How creative is the crowd in describing smart home scenarios?

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How Creative is the Crowd in Describing Smart Home Scenarios?

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Abstract

Internet of Things (IoT) is recently attracting vendors that have already brought to the market a plethora of IoT devices. However, according to recent studies;

- End-users face difficulties in conjuring up meaningful use scenarios that combine IoT devices
- Information provided by IoT vendors on their websites does not help consumers to translate their high-level goals to useful scenarios

We present an on-going investigation that explores the potential of sourcing IoT-relevant scenarios from a popular microtask-crowdsourcing platform, and a preliminary evaluation of such scenarios with respect to their originality and practicality.

Motivation

Our main motivation was to check the feasibility of a pipeline where end-users can select some smart home devices and then system generate several IoT scenarios in various categories based on selected devices.

However, there are several questions that arise:

- Where should these pre-defined scenarios come from?
- How can vendors anticipate and gather useful scenarios and provide them on their websites?
- How can inexperienced inhabitants, who are already living in smart homes and want to grow their system with new devices, get useful ideas?

In this research we examine whether crowdsourcing could be a suitable approach to collecting and organizing such scenarios.

Methods and Materials

Results

Categories:

Distribution of categories in which workers classified their scenarios. It closely resembles a bimodal distribution with Home Security and Comfort topping the list. The *Other* category includes user defined categories e.g. Pet Care, Entertainment, Child Care and Cleaning.

Correlates of Originality and Practicality:

	# of Action devices	# of words	# of actions
Originality	0.34*	0.42**	
Practicality	0.38**	0.47**	0.40**
*P < 0.05, ** P < 0.01			

We also found a weak inverse correlation between subjective evaluation of originality by experts and objective evaluation by cosine based similarity measures ($r=-0.10$, $p = 0.542$).

We found that the overall creativity increased with each subsequent scenario $\chi^2 (1, N = 40) = 5.06$, $p<0.05$

Conclusions

- In this paper, we reported some preliminary results based on the analysis that we conducted on a data set of IoT application scenarios collected with MTurk.
- We evaluated these scenarios on various dimensions finding interesting correlations between creativity and different features of scenarios like word count, number of devices used and their actions, and the order in which workers wrote scenarios.

Future Work

- In Future, we will build a system that allows end-users to just define trigger and action devices, and the system on the background will crowdsource creative scenarios in different categories.
- We have also planned to evaluate the crowd created scenarios from actual owners— smart home inhabitants and IoT vendors.
- In addition to that we will build a recommender system for smart home's inhabitants that can recommend use case scenarios based on preferences and other traits.

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