

SLW Schwegman Lundberg and Woessner



TECHNOLOGY: A UNIFORM LANGUAGE

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Why a language of technology?

- To help energize the innovation chain – the sequence of events that leads from scientific discovery, through technological progress and on to practical application

The problem

- Technology is a complex mix
 - Hard to manage
- A major source of economic growth
 - A daily outburst of new technologies
 - Difficult to harness full potential
- A source of many dangers
 - Most innovations fail
 - Billions of dollars wasted on poor technological investments
 - Technology-based pollution destroys the life giving forces of nature

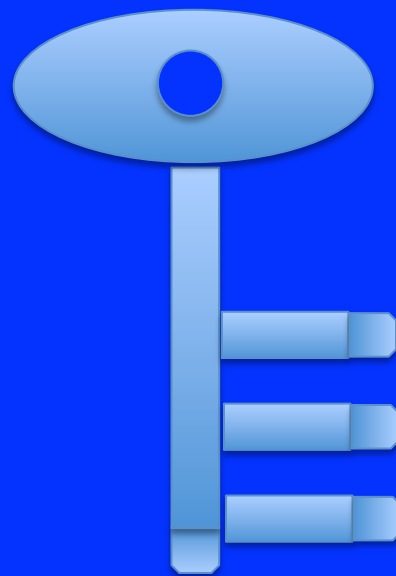
The cause

- Poor state of technological knowledge
 - Knowledge of individual aspects 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.”
- Limited grasp and guidance of technological progress

Need: A language of technology

- Present language reflects the dichotomy in knowledge
 - Many specialty “dialects” exist side by side
 - Not linked by a common bond
 - There is a conceptual void
- Problem defined in the 1980s
 - Strategic technology analysis (STA) – a specialty field within management of technology (MOT)
 - Roots of a language of technology
 - *Technology: A Unifying Code (2004)*
- Current status
 - Well known to a small group of specialists
 - Little used beyond

Key to a common language



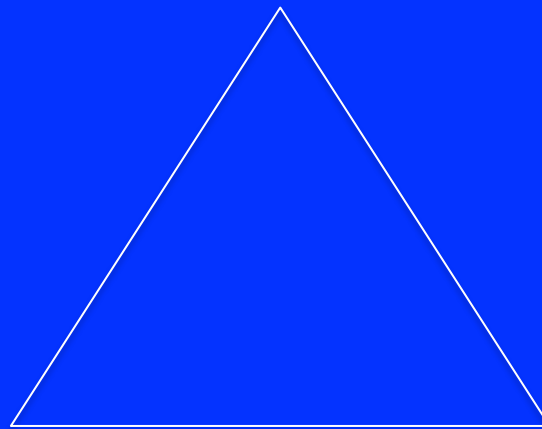
Central characteristic

Individual unit

Assembly of all units

Key to the language of technology

Central characteristic:
Functionality



Individual unit:
Technological entity

Assembly of all units:
Techno-sphere

Functionality

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

Functionality grid

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

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.

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 grid: A format for an atlas of the techno-sphere

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

The future

- Think tank
 - Stellenbosch Institute for Advanced Study (STIAS)
- Technoscan[®] Centre
 - Academic manual: *The language of technology*
 - Executive education: *Find business opportunities in technology-based innovations*
 - Executive education: *Techno-Audits*[™]
- Professional organizations
 - International Association for Management of Technology (IAMOT)
 - International Telecommunication Union (ITU)
 - IEEE
 - CFA Institute
- Universities
 - University of Minnesota
 - University of Stellenbosch

References

1. Arthur, W.B. (2009) *The Nature of Technology*, New York, The Free Press
2. Cockfield, A. and Pridmore, J. (2007) "A synthetic theory of law and technology" *Minnesota Journal of Law, Science and Technology*, Vol. 8, No. 2, pp. 475-513
3. Van Wyk, Rias J. (2004) *Technology: A Unifying Code*, Stage Media Group, Cape Town.
4. Van Wyk, Rias J. (2011) *The language of technology* Technoscan® Centre, Minneapolis, MN 55439
5. Van Wyk, Rias J.; Karschnia, Bob; Ohlson, Wayne; (2007) "Atlas of Technological Advance" *Research. Technology Management*, Volume: 51, Issue: 5, pp. 61-66