The complexity of connectivity

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THE WORK IN CONTEXT

The introduction of the internet and the proliferation of connected devices has completely revolutionised almost every aspect of our lives. For many of us, the way that we work, move around, shop, and even socialise has changed dramatically in the last twenty-five years. What's more, it is safe to say that we are only partway through this connected revolution. Advances in communication technologies and microprocessors are making it possible to connect more things – allowing for further changes in the way we live our lives, the way we manage our family's health, and how we interact with each other. While connectivity brings great opportunities, it also brings a number of challenges. Many of the dominant tools and philosophies within human factors practice remain based around a dialogue of human-machine interaction – whereby a user provides inputs to a device and the device provides feedback and information. As we migrate towards a world that now has a connected variant of almost every product imaginable, how should we be designing these devices? This paper and talk will address this question, describing the challenge for practitioners and describing how systems-based tools can play an important role in informing the design or the next generation of products.

KEYWORDS

Device design, connectivity, smart products

A brief outline of the work carried out

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Findings/solutions (the outcome)

Based on practical experience of designing a wide range of connected products, the best solution seems to be to augment the more traditional human factors tools (such as task analysis, human error identification, link analysis, etc.) with more systems-based tools (cognitive work analysis, social network analysis, system modelling tools). These systems tools provide rich additional insights into how the system performs with multiple actors, each with different values and priorities. It is

important to reiterate, that we are not advocating the replacement of these traditional tools, as they provide value, rather the aim is supplement the analysis with additional tools.

One potential challenge with this kind of approach is that it requires broad engagement and acceptance before it will be widely adopted. In many industries, notably safety-critical and regulated ones, the human factors approach and method choice is prescribed by regulators and within contractual project documents. As such, the path of least resistance is often the one that does not deviate from the set list of approaches and methods, which are in most cases the ones that are based on a dialogue of human-machine interaction.

Impact

This work is expected to be highly relevant to practitioners of human factors due to an increased focus on connectivity in almost all sectors. The paper is also expected to be a 'call to arms' to academics to consider how fit for purpose the existing tools that are widely used in practice are to the design of connected devices.