DESIGN SCIENCE RESEARCH METHOD

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The true mark of maturity is when somebody hurts you and you try to understand their situation instead of trying to hurt them back.
UNIX is user friendly...

It's just very particular about who its friends are.
DEFINITION

- **Research**: an activity that contributes to the understanding of a phenomenon (Kuhn, 1962; Lakatos, 1978)
- **phenomenon**: a set of behaviors of some entity(ies) that is found interesting by a research community
- **understanding**: knowledge that allows prediction of the behavior of some aspect of the phenomenon
- **activities considered appropriate to the production of understanding (knowledge) are the research methods and techniques of a research community**
Types of research (Simon, 1996):

- **natural sciences:** phenomena occurring in the world (nature or society)
- **design sciences ~ sciences of the artificial:**
  - all or part of the phenomena may be created artificially
  - studies artificial objects or phenomena designed to meet certain goals
- **social sciences:** structural level processes of a social system and its impact on social processes and social organization
- **behavioral sciences:** the decision processes and communication strategies within and between organisms in a social system
ARTIFACTS

• are not exempt from natural laws or behavioral theories
• artifacts rely on existing "kernel theories" that are applied, tested, modified, and extended through the experience, creativity, intuition, and problem solving capabilities of the researcher (Walls et al. 1992; Markus et al. 2002)
WHAT IS DESIGN SCIENCE RESEARCH (DSR)

- Activity conducted toward understanding a phenomenon
  - Other research methods study naturally occurring phenomenon
  - DSR creates the phenomenon for study

- Design assumes inventing or bringing into existence
  - DSR creates an artifact
    - If knowledge exists for artifact development, creation is routine
    - If knowledge does not exist in advance, creation is innovative

- DSR is creation of an artificial design of man-made object/phenomenon versus natural science (class of objects or things already in the world around us)

- Implies novel or innovative research
EMPHASIS OF RESEARCH

• Emphasis covers the realms of
  • Academically sound research
  • Practitioner solutions development

• Considered an Explanatory Science

• Produces knowledge (academic) and understanding of a problem domain
SEVEN GUIDELINES OF DSR

**Design as an artifact** - Design-science research must produce a viable artifact in the form of a construct, a model, a method, or an instantiation

**Problem relevance** - The objective of design-science research is to develop technology-based solutions to important and relevant business problems

**Design evaluation** - The utility, quality, and efficacy of a design artifact must be rigorously demonstrated via well-executed evaluation methods

**Research contributions** - Effective design-science research must provide clear and verifiable contributions in the areas of the design artifact, design foundations, and/or design methodologies
Research rigor - Design-science research relies upon the application of rigorous methods in both the construction and evaluation of the design artifact

Design as a search process - The search for an effective artifact requires utilizing available means to reach desired ends while satisfying laws in the problem environment

Communication of research - Design-science research must be presented effectively both to technology-oriented as well as management-oriented audiences
PRACTICAL CONCERNS OF USE OF DSR

Expectation that the artifact will work

- Can have issues, in which case the reasons for failure and suggestions for solutions must be presented

Artifact must be within the ability of the researcher to produce

Artifact development is expected to be prototyped during development of the research proposal

Requires detailed explanation of the artifact
THANK YOU FOR JOINING THIS SESSION!

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QUESTIONS?