

Registering cumulative effects in DCDs

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Abstract

A new feature of descriptive causal diagrams (DCD) enables the register of cumulative effects at each node.

1 Introduction

During impact tracing (Perdicóúlis, 2012), for instance for the purposes of an impact assessment in an EIA or SEA process, the original descriptive causal diagrams (DCD) count on human memory or informal ‘manual’ annotations to sum up all the effects that arrive at any particular node (Perdicóúlis, 2011) — Figure 1.

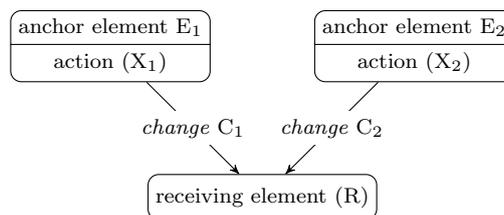


FIGURE 1 Two independent changes arrive at a receiving node

Keeping this new information in memory is relatively easy for small or simple DCDs, but it may be a cumbersome task for larger diagrams. In addition, proper diagramming includes the need to always leave a formal record of reasoning, built into the diagrams themselves.

2 The innovation

In a recent collaborative diagramming endeavour in the context of EIA (Perdicóulis et al., 2014), we developed a special feature of DCDs with the intent to enable the register of the cumulative effects at each node. The generic form of this feature is illustrated in Figure 2 as a special *locus* of the element receiving the changes. In this particular graphical representation, the text of this special locus remains in italics, exactly as the independent changes, and it has a coloured background to mark that it has a special function in the DCD.

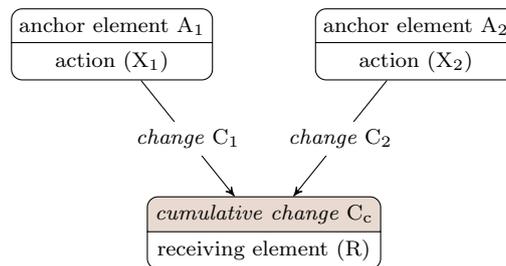


FIGURE 2 The special locus at the receiving node is a field for new information in the DCD

3 Illustration

Common DCDs convey each effect individually, from one or more system elements to the receiving element, and this can be done either as forecasts or as assessments — the latter being marked with asterisks, to indicate their special status (Perdicóulis, 2011). While two changes in the same sense (e.g. increase) would be expected to produce an even bigger change, it would be particularly interesting to consider an illustration in which changes are opposite to each other, as in Figure 3.

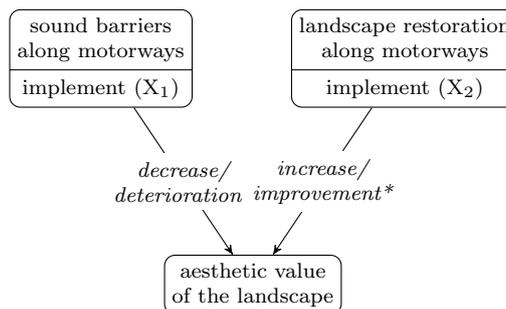


FIGURE 3 DCD without the innovation — extract from Perdicóulis (2012)

Figure 4 includes the new information field, located above the receiving element, which is now responsible to receive all incoming changes to the element. The content of this field is subject to expert processing, and the assistance it provides is as a record of the forecast and/ or assessment of the global or cumulative change.

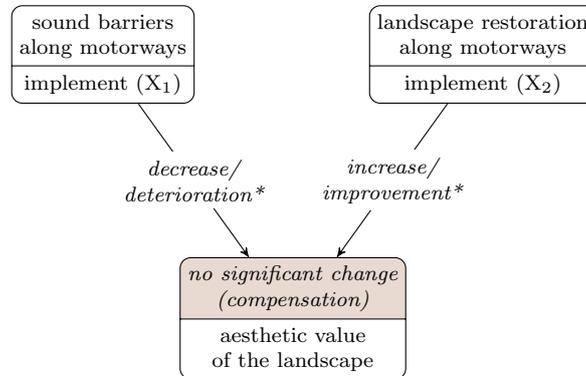


FIGURE 4 DCD with the innovation

4 Discussion

A special field to mark the cumulative changes to a system element should not influence the *individual* forecasts or assessments, but it is expected to facilitate the *cumulative* forecast or assessment by obliging a commitment of information that otherwise would be volatile — i.e. solely in people’s minds, and thus not properly shared.

The new semantic entity should be included in the current set of SPML conventions, maintaining the freedom of artistic embellishment in the formatting — as is the case with all SPML diagrams.

The utility of the new addition extends beyond EIA, and into any application of DCDs. However, the benefit of the new feature is only for diagrams with confluence of changes, and should not be made mandatory for all DCDs.

5 Conclusion

DCDs now have the option of a new information field associated with system elements that are receptors of multiple independent changes, destined to host forecast and/ or assessment annotations about the resulting global or cumulative change. This provides a formal record of reasoning, which is particularly valuable in the reading or revisions of the DCDs.

References

- Perdicóúlis, A., J. Jesus, and L.E. Sánchez (2014) Argumento Visual — Diagramas ‘base’ e ‘plus’, *Boletim Informativo da APAI* **31**:6–8.
- Perdicóúlis, A. (2012) Impact tracing. *Systems Planner*, **7**.
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