Grid-enabled Social Science

Yuwei Lin

ESRC National Centre for e-Social Science
University of Manchester
http://www.ncess.ac.uk

E·S·R·C
ECONOMIC
& SOCIAL
RESEARCH
COUNCIL

NCeSS

What is Grid?

- Computational Grid

- Data Grid

- Collaboration Grid

- Sensor Grid

- In short, grid is utilisation of widely distributed computing resources, storage facilities and networks owned by different organisations but used by individuals who are not necessarily a member of that organisation (Foster & Kesselman, 1999)
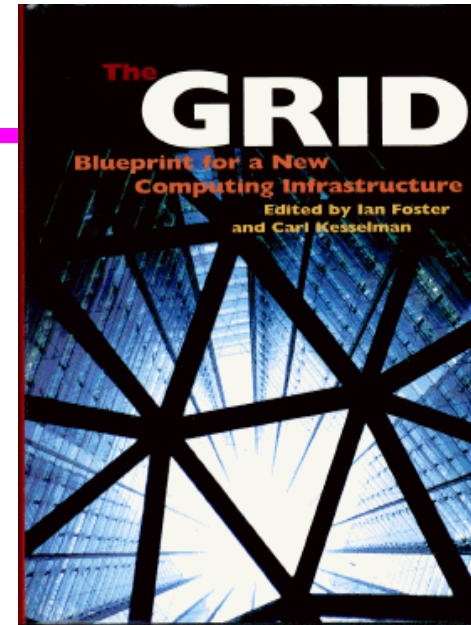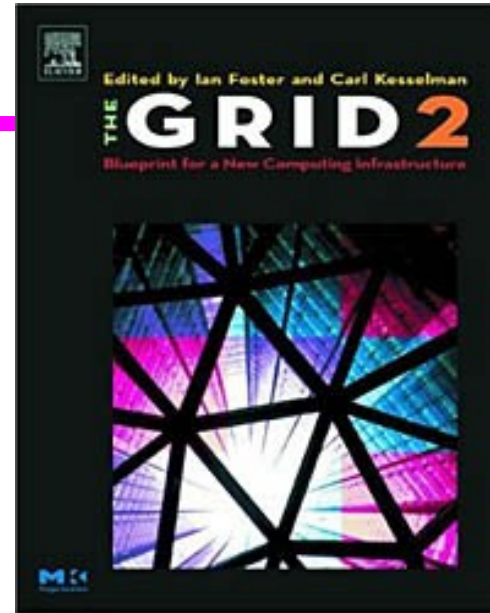
The collaborative nature of Grid

- Grid Resource Allocation is complex:
  - Resources belong to different domains
  - Resources are subject to different policies
  - Resources are geographically distributed
- Sharing of resources among institutions

NCeSS
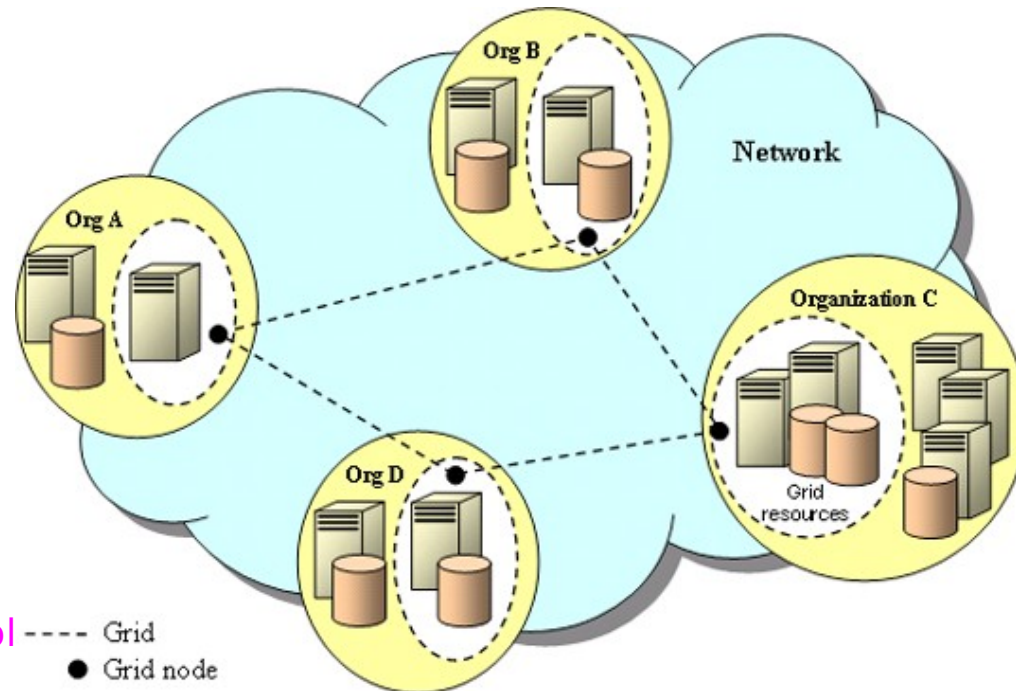
Mixed Methods (1)

- Digital Records Node (Nottingham)

- Digital Replay System: combining and replaying digital records side-by-side

- Video annotation

Representing molti-modality of data

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

NCeSS

Mixed Methods (2)

- Head Talk Small Grant Project (Nottingham)

- dealing with multi-modal corpus

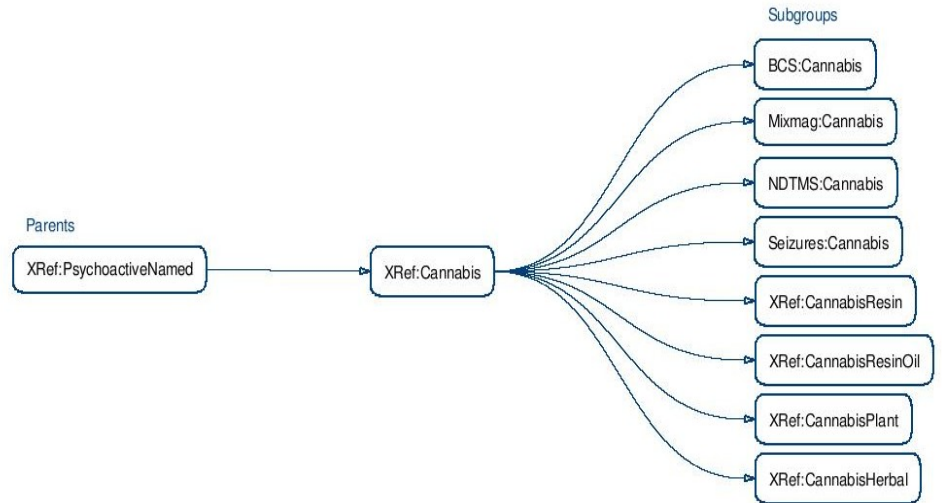- linguistic coding of verbal and non-verbal backchannels

Data Discovery (1)

- ## The Data Chronicles (Manchester): A Repository for Drug Survey Metadata

Creation of
Multiple
Ontologies

Data Discovery (2)
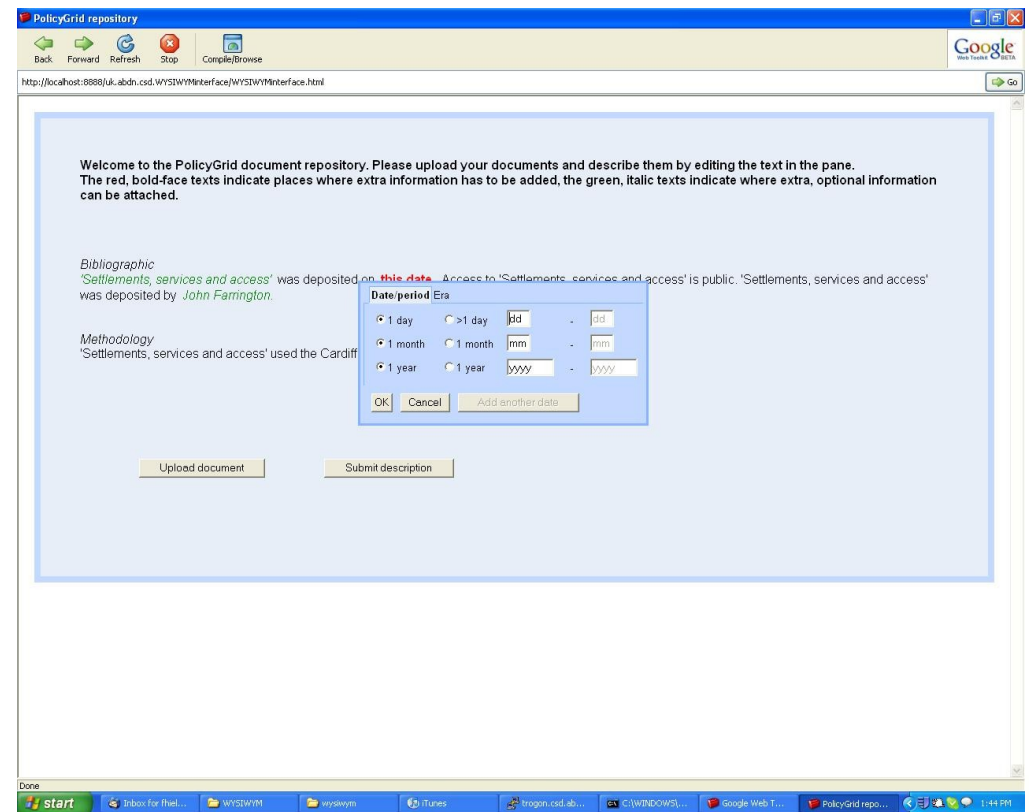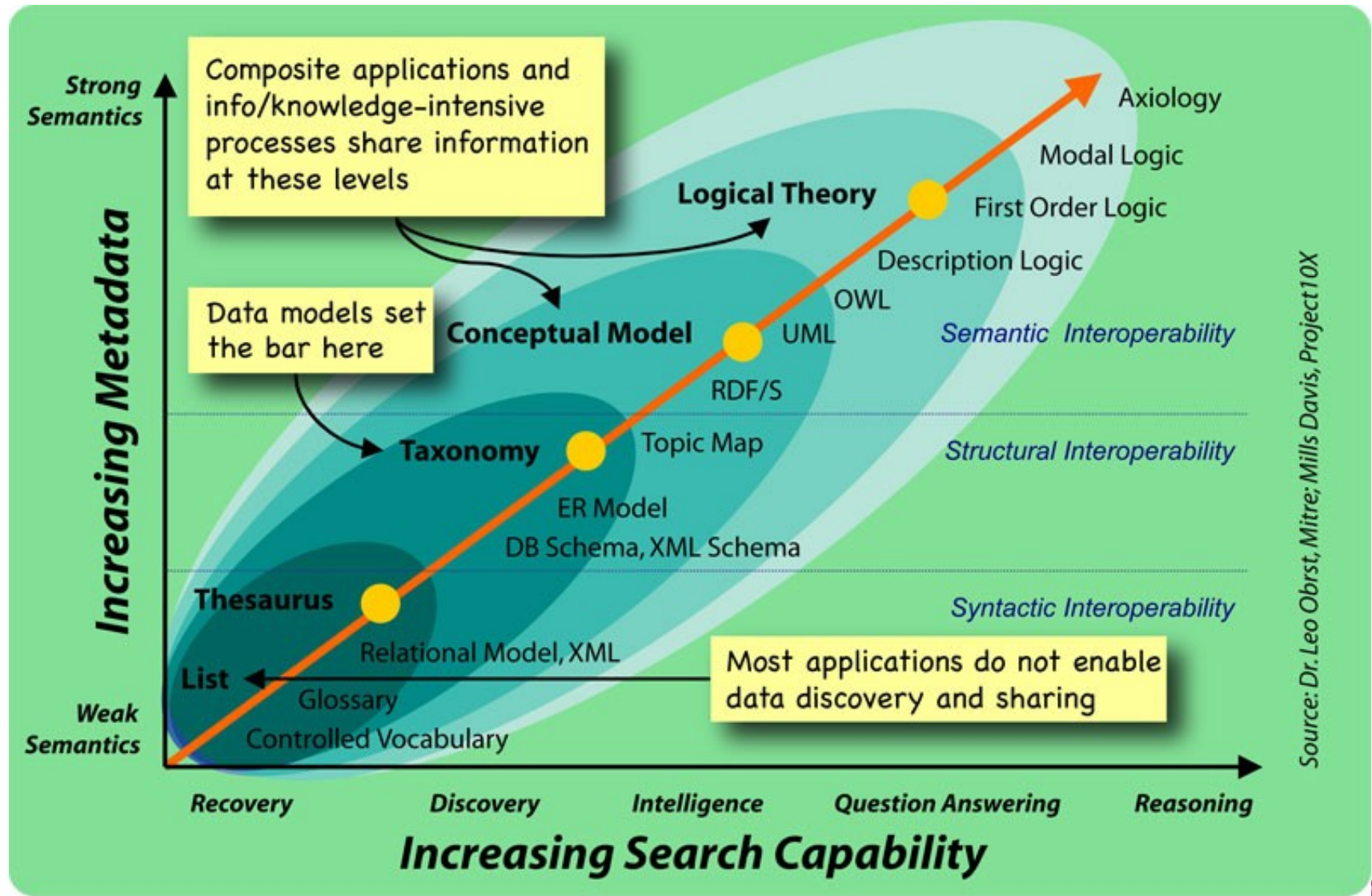
- PolicyGrid Node (Aberdeen)

- Semantic Grid Tools for facilitating evidence-based rural, social, and land-use policy-making through integrated analysis of mixed data types

- Ontologies and data integration
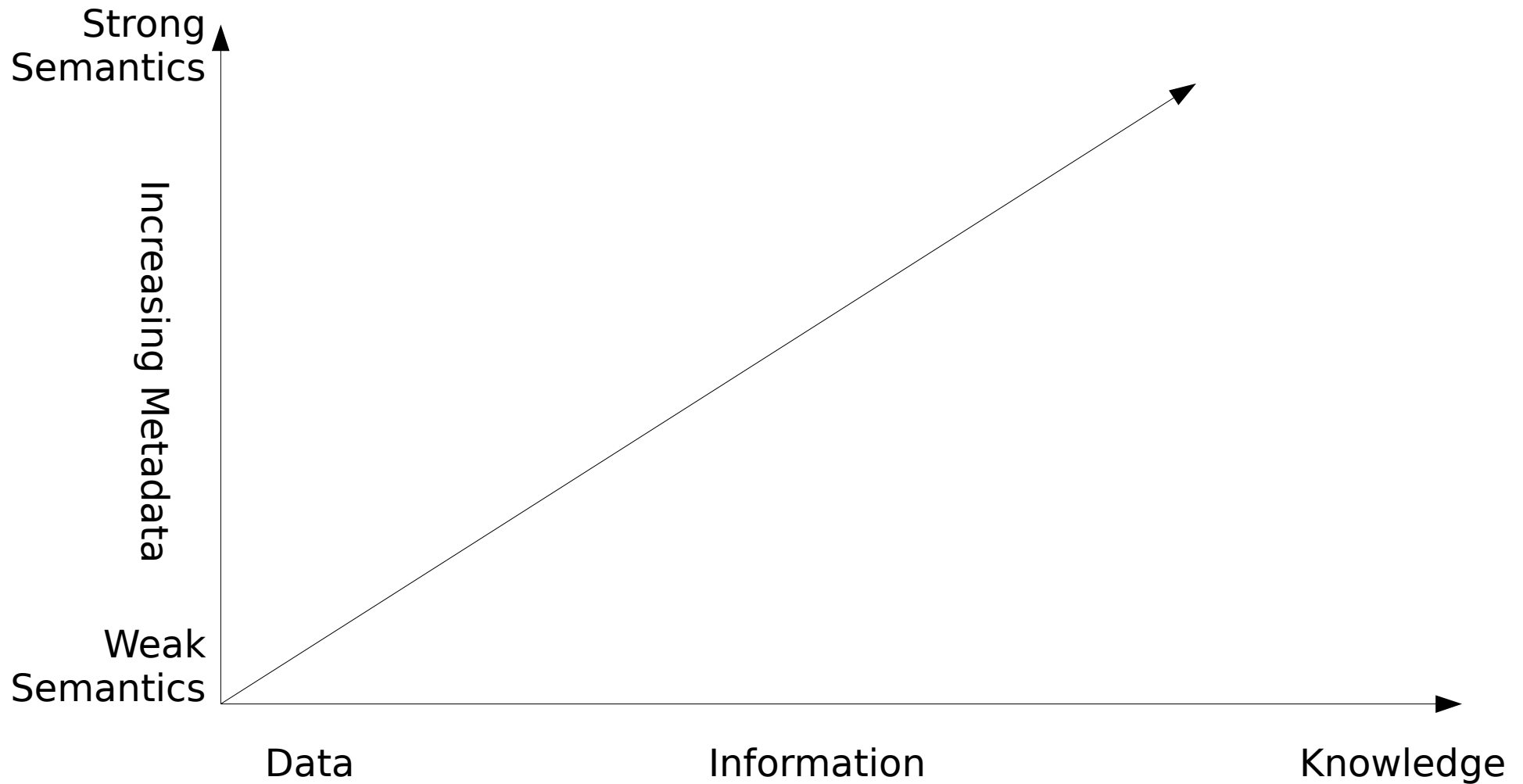
Semantic Data Discovery

Composite applications and info/knowledge-intensive processes share information at these levels

Data models set the bar here

Most applications do not enable data discovery and sharing

Strong Semantics

Weak Semantics

Increasing Metadata

Logical Theory

Conceptual Model

Taxonomy

Thesaurus

List

Axiology

Modal Logic

First Order Logic

Description Logic

OWL

UML

RDF/S

Topic Map

ER Model

DB Schema, XML Schema

Relational Model, XML

Glossary

Controlled Vocabulary

Semantic Interoperability

Structural Interoperability

Syntactic Interoperability

Recovery   Discovery   Intelligence   Question Answering   Reasoning

Increasing Search Capability

Source: Dr. Leo Obrst, Mitre; Mills Davis, Project10X

12 September 2007
NCRM Summer School, Southampton

E·S·R·C
ECONOMIC
& SOCIAL
RESEARCH
COUNCIL

NCeSS

Semantic Data Discovery

Modelling and Simulation (1)

- Modelling and Simulation for e-Social Science (MoSeS) (Leeds)

- represent and forecast the UK population at spatial level

- massive data resources and computing power

- To investigate **scenarios** which relate demographics to service provision
  - with particular emphasis on policy applications within the health, transport and fiscal policy sectors

E·S·R·C
ECONOMIC
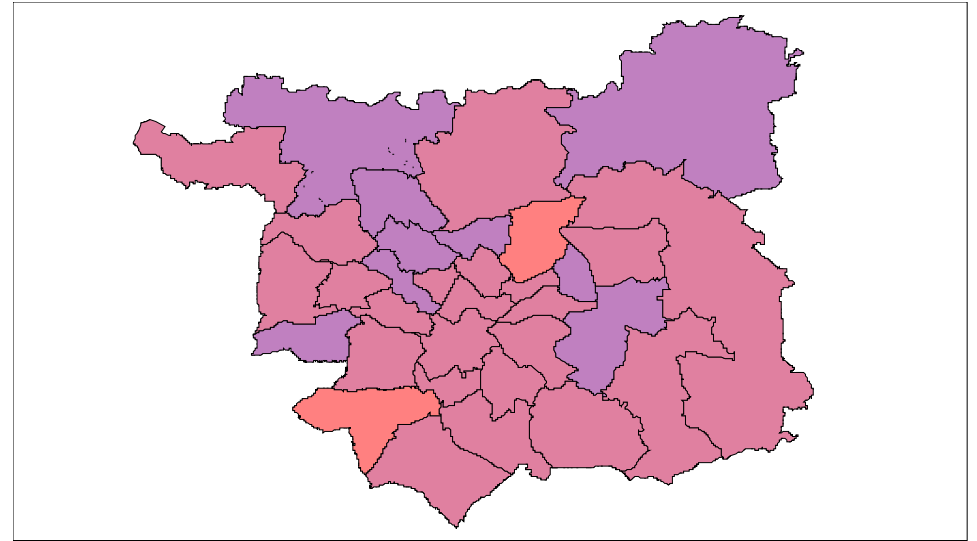& SOCIAL
RESEARCH
COUNCIL

NCeSS

Modelling and Simulation (2)
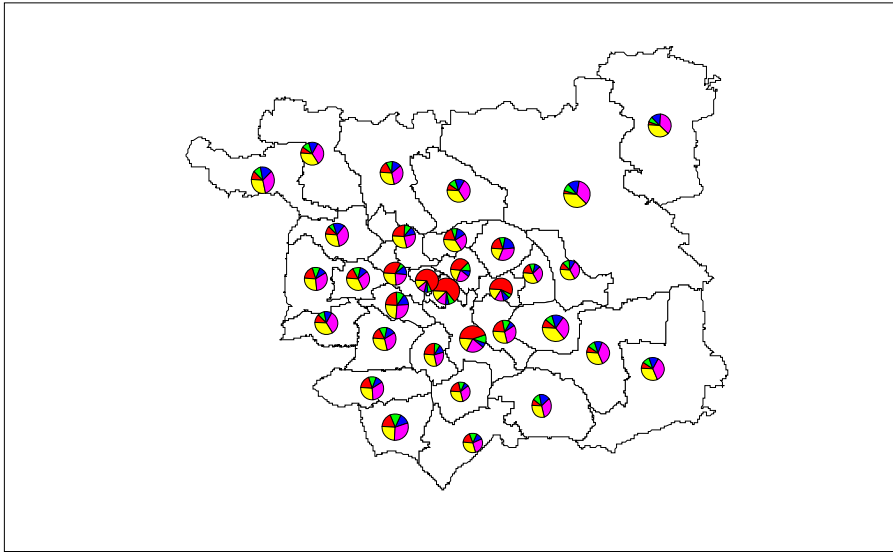
Diabetes 2005

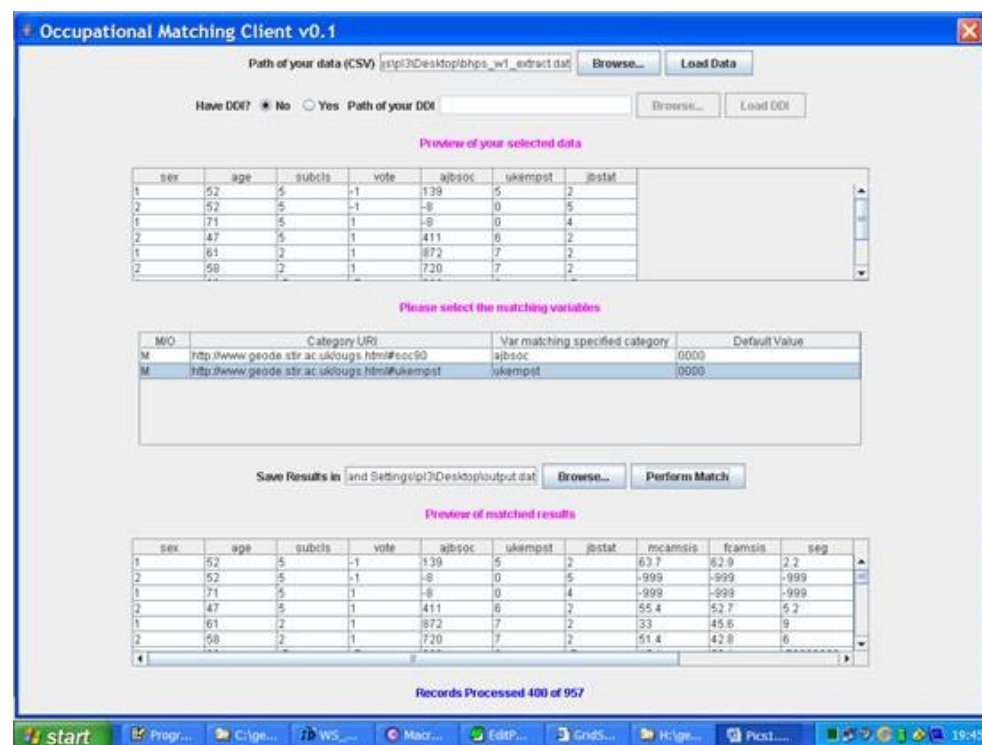Diabetes 2030

- Data-driven & evidence-based

- Challenges: Restricted access to patient data and privacy issues

E·S·R·C
ECONOMIC
& SOCIAL
RESEARCH
COUNCIL

NCeSS

Data linkage

- Grid Enabled Occupational Data Environment (GEODE) (Uni of Stirling)

- A Grid enabled internet portal to facilitate the processing of occupational data from social survey and related outputs
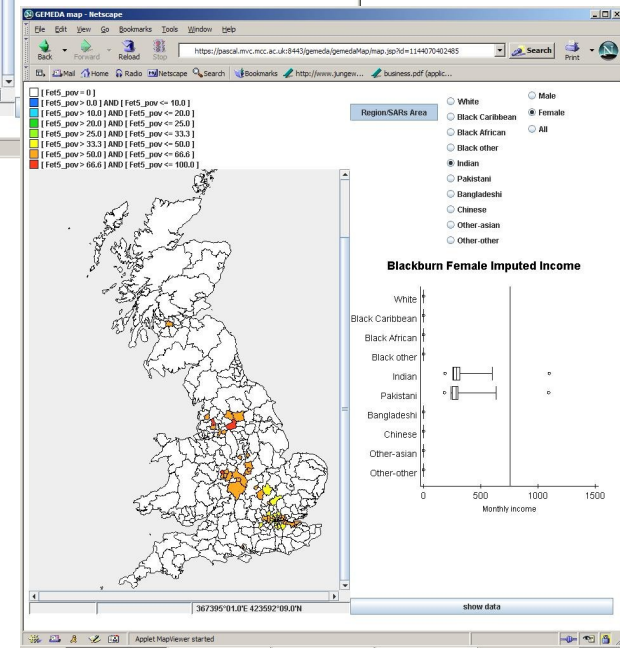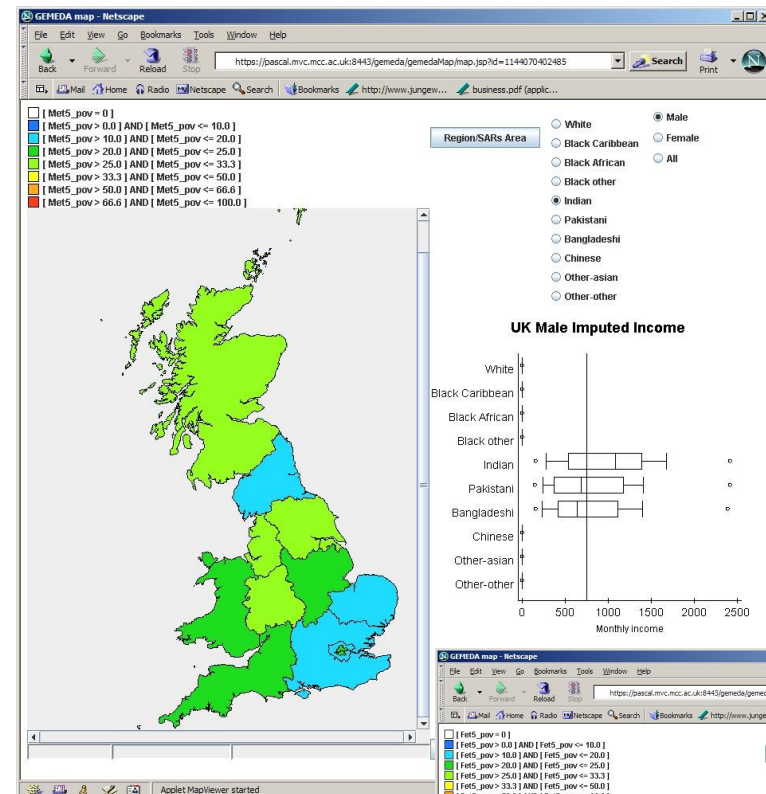
Data linkage and visualisation

- Grid-enabled micro econometric Data Analysis (GEMEDA) (Manchester)

- Data sources: British Household Panel Survey (BHPS) & UK Census' Samples of Anonymised Records (SARs)

- web-based service: access through browser light client

Data linkage and representation

- Geographic Virtual Urban Environments (GeoVUE) (UCL Centre for Advanced Spatial Analysis)

- visualise publicly available data using 2D, 3D and CAD

Animating pollution trails in Google Maps

The Google Map Creator - a freeware designed to make thematic mapping using Google Maps simpler.

Why e-Social Science?

- improved access

- better distributed collaboration

- linked data for richer results

- save time

- But, this talk is not to impose or preach to convert.

- parallel development at NCRM

- Mutual learning and community building

E·S·R·C
ECONOMIC
& SOCIAL
RESEARCH
COUNCIL

NCeSS