

V. Goal Diagrams

Goals and AND/OR Trreess

Softgoals

Building Goal Diagrams

How and Why Questions



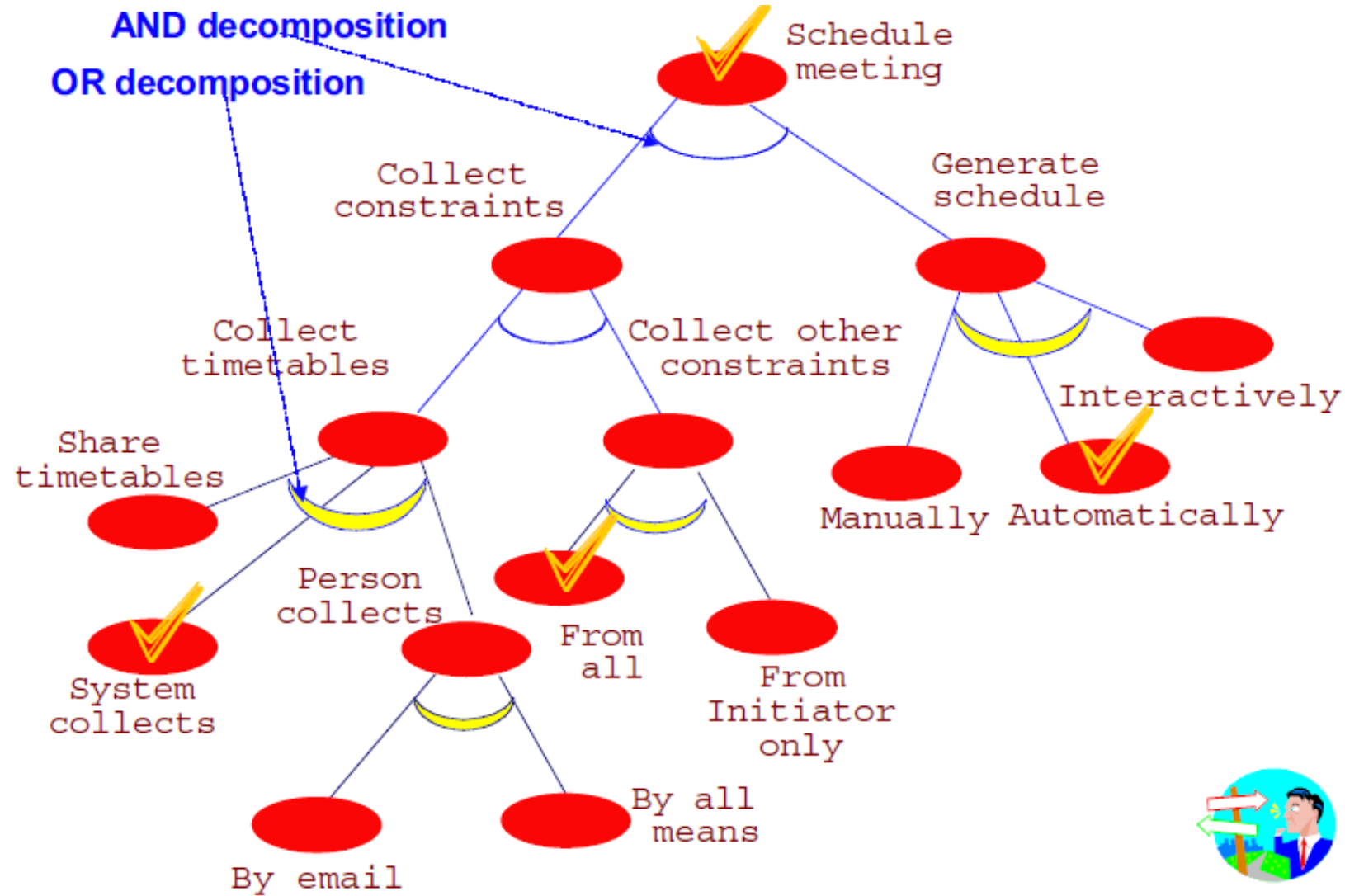
Presentation: N.C. Danh

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Goals

- *Goals represent business objectives for the new system and its operating environment.*
- *For example,*
 - ✓ *“Fulfill every book request” (Library organization)*
 - ✓ *“Produce 1M MacG5s within a year” (Apple), or,*
 - ✓ *“Serve more passengers” (TTC)*

Lifecycle Models



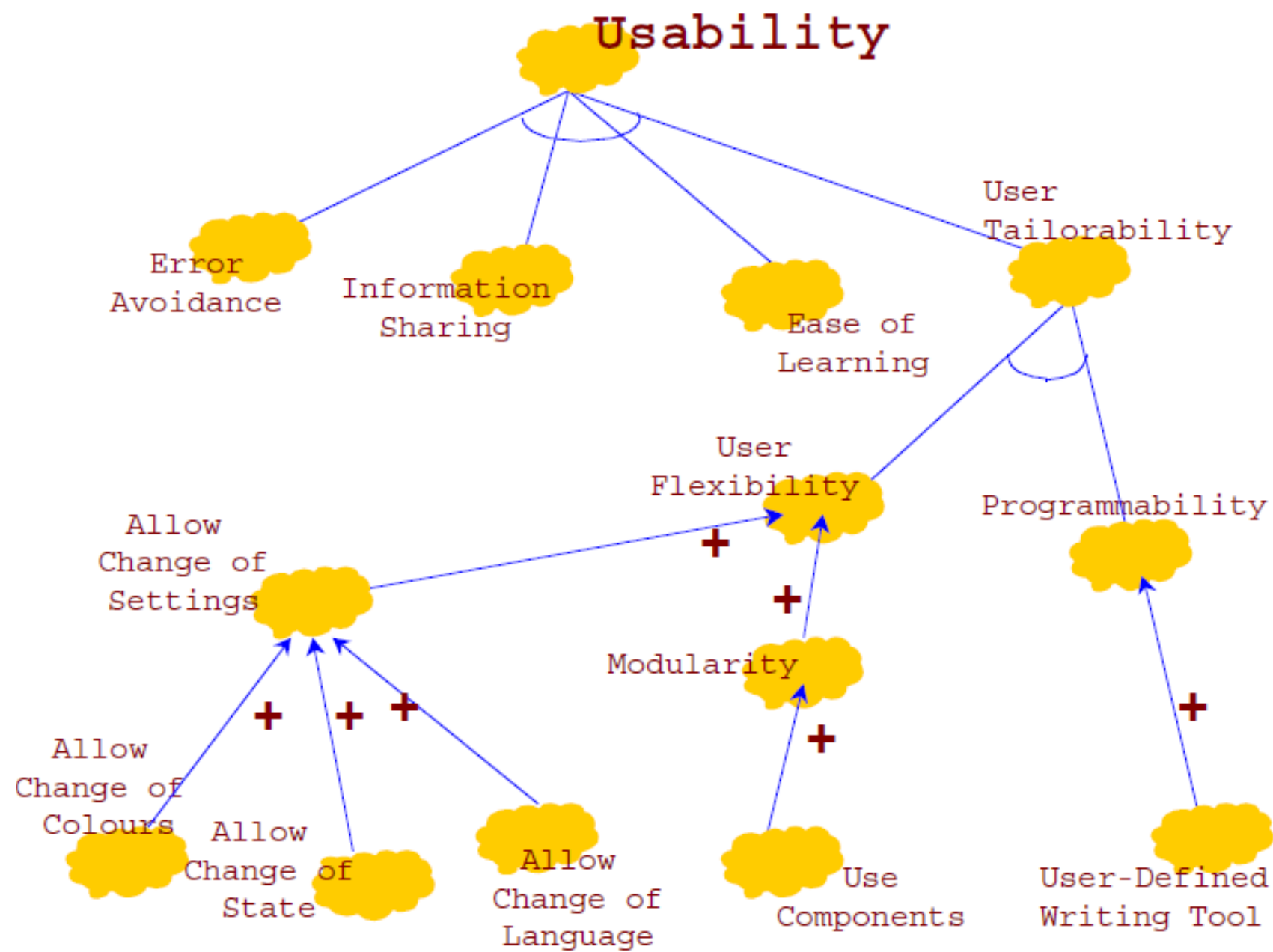
Alternatives for Satisfying Goals

- *An AND-goal is satisfied if all of its subgoals are; an OR-goal is satisfied if at least one its subgoals is.*
- *An alternative (solution) to a root goal G consists of a set of leaf goals which together satisfy G .*
- *There are 24 alternatives for the goal of the previous slide.*

Softgoals

- *These are goals that are used as criteria for comparing alternative solutions for other goals.*

E.g., Higher profits[ProductionUnit3] ,
Better service, Satisfied customer,
User-friendly[Interface, 2]
Portable[Module4]



Goal Relationships

- *We will use more than AND- and OR-relationships:*
 - ✓ *+ -- one goal contributes positively towards the fulfillment of another goal;*
 - ✓ *- -- one goal contributes negatively towards the fulfillment of another goal;*
 - ✓ *++ (--) -- one goal subsumes/negates another, i.e., if the first goal is fulfilled, the second is fulfilled/denied;*
- *With these enhancements, we can build goal models which could be useful for strategic business analysis or requirements analysis.*

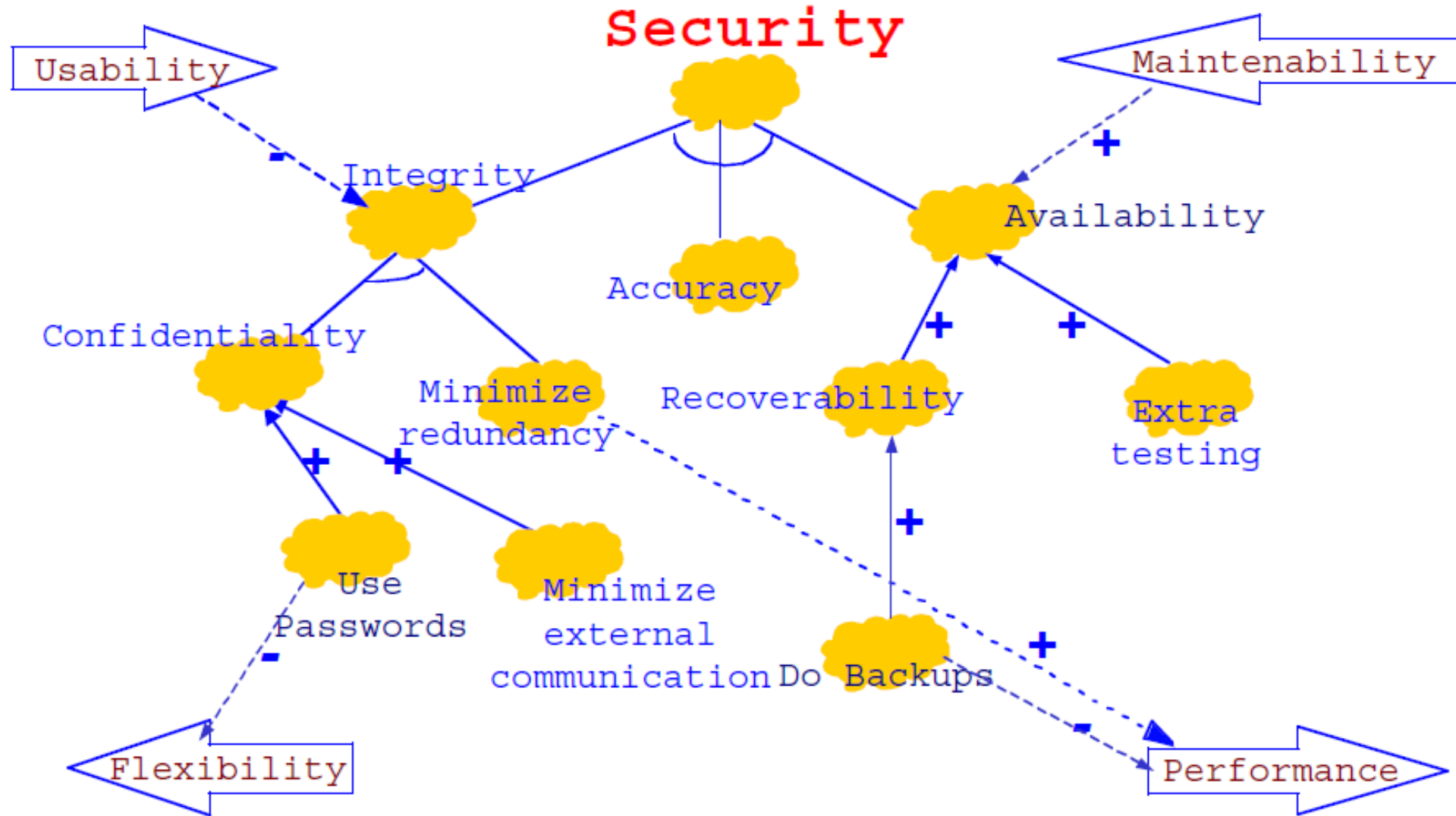
Alternatives for Satisfying Goals

- An **alternative** (solution) to the fulfillment of a goal *G* consists of one or more leaf goals which together fulfill the root goal.
- A **goal model** defines a space of alternatives for the fulfillment of its root goal.
- An alternative **A1 is better than A2 in fulfilling goal G** with respect to softgoals *G1, G2,...* if A1's net contributions to *G1, G2,...* (e.g., positive minus negative contributions) is greater than that of A2.
- In general, goals and softgoals can be contradictory. Given a set of root goals and softgoals, there may not be an optimal solution [Simon68]. Hence the search for **good-enough solutions**.

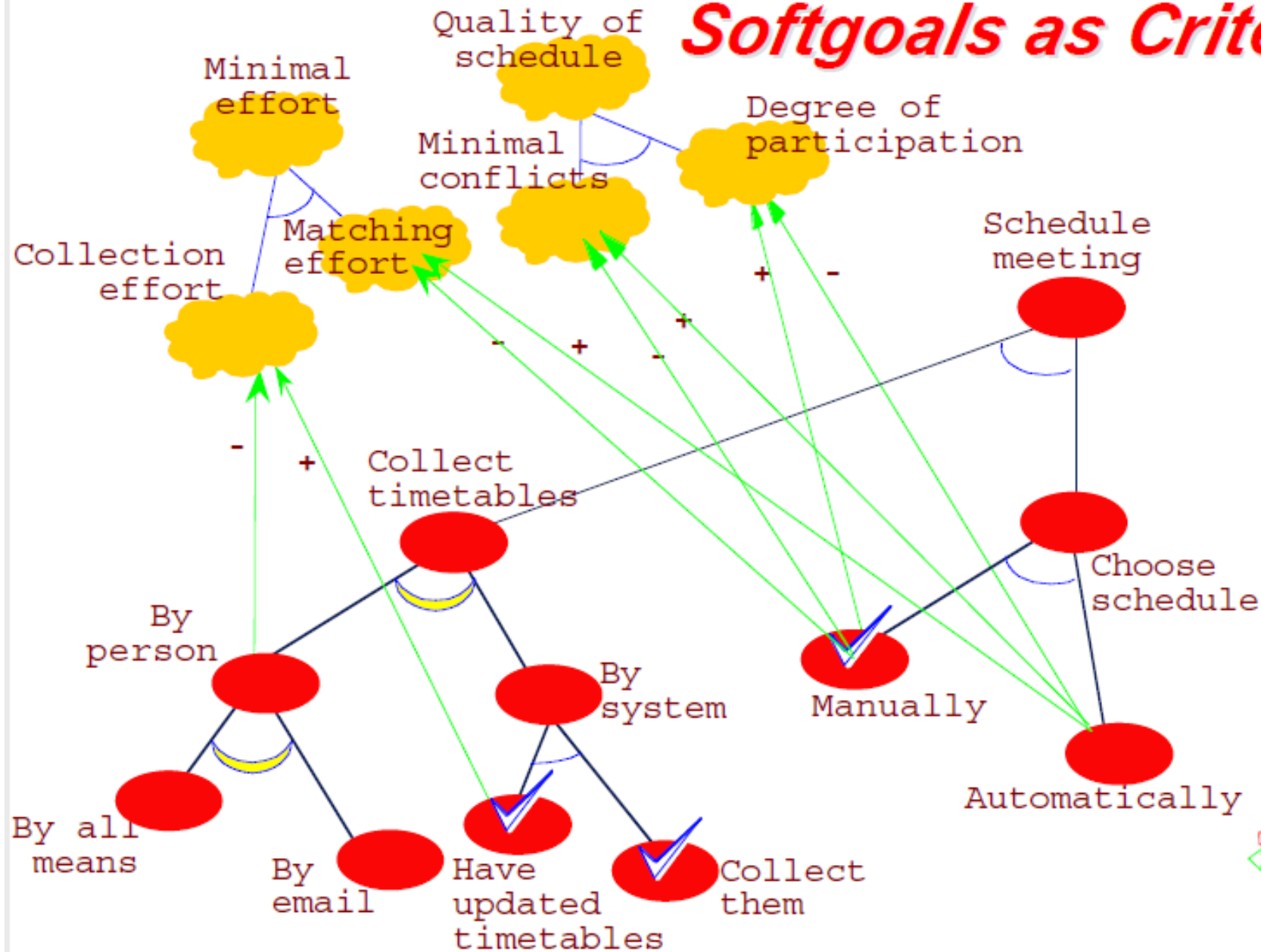
Building Goal Diagrams

- *Start from one or more goals and/or softgoals G_1, G_2, \dots, G_n which need to be fulfilled together.*
- *Analyze each, looking for ways to fulfill it through AND- or OR-decompositions, or through other refinements which contribute positively (**How** questions).*
- *Continue this process until there is enough positive support to fulfill all root nodes. At this point you have n disconnected goal trees $T(G_1), T(G_2), \dots, T(G_n)$.*
- *Identify positive and negative inter-tree influences, i.e., positive or negative relationships between goals g, g' which belong to different goal trees.*
- *Repeat the analysis to see if root goals are fulfilled; if so, done, else continue the analysis.*

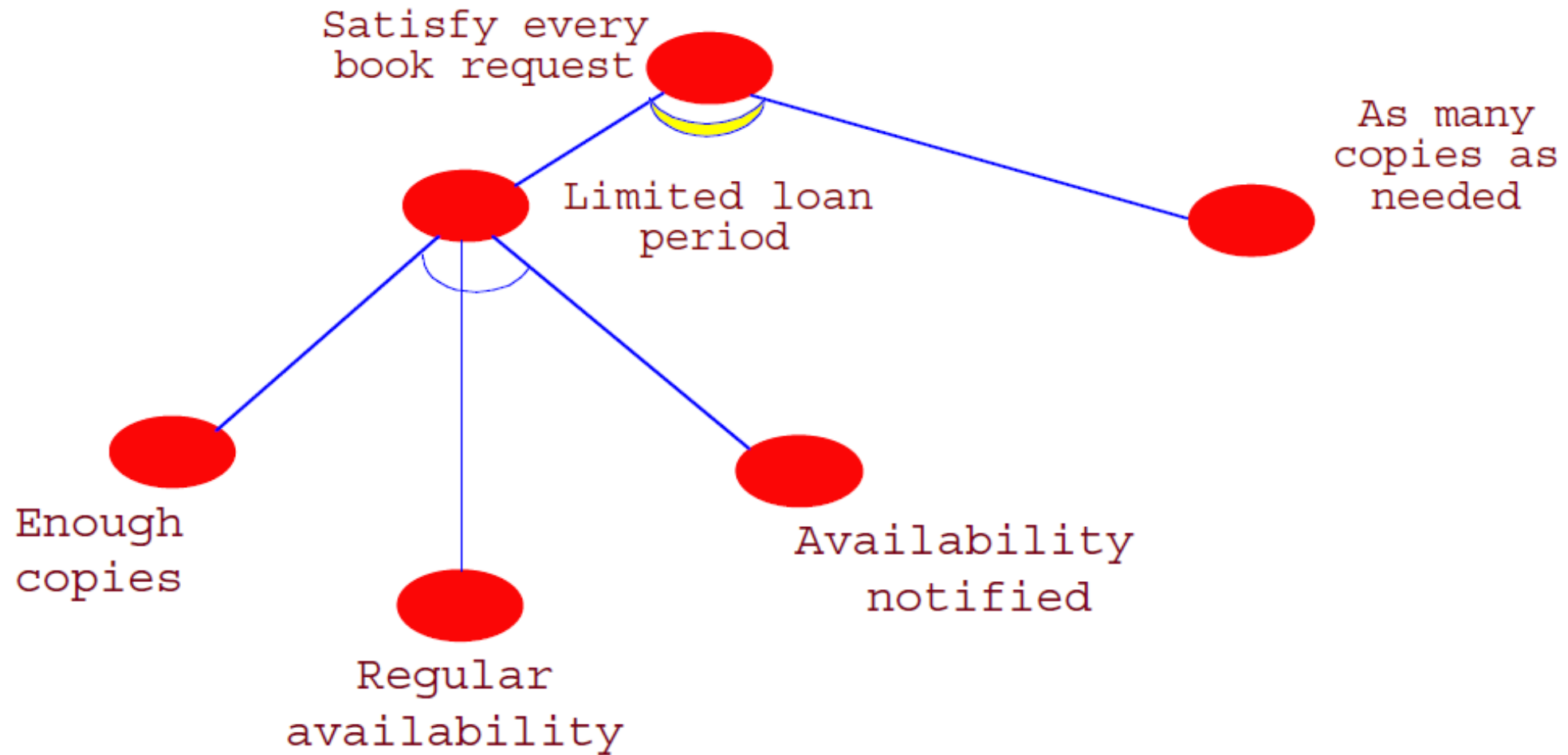
Lifecycle Models



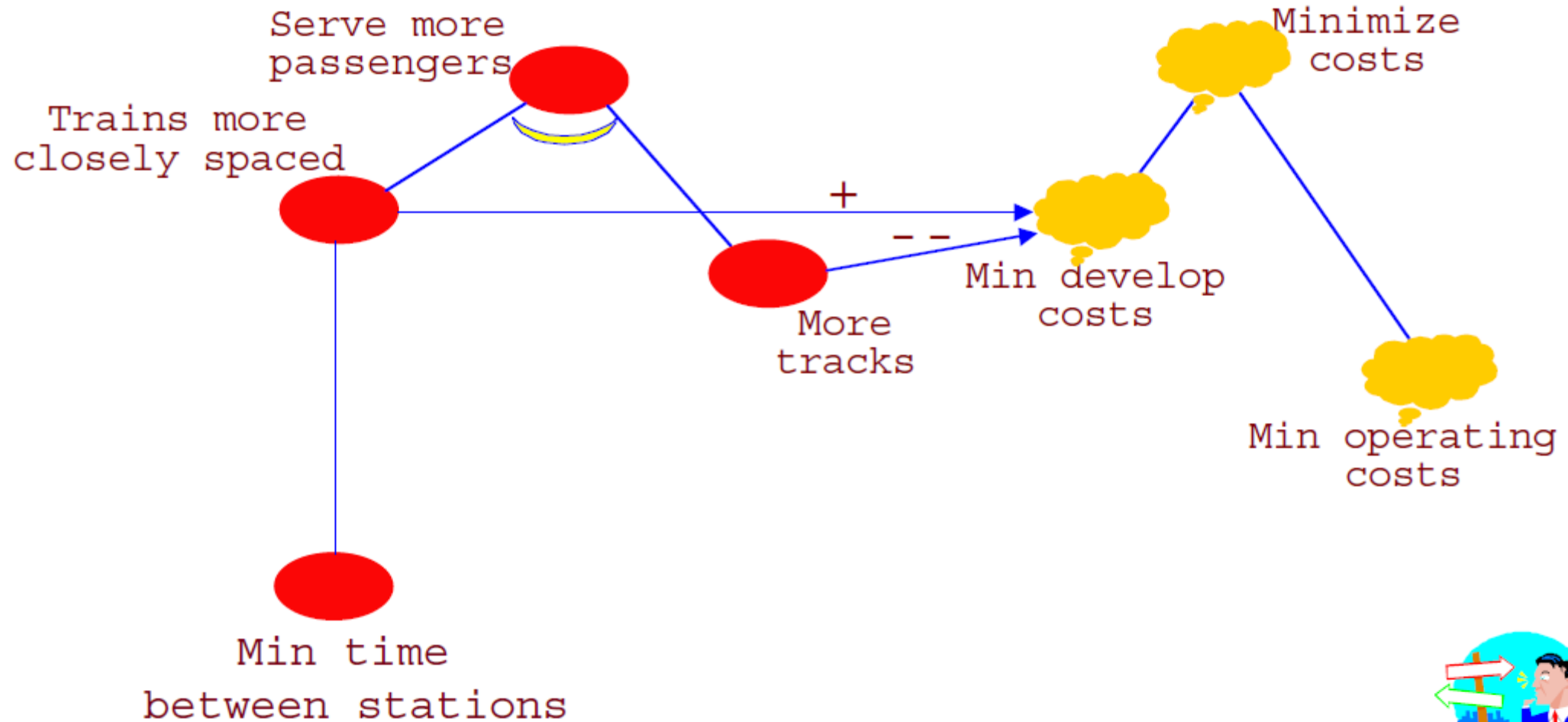
Softgoals as Criteria



Library Goals



Public Transit Goals



Why Questions

Min operating
costs



Passenger
comfort



*Why do we
need smooth
movement?*

Smooth
movement



Lifecycle Models

