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KING'S College LONDON

Capturing Provenance of Visual Analytics in Social Care

In financially pressured social care organisations, clearly communicated data and process provenance helps provide trust and transparency to decision-making using analytics software

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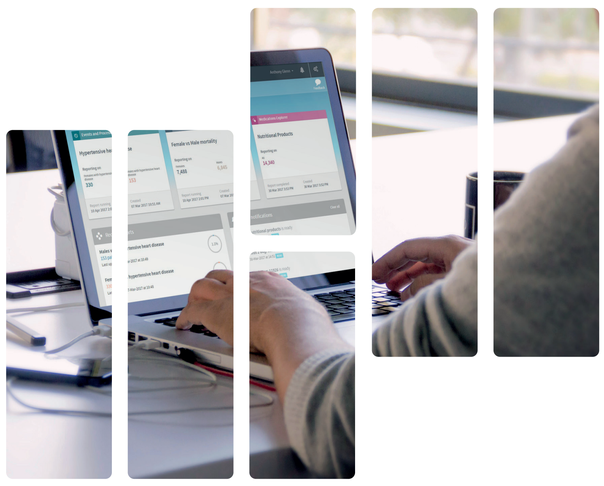
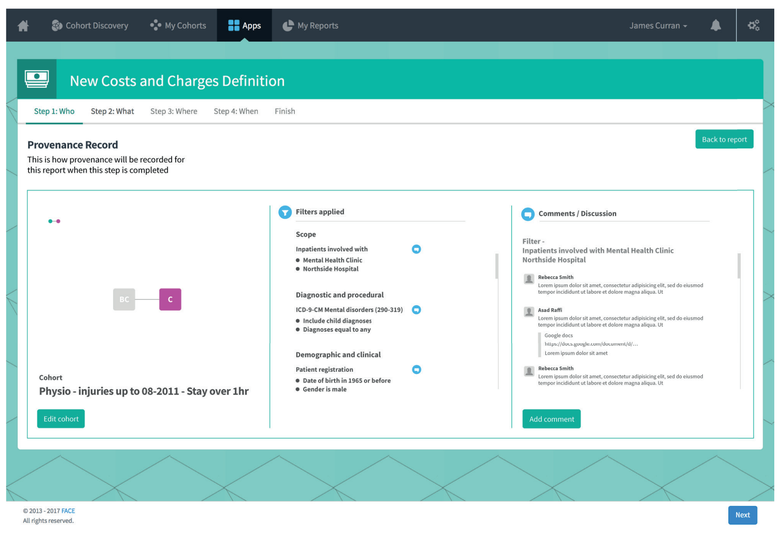
Introduction

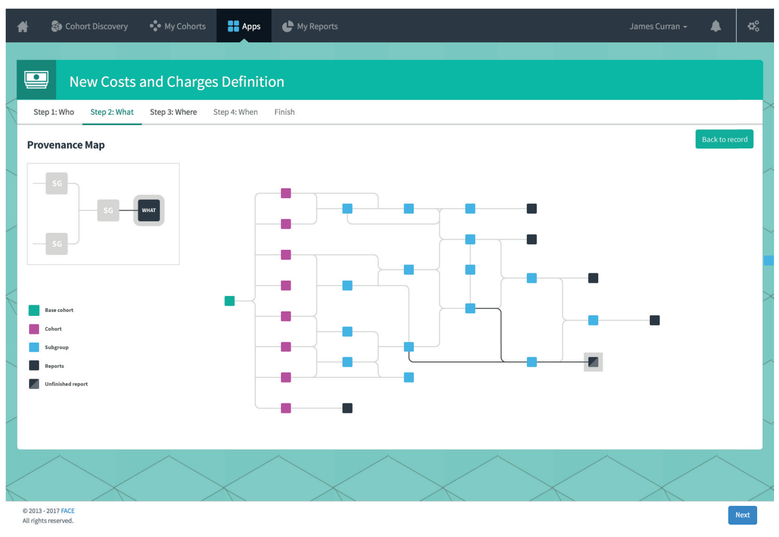
Social care organisations are under pressure to find savings [1]. A method of reliably identifying opportunities for savings comes through the use of analytics, but contains the risk of human and "systemic" errors [2], and loss of transparency on the reasoning behind important actions.
Practitioners need confidence in the results of analysis: those analytic results and any errors they contain contribute to life-changing decisions for the service user and can expose the organisation to legal dispute..

For instance, a review of service allocations can be undertaken with an objective of making an annual saving of at least £50k on personal budgets, achievable by identifying only four service users currently receiving care in a 24-hour support setting, who need less intensive care. How can the decision maker be confident that the outcome of that review has identified those four service users appropriately?
Provenance helps provide this confidence by answering the question "How was this data produced?", exposing where data came from, how they got to their present state, and who or what acted upon them.

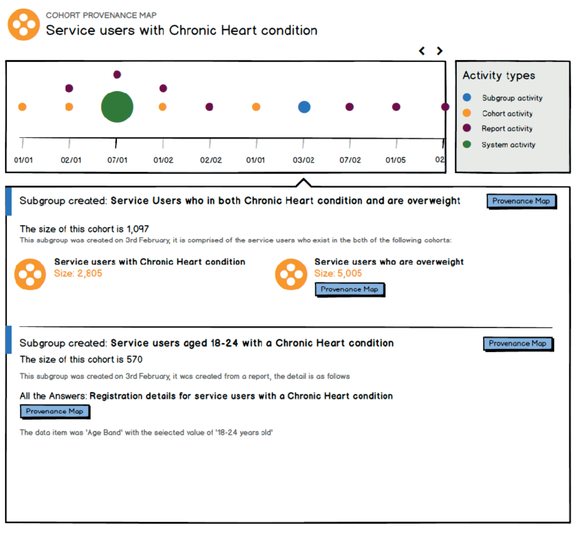




First UI Iteration



Second UI Iteration



Provenance Timeline UI Design

Method

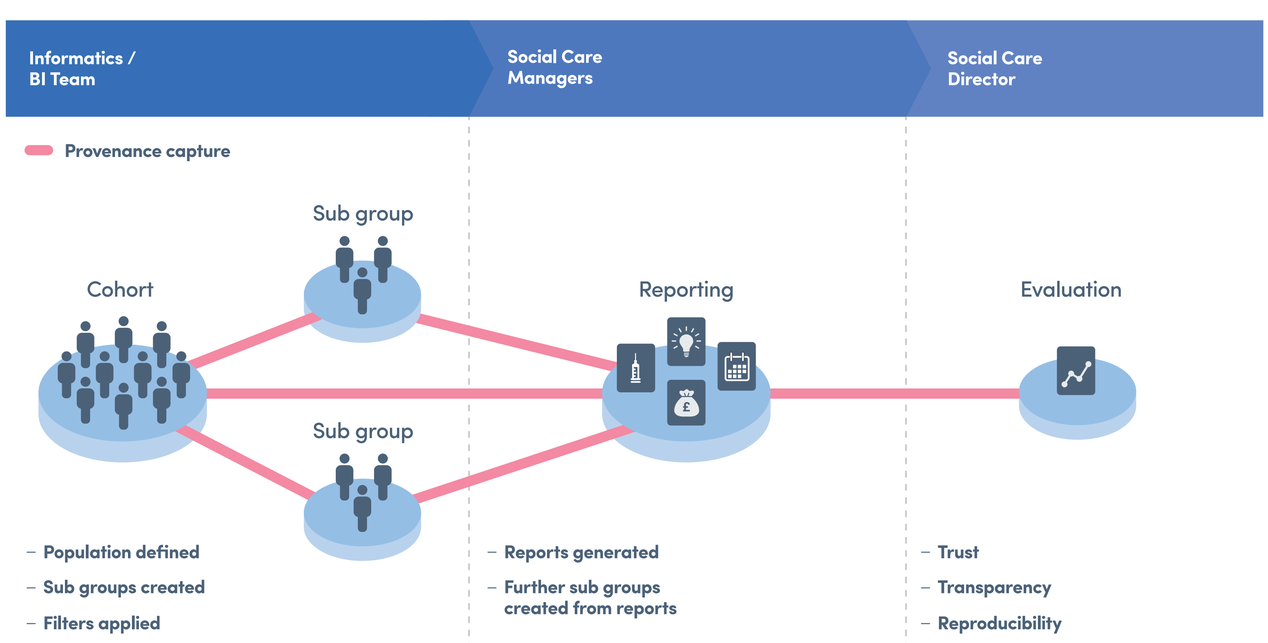
We are extending Atmolytics, a health and social care analytics platform, which already has the ability to address the "trust of data" problem, but lacks the sophisticated capacity of provenance interrogation. The focus is on how the system user would want to see and interact with such provenance data. We are experimenting with a variety of methods of visualising provenance data to identify how best to communicate to the end user, with some of the prototypes illustrated here.

Results

We have implemented a provenance capture server and 11 abstract provenance templates, covering all semantically meaningful tasks in Atmolytics. We are currently prototyping user experience, investigating the best options to enable users to extract relevant information from provenance graphs without overwhelming them.

Discussion

Data provenance is a promising technology for addressing research reproducibility and system auditability, but lacks usable front-ends to assist its adoption in commercial software. Our pioneering work in this area should impact on the wider software community looking to adopt provenance tooling.



Atmolytics Use Case and Provenance Capturing

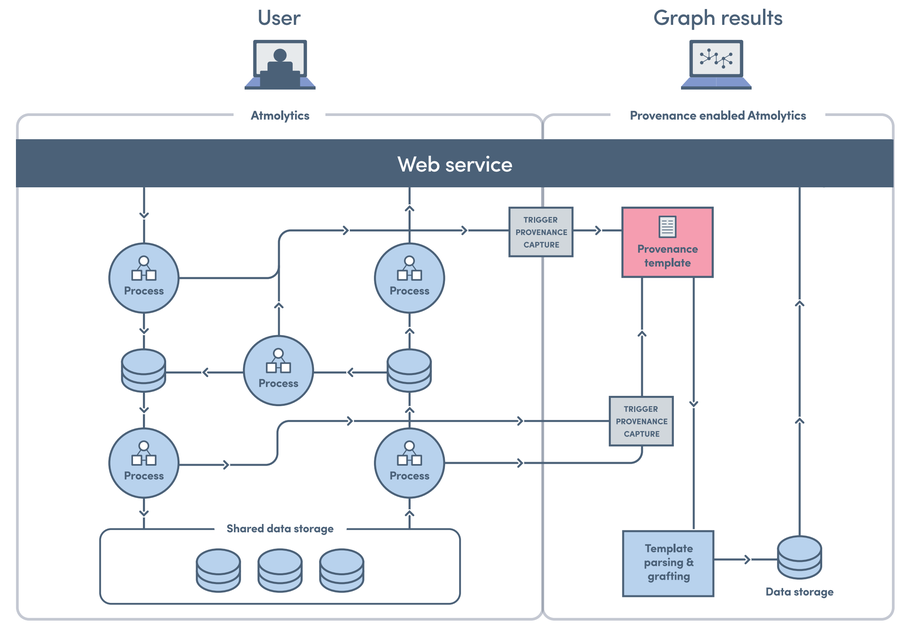
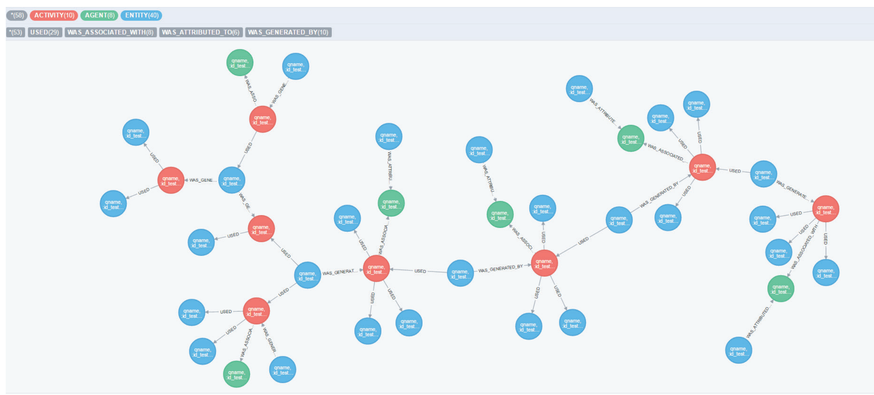
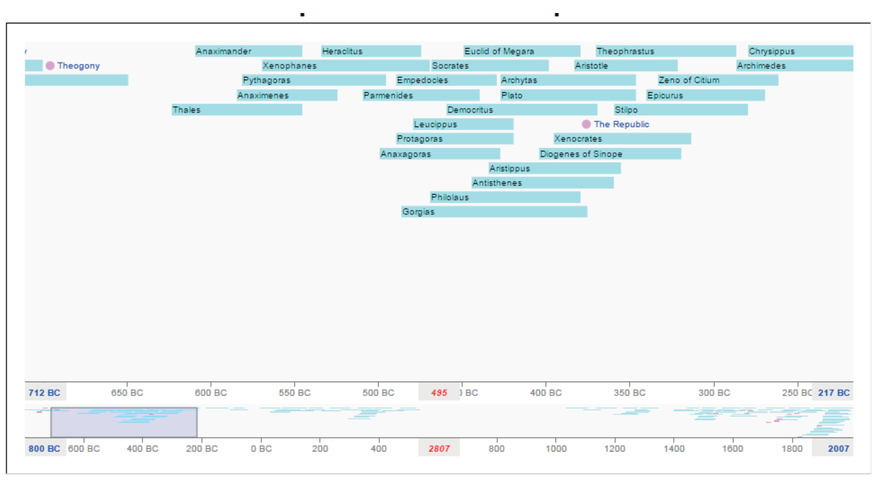


Illustration of Provenance Capturing Architecture



Example of Captured Data



Example of Timeline UI from D3

References

[1] Robertson, R. et al. 2014. Background paper: The social care and health systems of nine countries.
[2] Broadhurst, K. et al. 2010. Ten pitfalls and how to avoid them: What research tells us. September (2010), 1–42.

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