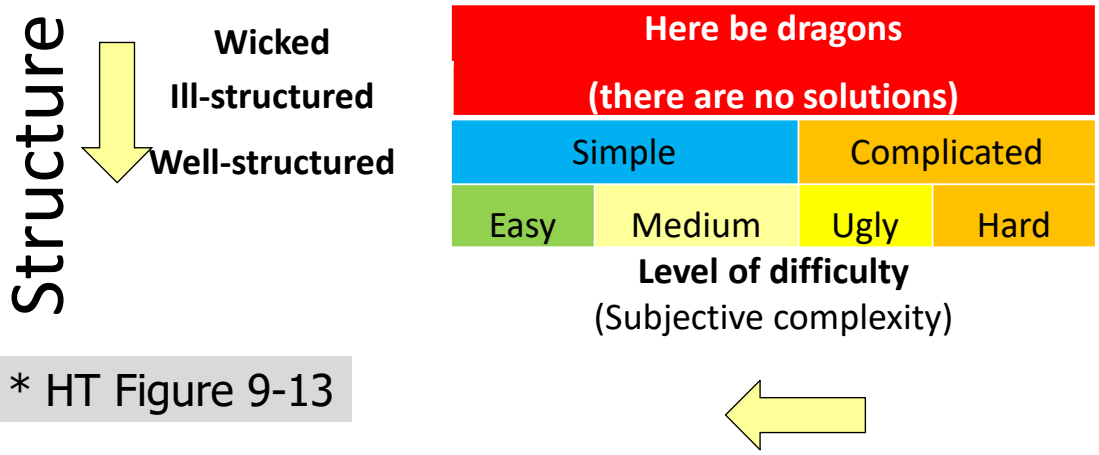
Module 6: Remedying simple and complex problems: Session 2 of 2

Rev. 1.6.6

Topics

- Complexity
- Managing complexity (complex problems) by
  - Using an actual number for "large" in the definition of objective complexity?
  - Separating objective and subjective complexity help remedy complex problems
- Reasons why some people can tackle complexity successfully while others cannot
- The nine-system model
- Exercises
- Summary

Problem classification matrix framework*



* HT Figure 9-13

Problem and sub-problems

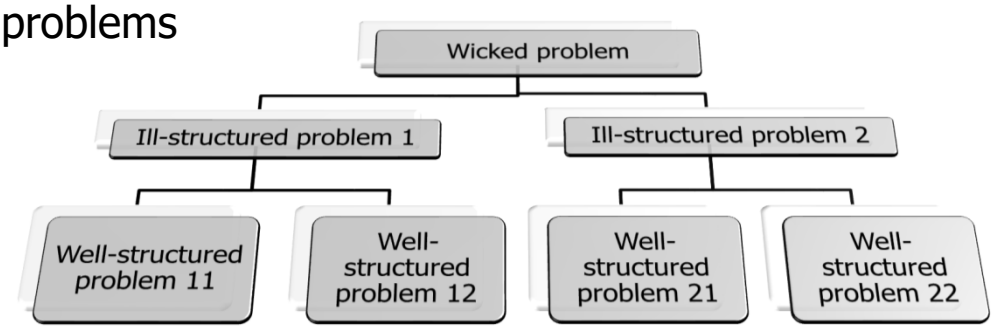
- *Ill-structured problems cannot be solved* (Simon, 1973)
- Ill-structured and wicked problems have to be converted to a (set of) well-structured problem(s)
  - Research problems
- (set of) well-structured problem(s) are/is solved via iterations of the problem-solving loop
  - Prioritize and take action
  - Intervention problems

Tackling a complex situation

- Gain an understanding of the situation
- Determine the structure of the problem
- Proceed accordingly
  1. Remedy the well-structured problem
  2. Convert the ill-structured and wicked problems to a set of well-structured problems
  3. Decide which one to tackle
  4. Go back to step 1

Problem decomposition

Generic HTP: system decomposition into sub-systems; problem decomposition into sub-problems



1. Research problems (Reminder)

1. **The undesirable situation** is either
   - The inability to explain observations of phenomena
   - The lack of (need for) some particular knowledge
2. **Assumptions**
   - Situation dependent
3. **The Feasible Conceptual Future Desirable Situation (FCFDS)** is the knowledge often in the form of the supported hypothesis
4. **The problem** is how to gain the needed knowledge
5. **The solution** is the FCFDS

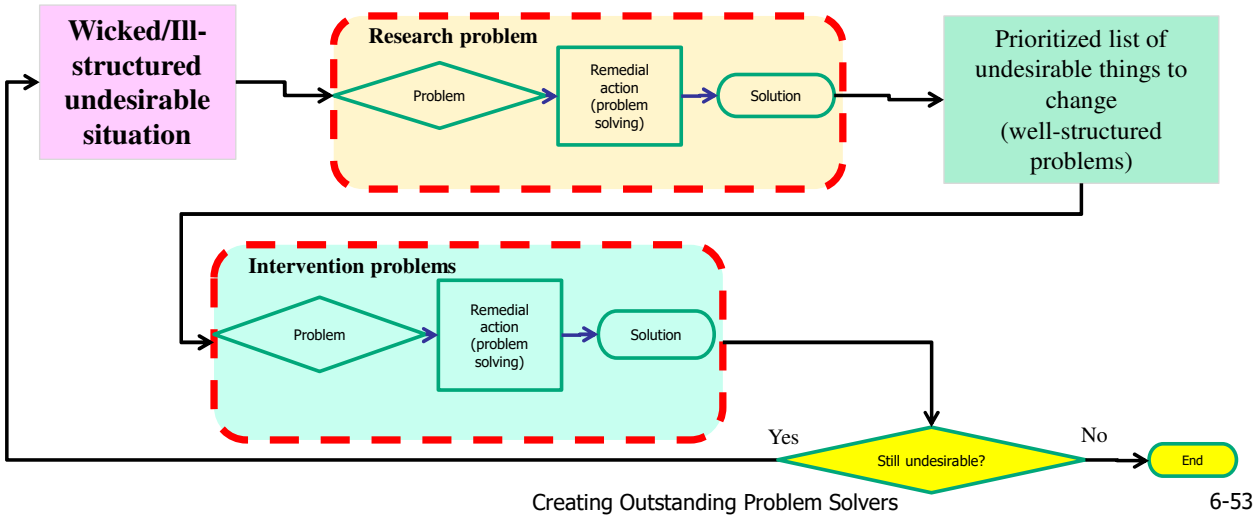
- **The problem solving process** is commonly known as the Scientific Method (SM), and works forwards
  - From the current situation
  - To the FCFDS in which the knowledge has been acquired
    - You don't know where you are going until you get there

2. Intervention problems (Reminder)

- The undesirable situation is when something needs to be changed over a period of time into a FCFDS
  - **the solution** is the FCFDS
  - **the problem** is how to realize a smooth and timely transition from the current situation to the FCFDS, and
  - **the problem solving process** first uses the research problem solving process *working forwards*, selects the best one, and then *works backwards* to the current problematic situation to document:
    - the FCFDS, and
    - the realization plans documented as a *forward process* starting from the current situation and ending with the deployment of the FCFDS.

Iterative problem-solving

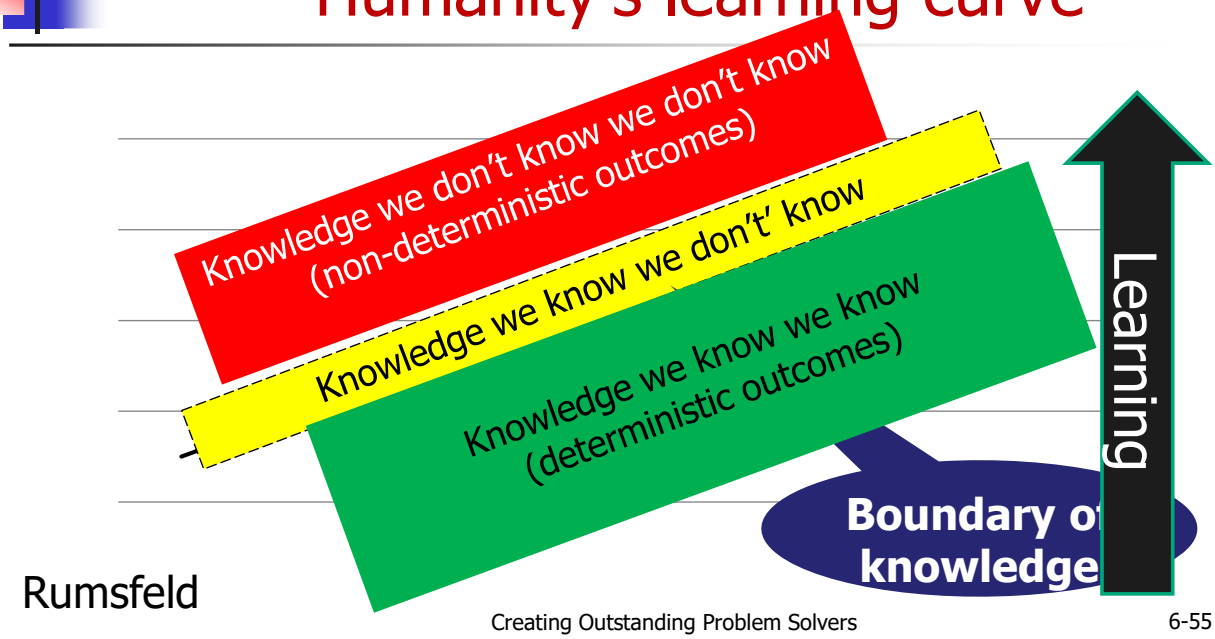
- Sequential research (1st) and intervention (2nd) problems



Complexity : *Scientific*

- Answers to:
  1. What is the value of "large" in the definition of objective complexity?
  2. Can separating objective and subjective complexity help remedy complex problems?
  3. **Why can some people tackle complexity successfully while others cannot?**
     - Assumption : more than one reason

Humanity's learning curve



Rumsfeld

Reasons for the complexity dichotomy

	Perspective	Unsuccessful	Successful
1	Solution paradigm	Looks for a single correct solution	Looks for acceptable solutions
2	HKMF column	B–F	A and G
3	HKMF layer	Layer 2 moving up to layer 3	In layer 3 (OR)
4	Subjective complexity	Hard to understand	Easy to understand
5	Degree of confusion	Confusing ill-structured problems with complexity	No confusion
6	Structure of the problem	Ill-structured, wicked	Well-structured
7	Systems engineering camp	Process	Problem-solving, enabler
8	Number of entities* (level)	More than 7 ± 2	Up to and including 7 ± 2
9	Boundary of knowledge	Outside	Inside

* Objective complexity

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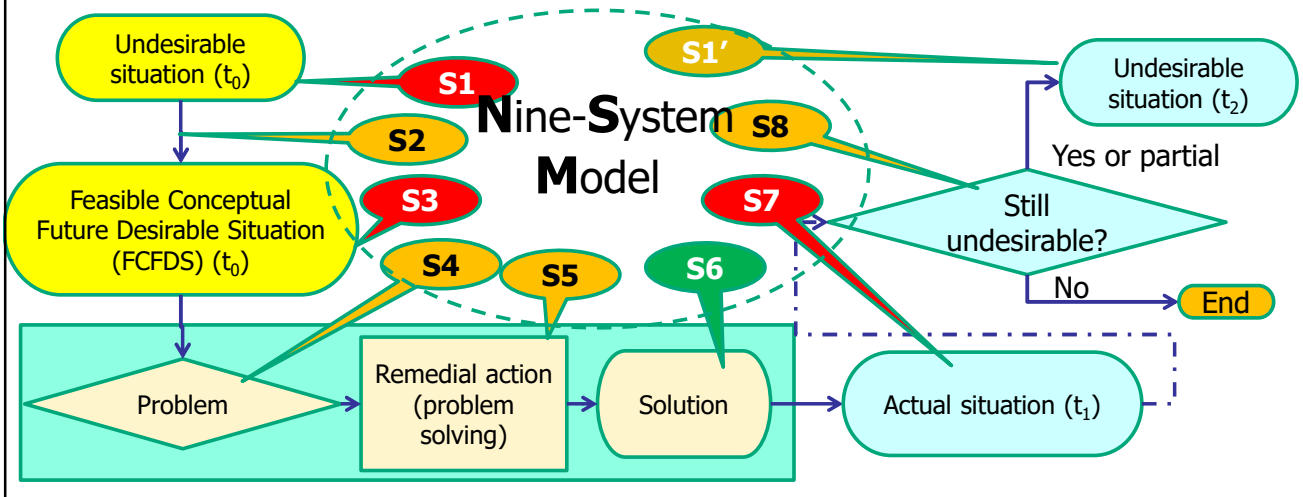
Holistic systems approach to managing problems and solutions

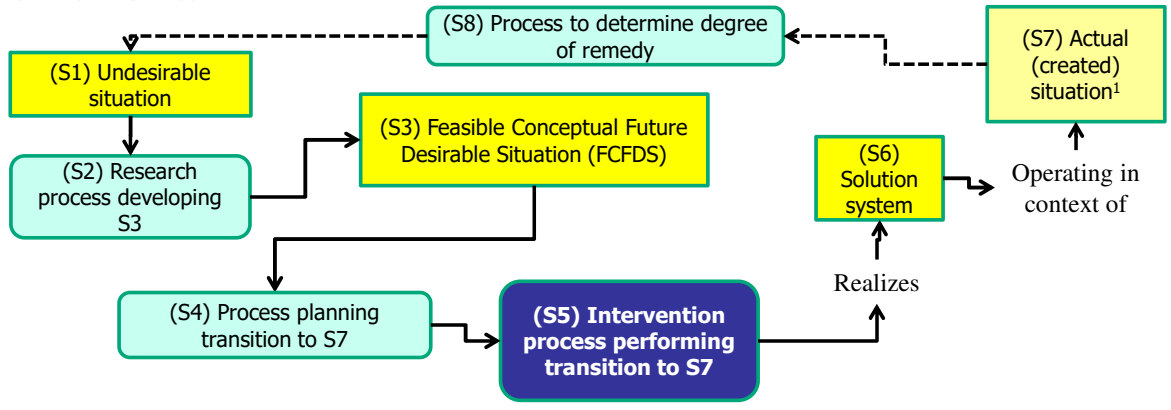


The 9 systems: situations, systems & processes

1. Undesirable or problematic **situation**
   - Baselined at t_0, but will evolve during realization of solution system
2. **Process** to develop the 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**

The Nine-System model

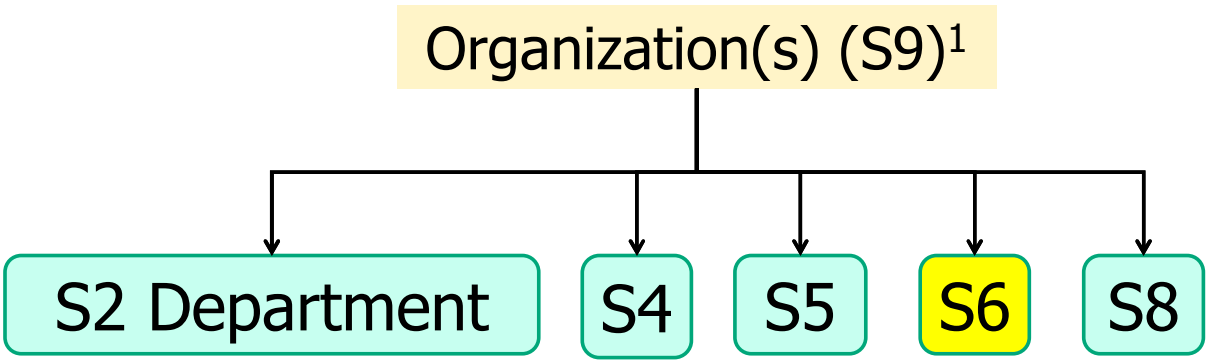
Functional HTP



1. The solution systems and the adjacent systems are subsystems in the actual situation

The Nine-System model

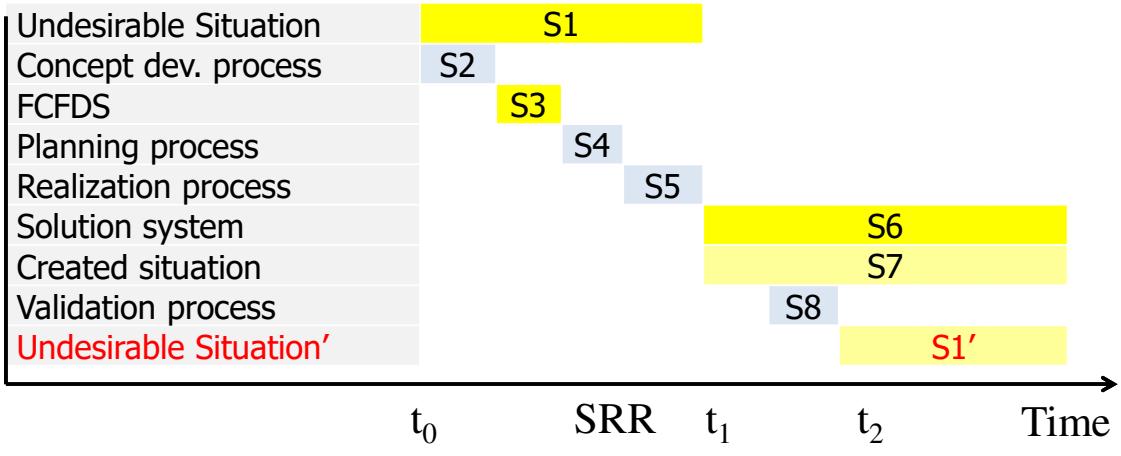
Structural HTP



1. Considered as one [class of] system but generally is at least two organizations

The Nine-System model

Temporal HTP



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Exercise 6-21

1. This class is S6, your organization is one of the S9s
2. Formulate your exercise problem using the Problem Formulation Template
3. Define the remaining seven systems
4. Use Brainstorming and Active Brainstorming to generate ideas about the nine systems
5. Prepare a <5 minute presentation on:
   1. The problem formulated according to the template
   2. The nine systems perceived from the descriptive HTPs
   3. The key questions that led to the identification of the systems
   4. Lessons learned from the exercise
   5. A compliance matrix
6. Save as a PowerPoint file as Exercise6-21-abcd.pptx
7. Post in the asynchronous group as instructed
8. Post/email presentation as, when and where instructed

Knowledge reading exercise 6-22

1. Prepare a brief on two main points in reading 0602 (< 5min)
2. Presentation to contain
    1. A summary of the content of the reading (<1 minute)
    2. The compliance matrix
    3. The problem formulated per the problem formulation template
    4. This slide and lesson version number
    5. A list of the 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 Exercise6-22-abcd.pptx
4. Post/email presentation as, when and where instructed
5. Brief on one main point

Knowledge reading exercise 6-23

1. Prepare a brief on two main points in reading 0605 (< 5min)
2. Presentation to contain
    1. A summary of the content of the reading (<1 minute)
    2. The compliance matrix
    3. The problem formulated per the problem formulation template
    4. This slide and lesson version number
    5. A list of the 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 Exercise6-23-abcd.pptx
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Meeting the objectives

1. Explained complexity
2. Explained the difference between simple and complex problems
3. Explained how to remedy complex problems
4. Explained how to remedy wicked problems

Any questions ?

1. Best
2. Worst
3. Missing

Email:
beyondsystemsthinking@yahoo.com
Subject: <class title> BWM Lesson #