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Using ANT to understand the Web
Part I: Wikipedia

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Tinati, R., Carr, L., Halford, S. and Pope, C. (2013) The HTP Model: Understanding the Development of Social Machines. In, *SOCM Workshop, WWW2013: 22nd International World Wide Web conference, http://eprints.soton.ac.uk/358946/*

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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

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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?

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- **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

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- **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

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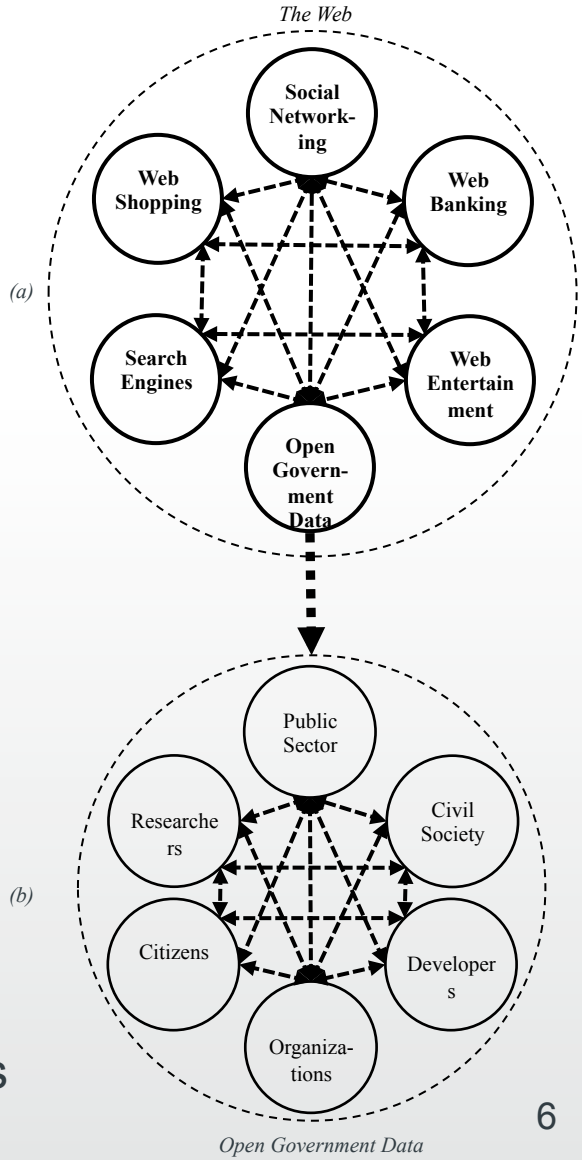
- **The Web is a heterogeneous network of associations**
  - Humans and Technologies
  - Network Artefacts
  - Agendas and Goals
- **A heterogeneous network is formed around a specific agenda, i.e.**
  - Open Data
  - Social Networking
- **A Heterogeneous network contains actors which:**
  - Share a common interest or goal
  - Work towards a shared set of common outcomes



Introduction to the Socio-Technical Framework – (2) Translation

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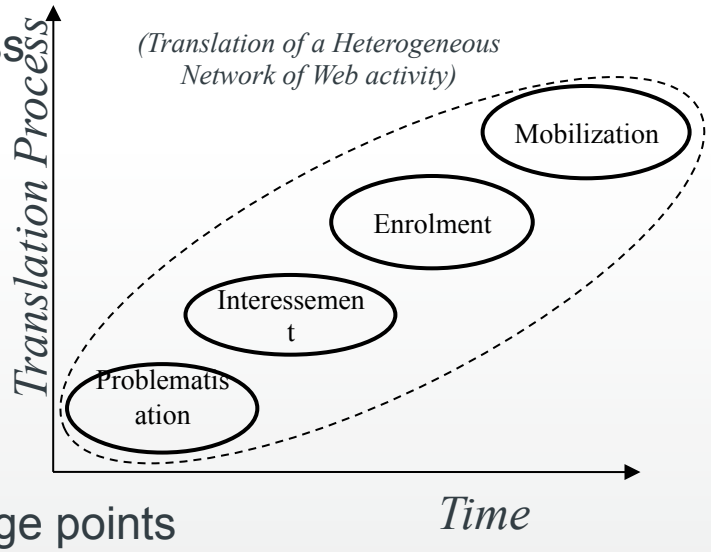
- **Translation describes the emergence and development of a network**
  - Social Machines translate towards stability
  - Translation is a multi-staged, multi-actor process
  - From a messy, unorganized set of actors to a mobilized network of activity
- **The process of translation involves**
  - Focal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

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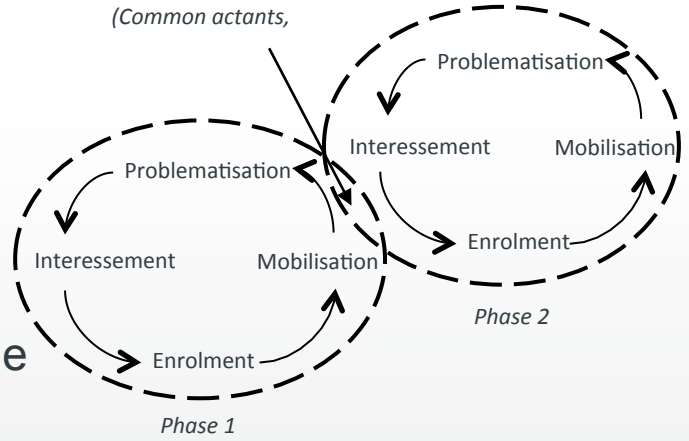
- **Phases are the result of multiple Translations**
  - The success and (temporary) stability of a network triggers changes in surrounding networks
  - Restructuring of the original agenda occurs
- **Phases can be conceptualised as layers in social machine development**
  - New phases build upon previous 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

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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

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- **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)

WIKIPEDIA
The Free Encyclopedia

Exploring the Development of a Social Machine

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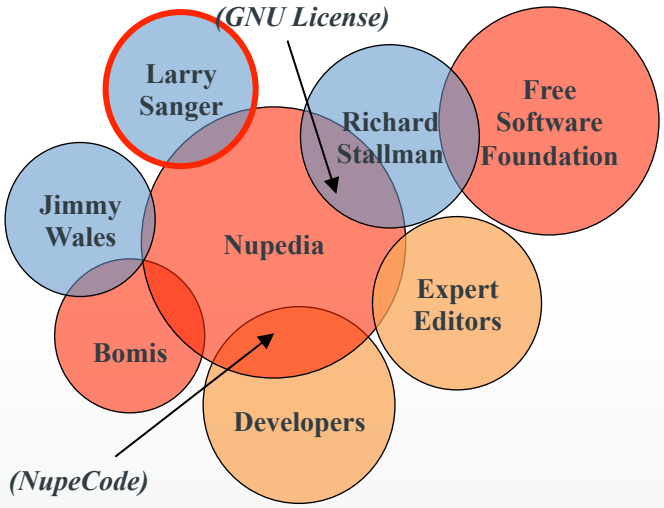
Wikipedia (Phase 0)

- **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)

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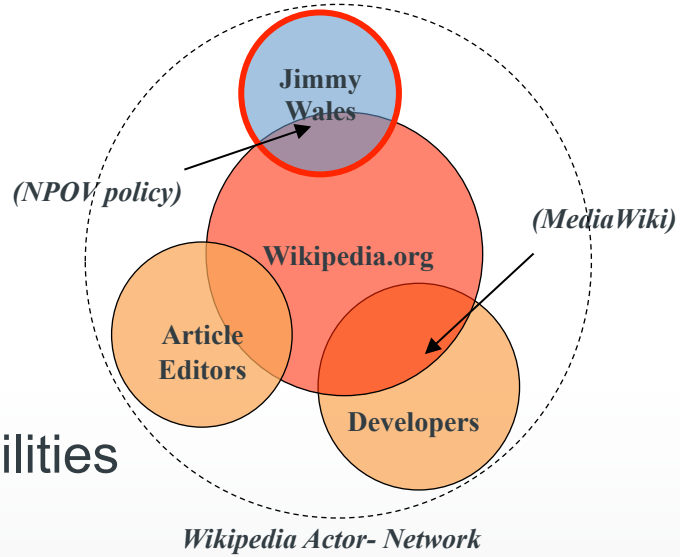

- **Wikipedia emerged by re-problematizing Nupedia**
  - Inscribed by the social motivations and incentives of focal actors, plus the capabilities of the NupeCode
  - The agenda now included the inscription of an “Open Licence”
- **Change in agenda causes threats and changes to the network**
  - Bomis 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)

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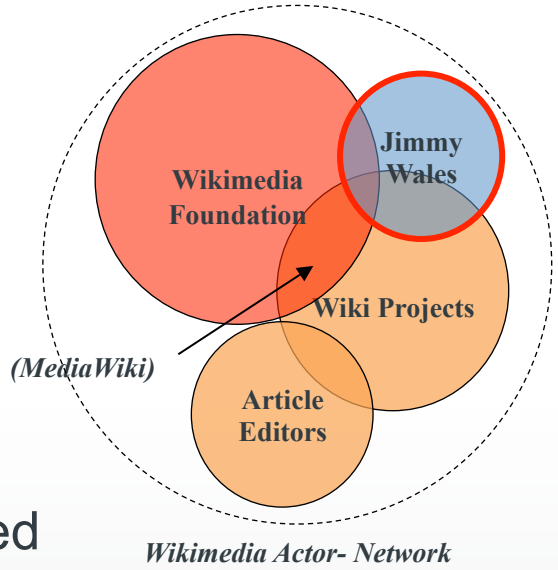

- **Wikipedia Translating towards stability**
  - Network of article editors established
  - MediaWiki becomes stabilising technology
  - New networks are subsumed by and associated with Wikipedia
  - Other web activities are now important in its stability
    - Google Indexing
    - Inward links from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

Exploring the Development of a Web Activity

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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