



## Toward a (New or Revived..) Science of Technology



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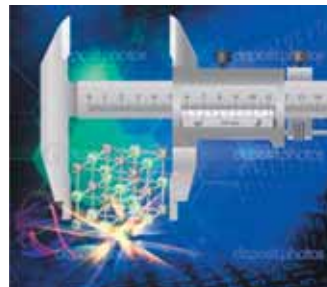
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## At This Time...

- Technology Keeps Growing
- But Humanity's Problems Grow too!
- Need New Solutions
  
- Maybe Need a Better "Science of Technology"
- Simple Science

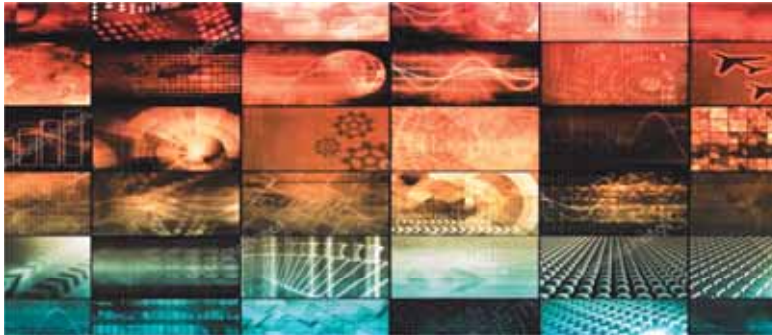


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# What is Technology?

No Common Definition  
No Agreement Among Scholars

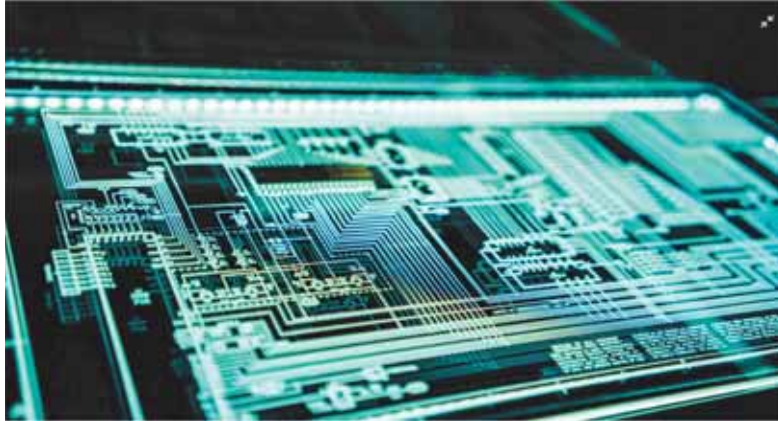


## Technology Definitions



- Technology is the result of accumulated **knowledge and application** of skills, methods, and processes used in industrial production and scientific research (Wikipedia 2022).
- Technology is the **scientific method** and material used to achieve a commercial or industrial objective (The Free Dictionary, 2021)
- Technology is the total **knowledge** and skills available to any human society for industry, art, science, etc. (Word English Dictionary, 2020)
- Technology is the sum of **techniques**, skill, methods, and processes used in the production of goods or services or in the accomplishment of objectives. Technology is the knowledge of techniques, process and the like or it can be embedded in machines (Wikipedia, 2020).
- Technology involves the invention, development, and cognitive **tools** and other artifacts, brought to bear on raw materials and intermediate stock parts, with a view to the resolution of perceived problems (Hickman, 2021).
- Technology is **people using knowledge**, tools, and systems to make their lives easier and better (Bergen Schools, 2007).
- Technology is the knowledge of the totality of the means by which the community attempts to achieve the ends that are deemed to be desirable (Bond, 2003).
- Technology is defined as **tools** made by humans, as efficient means to an end, or as an ensemble of material artifacts (Rammert, 1999).
- Technology also encompasses instrumental practices, like the creation, fabrication, and use of means and machines (Rammert, 1999).
- Technology is the **manufacture and utilization** of equipment, tools, and machines, the manufactured and used things themselves and the needs and ends that they serve (Heidegger, 1977).
- Technology (in general) is created capability (van Wyk, 1995).
- Technology equals the sum from concept to commercialization of the "created capability" (know-how) embedded in product (artifact), plus process, plus information, plus project management" (Gaynor, 1996).
- Technology is the means of producing useful artifacts ; "means" includes, but may not be limited to, "technical know-how" (Farrell, 1995).
- Technology is the **application** of scientific and engineering **knowledge** to achieve practical results (Roussel & Saad, 1991).
- Technology is a systematic and standardized **means for achieving any predefined result**. (Baker & Eshenbach, 1990).
- Technology is the **human process** of applying resources to satisfy our wants and needs to extend our capabilities (Santa Clara Eng., 2007).
- Technology is a science-based knowledge that can be "reduced to practice" or optimized towards a commercial use (Haour, 1995)
- Technology is the **totality of means created by people to facilitate human activity**. (van Wyk, 1995)
- Technology is knowledge embedded in products and processes (Dowling, 1995)

# So What is Technology?



## In search of a Fundamental Entity

### Area (ology)

- Biology
- Geology
- Dermatology
  
- Technology

Is the  
Science  
of..

### Fundamental Entity

- ✓ Organism
- ✓ Earth
- ✓ Derma (Skin)
  
- ✓ ??

# Human Made Objects



Artifact

One of a Kind



One of Many



# Human Made Objects

Artifact

Unifact



Technofact

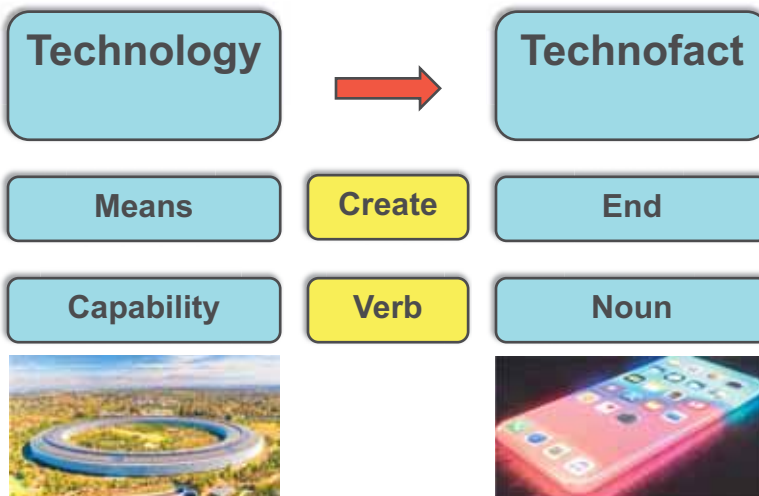
Fundamental Entity



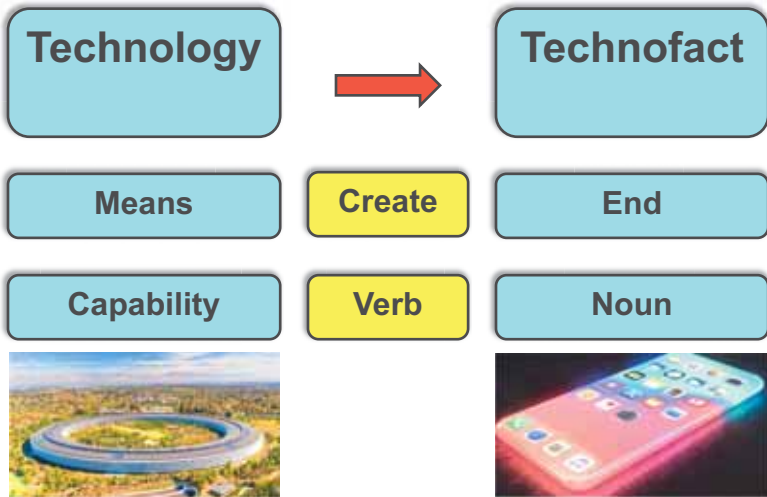
# The Definition

**Technofact** is a Human-Made Reproducible Object

**Technology** is the Capability to Create and Improve Technofacts



# New Questions





## Some New Perspectives

- Human-Made or Not?
- What About Software?
- Will Every Technofact be Reproduced?
- Microtechnology vs Macrotechnology
- Intellectual Property

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## Technology Science: 7 Principles of Technology

Technology

1. Elements
2. Performance



Technofacts

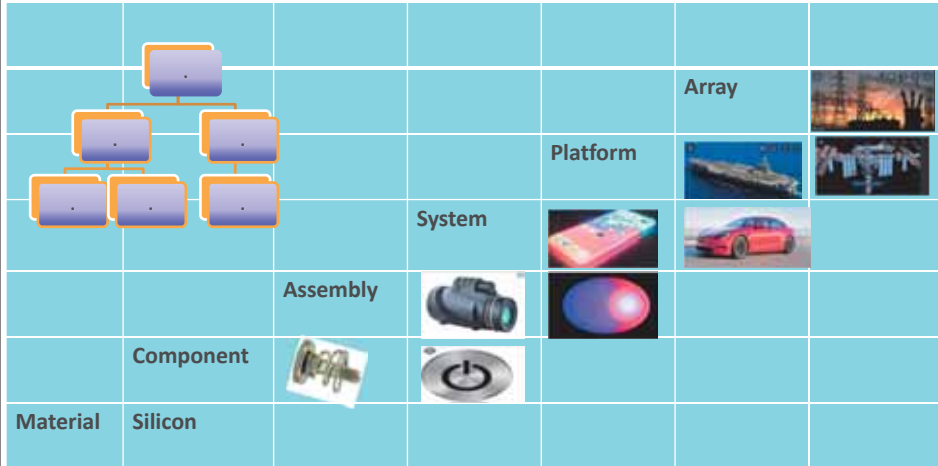
3. Structure
4. Function
5. Activities
6. Value
7. Order



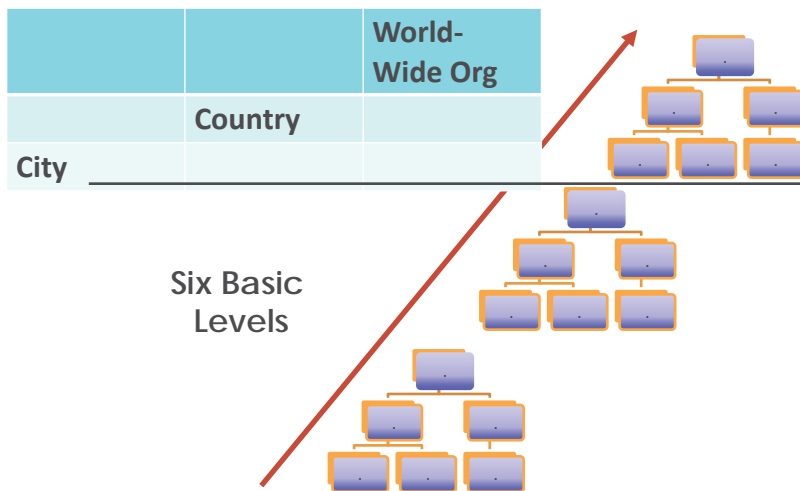
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# Hierarchy of Technofacts Levels (Structure of Systems and Subsystems)



# Technofacts (and Beyond – 9 Levels)





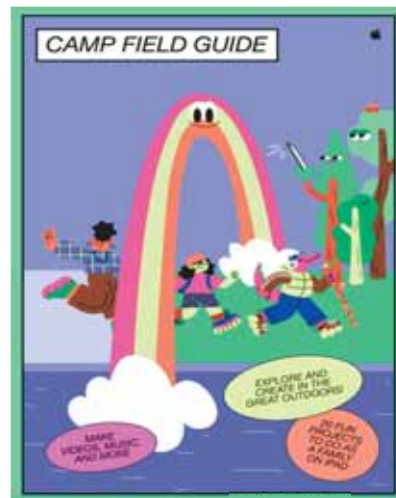
## Management of Technology

### The Management of Organizations that Create Economic Value with Technology



## Future Research and Education

- Technology Sci. Dept
- Multidisciplinary
- Systems View
- Areas of Expertise
  - » STEM, Law, Social Sci., Liberal Arts, Humanity History, Creatology...



# Thank You!

