

SLW Schwegman Lundberg and Woessner



TECHNOLOGY: A UNIFORM LANGUAGE

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Nokomis Conference Room

Why this topic?

- To increase the availability of relevant technologies, and the success rate in their adoption
- Executives need technological vigilance and flair
- But: “You cannot enter any world in which you do not have the language” - David Whyte

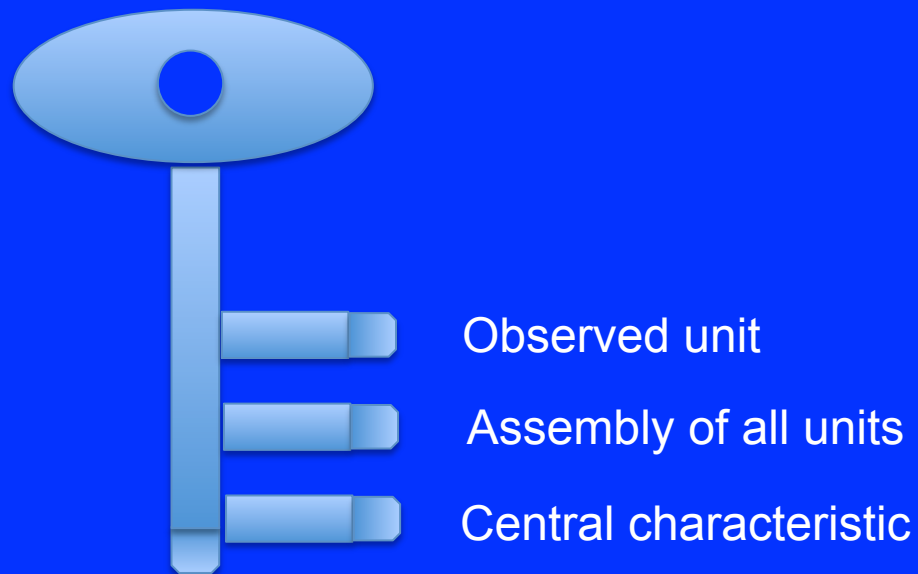
The language of technology

- An inconvenient dichotomy
 - Knowledge of individual specialties is brilliant
 - Knowledge of overall structure is non-existent
- W. Brian Arthur (2009), *The Nature of Technology*, New York, Free Press, p.14
 - “But we have no agreement on what the word ‘technology’ means, no overall theory of how technologies come into being, no deep understanding of what innovation consists of, and no theory of evolution for technology. Missing is a set of overall principles that would give the subject a logical structure, the sort of structure that would help fill these gaps.”
 - “Missing, in other words, is a theory of technology — an ‘ology’ of technology.”
- There is no adequate language

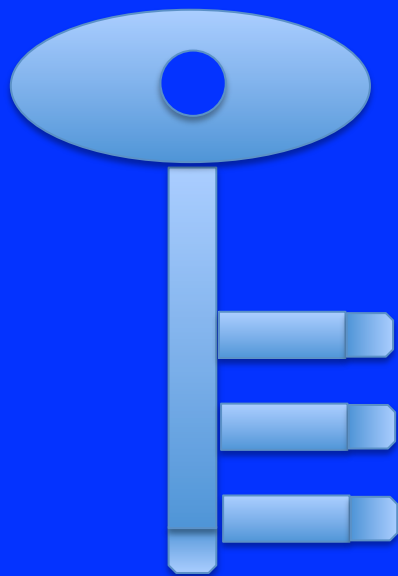
Crafting a uniform language

- Management of technology (MOT)
- Problem defined in the 1980s
- Research and practice; 1980-2010
 - Strategic technology analysis (STA)
 - A body of logically structured technological knowledge
 - A uniform technological language (UTL)
 - *Technology: A Unifying Code (2004)*
- Current status
 - Well known to a small group of specialists
 - Little used beyond

A uniform language: key components



Technological language



Observed unit = Technological Entity

Assembly of all units = Techno-sphere

Central characteristic = Functionality

Technological entity

- A unit composed of devices, procedures and human skill
- Both physical and social elements
- Evolving all the time
- Merges with other entities
- Performance can be measured

Techno-sphere

- An inter-linked mesh of all technologies
- The largest “mechanism” ever created
- Evolves all the time
- “Terra ignota” for most sciences

Functionality

- The essence of technology is the provision of functionality
- Functionality is the ability to transform physical reality
- Physical reality has three constituents
 - Matter (M)
 - Energy (E)
 - Information (I)
- Three actions affect these constituents
 - Process
 - Transport
 - Store
- There are nine fundamental categories of functionality
 - Functionality grid

Functionality grid

		Action		
		Process	Transport	Store
Output	Matter (M)			
	Energy (E)			
	Information (I)			

Van Wyk, Rias J: *Technology - A Unifying Code*, 2004, SMG, Cape Town, p. 34
Based on: Ropohl, Gunter: *Eine Systemtheorie der Technik*, 1979, Carl Hanser Verlag, Munich and Vienna, p. 178.

Features of functionality grid

- Concise
 - One page, simple mind map
- Coherent
 - Contextual framework
- Comprehensive
 - Encompasses entire techno-sphere
- Construct for an Atlas
 - Structured technology foresight

Functionality grid as an atlas

	Process	Transport	Store
Matter (M)	- Devices that self-assemble	- Maglev	- Intelligent packaging
Energy (E)	- Kinetic generator	- Wireless transmission	- Immobilized light
Information (I)	- Continuous orientation	- Mind activated interfaces	- Bio-based

Dissemination

- Know-how seminars
 - Capturing technology-based innovation opportunities
 - Technology assessment for investment professionals
- Promote UTL in professional practice
 - International Telecommunications Union (ITU)
- Support professional associations
 - International Association for Management of Technology (IAMOT)
 - IEEE
 - CFA Institute
- Encourage universities
 - University of Minnesota
 - University of Stellenbosch
- Book

Wrap up

- Need technological flair and vigilance
- No uniform technological language
- Contribution of MOT
- Time for dissemination
- Know-how seminars

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