

How to write good requirements Module 2 of 10



Stakeholders and their importance

Version 1.1.6

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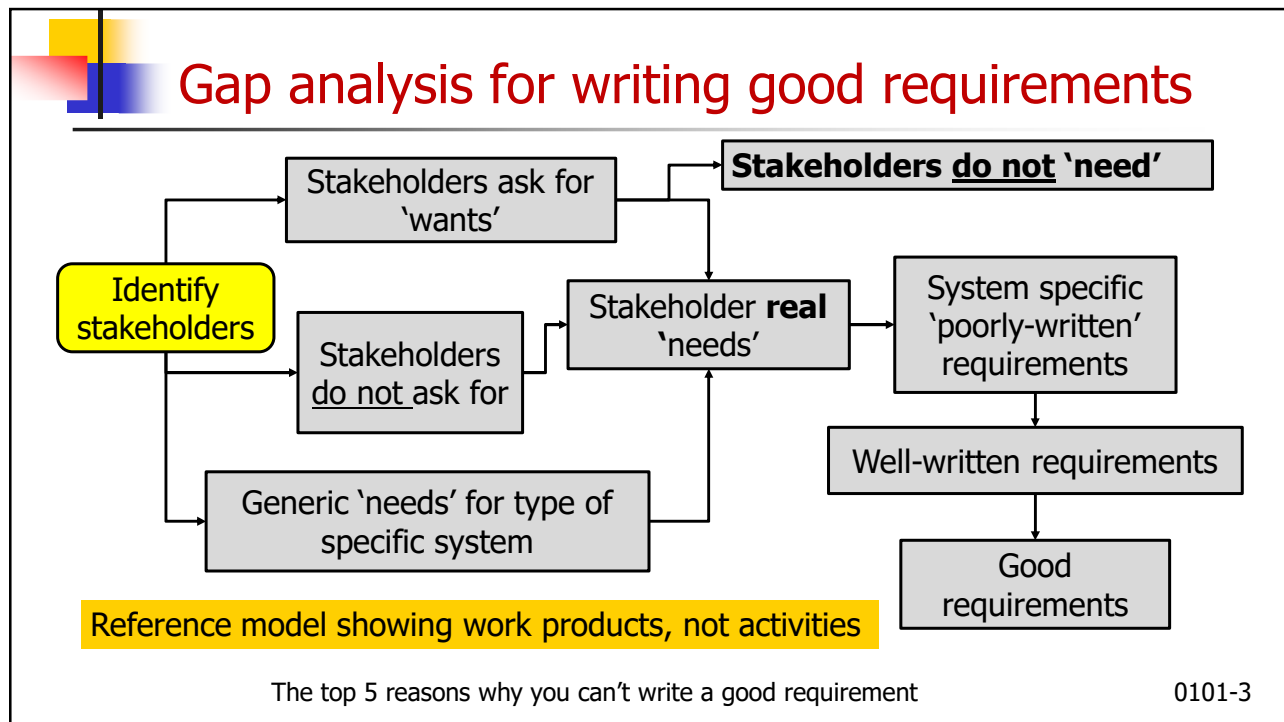


Course session topics

1. Introduction to requirements
- 2. Stakeholders and their importance**
3. Communicating with the stakeholders
4. Converting stakeholder wants to needs
5. Documenting stakeholders' needs
6. Converting stakeholder needs to requirements
7. Converting requirements to well-written requirements
8. Converting well-written requirements to good requirements
9. The use of requirements in the rest of the system development process
10. Summary and closeout

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Objectives of Session 2

1. To explain where and how to locate potential stakeholders for the project
2. To explain the extended process to realize the solution system as a generic model for locating stakeholders
3. To explain the difference between
 - Customers and other stakeholders
 - Information and contractual communications between stakeholders and how to manage them
 - Stakeholder wants and needs
 - Direct and indirect stakeholders
 - Generic and specific stakeholders
4. To explain the degree of influence of each stakeholder on the requirements
5. To provide the opportunity to obtain 5 levels of knowledge in the updated Blooms taxonomy

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Knowledge components

- Lecture
 - Sets the context and provides overview
- Readings
 - 0202 Kasser, J. E. and Zhao, Y.-Y. [Managing Complexity via the Nine Systems in Systems Engineering](#), *proceedings of the 24th International Symposium of the International Council on Systems Engineering (INCOSE)*, Las Vegas, NV, 2014.
 - 0203 Kasser, J. E., Zhao, Y.-Y. and Mirchandani, C. J., [Simplifying Managing Stakeholder Expectations using the Nine-System Model and the Holistic Thinking Perspectives](#), *proceedings of the 24th International Symposium of the INCOSE*, Las Vegas, NV, 2014.
- Exercises
 - 2-11 identifying stakeholders using the nine-systems model
 - 2-12 knowledge reading 0202
 - 2-13 knowledge reading 0203

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Session topics

- **Lessons learned from dealing with stakeholders**
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Lessons Learned

- Stakeholder participation is critical to the success of any project especially when a plurality is involved
 - Not only for needs
 - Eases conversion of wants to needs
 - Provide undocumented knowledge
 - Helps buy-in on changes
- Keep important stakeholders informed
- Keep stakeholders informed as to the status of their requirement requests
- Decisions should be discussed with those stakeholders who have the authority to make the decisions and are willing to do so
 - If not the stakeholder, then the stakeholder's supervisor

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Most important lesson learned

1. You can't write good requirements unless you understand the stakeholder's real needs
2. You can't understand the stakeholder's real needs until you gain an understanding of the undesirability in the current undesirable situation
 - You need three domain knowledge
3. You can't gain an understanding of the undesirability in the current undesirable situation until you have a functional model of some kind (as-is)
 - Concept maps, scenarios, flow charts, descriptive paragraphs, in computer, etc.
 - Undesirability (why the customer is willing to fund the project)
 - Assumptions
4. You should develop a draft concept of operations (CONOPS) for the system the stakeholder needs (to-be) before and while communicating with the stakeholders
5. You should also develop a conceptual model of the transition process for
 1. Acquiring the needed system (build/develop/integrate or buy)
 2. Transitioning the needed system into the current situation
 3. Disposing of the existing system (if necessary)

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The three domains of the problem

1. Problem

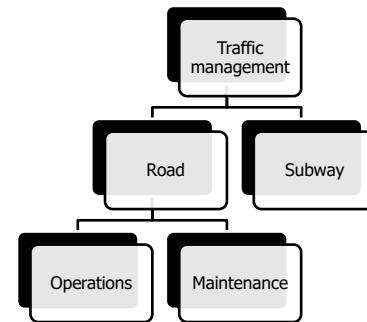
- E.g. reducing road traffic congestion
 - in road traffic management domain

2. Solution

- E.g. subway system

3. Implementation

- E.g. Tunnel boring,
- E.g. Road traffic management
 - Roadwork delays,
 - Reserved traffic lanes



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Some questions about stakeholders

- What is a stakeholder?
- Why should I be concerned about stakeholders?
- Where are the stakeholders located?
- Who are the stakeholders?
- How do stakeholders influence the requirements?
- How important are stakeholders?
- How can I find the stakeholders?

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Stakeholders

- People or organizations that are internal or external to the project who have a vested interest in its success or failure
 - Defined in Session 1
- Are sources of (stakeholder) requirements (requirement-requests)
- Stakeholders should be documented in an up-to-date stakeholder list with (at least) the following information*
 - Name
 - Function (role)
 - Additional personal and contact data
 - Temporal and spatial availability during the project progress
 - Relevance (influence)
 - Area and extent of expertise
 - Goals and interests in terms of the project

* IREB, 3.10, EU 4.1

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Stakeholder location in the literature

- Subset of an undefined list
 - "including"
- Which are relevant?
- How to manage conflicting concerns?
 - Quality Function Deployment (QFD)
- No systemic and systematic method for how to
 1. identify stakeholders
 2. manage stakeholder expectations



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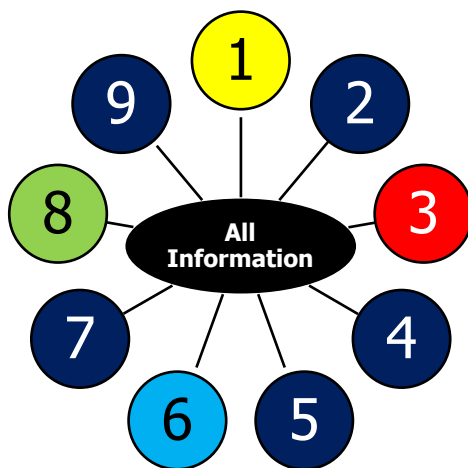
Example - IREB 3.1.0,4.1 Sources

- **"Include"**
 - End users
 - Sponsors
 - Managers
 - Developers
 - Authorities
 - Customers

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Traditional non-systems complex view of stakeholders



- Does not provide any guidance
- Stakeholder 1 is contractor
- Stakeholder 3 is customer
- Customer is stakeholder who pays for the project

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Where the potential stakeholders are located

- Stakeholders: (who) People or organizations that are internal or external to the project who have a vested interest in its success **or failure**
- People or organizations who are involved in, affect or are potentially affected by the three states of the situation:
 1. Current system in use in its operational environment (situation)
 - Current undesirable ~~system~~ situation (as-is)
 2. Conceptual future system in use in a feasible operational environment
 - Conceptual future system in its situation, as is should be operating in our imagination (e.g. CONcept of OPERATIONs (CONOPS), models, prototypes, concept maps, real pictures, etc.) (to-be)
 3. Transition process realizing the future system
 - Three streams of work, (1) management, (2) development and (3) test

This is in the time before the conceptual future system is realized and becomes operational

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The three functional representations

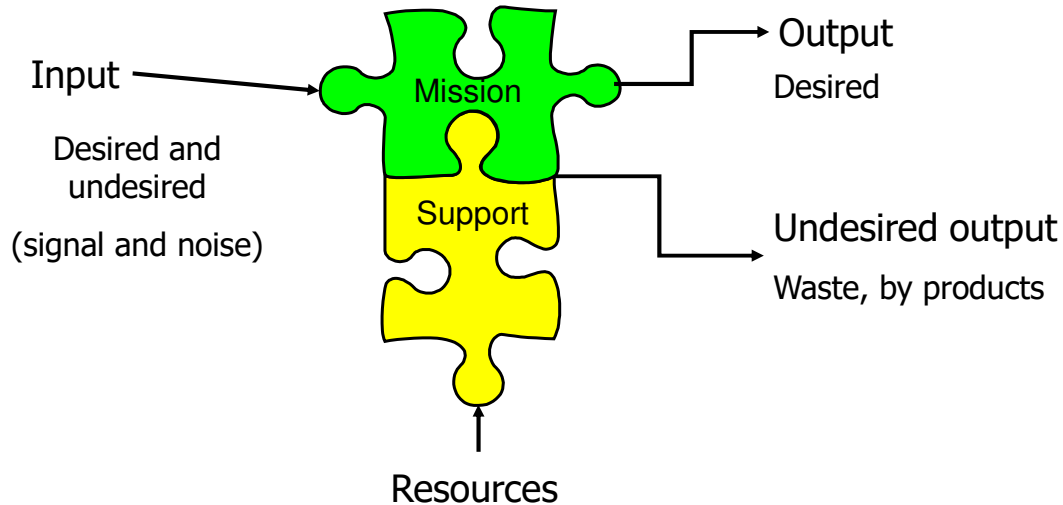
- | | |
|---|---|
| <ol style="list-style-type: none"> 1. The current undesirable situation (as-is) <ul style="list-style-type: none"> ■ To gain an understanding 2. The future system in-use (to-be) e.g., CONOPS <ul style="list-style-type: none"> ■ To identify the real needs 3. The transition process <ul style="list-style-type: none"> ■ To plan transition | <ul style="list-style-type: none"> ■ Scenarios coupled together ■ What functions are being done ■ Who are doing them ■ Why they are being done ■ Inputs, outputs and resources used in the scenario ■ Graphics, text or combination |
|---|---|

This is in the time before the conceptual future system is realized and becomes operational

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System functional template (stakeholders)



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How to locate potential stakeholders

- Use generic scenarios (in current situation, transition and future system)
 - Find out who/what is involved
 - "what's in it for them"
- For each generic scenario, use Active Brainstorming*, e.g.,
 - Who/what is doing something?
 - What are the inputs?
 - Where do the inputs come from?
 - What are the outputs?
 - Where do the outputs go?
 - Who uses the outputs? (check that outputs are used)
 - What do they use the outputs for? (identifies indirect stakeholders)
 - What resources are used?
 - Where do the resources come from?
 - Who orders them?
 - Who delivers them?


* Session 3

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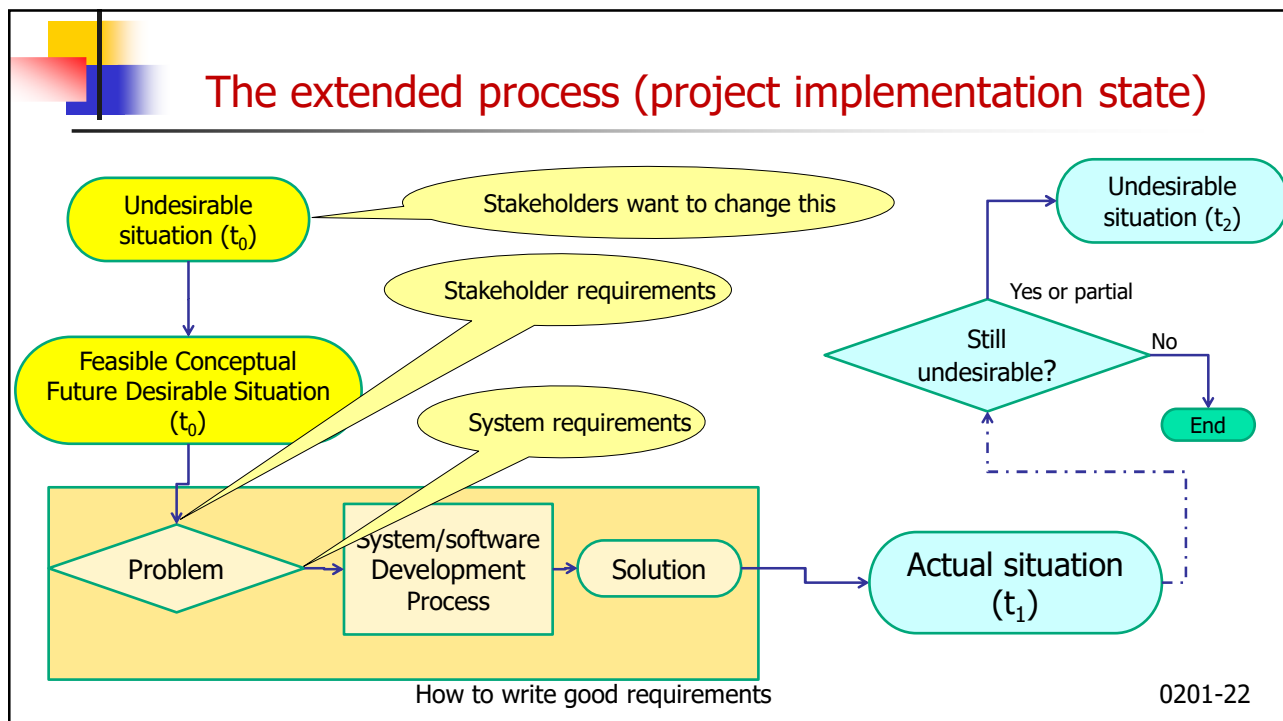
Session topics



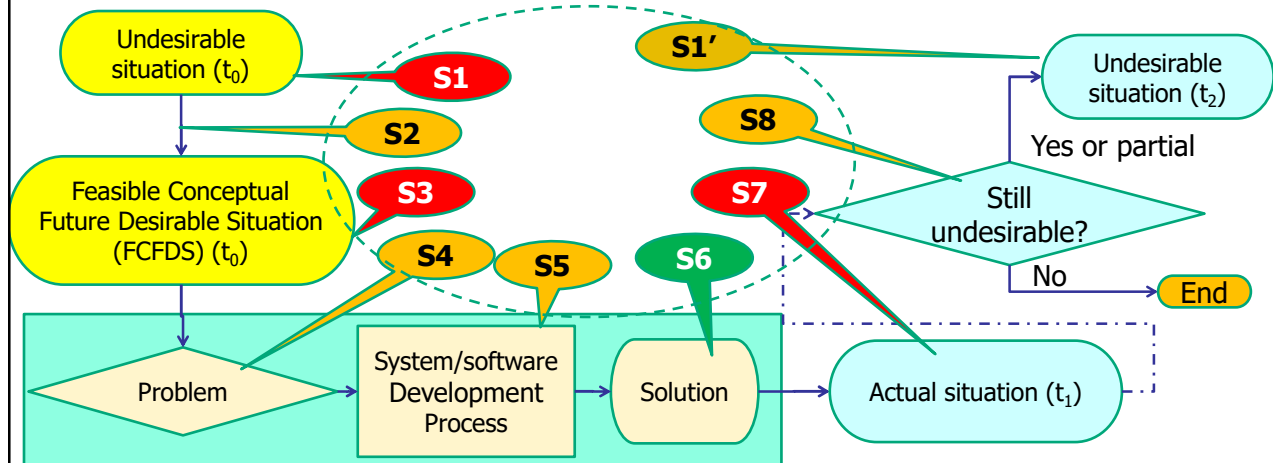
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The nine system model (*Functional view*)



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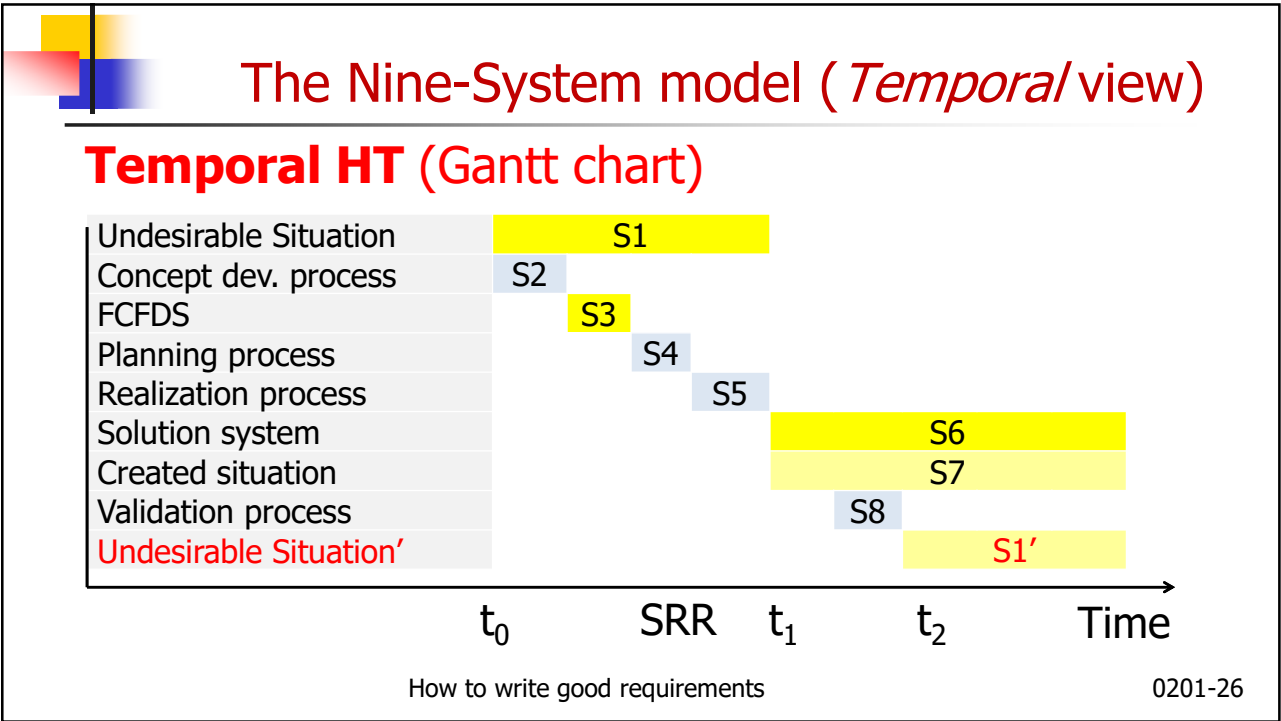
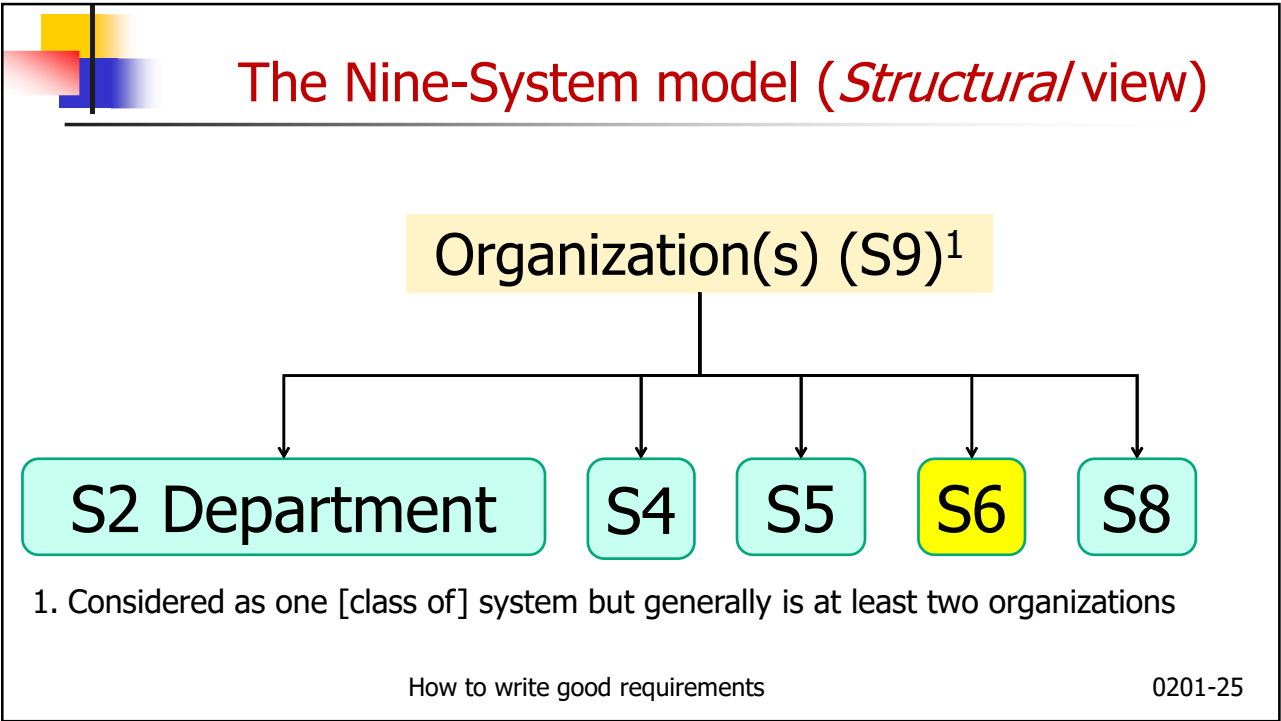
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The 9 systems: situations, systems & processes

1. Undesirable or problematic **situation**
 - Baselined at t_0 , but will evolve during realization of solution system
2. **Process** to develop the Feasible Conceptual Future Desirable Situation (FCFDS)
3. The FCFDS that remedies the undesirable **situation**
4. **Process** to plan the transition from the undesirable situation to the FCFDS
5. **Process** to realize the transition by providing the solution system
6. Solution **system** that will operate within FCFDS'
7. Actual or created **situation** at t_1
8. **Process** to determine that the realized solution remedies the evolved undesirable situation
9. **Organization(s)** containing the **processes**

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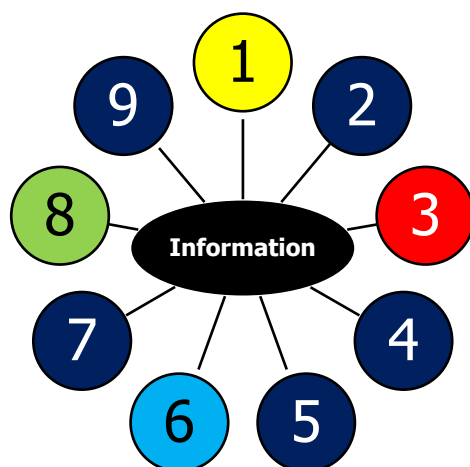


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Systems view of stakeholders - information view



- Uses two figures
- Splits wants/needs and contract information communications
- Lines show information flows pertaining to stakeholder wants and needs
- Customer is stakeholder who pays for the project
- Contractor is stakeholder 1
- Customer is stakeholder 3

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Systems view of stakeholders - contractual view



- Contractor is stakeholder 1
- Customer is stakeholder 3
- Contractual information only flows between customer and contractor (red line)
- Customer is contractual buffer between all stakeholders and contractor project personnel
- Clear control of which needs become requirements and who makes the decision
- Important perspective when all stakeholder needs cannot be met within the budget and schedule

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Needs, wants and problems

■ Difference between

1. What stakeholders want (ask for)


2. What stakeholders need

3. What stakeholders tell you

Stakeholders		Know what they <u>need</u>	
		Yes	No
Know what they <u>want</u>	Yes	Well-structured problem	Ill-structured problem
	No	Ill-structured problem	Well-structured problem'

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Structure of the problem

1. Well-structured

■ The existing undesired situation and the FCFDS are clearly identified

■ May have a single solution or sometimes more than one acceptable solution

2. Ill-structured

■ Either or both the existing undesired situation and the FCFDS are unclear

3. Wicked

■ Extremely ill-structured problems/situations

There are no solutions to ill-structured and wicked problems

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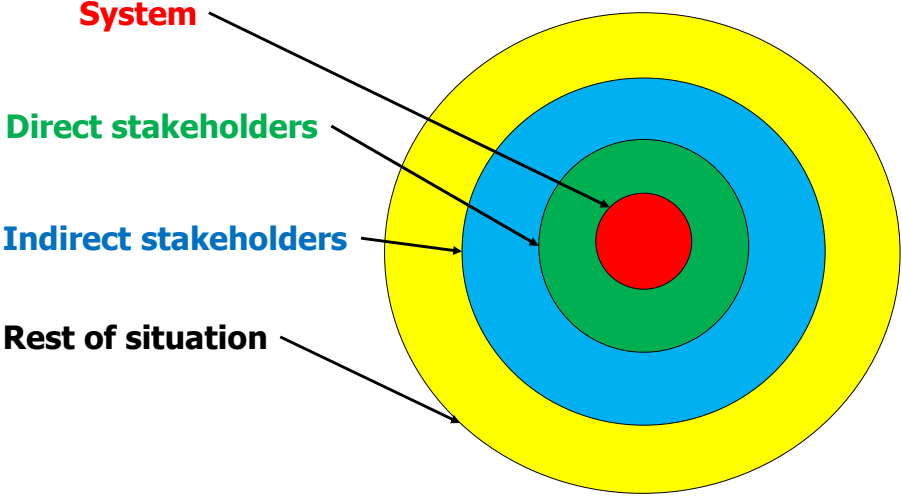
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Direct and indirect stakeholders



System

Direct stakeholders

Indirect stakeholders

Rest of situation

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Examples of direct and indirect stakeholders

- Direct
 - Users, contractor personnel, customer, entities affected by waste and undesired byproducts, opposers of project, etc.
- Indirect
 - People or organizations impacted by a system*
 - Families of direct stakeholders
 - Customers of direct stakeholders
 - Resource providers to direct stakeholders
 - Finance, business supplies, waste disposal services, other services, etc.
 - Managers of direct stakeholders

*IREB 3.10.0, 4.1

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Generic stakeholder template

- For any type or class of system
 - Generic scenarios
 - Generic stakeholders in each generic scenario
- Tailor generic scenarios to specific situation
- Helps you identify both stakeholders and needs
- Identify who performs the generic function
 - Becomes the specific stakeholder
- Can provide a comprehensive list of at least 85% of pertinent stakeholders in the nine systems

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Factors affecting influence include ...

- Closeness to system
 - Closer = increases influence (quantified functions needed)
- Ability to affect the system acquisition
 - Develop/build or buy commercial-off-the-shelf
- Political influence
 - Affect other present and future contracts
 - (Your) most important stakeholder is in the transition process
 - The person(s) who has/have the authority to promote you, raise your salary, give you a bonus or other recognition, or, fire you, demote you, etc.
 - Satisfied customers and other stakeholders influence that/those person(s)

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Determine initial degree of influence


- Same as prioritizing
- Each factor may have a different scale
- Scale of -5 to +5 where 0 is no influence
 - Degree of negative/positive influence, reason for number
 - No allocations to a number are fine.
 - Thinking exercise
 - May want to keep this confidential
- Allocate degree using preference/priority/decision-making tools
 - Pair-wise comparisons, Multi-attribute Variable Analysis (MVA), etc.
 - See Creating Outstanding Problem Solvers, module 5

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Background to Exercise 2-11

1. Spend between 60-90 minutes on the exercise
2. The Hypothetical University (HU) Student Enrollment and Course Tracking System (SECTS) upgrade project
3. HU installed the SECTS in 1998
4. The SECTS has had minor upgrades since then
5. The system needs a major upgrade
6. Your employer has won the contract to perform the upgrade
7. You have been promoted to become the "requirements engineer"


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Exercise 2-11

1. Using the nine-system model, identify some of the direct and indirect generic stakeholders for the SECTS upgrade project
2. Create at least three scenarios in each of the three states of the situation
3. Prepare a <5 minute presentation containing
 1. The generic stakeholders and the scenarios in which they were found
 2. The three most influential stakeholders and why they are influential
 3. A compliance matrix for the exercise
 4. Formulated problem per COPS problem formulation template
 5. Lessons learned from exercise
 6. This slide and the version number of the session
4. Save as a PowerPoint file in format Exercise2.11-abcd.pptx
5. Post/email presentation as and where instructed

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Exercise 2-12 knowledge reading

1. Prepare a brief on two main points on reading 0202 (< 5min)
2. Presentation to contain
 1. Formulated problem per COPS problem formulation template
 2. A summary of the content of the reading (<1 minute)
 3. The compliance matrix
 4. This slide and the version number of the session
 5. The two main points
 6. The two briefings
 7. Reflections and comments on reading (<2 minute)
 8. Comparisons of content with other readings and external knowledge
 9. Why you think the reading was assigned to the module
 10. Lessons learned from module and source of learning e.g. readings, exercise, experience, etc. (<2 minutes)
3. Save as a PowerPoint file as Exercise2.12-abcd.pptx
4. Post/email presentation as and where instructed
5. Brief on one main point

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Exercise 2-13 knowledge reading

1. Prepare a brief on two main points on reading 0203 (< 5min)
2. Presentation to contain
 1. Formulated problem per COPS problem formulation template
 2. A summary of the content of the reading (<1 minute)
 3. The compliance matrix
 4. This slide and the version number of the session
 5. The main points
 6. The two briefings
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Meeting the objectives

#	Objectives	Met
3	Explained where and how to locate potential stakeholders for the project	14-21
4	Explained the extended process to realize the solution system as a generic model for locating stakeholders	22-26, Readings
5	Explained the difference between	
5a	Customers and other stakeholders	28,29
5b	Information & contractual communications between stakeholders & how to manage them	28,29
5c	Stakeholder wants and needs	31
5d	Direct and indirect stakeholders	34,35
5e	Generic and specific stakeholders	37
6	Explained the degree of influence of each stakeholder on the requirements	39,40
7	Provided the opportunity to exercise the 5 levels of knowledge in the updated Blooms taxonomy	42-45

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Any questions ?

1. Best
2. Worst
3. Missing



Email:

beyondsystemsthinking@yahoo.com

Subject: <class title> BWM Session #

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