DUVis: A visual analytics tool for supporting a trans-disciplinary project

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Dŵr Uisce | Energy Recovery in Water Services / Adennill Ynni yn y Diwydiant Dŵr

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We present DUVis, a visual analytics application developed to support the analysis and appraisal, of the trans-disciplinary project Dŵr Uisce. DUVis provides a number of visualizations and additional features to facilitate data exploration of a project's progress. It presents a map of stakeholders' activities, and their engagement with each other, as well as outputs, workpackages, their completion status and potential impact.

Trans-disciplinary research (TDR)

TDR aims to facilitate a more holistic research output by bringing together different disciplines, and recognizing the value of engaging with external partners and stakeholders from outside the academic sphere.

However, tracking collaboration and ensuring continued communication can be challenging, especially as a project grows and expands.

Our research proposes visual analytics and data exploration as a method of easing the pressure of such challenges in the water sustainability TDR project, Dŵr Uisce.

The Team

Our team included researchers, from a range of disciplines collaborating closely with one another, implementing a TDR approach to a TDR problem. Two teams were involved.

The Developers
A group of visualization researchers

The data-managers
A group of project management researchers

The Data

With the organizational structure of Dŵr Uisce resembling that of many TDR projects the final dataset used comprised of four tables.

1 Work packages
A way of grouping activities by category or relevance to one another

2 Activities
Individual activities as defined in the synopsis and progress reports

3 Links
Communication and collaboration between activities and stakeholders

4 Stakeholders
Organizations external to the research institutes which have engaged in some way with the project
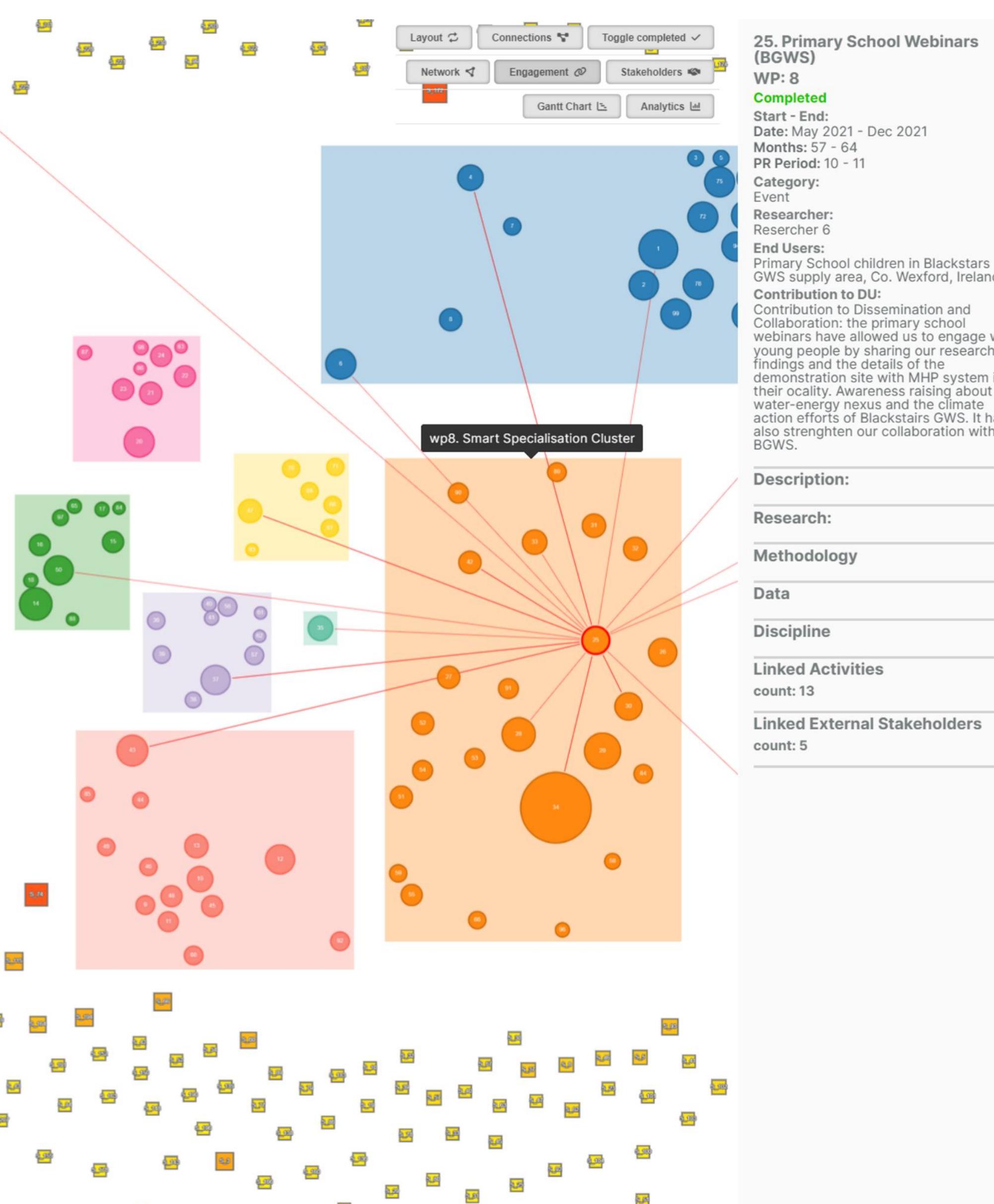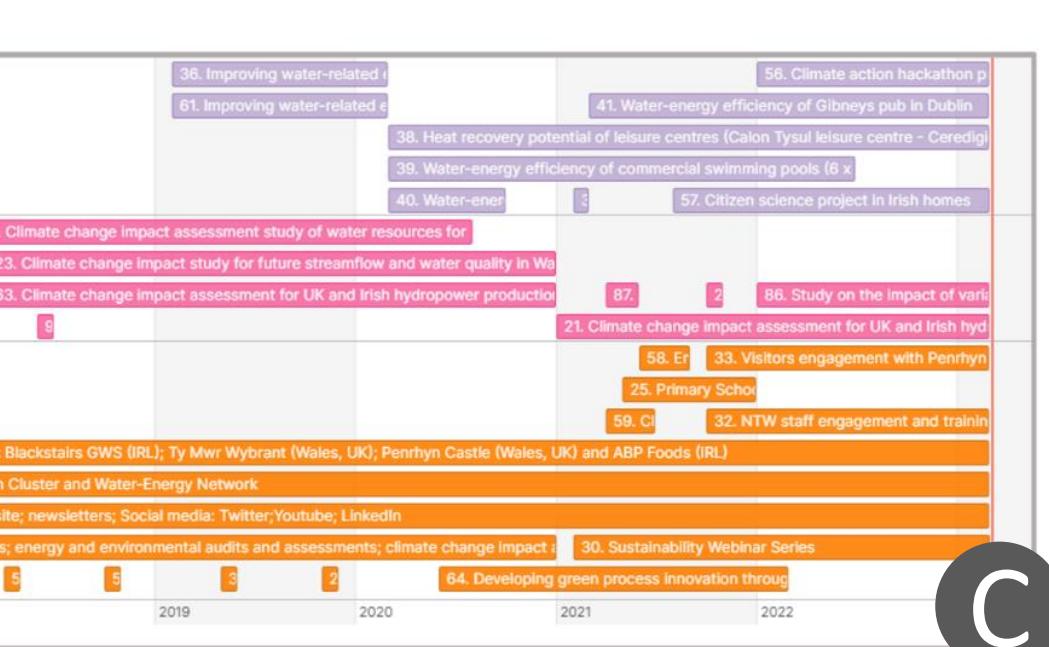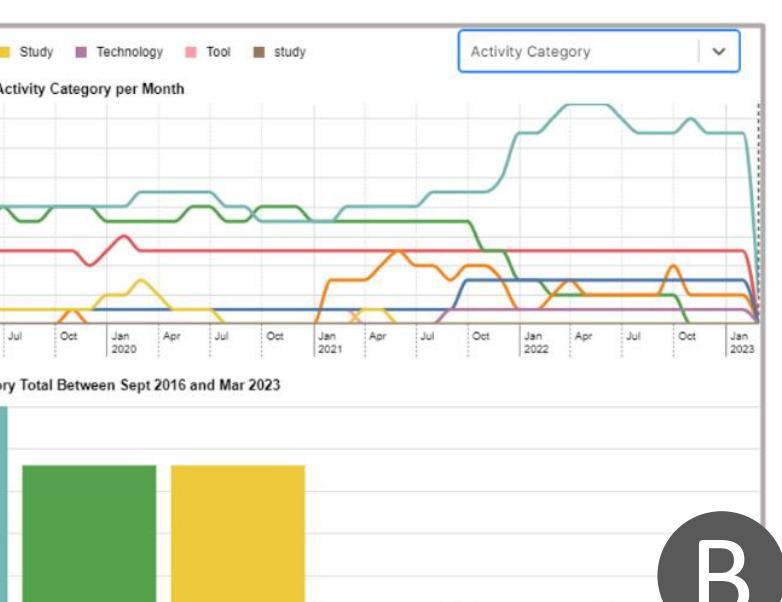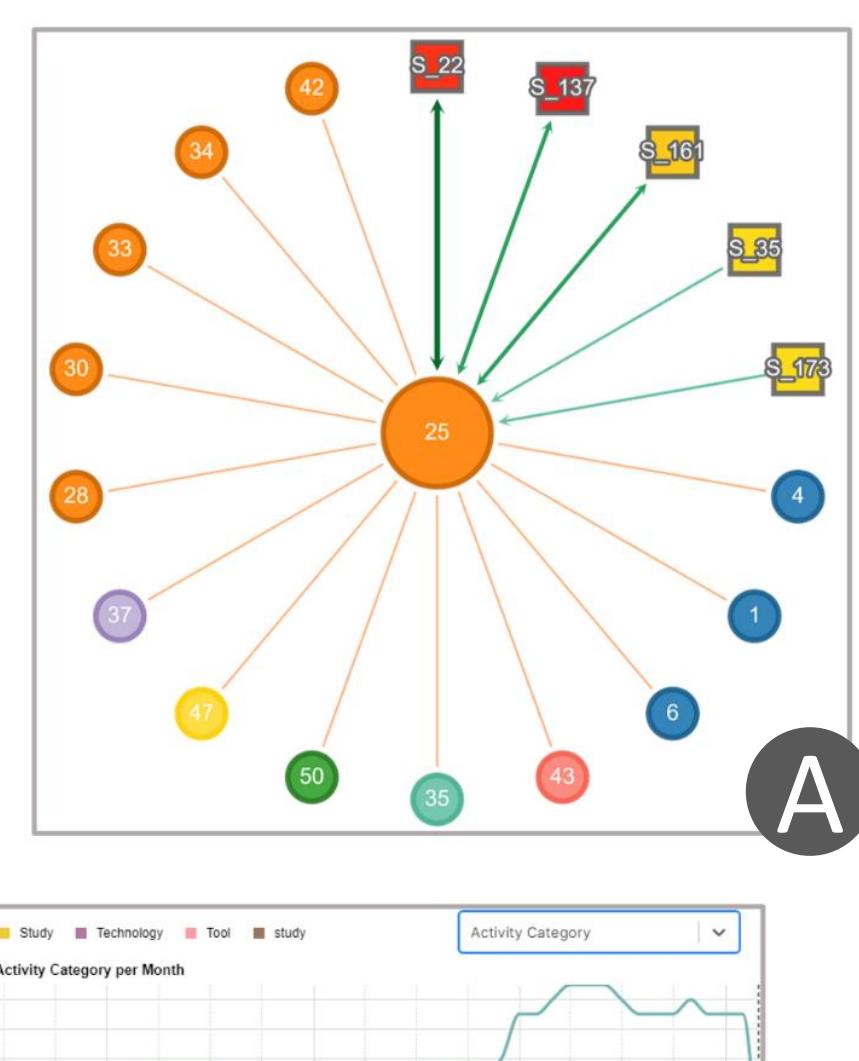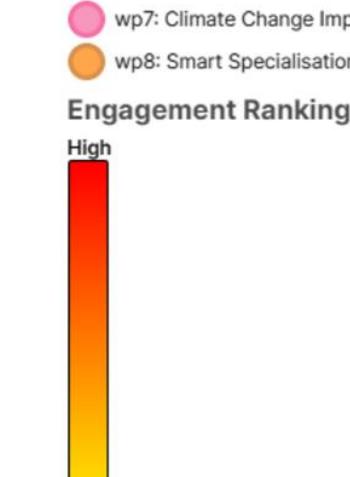

The Tool

Built with ReactJS and Cytoscape.js, DUVis is centred around a node-link diagram.

Color coded **workpackage** nodes house circular **activity** nodes, while square **stakeholder** nodes encompass the main diagram body.

Data exploration is facilitated through temporal and custom filters.

Selecting any element opens the meta panel, providing more information regarding the element.

Secondary Visualisations

A Network View

The network view provides a visualisation of the selected node's immediate network while also displaying the engagement level of external stakeholders.

B Analytics Panel

Two charts are displayed in the analytics panel. The top displays the total number of activities per category per month, the bottom displays the total number of activities per category over the selected timeframe.

C Gantt Chart

The Gantt chart provides a temporal visualisation of each activity's lifespan, a metric not obtainable through the use of a node-link diagram. Each item in the Gantt chart represents a single activity and can be selected, activating the meta panel.

Overall, DUVis acts as a showcase for the potential visualization tools may have in research project management. The use of a system like DUVis from planning through to completion of a research project would encourage a more data-driven approach to project record keeping.

We believe that DUVis can form the basis for a generalized tool that offers support for visualizing important project meta-data, and can be used by a variety of project stakeholders. We are currently working towards the enhancement of our prototype.

www.dwr-uisce.eu   @Dwr_uisce

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