ACCESS and Cultural Evolution

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Overview

- **The ACCESS Language Model**
  - What it is
  - What it does
  - The Language Model and Markets
  - The Language Model and Stakeholders
  - Interesting Questions…
- **Cultural Evolution**
  - New research
  - Applications
  - Application to ACCESS

The ACCESS Language Model

- Stakeholders in ACCESS buy and sell goods using *descriptive terms*
- Language Model is a cache of such terms, used by stakeholders to describe requirements (services, goods, money, etc.) or provisions (money, services, goods, etc.)
- Each market has its own Language Model, with fixed terms used consistently by buyers and sellers

Language Model and Markets

- A market's descriptive terms characterise it
- Examples:
  - *Good runner, e/w, cruise, c/locking, abs, e/sr, pas, years MoT, 5 speed, FSH*
  - *2GB DDR\200GB\Radeon 9600 256MB DDR\8X +- DVDRW\16X DVD*
- Language Model is a set of such descriptive terms
  - Used by Stakeholder and agent to describe and negotiate in a resource in a specific market
  - Terms captured via a Domain Specific Language (DSL)

Language Model and Stakeholder

- Language Model ensures automated market and stakeholder speak the same terms
- Stakeholder's Agent augments Language Model by inspecting market and feeding terms back to Stakeholder
- Stakeholder's requirements and provisions thereby refined in an iterative, interactive and ongoing process

Interesting Questions

- What are these terms?
- Where do they originate from?
- How permanent are they?
- How does a market settle on a consistent set of terms – which are chosen and why?
- New research focuses on these issues

Providing an answer with Cultural Evolution

- Hypothesis: Terms evolve over time as some are selected more frequently over their competitors
- Eventually stability is reached as most fit terms persist
- Term generation is therefore evolutionary
- To understand how a market's Language Model evolves, we need to model *cultural evolution* – the evolution of information used within a culture

Cultural Evolution

- **Culture:**
  - Accumulated habits, attitudes, beliefs, styles, behaviour, fashion, art, etc. of a group of people
- **Evolution:**
  - Process of change in the traits of populations over time.
- **Cultural Evolution:**
  - The process of change in the accumulated habits, attitudes, beliefs, styles, behaviour, fashion, art, mannerisms, etc. of a group of people over time

New research into Cultural Evolution

○ **Existing work:**
  - Developed new model of cultural evolution that uses situation theory to provide new ontology of memetics
○ **Next phase:**
  - Use techniques from genetics(phylogenetics, systematics, food webs) to categorise, order, identify ideas from text
○ **Result:**
  - General model of memetics applicable to many different Digital Information Environments

Applications

○ **Software**
  - will model evolution of code
  - data provenance
○ **The Web**
  - enhance search by identifying common ideas expressed using different terms
○ **ACCESS**
  - New model could explain the evolution of a market's terms, ensuring Language Model evolves with market

Summary

○ Language Model is a cornerstone of ACCESS
○ Acts as a bridge between human's expression of requirements and machine's ability to interpret them
○ Persistent descriptive terms are used by ACCESS
○ Their evolution will be modelled in future projects