

Internet of Things: An opportunity for the AC drives business?

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1 INTRODUCTION

Internet of Things (IoT) became one of the hottest topics within the electrical, automation and manufacturing industry during the year 2014. The coming 18 months will show if the promises of connected devices, great value add to customers and the biggest industrial revolution since the computer are to be kept.

The extended audience, aside from the technology nerds, is also asking if there is a real, tangible business benefit behind all of the hype. What are the benefits that IoT will bring, for example, to process technology and manufacturing?

2 TECHNOLOGY BREAKTHROUGHS DRIVING THE INNOVATION

The recent technological breakthroughs and technology evolution open up possibilities to combine multiple trends to support the IoT. The Harvard Business Review (November 2014) lists the topics shown in Figure 1 as key enablers of technically feasible and economically sustainable products of a new era:

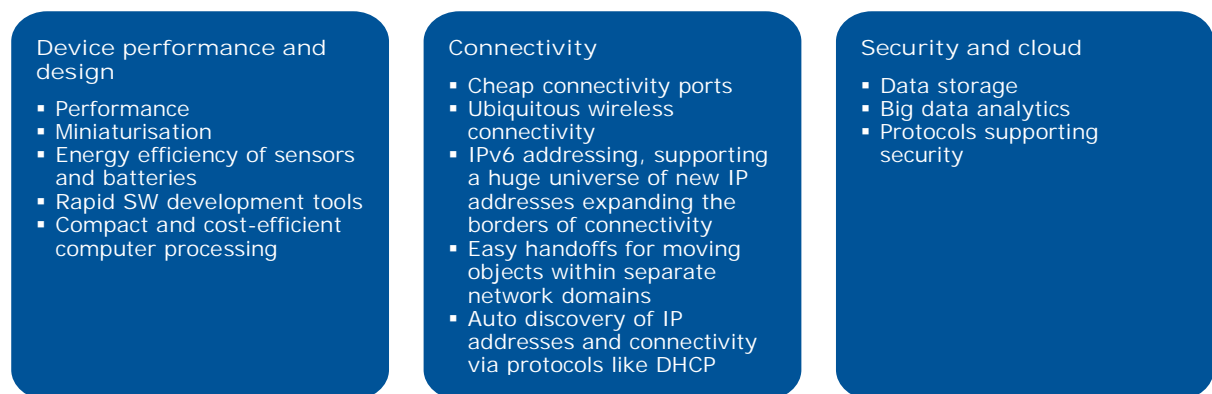


Figure 1. Innovations enabling smart, connected products.

Some of these topics are related to the device performance and design itself, others more towards the connectivity and new ways of utilising existing wide area networks (WAN), while the third category consists of security and cloud connectivity and computing-related topics. The most interesting and promising innovations in the area of IoT require knowledge and simultaneous contribution of the multiple areas listed above. In order to

succeed with the new area of IoT, the products must support monitoring, control, optimisation and autonomy features and functionalities adding value to the users of the devices or processes they run.

3 AC DRIVES IN ACTION – A CASE STUDY IN THE PROCESS INDUSTRY

The industry cannot wait to phase out the existing installed base of devices and systems before we start enjoying the benefits of the IoT concepts. Therefore, at Vacon we are taking a practical approach. We have identified together with our customers some first line applications that in themselves are not revolutionary, but are the first step towards the final phase of the IoT evolution. The first steps already require development and design in new technology areas that have not traditionally been a focus of AC drive development.

The first application in the area of monitoring has been implemented by collecting data from AC drives in a process industry environment. To achieve this, remote connectivity from the device was needed to a location within the same premises and across the Internet to other premises and cloud storage. The collected data includes the general status of the device, configured parameters, installed software version and fault history. The information is used for quickly detecting and localising faults to enable timely resolution of detected issues.

The practical application in the area of control utilises the gathered data in case of device replacements. The device replacement itself is straightforward, but the parameter restoration and software upgrade to the new drive requires drive-specific knowledge and routine usage of the software tools. Using the stored data, the pre-existing parameters can be restored to the new drive automatically using, for example, a smartphone or tablet with connectivity to the application software. The end result is that the device replacement time is considerably reduced and the process can be brought back up quickly.

The third application falls into the category of optimisation, by enabling proactive maintenance to prevent process downtime. The application utilises collected data by analysing and comparing it against the normal operating conditions. If significant deviations are detected a warning in the form of, for example, an email notification is triggered. Possible future issues can then be investigated and fixed before they occur, preventing process downtime. While the steps taken during the implementation of the above applications might seem small, they are anyhow significant in the sense that they are addressing fundamental components in the overall puzzle of Internet of Things.

4 CONCLUSIONS

Internet of things offers new, interesting opportunities for the process and manufacturing industries. The new innovations are inevitable as the technical breakthroughs become more widely utilised in tomorrow's products and services. The new era, however, will seize opportunities through concrete small steps that create immediate value to the end users of the products and processes – for which the AC drives offer a perfect platform. As always, the revolution will become a commodity before we even notice that we are in the middle of a great change.