

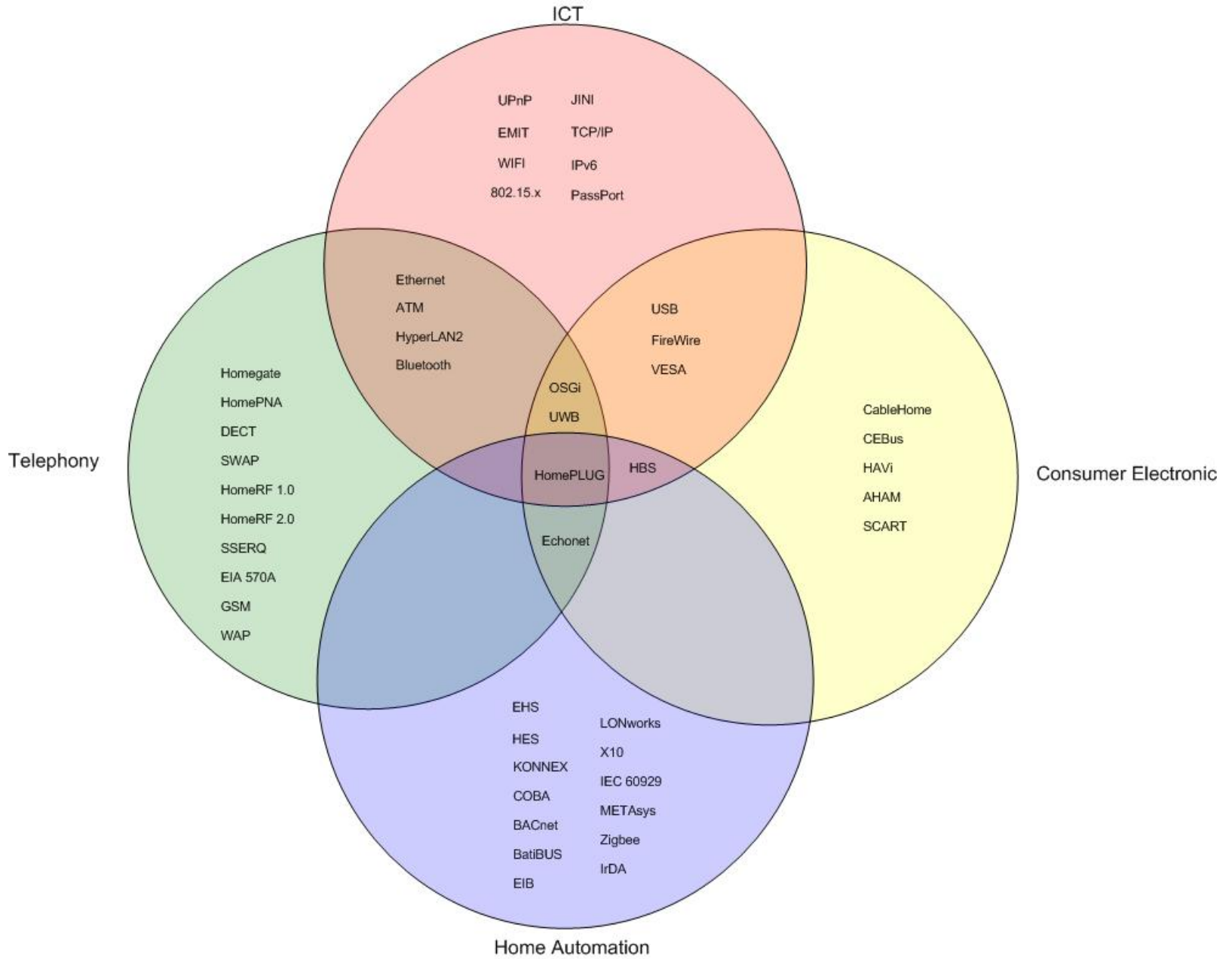
Factors affecting the adoption of standards in converging worlds: An AHP Analysis

Euras workshop 16-5-2007

Geerten van de Kaa
Henk de Vries
Jan van den Ende

Contents

- **Research objective and background information**
- **Framework for standard selection**
- **Complex systems: the home network**
- **Research methodology: AHP**
- **Results**
- **Conclusion**



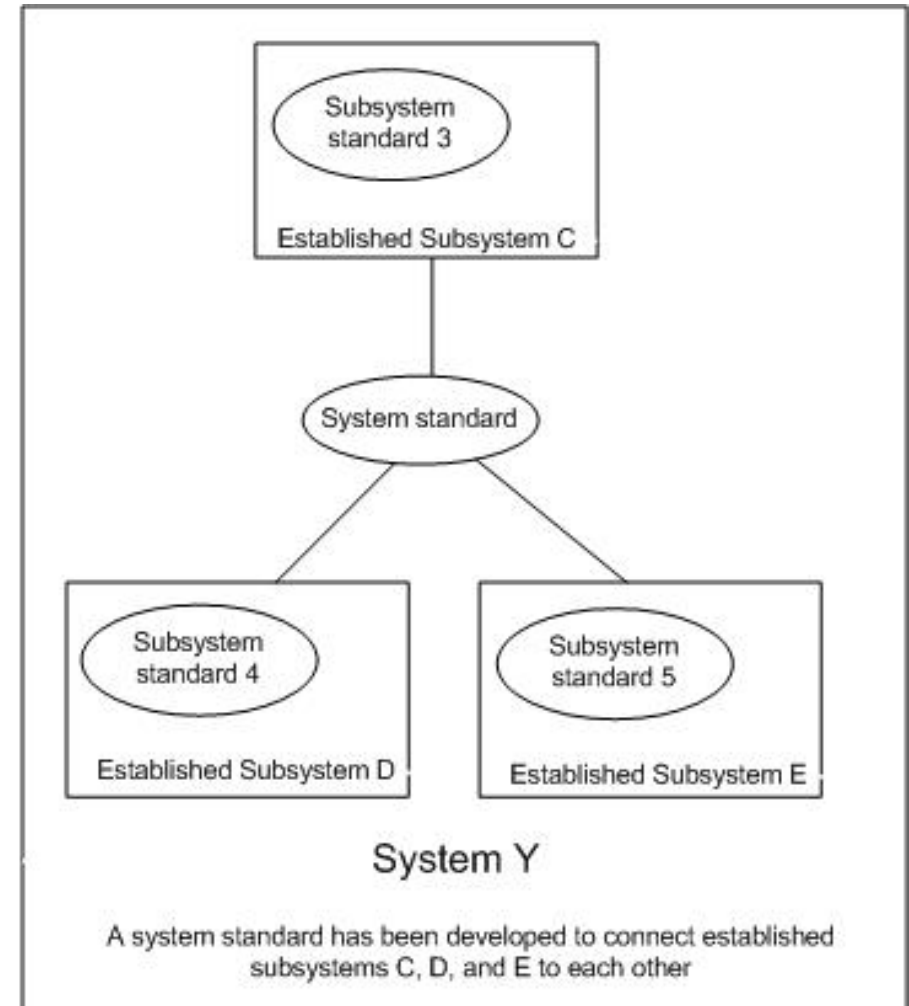
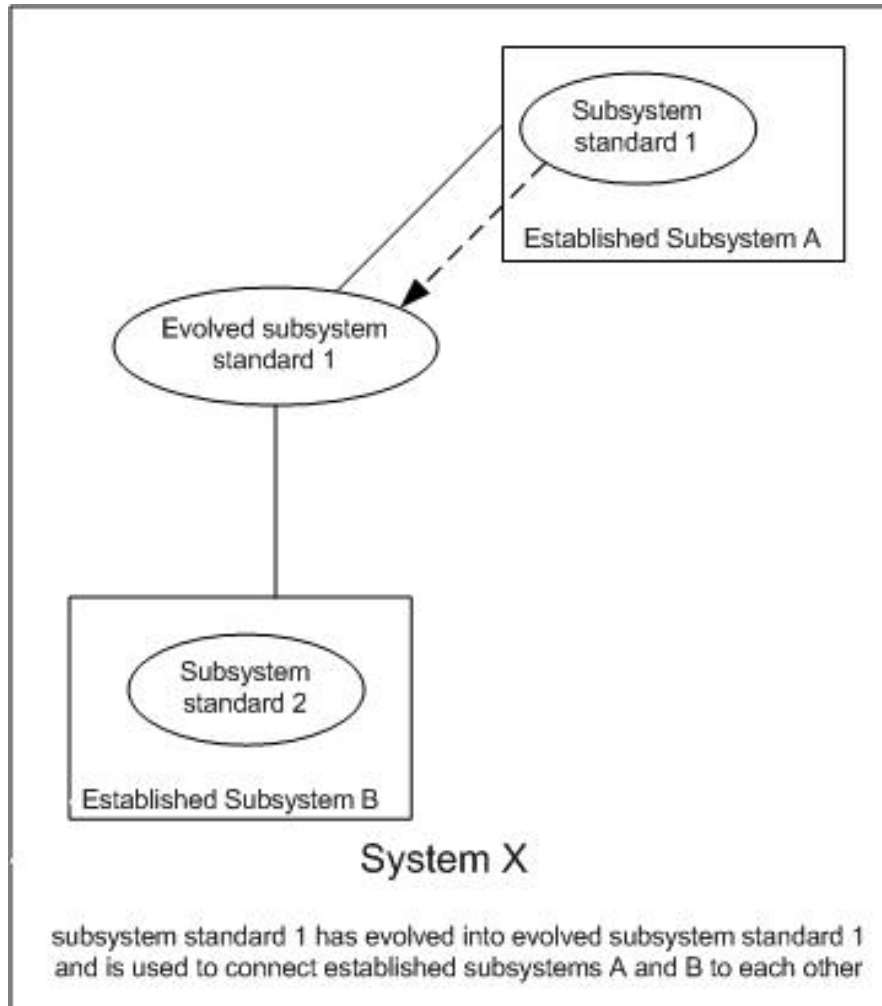
Research objective

- To reach insight into the potential application of the Analytical Hierarchy Process (AHP) method in standardization research
- Can we by applying the AHP give weights to different factors that influence the chances that standards achieve dominance...
- and give recommendations as to which standard will have the highest chance of reaching dominance

Framework for standard dominance

- **Superior design**
 - Technological superiority of the standard
 - Compatibility
 - Complementary designs
 - Flexibility of the design trajectory
- **Stakeholders**
 - Current installed base
 - Previous installed base
 - Big fish
 - Regulator
 - Judiciary
 - Other suppliers that adhere to the standard
 - Effectiveness of standardisation process
 - Position in a network of other stakeholders
- **Dominant agent**
 - Financial strength of the agent
 - Brand reputation and credibility
 - Learning orientation of the agent
- **Strategy**
 - Pricing strategy
 - Appropriability regime
 - Timing of entry
 - Marketing communications
 - Commitment of the agent

The home network



The home network

- Analysis of 9 representative standards
- Subsystem standards:
 - HAVi, IrDA, Bluetooth*
- Evolved subsystem standards:
 - WIFI*, DECT, Homegate
- System standards:
 - HyperLan2, HomeRF, HomePNA*

AHP

- Representing the problem into a structural hierarchy consisting of criteria (factors for standard dominance), and alternatives (standards)
- Experts compare the factors with each other and rate the importance of each factor over the other.
- For every factor, experts compare the standards with each other with respect to how they score on each factor
- The consistency of the answers provided is checked
- The (dis)similarities among data provided by respondents are analysed.
- → Results in a weight for each factor in the framework as well as a percentage chance that a standard achieves dominance.

Results: categories

- Consistent answers are in bold

	Weight Respondent A	Weight Respondent B	Weight Respondent C	Mean weight (standard deviation)
Superior standard	0.05 (0.03)	0.14 (0.10)	0.12 (0.15)	<u>0.10</u> <u>(0.06)</u>
Stakeholders	0.58 (0.03)	0.27 (0.10)	0.28 (0.15)	0.43 (0.22)
Dominant agent	0.26 (0.03)	0.05 (0.10)	0.52 (0.15)	0.16 (0.15)
Strategy	0.12 (0.03)	0.54 (0.10)	0.08 (0.15)	0.33 (0.30)

Results: factors

	Respondent A	Respondent B	Respondent C	mean (standard deviation)
Superior standard				
Technological superiority	0.12	0.12	0.06	<u>0.10 (0.03)</u>
Compatibility	0.58	0.58	0.19	0.45 (0.23)
Complementary products	0.04	0.25	0.53	0.27 (0.25)
Flexibility of the design trajectory	0.25	0.04	0.22	0.17 (0.11)
Stakeholders				
Current installed base	0.04	0.13	0.07	<u>0.09 (0.06)</u>
Previous installed base	0.07	0.13	0.01	<u>0.1 (0.04)</u>
Big fish	0.12	0.04	0.14	<u>0.08 (0.06)</u>
Regulator	0.38	0.28	0.3	<u>0.33 (0.07)</u>
Judiciary	0.04	0.28	0.08	0.16 (0.17)
Other suppliers	0.22	0.06	0.12	0.14 (0.11)
Effectiveness SD	0.02	0.02	0.09	<u>0.02 (0.00)</u>
Position in a network	0.12	0.06	0.19	<u>0.09 (0.04)</u>

Results: factors (continued)

	Respondent A	Respondent B	Respondent C	Mean (standard deviation)
Dominant agent				
Financial strength of the agent	0.28	0.64	0.63	0.52 (0.21)
Brand reputation and credibility	0.64	0.28	0.26	0.39 (0.21)
Learning orientation of the agent	0.07	0.07	0.11	<u>0.08 (0.02)</u>
Strategy				
Pricing strategy	0.26	0.16	0.17	0.26 (N/A)
Openness of the standard	0.50	0.08	0.07	0.5 (N/A)
Timing of entry	0.03	0.49	0.42	0.03 (N/A)
Marketing communications	0.07	0.24	0.23	0.07 (N/A)
Commitment of the agent	0.13	0.03	0.11	0.13 (N/A)

Results: types of standards

	Subsystem standard	System standard	Evolved subsystem standard
Technological superiority	0.64 ⁽¹⁾	0.10 ⁽¹⁾	0.26 ⁽¹⁾
Compatibility	0.65 (0.02) ⁽²⁾	0.10 (0.01) ⁽²⁾	0.25 (0.01) ⁽²⁾
Complementary products	0.35 (0.28) ⁽³⁾	0.26 (0.27) ⁽³⁾	0.29 (0.04) ⁽³⁾
Flexibility of the design trajectory	0.40 ⁽¹⁾	0.20 ⁽¹⁾	0.40 ⁽¹⁾
Current installed base	0.41 (0.20) ⁽³⁾	0.31 (0.20) ⁽³⁾	0.28 (0.05) ⁽³⁾
Previous installed base	0.41 (0.20) ⁽³⁾	0.31 (0.20) ⁽³⁾	0.28 (0.05) ⁽³⁾
Big fish	0.21 (0.18) ⁽²⁾	0.53 (0.28) ⁽²⁾	0.26 (0.10) ⁽²⁾
Regulator	0.25 (0.14) ⁽³⁾	0.46 (0.23) ⁽³⁾	0.2 (0.08) ⁽³⁾
Judiciary	0.33 (0.00) ⁽²⁾	0.33 (0.00) ⁽²⁾	0.33 (0.00) ⁽²⁾
Other suppliers	0.13 (0.04) ⁽³⁾	0.65 (0.08) ⁽³⁾	0.22 (0.06) ⁽³⁾
Effectiveness SD	0.33 ⁽¹⁾	0.33 ⁽¹⁾	0.33 ⁽¹⁾
Position in a network	0.12 (0.03) ⁽²⁾	0.60 (0.04) ⁽²⁾	0.27 (0.02) ⁽²⁾
Financial strength of the agent	0.21 (0.18) ⁽²⁾	0.53 (0.28) ⁽²⁾	0.26 (0.10) ⁽²⁾
Brand reputation and credibility	0.26 (0.13) ⁽³⁾	0.43 (0.17) ⁽³⁾	0.31 (0.04) ⁽³⁾
Learning orientation of the agent	0.24 (0.14) ⁽²⁾	0.52 (0.27) ⁽²⁾	0.24 (0.14) ⁽²⁾
Pricing strategy	0.33 ⁽¹⁾	0.33 ⁽¹⁾	0.33 ⁽¹⁾
Openness of the standard	0.11 ⁽¹⁾	0.44 ⁽¹⁾	0.44 ⁽¹⁾
Timing of entry	0.42 (0.16) ⁽²⁾	0.48 (0.21) ⁽²⁾	0.30 (0.05) ⁽²⁾
Marketing communications	0.33 ⁽¹⁾	0.33 ⁽¹⁾	0.33 ⁽¹⁾
Commitment of the agent	0.17 (0.23)	0.17 (0.24)	0.27 (0.09)

Results: standards

	Respondent A	Respondent B	Respondent C
Subsystem standards			
HAVi	15.37% ⁽⁷⁾	33.66% ⁽⁶⁾	27.94% ⁽⁴⁾
IrDA	14.81% ⁽⁷⁾	33.24% ⁽⁶⁾	38.36% ⁽⁴⁾
Bluetooth *	69.82% ⁽⁷⁾	33.10% ⁽⁶⁾	33.70% ⁽⁴⁾
System standards			
Hyperlan2	24.68% ⁽¹¹⁾	-	28.78% ⁽³⁾
HomeRF	27.94% ⁽¹¹⁾	-	52.09% ⁽³⁾
HomePNA *	47.38% ⁽¹¹⁾	-	19.13% ⁽³⁾
Evolved subsystem standards			
Wifi *	51.66% ⁽¹¹⁾	66.67% ⁽²⁾	53.19% ⁽⁶⁾
DECT	39.57% ⁽¹¹⁾	22.61% ⁽²⁾	27.50% ⁽⁶⁾
HomeGate	8.77% ⁽¹¹⁾	10.71% ⁽²⁾	19.31% ⁽⁶⁾

Conclusion

- **First indication that AHP can be used in standardization research**
- **Large dispersion in data → more respondents needed**