Reverse Blueprints™

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Abstract

Reverse Blueprints™ give a visual form to mental models of 'how things are' or 'how things work', and thus help gain understanding about assumptions and knowledge (or lack thereof) regarding the dynamic structure and function of the object of interest — e.g. an un-documented system.

1 Professional value

Constructed systems such as engineering or architecture artefacts are first designed and then implemented. These 'designs' or 'blueprints' document system structure and function through the description of individual elements and their relations. Discovering the structure and function of natural systems (e.g. organisms, ecosystems) has been the long and arduous path of science, and their representation as Reverse Blueprints™ (RBP) produces System Maps™.

Systems Planning℠ RBPs follow the tradition of System Dynamics and Systems Thinking to represent system elements together with their *relative* causal relations and feedback loops. RBPs give attention to stakeholder interests and interventions through an 'XYZ' mark-up of the planning problem — e.g. concerns, objectives, action, outcomes. Through Viewport Design™, RBPs become platforms for convenient system conduct (e.g. cockpits, dashboards).
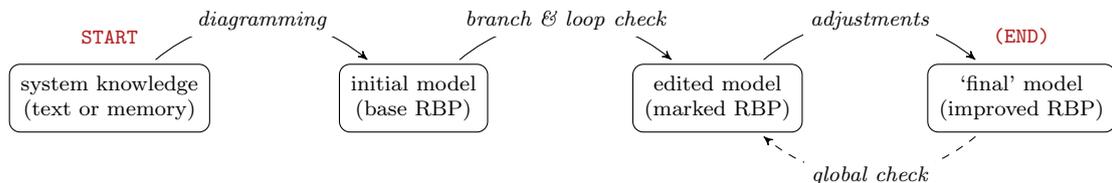
2 Workflow

FIGURE 1   The work to be carried out over four (4) hours; a number of 'loop' iterations may be necessary to achieve a satisfactory system model

3 Programme

INTRODUCTION (1.5H)
- Exploring the system of interest — elements and relationships (Figure 2)
- Simulating the function by branches and loops — (Figure 3)
- Post-simulation adjustments — towards a better model
- Overall system check — putting it all together

WORK SESSION (4H)
- Work in groups (2–4 people)
- Interactive assistance

PRESENTATION, DISCUSSION, AND CONCLUSION (2H)
- Shared experiences
- Applicability issues

4 Technical notes

TECHNIQUES[a]
- Text mark-up — $TMU_{[T]}$
- Reverse blueprints — $RBP_{[T]}$ (Figure 2)

METHODS[b]
- Qualitative simulation — $QSM_{[M]}$ (Figure 3)

AUDIENCE
- *Government*: e.g. central government, local authorities
- *Enterprise*: e.g. market analysis
- *Scientists*: e.g. natural (physical) systems, social systems
- *Consultants*: e.g. marketing, impact assessment (e.g. environmental,
- *Community*: e.g. planning stakeholders; NGOs social)

COMPETENCES
- Identify and get to know system elements of interest (e.g. 'indicators')
- Identify and get to know causal relationships between the elements
- Distinguish between causal and computational relationships (e.g. in 'indices')
- Think clearly and explain how some system elements may affect others
- Register and communicate this efficiently
- Identify information in existing documents regarding causal explanations
- Identify where action takes place in the system
- Think of the limits or boundaries of the system (e.g. 'closed' or 'open' type)
- Understand how the system functions
- Verify and demonstrate that through manual simulations
- Start thinking of 'interesting' elements (e.g. as points of concern or intervention)

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[a]v. Perdicoúlis, 2014a
[b]v. Perdicoúlis, 2014b
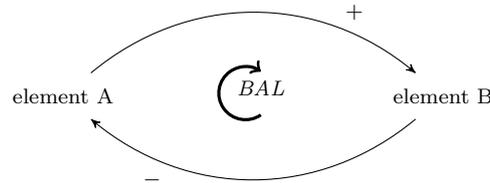
5 Protocols

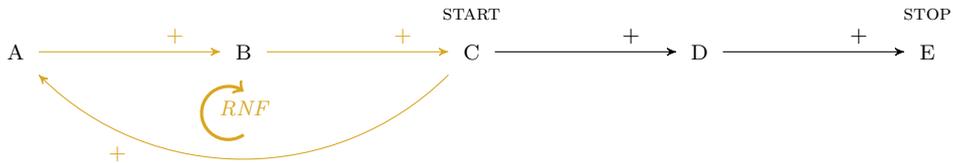FIGURE 2   Generic Reverse Blueprint (RBP) representing a *balancing* feedback loop

FIGURE 3   A qualitative simulation starting at element C will only stop at element E, but also involves a reinforcing feedback loop (marked in Gold)

6 Materials and preparation

CASE-STUDY/ WORK MATERIAL   Participants are welcome to bring their own support material (e.g. system descriptions) in (human) memory or documentation (e.g. digital or printed media).

SOFTWARE   Diagramming can be carried out manually, with pencil and paper. Optionally, participants are welcome to use their own diagramming software, such as *Graphviz*, *LibreOffice Draw*, *OmniGraffle*, or *Visio*.

STENCILS

Perdicoulis, A. (2011b) *OmniGraffle* stencil for RBP [`.graffle`]
Perdicoulis, A. (2011a) *Graphviz* node-and-edge starter file [`.dot`]

References

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