

# Information Envelope And Uncertainties therein

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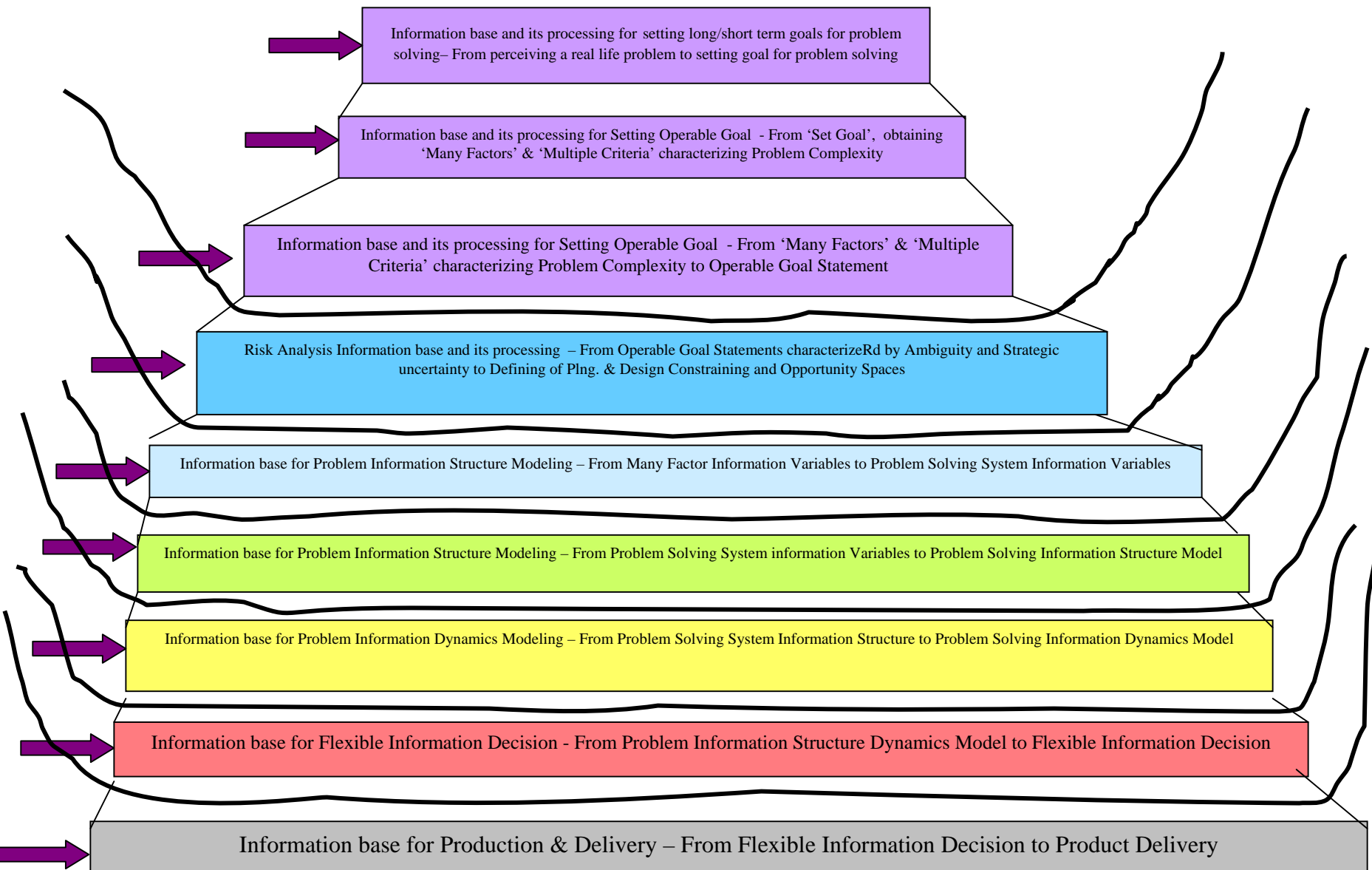
Course Lecture # 23

2006-2007

Lecture # 23  
Information Envelope  
And Uncertainties therein

# INFORMATION ENVELOPE

- Development of information bases for flexible information decision as studied in Lecture # 19 gives rise to *information envelope* characterizing an open, complex system.
- Information envelope shows that information model should include entities in respect of both normative information as also factual information.
- Figure in the next slide gives the systems view of the information envelope so emerging.



**Figure : A Systems View of Information Envelop characterizing an Open, Complex System and its Integrity Implications**

# **UNCERTAINTIES CHARACTERIZING INFORMATION ENVELOPE**

# UNCERTAINTIES IN SETTING LONG TERM GOAL

- Lecture # 19 has developed systems representations of information bases constituting the information envelope. These system representations indicate uncertainties present at each each base. These uncertainties, which lead to informational errors, are briefly listed here.
- Uncertainties in long term goal setting are caused by:

Assumption of linear trend

# UNCERTAINTIES IN SETTING GOAL, IN IDENTIFYING MANY FACTORS AND MULTIPLE CRITERIA ARE CAUSED BY....

- Goal selection based on obviousness of a problem or competence to solve it,
- Due to difficulty in taking a system's view, recourse to an ad hoc "Repair-Service" approach,
- Minimal capacity and inclination in dealing with time,
- Need to preserve a sense of self competence amounting to self-protection tendency,
- Difficulty in recognizing complex goals,
- Not analyzing complex goals by breaking them into concrete, partial goals; risking activity at hand taking a life of it's own,
- Clear Guidelines for applying criteria & for assessing if goals met not common in the real world,
- Danger of Goal Degeneration through: (a)Effect of 'Flow Experience'; (b) Adherence to safe option in the wake of insecurity. This can lead to incorrect identification of multiple goals, which make implicit goals explicit,
- Malfunctions that emerge with delay,

## **UNCERTAINTIES IN SETTING OPERABLE GOAL STATEMENT ARE CAUSED BY....**

- Difficulty to recognize that complex goals are characterized by inter-related criteria. This leads to incorrect identification of interdependent goals,
- Goal inversion, conceptual integration, and conspiracy theories, leading to incorrect identification of conflicting goals, which are negatively linked,

## **UNCERTAINTIES IN IDENTIFYING PROBLEM SOLVING SYSTEM VARIABLES ARE CAUSED BY....**

- Difficulty in recognizing interdependent variables,
- In the dynamic decision making process, if information gathered is less, it creates uncertainty. If more information is gathered, it also adds to uncertainty. Requirement is to gather just optimum, i.e., just correct information, information with Integrity.

# UNCERTAINTIES IN DEVELOPING PROBLEM INFORMATION STRUCTURE ARE CAUSED BY....1

- Uncertainties in developing problem information structure concern uncertainties in identifying interdependencies of culled out information variables. These are caused by variety of reasons. These reasons are as follows.
- Insufficient assessment of reality model,
- Disregard for systemic nature of situations,
- Difficulty in thinking by analogy,
- Difficulty in pursuing efforts to know more,
- Difficulty recognizing interrelated variables,
- Looking at problem as a sequence of problems to be solved one at a time,
- Not accounting for side effects and repercussions of certain measures,
- Not recognizing problems that come with delay,
- Difficulty in having big picture,
- Preoccupation with immediate goals leading to dealing with partial goals in isolation,

# UNCERTAINTIES IN DEVELOPING PROBLEM INFORMATION STRUCTURE ARE CAUSED BY....2

- Information overload,
- Economizing on cognitive energy leading to see a system as a bundle of unrelated individual systems and leading to neglect of side effects and repercussions,
- Adoption of reductive hypothesis,
- Effects of overgeneralization in the form of:
  - (a) Tendency to deconditionalize,
  - (b) Tendency for similarity (as against dissimilarity) matching,
  - (c) Inability to recognize that effectiveness of a measure almost always depends on the context within which measure is produced, and
  - (d) Tendency (in the face of insecurity) to act either with minimal information (saving on cognitive energy) or by gathering excessive information

# UNCERTAINTIES IN DEVELOPING PROBLEM INFORMATION STRUCTURE ARE CAUSED BY....3

- Other types of uncertainties:
  - Uncertainty in observing co-variance, between which there is time lag . This requires collection and integration of data/information over time.
  - How long should one observe? Observation over less time will give incorrect structural information. To continue to observe for long time will delay planning and action. How to decide on the optimum time needed for observation?
  - Difficulty due to complexity,
  - All Information variables not observable,

# **UNCERTAINTIES IN DEVELOPING PROBLEM INFORMATION STRUCTURE DYNAMICS ARE CAUSED BY...1**

- Difficulty in perceiving – recognizing, dealing, arranging in time,
- Tendency to treat successive steps in temporal development as individual steps,
- Reliance on only few mechanisms of prognostication to gain insight in to the future,
- Limited focus on the present,
- Fixation with the characteristics of the moment brings with danger that too much significance ascribed to present circumstances,
- Fixation on linear future development preventing from anticipating changes in direction and pace.

# UNCERTAINTIES IN DEVELOPING PROBLEM INFORMATION STRUCTURE DYNAMICS ARE CAUSED BY....2

- Difficulty in dealing with non-linear configurations like “exponential growth,”
- Tendency to interpret numbers solely on the basis of their size,
- Tendency to rely on “feelings” or “intuition”- even professionals demonstrate this trait,
- Reliance on magical hypothesis as a result of overgeneralization,
- Misjudging non-linear growth,
- Fallacy of “progressive conditionalizing” resulting in action completely devoid of reality,
- Fallacy of metahypotheses,
- Absence of learning mechanisms in the form of continuity and constant correctives in respect of information, making prediction difficult,

# UNCERTAINTIES IN DEVELOPING PROBLEM INFORMATION STRUCTURE DYNAMICS ARE CAUSED BY...3

- Other types of uncertainties:
  - Difficulty due to complexity
  - Information dynamics difficult to develop
  - Limited focus on a notable feature of the present
  - Extension of the perceived trend in a more or less linear and “monotone” fashion (that is, without allowing for any change in direction)

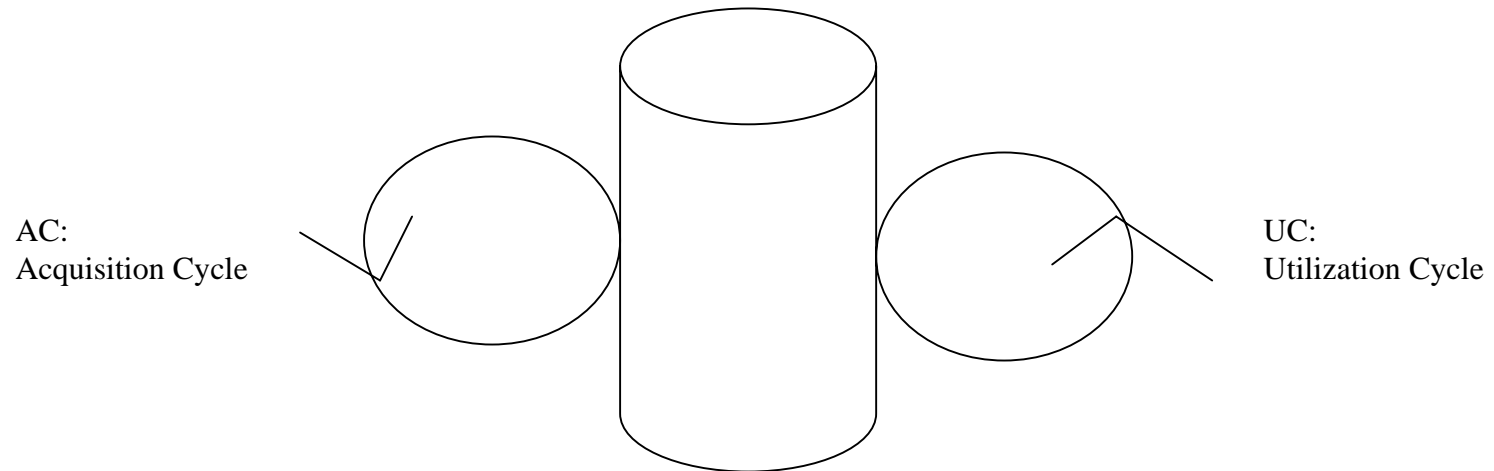
# UNCERTAINTIES IN DEVELOPING FLEXIBLE INFORMATION DECISION ARE CAUSED BY....1

- Difficulty in planning due to complexity,
- Deconditionalization,
- Effect of methodism: unthinking application of sequence of actions,
- Adapting “ballistic” behavior,
- Tendency for external attribution,
- Goal Inversion,
- Complex problem solving is a team activity which is a difficult task,
- Slowness of human thinking,
- Requirement to use time & effort economically or simplifying steps in thought process as much possible,
- In problem solving an approach like hill climbing method may take secondary peak instead of main one,
- Succumbing to methodism, e.g., adopting method of selecting most proven decision/action,

## UNCERTAINTIES IN DEVELOPING FLEXIBLE INFORMATION DECISION ARE CAUSED BY....2

- Being captive to old ideas, may not be considering all available possibilities,
- Long association of particular item with particular function makes it difficult to imagine item is serving any other purpose,
- Given the dynamic decision making that the problem solving requires, under-planning & over-planning, both add to **uncertainty** (insecurity). Requirement, therefore, is for optimum planning, i.e., just correct information gathering – information with integrity for planning so as to achieve end planning goal of deciding on integrity flexible information decision for control implementation.

# IMPLICATION FOR DBMS: TOWARDS A MORE WORKABLE MODEL - IBMS



# IMPLICATIONS OF IBMS

- Need to ensure integrity of acquisition cycle
- Need to ensure integrity of data base
- Need to ensure integrity of utilization cycle
- This takes the exercises such as say data mining well beyond the mere data retrieval interpretation of the task and adds to it the requirements of evaluation of the information retrieved and *used*.
- Requirement of I\*I at every stage is fundamental to this exercise.

**THANK YOU**