Title: Artificial Intelligence and the IoT Connected Home

The IoT Connected Home is currently in its infancy with many predicting its veritable explosion in the next few years. This paper will survey the current state of development and future opportunities for use of 'AI' (Artificial Intelligence) incorporating Business Intelligence into the operation of the IoT Connected Home.

'The modern definition of artificial intelligence (or AI) is "the study and design of intelligent agents" where an intelligent agent is a system that perceives its environment and takes actions which maximizes its chances of success.'[1] 'Business Intelligence ('BI') comprises the set of strategies, processes, applications, data, technologies and technical architectures which are used by enterprises to support the collection, data analysis, presentation and dissemination of business information.'[2] The techniques of BI may be applied to produce data streams to feed the home's intelligent agents in the control, monitoring and direction of the IoT Connected Home expanding the BI parameters beyond economics to include such human values as comfort, convenience, conservation.

An architecture that uses BI-based AI as an approach to operating the IoT Connected Home can accelerate the development and deployment of complex inter-related software managing large numbers of intelligent components that interact with each other in real-time.

Dashboards incorporating virtual assistants (intelligent agents e.g., Alexa, Siri, etc.) for non-technical users and technical support will assist these users in answering whatever questions they propose, in responding to notifications from the agents and in visualizing the home status and the results of their queries.

This paper will discuss various system components that will require or be enhanced using BI-based AI such as:

- control/monitoring/notification for the network of home connected devices
    - smart devices (appliances, routers, phones, computers, tablets, etc.)
    - sensors
    - cameras
    - thermostats, etc.
- interconnection and information sharing between
    - community services (fire, police, ambulance, etc.)
    - cloud services
    - smartgrid services, community grids
- security
    - physical
    - network
    - medical, etc.

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[1] Russell, Stuart J.; Norvig, Peter (2003), Artificial Intelligence: A Modern Approach (2nd ed.), Upper Saddle River, New Jersey: Prentice Hall, ISBN 0-13-790395-2.

[2] Dedić N. & Stanier C. (2016). Measuring the Success of Changes to Existing Business Intelligence Solutions to Improve Business Intelligence Reporting. Lecture Notes in Business Information Processing. Springer International Publishing. Volume 268, pp. 225-236.