Using ANT to understand the Web

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Overview

• Background and Research Questions
  – Why we need to understand the Web?
  – A Socio-Technical Web?
  – A conceptualisation of the Web

• Introduction to the socio-technical framework
  – Theoretical underpinning
  – From theory to application

• Exploring the development of a the Web
  – Applying the framework to Wikipedia
Background to Research

• The Web is a collection of Web Activities
  – Online Shopping, Online Banking, E-Government, Online Networking, etc.
  – These activities reflect *human interaction* and *technological development*

• Web Activities are not exclusive
  – They develop together with other activities
    • As does the development of the technologies
  – Their development are *internally* and *externally* co-constructive
  – They emerge, develop, adapt and fail
Why Describe the Web as Web Activities?

• We (Web Science, Researchers, Business, Society) want to understand how the Web functions
  – Often described as socio-technical – But what does that mean?

• This can be done technically! Community clustering, etc.
  – However, it does not reflect the co-constructive process of the Web
Introduction to the Socio-Technical Framework – Background to Theory

• Drawing upon concepts from Actor-Network Theory (ANT)
  – Actor-Networks are fundamental to understanding phenomena
  – Radical Symmetry of Human and Technological Actors
  – Structures emerge from the network, they are not assumed to exist
    • - The Web does not exist without the Web activities that occur
  – Exposes the interplay between humans and technologies

• Application is beyond a descriptive framework
  – ANT provides the underlying theoretical position
  – Mixed methods takes it from description to explanation
Introduction to the Socio-Technical Framework – (1) Heterogeneous networks

• The Web is a heterogeneous network of associations
  – Humans and Technologies
  – Network Artefacts
  – Agendas and Goals

• A heterogeneous network is formed around a specific agenda, i.e.
  – Open Data
  – Social Networking

• A Heterogeneous network contains actors which: (b)
  – Share a common interest or goal
  – Work towards a shared set of common outcomes
Introduction to the Socio-Technical Framework – (2) Translation

- Translation describes the emergence and development of a network
  - Social Machines translate towards stability
  - Translation is a multi-staged, multi-actor process
  - From a messy, unorganized set of actors to a mobilized network of activity

- The process of translation involves
  - Focal actors setting the agenda and goals
    - problematizing actors and activity
  - The alignment of actors passing through passage points
    - Requirements for a network to succeed, i.e.
      - develop a technology, create a policy, gain more actors.

- Translation does not promise stability!
  - Network stability is only ever held in a temporary state
Introduction to the Socio-Technical Framework –

(3) Extension to ANT – Phases

• Phases are the result of multiple Translations
  – The success and (temporary) stability of a network triggers changes in surrounding networks
  – Restructuring of the original agenda occurs

• Phases can be conceptualised as layers in social machine development
  – New phases build upon previous layers
    • However, previous layers must remain stable

• Transition from one phase to another
  – Contains common actants (humans or technologies)
  – Shares common goals or interests (not all)!
The Socio-Technical Framework – The HTP model

3 principles:

1. The Web is made up of multiple Heterogeneous networks
   - humans and technologies associated together via common interests and outputs

2. The heterogeneous networks are all undergoing a process of Translation
   - Requires the continuous alignment of the actors.
   - Dynamic and constantly changing shape as a result of the associations between actors
   - The stability (sustainability) is dependent on the actors’ commitment towards the network goals.

3. A web activity is the product of a number of translating Phases
   - Requires the alignment of different heterogeneous networks through the association of shared actors and interests.
   - Each phase contains translating heterogeneous networks, and must persist in a stabilized state in order for the subsequent phases to function.
Exploring the Development of a Web Activity

- Exploring the development of Wikipedia
  - Emergence, Formation, Evolution

- Analysis applied via a socio-technical lens
  - Describe and understand the co-constructive activity and interaction between humans and technology

- Analysis based upon a mixed methods approach
  - Qualitative analysis of inscriptions, associations and activities between actors
  - (Quantitative analysis of network structures and growth)
Exploring the Development of a Social Machine

Wikipedia (Phase 0)

- Prior to Wikipedia, Nupedia social machine existed
  - Network of multiple actors and stakeholders
  - Driven by agenda of collaborative editing and peer review by expert community
  - NupeCode underlying technological actant

- Associated actor networks translating towards similar agenda
  - As part of the network, focal actors were re-problematized the agenda

- A new Obligatory Passage Point (OPP) was established
  - A collaborative environment for non-experts to create and edit knowledge based articles
Exploring the Development of a Social Machine

Wikipedia (Phase 1)

- Wikipedia emerged by re-problematizing Nupedia
  - Inscribed by the social motivations and incentives of focal actors, plus the capabilities of the NupeCode
  - The agenda now included the inscription of an “Open Licence”
- Change in agenda causes threats and changes to the network
  - Bomis was not aligned to the new network OPP’s
- Translation towards a new technology and social practice
  - WikiMedia Created
  - New social practice of non-expert collaborative editing emerged
Exploring the Development of a Social Machine

Wikipedia (Phase 2)

- **Wikipedia Translating towards stability**
  - Network of article editors established
  - MediaWiki becomes stabilising technology
  - New networks are subsumed by and associated with Wikipedia
  - Other web activities are now important in its stability
    - Google Indexing
    - Inward links from other platforms

- MediaWiki becomes a catalyst for new projects
  - Wikiprojects emerges….
Exploring the Development of a Web Activity

Wikipedia - Summary

• Unpacking Wikipedia into its phases exposes
  – The actor-networks that operate within it
    • The humans and technologies part of it
    – The layers of evolution and translation that have been part of the process
• By understanding the layers and components
  – Know what is critical for its success and sustainability
    • i.e. if MediaWiki changed, what would happen?
  – Start to explore/predict the future translation and pathway