



# WPI

## **Moving policies from documents to models a VA case study**

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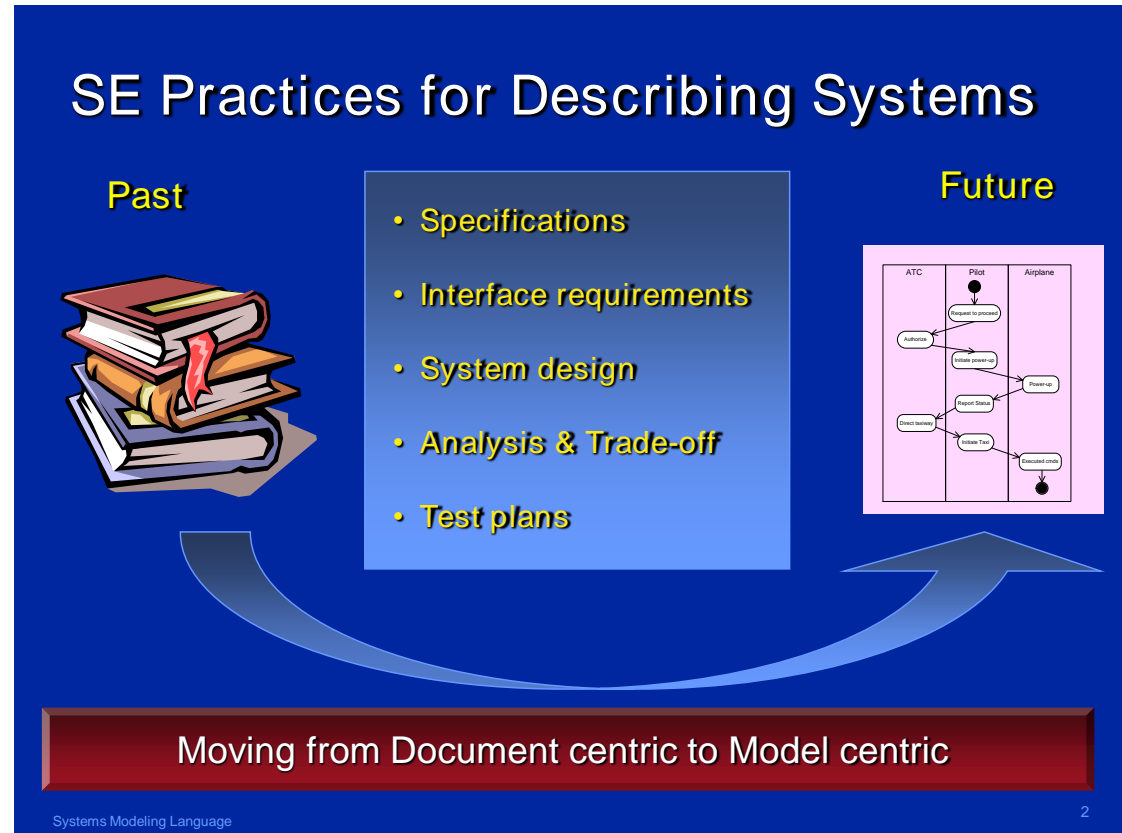
# Agenda

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- Why Model
- Why Model Policy
- Why Systems Engineer should care?
- Proposed Methodology
- Case Study
- Future Research
- Other Activities

# Why Model Systems

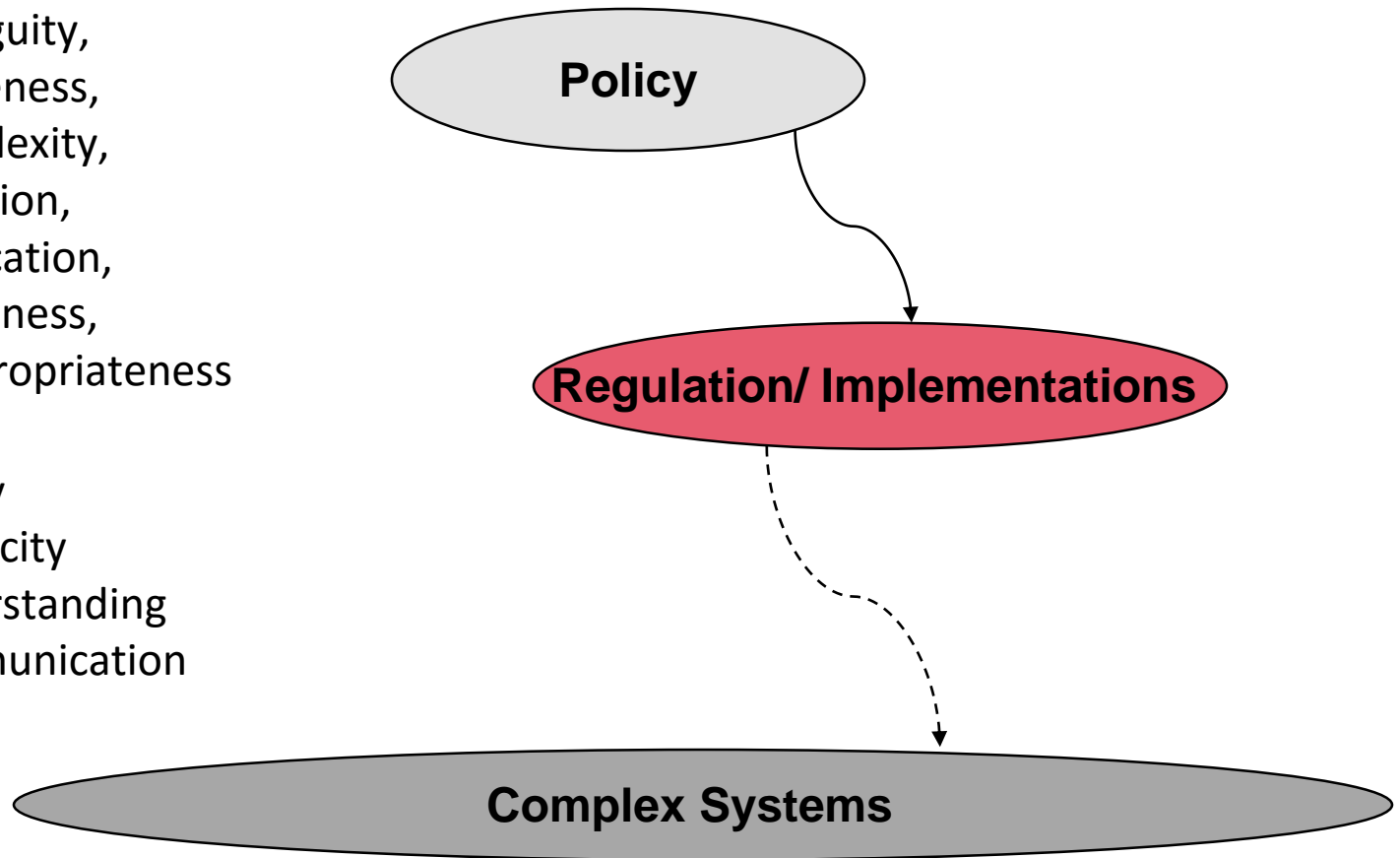
- Reduce
  - Ambiguity,
  - Vagueness,
  - Complexity,
  - Omission,
  - Duplication,
  - Wordiness,
  - Inappropriateness
- Increase
  - Clarity
  - Simplicity
  - Understanding
  - Communication



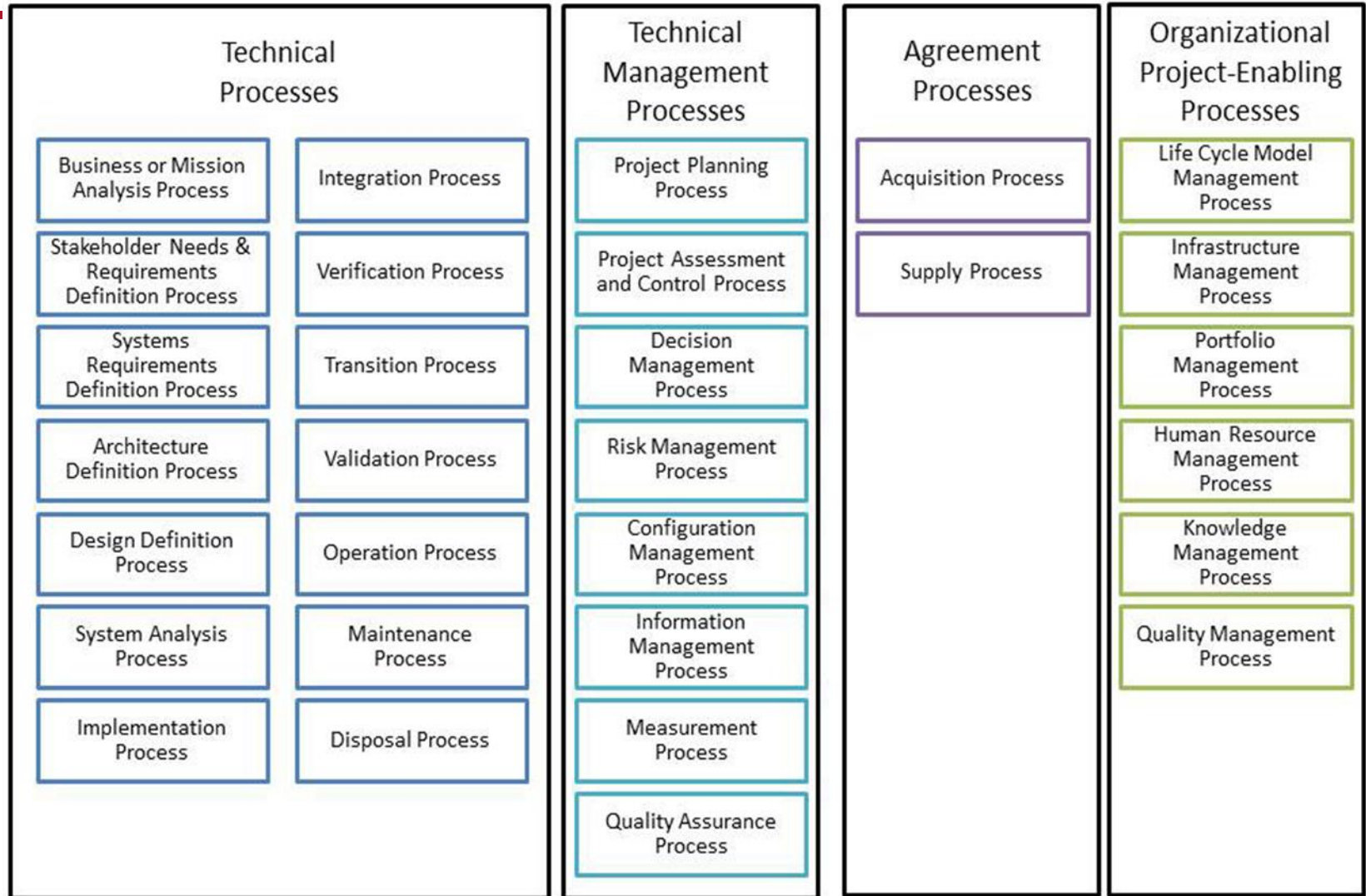
# Why Model Policy

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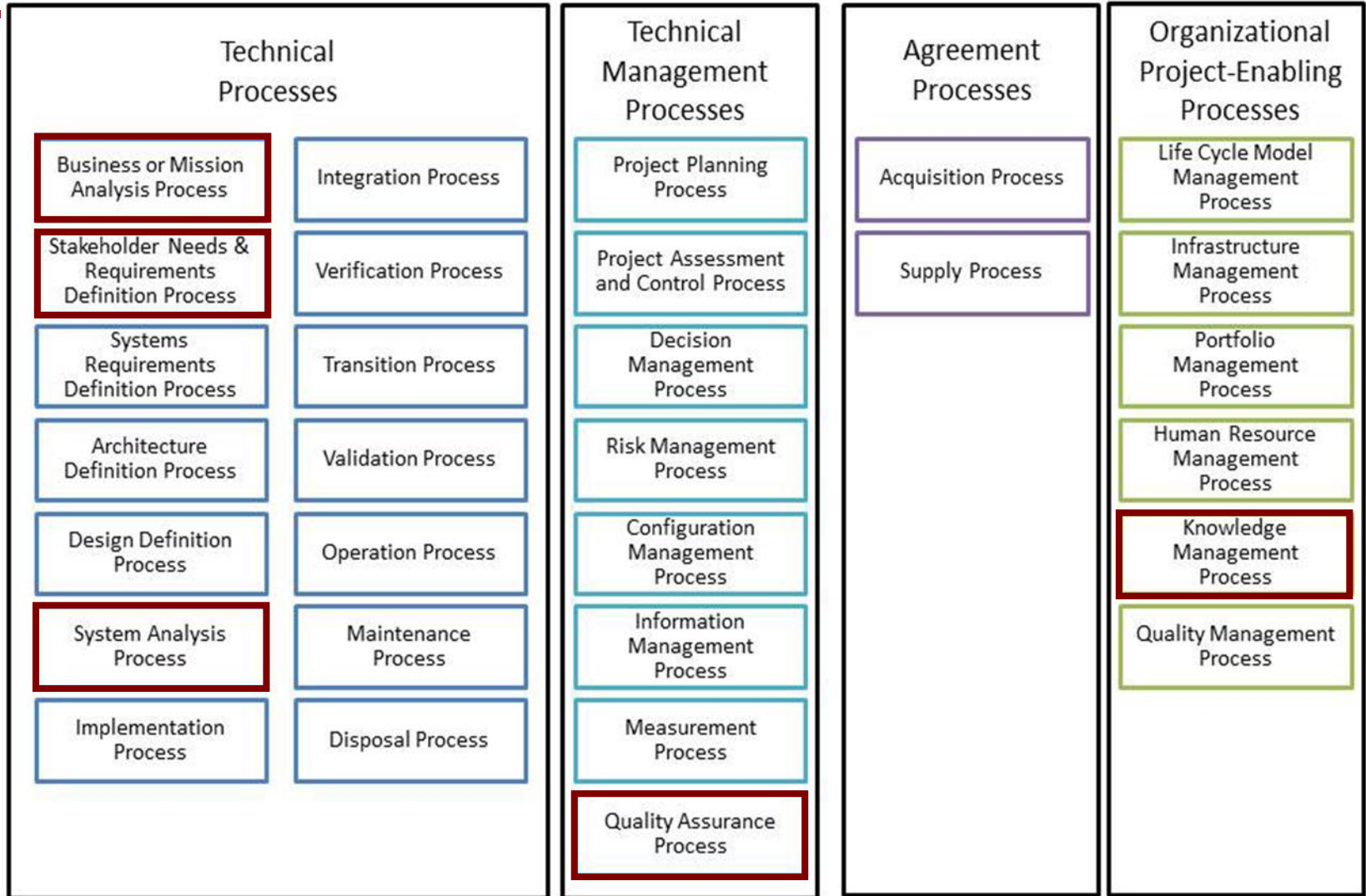
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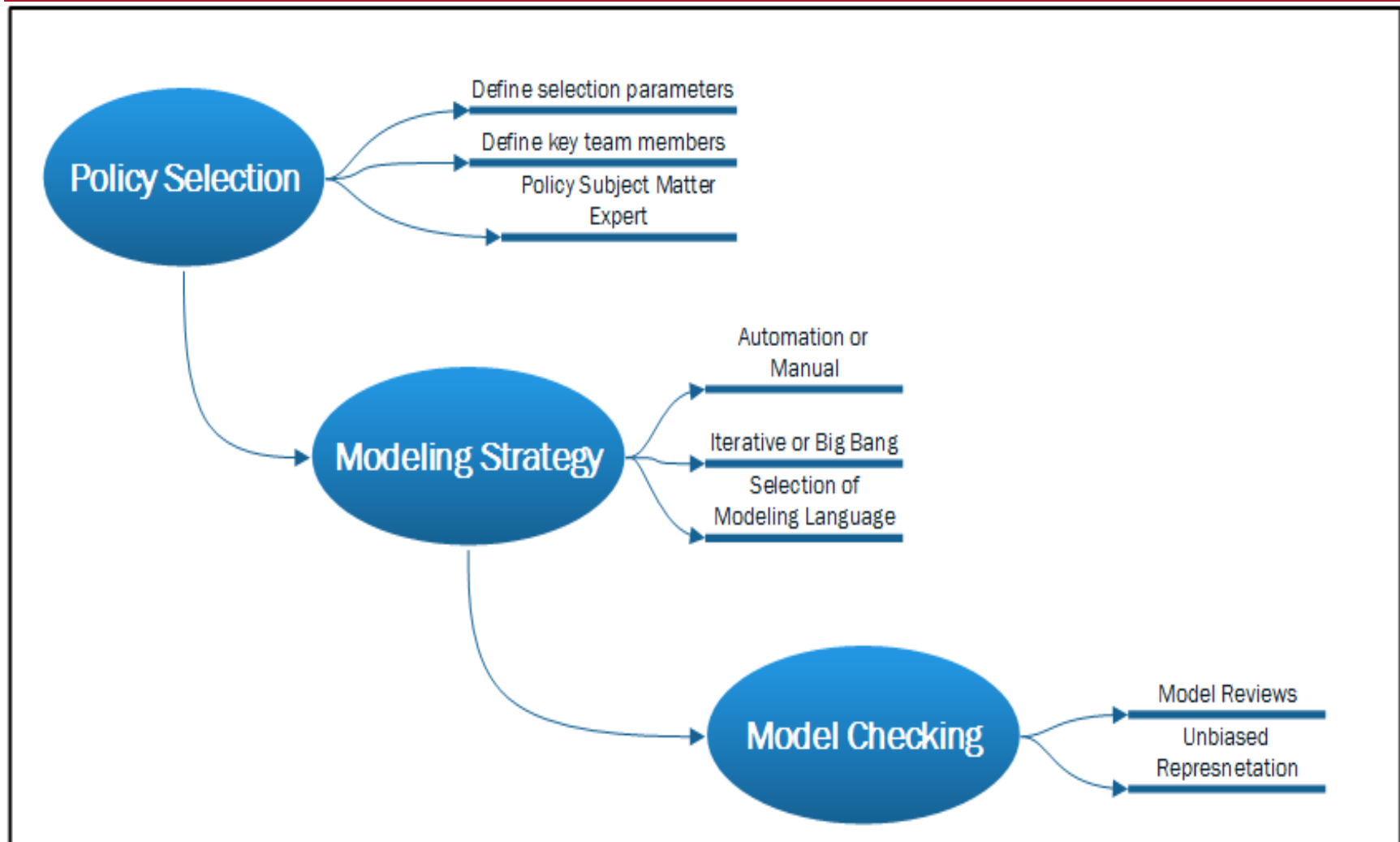
# Standard System Life-Cycle Processes – ISO/IEC/IEEE 15288:2015



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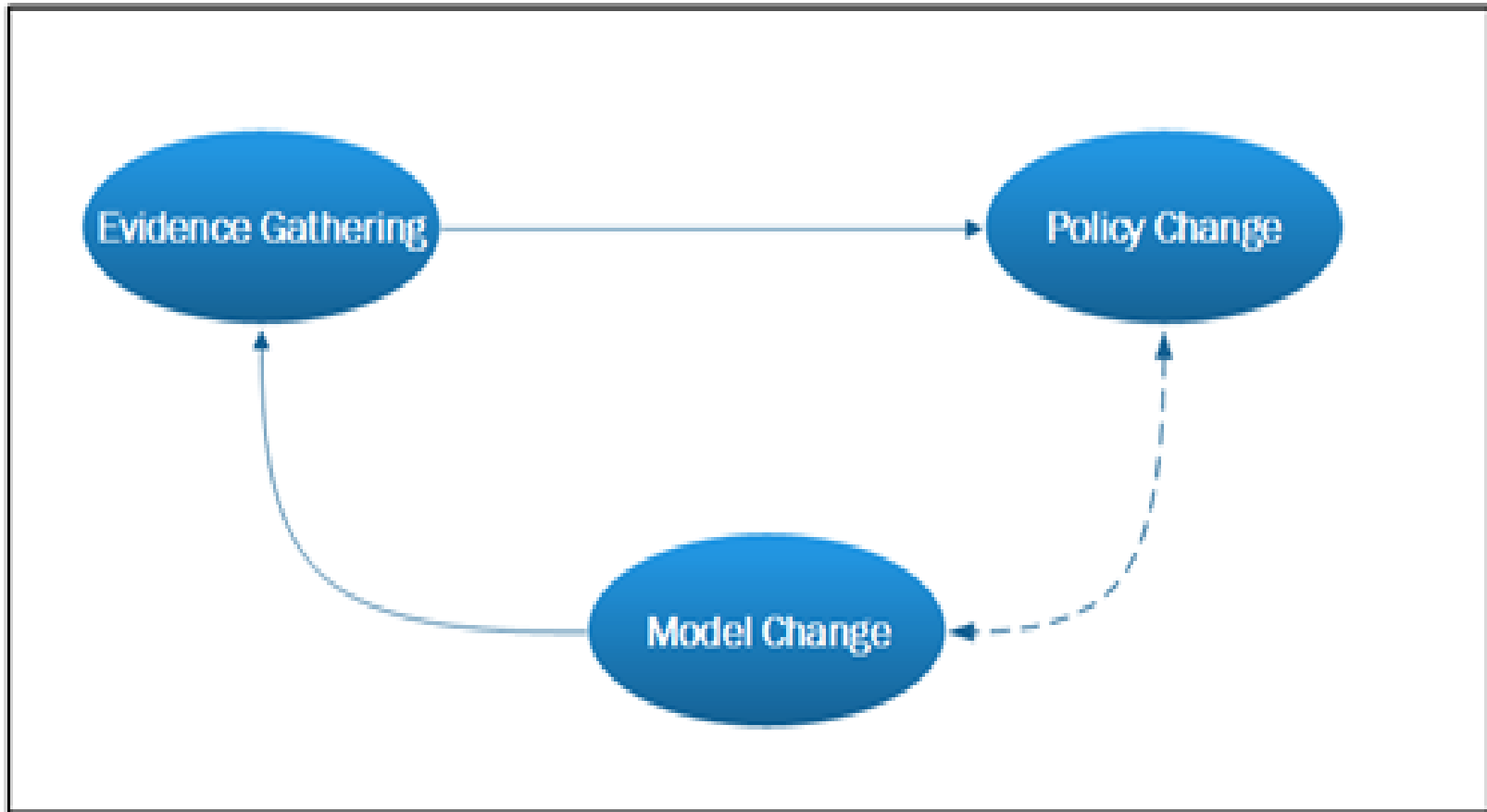


# Proposed Policy Modeling Methodology



# Evidence based Policy Change

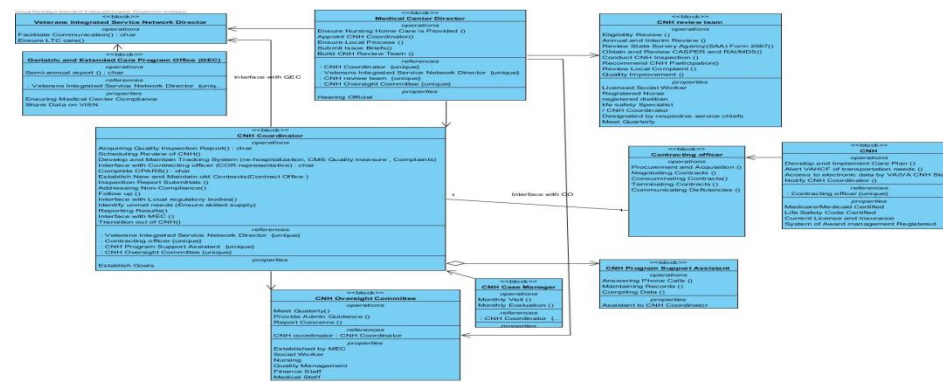
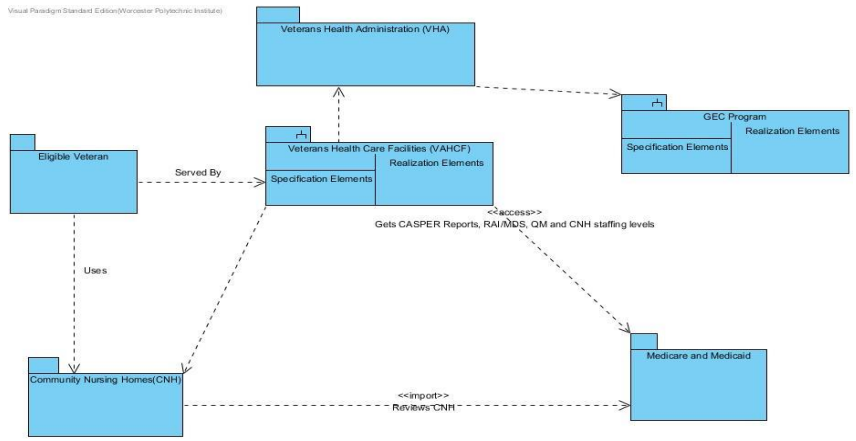
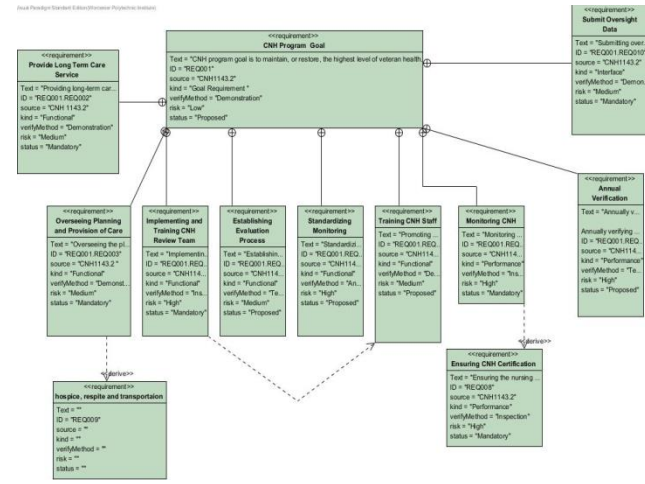
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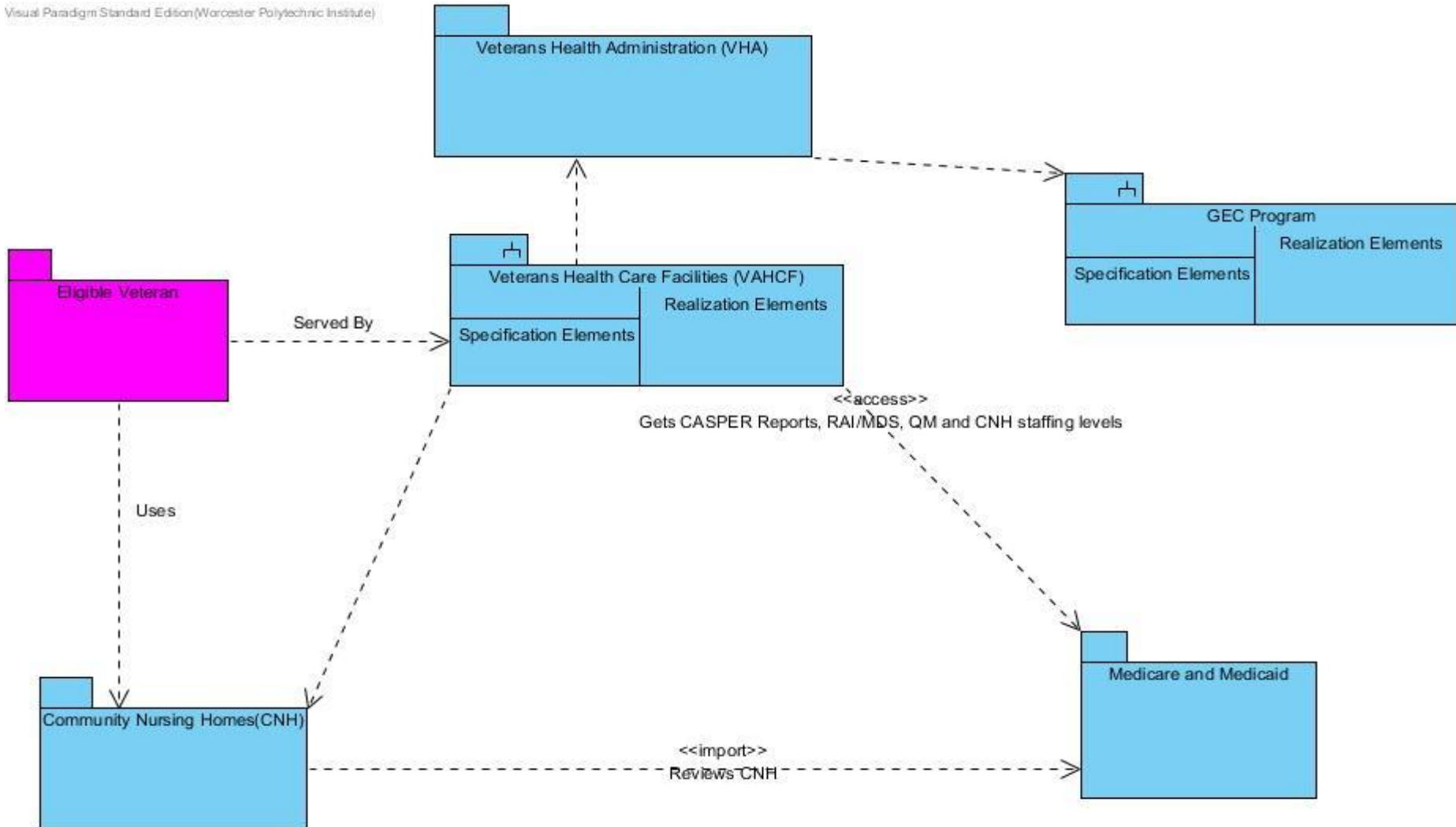
# Policy Analysis

- Modeled Policy
- Types of Failures classified
  - VL: Vague Language
  - NR: No call return
  - UT: Undefined Term
  - RD: Redundancy
- 49 Failures were identified, 27 resolved
- 3 major gaps all addressed
- FMEA Questionnaire constructed and deployed
- Results and Recommendations

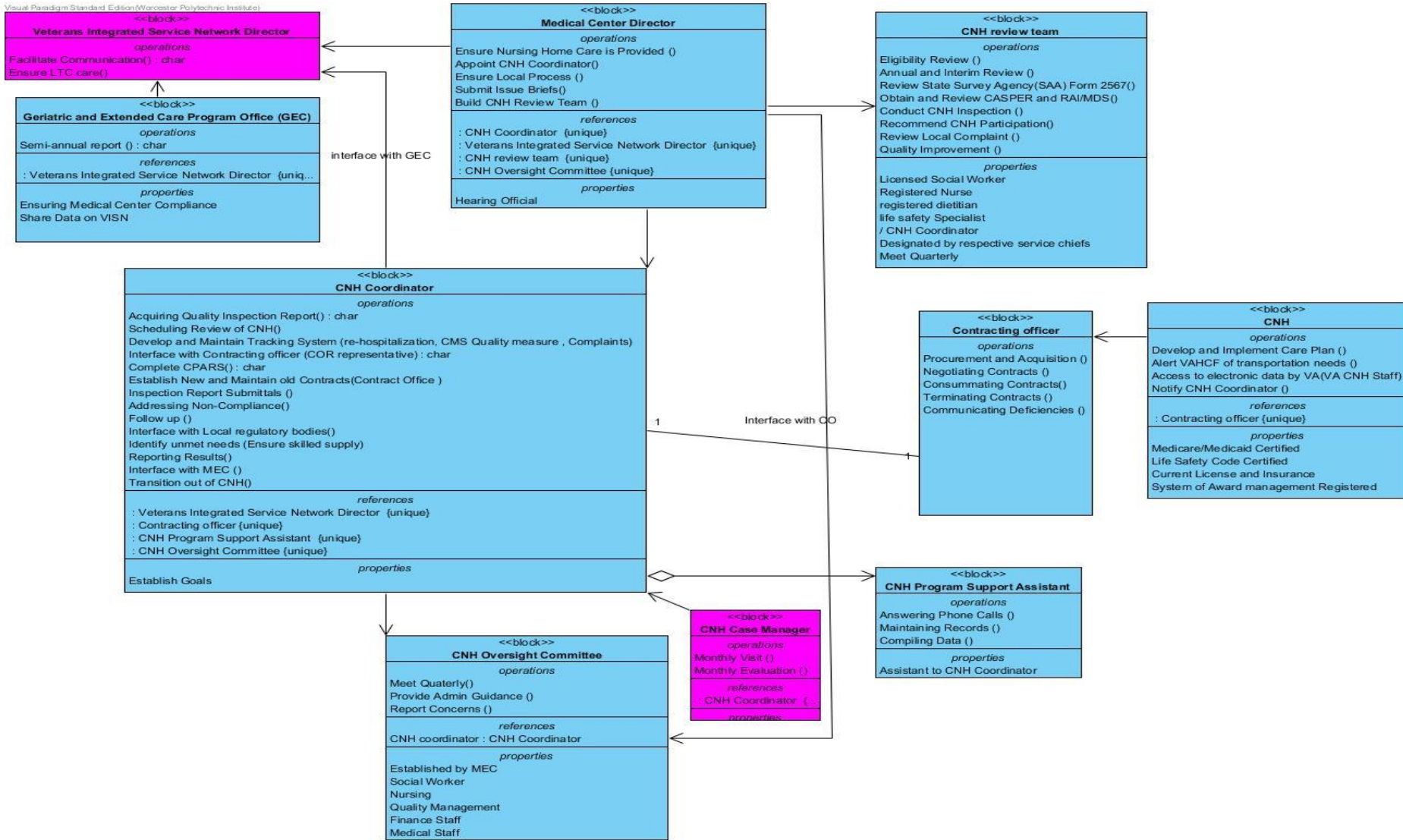


# Mapping the CNH Policy – Organizational Relationships

Visual Paradigm Standard Edition(Worcester Polytechnic Institute)

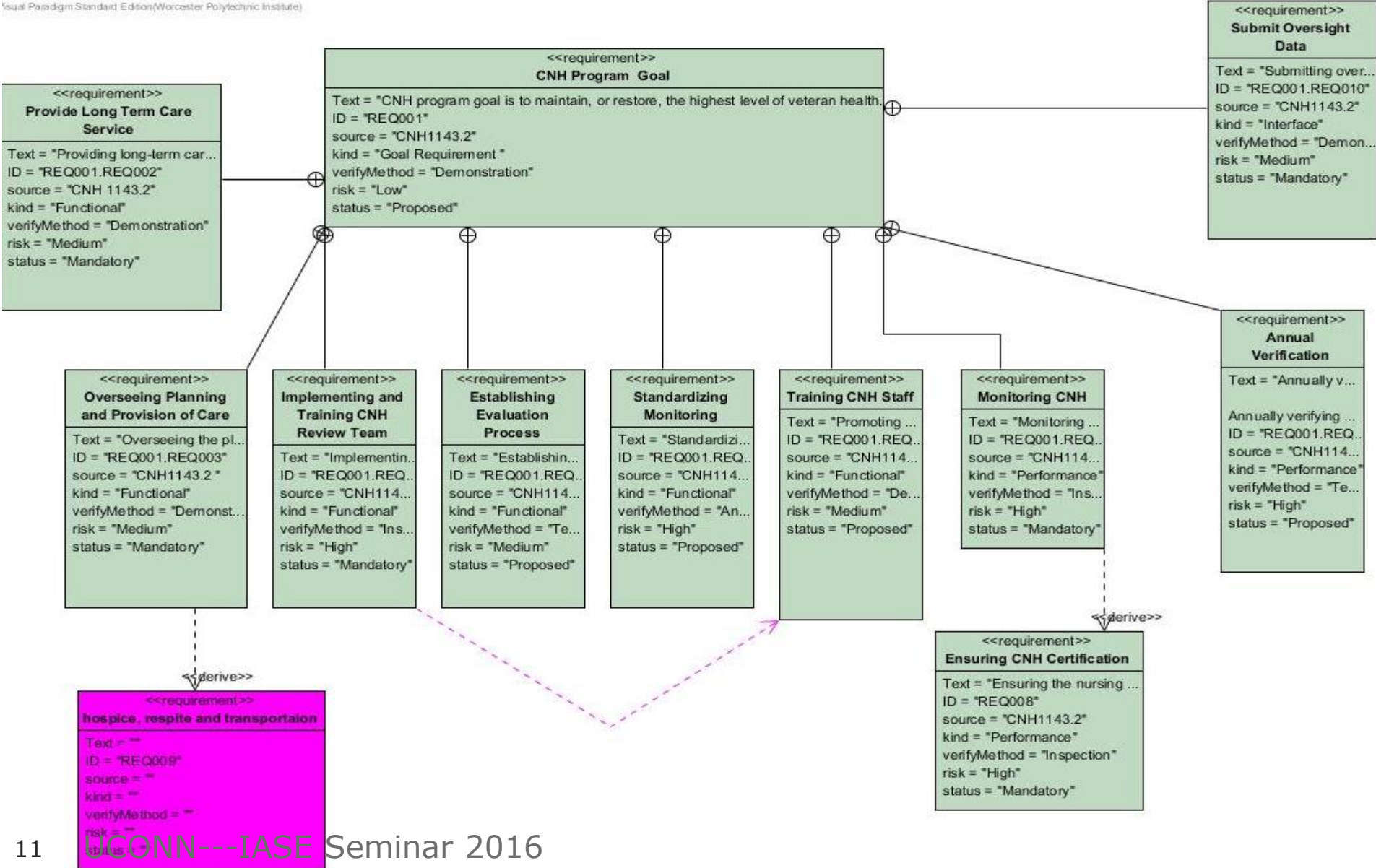


# Modeled Policy : Roles and Responsibilities



# Mapping the CNH Policy – Required Functions

Visual Paradigm Standard Edition (Worcester Polytechnic Institute)



# Failure Modes and Effects Analysis

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- Three major gaps identified
- Collected data on severity, occurrence and ease of change on old and new policy
- Captured gap propagation from old to new
- Build evidence based recommendations



# Evidence Gathering: Failure Classifiers

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## A. Planning and Provision of Long Term Care for Eligible Veterans

1. No Established staff for the CNH Program at the Veterans Health Care Facility
2. No available Community Nursing Home with the specialty needed
3. Long and difficult process to add new quality Community Nursing Home to the VA's CNH Program
4. No established CNH staff for oversight of Community Nursing Home Associated with the Veterans Health Care Facility
5. Other

## B. Implementation and Training of an Interdisciplinary CNH Review Team

1. No Training
2. No Established Staff
3. Outdated / Low Quality Training
4. No Clear Signs of Available Resources to Seek Guidance
5. No Encouragement/Motivation to Seek Guidance
6. Other

## C. CNH Oversight and Quality Control

1. No Established Minimum Criteria for Selection of a New CNH
2. No Established Minimum Criteria or Review for Maintaining a CNH on Contract With the VA
3. No Dedicated Staff to Complete Annual Evaluation of each CNH in the Veterans Health Care Facility
4. No Clear Process for Monitoring and Oversight of Existing CNH
5. Other

# (A) Planning and Provision of Long Term Care for Eligible Veterans

## Old Policy

#	Gap Name	# of People	Severity	Frequency	Ease of Change	RPN
1	No established staff	5	4.6	7.2	3	105.6
2	No available CNH with	13	6.61	4.53	6.69	220.53
3	Long and Difficult	17	5.35	6.47	6.17	246.11
4	No established CNH	4	6.25	8	4.25	176.5
5	Other	8	5.12	7.8	5	219

## New Policy

#	Gap Name	# of People	Severity	Frequency	Ease of Change	RPN
1	No established staff	3	5	5.66	6	186.67
2	No available CNH with...	10	7	5.9	8	340
3	Long and Difficult ...	18	5.94	7.2	6.83	342
4	No established CNH staff	5	5.4	5.8	5.8	162.4
5	Other	2	4.5	4.5	2	96.5

A2: No available Community Nursing Home with the specialty needed  
 A3: Long and difficult process to add new quality Community Nursing Home to the VA's CNH Program

# (B) Implementation and Training of an Interdisciplinary CNH Review Team

## Old Policy

## New Policy

#	Gap Name	# of People	Severity	Frequency	Ease of Change	RPN
1	No Training	14	5.3	7.36	4.85	219.78
2	No established staff	3	6	9	5	244.67
3	Outdated / Low Quality Training	10	5.7	6	4.2	151.1
4	No Clear Signs of Available	6	4.83	8	5.5	266.16
5	No Encouragement/Motivation	2	6	9	5.5	282
6	Other	7	4	8.14	5.85	191.28

#	Gap Name	# of People	Severity	Frequency	Ease of Change	RPN
1	No Training	13	6.615	8.15	5.30	305.15
2	No established staff	1	9	10	8	720
3	Outdated / Low Quality Training	8	6.25	6.25	5.5	221
4	No Clear Signs of Available	9	6.33	5.33	4.33	189.67
5	No Encouragement/Motivation	4	5	4.25	3	90
6	Other	4	3.25	3	3	27.75

B1: No Training



# (C) CNH Oversight and Quality Control

## Old Policy

#	Gap Name	# of People	Severity	Frequency	Ease of Change	RPN
1	No Established minimum - New CNH	2	9	10	6.5	550
2	No Established minimum Maintaining	5	4.8	6.4	3	91.4
3	No dedicated staff	6	5	7.83	4.33	178.83
4	No clear process	9	5.55	6.22	4.88	181.55
5	Other	6	5	7.66	4	171.66

## New Policy

#	Gap Name	# of People	Severity	Frequency	Ease of Change	RPN
1	No Established minimum - New CNH	5	6.8	5.4	4.6	152.8
2	No Established minimum Maintaining	7	5.43	5.57	4.71	150.86
3	No dedicated staff	5	5.2	5.6	5	171.2
4	No clear process	2	5.5	6	6	280
5	Other	9	3.44	4.22	3.55	82.889

	10										
Severity	9										
	8										
	7					A2					
	6					C4	B3				
	5						A3	B1	C3,C5		
	4										
	3										
	2										
	1										
			1	2	3	4	5	6	7	8	9
Likelihood											

Severity	10										
	9										
	8										
	7					C1	A2		B1		
	6					B4	B3	A3			
	5					C2	C2,C3				
	4										
	3				C5						
	2										
	1										
		1	2	3	4	5	6	7	8	9	10
Likelihood											

# What that means for New Policy

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## Good News

- C5: Other <9>
- C3: No Dedicated Staff to Complete Annual Evaluation of each CNH in the Veterans Health Care Facility<5>

## Gaps

- B1: No Training <13>
- A3 : Long and difficult process to add new quality Community Nursing Home to the VA's CNH Program <18>
- A2: No available Community Nursing Home with the specialty needed <10>
- B3:Outdated / Low Quality Training <8>
- C2 :No Established Minimum Criteria or Review for Maintaining a CNH on Contract With the VA<7>
- C3:No Dedicated Staff to Complete Annual Evaluation of each CNH in the Veterans Health Care Facility<5>

# Recommendations

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- Add a Section on Training in the policy
- Reconsider Provider Agreements or Change the initial review process
- Research Specialty Care Predictions based on projected needs of the current population

## Take Home Points

- **New Policy has some significant advantages and opportunity**
  - Advantage: Clear process on oversight
  - Opportunity: Initial and Ongoing Educational needs of Facility CNH staff
- **Systemic Challenges are the biggest threats the process**
  - No dedicated CNH staff
  - Contracting Process
  - Identifying specialized CNH to meet the needs of Vets
- **Recommendations**
  - Lobby for CNH Provider Agreements
  - Build an educational program (GRECC AD-E, Coaching, Mentor network, etc)
  - Present CNH Quality data

# Modeling and FMEA Process Impact

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- Helped understand dependencies across multiple sections
- Analyze Document Policy
- Understand the Operational Aspects of the Policy
- Help Edit Policy
- Identify Gaps
- System View of the Policy
- View Major Actors/ Stakeholders and their role in the policy

# Future Research

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- Build a structured machine readable natural language for writing policies
- Build algorithms to test fitness of a policy
- Visualization of Enterprise-wide policy web

# Other Activities

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- INCOSE
  - Academic Forum 2015, 16
  - Empowering Women as Leaders in Systems Engineering(EWLSE)
  - Academic Council
- Teaching
  - Online, on-campus, onsite courses
    - Online Capstone, SE Fundamentals and Requirements Engineering
- Research
  - MBSE
    - Policy Modeling
    - Human Reference Architecture
    - Reusable Architectural Tactics
  - Software Quality
  - Engineering Education

# Questions

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