

System analysis for problem structuring

Part 1A: the mono-actor perspective - theory

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System analysis for problem structuring

The mono-actor situation

1. Functions of basic system analysis
2. The system or problem diagram
3. How to construct a system diagram?
4. Interpretation and uses of the system diagram
5. Example: wind power
6. conclusions

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Functions of the system diagram

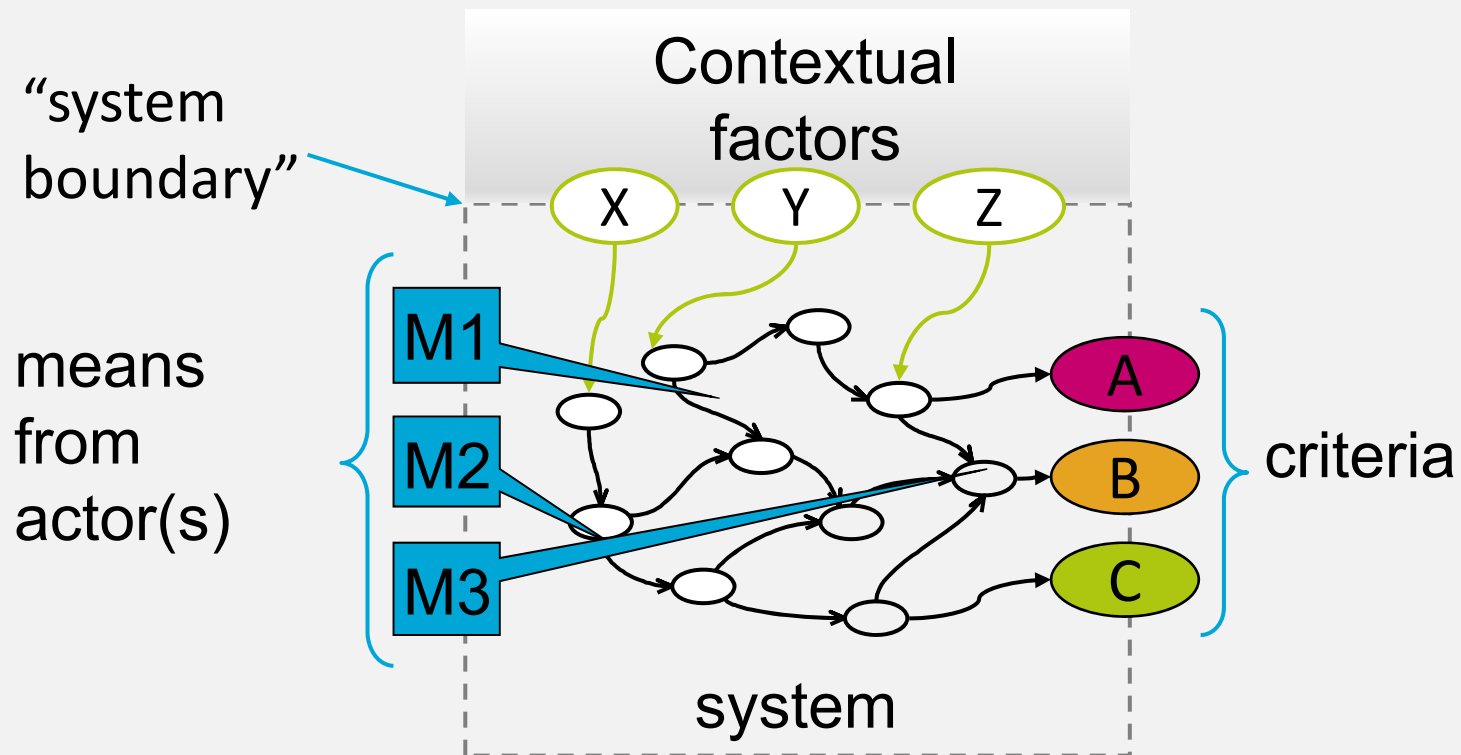
- Integrates different aspects and pieces:
 - Problem demarcation (Means-ends analysis)
 - Analysis of objectives and means
 - Causal analysis
 - Identification of external factors and future exploration
 - Actor network analysis
- Helps achieve consistency in the analysis
- Stepping stone for further modeling and analysis
- Communication tool

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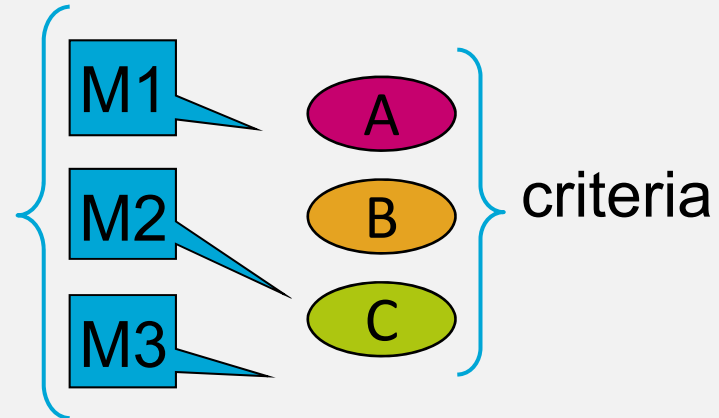
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System Diagram



Score card

means
from
actor(s)



→Criteria ↓ Means	C1	C2	C3
M1	+	+	-
M2	-	?	+
M3	0	+	-

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How to construct a system diagram?

- Formulate initial problem and choose a level/scope of analysis (means-ends analysis)
- Specify objectives and criteria (objectives tree)
- Identify means and external factors (means-ends analysis and causal analysis)
- **Iterate and check for consistency!**

Consistency checks

- Set of system outcomes \leftrightarrow results of objectives tree ?
- Set of means \leftrightarrow results of means-ends analysis?
- Do all the means have an impact on at least one of the criteria?
- Do all the external factors have an impact on at least one of the criteria?
- Have relevant side-effects (e.g., costs!) of using the means been included?

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Interpretation and uses of a system diagram

- Does the client face intrinsic dilemmas?
 - Actions or changes that are good for some goals but bad for other goals
- Are actions effective?
 - Can the client attain all of his goals?
 - How much control has the client over his criteria??
- Are criteria sensitive to external influences? Might the client's goals be attained without taking action?
- Are there any important knowledge gaps?

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Thank you for your attention!