Summary of "Energy saving in smart homes based on consumer behavior: A case study"
Michael Zehnder, Holger Wache, Hans-Friedrich Witschel, Danilo Zanatta, and Miguel Rodriguez
2015 IEEE International Smart Cities Conference

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CS 791/891, Fall 2015

The authors in this article address energy savings in the home. An automated system, called digitalSTROM, was used for collecting data patterns from inhabitants. Then, based on associate rules and behaviors, a recommendation system was built to inform inhabitants on saving energy by taking actions, while not sacrificing their comfort of living. After each recommendation, which was sent by SMS, the person would decide if it was useful or not. There were two phases during the evaluation period, with the second building off of the findings of the first. After phase two, the system produced 120 recommendations [1]. About 10 percent of them were considered useful while sending 0.44 recommendations per house per day [1].

A historical dataset was collected over a period of roughly twelve years. Then, patterns were mined from this data using the PrefixSpan, BIDE+, and GapBIDE algorithms. These were stored in an association rule database, which were used to analyze real-time data on homes. Then, this information was matched depending on the confidence, length, position, and support of the rules and patterns, deriving recommendations.

Future work is already underway. A follow-up research project hopes to build off this paper’s findings. Some recommendations include changing the attributes for the matching algorithm and learning from the feedback of the inhabitants.

Questions/Comments

- The percentage of useful recommendations were noted. How do they affect the amount of energy saved? Dollar amount?
- How much would something like this cost?
- Is there a return on investment? How long would it take for the energy savings in dollars make up for the cost of the system?

References