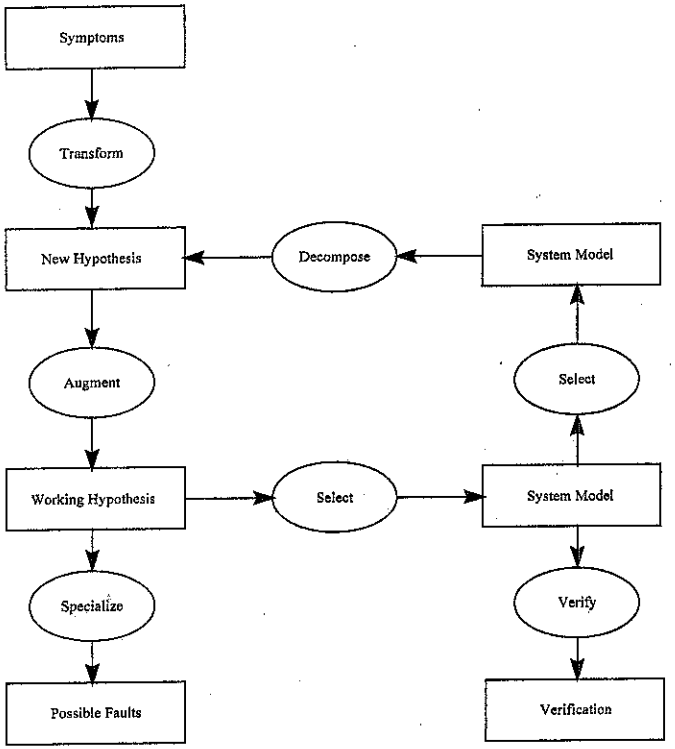
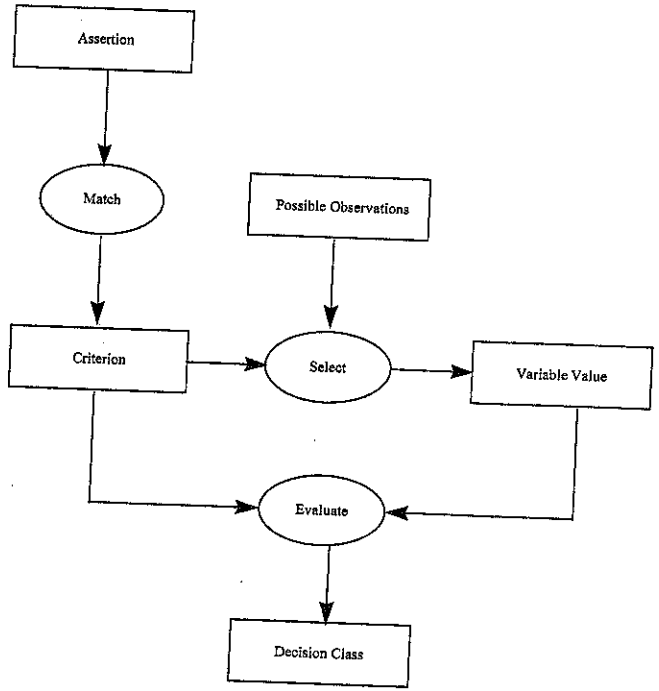
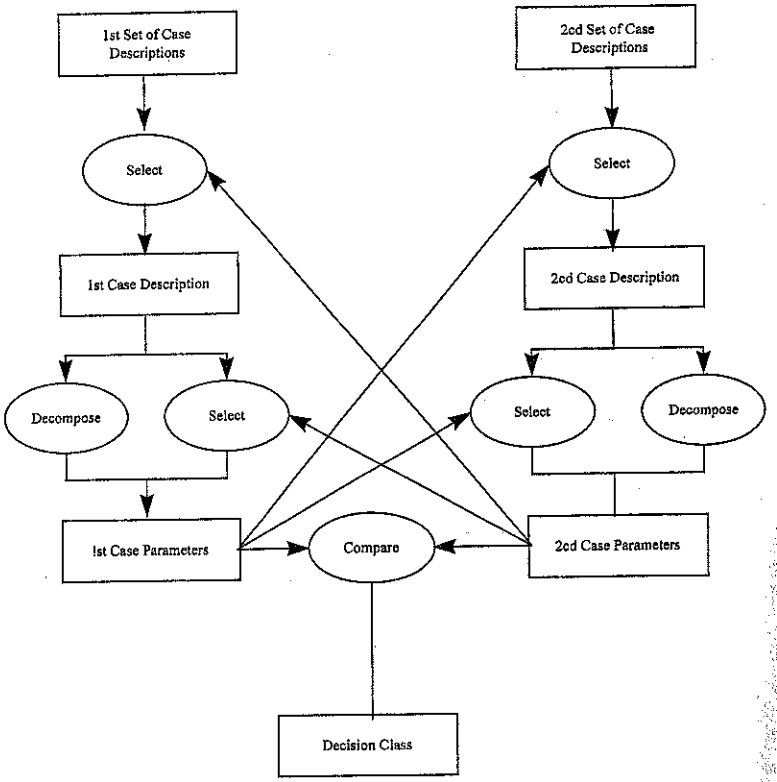
Name:	**Mixed Mode Diagnosis:** (Identification - Diagnosis)
Definition:	Identifying faults with a system, given a set of complaints, using a combination of the essence of the Localization and Causal Tracing tasks, together with Heuristic Classification.
Strategies:	Attempt to capture and separate out the different ways of operating the task.
Source:	*Tansley & Hayball, 1993*



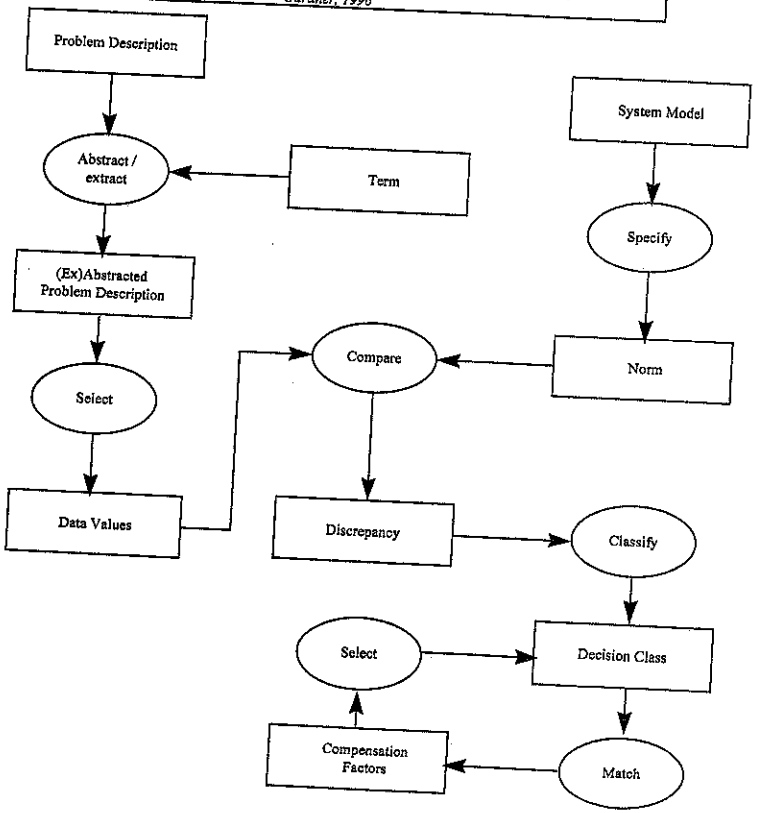
Name:	**Verification:** (Identification - Verification)
Definition:	Determining whether an assertion made about a system is consistent with (at least some of) the actual values of the observables of the system.
Strategies:	Describe how to choose between a goal-driven, data-driven, or mixed-initiative approach to verification, if needed. Otherwise, use a fixed approach.
Source:	*Tansley & Hayball, 1993*



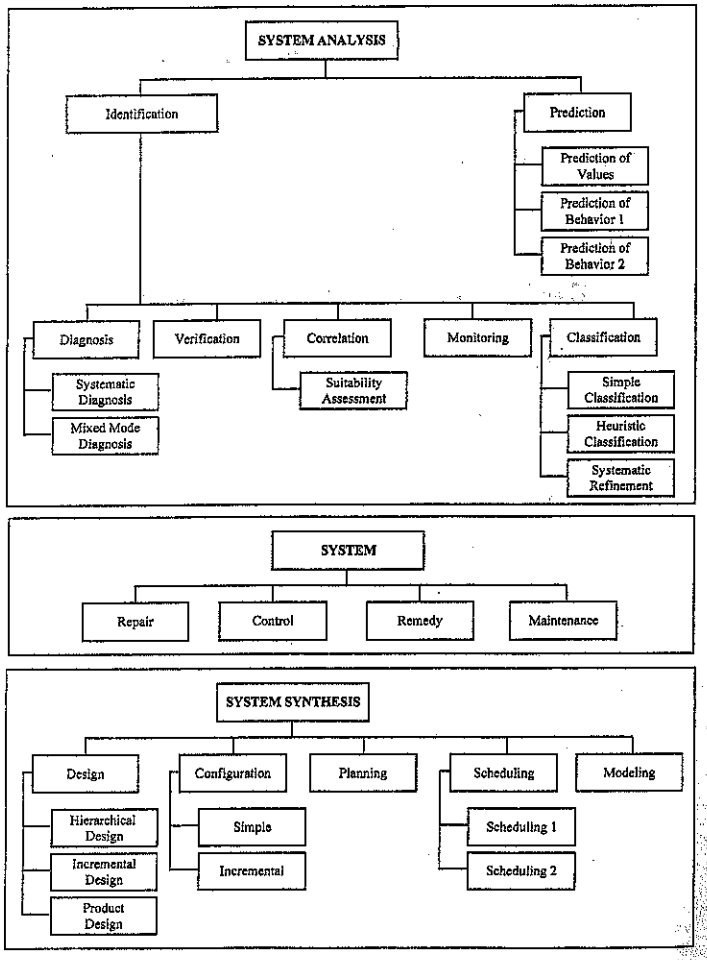
Name:	**Correlation:** (Identification - Correlation)
Definition:	Comparing two entities (systems) and producing some result on the basis of that comparison. *Assessment* is a specialization.
Strategies:	Correlation typically has a lot of strategic information. Base it on availability of data, format or structure of data, level of abstraction, changes over time.
Source:	*Tansley & Hayball, 1993*



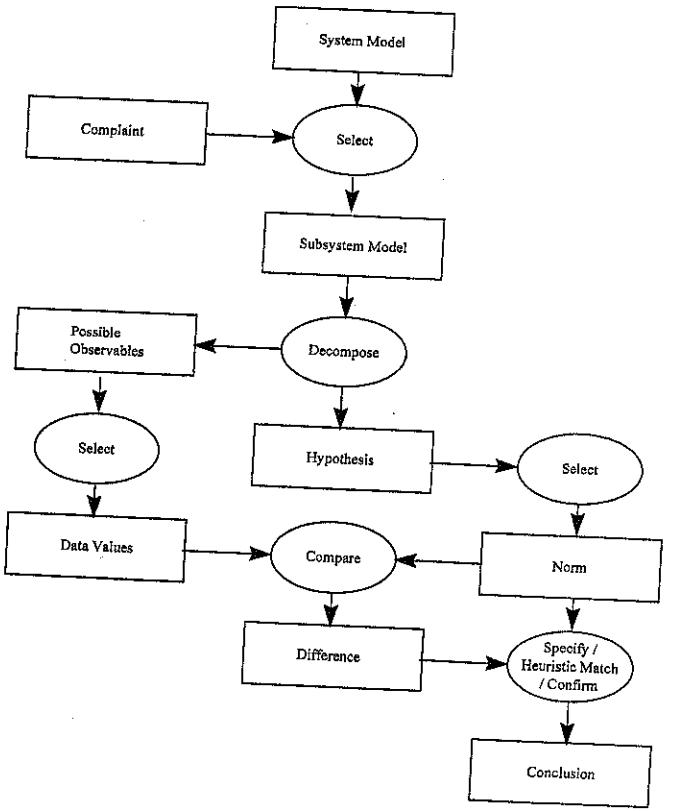
Name:	**Suitability Assessment:** (Identification - Correlation)
Definition:	The process of comparing an expected value with an abstracted or extracted data value, resulting in a (usually) binary decision, and where the decision may be subject to compensating factors.
Strategies:	Need for pre-assessment abstraction of data, top-down vs. bottom-down approach to working through the system model. How long to continue in the Compensation Loop.
Source:	*Gardner, 1996*



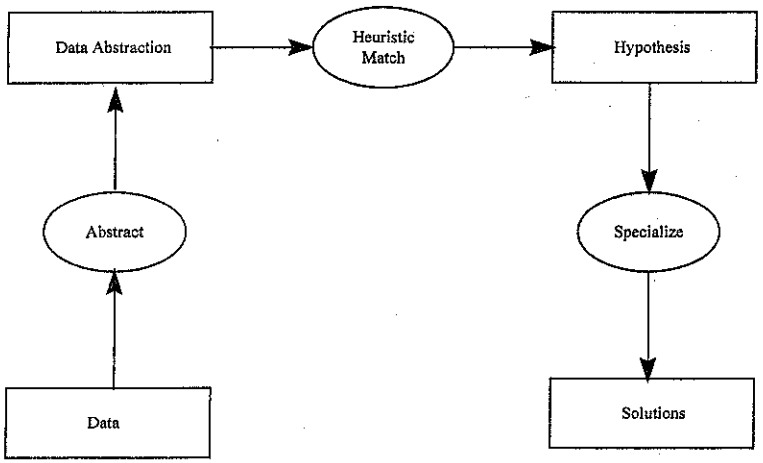
KADS Object
Problem Solving Template Taxonomy



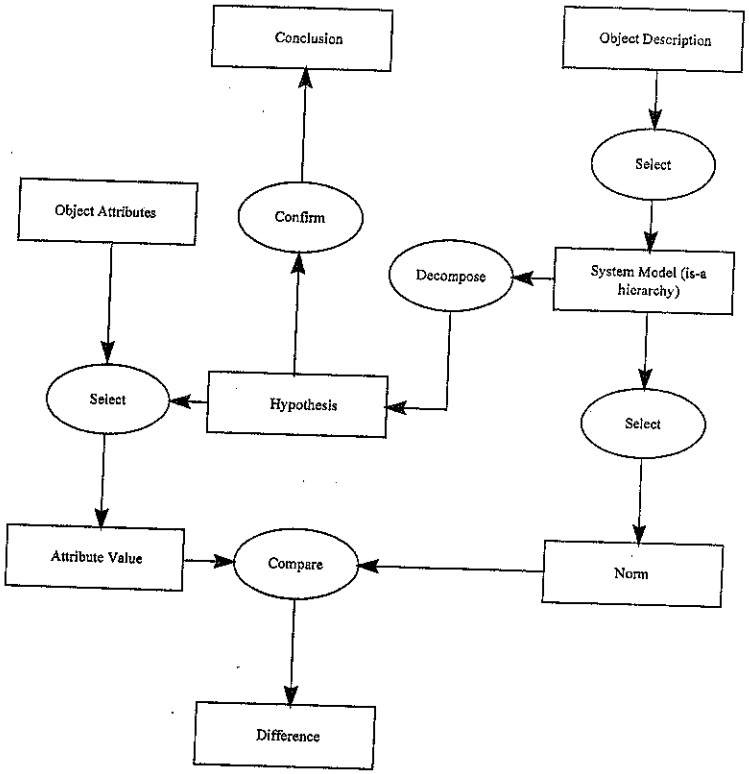
Name:	**Systematic Diagnosis:** (Identification - Diagnosis)
Definition:	Determining the cause and location of a problem by the use of hypothesis and tests.
Strategies:	Traverse a *consists-of* or *causes* knowledge structure.
Source:	*Tansley & Hayball, 1993*



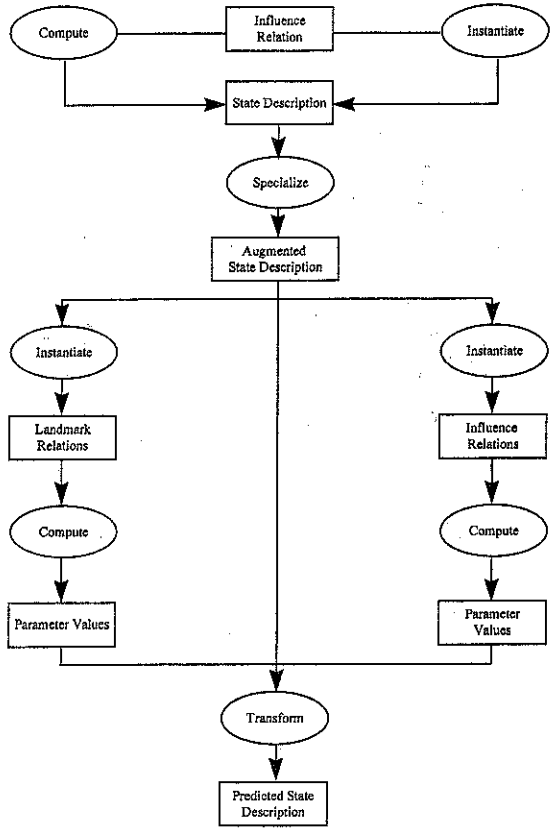
Name:	**Heuristic Classification:** (Identification - Classification)
Definition:	The process of hypothesizing and reaching a conclusion using heuristic knowledge.
Strategies:	If cost of obtaining data is high, choose backward-reasoning approach; else use a more forward-reasoning approach. How accurate must the solution be, to what level of classification? Which level of "specialize" is needed?
Source:	*Tansley & Hayball, 1993; Gardner, 1996*



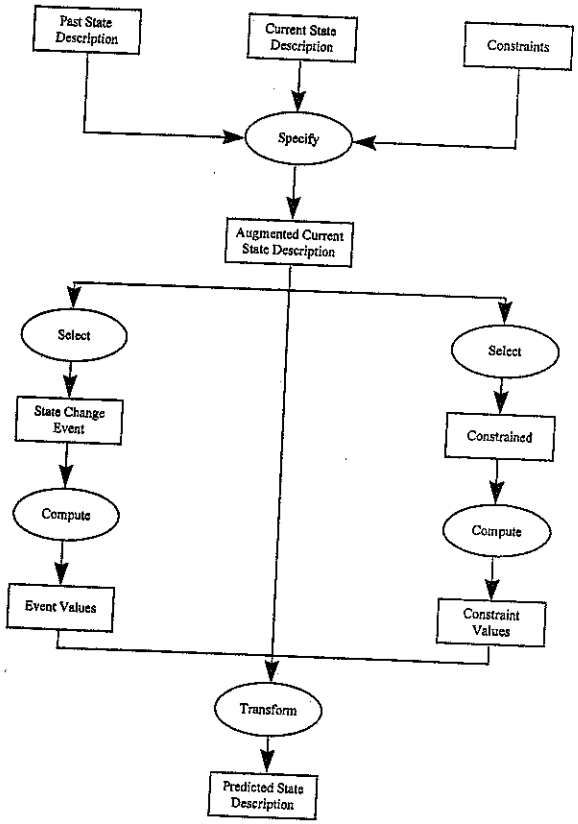
Name:	**Systematic Refinement:** (Identification -Classification)
Definition:	Traversal of a is-a knowledge structure in order to determine a refinement of an existing system.
Source:	*Tansley & Hayball, 1993*



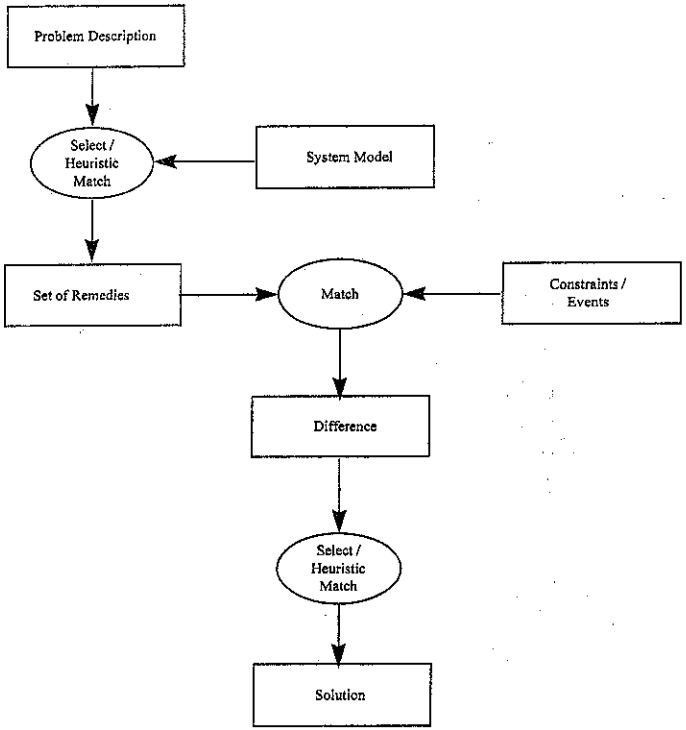
Name:	**Prediction of Behavior 1:** (Prediction - Quantitative Reasoning)
Definition:	Determine what will happen next, to or within a system in a certain situation. Precise prediction is not required. Use simpler quantitative math , quick problem solving. Use a library of modeling elements to build the system model.
Strategies:	Plan or choose a task structure (depth-first, breadth-first). Monitoring execution (when a reasonable outcome has been found).
Source:	*Tansley & Hayball, 1993*



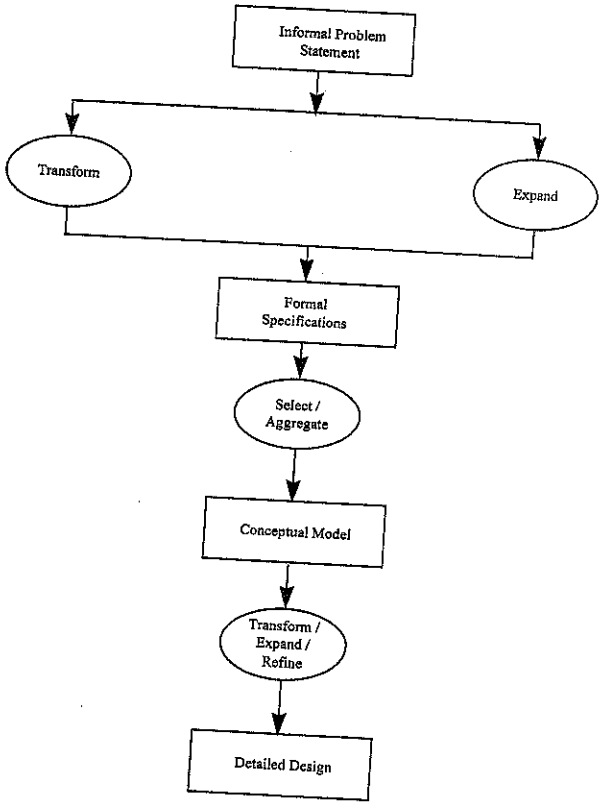
Name:	**Prediction of Behavior 2:** (Prediction - Quantitative Reasoning)
Definition:	Determining the future behavior of a system or structure by analyzing its current and past state.
Strategies:	Plan or choose a task structure (depth-first, breadth-first). Monitoring execution (when a reasonable outcome has been found). Updating/changing the task structure.
Source:	*Gardner, 1996*



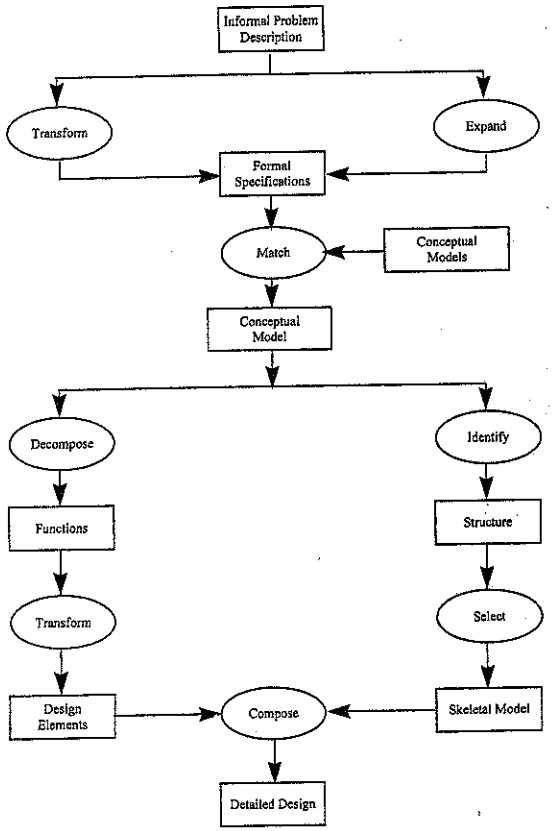
Name:	Repair: (Modification)
Definition:	Changing the characteristics of a "system" or structure with the goal of changing its behavior. This is an area of growth in KADS.
Source:	*Gardner, 1996*



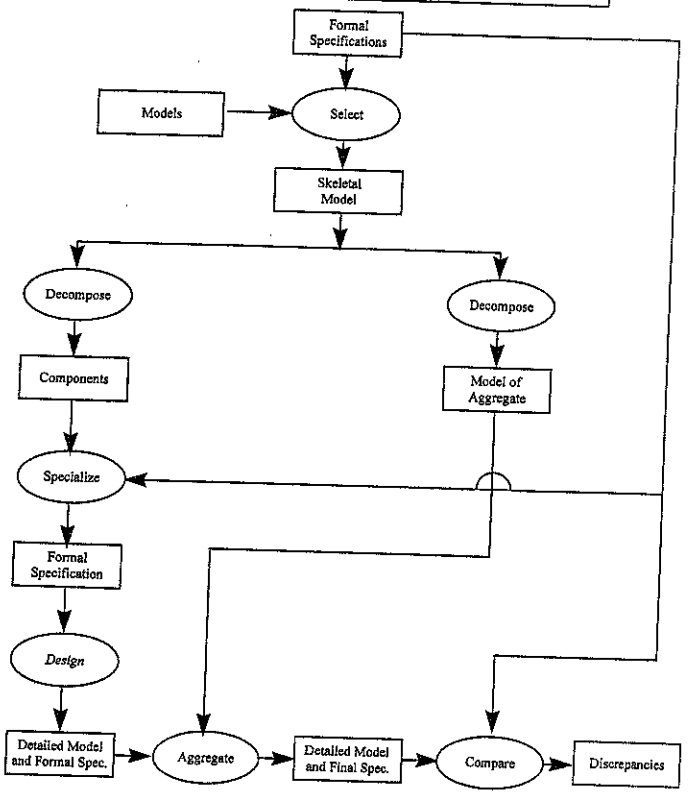
Name:	**Generic Design:** (Synthesis - Design)
Definition:	Specifying the components and architecture of some artifact, given a statement of the role that that artifact must fulfill.
Strategies:	Control of degree of overlap between inference. Could be based on externally arising constraints and/or constraints from design guidelines or paradigms.
Source:	*Tansley & Hayball, 1993*



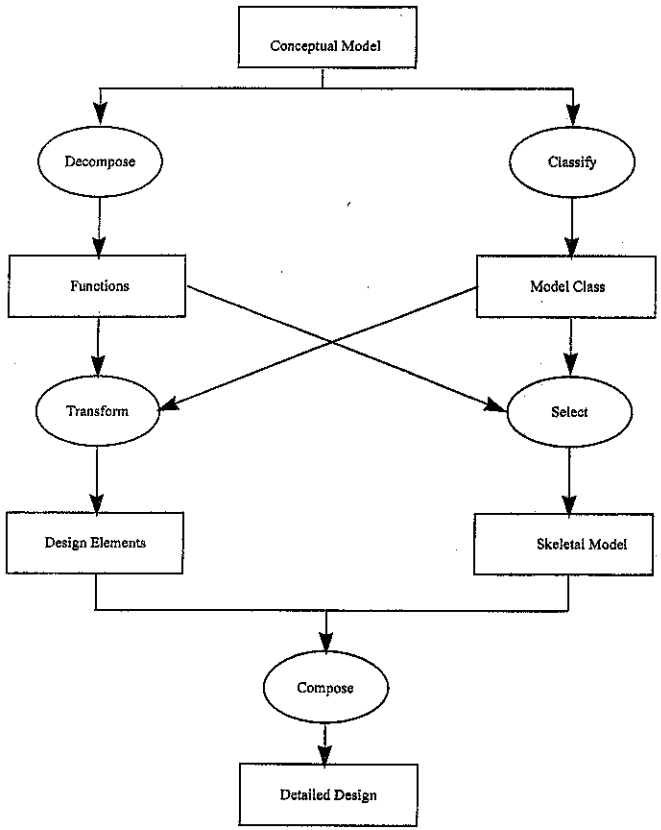
Name:	**Product Design:** (Synthesis - Design)
Definition:	Specifying the components, the structure and the function of a product, given a statement of the problem the product will solve.
Source:	*Gardner, 1996*



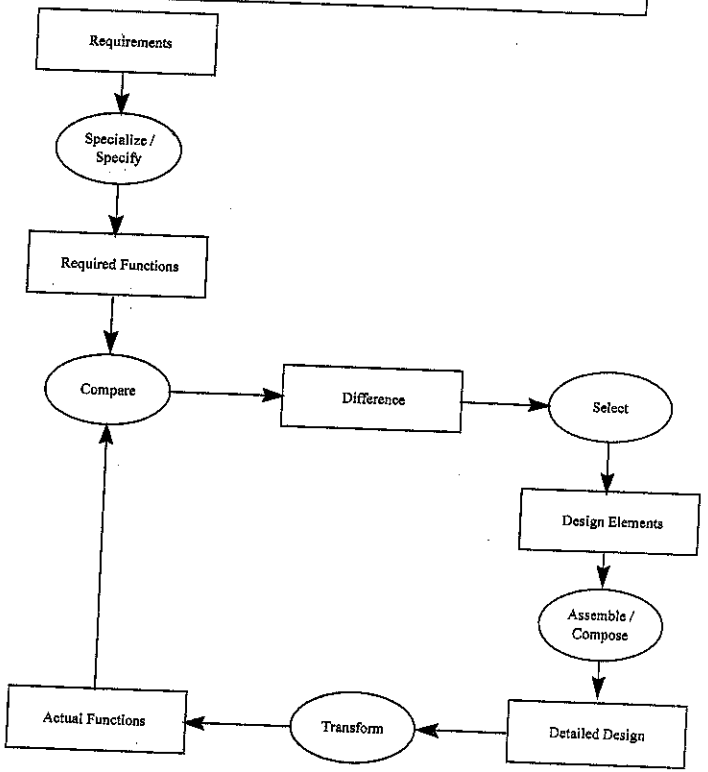
Name:	**Hierarchical Design:** (Synthesis - Design)
Definition:	A design task in which a model of the artifact is first built and then modified: the design works at different levels of abstraction by recursion. *This is a special case of the Generic Design and is not fully refined.*
Strategies:	If well understood, follow a structured task approach. Otherwise, fill in skeletal models. How long to recurse. *Note: recursive steps shown in italics.*
Source:	*Tansley & Hayball, 1993*



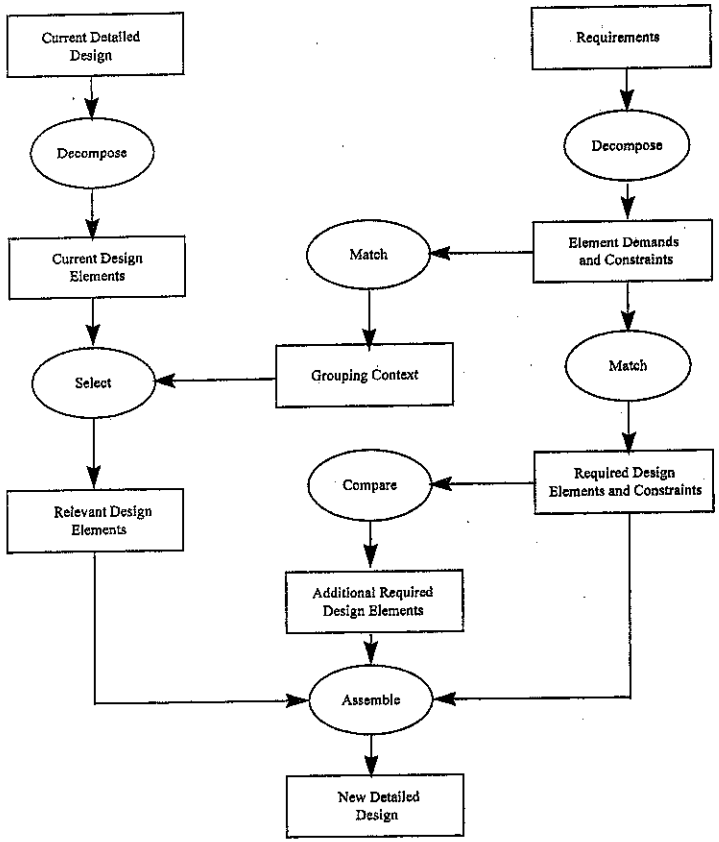
Name:	**Incremental Design:** (Synthesis Design)
Definition:	Expansion of the Transform/Expand/Refine inference found in generic design. *Special case of Generic Design and not fully refined.*
Strategies:	Describe if and how to combine functional decomposition-driven vs. conceptual model class-driven approaches. Are inferences carried out in parallel.
Source:	*Tansley & Hayball, 1993*



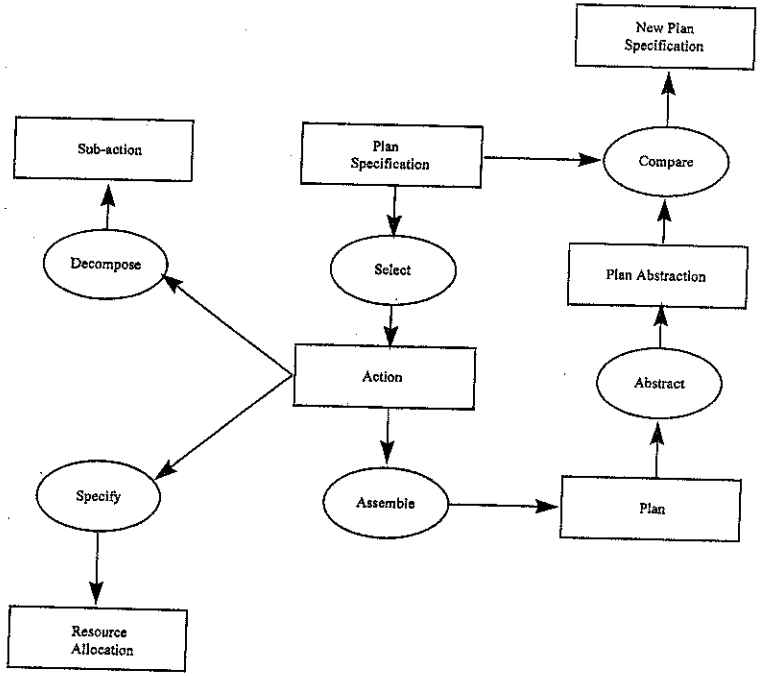
Name:	**Simple Configuration:** (Synthesis - Configuration)
Definition:	Assembling elements of a system together such that spatial or logical constraints are not violated in the case when there are no common resources that can help satisfy several types of functions.
Strategies:	Use pure nominate, pure verify, or mixture of the two. Control of overlap between inferences in nominate and verify.
Source:	*Tansley & Hayball, 1993*



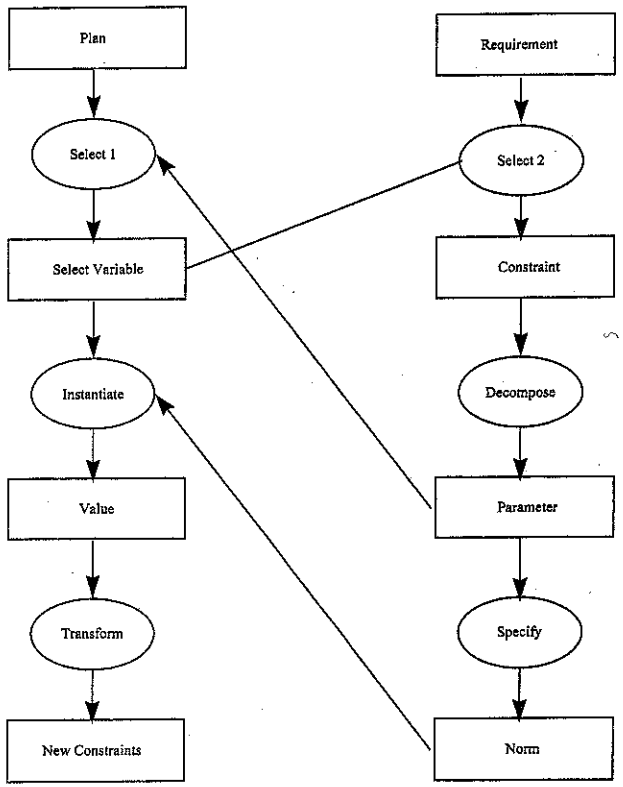
Name:	**Incremental Configuration:** (Synthesis - Configuration)
Definition:	Assembling elements of a system together such that spatial or logical constraints are not violated in the case when common resources can help satisfy several types of functions.
Strategies:	How to iterate over the "grouping contexts" and increase the coverage of the configuration. Ordering of the matches and decompositions.
Source:	*Tansley & Hayball, 1993*



Name:	**Planning:** (Synthesis - Planning)
Definition:	Taking an initial state and determining the actions required to meet a final goal (and sub-goal) within a set of constraints. Output is a refined version of the original plan with some or all of its actions decomposed. Optionally, a resource allocation can be output.
Strategies:	Identification of and resolution of conflict between goals. Importance of meta-goals.
Source:	*Tansley & Hayball, 1993*



Name:	**Scheduling 1:** (Synthesis - Planning)
Definition:	Take a plan and determine the temporal ordering of groups of actions within that plan according to a set of minimizing constraints.
Strategies:	Take into account a data-driven or constraint-driven approach or mixture of the two.
Source:	*Tansley & Hayball, 1993*



Name:	**Scheduling 2:** (Synthesis - Planning)
Definition:	Arriving at a schedule, given resources, planning steps, and planning periods.
Source:	*Gardner, 1996*