

The Next Era In Human Evolution

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Human evolution has experienced the birth and extinction of countless eras of progress. However, if one constant is to be conceptualised from all of history's irregularities, it would be the human desire to expand. Humans first started communicating with one another in order to expand family units and develop communities. The Romans fought merciless wars in order to expand their thriving empires. Today, in modern society, businesses desperately seek new ways to become more efficient allowing them to expand their firms and profits.

Unfortunately, the inception of modernistic opportunities to increase productivity and expand revenues at a large scale, as experienced during the industrial revolution, have become harder to realise. However, just before the turn of the millennium, a new concept was conceived, 'The Internet Of Things' (IoT) and the ancient thirst to expand will likely foster this abstract idea into the next era of human progression.

Put simply, the Old Internet connects individual computers to one another, the Internet of Things, uses the same internet protocol (IP) to connect almost all electronic components in our lives. In other words, "IoT is a fast-expanding digital ecosystem of connected devices" said Chandra Reddy, Cooperate Advisor to GMR Infrastructure Ltd. The real commercial value of IoT is found in the connection of sensors and systems [such as lighting and security] and what this can provide to companies. The Internet of Things facilitates the communication between these devices, sensors and systems in order to collect useful data that can be used to improve the well-being of individuals and the efficiency of economies.

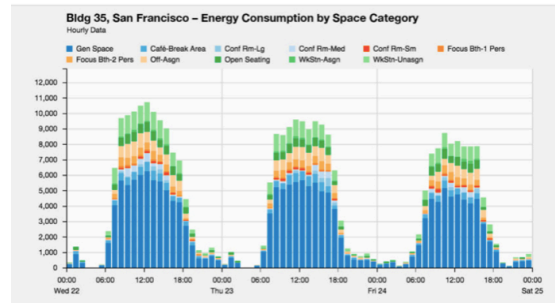
The forecasted growth of the Internet of Things is not arbitrary; with the current rate of technological development, decreasing cost / size of technology and the increased number of devices built to be compatible with wifi – by 2020 the number of connected devices is expected to triple from 10 to 34 billion. As more devices participate in this transaction of information, a large amount of data about spaces, objects and people accumulates and gets stored in IP Backbones. IP Backbones not only hold big data but can also compile it into user-friendly graphics, reports and trend visualisers. Interpreting the data collected by multiple devices to provide a holistic overview of a business's performance.



The paramount question now is how will this technology be implemented? This technology is still immature and the full extent of its capabilities are still being explored.

However, functioning applications of this technology do already exist in the world. One example of this integration is in Building Energy Management Systems (BEMS).

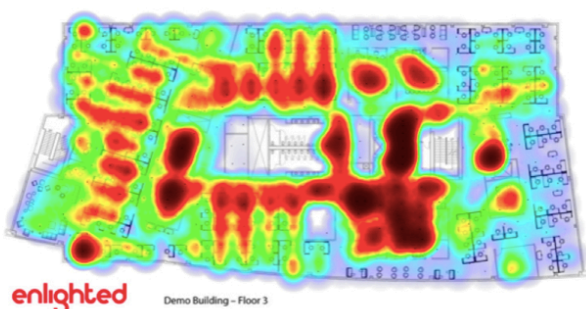
75% of a building's lifetime cost is spent on maintenance and operations (US Department of Energy). BEMSs are responsible for cutting these expenses by managing utility cost and energy consumption. Prior to IoT, BEMSs were limited to the results they conceived via diagnostic tests, limiting them to a very linear operating model. However, according to Rick Lisa, Intel's IoT Business Development Manager, monitoring building system data "is no longer good enough." By adopting systems built around an IoT platform, BEMSs are able to operate with an increased level of complexity as the technology allows them to; receive real-time information, compile data into digestible visualisations and make accurate judgments of what will be required in the future.



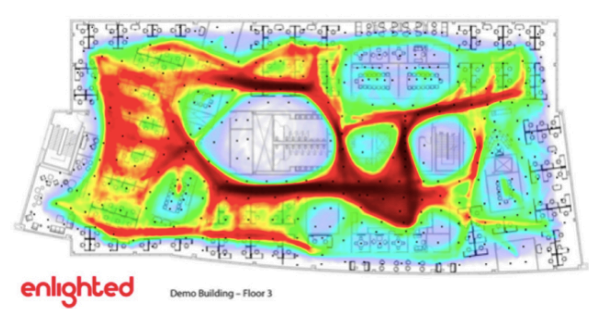
Visuals like this produced by IoT applications can help BEMS make more informative decisions for a company

Additionally, IoT is paving the way for evolution in the BEMS market. Traditionally BEMSs were responsible for purely energy management, however, IoT is providing ways for BEMSs to help companies better utilise space, become more sustainable, improve employee productivity and increase operational efficiency.

For example, the Enlighten Aire (EA) is a building management service that is built on an IoT platform. EA is one example of integration between building management and IoT or the uses of smart sensors. The tiny smart sensors spaced across the roof of a building each monitor its own 100 square feet region. The sensors ping the floor 65 times/second collecting real-time data about the space it occupies. Amongst the recorded variables, the sensors monitor temperature, light and human movement.



Map produced by EA showing where employees spend most of their time amongst a floor



Another Map by EA showing human movement around a floor.

Visuals like these can show companies where employees spend most of their time as well as how they move over time. These visualisations can help companies fine tune a handful of factors. For example, better-designing their space in order to increase the

productivity of their employees or detecting and eradicating redundant spaces or rooms in the building.

Aside from purely collecting and presenting data, EA and other smart building applications alike, have the ability to make adjustments to a variety of systems such as lighting and heating. As a result of this spontaneous synchronisation between the data the sensors collect and the components the program controls, companies can increase their energy savings by 90% and decrease light maintenance cost by 10% (Chandra Sakar Ready).

We are living in a technological era where society is forecasted to develop at a pace never before experienced in human history. We will continue to witness digitalisation impact more areas of our lives. The Internet of Things ropes these components together and allows for the transaction of data that is being used in a variety of ways to increase productivity, efficiency and satisfaction. Although the Internet of Things is still a young idea, it is not too early to invest. Companies have already begun to adopt these new technologies. Pioneers are experiencing an increase in productivity that industries have not witnessed since the industrial revolution. It would be ignorant of us to discount the potential for IoT to positively influence the future of our society, however, who exactly will lead this revolution and what is the full extent of its capabilities? Growth has never been forgiven in human history and is especially idealised in companies today. However, the Internet of Things is more than a means to grow, it is a means to improve.