INCOSE Healthcare Working Group
5th Annual Systems Engineering in Healthcare Conference
May 1-2, 2019
Minneapolis, MN

Tutorial: Lean Startup Method (LSM) and Agile for Initial Project Planning (IPP) of "Resilient Hospital Reference Model" MBSE Project

"Getting It Right, Right From the Start!"

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LSM/Agile IPP Tutorial Information

LSM/Agile IPP Tutorial slides are posted:

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

- In **Dropbox**:
  - **https://tinyurl.com/y8glnpbp**

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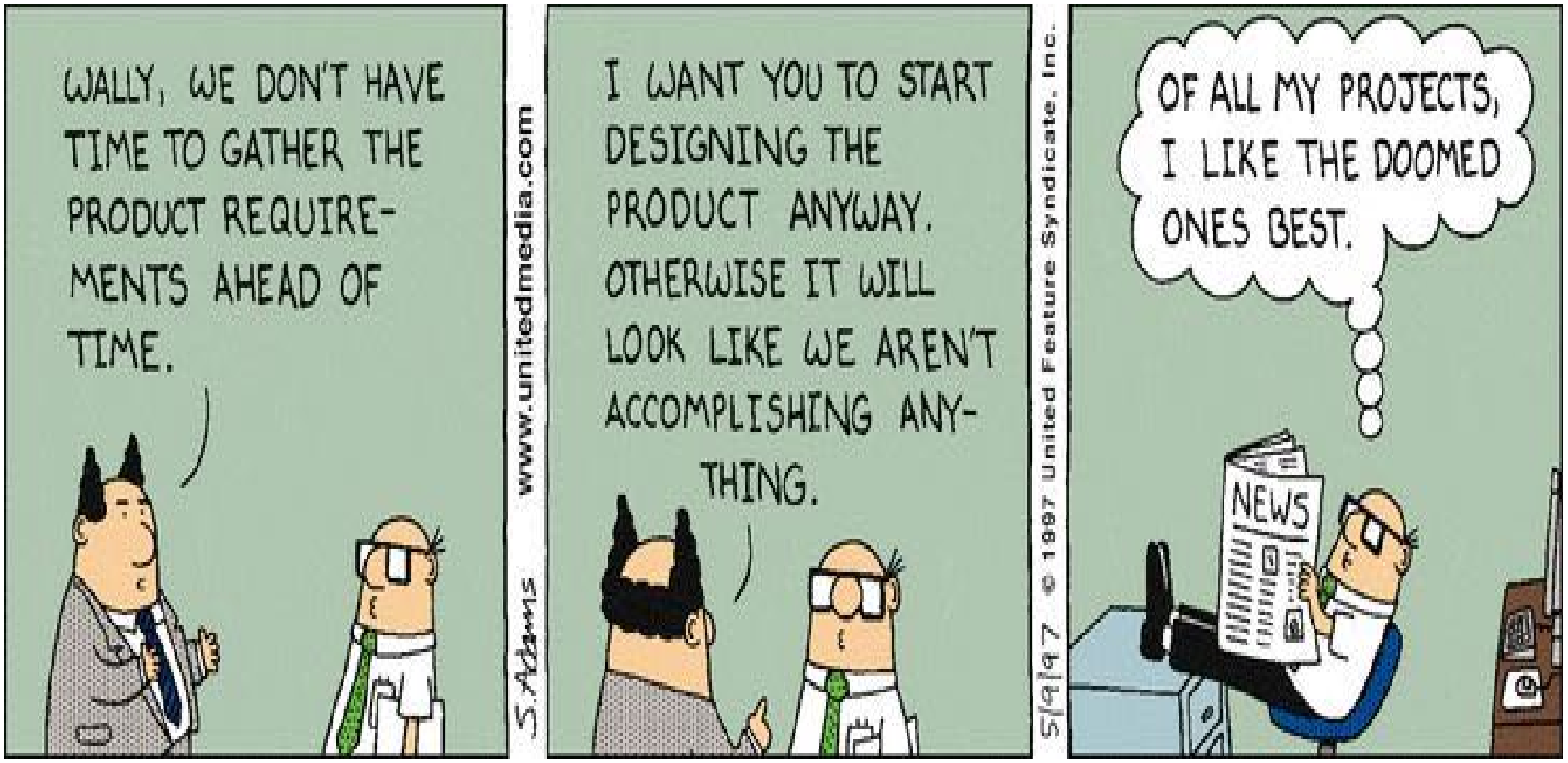
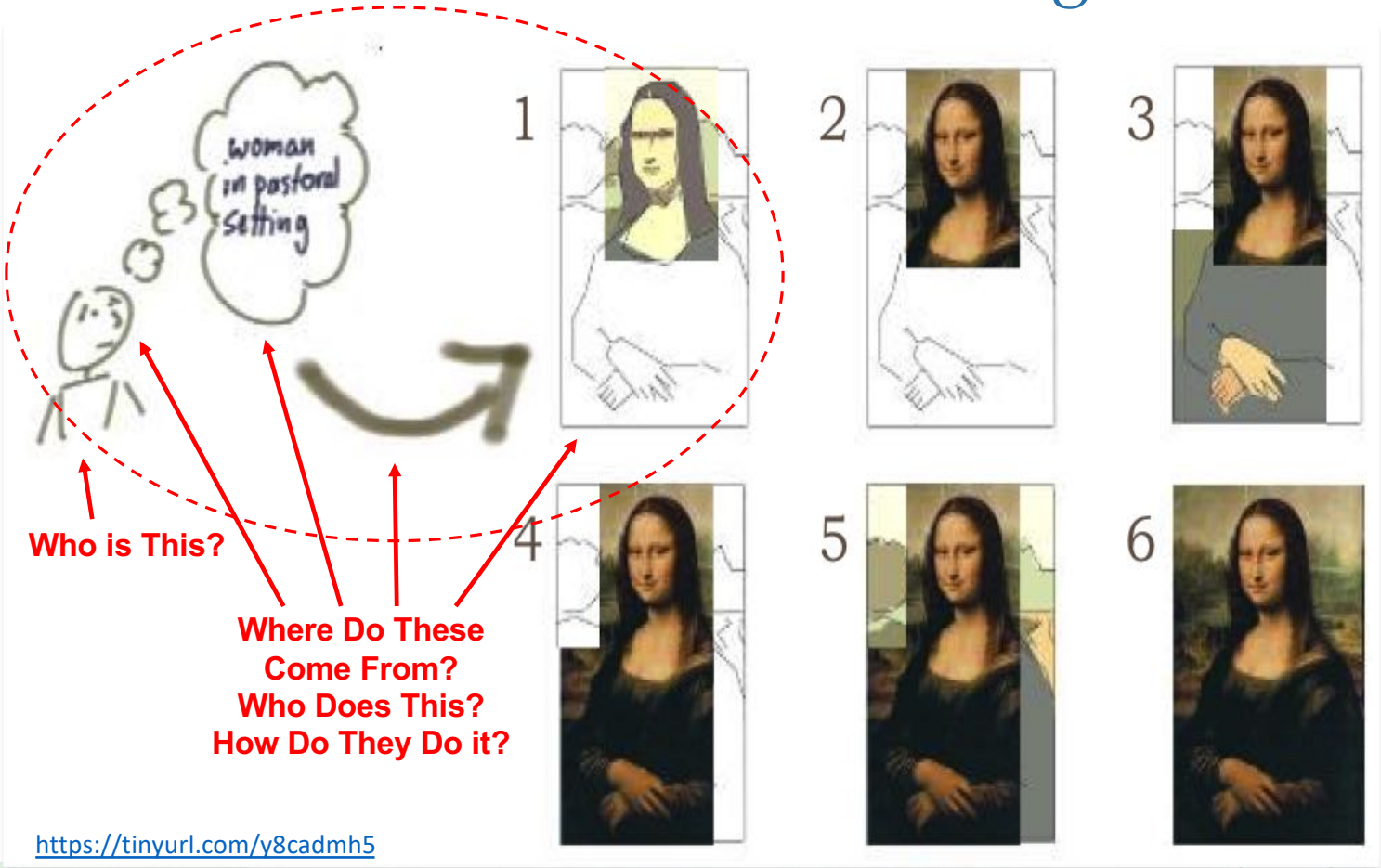
LSM/Agile IPP Tutorial Information

- The roles and responsibilities of Systems Engineers (SEs), Software Engineers (SWEs), and Project Managers (PjMs) are rapidly evolving.
- The purpose of this Tutorial is to acquaint SEs, SWEs, and PjMs with some current and modern tools and techniques being used, specifically in the initial Project Planning (IPP) phases of System Development Lifecycle (SDLC) projects.
- Tutorial information will be based on example Problem Statements and User Scenario narratives from a Resilient Hospital Reference Model (RHRM) MBSE project integrating hardware, software, data, processes, and people.
- A Primary Objective of the Tutorial is to highlight the value of using best practices from the Lean Startup Method (LSM), Agile (SE & SWE, as well as Agile Project Management) together to enhance initial project planning.
- Using information from the Tutorial, including example narratives, attendees will be introduced to LSM/Agile process steps and techniques involved in developing project initial planning artifacts such as Product Vision Board Extended (PVBE), Persona Templates, Product Canvas, and high level initial system Capabilities.
- The **Objective** of using LSM/Agile for Initial Project Planning, is to develop an **Actionable Set of Project Focus Mechanisms that can be used to enhance the start of any project—no matter the methodology.**

Motivation: Right, Right From The Start – Or Else



Motivation: The 'Real' Starting Point?



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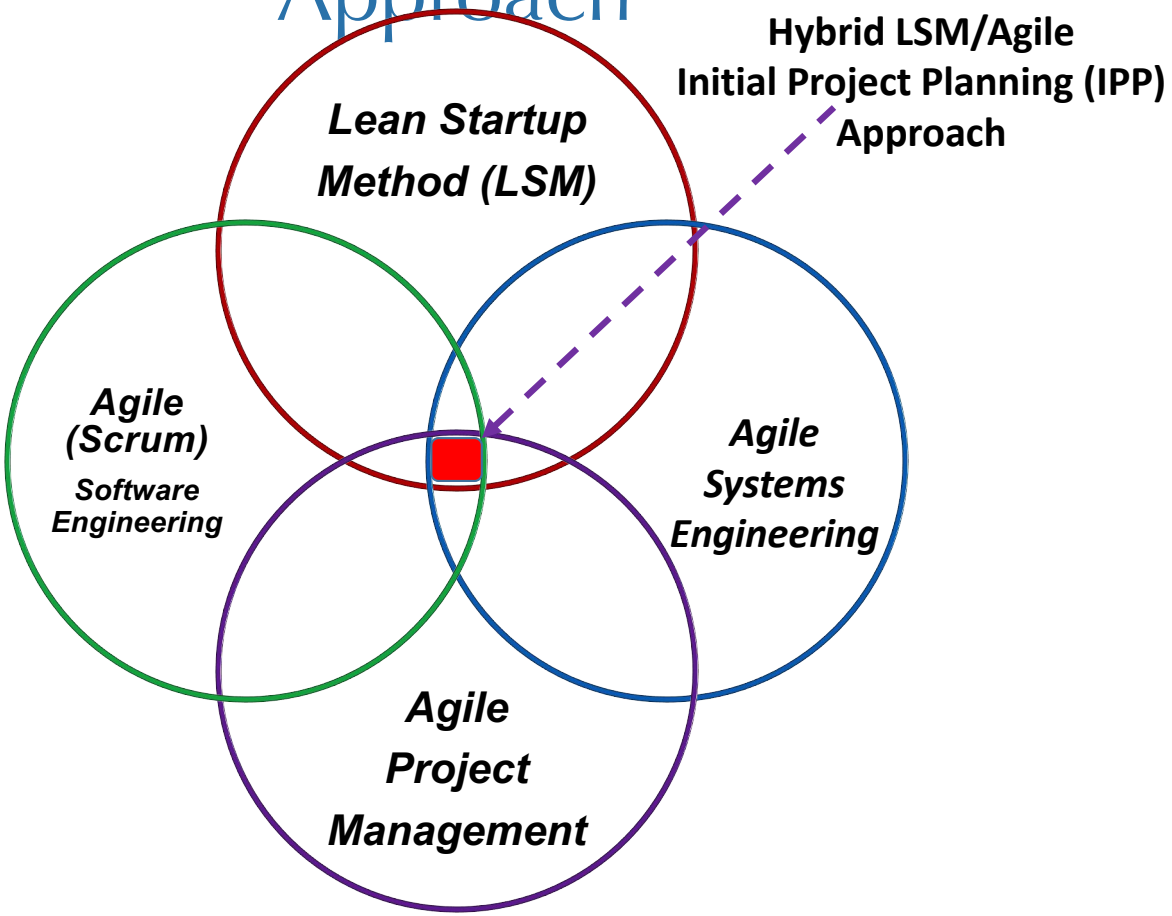
LSM/Agile IPP Tutorial Objectives

The following are very informal Learning Objectives for this LSM/Agile IPP Tutorial:

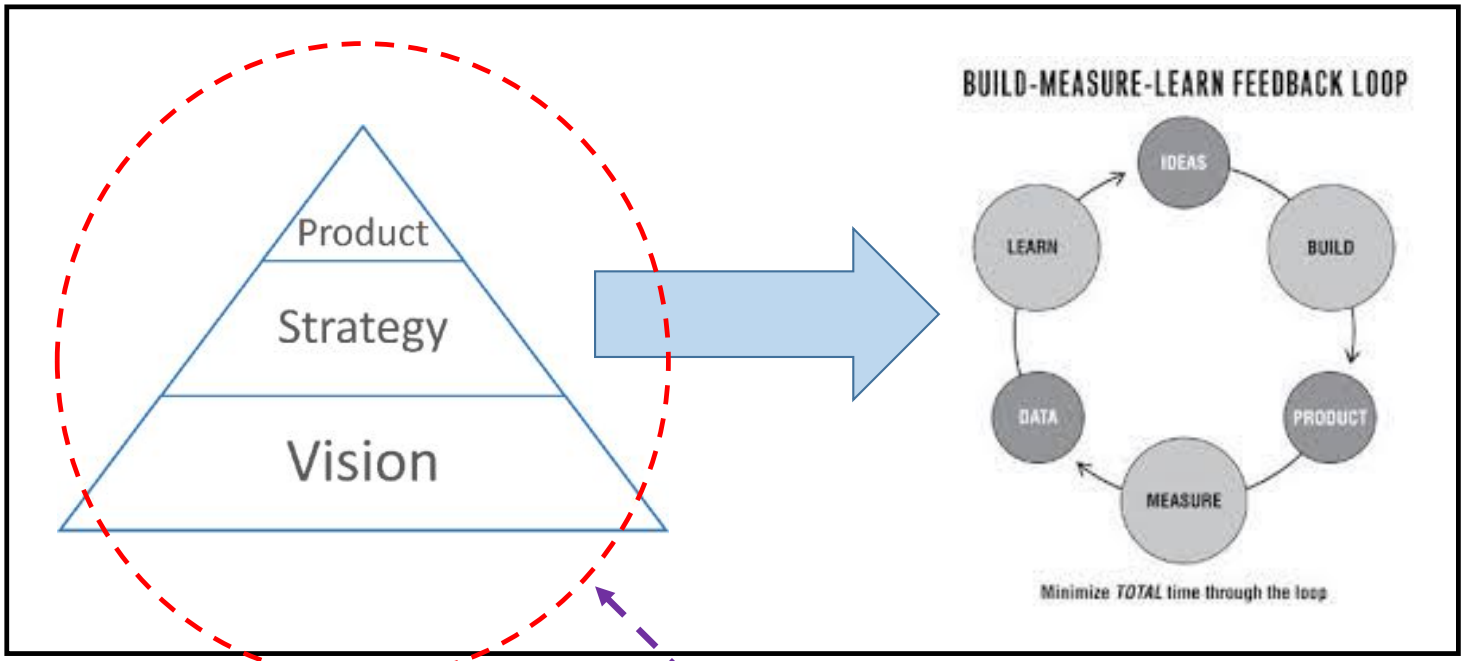
- **Better Understand how LSM/Agile can help enhance Initial Project Planning (IPP).**
- **Become familiar with how to collaboratively develop the following Seven LSM/Agile IPP artifacts, or Seven Project Focus Mechanisms:**

1. **Project Decision-Level Perspectives or 'Hats'**
2. **Project 'Title' and 'Purpose' Statements**
3. **Project Vision Board Extended (PVBE)**
4. **Project 'Personas' (i.e. Stakeholder Groups) List**
5. **Project 'Persona Templates'**
6. **Project 'Target Groups' and 'Big Picture'**
7. **Project High Level System Solution Capabilities**

Hybrid LSM/Agile IPP Approach



Approach in the Lean Startup Method

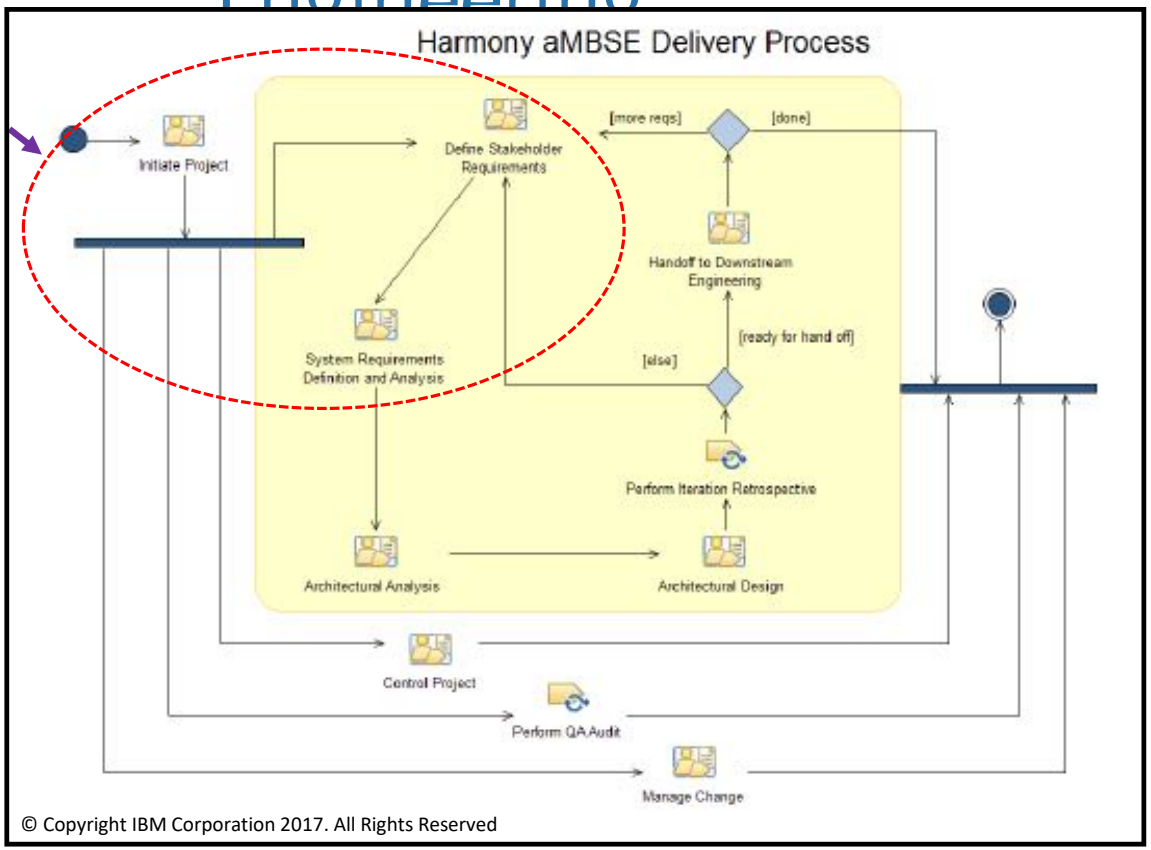


Hybrid LSM/Agile Initial Project Planning (IPP) Approach

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

Approach in Agile Systems Engineering

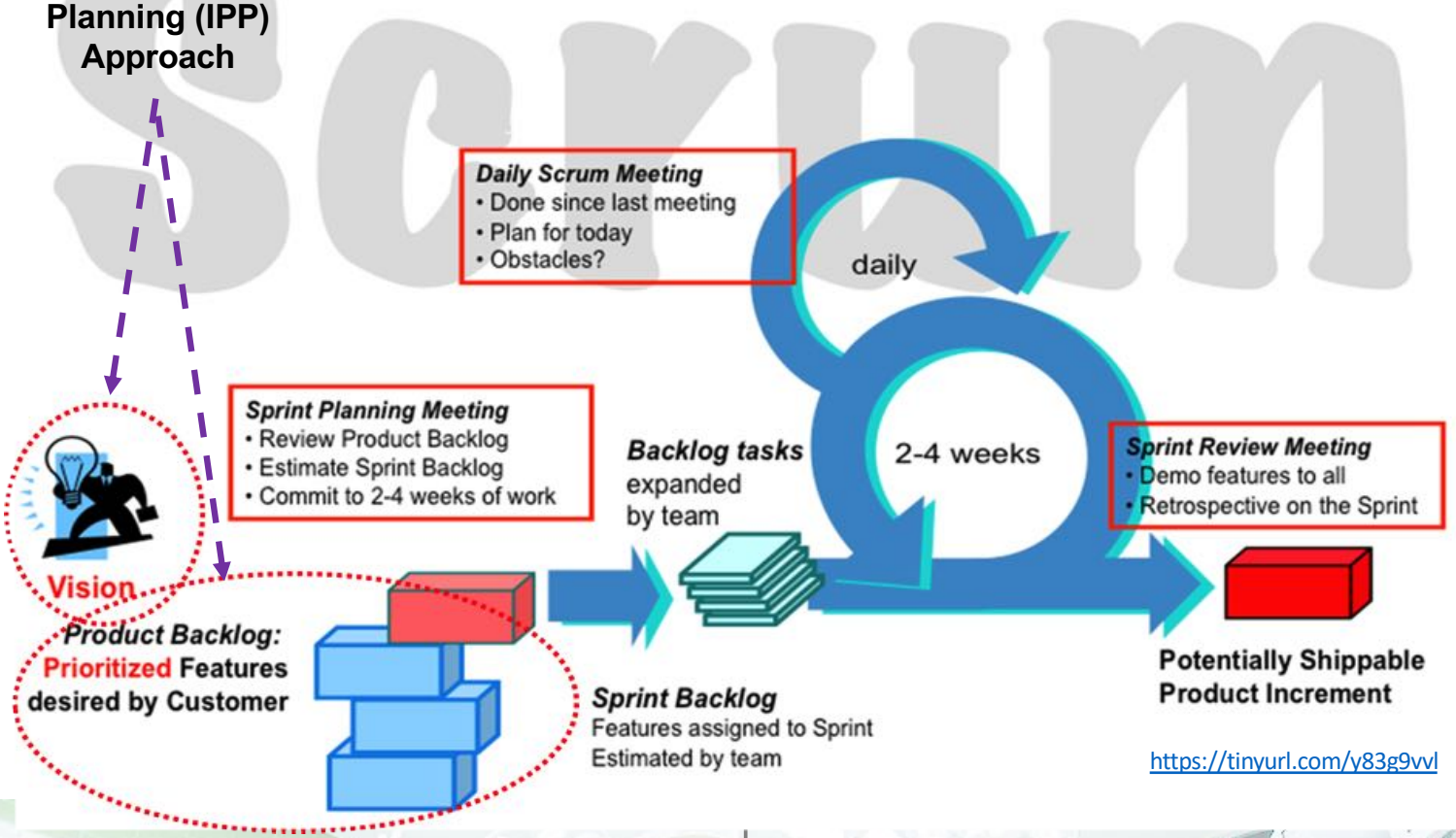
Hybrid LSM/Agile Initial Project Planning (IPP) Approach



Harmony aMBSE Deskbook Version 1.00; https://tinyurl.com/y7gqoj5z

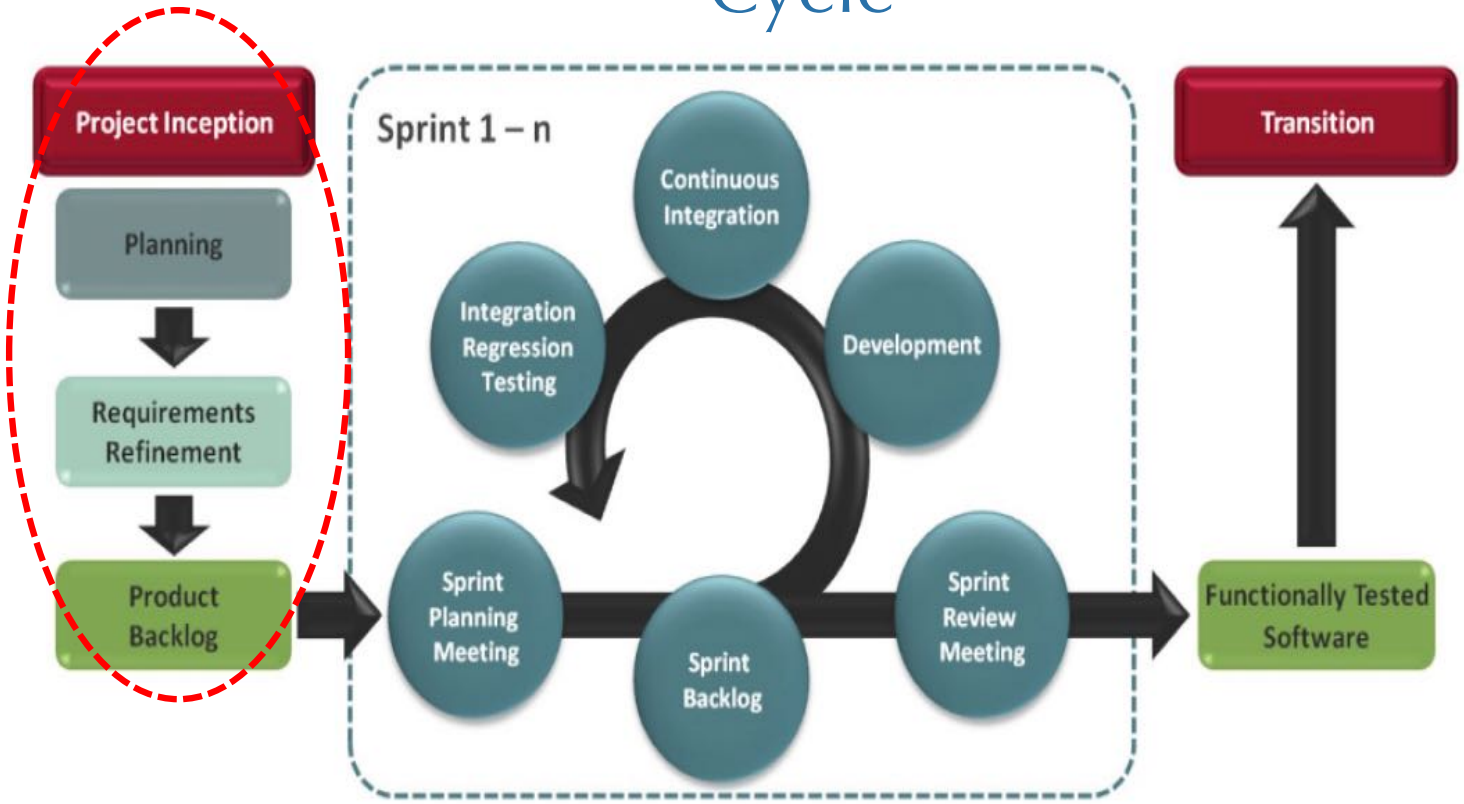
Approach in Agile (Scrum) Software Engineering

Hybrid LSM/Agile Initial Project Planning (IPP) Approach



https://tinyurl.com/y83g9vvl

Approach in the Agile System Development Life Cycle



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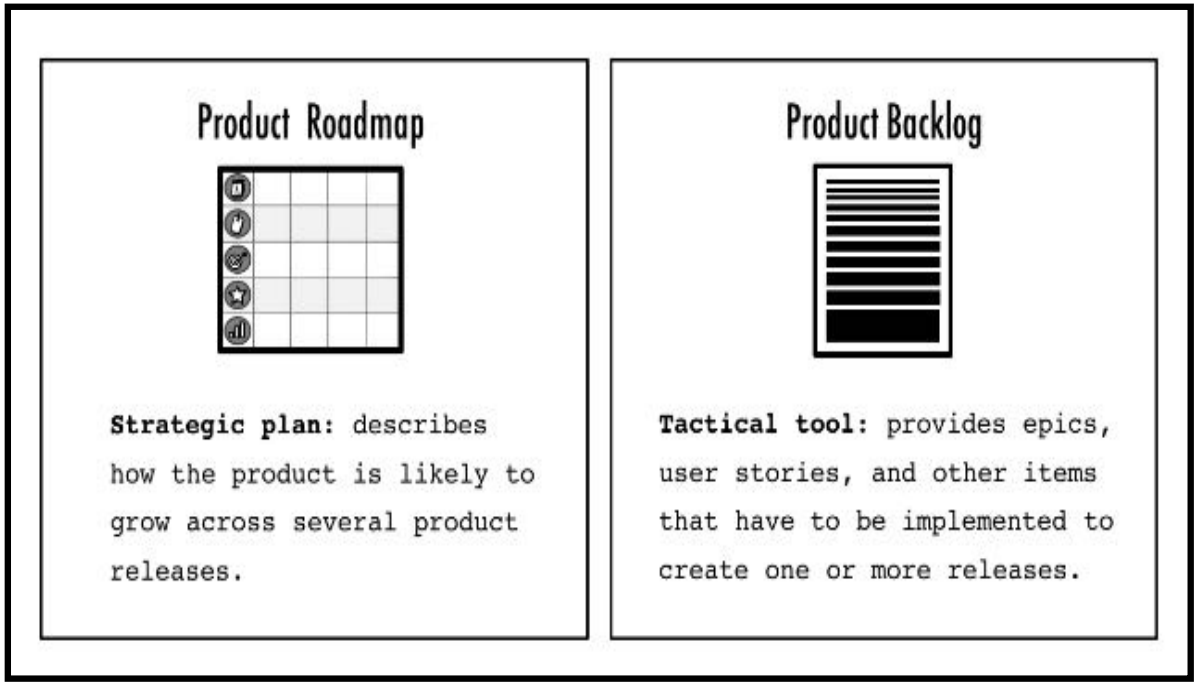
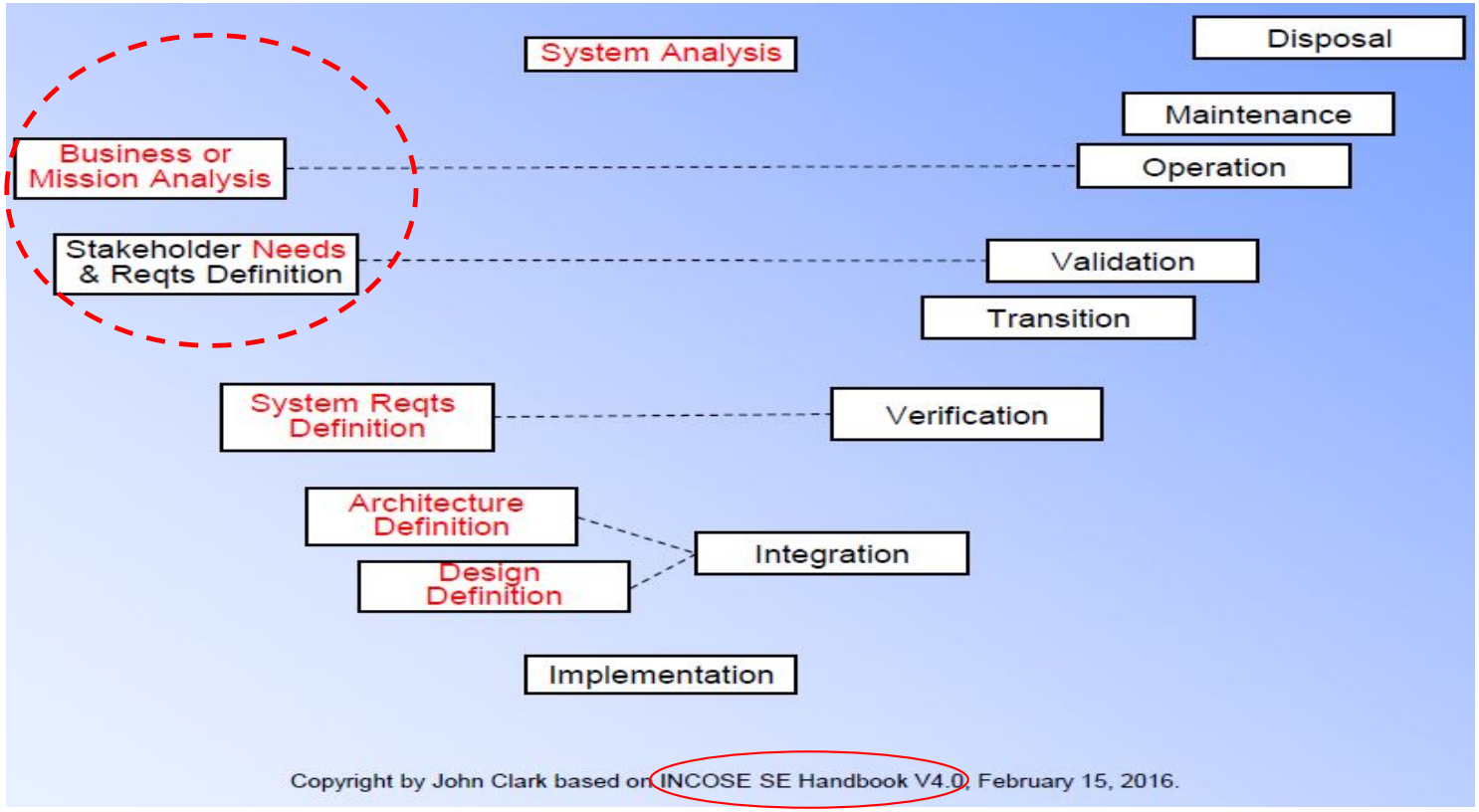
Approach in Agile Project/Product Management



Hybrid LSM/Agile Initial Project Planning (IPP) Approach

https://www.romanpichler.com/blog/product-roadmap-product-backlog/

Approach in the 'Traditional SE Vee'



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Approach in the NASA System Development Life Cycle

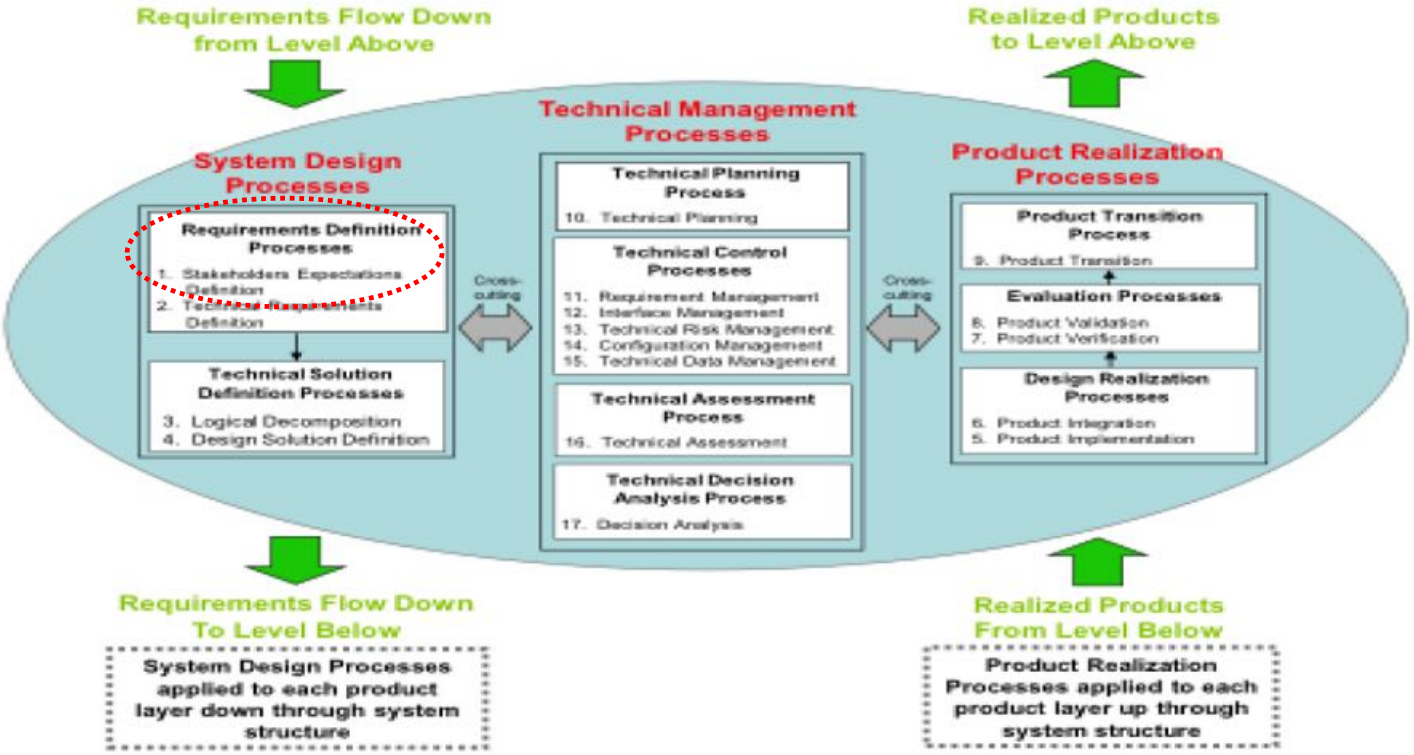

Figure 3 1 - Systems Engineering (SE) Engine

https://snebulos.mit.edu/projects/reference/NASA-Generic/NPR_7123_1B.pdf

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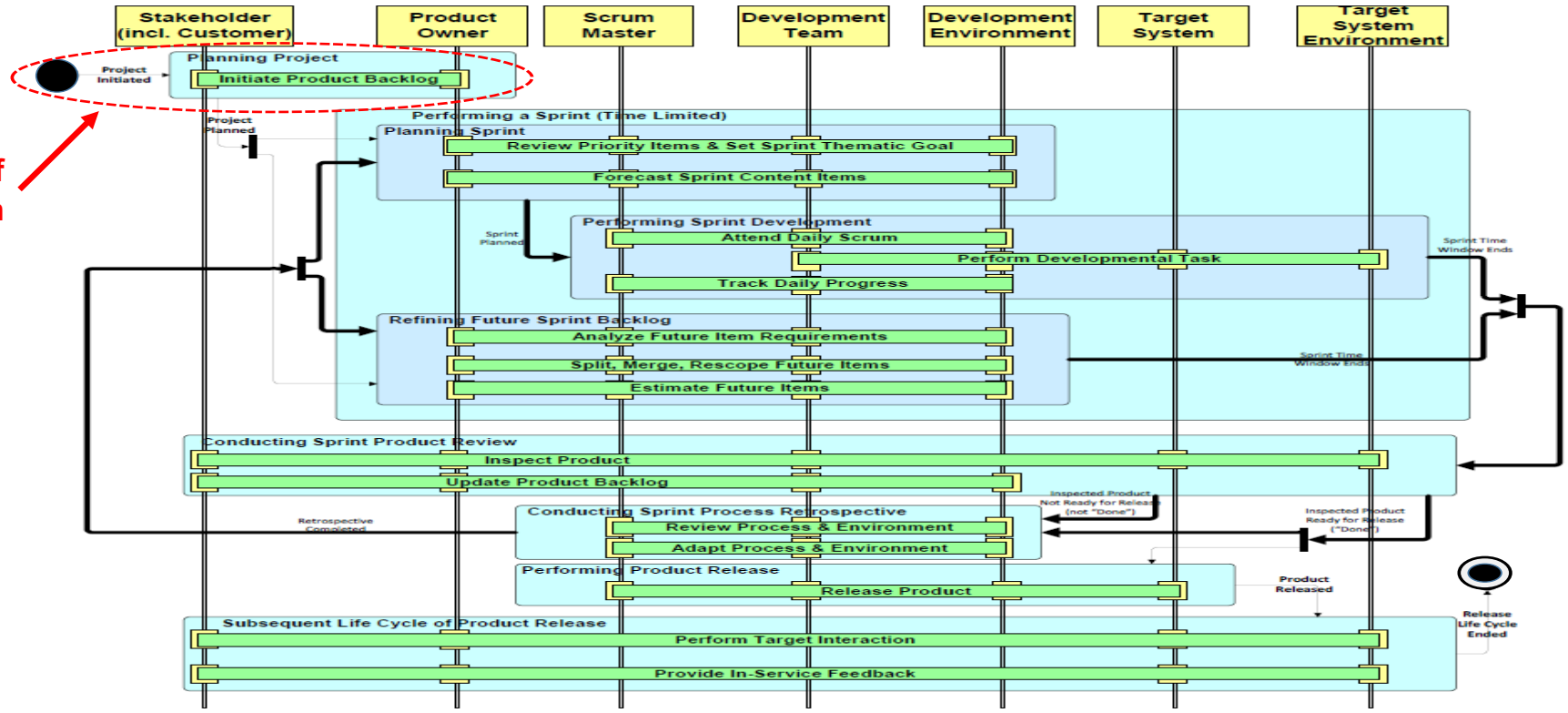
Approach in the Agile Project Lifecycle

Focus of research



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LSM/Agile IPP Approach

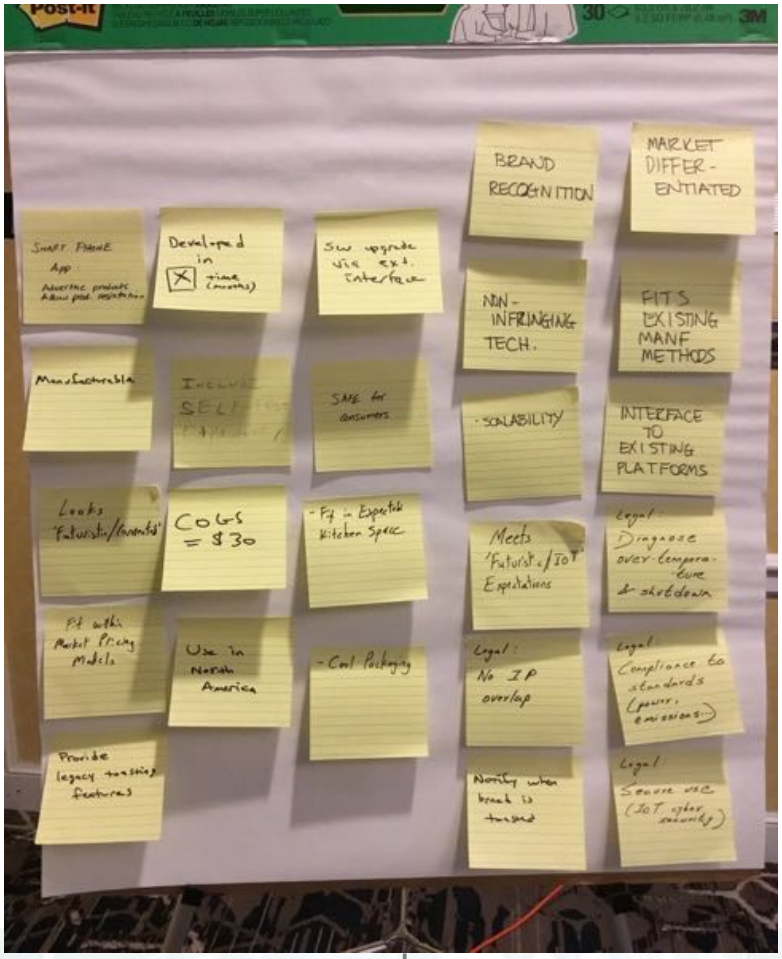
"Meetup"

Focus of Tutorial

"Clean Up"

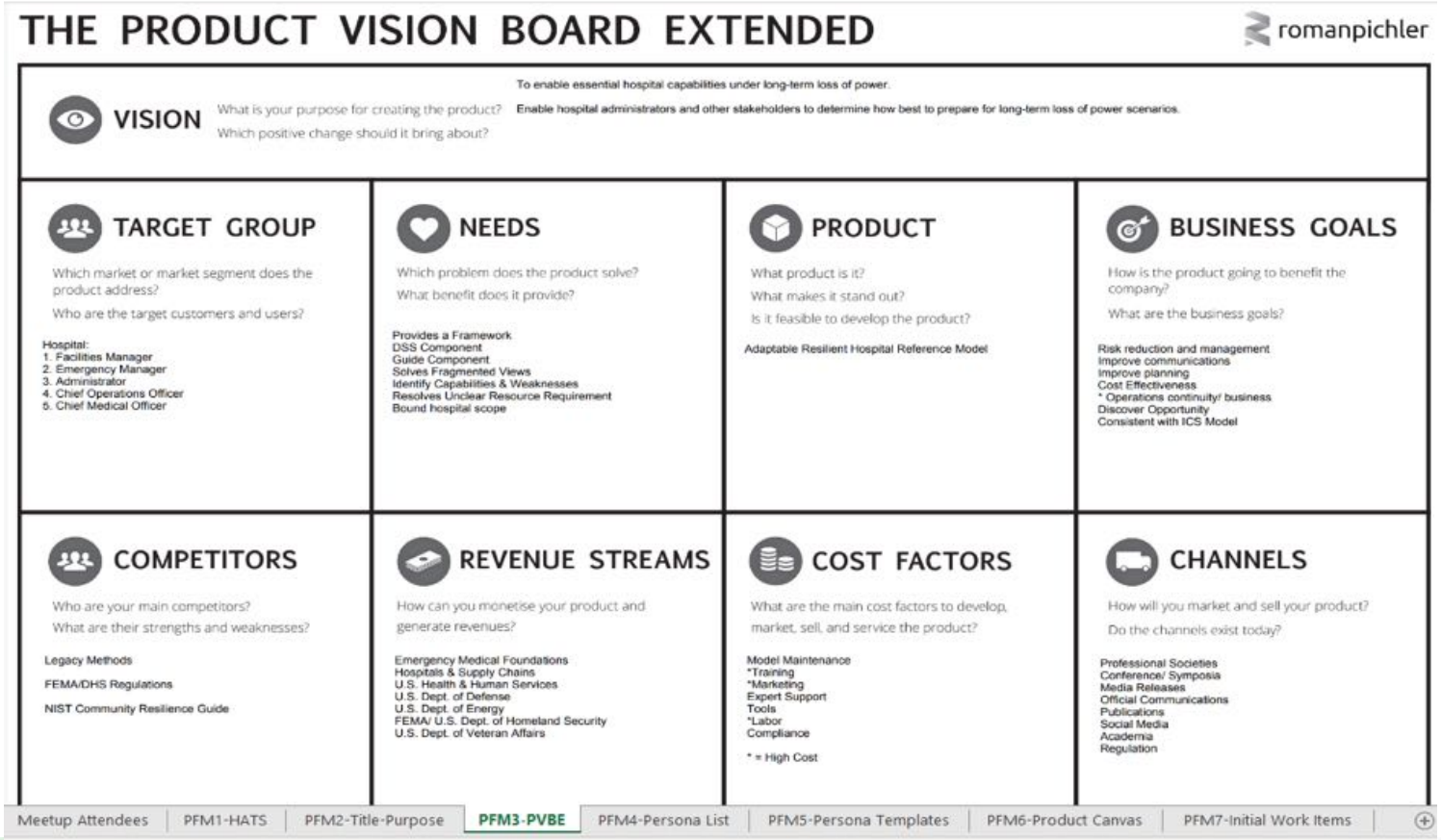
"Post Up"

Example of 'Meetup'



Example of 'Clean Up'

RHET PFM3 (Product Vision Board Extended) from merging work from Meetup1, Meetup2, and Meetup3 (Mike de Lamare)



THE PRODUCT VISION BOARD EXTENDED

romanpichler

VISION

What is your purpose for creating the product?
Which positive change should it bring about?

To enable essential hospital capabilities under long-term loss of power.

Enable hospital administrators and other stakeholders to determine how best to prepare for long-term loss of power scenarios.

TARGET GROUP

Which market or market segment does the product address?

Who are the target customers and users?

Hospital:
1. Facilities Manager
2. Emergency Manager
3. Administrator
4. Chief Operations Officer
5. Chief Medical Officer

NEEDS

Which problem does the product solve?

What benefit does it provide?

Provides a Framework
DSS Component
Guide Component
Solves Fragmented Views
Identify Capabilities & Weaknesses
Resolves Unclear Resource Requirement
Bound hospital scope

PRODUCT

What product is it?

What makes it stand out?

Is it feasible to develop the product?

Adaptable Resilient Hospital Reference Model

BUSINESS GOALS

How is the product going to benefit the company?

What are the business goals?

Risk reduction and management
Improve communications
Improve planning
Cost Effectiveness
* Operations continuity/ business
Discover Opportunity
Consistent with ICS Model

COMPETITORS

Who are your main competitors?

What are their strengths and weaknesses?

Legacy Methods

FEMA/DHS Regulations

NIST Community Resilience Guide

REVENUE STREAMS

How can you monetise your product and generate revenues?

Emergency Medical Foundations
Hospitals & Supply Chains
U.S. Health & Human Services
U.S. Dept. of Defense
U.S. Dept. of Energy
FEMA/ U.S. Dept. of Homeland Security
U.S. Dept. of Veteran Affairs

COST FACTORS

What are the main cost factors to develop, market, sell, and service the product?

Model Maintenance
*Training
*Marketing
Expert Support
Tools
*Labor
Compliance

* = High Cost

CHANNELS

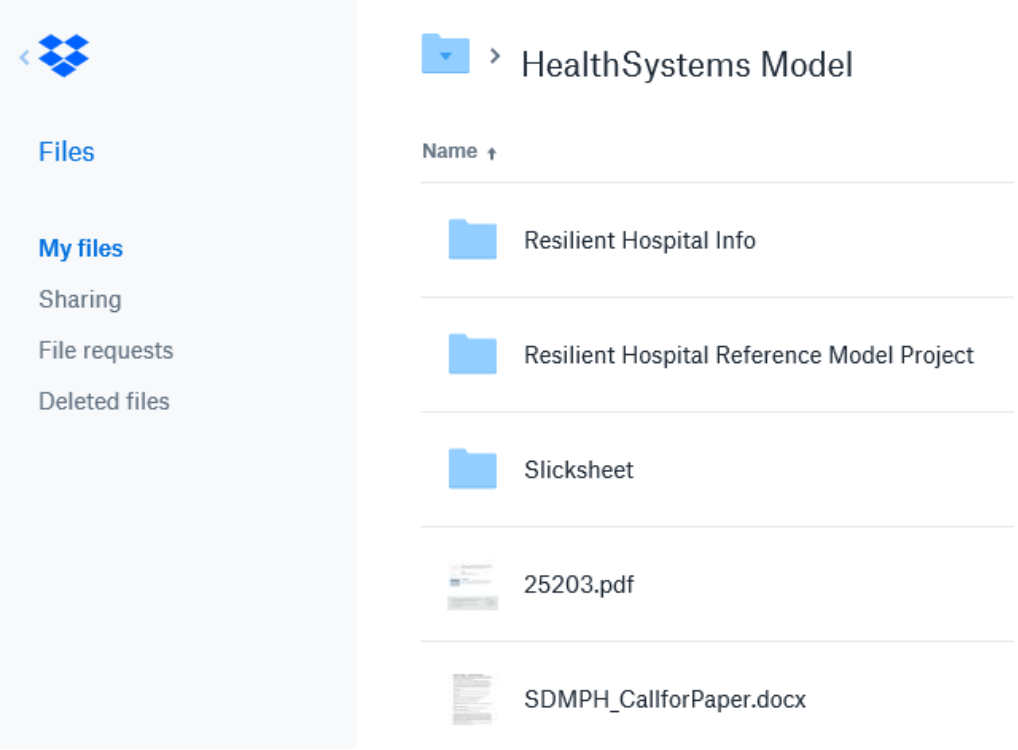
How will you market and sell your product?

Do the channels exist today?

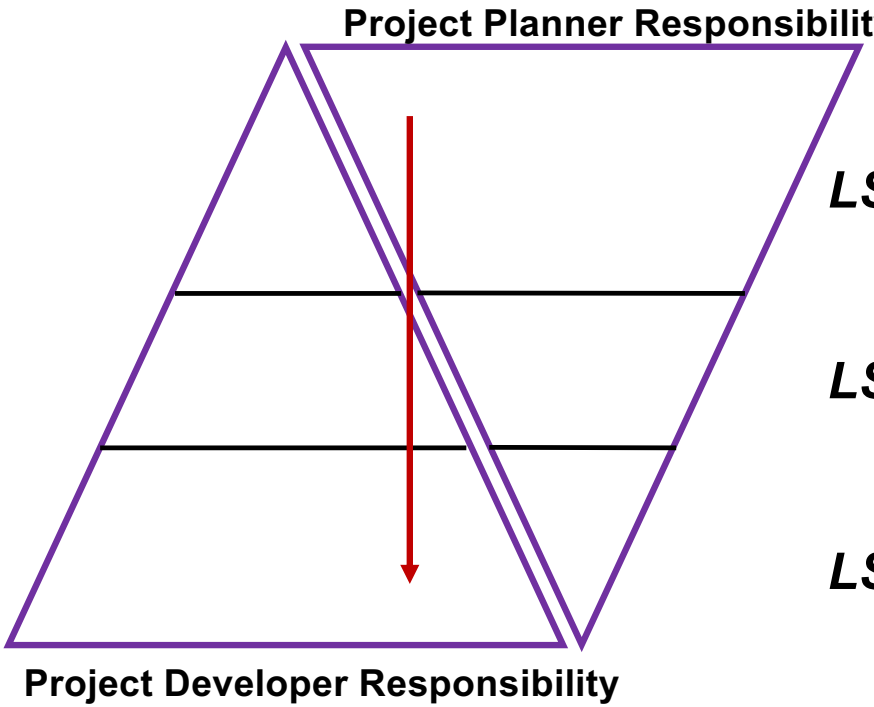
Professional Societies
Conference/ Symposia
Media Releases
Official Communications
Publications
Social Media
Academia
Regulation

Meetup Attendees | PFM1-HATS | PFM2-Title-Purpose | PFM3-PVBE | PFM4-Persona List | PFM5-Persona Templates | PFM6-Product Canvas | PFM7-Initial Work Items

Example of 'Post Up'



LSM/Agile IPP Approach: Responsibilities



LSM/Agile IPP 'Meetup'

LSM/Agile IPP 'Clean Up'

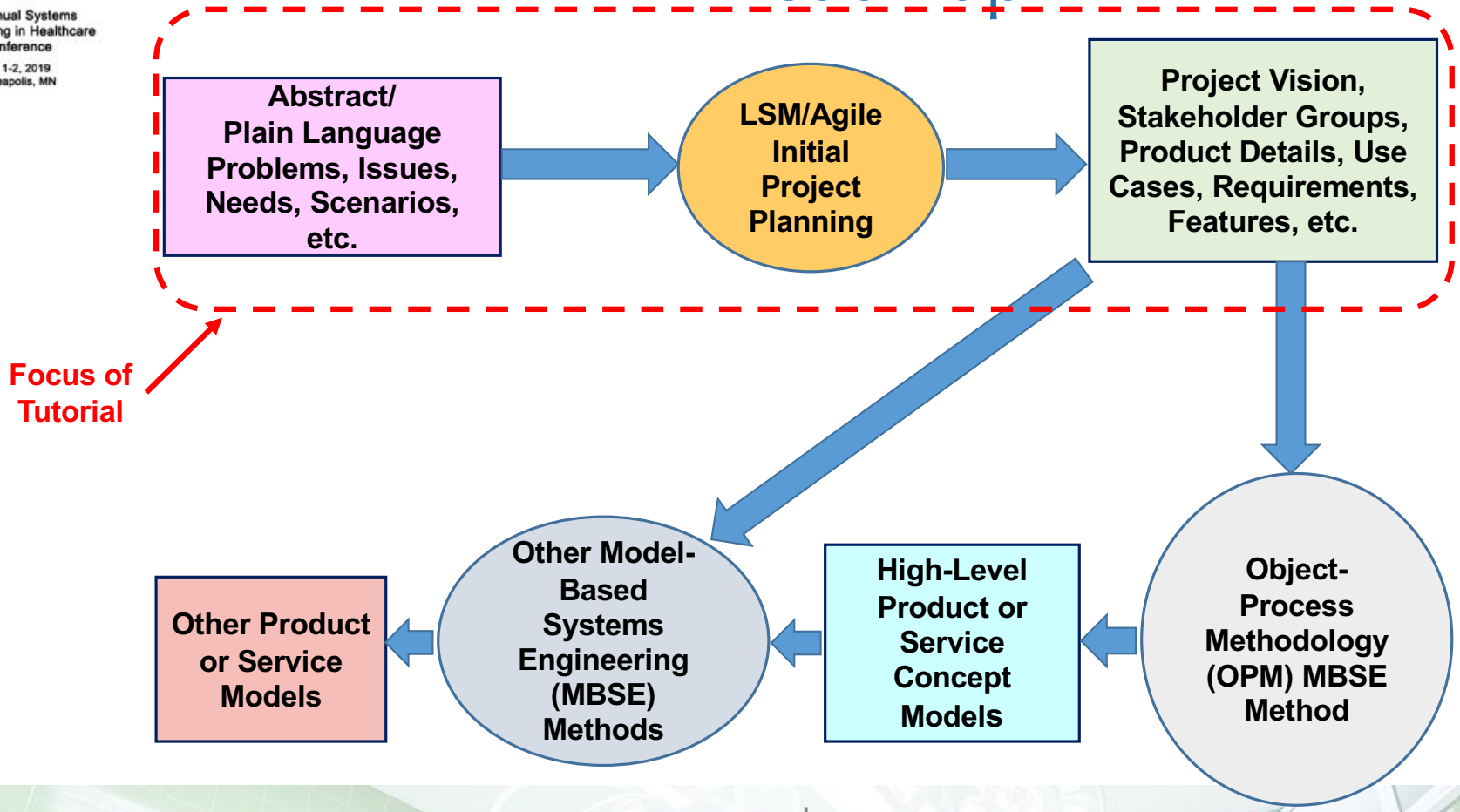
LSM/Agile IPP 'Post Up'

LSM/Agile IPP Approach: Phases and Artifacts

During the three phases of this **Hybrid LSM/Agile for IPP Approach**, the following types of artifacts are created:

- **'Meetup' Artifacts include:**
  - Whiteboard Pictures
  - Flip Charts and Flip Chart Pictures
  - Stickie Notes and Stickie Note Pictures
  - Hand-Written Pages and Page Pictures (e.g., Sign-In Sheets, Forms, etc.)
- **'Clean Up' Artifacts include:**
  - Whiteboard Pictures to Files (PDF, Microsoft Office™ Tools, etc.)
  - Chart Pictures to Files
  - Stickie Note Pictures to Files
  - Hand-Written Page Pictures to Files
- **'Post Up' Artifacts include:**
  - Files to Repository-Based Collaboration Tools (SharePoint™, Confluence™, Dropbox™, etc.)

LSM/Agile IPP Approach in the MBSE Roadmap

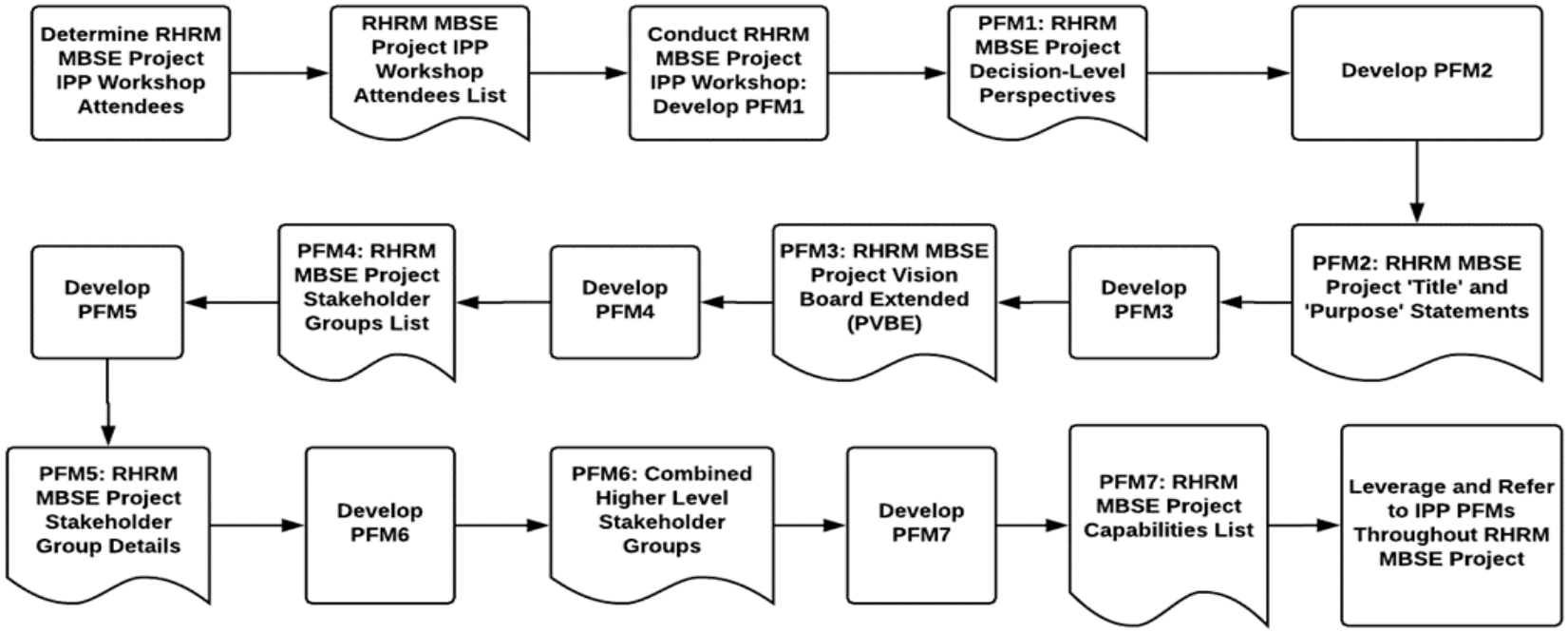


Approach: Project Focus Mechanisms

LSM/Agile IPP 'Meetup' Phase	Project Focus Mechanisms (PFMs)	Best Practice From Discipline:
IPP Meetup Attendee Selection/Confirmation	PFM1: IPP Meetup 'Hats' (i.e., Roles)	Agile Scrum 'Product Owners', and Project Managers
Initial Project Outcome Discussions	PFM2: Project 'Title' and 'Purpose' Statements	Agile SE (Systems Thinking)
Project 'Problem Validation'	PFM3: 'Product Vision Board Extended (PVBE)'	Lean Startup Method (LSM) and Agile Project/Product Management
Project 'User Validation'	PFM4: Project 'Persona List'	LSM and Agile Project/Product Management
Project 'User Validation'	PFM5: Project 'Persona Card' or 'Persona Template' Set	LSM and Agile Project/Product Management
Project 'Solution Validation'	PFM6: Project 'Product Canvas' Set	LSM and Agile Project/Product Management
Project 'Solution Building Blocks'	PFM7: Set of 'Title Level' Project Capabilities and Features	Agile (Scrum) SWE 'Product Backlog Item' Development

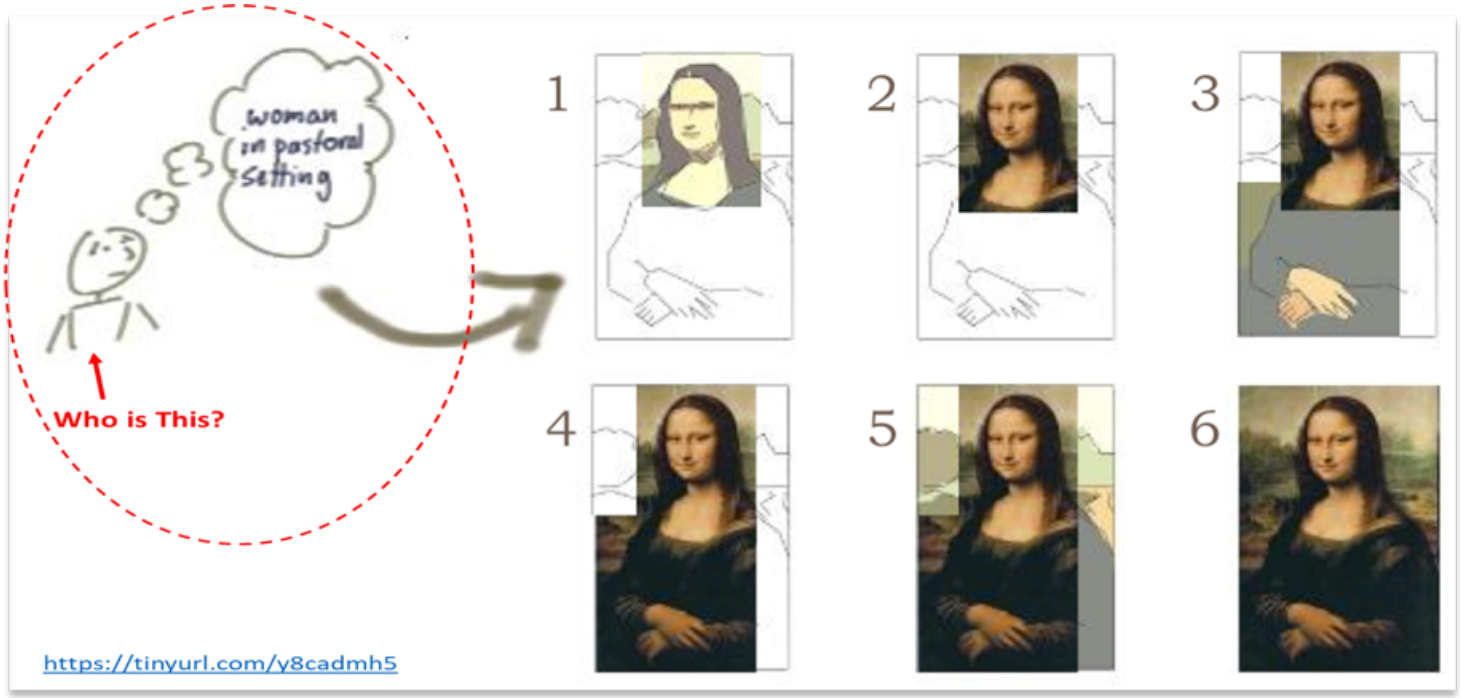
LSM/Agile IPP Approach: RHRM MBSE Project

LSM/Agile IPP Approach for "Resilient Hospital Reference Model (RHRM) MBSE Project



Approach: Initial Conditions

- Like any Project Planning, there are always **"Initial Conditions"**.
- For this Hybrid **LSM/Agile for IPP Approach**, those Initial Conditions include identifying **Who Should Attend the IPP Meetups**.

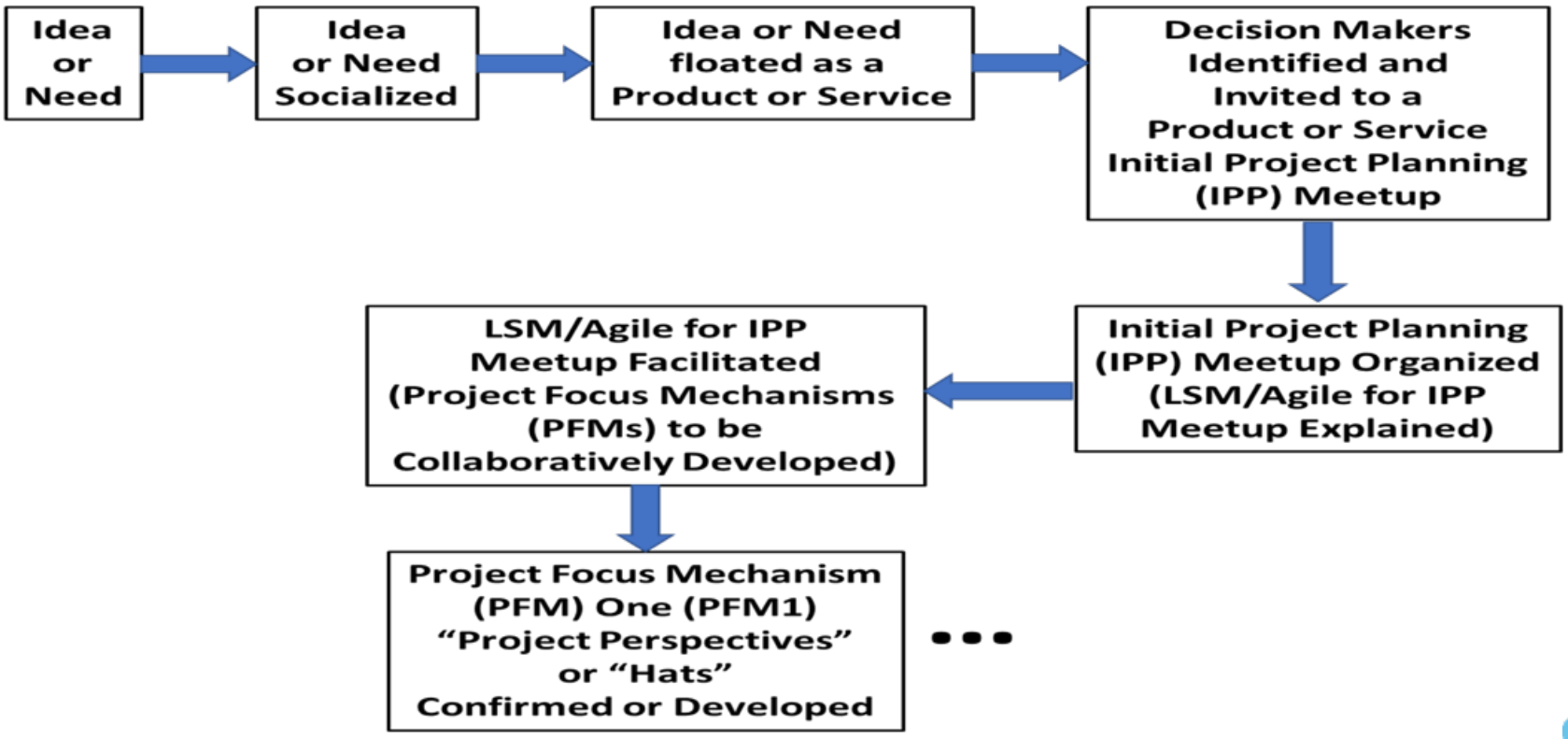


Approach: Who Should Attend IPP Meetups?

- **IPP Meetup Attendees** should be people who can:
  - 1) speak about **Project Outcomes (Not specific solutions)**, and
  - 2) identify **Stakeholder Groups** who have 'equities' in project resourcing, work, and outcomes.
- It is possible that some IPP Meetup Attendees will also be leaders or members of Stakeholder Groups.
  - That will come out during approach steps at the IPP Meetups.
  - But, it is important that IPP Meetup Attendees be able to speak at the very abstract '**Outcomes**' level for the project.
  - This approach is a current/modern way of developing Project Guidance or Direction.
- If possible, the first 'Project Focus Mechanism' (next slides), "Hats" (i.e., Project Perspectives) should be carried out before the first IPP Meetup.
  - At the first IPP Meetup, the 'Hats' can be confirmed, or modified.

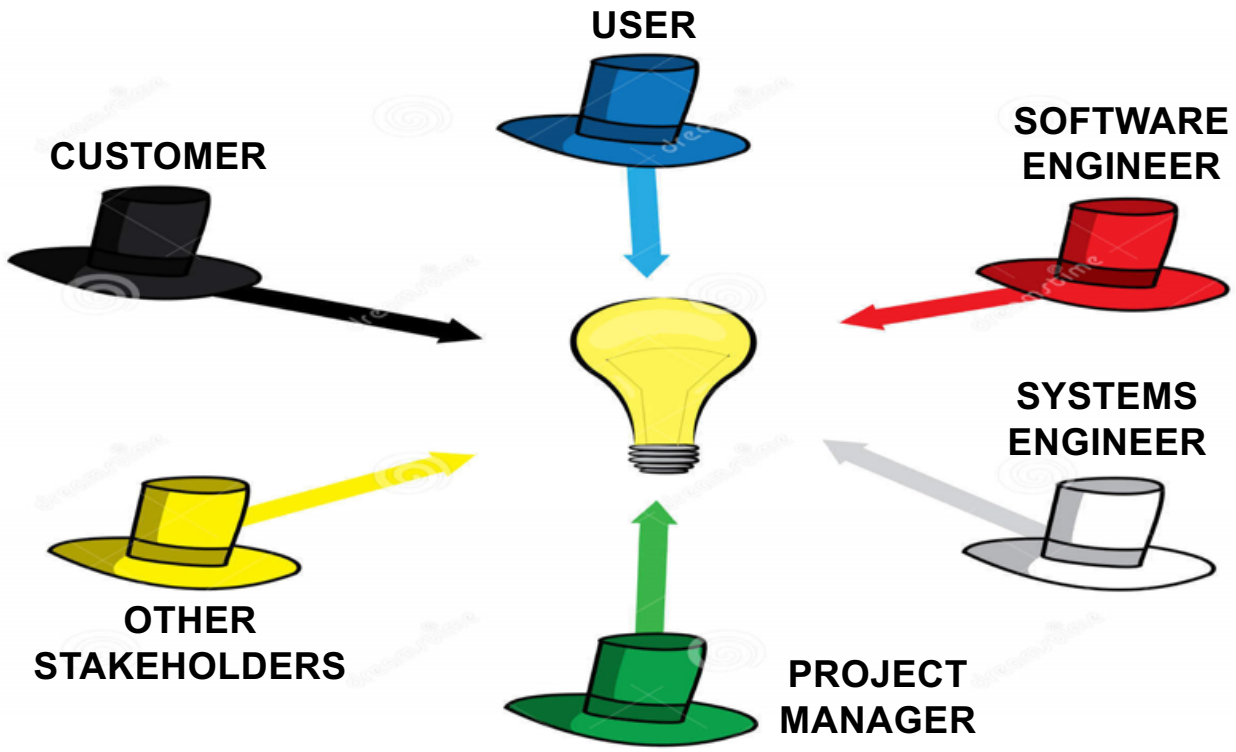
LSM/Agile IPP: 'Hats'

LSM/Agile IPP 'Focus Mechanism 1': IPP Meetup 'Hats' (i.e., Perspectives) (Workflow)



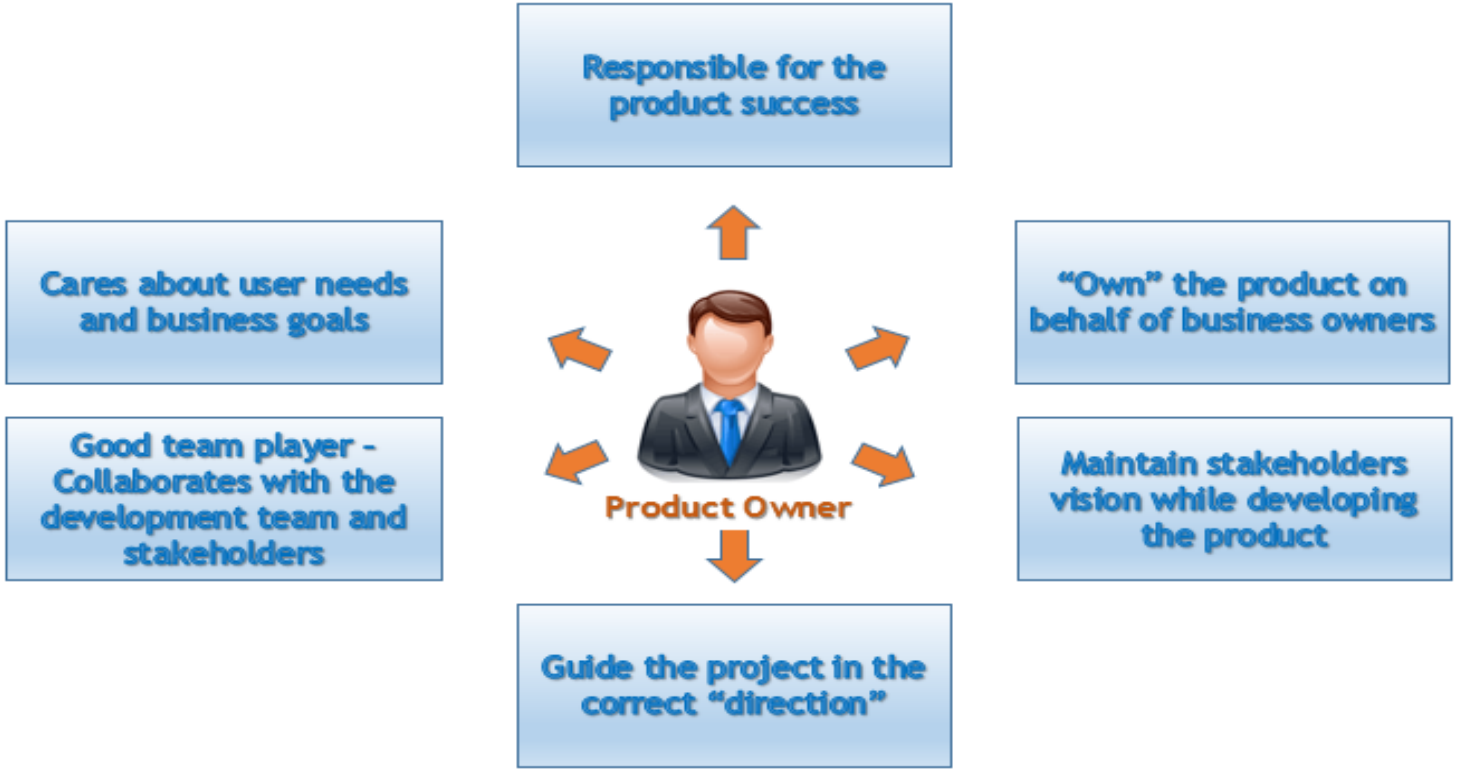
LSM/Agile IPP: 'Hats'

LSM/Agile IPP 'Focus Mechanism 1': IPP Meetup 'Hats' (i.e., Perspectives) (Examples)



LSM/Agile IPP: 'Hats' – Agile (Scrum) Product Owners

LSM/Agile IPP 'Focus Mechanism 1': IPP Meetup 'Hats' (i.e., Perspectives)



© www.QuickScrum.com

LSM/Agile IPP: 'Hats' – Project Managers

LSM/Agile IPP 'Focus Mechanism 1': IPP Meetup 'Hats' (i.e., Perspectives)

LSM/Agile IPP Pilots (uGrid RM Example)

LSM/Agile IPP 'Focus Mechanism 1': IPP Meetup 'Hats' (i.e., Perspectives)

Eight uGrid RM Project "HATS"

Project Lead	**System Integrator**
Consumer (Hospital, etc.)	**Producer**
Customer (County, etc.)	**Infrastructure**
Engineers (Systems, Software, etc.)	**Ops Manager** (County, etc.)

LSM/Agile IPP [illegible] Example)

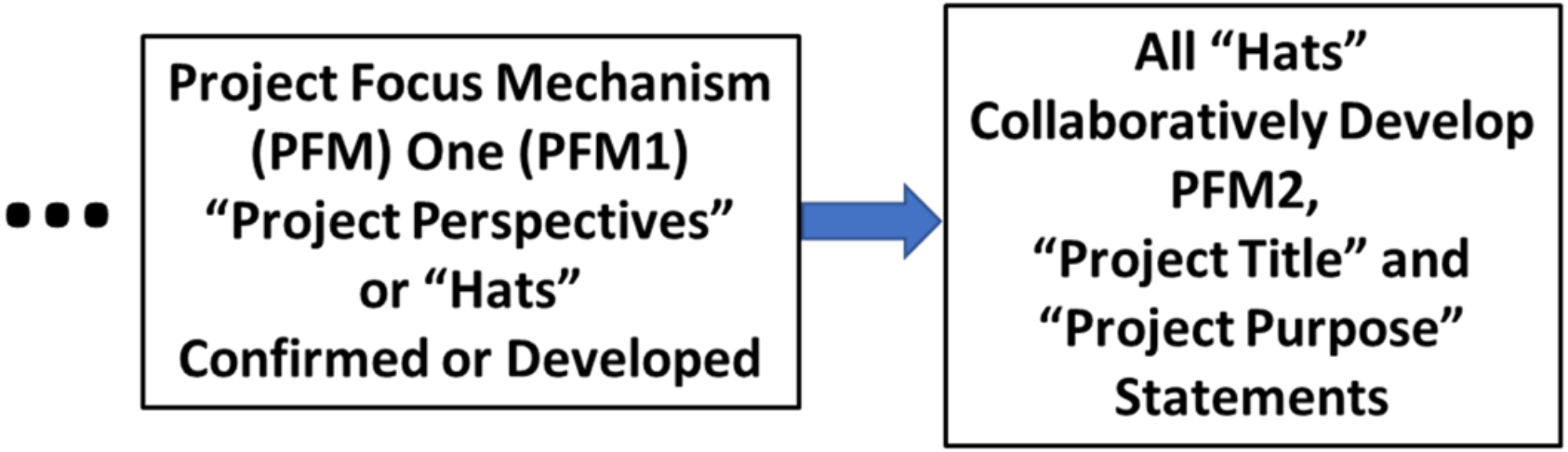
LSM/Agile IPP 'Focus Mechanism 1': IPP Meetup 'Hats' (i.e., Perspectives)

Resilient Hospital Reference Model (RHRM) MBSE Project

Facility Operator (CTO)
Chief Operating Officer (COO)
Chief Information Officer (CIO)
Chief Medical Officer
Hospital Emergency Manager
Hospital Facility Manager
Chief Nursing Officer
Human Resources Manager
Hospital CEO

LSM/Agile IPP: Project Title and Purpose

LSM/Agile IPP 'Focus Mechanism 2': Project 'Title' and 'Purpose' Statements



LSM/Agile IPP: Project Title and Purpose

LSM/Agile IPP 'Focus Mechanism 2': Project 'Title' and 'Purpose' Statements

Info: sgabriele@gemslearning.net SYSTEMS THINKING ROUNDTABLE

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.

LSM/Agile: Project Title & Purpose (uGrid RM Example)

Project Title:

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

Project Purpose:

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

LSM/Agile: Project Title & Purpose (RHRM Example)

LSM/Agile IPP 'Focus Mechanism 2': Project 'Title' and 'Purpose' Statements

RHRM MBSE Project 'Title'	RHRM MBSE Project 'Purpose'
Adaptable Resilient Hospital Reference Model Development	To enable (i.e., generically model) essential hospital capabilities under long-term loss of power

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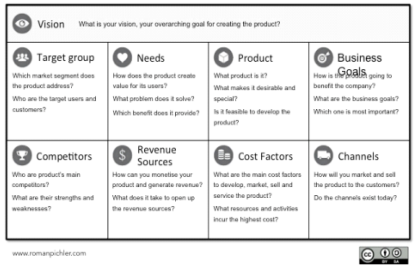
LSM/Agile IPP: Process Flow

"PROBLEM VALIDATION"

Product Vision Board Extended (PVBE)

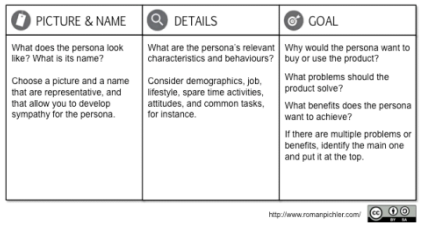


-- Compliant with Lean Business Model Canvas (BMC)
-- Can be shared in tools like Atlassian 'Confluence'

← ***The Next Part of This Tutorial!***

"USER VALIDATION"

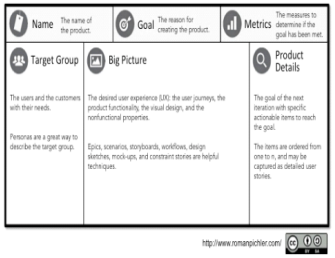
Persona Templates



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

"SOLUTION VALIDATION"

Product Canvas



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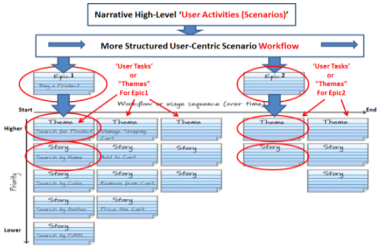
"SOLUTION BUILDING BLOCKS"

User Story Workshop/Story Mapping



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

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 and iteratively start to 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).
  - A former student of **Steve Blank**, who pioneered the **Lean Startup Movement** with his **Customer Development** concept.

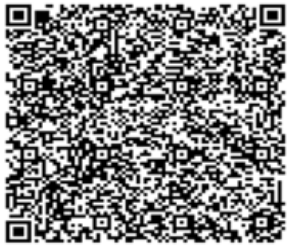
Understanding Stakeholders and Stakeholder Feedback are at the center of successful use of LSM and Agile for Initial Project Planning.

Getting Started Right, with 'Outcomes', not 'Solutions'!

Lean Startup Method (LSM)

Who's Using LSM?

- **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



LSM/Agile IPP: "Problem Validation"

LSM/Agile IPP 'Focus Mechanism 3': Project Vision Board Extended (PVBE)

"PROBLEM VALIDATION"

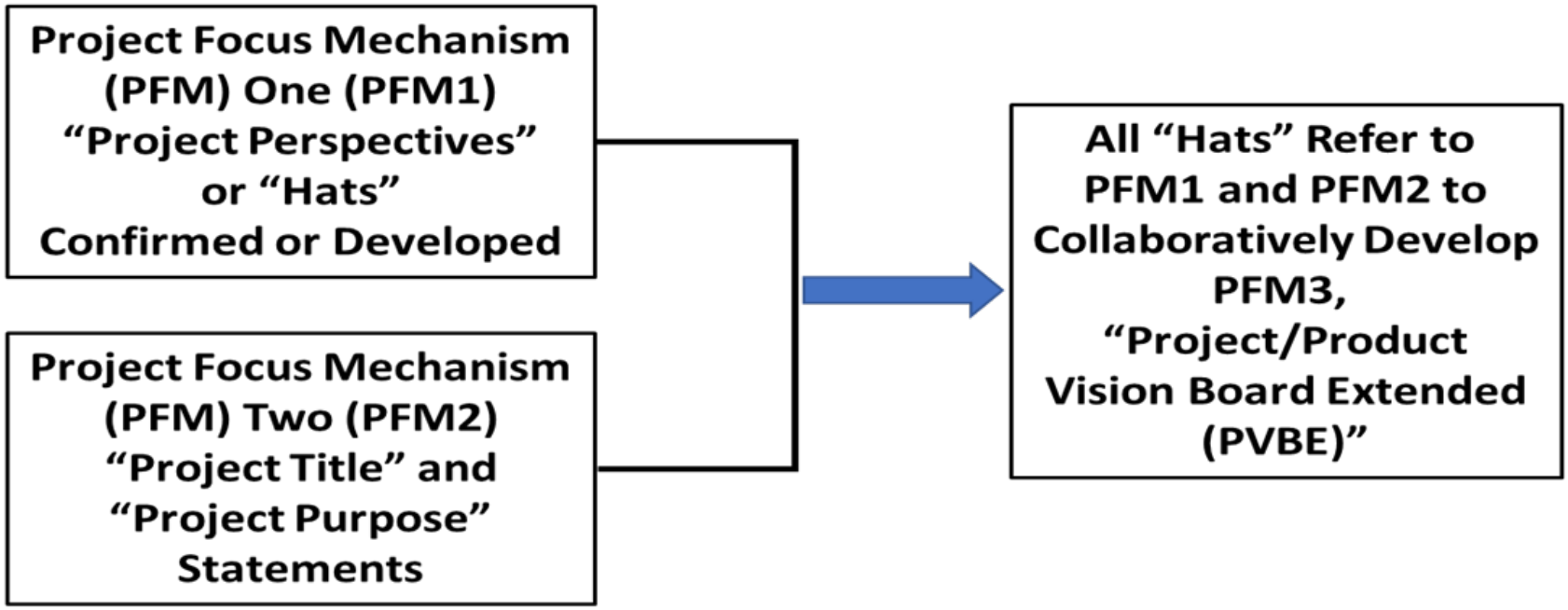
Product Vision Board Extended (PVBE)

-- Compliant with Lean Business Model Canvas (BMC)

-- Can be captured and managed as a 'Confluence Space'

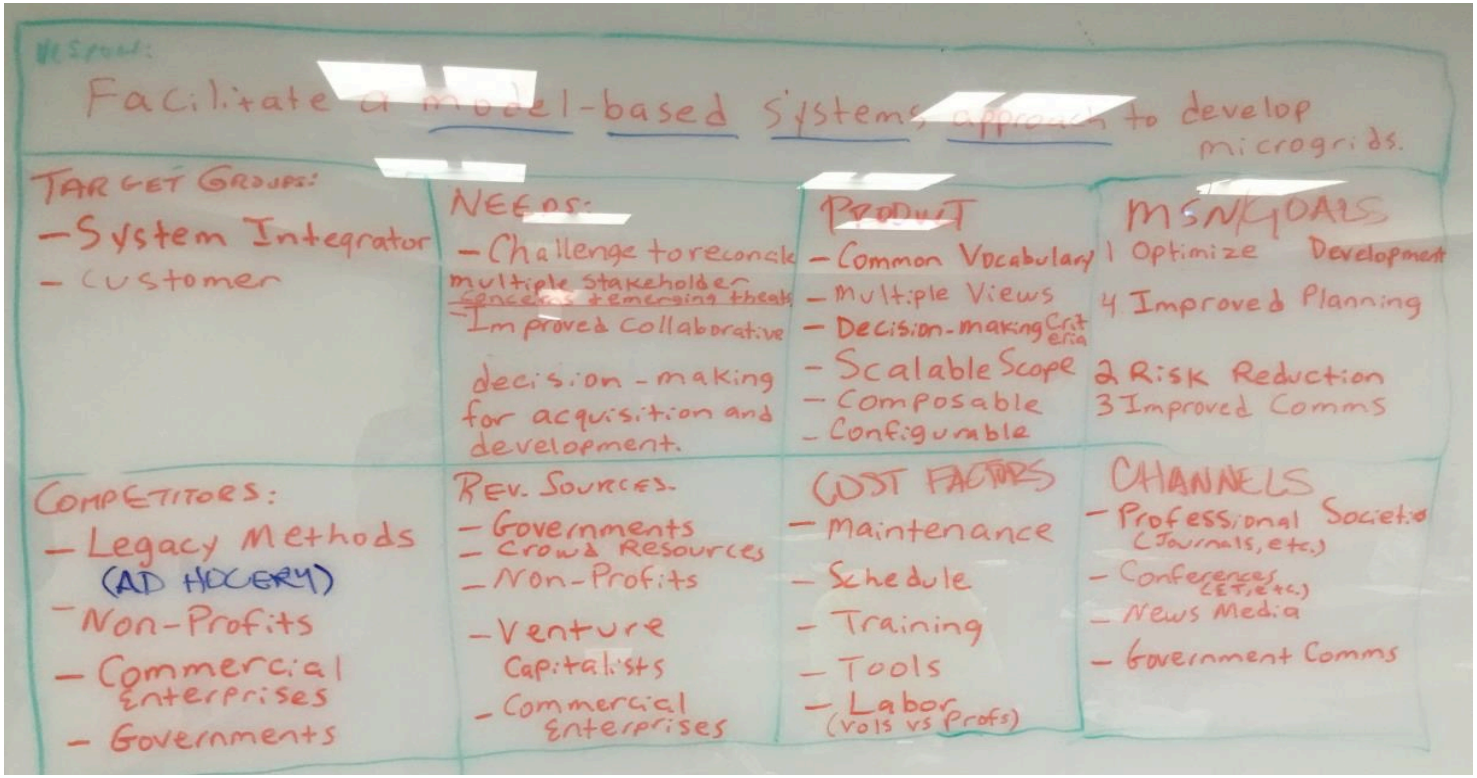
LSM/Agile IPP: "Problem Validation"

LSM/Agile IPP 'Focus Mechanism 3': Project Vision Board Extended (PVBE)



LSM/Agile IPP: "PVBE" (uGrid RM Example)

LSM/Agile IPP 'Focus Mechanism3': Project Vision Board Extended (PVBE)



LSM/Agile IPP: "PVBE" (uGrid RM Example)

LSM/Agile IPP 'Focus Mechanism 3': Project 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

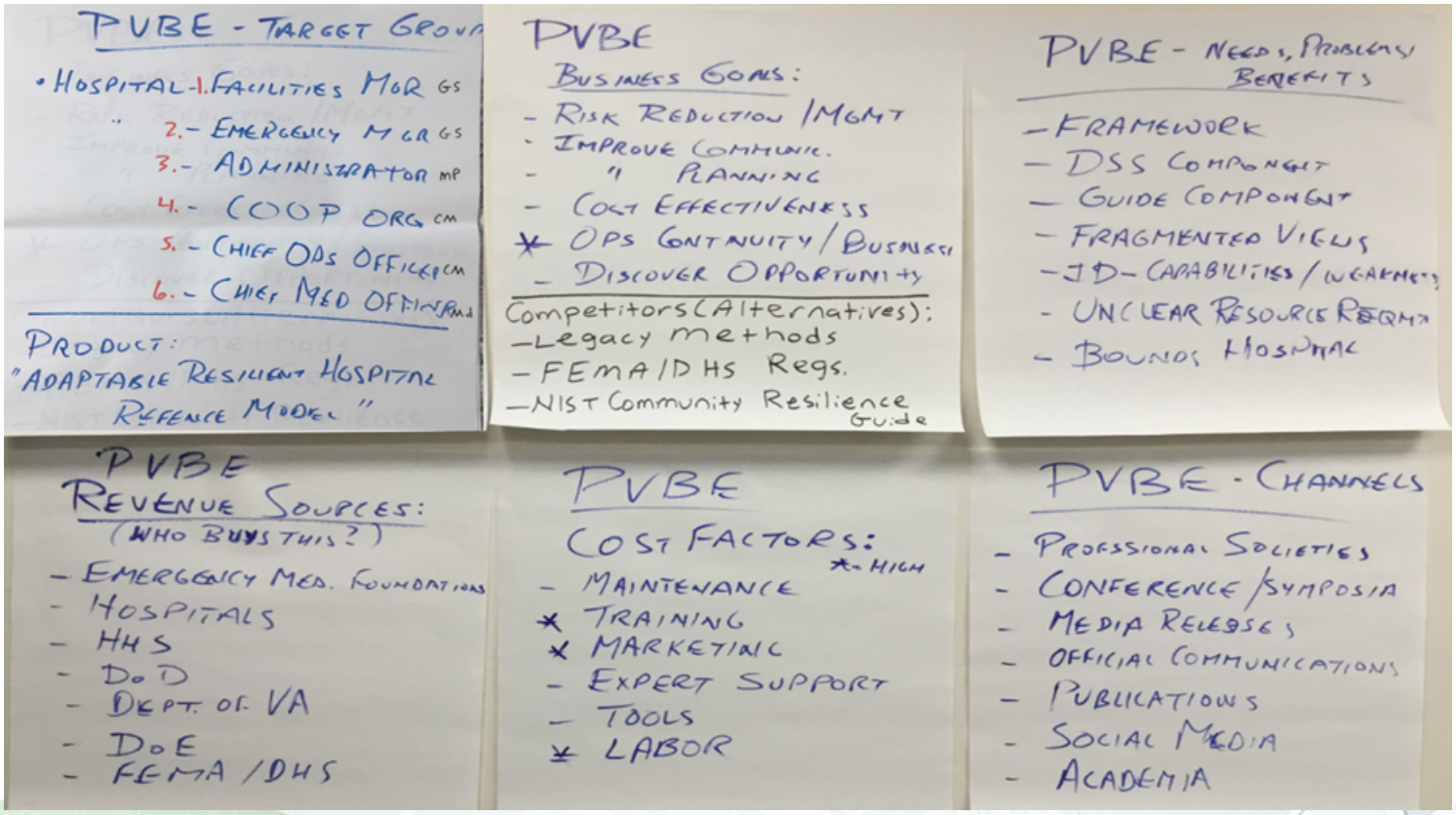
INCOSE Healthcare Working Group

5th Annual Systems Engineering in Healthcare Conference

May 1-2, 2019
Minneapolis, MN

LSM/Agile IPP: "PVBE" (RHRM Example)

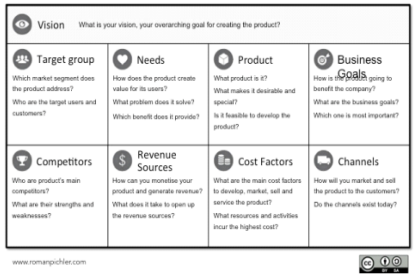
LSM/Agile IPP 'Focus Mechanism 3': 'Project Vision Board Extended'



LSM/Agile IPP: Process Flow

"PROBLEM VALIDATION"

Product Vision Board Extended (PVBE)



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The Next Part of This Tutorial!

"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.

http://www.romanpichler.com/

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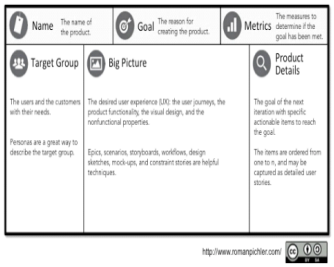
"SOLUTION VALIDATION"

Product Canvas



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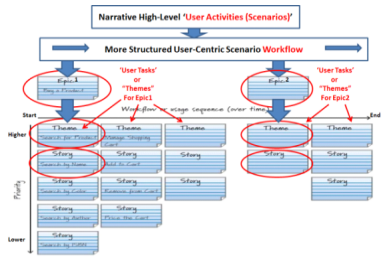
"SOLUTION BUILDING BLOCKS"

User Story Workshop/Story Mapping



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LSM/Agile IPP: "User Validation"

"USER VALIDATION"

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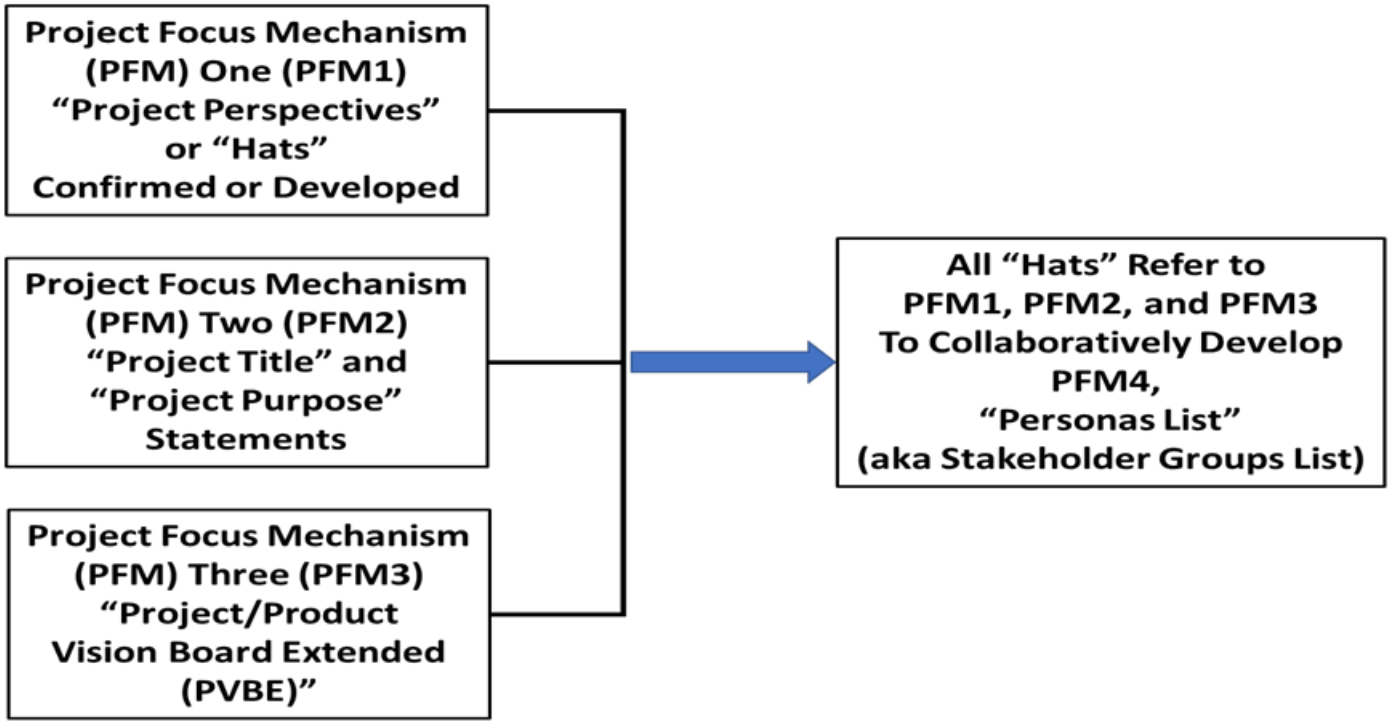
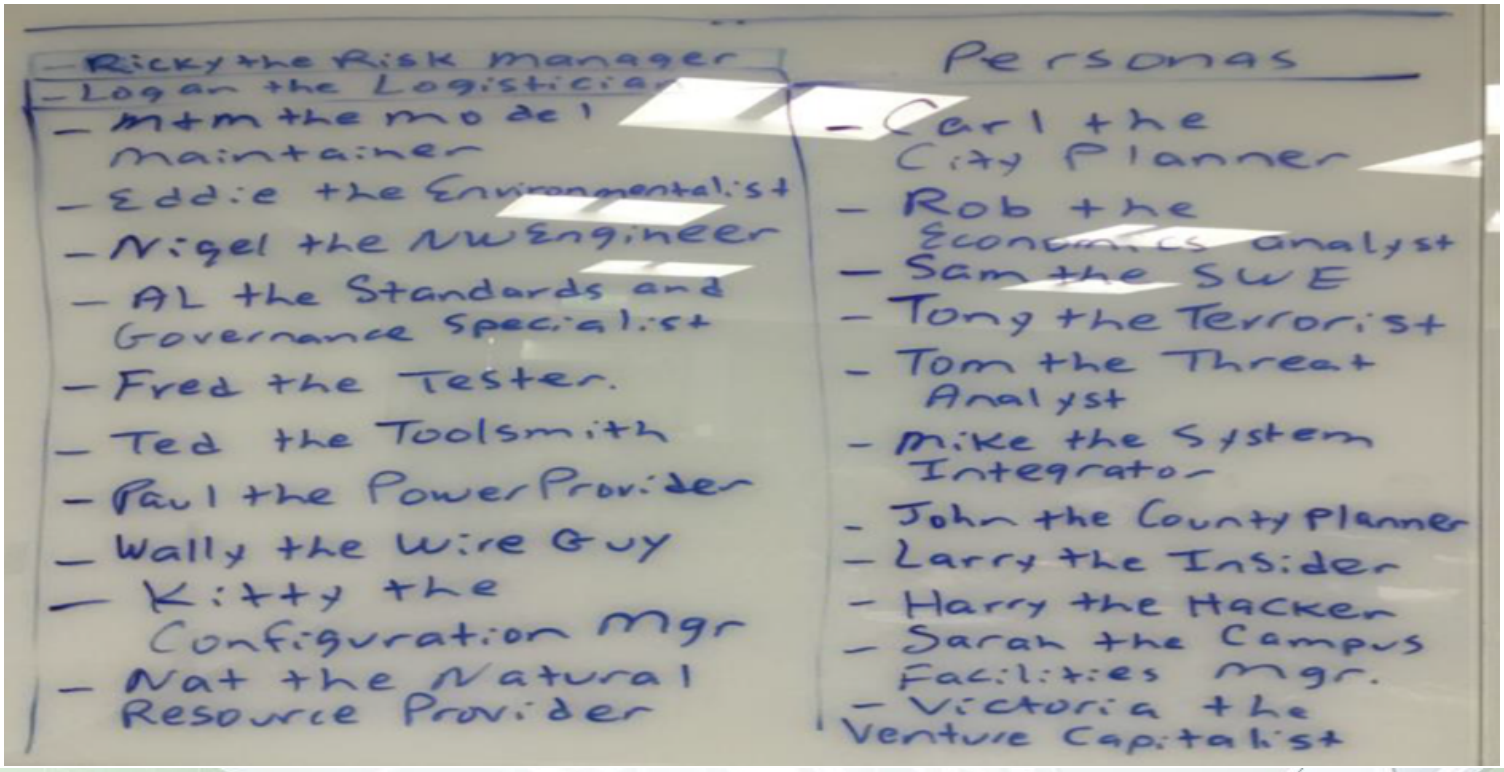
LSM/Agile IPP: "User Validation"

LSM/Agile IPP 'Focus Mechanism 4': 'Personas (Stakeholder Groups) List'



LSM/Agile: "User Validation" (uGrid RM Example)

LSM/Agile IPP 'Focus Mechanism 4': 'Personas List'



LSM/Agile: "User Validation" (uGrid RM Example)

LSM/Agile IPP 'Focus Mechanism 4': 'Personas List'

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

LSM/Agile: "User Validation" (RHRM Example)

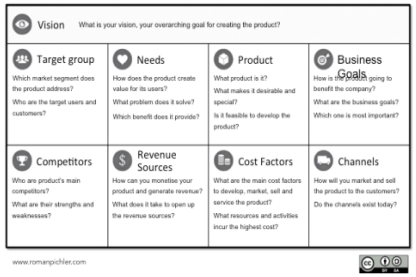
LSM/Agile IPP 'Focus Mechanism 4': 'Personas List'

Ricky the Legal Department Staffer
Logan the Materials Manager
Alan the Hospital Compliance Officer
Marty the Systems Integrator
Harry the Hospital Emergency Manager
Sarah the Facilities Manager
Phil the Hospital Security Officer
Charlie the Hospital COO
Charlene the Hospital CFO
Craig the Hospital CIO
Mandy the Chief Medical Officer
Sally the Hospital HR Lead
Nancy the Chief Nursing Staffer

LSM/Agile IPP: Process

"PROBLEM VALIDATION"

Product Vision Board Extended (PVBE)



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Flow

The Next Part of This Tutorial!

"USER VALIDATION"

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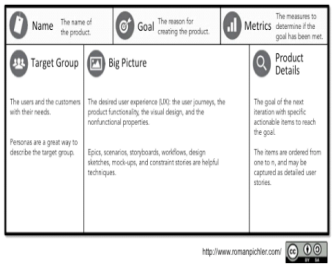
"SOLUTION VALIDATION"

Product Canvas



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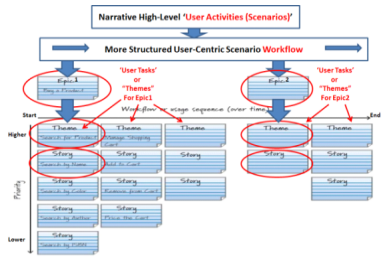
"SOLUTION BUILDING BLOCKS"

User Story Workshop/Story Mapping



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LSM/Agile IPP: "User Validation"

"USER VALIDATION"

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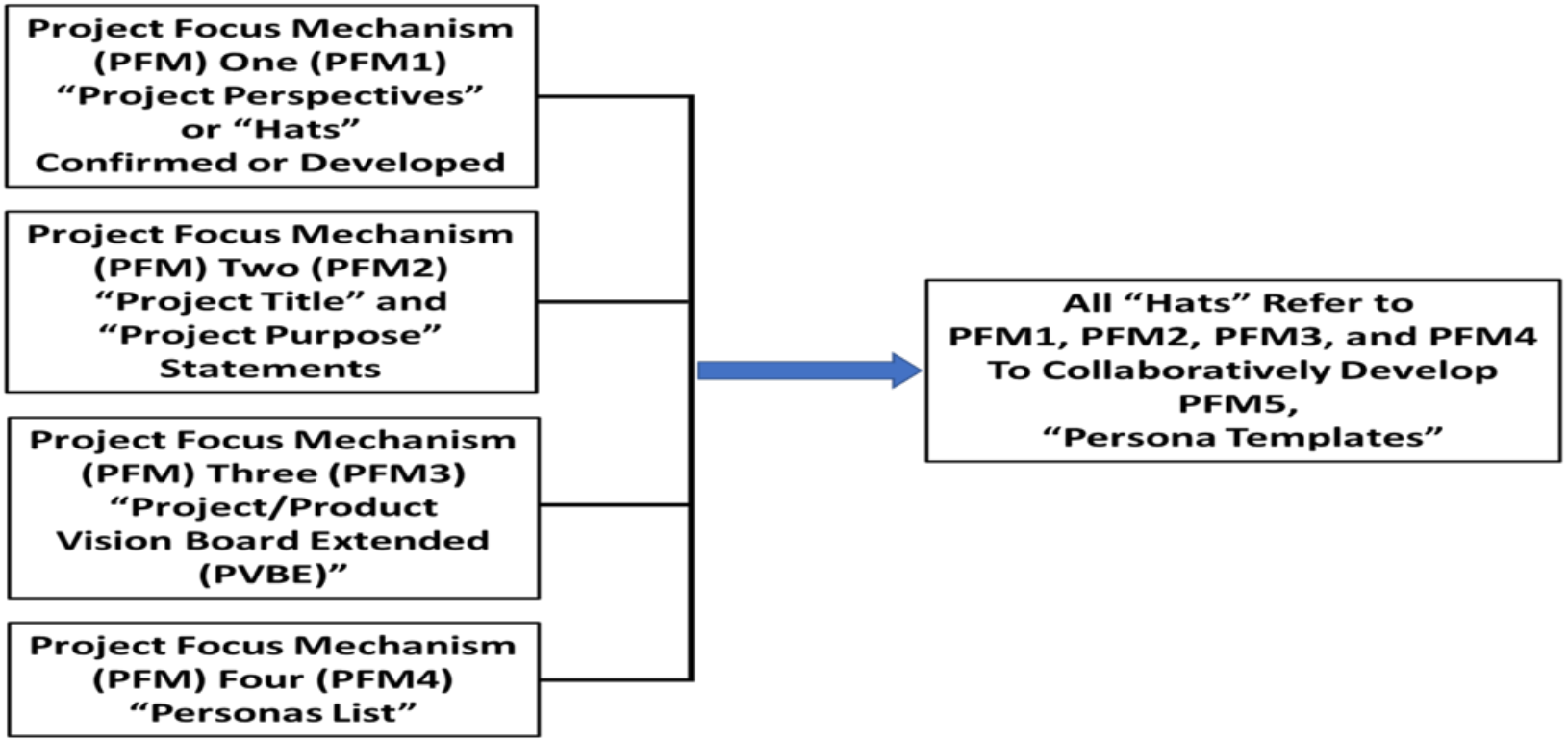
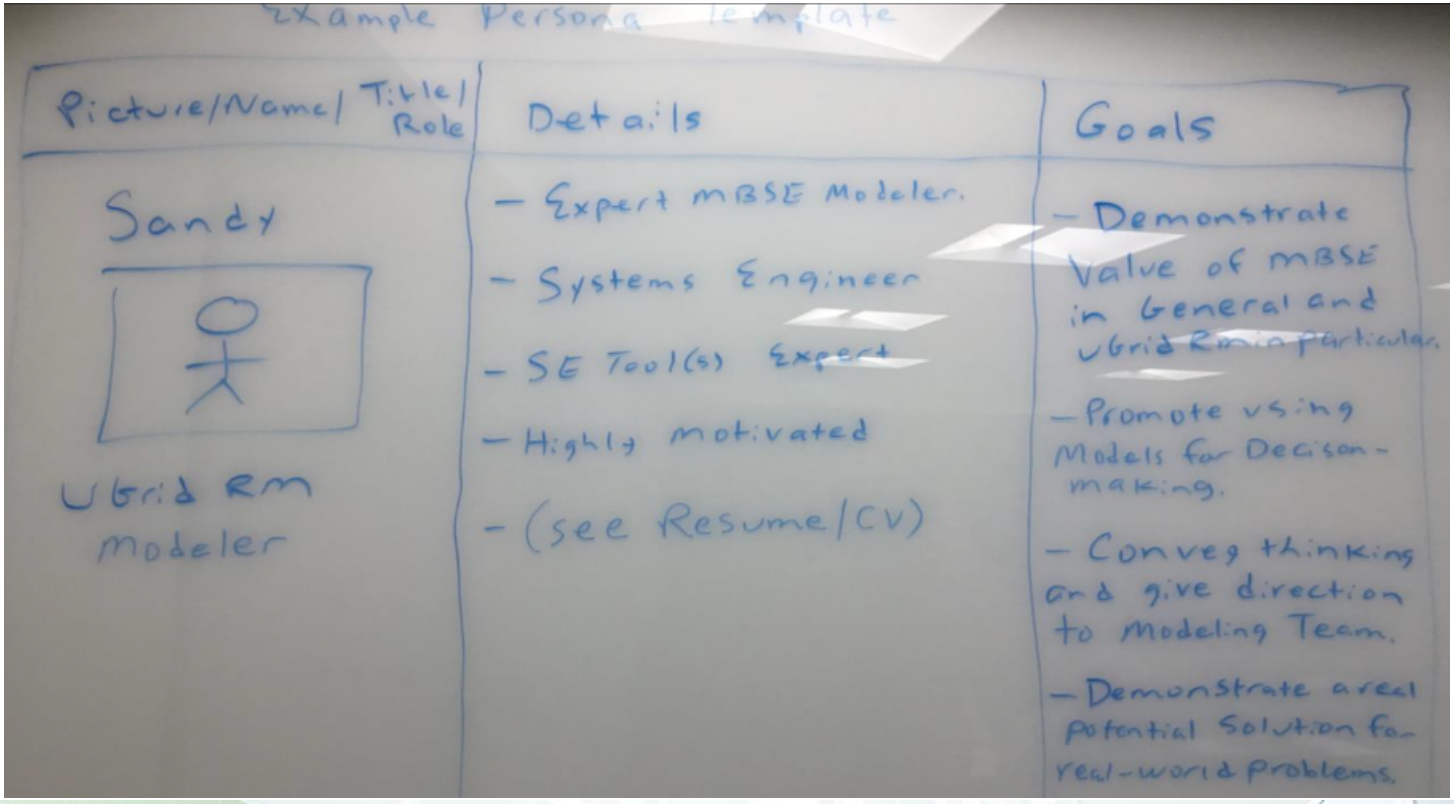
LSM/Agile: "User Validation"

LSM/Agile IPP 'Focus Mechanism 5': 'Example Persona Template'



LSM/Agile: "User Validation" (uGrid RM Example)

LSM/Agile IPP 'Focus Mechanism 5': 'Example Persona Template'



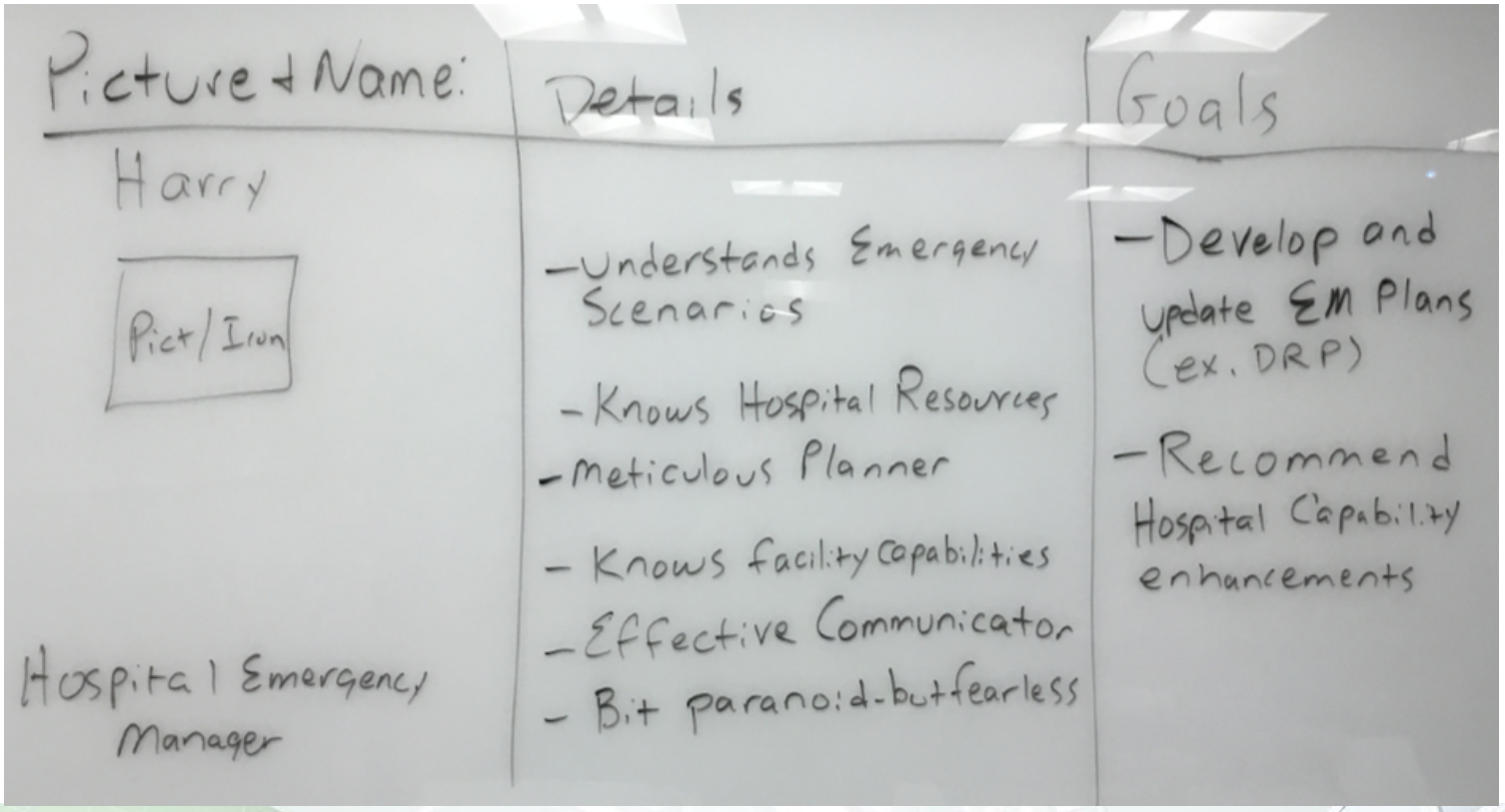
LSM/Agile: "User Validation" (uGrid RM Example)

LSM/Agile IPP 'Focus Mechanism 5': '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.

LSM/Agile: "User Validation" (RHRM Example)

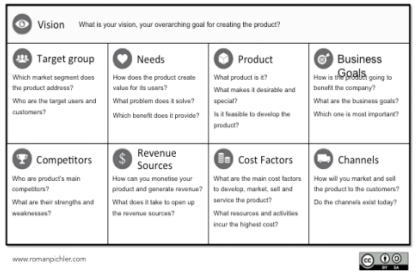
LSM/Agile IPP 'Focus Mechanism 5': 'Example Persona Template'



LSM/Agile IPP: Process Flow

"PROBLEM VALIDATION"

Product Vision Board Extended (PVBE)



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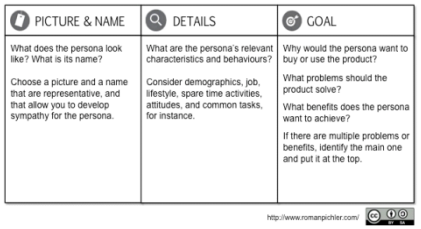
"USER VALIDATION"

Persona Templates



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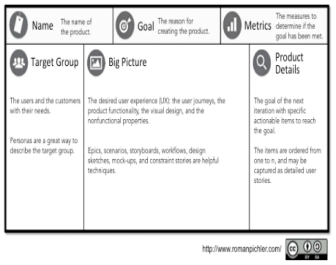
The Next Part of This Tutorial!

"SOLUTION VALIDATION"

Product Canvas



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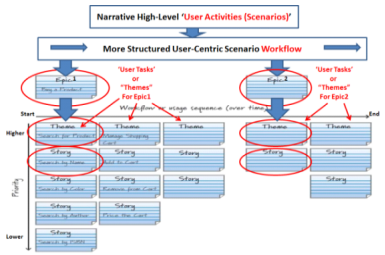
"SOLUTION BUILDING BLOCKS"

User Story Workshop/Story Mapping



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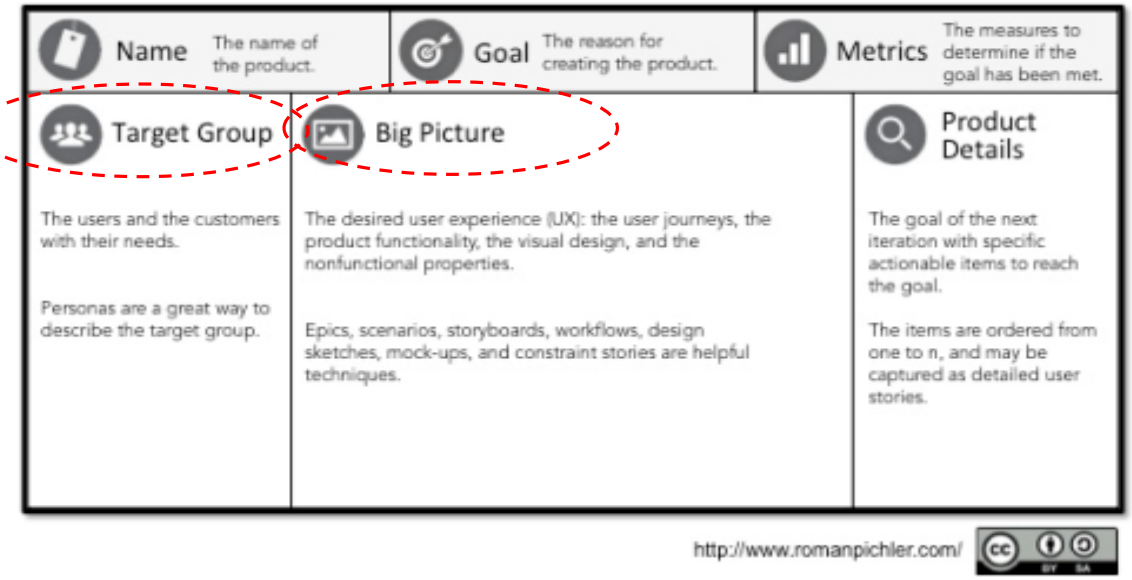
LSM/Agile IPP: "Solution Validation"

"SOLUTION VALIDATION"

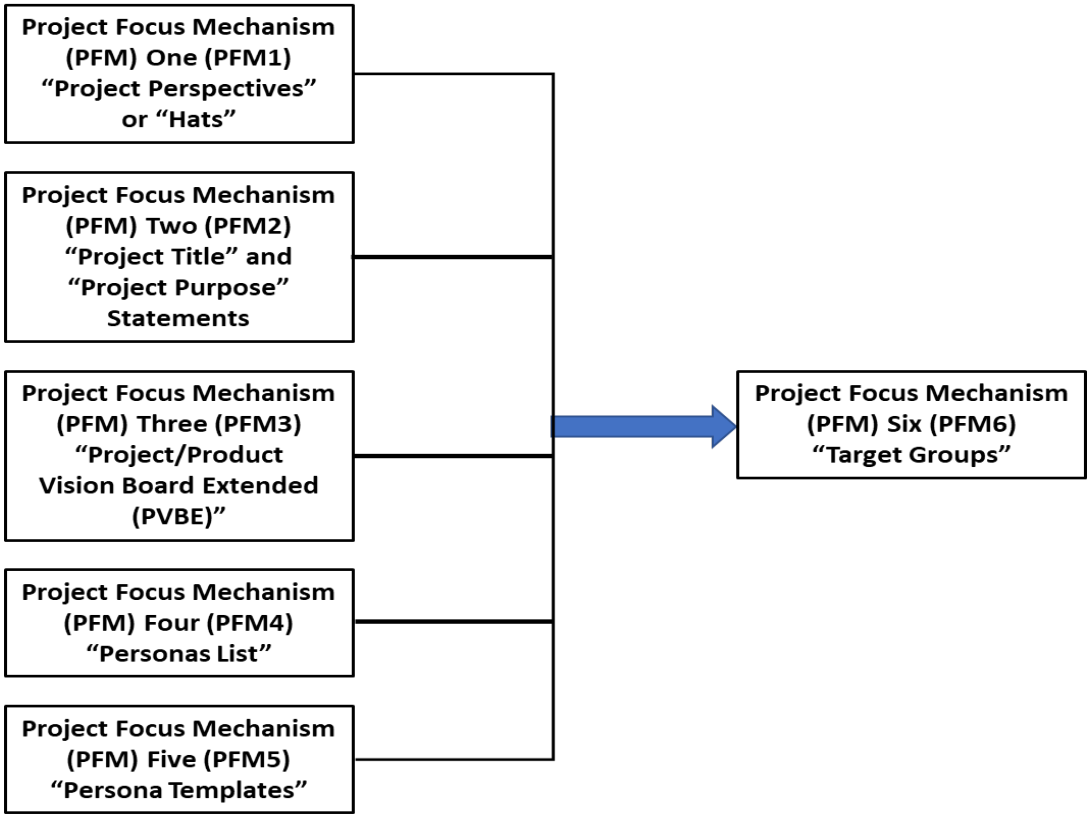
Product Canvas



-- Can be captured and managed as a 'Confluence Space'

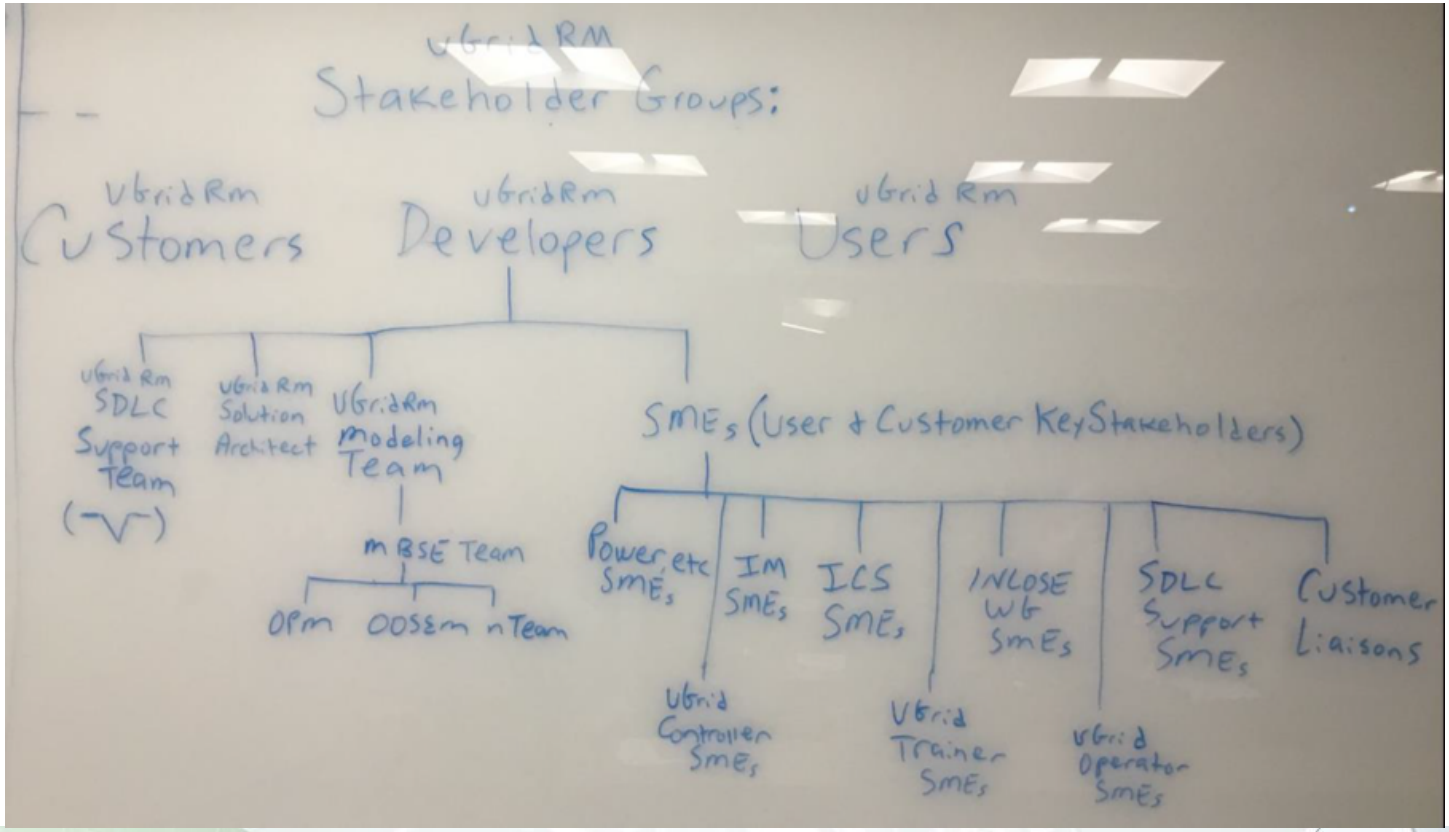
LSM/Agile IPP: "Solution Validation"

LSM/Agile IPP 'Focus Mechanism 6': "Target Group List"



LSM/Agile: "Solution Validation" (uGrid RM Example)

LSM/Agile IPP 'Focus Mechanism 6': 'Target Groups'



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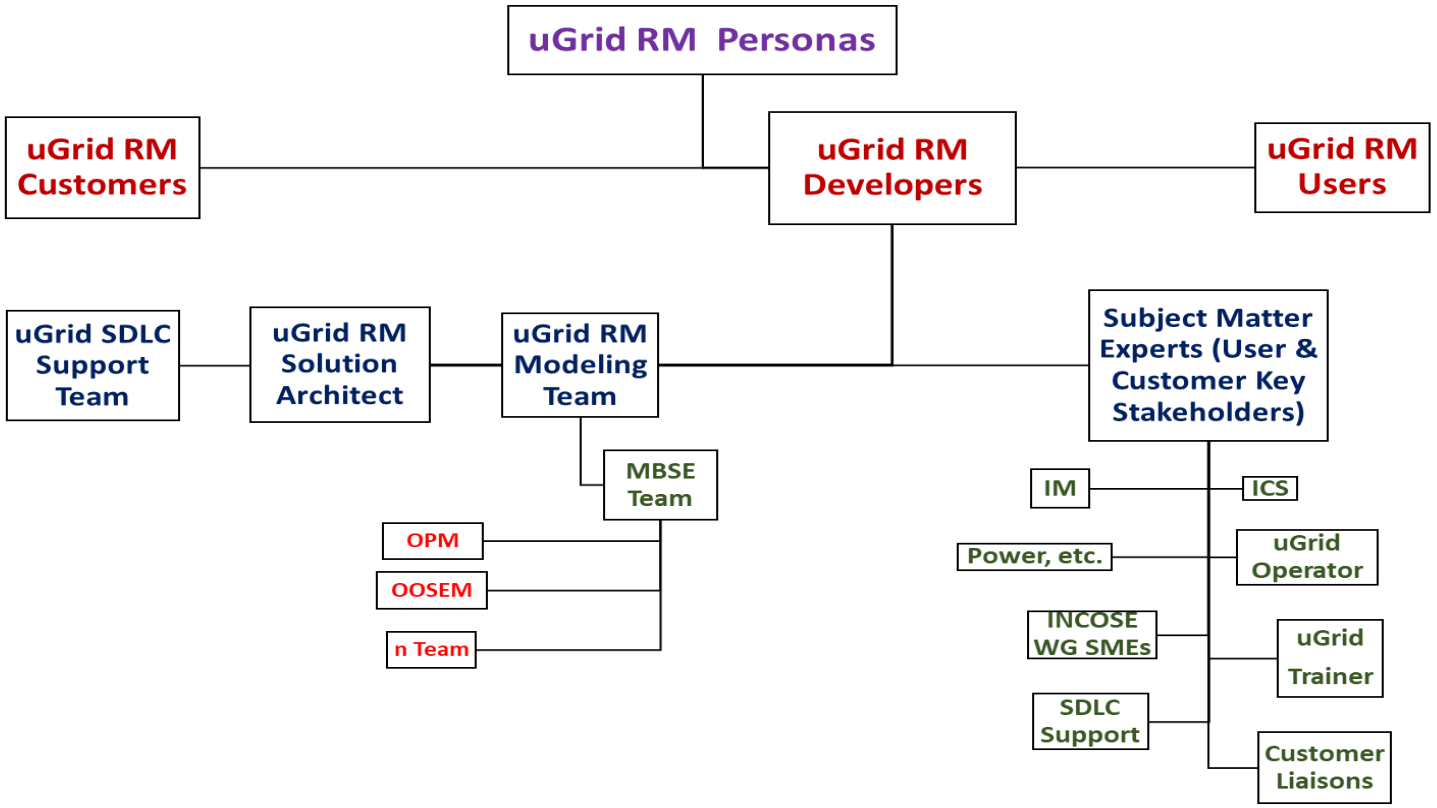


LSM/Agile: "Solution Validation" (RHRM Example)

LSM/Agile IPP 'Focus Mechanism 6': 'Target Groups'

Target Group	Target Group Personas
Helen Hospital Facilitator	- **Sarah** Facilities Manager - **Logan** Materials Manager
Harry Hospital Emergency Manager	- **Harry** Emergency Manager
Howard Hospital Administrator	- **Ricky** Legal Department Staffer - **Alan** Compliance Officer - **Charlene** Chief Financial Officer (CFO) - **Craig** Chief Information Officer - **Sally** Human Resources Lead
Charlie Hospital Chief Operating Officer (COO)	- **Logan** Materials Manager - **Marty** Systems Integrator - **Phil** Security Officer - **Charlie** COO
Mandy Hospital Chief Medical Officer	- **Mandy** Chief Medical Officer - **Nancy** Chief Nursing Staffer
Avery	All RHRM Users

LSM/Agile: "Solution Validation"

Notes concerning **PFM1 'Hats'**, **PFM4/PFM5 Personas**, and **PFM6 Target Groups**:

- **PFM1 'Hats'** are Decision Maker level Initial Project Planners.

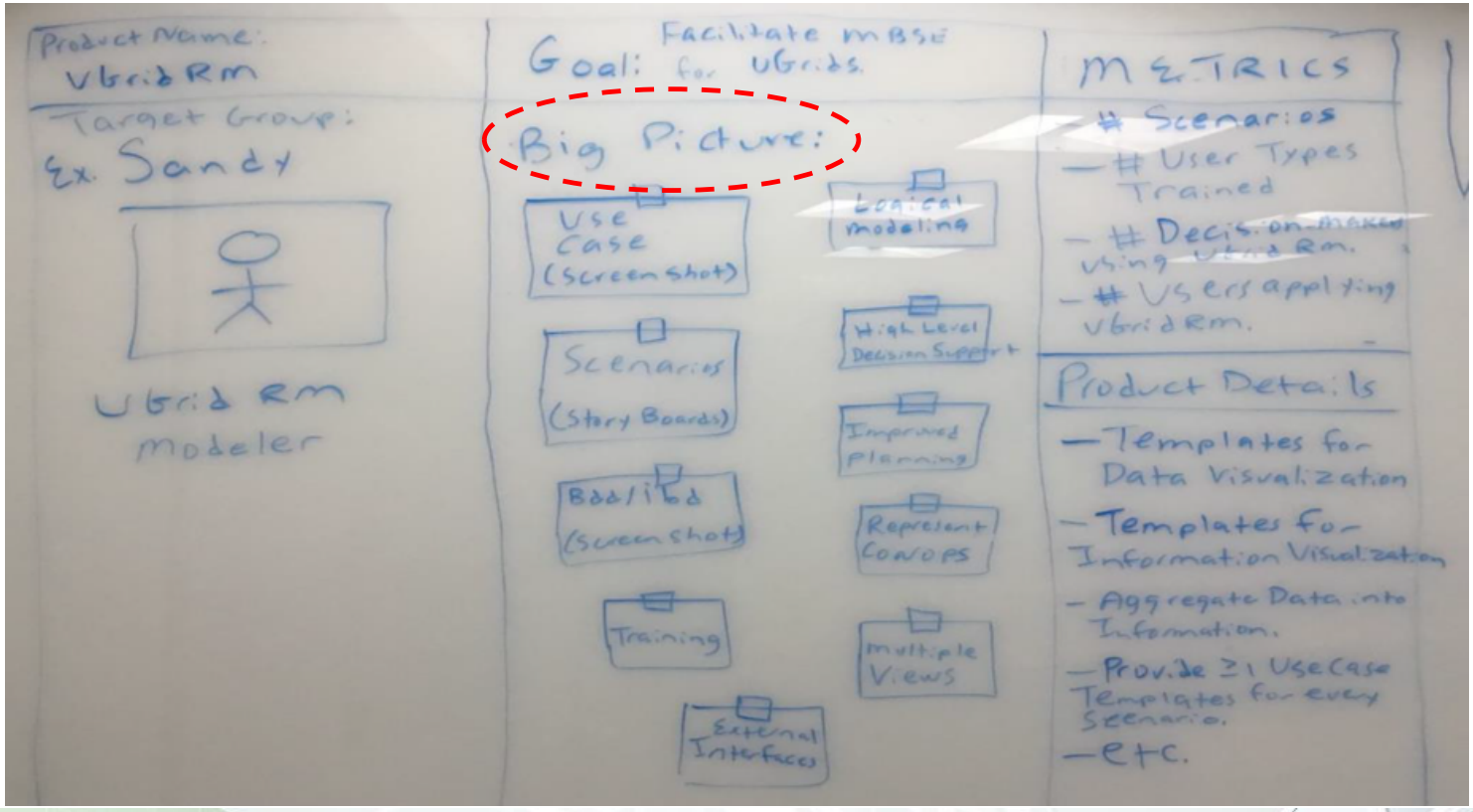
- **PFM4/PFM5 'Personas'** are Project Development Stakeholder Groups.

- **PFM6 'Target Groups'** are 'Grouped' or 'Binned' Common Project Development PFM4/PFM5 Personas (Stakeholder Groups).

** Whereas PFM1 'Hats' are not usually also PFM6 Target Groups, it is possible that some PFM4/PFM5 Personas (Stakeholder Groups) may also be PFM6 Target Groups—if the PFM4/PFM5 Persona is 'unique' (i.e., PFM5 GOALS are not Common enough to any other PFM4/PFM5 Persona, and therefore can't be 'binned' with any other Personas).

LSM/Agile IPP: "Solution Validation" (uGrid RM Example)

LSM/Agile IPP 'Focus Mechanism 6': 'Big Picture'



LSM/Agile IPP: "Solution Validation" (uGrid RM Example)

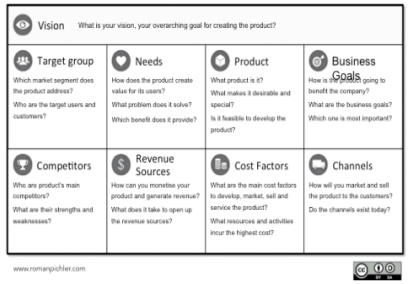
LSM/Agile IPP 'Focus Mechanism 6': 'Big Picture'

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.

LSM/Agile IPP: Process Flow

"PROBLEM VALIDATION"

Product Vision Board Extended (PVBE)



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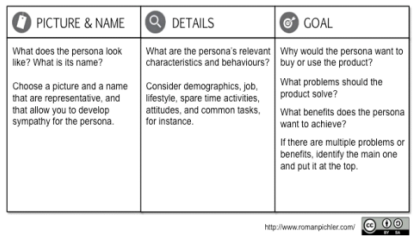
"USER VALIDATION"

Persona Templates



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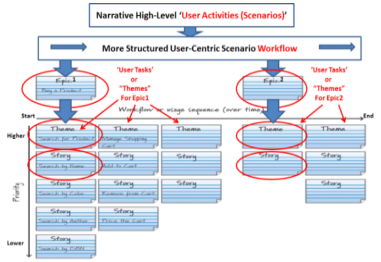
The Next Part of This Tutorial!

"SOLUTION BUILDING BLOCKS"

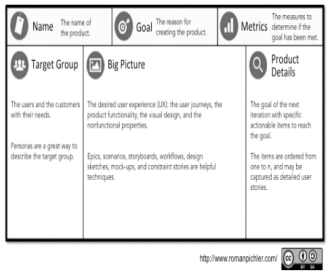
User Story Workshop/Story Mapping



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

"SOLUTION VALIDATION"

Product Canvas



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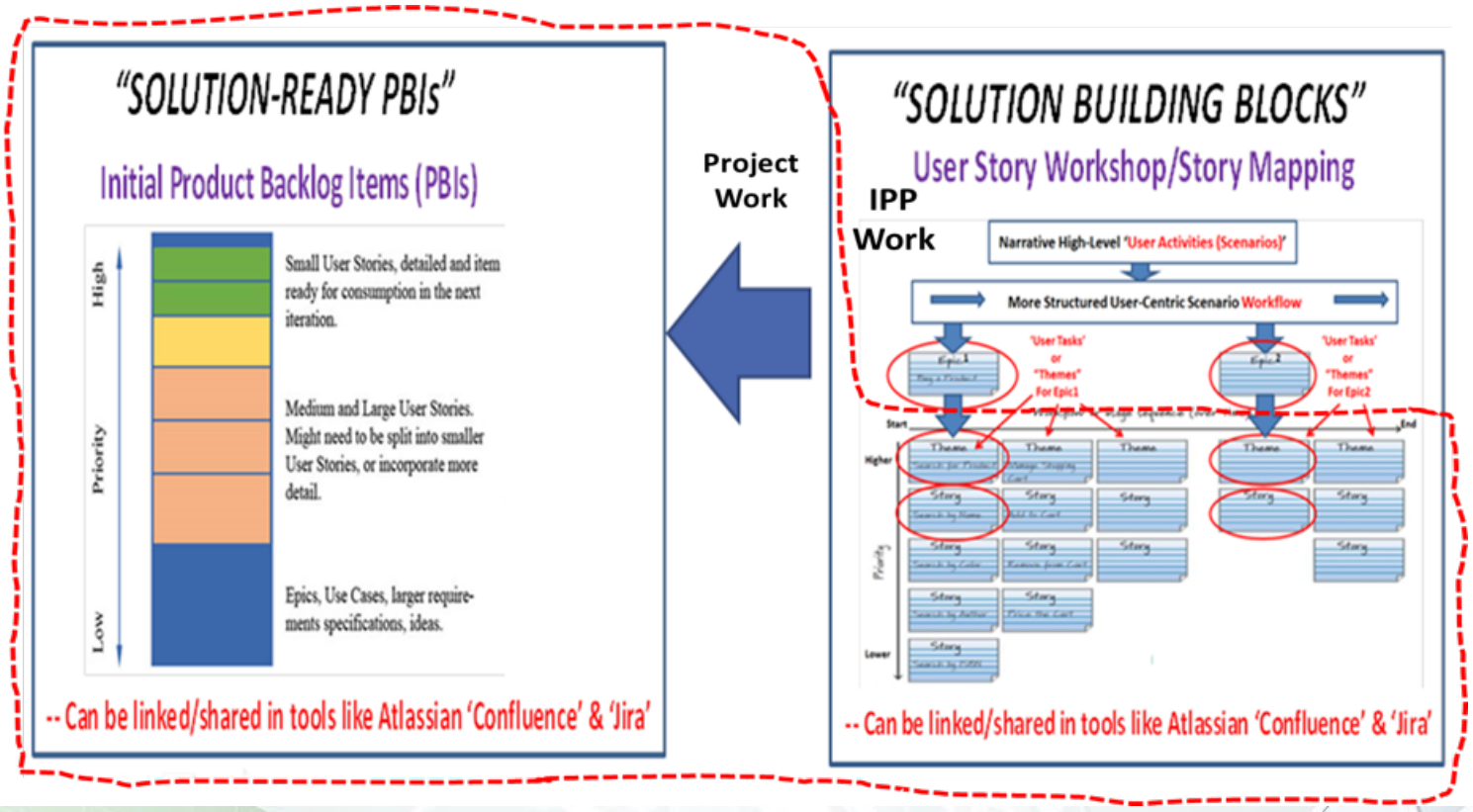
LSM/Agile IPP: Solution Building Blocks

LSM/Agile IPP 'Focus Mechanism 7': 'Preliminary Capabilities List'

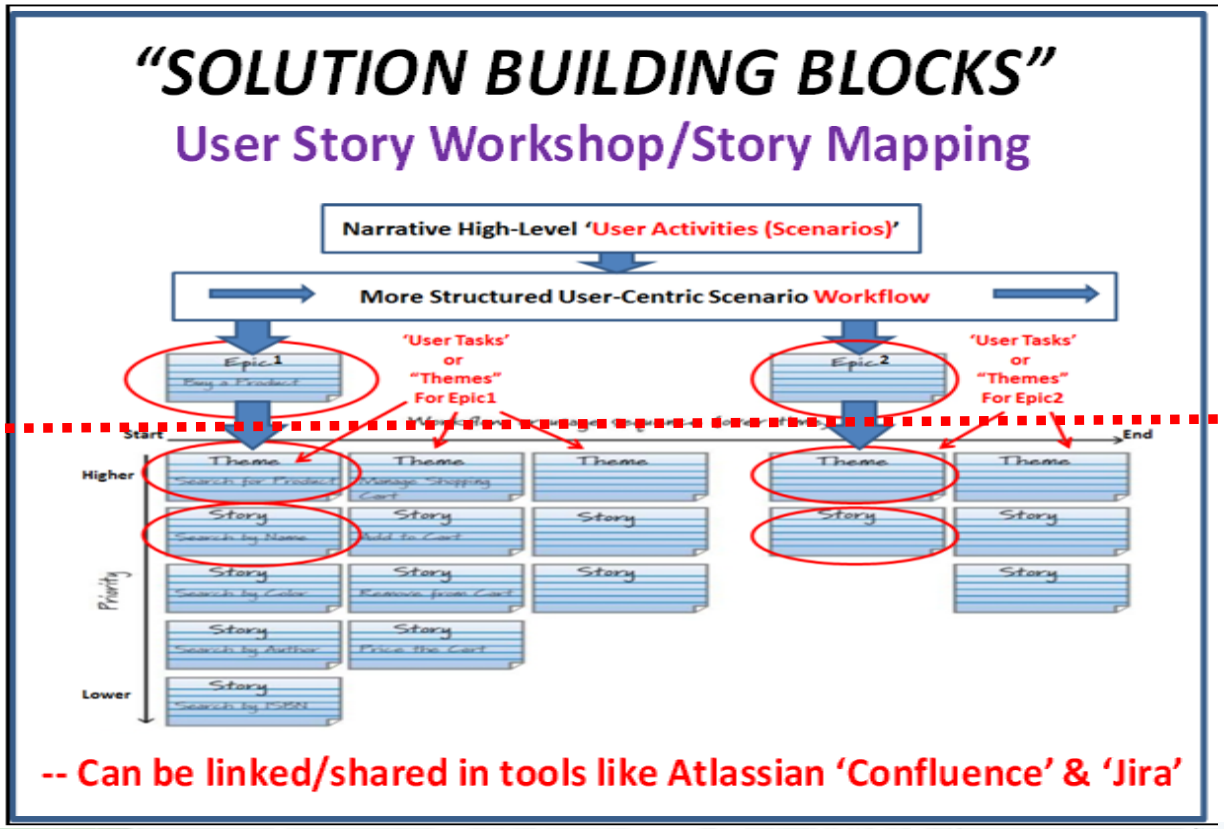


LSM/Agile IPP: Solution Building Blocks

LSM/Agile IPP 'Focus Mechanism 7': 'Preliminary Capabilities List'

IPP Work

Project Work



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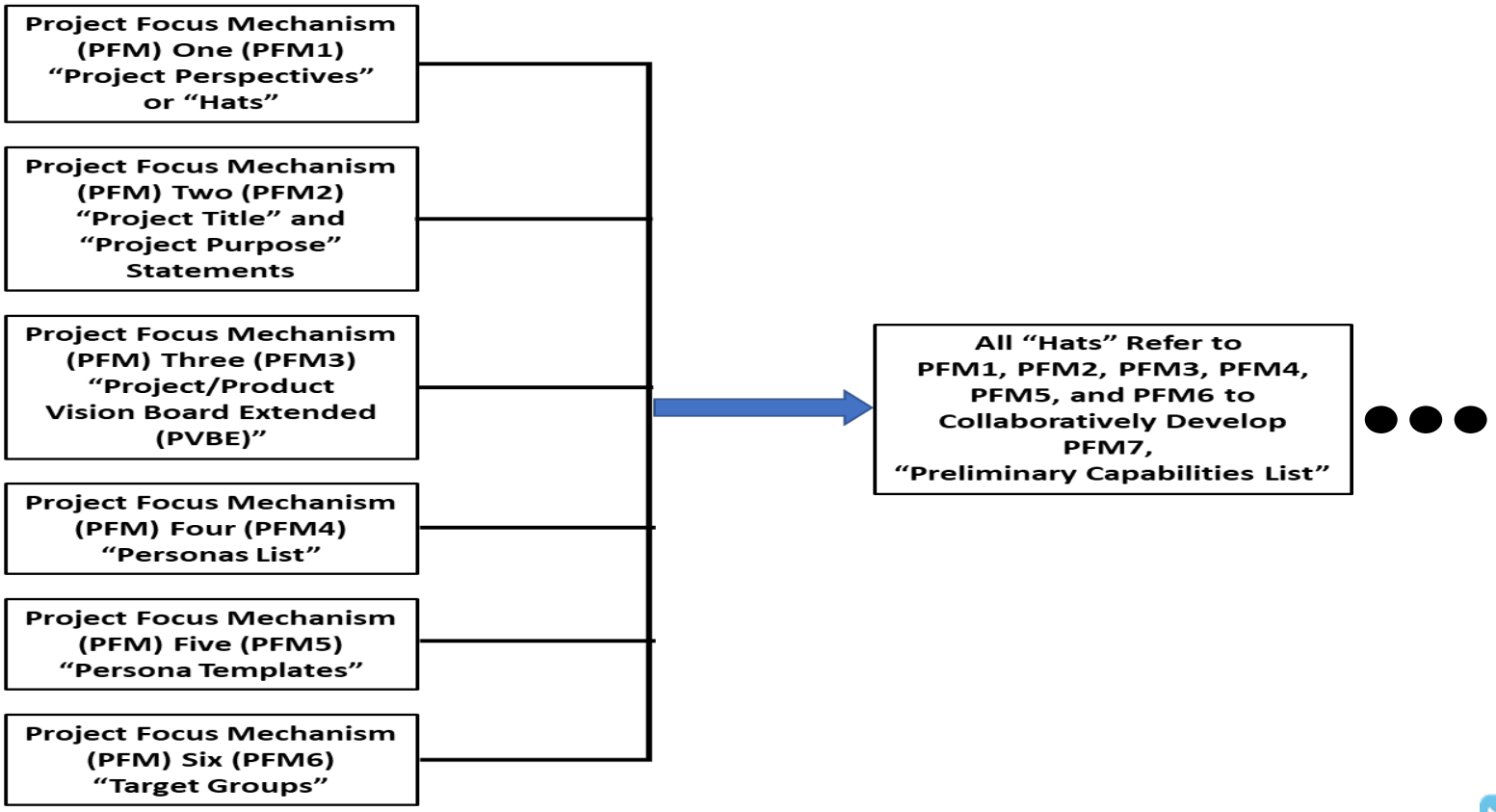

LSM/Agile IPP: Solution Building Blocks

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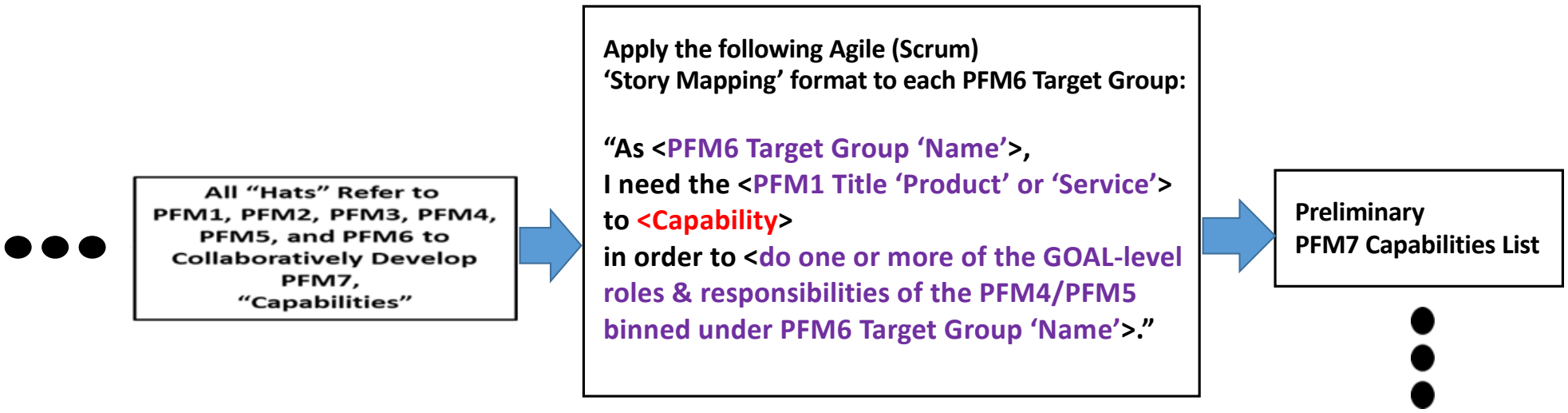
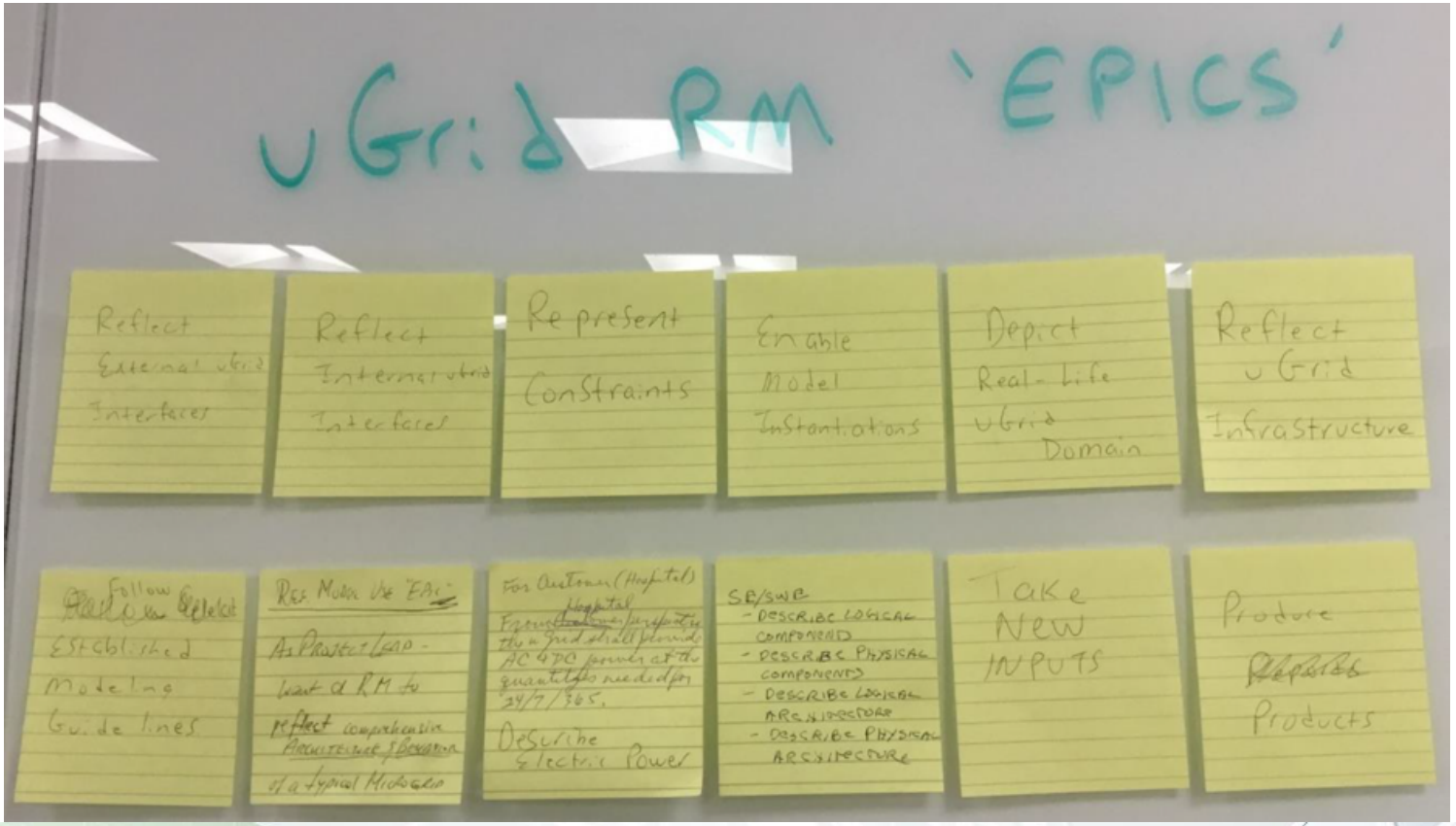


LSM/Agile IPP: Solution Building Blocks (uGrid RM Example)

LSM/Agile IPP 'Focus Mechanism 7': 'Preliminary Capabilities List'



LSM/Agile IPP: Solution Building Blocks (uGrid RM Example)

LSM/Agile IPP 'Focus Mechanism 7': 'Preliminary Capabilities List'

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

LSM/Agile IPP: Solution Building Blocks (RHRM Example)

LSM/Agile IPP 'Focus Mechanism 7': 'Preliminary Capabilities List'

Reflect External Interfaces
Reflect Internal Interfaces
Represent Constraints
Enable Model Instantiations
Depict Real-Life Resilient Hospital Domains
Reflect Resilient Hospital
Follow Established Modeling Guidelines
Reflect Comprehensive Architecture and Behavior of a Typical Resilient Hospital
Describe Critical Operations
Describe Relevant Logical Architecture
Describe Relevant Physical Architecture
Describe Relevant Logical Components
Describe Relevant Physical Components
Accept New Inputs
Produce Information Products
Present Selected Alternatives
Model Water Supply and Consumption
Model Biohazard Disposal
Model Waste Water Processing
Model Laundry

Model Solid Waste Disposal
Reflect Essential Services
Estimate Capabilities and Capacities in Resource-Constrained Environments
Save Alternatives
Reflect Critical Infrastructure
Estimate Resource Needs
Depict Range of Scenarios
Provide Response Checklists
Provide Help Plan Resources
Support Continuity of Operations
Support Human Resources
Account for Personnel Availability Over Time
Track Employee Skills
Track Employee Specialized Training
Track External Candidates
Track Locations
Perform Administrative Functions of an Organization
Ensure Minimal Staffing

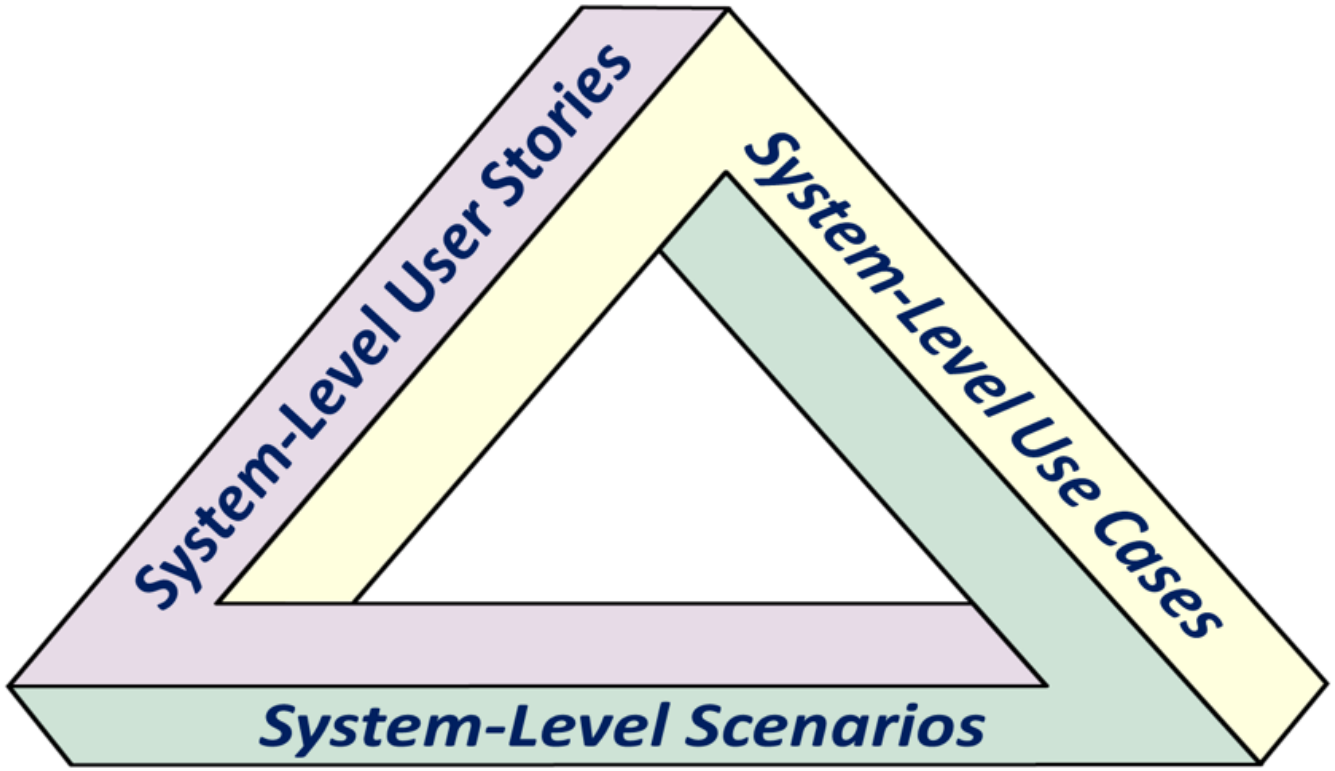
Family Support
Describe Methods for Family Care On Site or At Home
Show Situational Awareness
Show Resource Status
Show Essential Functions
Choose Essential Services for Resilience Scenario
Realism for Operations
Address a Range of Threats
Safety Recognition of Threats as Features and Benefits
Express and Rate Physical Vulnerabilities
Trigger Cessation of All Care (i.e., Close Hospital)
Inform About Situational Awareness and Operational Period Goals
Define and Train for First and Second Order Communications
Enable Capacity Planning
Address and Forecast all Hospital Input and Output
Support Logistics and Supply Management
Manage Equipment and Medical Care Supplies
Model Effects of Supply Support
Climate Control
Functional Operating Rooms
Laboratory Support

Imaging Support
Adequate Pharmaceuticals
Model Patient Status
Model Patient Intake and Release
Model Morgue Process
Direct Patient Care Tracking
Triage Patients and Determine Alternative Care
Enable and Enhance Nursing Staff Function Coordination
Depict Secure Facility Architecture
Express Security Procedures
Express Security Interfaces
Express and Prioritize Physical Security Requirements
Address Various Financial Scenarios
Address Assumptions About Financial System Availability
Address the Supply Chain Availability and Depletion
Cost Estimation of Alternatives
Estimate Burn Rate
Estimate Time to Depletion
Model Essential Data
Model Information Equipment
Model Information Data
Model Actions
Model Information on People
Execute High-Fidelity Modeling Scenarios
Archipelago Simulation
Island Mode Simulation

LSM/Agile IPP Meetup: Ballpark Time Estimates

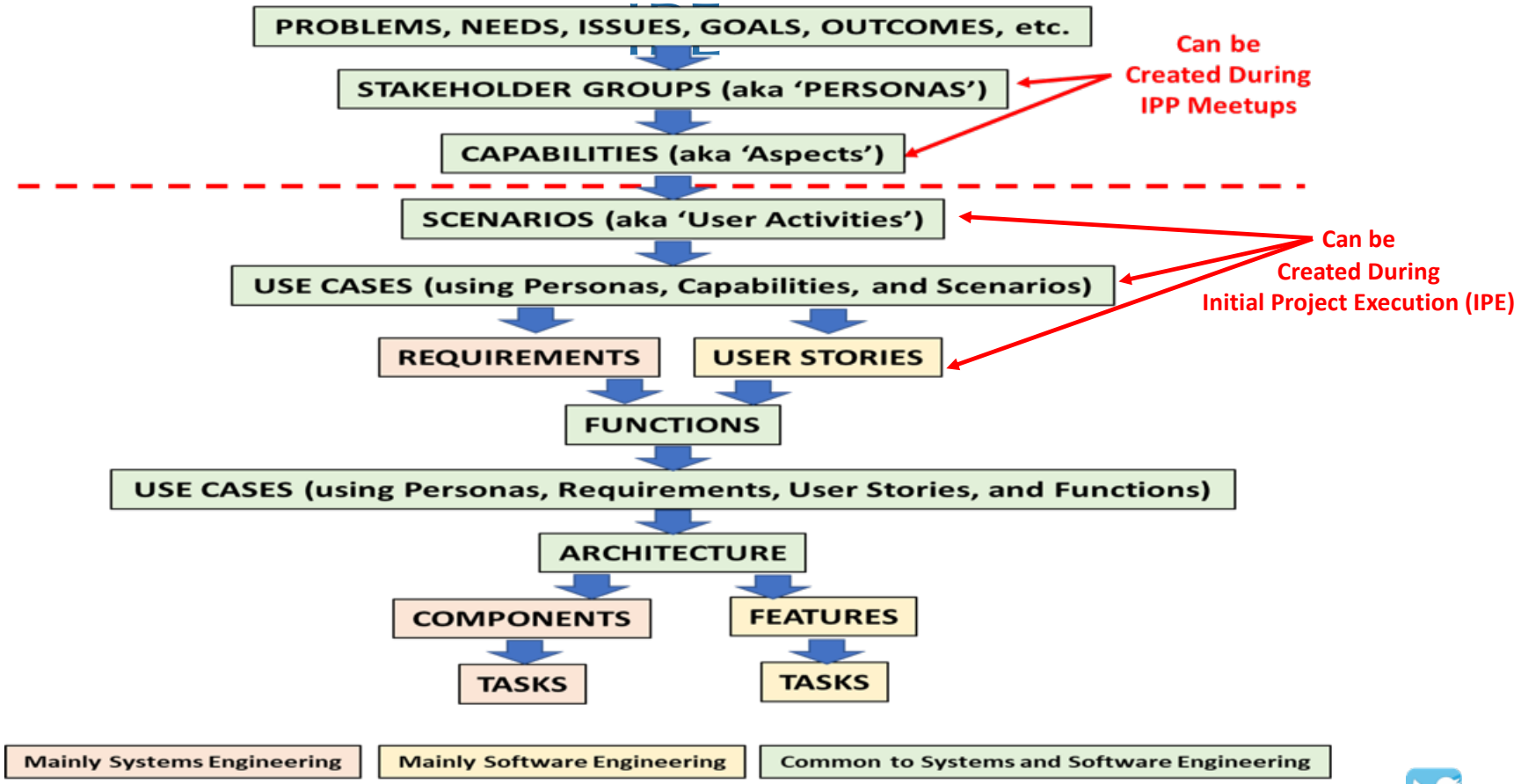
Ballpark Time Estimate (Minutes)	IPP Meetup Process Step	Notes
60-90	Verify/Modify/Assign **PFM1** 'Hats'	Shorter time if PFM1 'Hats' assigned ahead of the IPP Meetup.
60-90	Develop **PFM2** Project 'Title' and 'Purpose' Statements	
120-180	Develop **PFM3** Project Vision Board Extended (PVBE)	
60-90	Develop **PFM4** Personas List	
60-90	Develop **PFM5** Persona Template Example(s)	Final Set of PFM5 Persona Templates completed during IPE.
60-90	Develop **PFM6** Target Groups List	
120-180	Develop Preliminary **PFM7** System Capabilities List	Final PFM7 System Capabilities List completed during IPE.

LSM/Agile IPP to Initial Project Execution



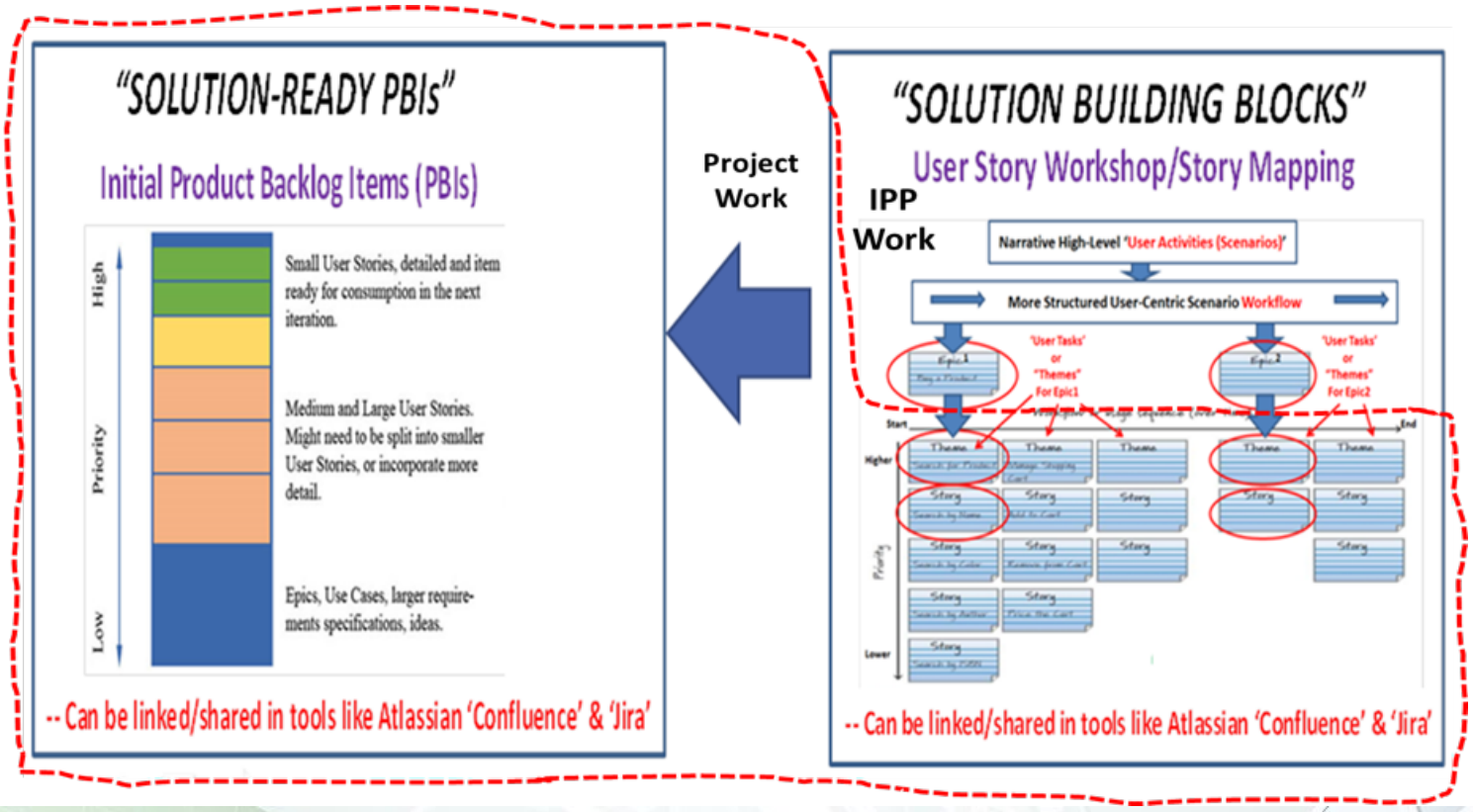
"Taming the Impossible Triangle"

LSM/Agile IPP Hand-Off to



LSM/Agile IPP: Hand-Off to Agile (Scrum) IPE

LSM/Agile IPP – Leveraged into Initial Project Execution (IPE)

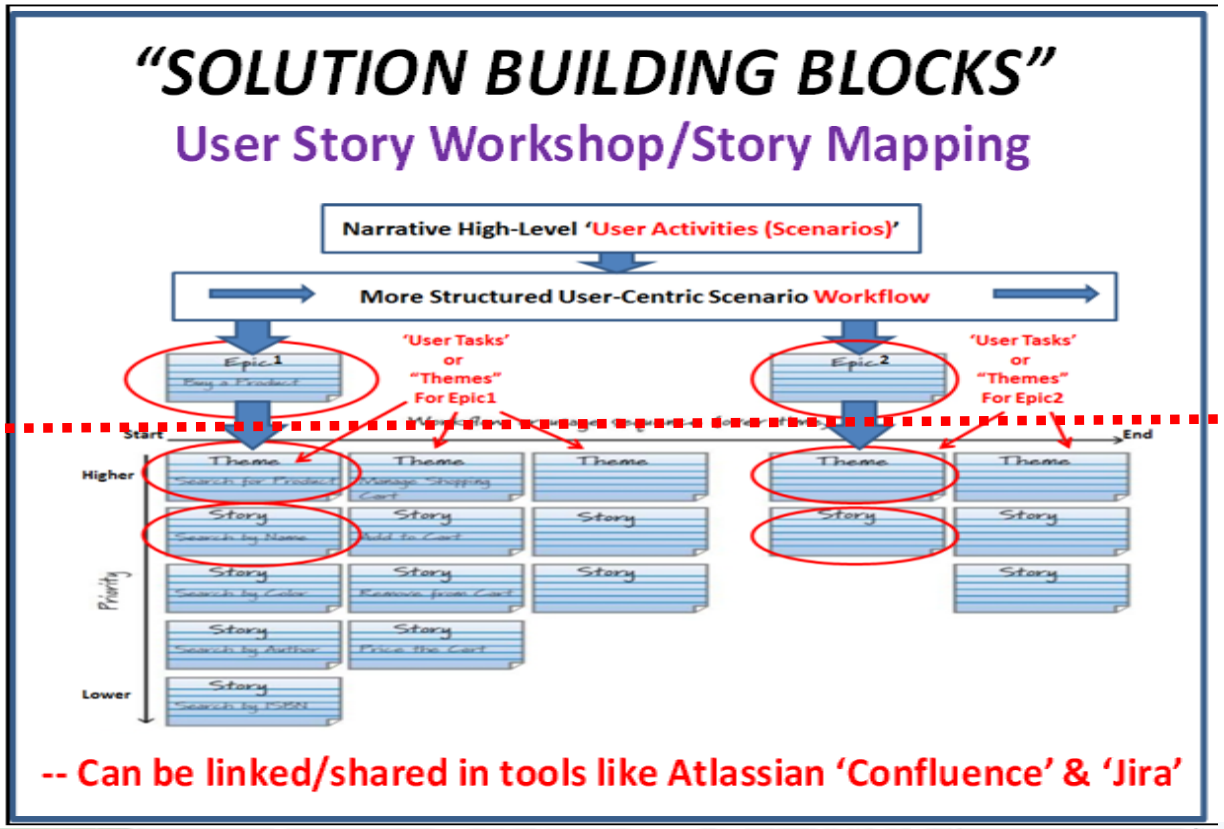


LSM/Agile IPP: Hand-Off to Agile (Scrum) IPE

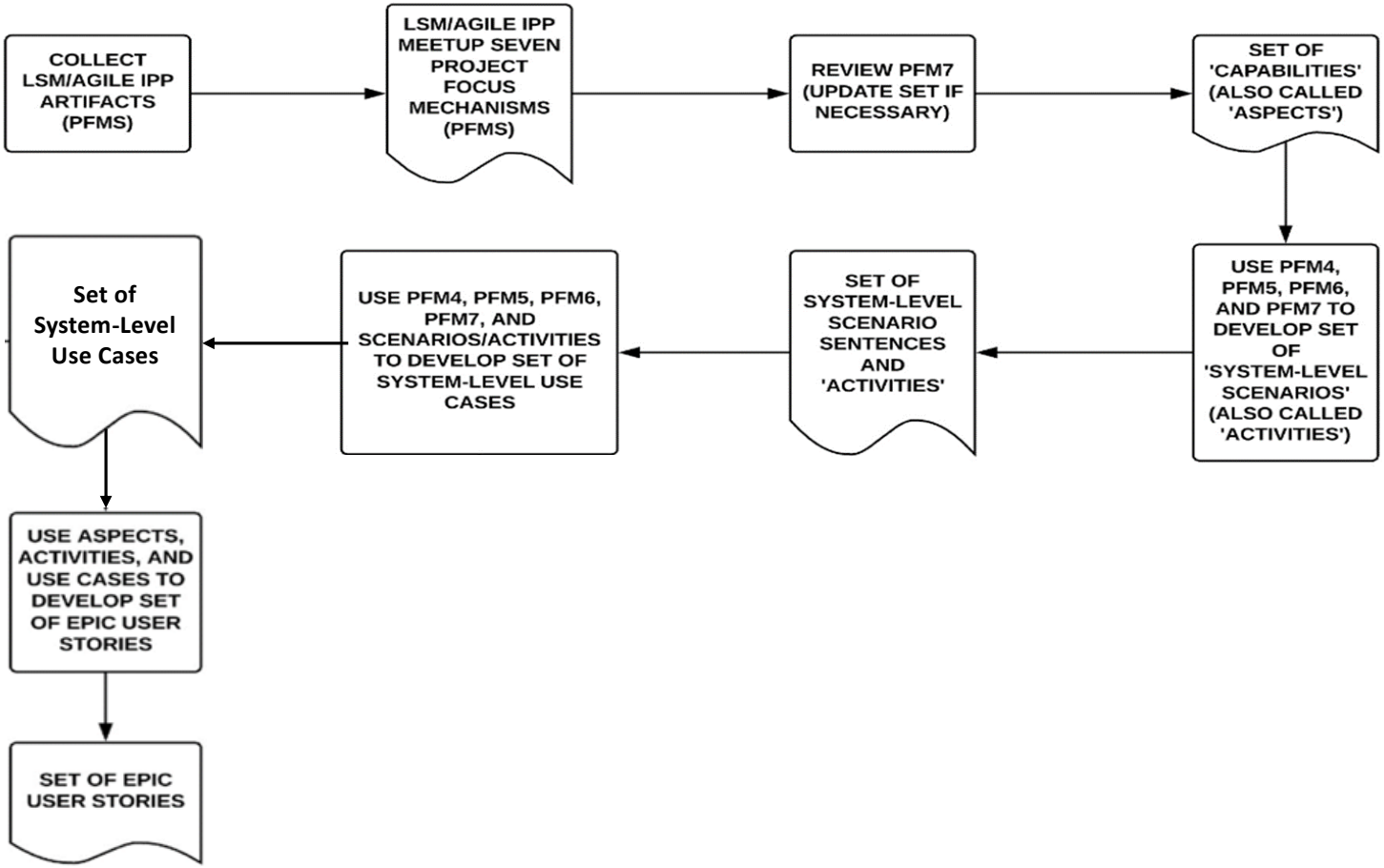
LSM/Agile IPP – Leveraged into Initial Project Execution (IPE)

IPP Work

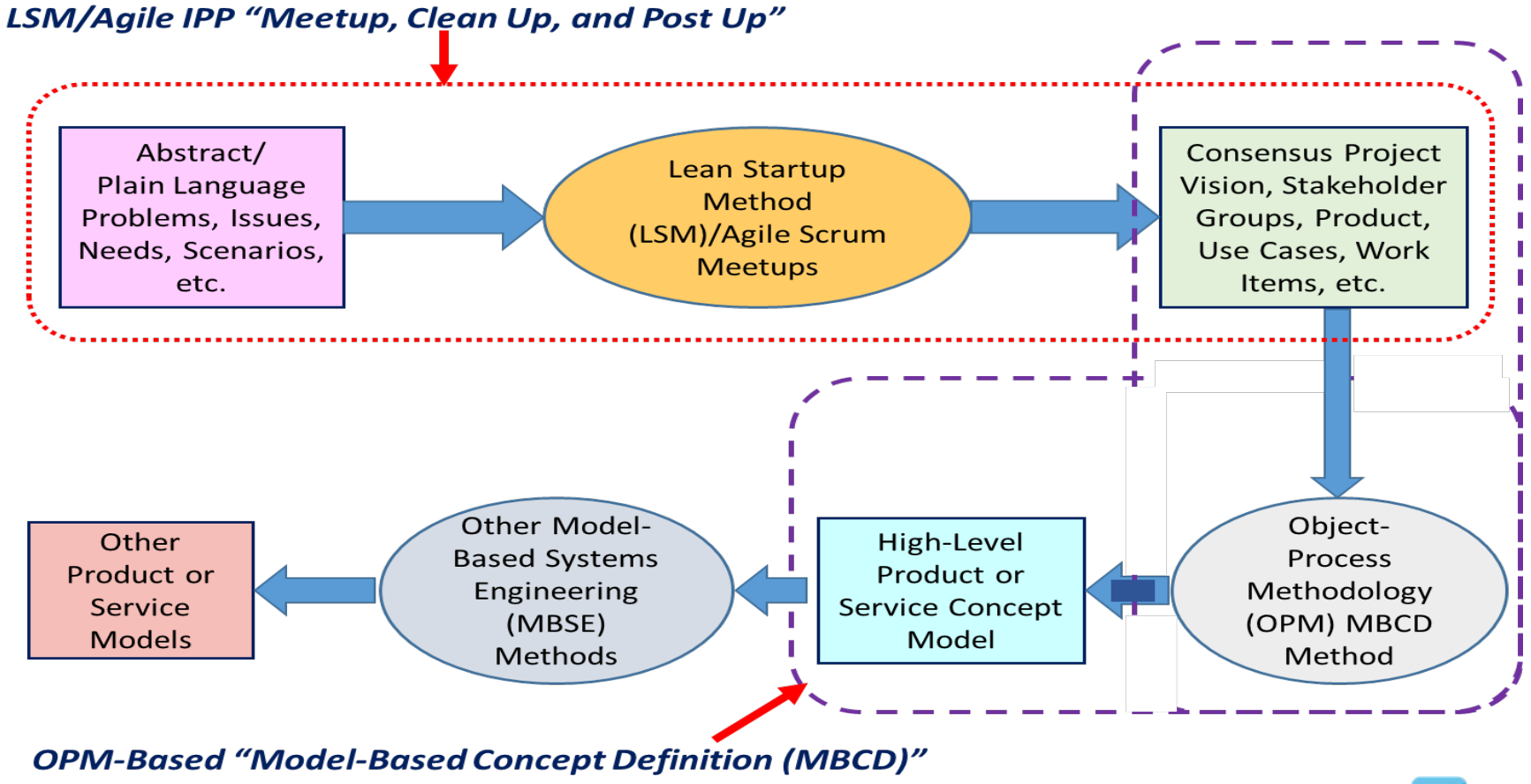
Project Work



LSM/Agile IPP Hand-Off to RHRM MBSE



LSM/Agile IPP to MBCD In MBSE



References

- **Lean Startup Method (LSM):**
  - **WWW:** http://theleanstartup.com/
  - **Book:** *The Lean Startup*; **Eric Ries**; 2011; ISBN: 978-0-670-92160-7; http://tinyurl.com/y7nvq66c
  - **Blog: Steve Blank**; https://steveblank.com/

- **Agile Project Management:**
  - **WWW:** https://www.romanpichler.com/blog/product-roadmap-product-backlog/
  - **Book:** *Agile Product Management with Scrum;* **Roman Pichler**; 2011; ISBN-13: 978-0321605788; https://tinyurl.com/y856stnk

- **Agile Systems Engineering:**
  - **WWW:** SEI CMU - https://tinyurl.com/yb56mb4g
  - **Book:** *Agile Systems Engineering;* **Bruce Powel Douglass, Ph.D.;** 2016; ISBN: 978-0-12-802120-0; https://tinyurl.com/yc7nk2f4
  - **Group, S.** (2009); "Standish Newsroom – CHAOS 2009"; https://tinyurl.com/y8zzleyr

- **Agile (Scrum) Software Engineering:**
  - **WWW:** https://www.scrumalliance.org/learn-about-scrum
  - **Book:** *SCRUM: The Art of Doing Twice the Work in Half the Time*; **Jeff Sutherland & J.J. Sutherland**; https://tinyurl.com/ycp6zs3f

INCOSE Healthcare Working Group
5th Annual Systems Engineering in Healthcare Conference
May 1-2, 2019
Minneapolis, MN

LSM/Agile IPP Tutorial: QR Codes

Mike Pafford Contact Info

Tutorial Info In Dropbox

Steve Blank URL

LSM Use URLs

Eric Ries LSM Book

Microgrid Reference Model POC

Roman Pichler Agile Project Management

Atlassian Tool "Confluence"

Gartner Agile Planning

Resilient Hospital Reference Model POC

Agile Scrum Guide URL

LSM/Agile Refs

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THANK YOU!!

Final Questions and Eval Forms

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Thank you for attending!
Share your experiences on Twitter at #HWGSEC