Challenges in Environmental Storytelling*

Extended Abstract†

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ABSTRACT

Conveying complex knowledge effectively to non-expert audiences is highly challenging and increasingly urgent. The Driver-Pressure-State-Impact-Response (DPSIR) framework has been widely used in the last decades to structure environmental problems and assess causes, consequences and responses to change. At NUIG we have developed novel software which allows marine scientists to map their specialist knowledge on selected marine conservation themes, such as microplastics in the oceans, using a new variation of DPSIR. Expert users construct stories as chains of causally linked concepts drawn from a newly-derived controlled vocabulary, and can also, significantly, attach Evidence and Actors to relevant parts of the story, either to concepts or the links between them.

CCS CONCEPTS

• Human-centered computing~Scientific visualization • Computing methodologies~Model development and analysis • Software and its engineering~Model-driven software engineering

KEYWORDS

Software, taxonomy, environmental model, causal framework, DPSIR, DAPSI(W)R, visualization

1 INTRODUCTION

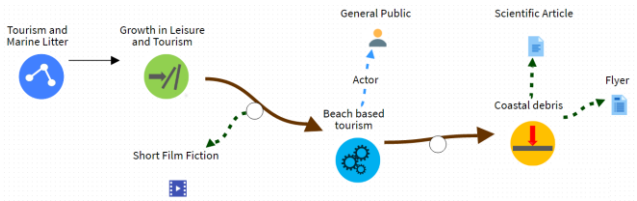

Figure 1: Tourism and Marine Litter story segment

The Driver - Activity – Pressure - State Change – Impact - Welfare - Response (DAPSI(W)R) framework is a new variation of DPSIR, designed to overcome some of its limitations, and was selected based on work done in previous EU projects. Tamer Fawzy constructed new taxonomies for DAPSI(W)R, Actors and Evidence from various sources including the EU Marine Strategy Framework Directive, and these were implemented in the software. Users build a causal map of the problem, selecting in turn the most relevant types of Driver, Activity and so on from the DAPSI(W)R taxonomy, dropping each concept onto the canvas, adding details, and then linking them. They then attach relevant Actors and Evidence to parts of the story. Figure 1 shows how a growth in tourism (Driver) drives beach-based tourism (Activity), causing coastal debris (Pressure), and so on. The general public are involved in the activity (Actor), and a scientific article, a flyer, and a film are attached (as Evidence).

2 SOFTWARE PLATFORM

Server-side: OrientDB graph database, with taxonomies defined in the schema; Java Tinkerpop Graph API; RESTful web services.
Client-side: Rappid & Bootstrap frameworks.
Functionality: Based on an underlying graph database, provides both a visual map of complex systems, and a queriable structured data store for evidence and the actors involved.

3 PRELIMINARY RESULTS

The tool has been successfully used to build six key stories. See https://responseable.exposure.co/the-responseable-key-stories.

4 CONCLUSIONS

Further research is needed to manage inherent complexity, provide multiple views eg for marine scientists, fishermen and policy-makers, and support further visualisations and analysis, eg identifying evidence for complex concepts, and evidence gaps.

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