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The Science of Complexity
and
How it translates into
Interactive Management work

Note: SBSOC refers to the Structure-Based Science of Complexity

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"THE OBSCURE WE SEE

EVENTUALLY, THE

COMPLETELY APPARENT

TAKES LONGER"

---- **Attributed anonymously to Edward R. Murrow**

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A. THE TWO-DOMAIN THEORY

THE NORMAL DOMAIN	THE DOMAIN OF COMPLEXITY
People solve a problem. Defining the problem is the first step. Universities teach about this domain.	People struggle with a "problematic situation" There are many inter-linked problems. Sometimes a resolution Is achieved, but not often. Universities ignore this domain.

B. THE THREE-LEVEL ORGANIZATION

Level 1. The Strategic Level   **(Survive and grow)**
Level 2. The Tactical Level   **(Mediate and Reconcile Levels 1 and 3)**

Level 3. The Producing Level
        (Deliver goods and services of the
        organization)

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C. Linking the Domain of Complexity to the Three-Level Organization

The Domain of Complexity and the Three Organizational Levels are to be jointly dealt with, because individuals acting alone can't resolve complexity, because organizational roles in the three levels require adjustments, and because sustained organizational resources are required at implementation time.
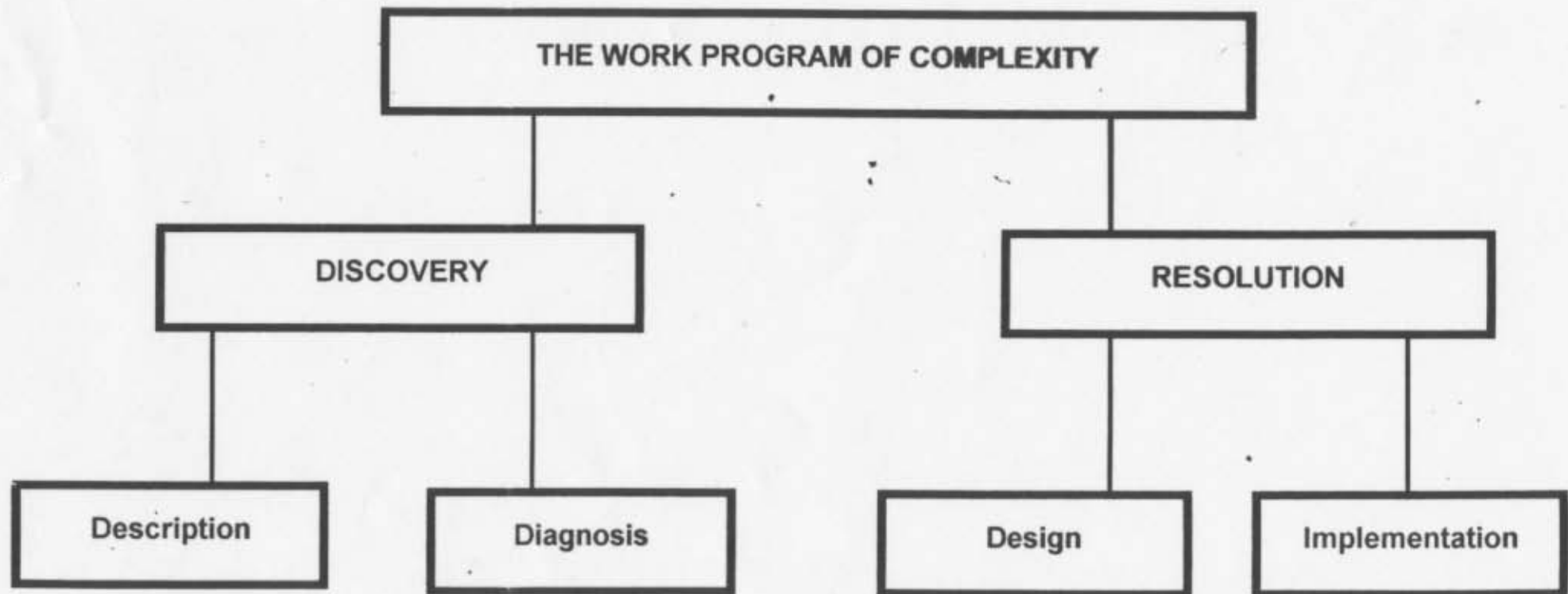
The organization requires an appropriate infrastructure to enable the Work Program of Complexity to be carried out with sufficient quality to inspire the confidence needed to enable implementation to be carried out.

The individual who conducts an organizational intervention in the Domain of Complexity, and thinks that he/she can supplant the Work Program of Complexity and the Organizational Infrastructure is walking down the proverbial "primrose path".

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STRUCTURE OF THE WORK PLAN FOR UNDERSTANDING AND RESOLVING COMPLEXITY

January, 1999-John N. Warfield

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          ┌─────────────────────────────────────────────┐
          │      THE WORK PROGRAM OF COMPLEXITY          │
          └─────────────────────────────────────────────┘
                 │                              │
        ┌────────────────┐            ┌────────────────┐
        │   DISCOVERY    │            │   RESOLUTION   │
        └────────────────┘            └────────────────┘
         │          │                  │            │
   ┌───────────┐ ┌───────────┐   ┌───────────┐ ┌──────────────┐
   │Description│ │ Diagnosis │   │  Design   │ │Implementation│
   └───────────┘ └───────────┘   └───────────┘ └──────────────┘
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WORK PROGRAM OF COMPLEXITY: PRODUCTS OF DESCRIPTION

- **Problem Set**

Between 35 and 180 problems generated in response to a triggering question

- **Clarified Problem Set**

Attaching, to each problem in the Problem Set, a set of clarifying remarks

- **Partitioned Problem** Set, Blocks PI and P2

PI (The Selected Subset) consists of those members of the Problem Set for which *at least one* participant thought the member to be in the top 5 in terms of importance (between 20 and 40 members, usually)

P2 (The Deferred Subset) consists of those members of the Problem Set which *no* member found to be in the top 5 in terms of importance

- **Voting Record on Important Problems**

The records of individual participant votes to determine the five most important problems in the original problem set, and to rank them in order importance

- **Weighted Voting Scores for Important Problems**

Each problem in PI has a Weighted Voting Score found by adding the weighted scores of all participants in their rankings of the problems

- **Problematique**

A prose-graphics structure showing how problems aggravate (make worse) one another

- **Problem Field**

Showing an Organization of the Problem Set into Problem Categories

- **Problem Categories**

Categories of the Problem Set discovered (NOT preselected) when developing the Problem Field (between 6 and 20 categories, usually)

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WORK PROGRAM OF COMPLEXITY: PRODUCTS OF DIAGNOSIS

* **Problem Scores**

They are found by analysing the Problematique.

- Problem Influence Score, Activity Score, and Net Score.

* **Problem Status Categories Report**

- Critical Problem. This problem type has high Influence, aggravates many other problems, and was rated as among the most important by the group. Conclusion: It deserves immediate, high-priority attention.

- Underrated Problem. This problem type has high influence, aggravates many other problems, but was not recognized as among the most important by the group. :

Hypothesis: This problem deserves immediate, high-priority attention. The group should reevaluate the importance in the light of interactions.

- Overrated Problem. This problem type received a high NGT weighting score and a high activity score, but it has a low or negative influence score. Because it does not aggravate many other problems it is probably not as important for the moment at least, as several group members imagined.

Hypothesis: Action on this problem should very likely be deferred until some later time.

- Cyclic Problem. Problems in cycles aggravate each other.

Hypothesis: Problems in cycles should be acted on collectively, and this should be recognized in team working assignments.

- High Activity Problem. Problems of this type are both aggravated by other problems and aggravative to other problems, even though their influence may not be high.

Hypothesis: The interactions involving these problems should be studied in detail, and recognized in choosing personnel for task forces.

- High-Weighted Problem. This type of problem was thought to be quite important in the NGT voting, but this voting has been shown to be unreliable. (This category overlaps but is not the same as category 3).

Hypothesis: Interactions involving these problems should be studied carefully and their importance should be reevaluated in the light of the interactions.

* **Categories Problematique**

* **Interpretation Session for Participants**

* **Computed Values of the Five Indexes of Complexity**

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WORK PROGRAM OF COMPLEXITY: PRODUCTS OF DESIGN

- Options Set;
  Clarified Options Set
  Tailored to the Problem
  Categories

- Options Field,
  Showing Options
  Categories

- Triply-Structured
  Options Field

Structured first on Inclusion (above), next on dependency among categories, and finally on category choice sequence, in preparation for choosing options.

- Two or Three Options
  Profiles

Prepared by two or three small teams, starting with the same triply-structured Options Field, and choosing options in the light of all available products from the previous IM work.

- One Integrated Option
  Profile

The facilitator gets team reports from the group on their separate options profiles, and then facilitates a discussion in which they are merged into a consensus Design Alternative

- Enhancement Structure

Optional, but can show how chosen options help achieve other chosen options

- DELTA CHART

Shows the action sequence chosen to implement the selected Design Alternative (Integrated Options Profile), along with work assignments and key decisions required along the way to implementation
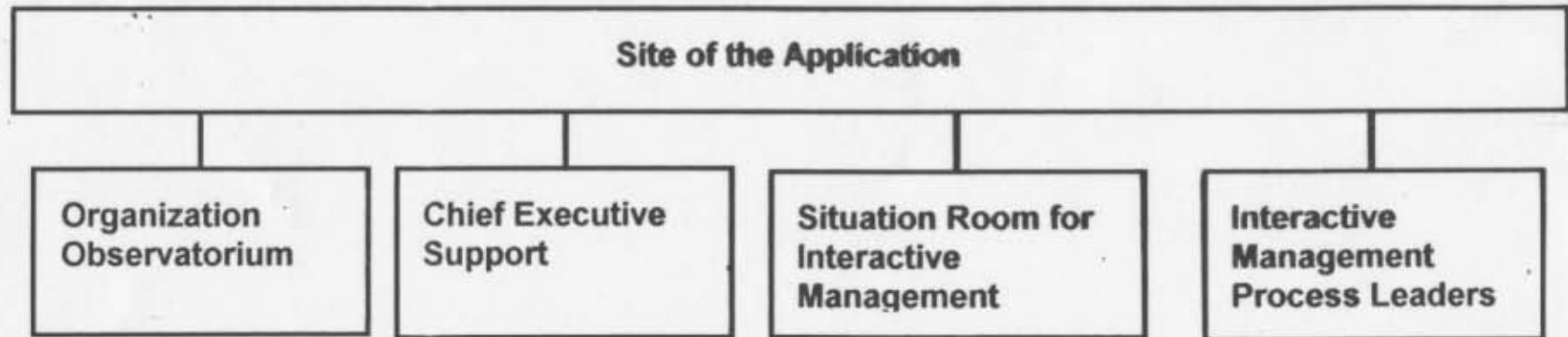
- Resolution Structure

(Optional). Shows how the various selected options help resolve the problems, by connecting the chosen options to the Problematique.

- Plausibility Structure

(Optional) Projects the plausibility of desired results, based on how the options interact

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COMPONENTS OF THE INFRASTRUCTURE OF THE ORGANIZATION IN WHICH THE SCIENCE OF COMPLEXITY IS TO BE APPLIED

Site of the Application			
Organization Observatorium	Chief Executive Support	Situation Room for Interactive Management	Interactive Management Process Leaders

The four key components of the Infrastructure of the Organization that are needed in order to apply the Science of Complexity effectively are shown above. Chief Executive Support is needed to enable the work to proceed across institutional boundaries (both horizontal and vertical). The IM Process Leaders are needed to provide continuity within the organization and to serve whatever legitimate needs arise. (They may or may not carry out the IM Workshops, which could be contracted out.) The Situation Room is needed to enable effective group work to be done, and to make the IM work efficient, saving of group resources. The Organization Observatorium portrays the products of IM Work for all learners.

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BEHAVIORAL PATHOLOGIES AFFECT CLIENT AND INTERVENOR ALIKE

Individual Pathologies

- **Triadic Compatibility,** no extension to larger aggregates (Miller, Simon)
- **Negative Behavior** in the social-emotional area (Bales)
- **The Boulding Triad:** unproductive emulation, spurious saliency, cultural lag
- **Unquestioned Acceptance of Received Doctrine,** if it comes from "prestigious" experts and organizations
- **Linguistic Pollution** (Production and propagation)
- **"Killer Assumptions"** (Susceptibility to them)

Group Pathologies

- **Groupthink** (Janis, Allison)
- **Clanthink**
- **Spreadthink**
- **Inadequate "Complexity Workspace"** (Acceptance of that almost everywhere in almost every medium)

Organizational Pathologies

- **Satisficing Behavior** (no internal search process) (Simon)
- **Silent Agreement on Undiscussability of some topics** (Argyris)
- **Subformal Communications** highly-determining (affording no opportunity for corrective inputs) (Downs)
- **Structural Incompetence** (organizational form disabling creativity and productivity, forcing undue behaviors)

The cumulative impact of these pathologies, eroding the capability of the people involved, makes it necessary that intervenors provide a well-designed and tested process capable of eradicating the impact of these pathologies, at the depth required by the thematic complexity.

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BRINGING COHERENCE TO INQUIRY

* ★ **Methodological Coherence: "the archaeological and genealogical study of practices envisaged simultaneously as a technological type of rationality and as strategic games of liberties"**

* ★ **Theoretical Coherence: "the definition of the historically unique forms, in which the generalities of our relations to things, to others, to ourselves, have been problematized"**

* ★ **Practical Coherence: "the care brought to the process of putting historico-critical reflection to the test of concrete practices"**

------- The quotations are from Paul Rabinow, Ed. (1984), THE FOUCAULT READER, New York, Pantheon Books, page 50.

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FOUNDER OF DISCURSIVITY

Michel Foucault has chosen the name "founder of discursivity" to refer to those "rare figures who provide a paradigmatic set of terms, images, and concepts which organize thinking and experience about the past, present, and future of society, doing so in a way which enigmatically surpasses the specific claims they put forth. This status is particular to the human sciences".

------- The quotations are from Paul Rabinow, Ed. (1984), THE FOUCAULT READER, New York, Pantheon Books, page page 25.

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AN ANALOGY

	Air	Action
Comprehensive domain	Air	Action
Component 1 (Subdomain)	Oxygen	Normal or Ordinary
Component 2 (Subdomain)	Nitrogen	Complexity
Typical pairing	Oxygen & Air	Normal or Ordinary & Action
Unlikely pairing	Nitrogen & Air	Complexity & Action