Position Paper for W3C Workshop on Web of Things

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Introduction

"The Motley Fool" keeps taunting that the Internet of Things (IoT) is going to be "The Monster That Swallowed the Internet." While that may be hyperbolic, there is little doubt that small and ubiquitous sensors are rapidly growing in popularity and all of them will be connected to the Internet.

Oracle, an enterprise cloud software provider, has recognized this trend, as well as others. Wearable devices are becoming popular, as is the quantified-self movement. Enterprises are beginning to focus on their employees' general wellness, and beginning to strongly encourage a Work/Life balance (WLB) among employees as healthy and happy employees are more productive and less likely to change jobs.

Oracle is creating products that address these trends. The "Employee Wellness" product brings consumer-oriented wellness-related wearables into the enterprise in a manner that benefits both employees and the organization itself.

Employees can use the information and insights gained from these devices to improve the "Life" part of their WLB. Since Employee Wellness is integrated with Oracle's Cloud applications, it also provides information and flows that integrate "Life" information with "Work". For example, the Oracle Cloud has access to information about work, such as projects to which the user is attached. If an employee opts-in, the application provides an integrated view of the data from their devices and time at the office. Employee Wellness users are therefore encouraged to think about and proactively manage their wellness. Over time, this benefits the organization by potentially lowering healthcare costs and absenteeism, and by improving turnover rates.

While creating this application we have strived to make Wellness flexible so we can capture and utilize data from devices and sensors that may not have been invented or marketed yet. This process uncovered many issues that we would like to discuss as we continue to move forward with bringing wearables and other sensors into the world of enterprise cloud applications.

Challenges

Provenance of Data

Employee Wellness allows the enterprise to create recognition programs in which users participate, either to reach individual goals or team goals. Successful individuals and/or teams receive recognition for their efforts.

Whenever you have a reward as a result of some actions there's a risk that people will game the system. Therefore, we would like to discuss models for provenance of the incoming device data and models that ascribe levels of trust to that data.

Data versus Information

The WoT is going to provide massive and unheard of amounts of data to be processed and integrated. Wellness uses fairly standard techniques to clean the data, to find the signal in the noise, and then to present this information in a useful manner. It is clear that a lot more can done and we would like to discuss how we might be able to leverage semantic web standards to allow reasoning over data at these volumes and noise-levels.

Metrics and Units

We have attempted to create a data store and schema that can be readily extended to allow for the addition of new kinds of measures from new devices and sensors. We have also created an analytic framework that can take advantage of newly added data sources. We would like to discuss the need for a standard format in which these two axes of extension might be addressed.

Conclusion

We are excited by the opportunity presented by the W3C and look forward to discussing the emerging Web of Things with colleagues who are thinking in similar arenas.