Developing Knowledge Systems for Social Science Research

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What is knowledge system?

• A computer system relying primarily on domain-specific knowledge for problem-solving

• also called expert system or knowledge-based system
Types and possible application (1)

• 1) interpretation of data - data mining and statistical analysis
• 2) Diagnosis - diagnose systems
• 3) Decision support - in IR or in public administration
• 4) Control - for eGovernment
Types and possible application (2)

- 5) Prediction
- 6) Campaign (marketing)
- 7) Human resource management
- 8) e-Learning (training)
Special RM Systems

• A system to bridge formal theories with empirical research
• A system to bridge decision-making with empirical research
• A system to optimize campaign results
Components

• User interface
• Knowledge base
• Inference engine
• (input, output, editor, …)
Tools to Build Knowledge Systems

• Use programming language: Prolog, LISP or C++

• Use SHELLs - shell is an expert system without knowledge base (or a bundled package containing an inference engine and a user interface)

• Use SDKs - software development kits
Representing Knowledge

- Rules based (forward chaining, backward chaining)
- Meta knowledge
- Semantic network
- Frame hierarchies
- Blackboard
- Case-based
Building Process

- Problem description
- Knowledge representation selection
- User interface design
- Customization
- Initial prototype