

# Standards, Open Systems and Design

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# Design Goal

- “Design is the fundamental soul of a humanmade creation that ends up expressing itself in successive outer layers of the product or service.” -Steve Jobs
- From the presentation of: Fumiko Ichikawa, Innovation Lab, Hakuhodo November 29, 2011

# Definitions

Standard: Model, document or concept

Standardization: Process of creating, implementing,  
or using a standard

# Definitions

Reference - A rule applied to define something

Standard - A codified and quantified rule imposed by  
an authority, committee or market

(F.A. Hayek, *Rules and Order*, 1973).

# Established References

<b>Established by</b>	<b>Term</b>
Accident, assumption, convention	common reference
Government	regulation
Private entity	specification
Committee	standard
Market	de facto standard

# Succession of Standards

<b>Standards</b>	<b>Examples</b>	<b>Purpose</b>	<b>Effect</b>
<b>1. Symbols</b>	<b>Number systems</b>	<b>Identity</b>	<b>Communications</b>
<b>2. Measurement</b>	<b>Units of Measure, Monetary system</b>	<b>Measurement</b>	<b>Quantify abstractions</b>
<b>3. Similarity</b>	<b>Cellular mobile and base, ISO9000, 14000, X.3 PAD</b>	<b>Repeatability</b>	<b>Maintain sameness</b>
<b>4. Compatibility</b>	<b>Nuts &amp; bolts, Group 3 facsimile, telephone modems, X.25 interface, cellular air interfaces</b>	<b>Interworking</b>	<b>Sender compatible with receiver</b>
<b>5. Adaptability</b>	<b>Aloha protocol, CSMA/CD, Modem handshakes, XML, SIP, fax T.30</b>	<b>Variability</b>	<b>Negotiate the variation</b>

# Taxonomy of Technology

	<b>Age</b>				
	<b>Hunter Gatherer (before 3000 BC)</b>	<b>Agrarian (3000 BC - 1750 AD)</b>	<b>Industrial (1750 - 1950)</b>	<b>Information (1950 - 2000)</b>	<b>Post-Information (2000 +)</b>
<b>Value System</b>	<b>Property (private)</b>	<b>Currency</b>	<b>Invention (patents)</b>	<b>System (public utilities)</b>	<b>Concept (copyright, brands)</b>
<b>Technology</b>	<b>Counting</b>	<b>Units of Measure, Monetary Systems</b>	<b>Powered machines</b>	<b>Sequential processes (railroad, telephone, utilities)</b>	<b>Adaptive processes (computers)</b>
<b>Communi- cations</b>	<b>Barter</b>	<b>Commerce</b>	<b>Mechanized transport</b>	<b>Electronic (telegraph, telephone)</b>	<b>Internet</b>
<b>Standards Successions</b>	<b>Symbols</b>	<b>Measurement</b>	<b>Similarity</b>	<b>Compati- bility</b>	<b>Adaptability</b>

# Successions of Technical Standards: Political/Economic Effects

	<b>Age</b>				
	<b>Hunter Gatherer (before 3000 BC)</b>	<b>Agrarian (3000 BC - 1750 AD)</b>	<b>Industrial (1750 - 1950)</b>	<b>Information (1950 - 2000)</b>	<b>Post-Information (2000 +)</b>
<b>Standards Succession</b>	<b>Symbols</b>	<b>Measurement</b>	<b>Similarity</b>	<b>Compatibility</b>	<b>Adaptability</b>
<b>Authorities' involvement in standardization</b>	<b>Dominate</b>	<b>Authoritarian</b>	<b>Oversight</b>	<b>Limited or none</b>	<b>Future: Guidelines?</b>
<b>Entrepreneurs' view of standards</b>	<b>Unknown</b>	<b>Undesirable</b>	<b>Distrustful</b>	<b>Winner-take-all</b>	<b>Future: Fair?</b>
<b>Economic Self-reinforcing mechanisms</b>	<b>Communications</b>	<b>Coordination effects</b>	<b>Scaling and learning effects</b>	<b>Network-effects</b>	<b>Gateway effects</b>



**Part II**  
**Open Standards**  
**are a part of**  
**Open Systems**

**Once all stakeholders participated in standardization:**

- **Users/carriers**
- **Implementers**
- **Government**

**Now implementers dominate the standardization processes.**

**When SDOs and Consortia no longer focus on everyone's needs, some are disenfranchised.**

**This creates the desire for  
“open standards.”**

# Open Standards mean different things to different people

## **Implementers want:**

- A single process for worldwide standards
- A fair process to negotiate intellectual property rights (IPR)

## **Users/carriers want:**

- Backward and forward compatibility
- Maintained standards
- Public (low fees) technology

## **Government wants:**

- A means to address the standardization aspects of political problems.

## **Everyone wants:**

- A fair, fast and efficient standardization system.

# Ten Requirements for Open Standards

## Requirements

1. Open meeting
2. Consensus
3. Due Process
4. Open World
5. Open IPR
6. Open Change
7. Open Documents
8. Open Interface
9. Open Use
10. On-going Support

## Stakeholders

Creation

Implementation

Use

**Part III**  
**Open Systems**  
**are**  
**Adaptable**



# Current Problems With Controlled Compatibility Standards

- The EU's concern that only Apple iPods can download music from Apple iTunes web sites.
- The Chinese government's push for their own communications technology in Chinese communications systems.
- The EU and previous US anti-trust actions over Microsoft's proprietary software interfaces.

# Adaptability

The means to create and maintain interoperation between autonomous heterogeneous systems at all OSI layers.

Adaptability includes three processes:

- Identification
- Negotiation
- Selection

# Creating Adaptability

## OSI layers

7  
6  
5 }  
4 TCP/UDP  
3 IP  
2 }  
1

## Negotiation means:

Service discovery protocols

Etiquettes  
(Network discovery protocols)

## The properties of an etiquette include

- Negotiation services without operational functionality.
- Single tree, unambiguous, logical structure.
- Deletions are not allowed.
- An etiquette receiver ignores what it does not understand.
- Mechanism available to prioritize each branch.
- Supports proprietary functionality.
- Etiquette revision level.

The testing of an etiquette is different from  
a protocol.

# The Benefits of Adaptability - 1

- Supports the rapid introduction of new technology.
- Supports proprietary, national and regional functions and features within public standards.
- Supports negotiation of modes, features and options.
- Selects compatible modes between different multi-mode systems while increasing system capacity.

# The Benefits of Adaptability - 2

- Maintains interoperation between multiple implementations or revisions of standards.
- Moves intellectual property issues to the market.
- Identifies the specific reason(s) when interoperation fails.
- Avoids interfering communications.

# Insights Offered by the Succession of Standards

- Adaptability standards support new value systems
- Government should promote guidelines, not solutions
- Patents best applied to similarity
- Need to limit patents in compatibility standards
- Need to avoid patents in adaptability standards

# Thank you

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