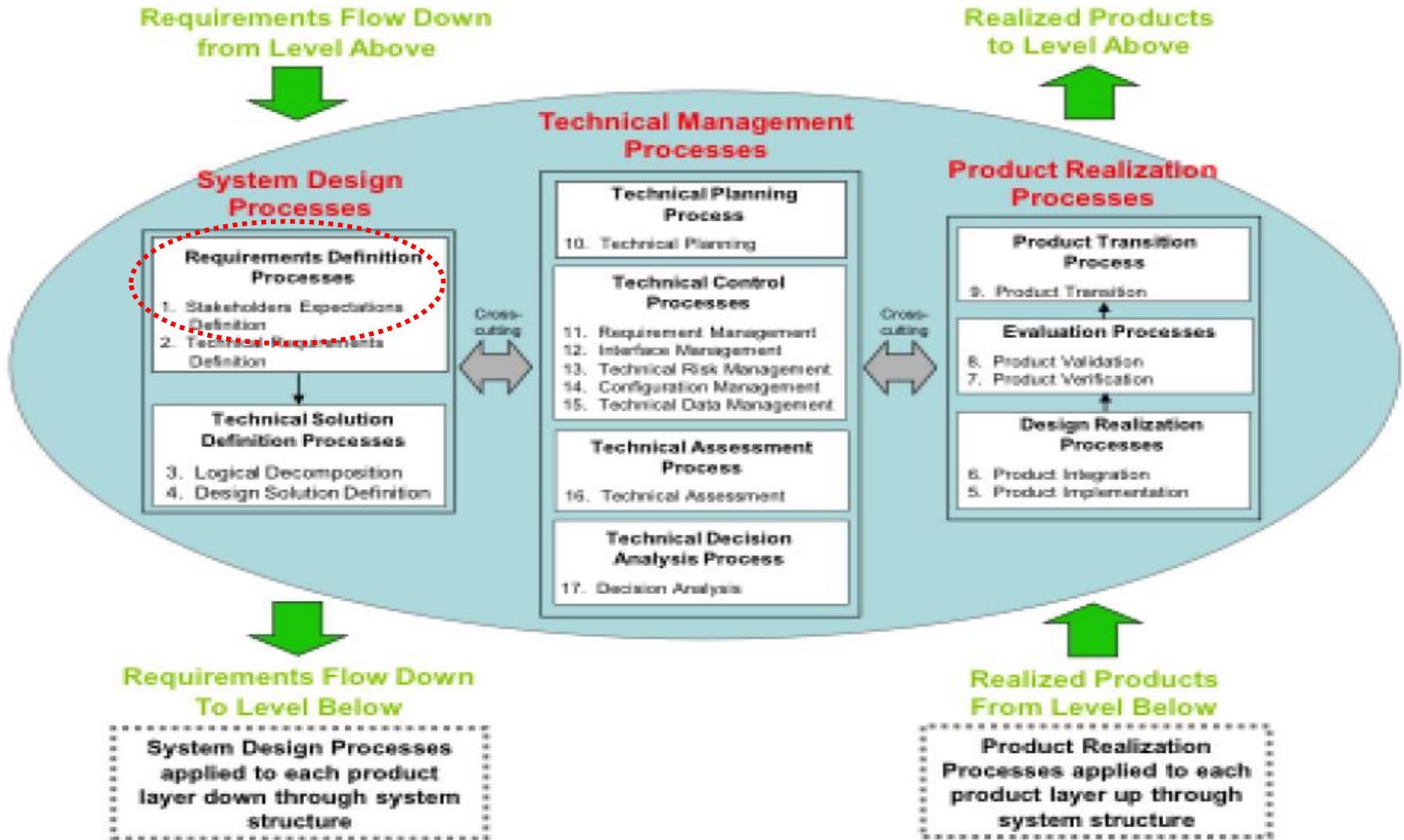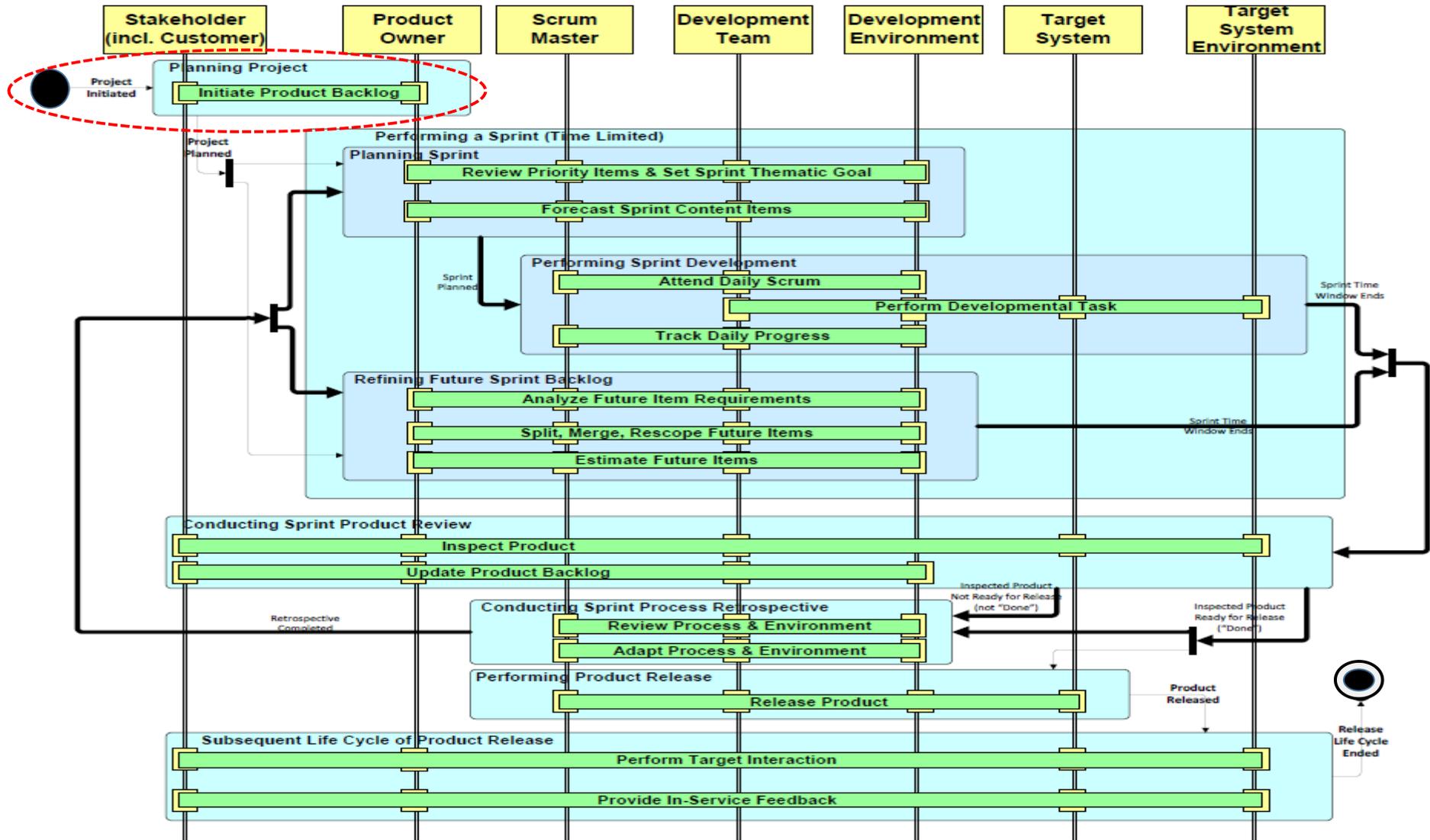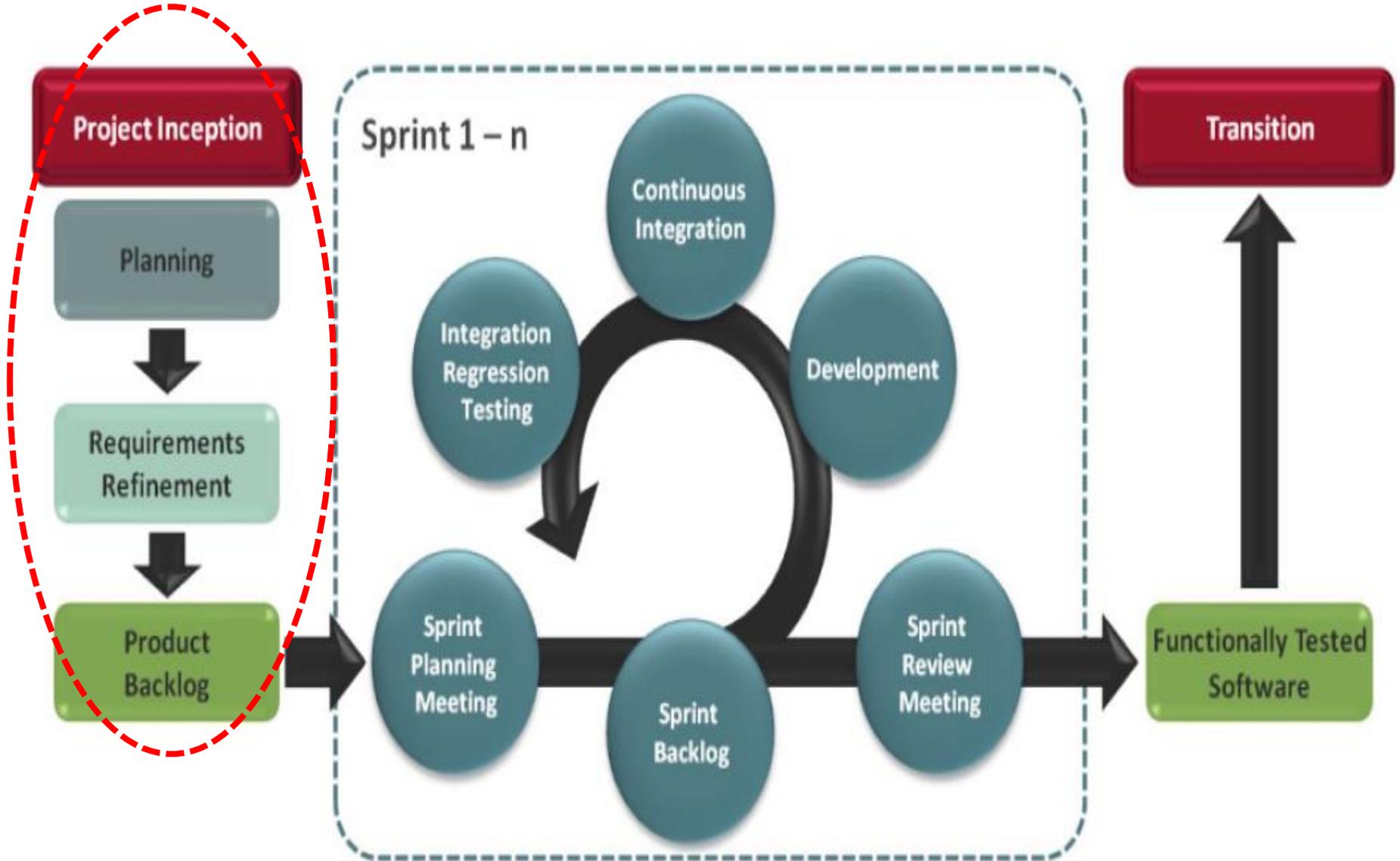# IPP in the System Development Life Cycle
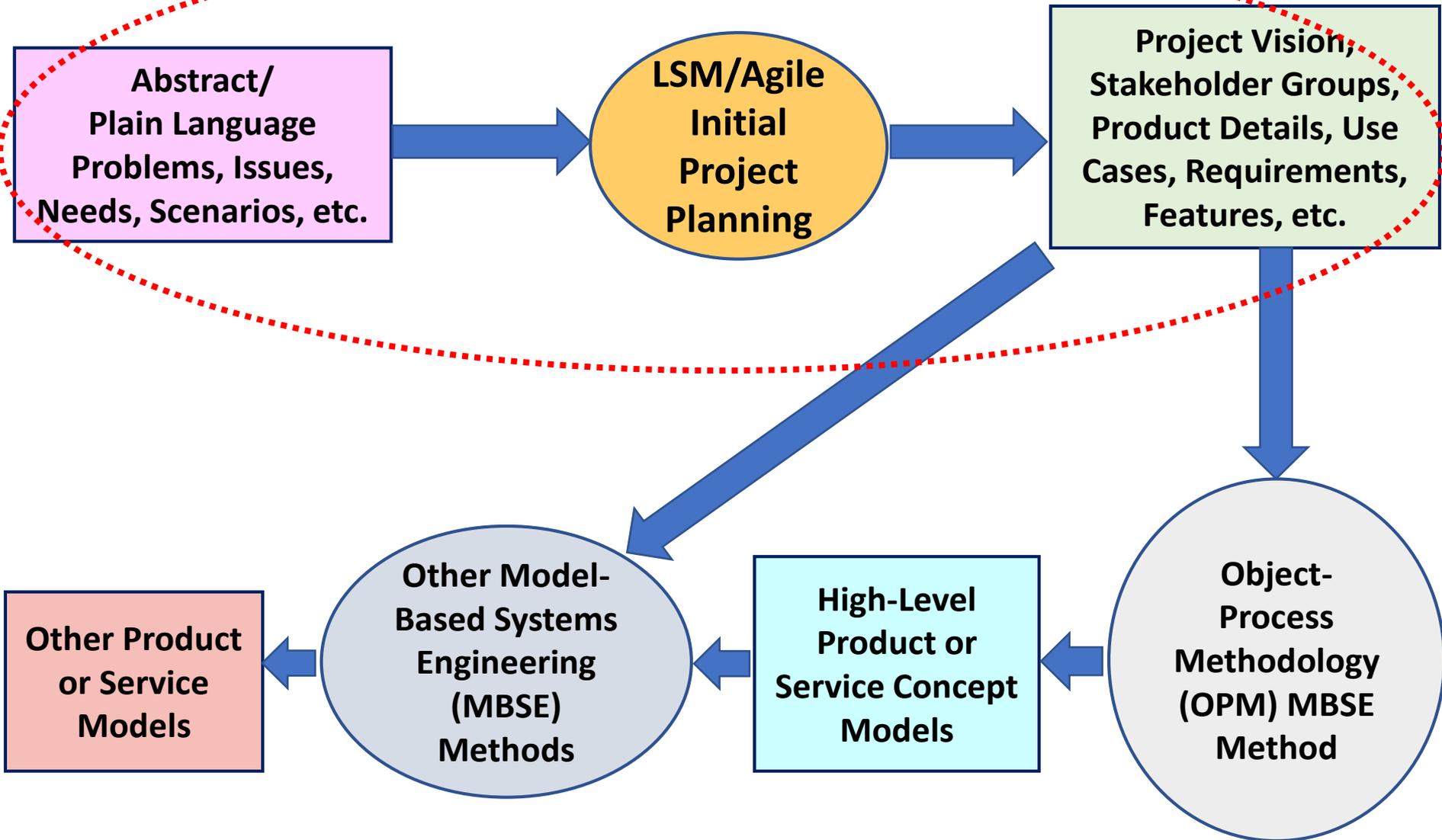

Figure 3 1 – Systems Engineering (SE) Engine
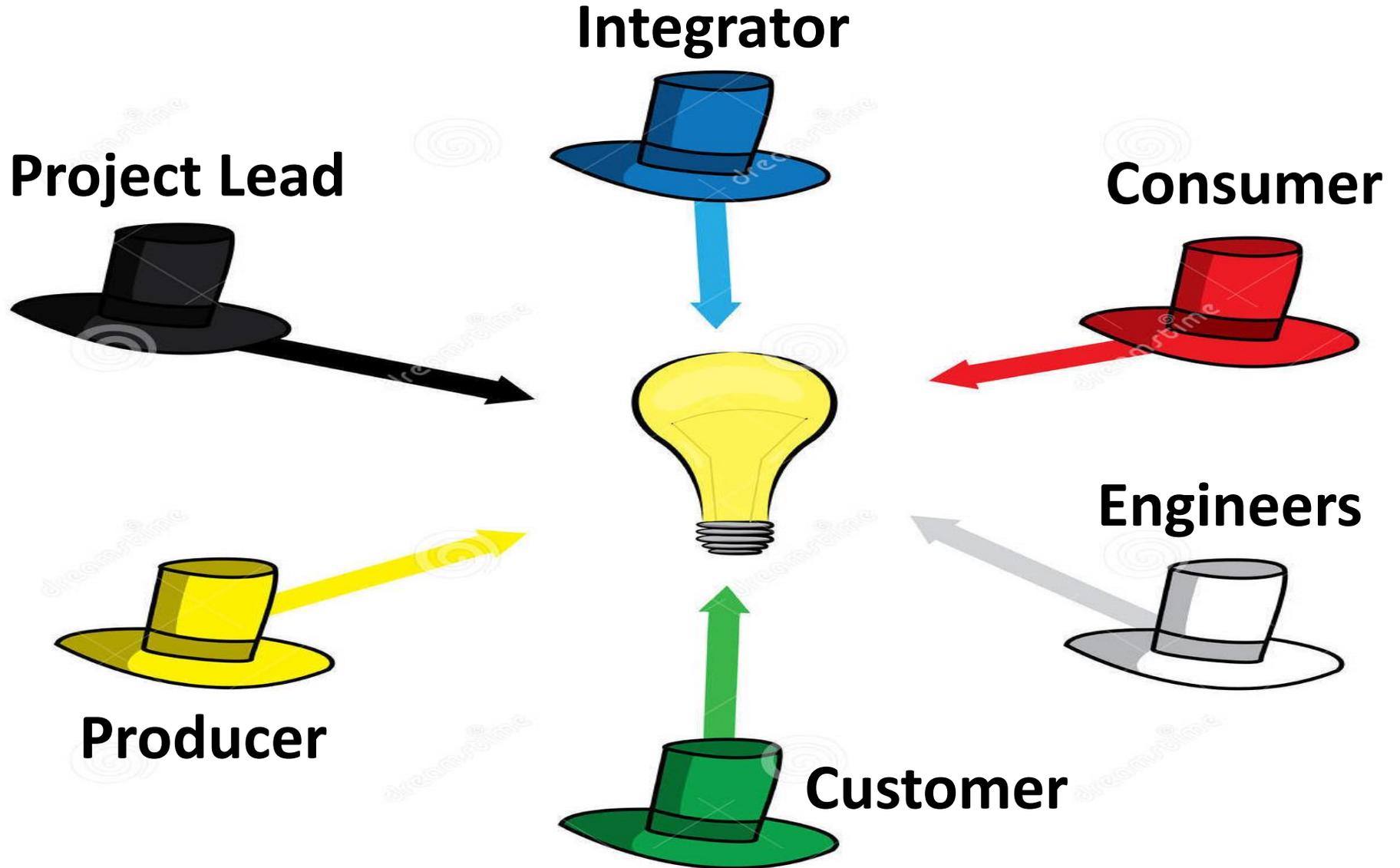
IPP in the System Development Life Cycle

IPP in the System Development Life Cycle

https://tinyurl.com/y83g9vvl

uGrid RM MBSE Project Roadmap

uGrid RM MBSE Project - Perspectives via "Hats"

Integrator

Project Lead

Consumer

Producer

Engineers

Customer

Eight uGrid RM MBSE Project 'HATS'

Project Lead

Consumer

(Hospital, etc.)

Customer

(County, etc.)

Engineers

(Systems, Software, etc.)

System Integrator

Producer

Infrastructure

Ops Manager

(County, etc.)

uGrid RM Project - Title and Purpose

FACILITATOR GUIDE (300 words: 2.5 minutes read aloud)

At __:00 a.m. begin. Don't read words in parentheses.)

1. Welcome, to our Systems Thinking RoundTable (RT). My name is ___, and I am today's facilitator. The RoundTable Guide is in front of you. (Be sure new people have RT Guides). We propose to suspend judgment and experience this together without stopping for 45 minutes today. Let's take one minute and go around the room for initial introductions--about three words: e.g., your first name, role/title, school. (Cue the person on your left).

2. Thank you and welcome again to everyone. For our reflection today, I'll suggest the topics ___ (see bottom of page) for everyone to comment on. While we each consider the topics for a few minutes, I'll ask for volunteers to read aloud the RoundTable Guidelines on the right. Will ___ read OUR FORMAT?... OUR PURPOSES?... GUIDELINES FOR LISTENING? .... GUIDELINES FOR SPEAKING?.. GUIDELINES FOR RESPONDING?..

(At __:05 a.m. please read...)

3. Did anyone come in after the introductions?... Welcome! (Option: Ask for 3-word intro and offer RT Guide).

4. Again, today's suggested topics are: ___*. I would like to hear everyone's thoughts about these topics or anything else that is on your mind. Let's each take about (___) minutes to speak. I will use a timer to help us stay on time. Please speak so that everyone can hear. What you say is important to us. (Options: I will start, or we'll start with __) and continue around the circle. (If time permits: a 2nd, 3rd full round.)

5. **(If there is time)** Anyone who hasn't spoken who is ready to speak now?

(At __:45 a.m. please read...)

6. It's time to close.

7. Thank you all for coming today. We hope to see you at a future session. If you have something more to say, ask a colleague to listen to you on your way out.

READINGS: RoundTable Guidelines (300 words: 2.5 min.)

OUR FORMAT. Our unique format is a new best practice in systems thinking. We spend 5 minutes listening to short readings and the suggested topics. We then spend 40 minutes on individual comments, time divided equally among all present (e.g. 22 people = 2 minutes each). Each session is facilitated by a different volunteering facilitator chosen from those in attendance.

OUR PURPOSES. We use a facilitator guide/script and basic readings--RoundTable Guidelines--for many reasons: 1- We pack in a great deal of information in a very short time, thus leaving maximum time for each of us to present our ideas. 2- The result is we hear everyone's point of view on a topic. 3- We experience some new real-time effortless practices in equal participation: including rotating, distributed leadership; equal time; as well as a simple scaffold to facilitate conscious self-guided evolution. 4- We have found that just as we break the sound barrier when we travel faster than the speed of sound, we break the communication barrier when we hear 20 authentic viewpoints in 45 minutes—and a different facilitator at each session.

GUIDELINES FOR LISTENING. Listening to the 5 minutes of readings allows us the opportunity to quiet our minds and silently reflect on the topics, the readings, our inner thoughts, and our work and lives. Listening to each other's comments, we hear a great variety of viewpoints. We consciously shift our attitudes from "evaluation" to "valuation," from critiquing to appreciating, from problem-solving to ideal-seeking -- towards one another and towards ourselves.

GUIDELINES FOR SPEAKING. At your turn, please say your name again. Then say something about today's topic, or anything else that is on your mind. Let's each take only one turn to speak and limit our time, so we can offer everyone a turn. Or, if you prefer, pass your turn and just listen today.

GUIDELINES FOR RESPONDING. The facilitator may say "thank you" after you speak. In the interest of time and purpose, we will save all other responses to each other until after the session. We don't want to divert others, or be diverted, from our own individual learning. If someone says something that you want to build on, you may want to make a note of it so you can do so during your turn.

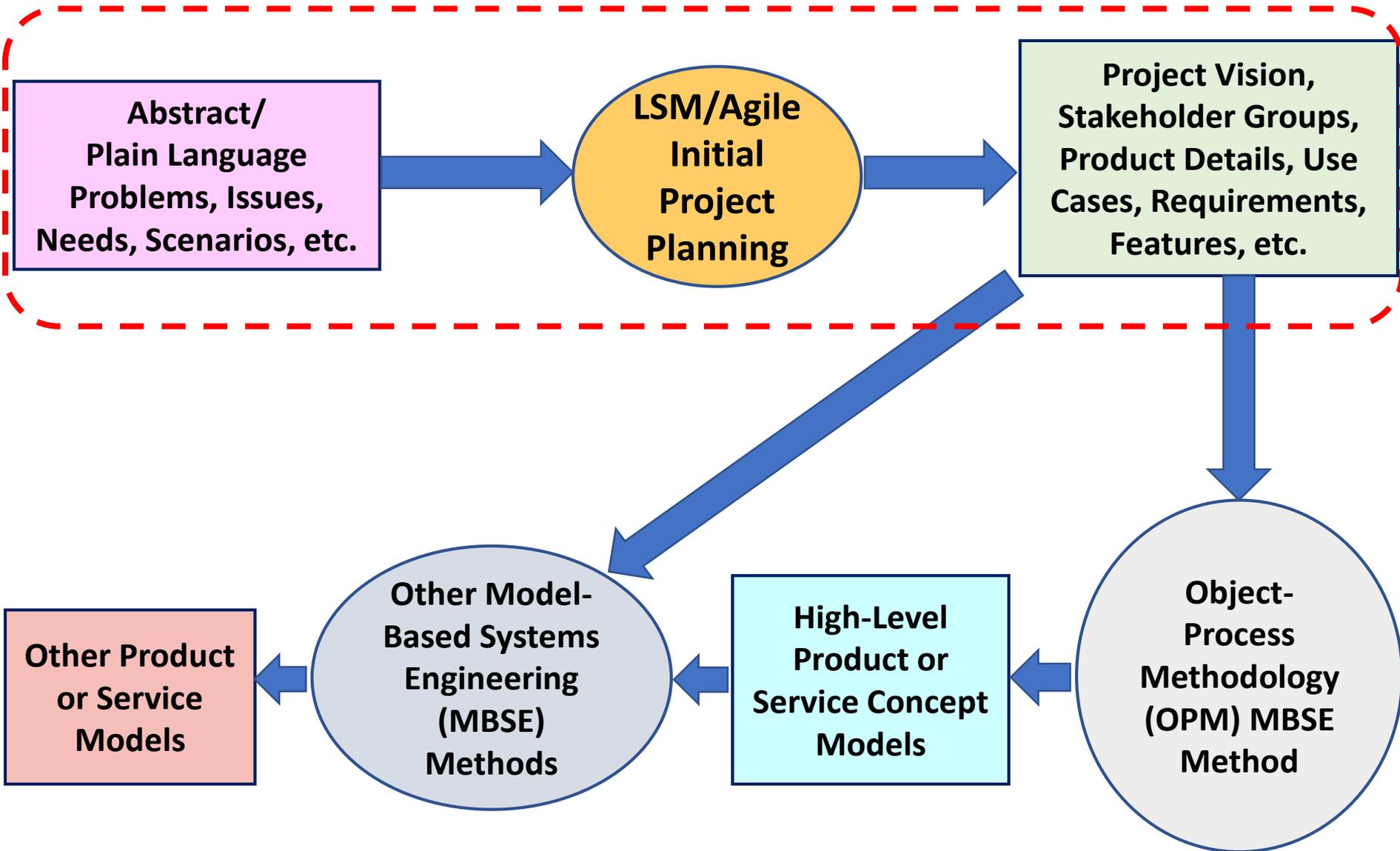# uGrid RM Project - Title and Purpose

Project Title:

*"Microgrid (uGrid)
Reference Model (RM)
and Application Process"*

Project Purpose:

*"Use LSM to Produce
Initial Work Items
for uGrid RM Project"*

uGrid RM MBSE Project Roadmap

uGrid RM MBSE IPP: LSM and Agile (Scrum)

"PROBLEM VALIDATION"

Product Vision Board Extended (PVBE)

-- Compliant with Lean Business Model Canvas (BMC)
-- Can be shared in tools like Atlassian 'Confluence'

"USER VALIDATION"

Persona Templates

-- Can be shared in tools like Atlassian 'Confluence'
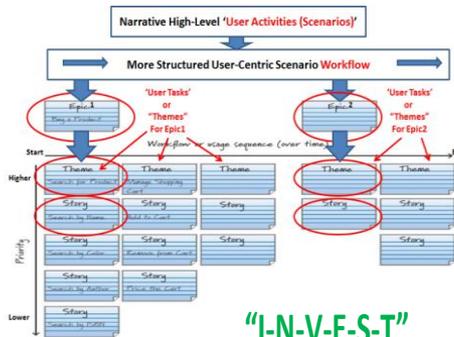
"SOLUTION-READY PBIs"

Initial Product Backlog Items (PBIs)

"D-E-E-P"

-- Can be linked/shared in tools like Atlassian 'Confluence' & 'Jira'

"SOLUTION BUILDING BLOCKS"

User Story Workshop/Story Mapping

"I-N-V-E-S-T"

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"SOLUTION VALIDATION"

Product Canvas

-- Can be shared in tools like Atlassian 'Confluence'

LSM IPP Step: "Problem Validation"

"PROBLEM VALIDATION"

Product Vision Board Extended (PVBE)

Vision	What is your vision, your overarching goal for creating the product?

Target group	**Needs**	**Product**	**Business Goals**
Which market segment does the product address? Who are the target users and customers?	How does the product create value for its users? What problem does it solve? Which benefit does it provide?	What product is it? What makes it desirable and special? Is it feasible to develop the product?	How is the product going to benefit the company? What are the business goals? Which one is most important?
Competitors	**Revenue Sources**	**Cost Factors**	**Channels**
Who are product's main competitors? What are their strengths and weaknesses?	How can you monetise your product and generate revenue? What does it take to open up the revenue sources?	What are the main cost factors to develop, market, sell and service the product? What resources and activities incur the highest cost?	How will you market and sell the product to the customers? Do the channels exist today?

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uGrid RM: Product Vision Board Extended (PVBE)

VISION: Facilitate a Model-Based Systems Approach to Develop Micro-Grids

TARGET GROUP

- System Integrator
- Customer

NEEDS

- Challenge to reconstruct multiple stakeholder concerns and emerging threats.
- Improved collaborative decision-making for acquisition and development.

PRODUCT

- Common vocabulary
- Multiple views
- Decision-making criteria
- Scalable scope
- Composable
- Configurable

MISSION/GOALS

1 Optimize Development
2 Risk Reduction
3 Improved Comms
4 Improved Planning

COMPETITORS

- Legacy Methods
- Non-Profits
- Commercial Enterprises
- Governments

REVENUE SOURCES

- Governments
- Crowd Resources
- Non-Profits
- Venture Capitalists
- Commercial Enterprises

COST FACTORS

- Maintenance
- Schedule
- Training
- Tools
- Labor (Vols vs Professionals)

CHANNELS

- Professional Societies
- Conferences
- News Media
- Government Communications

uGrid RM MBSE IPP: LSM and Agile (Scrum)

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LSM IPP Step: "User Validation"

"USER VALIDATION"

Persona Templates

🏷 PICTURE & NAME	🔍 DETAILS	🎯 GOAL
What does the persona look like? What is its name?

Choose a picture and a name that are representative, and that allow you to develop sympathy for the persona. | What are the persona's relevant characteristics and behaviours?

Consider demographics, job, lifestyle, spare time activities, attitudes, and common tasks, for instance. | Why would the persona want to buy or use the product?

What problems should the product solve?

What benefits does the persona want to achieve?

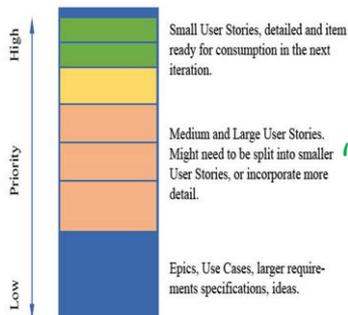If there are multiple problems or benefits, identify the main one and put it at the top. |

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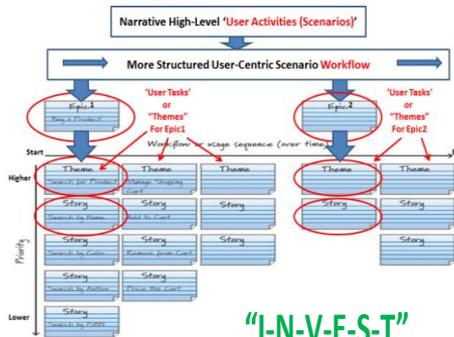
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uGrid RM Stakeholder Groups, or "Personas"

uGrid RM Personas (Stakeholder Groups)	
Ricky the Risk Manager	**Carl** the City Planner
Logan the Logistician	**Rob** the Economics Analyst
Mike the Model Manager	**Sam** the Software Engineer
Eddie the Environmentalist	**Nigel** the Network Engineer
Alan the Standards & Governance Specialist	**Tony** the Terrorist
Fred the Model Tester	**Marty** the Systems Integrator
Ted the Toolsmith	**Tom** the Threat Analyst
Paul the Power Provider	**John** the County Planner
Wally the Wire Guy	**Larry** the Insider (Threat)
Kitty the Configuration Manager	**Harry** the Hacker
Nat the Natural Resource Provider	**Sarah** the Campus Facilities Manager
Victoria the Venture Capitalist	**Rita** the Systems Engineer

uGrid RM MBSE Project: "Persona Hierarchy"
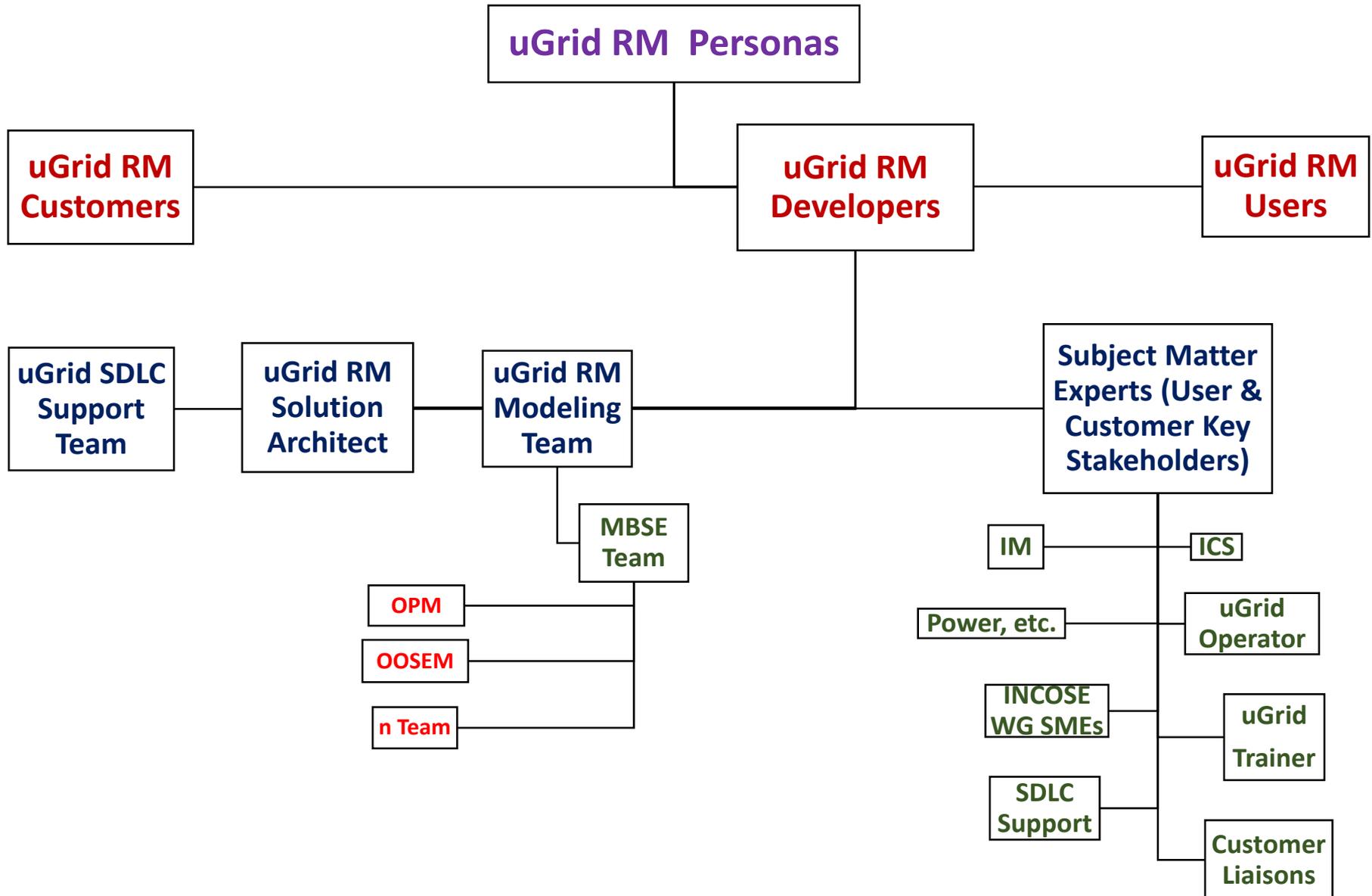
uGrid RM Project: Example "Persona Template"

PICTURE/NAME/TITLE	DETAILS	GOALS
Samantha **uGrid RM Modeler**	-- Expert MBSE Modeler -- Systems Engineer -- Systems Engineering Tools Expert -- Highly Motivated -- (See Resume and CV)	-- Demonstrate value of MBSE in general and uGrid RM in particular. -- Promote using models for decision-making. -- Convey thinking and give direction to modeling team. -- Demonstrate a real potential solution for real-world problems.

Example "Persona Cards"

uGrid RM MBSE IPP: LSM and Agile (Scrum)

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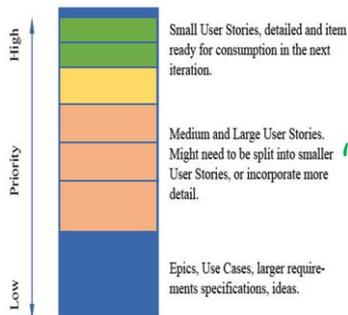| PICTURE & NAME	DETAILS	GOAL
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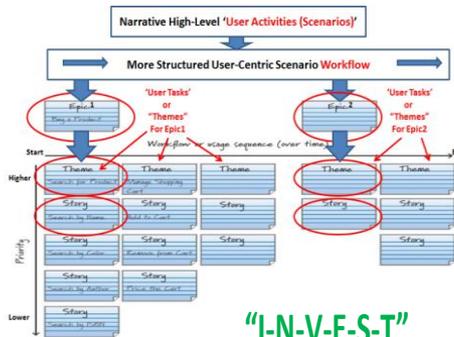
"SOLUTION-READY PBIs"

Initial Product Backlog Items (PBIs)

Small User Stories, detailed and item ready for consumption in the next iteration.

Medium and Large User Stories. Might need to be split into smaller User Stories, or incorporate more detail.

Epics, Use Cases, larger require-ments specifications, ideas.

"D-E-E-P"

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"SOLUTION BUILDING BLOCKS"

User Story Workshop/Story Mapping

Narrative High-Level 'User Activities (Scenarios)'

More Structured User-Centric Scenario Workflow

'User Tasks' or "Themes" For Epic1

'User Tasks' or "Themes" For Epic2

Workflow usage sequence (over time)

Start ... End

"I-N-V-E-S-T"

-- Can be linked/shared in tools like Atlassian 'Confluence' & 'Jira'

"SOLUTION VALIDATION"

Product Canvas

Name	The name of the product.	Goal	The reason for creating the product.	Metrics	The measures to determine if the goal has been met.

Target Group	Big Picture	Product Details
The users and the customers with their needs. Personas are a great way to describe the target group.	The desired user experience (UX): the user journeys, the product functionality, the visual design, and the nonfunctional properties. Epics, scenarios, storyboards, workflows, design sketches, mock-ups, and constraint stories are helpful techniques.	The goal of the next iteration with specific actionable items to reach the goal. The items are ordered from one to n, and may be captured as detailed user stories.

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uGrid RM Project: Example "Product Canvas"

Product Name: **uGrid RM**	GOAL: **Facilitate MBSE for uGrids**	**Metrics:**
Target Group: Ex. Samantha **uGrid RM Modeler** **(Other Personas as decided in this Target Group)**	**Big Picture:** Use Cases — Logical Modeling Scenarios (Story Boards) — High Level Decision Support External Interfaces — Improved Planning Training — Multiple Views	-- # of Scenarios -- # of User Types Trained -- # of Decisions Makers using uGrid RM -- # Users Applying uGrid RM **Product Details:** -- **Templates for Data Visualization** -- **Templates for Information Visualization** -- **Aggregate Data into Information** -- **Provide at least One Use Case Template for every Scenario** -- **etc.**

uGrid RM MBSE IPP: LSM and Agile (Scrum)

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Product Vision Board Extended (PVBE)

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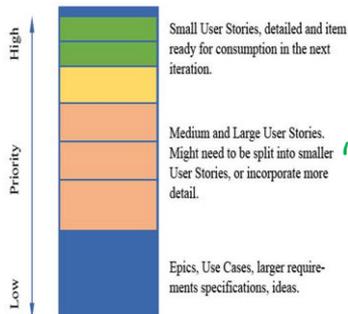
Persona Templates

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Agile IPP Step: "Initial Solution-Ready Work Items"

"SOLUTION-READY PBIs"
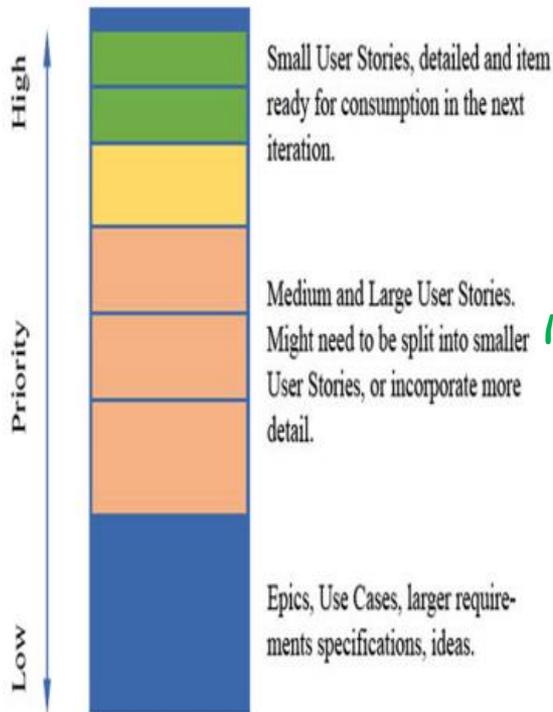
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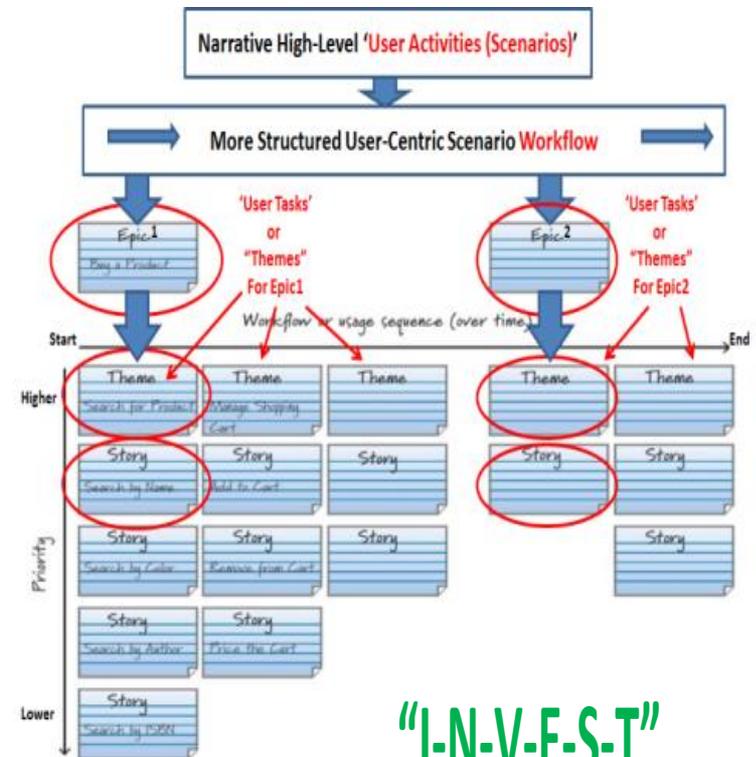
"I-N-V-E-S-T"

-- Can be linked/shared in tools like Atlassian 'Confluence' & 'Jira'

Example: "Initial Solution-Ready Work Items"

Reflect External uGrid Interfaces	**Reflect Internal uGrid Interfaces**	**Represent Constraints**	**Enable Model Instantiations**
Follow Established Modeling Guidelines	**Depict Real-Life uGrid Domain**	**Reflect uGrid Infrastructure**	**Describe uGrid Logical and Physical Components**

Example: "Initial Solution-Ready Work Items"

Work Flow	uGrid RM 'Epics' – Iterations Work								
	Describe Electric Power	Reflect Arch. Behavior	Follow Model Guides	ID Products Needed	Reflect External Interface	Reflect Limits	Describe Model Parts	Enable Mods	Depict uGrid Domain
I1	ID Specific Needs; ID all Policy Limits	ID Simulate Needs		ID all User Needs	Review all Use Cases			ID Changes Required	ID all Hazards
I2	ID all Scenarios	ID all Sub Systems		ID all Ops Processes		ID Power Available			
I3	ID all Power Mediums			ID all Customer Types		ID all Weather Limits			

Key Points

- This **Hybrid Lean Startup Method (LSM)/Agile (Scrum) Product Backlog Item (PBI) Development Approach to Initial Project Planning (IPP)** has proven itself to be an effective approach to help projects, "Get It Right, Right From the Start".

- A small group of Decision Makers and Subject Matter Experts (SMEs) can use this approach in a series of off-site style workshops to quickly and efficiently develop together an actionable set of **IPP Focus Mechanisms** that any Development Team can use throughout the life cycle of any system solution project:
    - **'Hats'** project perspectives/insights
    - **Project Title & Purpose**
    - **Product Vision Board Extended (PVBE)**
    - **Persona List and/or Personal Hierarchy**
    - **Persona Templates/Cards**
    - **Product Canvas**
    - **Initial Set of Solution-Ready Work Items**

MBSE, LSM, and Agile References

- **MBSE Book:** *Don't Panic! The Absolute Beginner's Guide to Model-Based Systems Engineering;* **Jon Holt** *and* **Simon Perry***;* 2017; ISBN 978-0-9934857-1-8 http://tinyurl.com/y8bazggw

- **LSM Book:** *The Lean Startup***; Eric Ries**; 2011; ISBN 978-0-670-92160-7 http://tinyurl.com/y7nvq66c

- **LSM Book***: The Lean Product Playbook***; Dan Olsen**; 2015; ISBN 978-1-118-96087-5 http://tinyurl.com/yc9ucoox

- **Agile Project Management Book:** *Agile Product Management with Scrum;* **Roman Pichler**; 2011; ISBN-13: 978-0321605788 https://tinyurl.com/y856stnk

- **Agile User Story Book:** *User Story Mapping: Discover the Whole Story, Build the Right Product 1st Edition;* **Jeff Patton**; 2014; ISBN-13: 978-1491904909 https://tinyurl.com/yby2esm9

THANK YOU!!

Michael E. (Mike) Pafford

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Co-Chairman, INCOSE Object-Oriented Systems Engineering Method Working Group

Co-Chairman, INCOSE System and Software Interface Working Group

Instructor, Johns Hopkins University, Software Systems Engineering

Trainer; Lean Startup Methods (LSM)/Agile for Initial Project Planning

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