Middlesex University London

S.E.Arch

Smart Environments Architecture

Research Group on Developing Intelligent Environments

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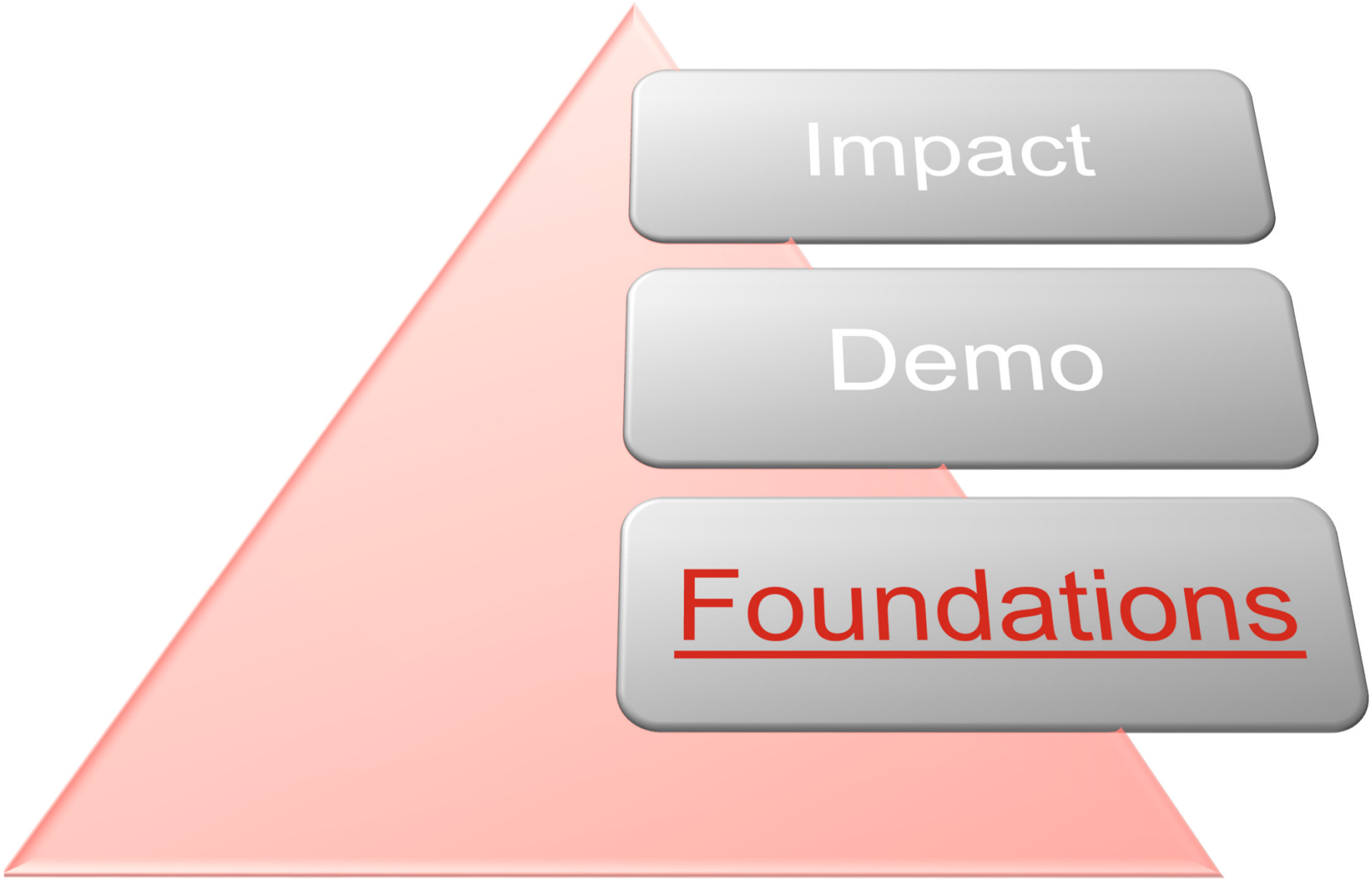

S.E.Arch

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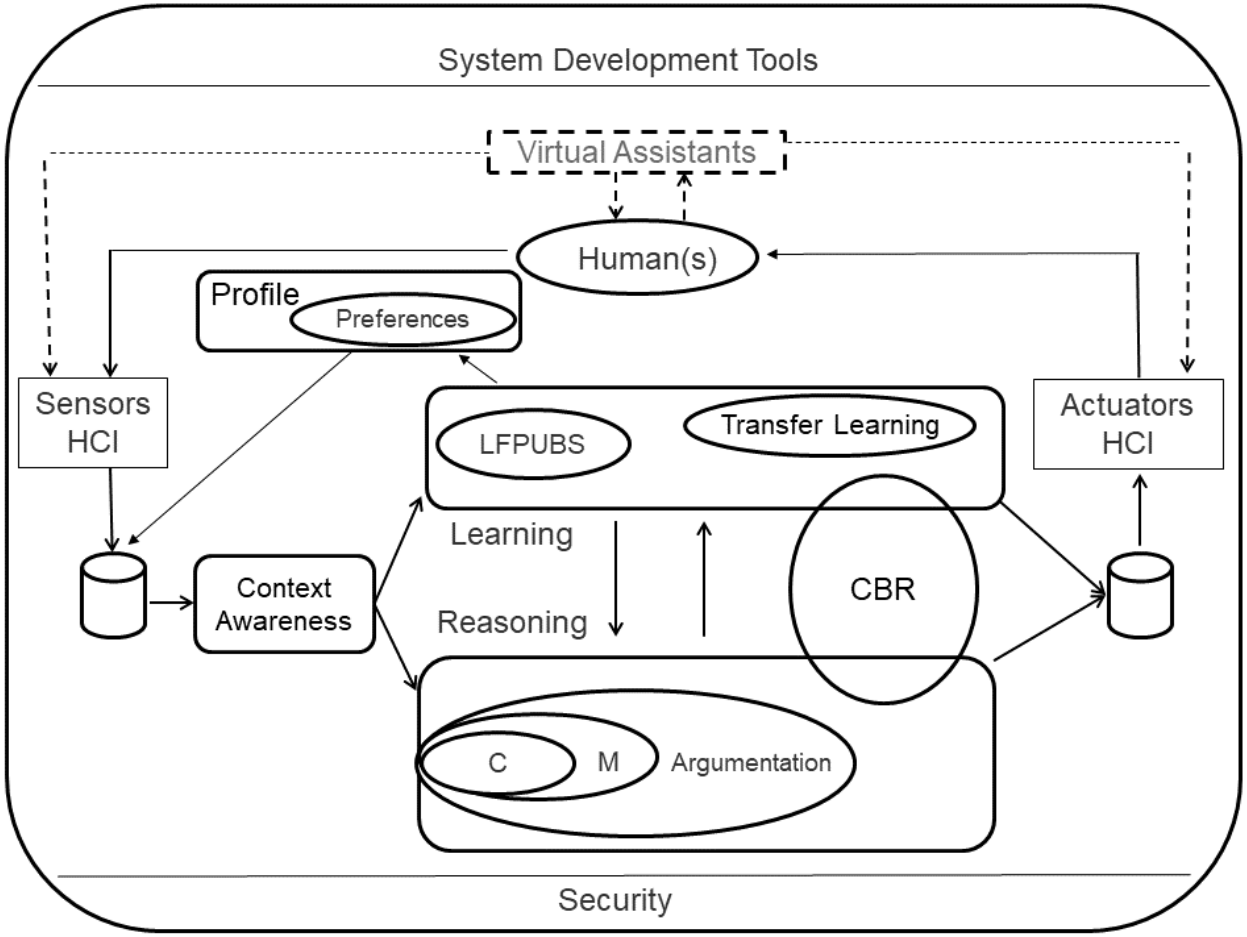
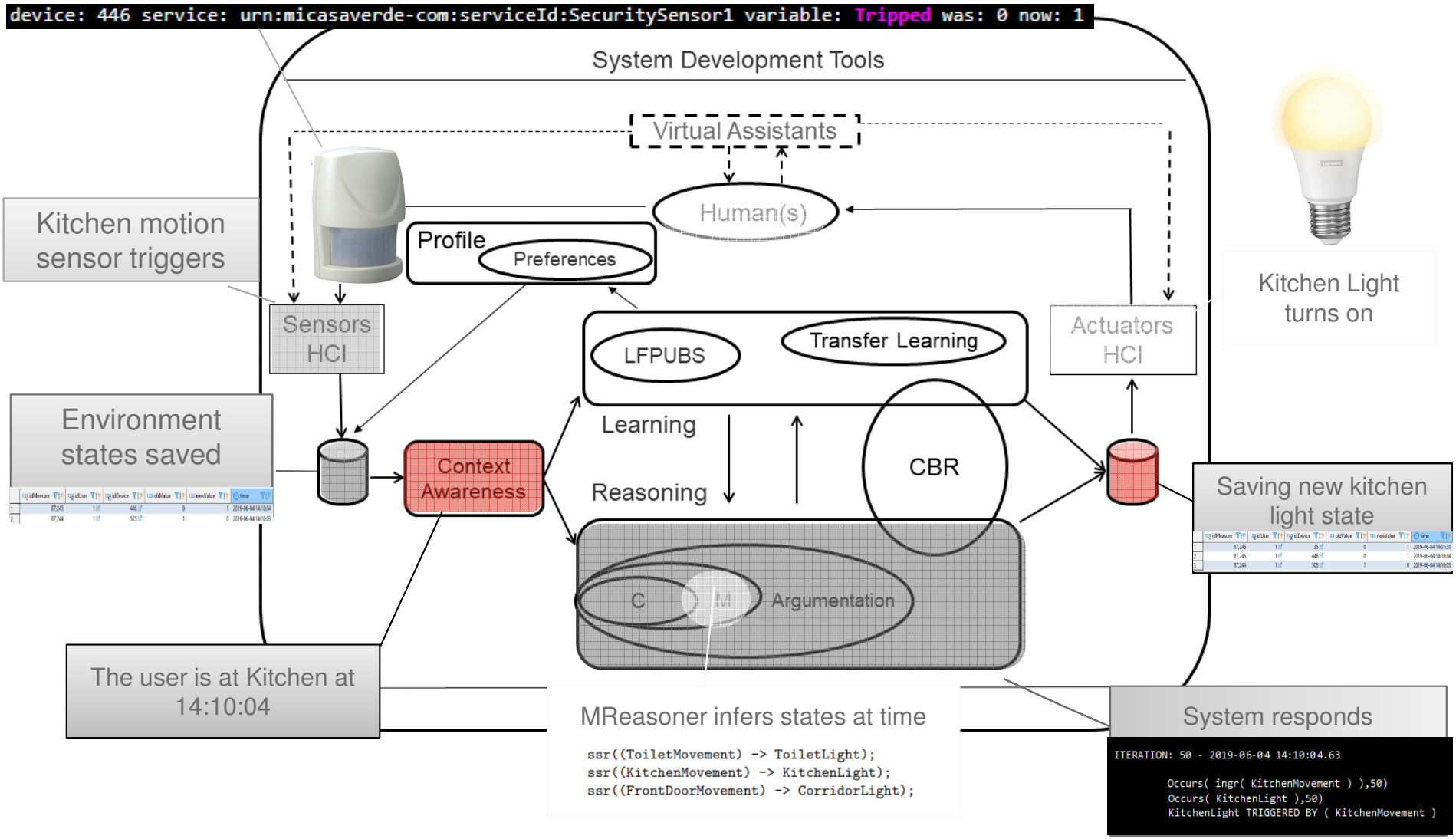
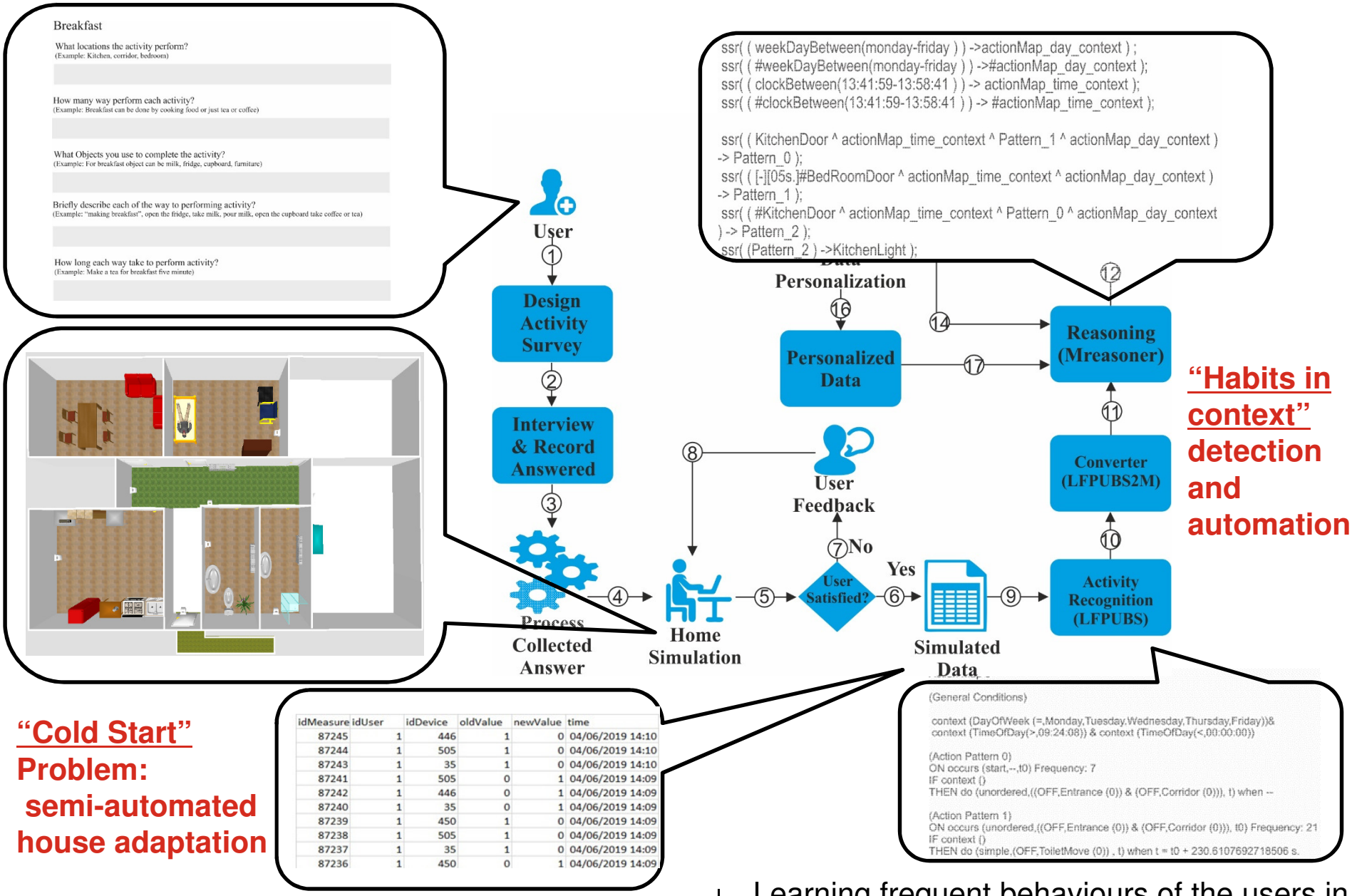
A collection of AI resources developed bottom up to provide practical services.



Designed to align itself from the start with each user needs and preferences.

S.E.Arch. Scenario





"Habits in context" detection and automation

"Cold Start" Problem: semi-automated house adaptation

Improving the Adaptation Process for a new Smart Home User. M Ali, J. C. Augusto, D. Windridge. To appear in AI-2019, Cambridge, 2019.

Learning frequent behaviours of the users in Intelligent Environments. A. Aztiria, JC Augusto, et al. IEEE's Tr. SMC 43(6):1265-1278, IEEE Press. Nov 2013.

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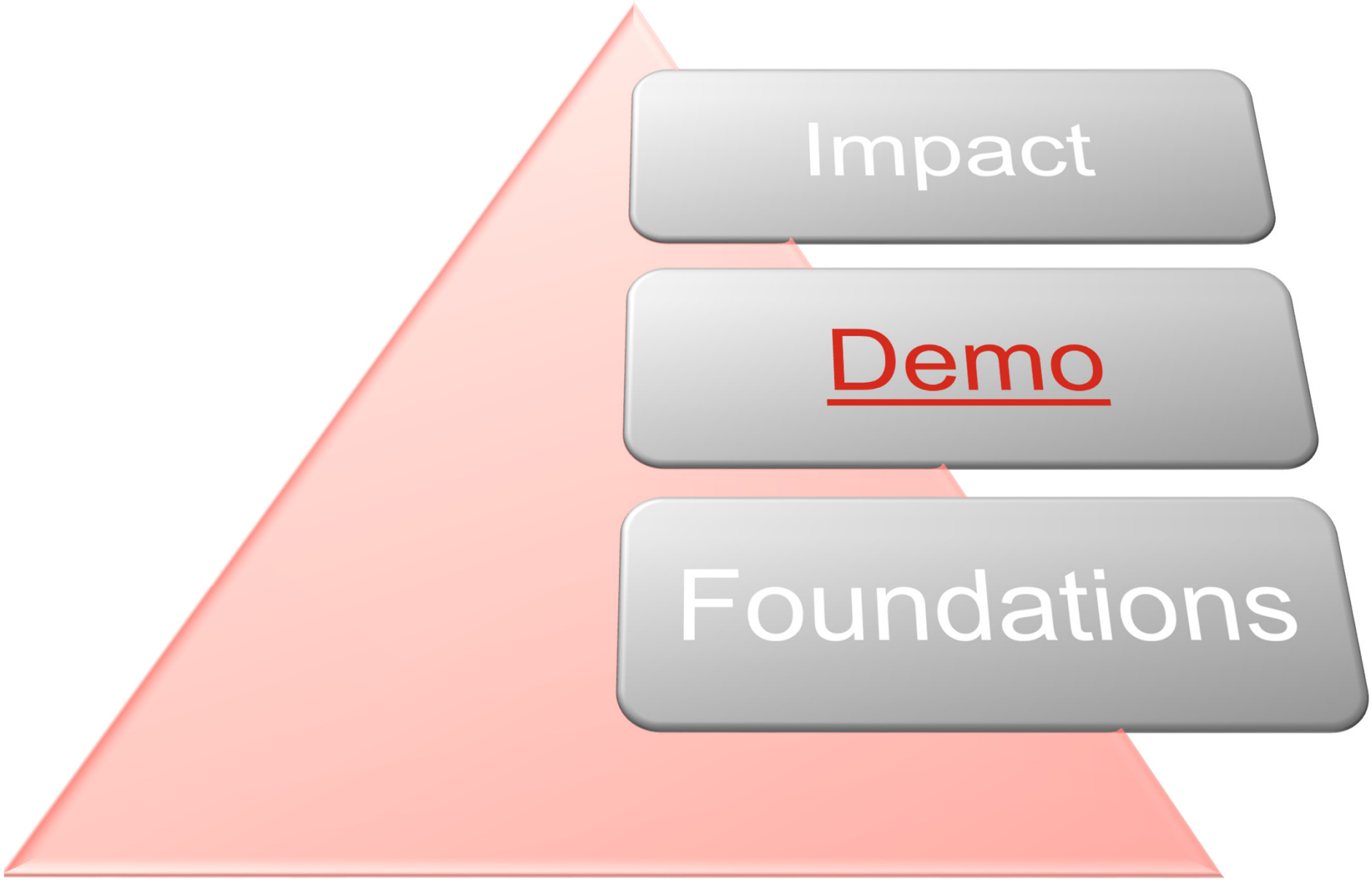
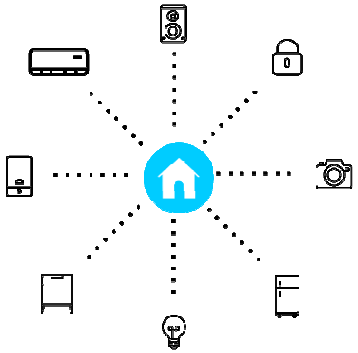
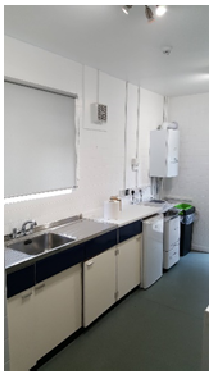
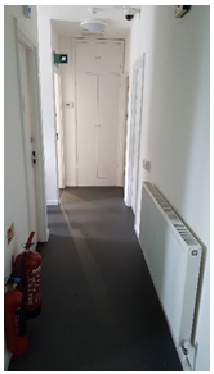


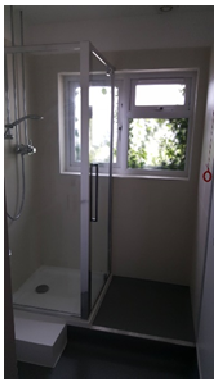
Smart Spaces Lab

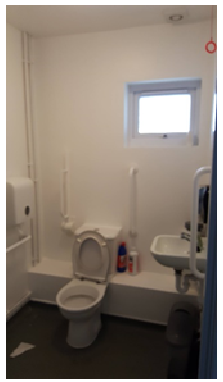


Currently our experimentation space: consists of a domestic living space (Smart Home) and additional general purpose rooms.

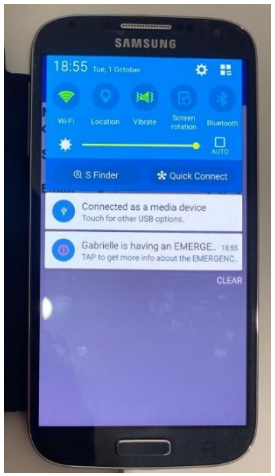


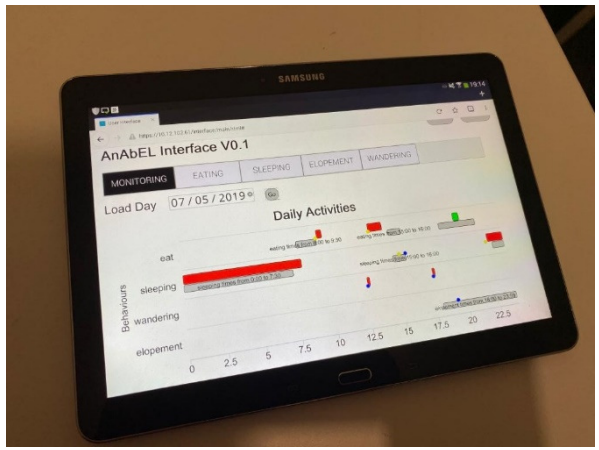




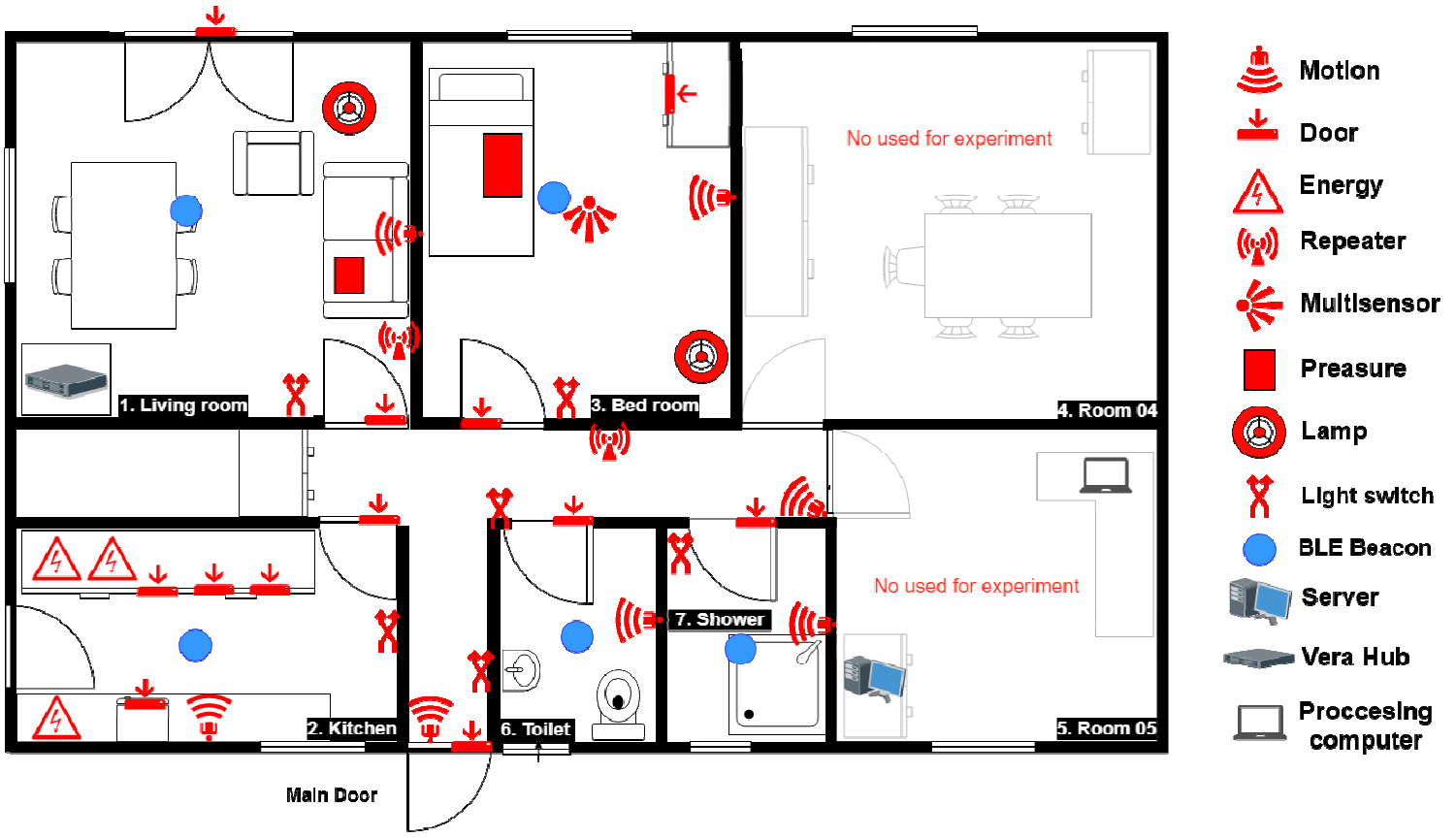


Samples of equipment (affordable / ‘off the shelf’)





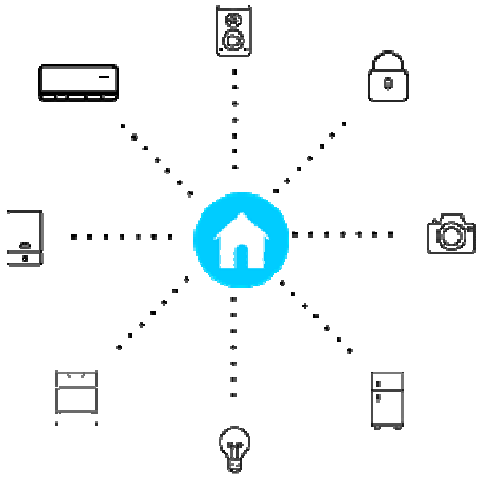
Distribution of technology in the Smart Home



Scenarios: detecting Activities of Daily Living (ADLs) in Ambient Assisted Living (AAL)

Demo

States + Events + Metric Time Operators (Monotonic Reasoning)



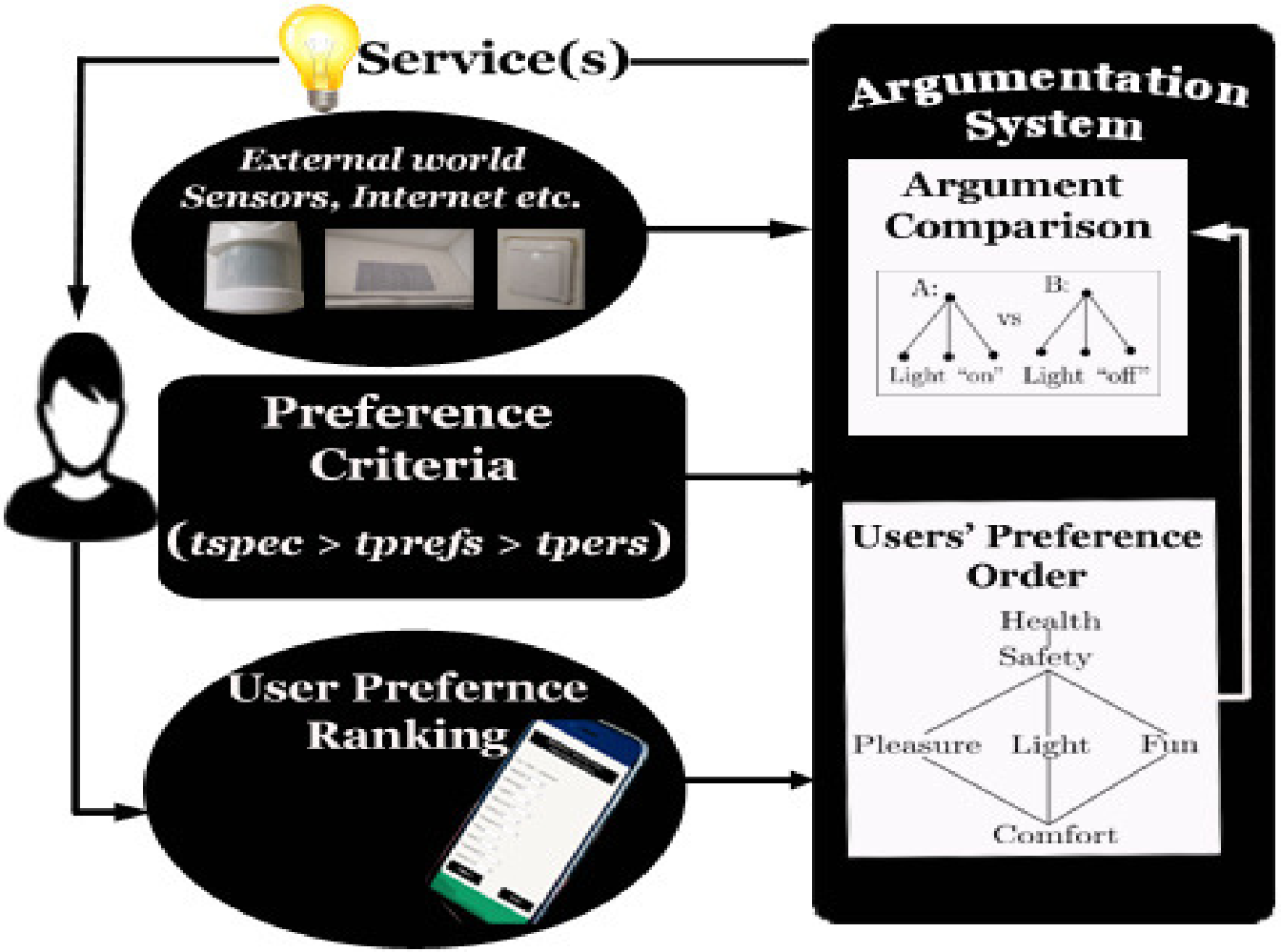
- *Stratified Causal Theories for Reasoning about Deterministic Devices and Protocols.*

A. Galton and J. C. Augusto. Proc. of 9th TIME, pp. 52-54, Manchester, 2002.

- *Temporal Reasoning for Intuitive Specification of Context-Awareness.*

U. Alegre, J.C. Augusto, A. Aztiria. Proc. 10th Int. Conf. on Intelligent Environments, pp. 234-241. IEEE Press. Shanghai, 2014.

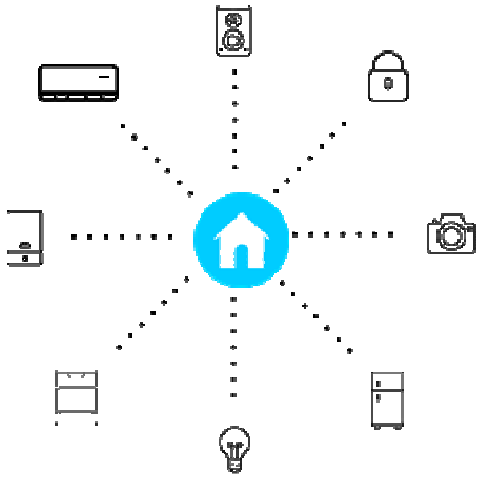
Scenario 3: Preferences + Conflicts + Explanations



Using Argumentation to Manage Users' Preferences. C. L. Oguego, J. C. Augusto, A. Muñoz, M. Springett. Future Generation Computer Systems, 81:235-243. Elsevier. April 2018.

Scenario: possibilities assessed through supporting arguments.
Shown: house automation
(also available in Figshare repository advice on healthy food for diabetic patient using TESCO API and London Air API).

Demo



Non-Monotonic Reasoning:

- Temporal Argumentation with Preferences
- User identification
- Specificity + User Preferences + Persistency
- Explainable AI

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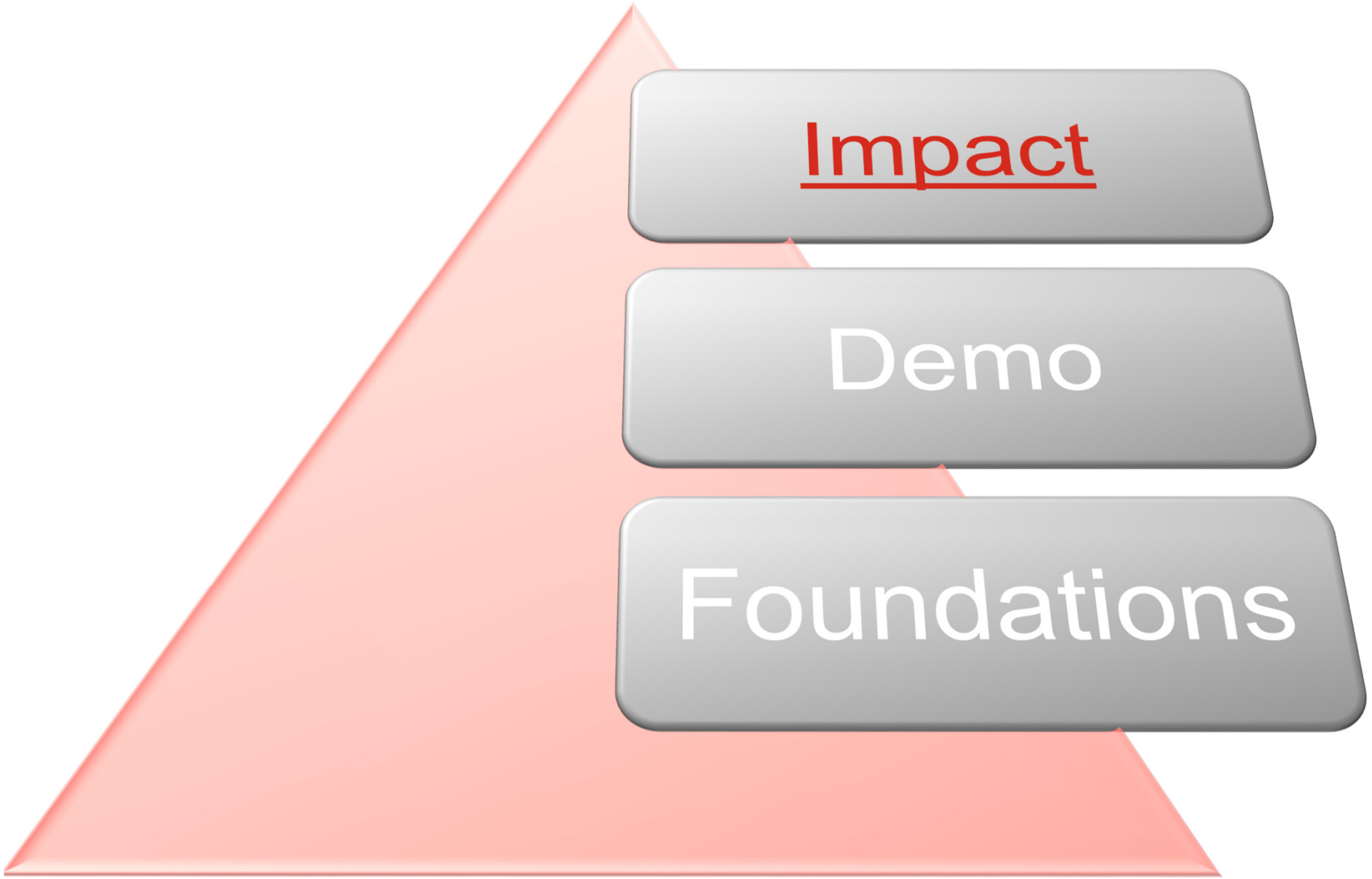

Impact

- Ethical and privacy preserving AI (no multinationals looking at your daily data log or hearing your conversations)

- We have interacted with the following organizations:

Benefit for our scientific community and developers worldwide through open source projects:

Figshare

https://mdx.figshare.com/account/home#/projects

Github

https://github.com/GOODIES-RG

Publications

http://ie.cs.mdx.ac.uk/publications/

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Thanks for your attention!