

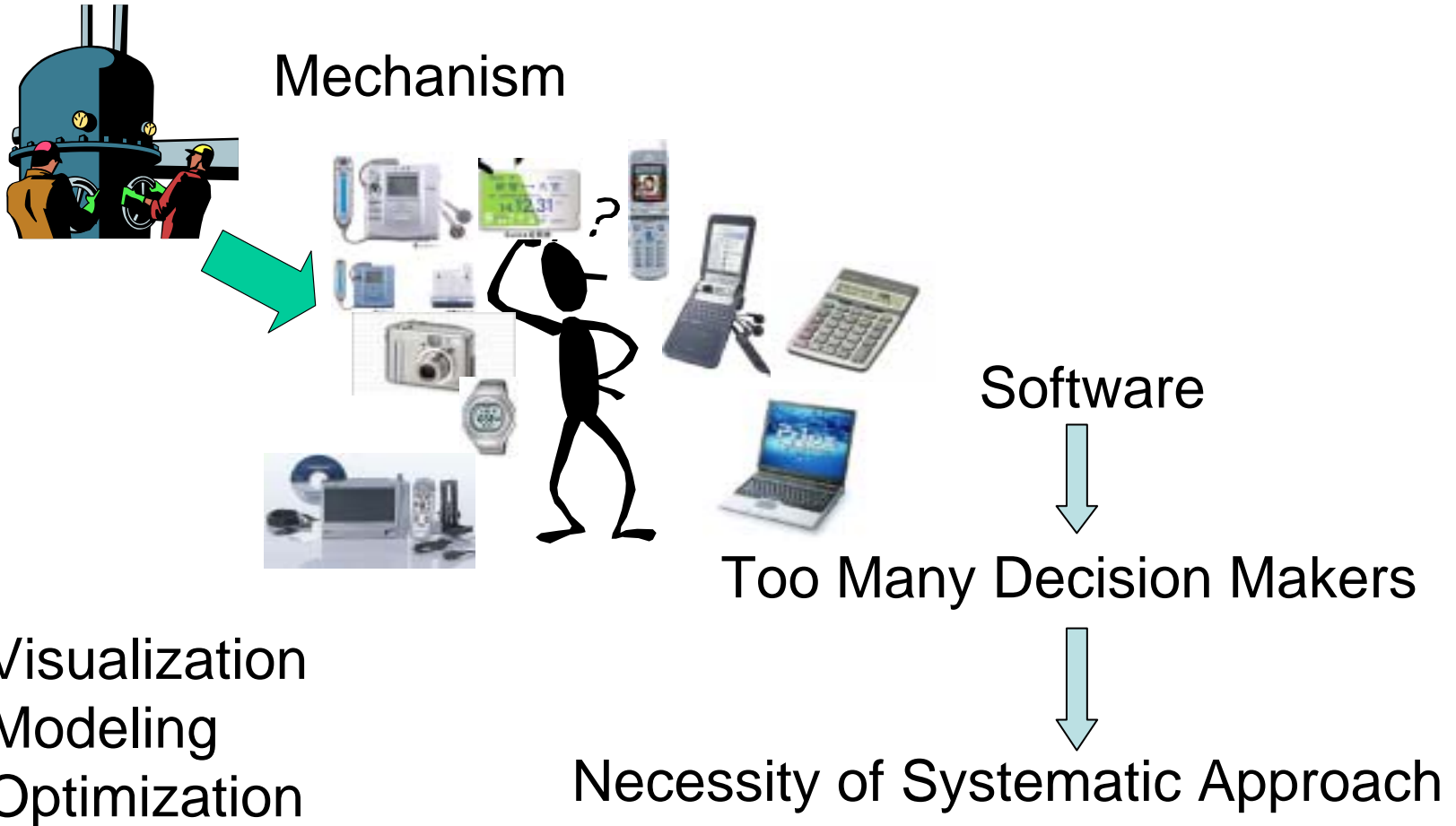
Role of Systematic Approach to the Yaoyorozu Information Society

Seiichi Shin

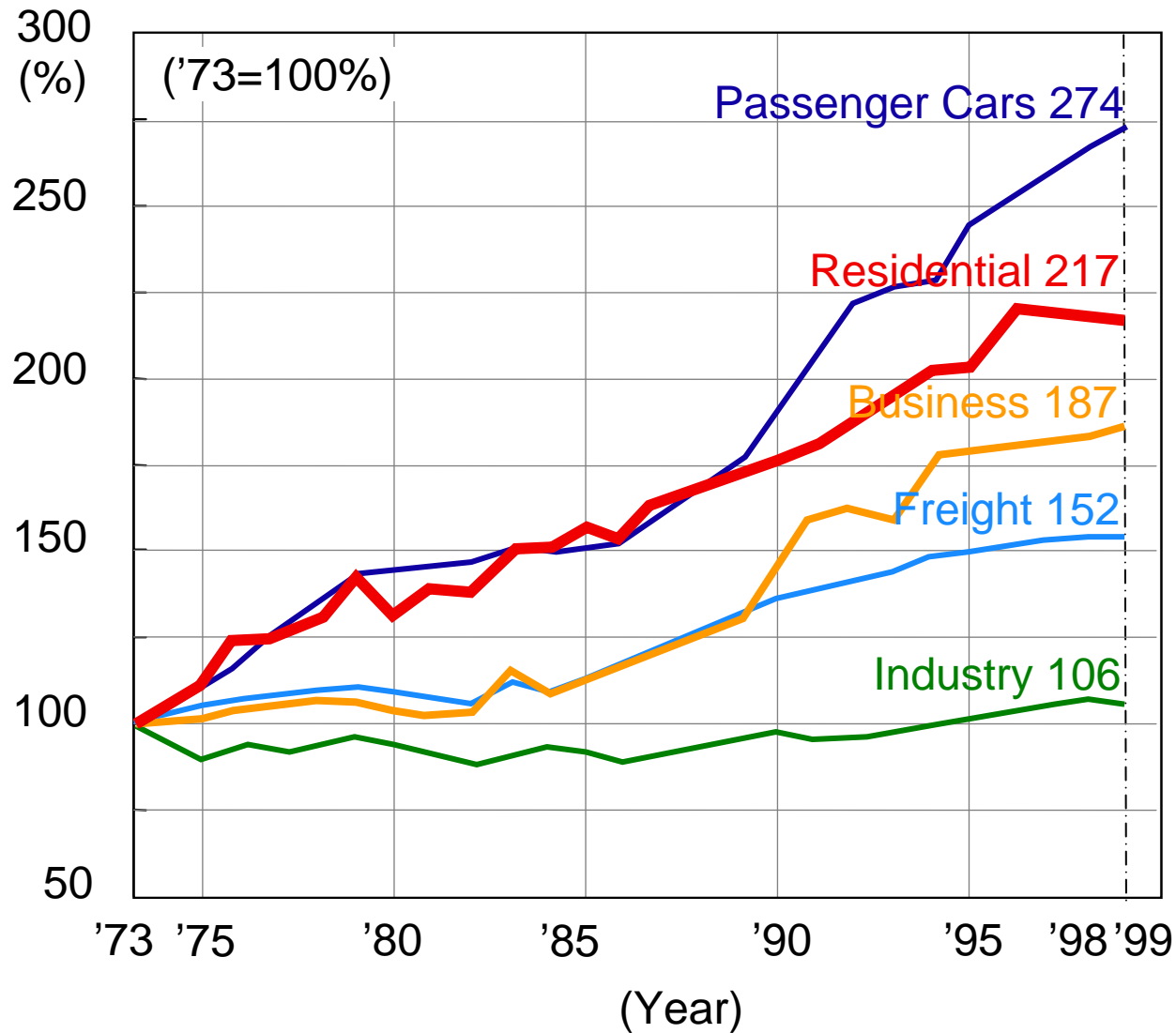
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Change of relation between human and machine



Trend of Energy Consumption in Japan

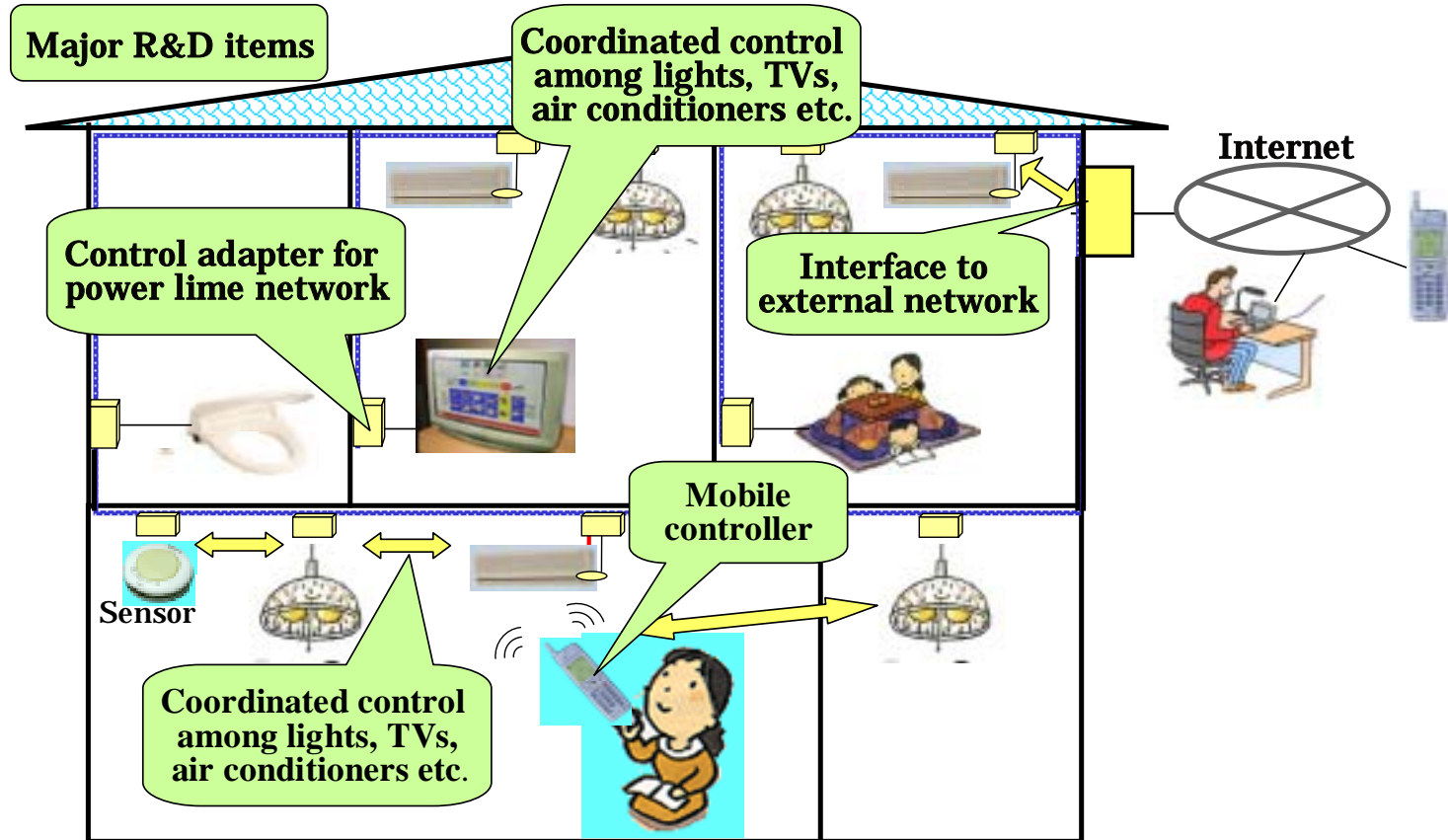


Monitor for saving energy at home

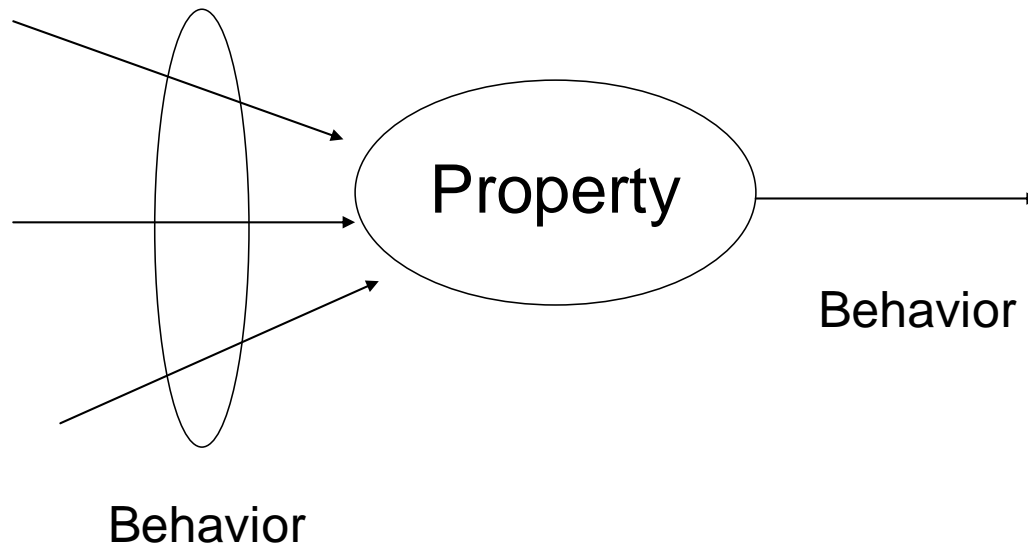


1. Visualization

All home appliances are connected by a network.

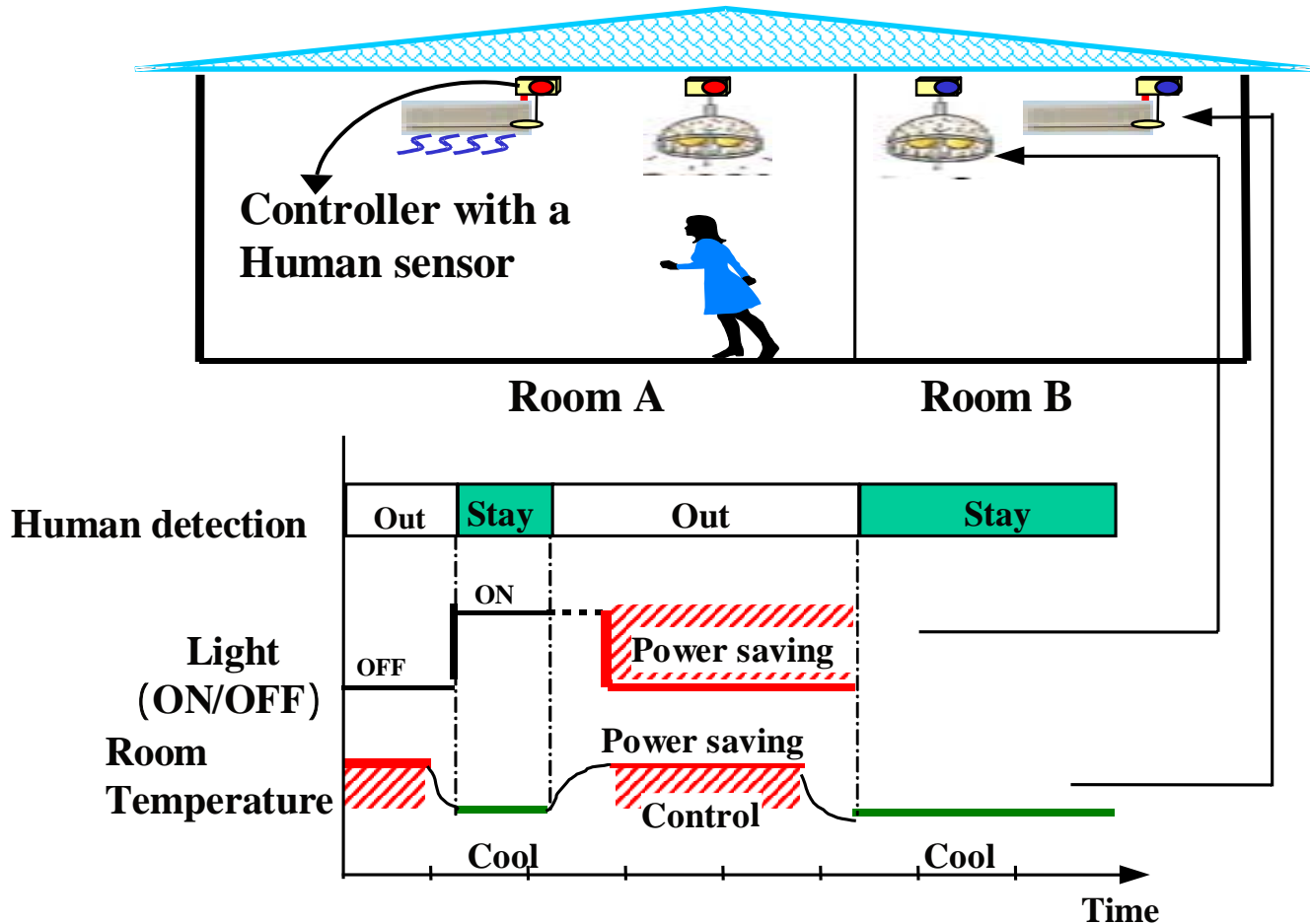


Property and behavior.

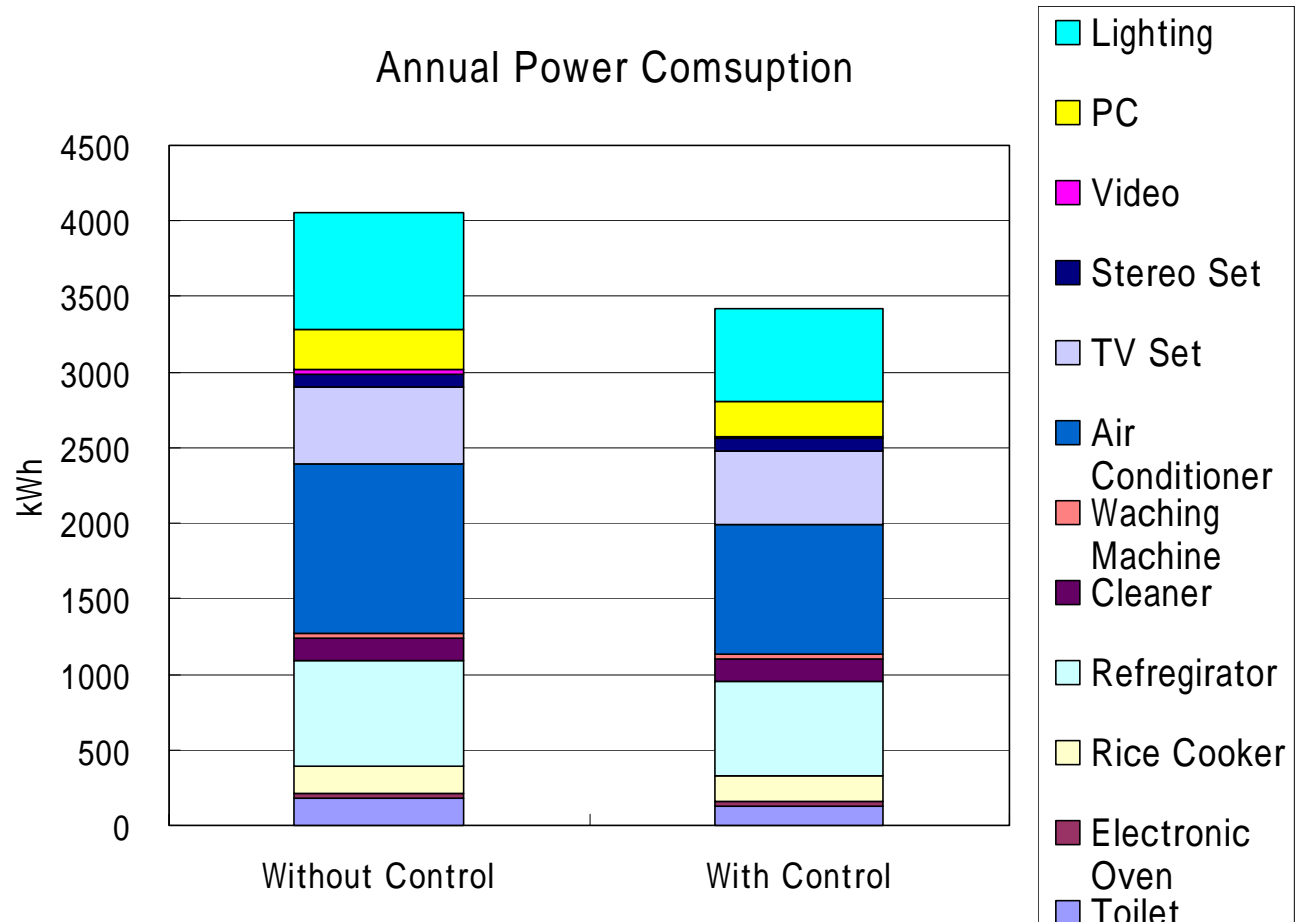


2. Modeling

Power saving control by human detection



Simulation Result

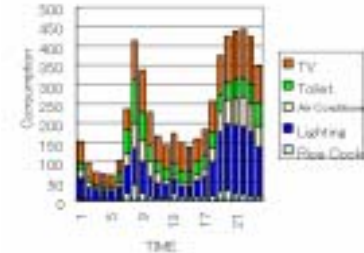


15.6% Saving by Networking

Optimization Problem

$$J = \sum_{t=1}^{24} \sum_i a_i(t) c_i(t)$$

Matching between the target pattern and solution $C_i(T)$



$$\sum_{t=1}^{24} c_i(t) \geq q_i$$

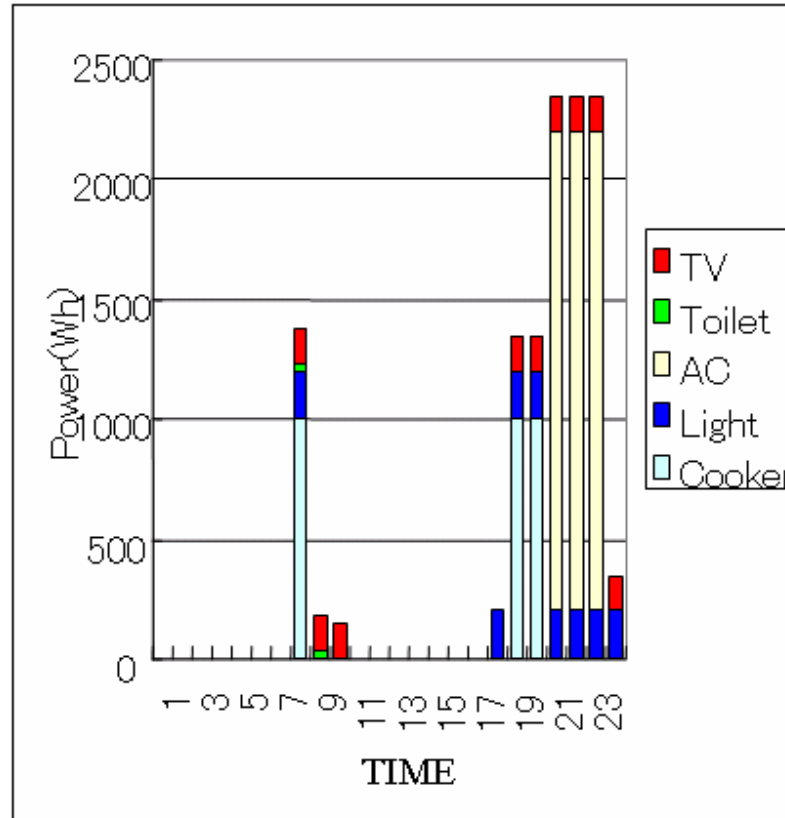
$$\sum_{t=1}^{24} \sum_i w_i c_i(t) \leq s$$

$$\sum_i w_i c_i(t) \leq r$$

Constraints on $C_i(t)$

3. Optimization

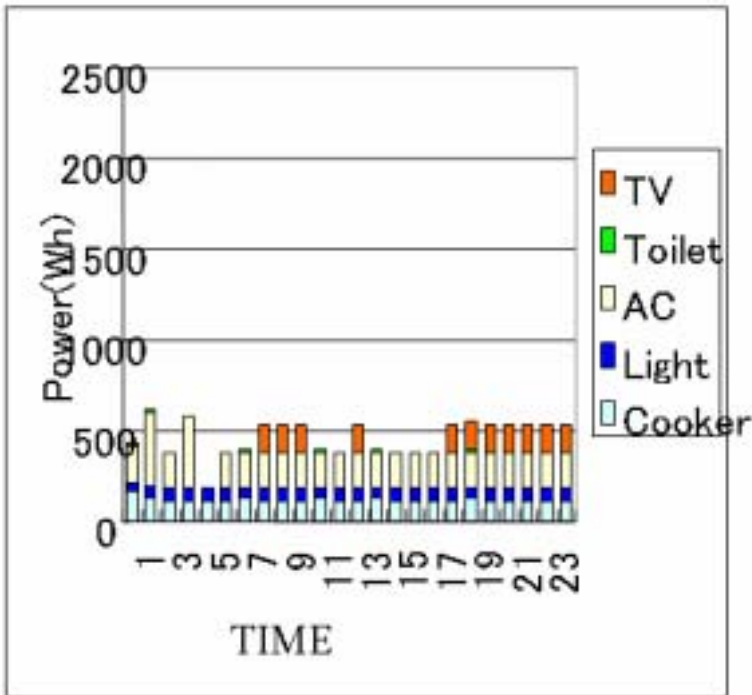
Optimization result of Centralized Case



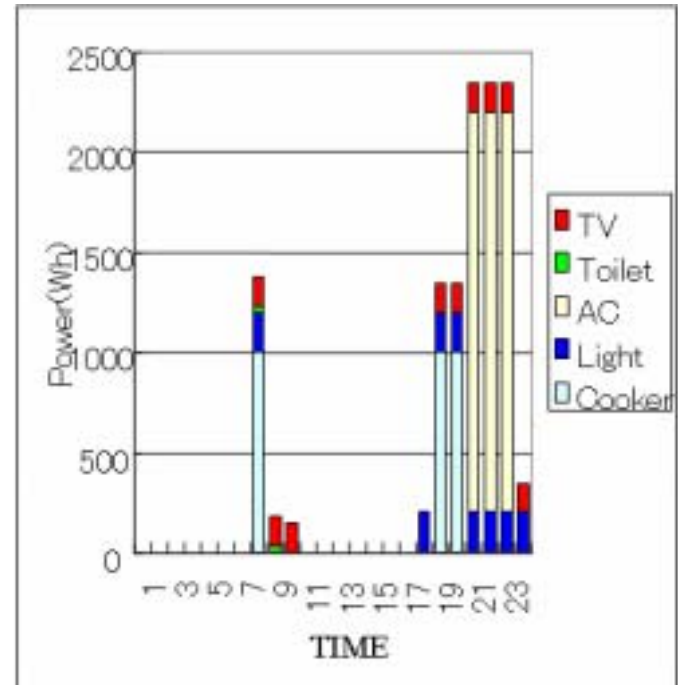
All Appliances exchange All information

Optimization result in the Case b

Not Connected Case



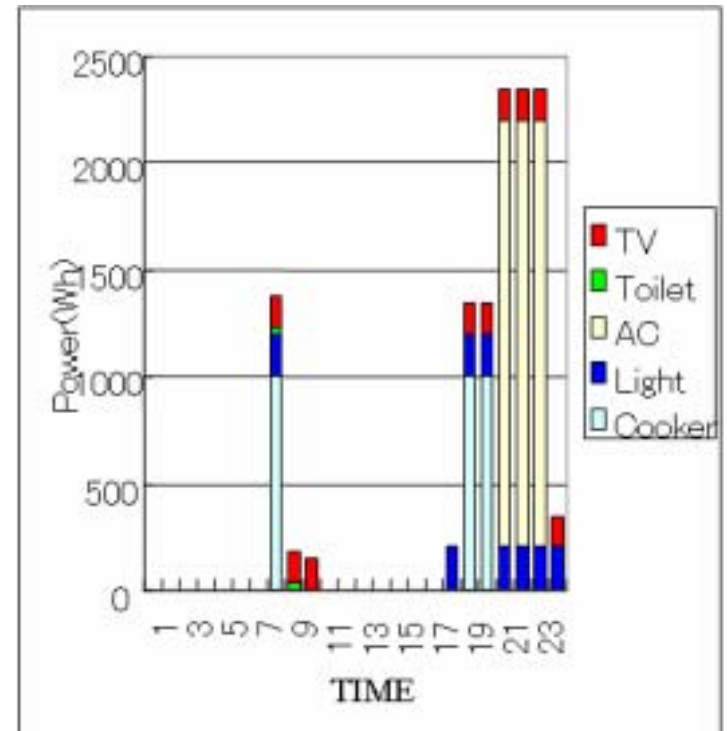
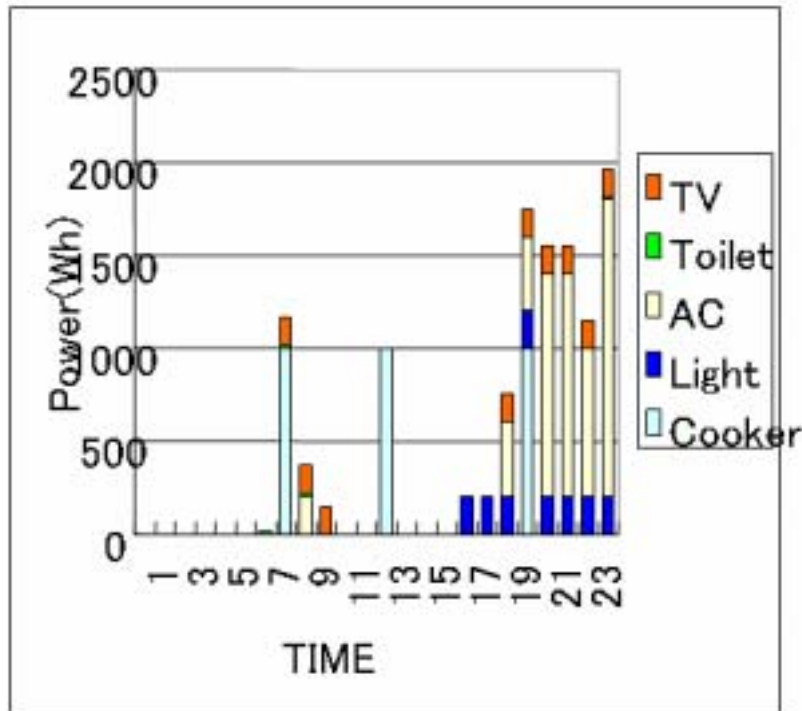
Independent Case



Centralized Case

Result of Optimization in the case c weekly cooperated case

Weekly Connected



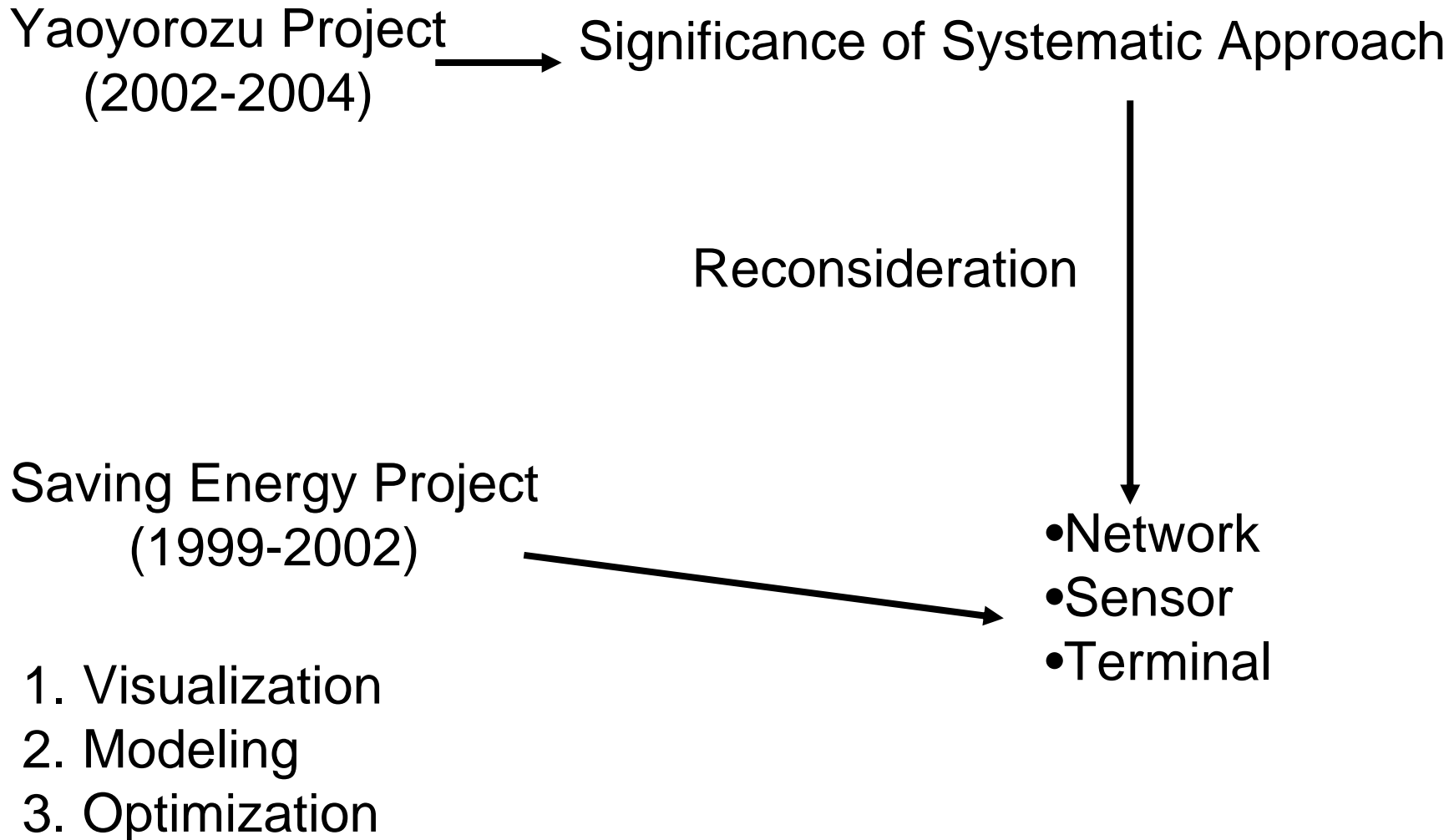
Appliances knows a past Information

Centralized Case

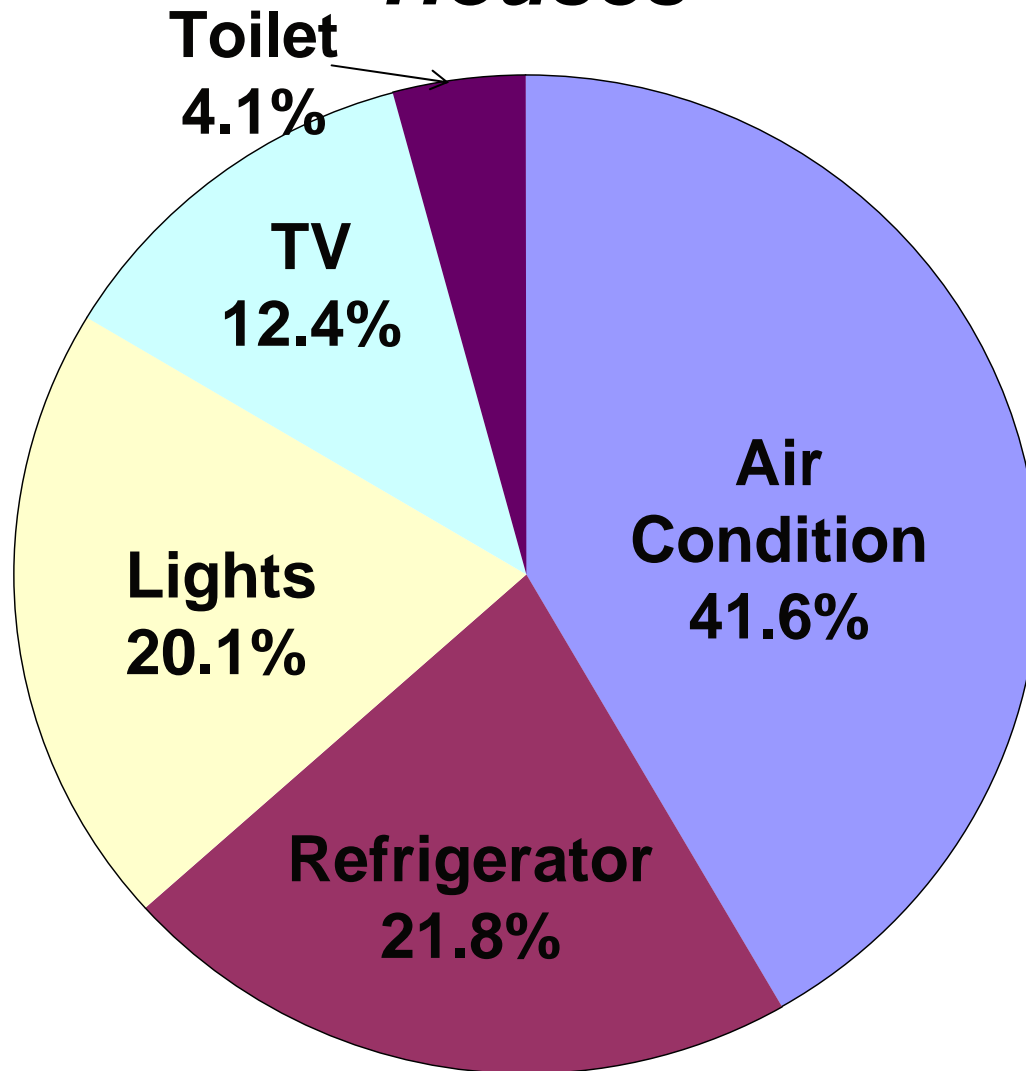
Conclusion

- Visualization (Seeing, not reading)
- Modeling (Entrance for Systematic Approach)
- Optimization (Real tool for a solution of Ubiquitous Information Society)
- Application of this systematic approach to Software Verification (SICE04, Aug. 2004)

Objective of This Presentation



Proportion of Electricity Consumption in Houses



Target pattern.

