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## **New methods for measuring adoption of voluntary standards: the UK CoP for IoT Consumer Devices**

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The world-leading Code of Practice (CoP) for Consumer IoT (Internet of Things) cybersecurity published by the UK government in October 2018 has experienced rapid international uptake since (DCMS, 2018). The CoP laid out thirteen basic and cybersecurity guidelines for consumer 'Internet of Things' (IoT) devices informed by industry best practices with the explicit aim of establishing "a set of guidelines to ensure that products are secure by design and to make it easier for people to stay secure in a digital world". An analysis of the scope and dynamics of how this 'internationalisation' progressed presents a unique lens for better understanding the uptake-dynamics of digital technical standards. However, this is yet to be studied and a key reason is because the data of interest based on 'uptake' instances globally is typically available in online formats such as company websites that are uncaptured by the academic source remit of classical bibliometric analysis. Thus, the study of digital technical standards internationalisation is inextricably tied to a methodological challenge and this paper overcomes this challenge in two ways. First it presents a unique methodological 5-step fully-automated approach using Natural Language Processing (NLP)-based co-occurrence networks for studying unstructured datasets and is expected to be useful for future research where classical bibliometrics would not work, as is the case here. Furthermore, this methodology has considerable implications for knowledge discovery processes especially enabling faster data collection by eliminating labour intensive manual data collection and structuring. Second, the findings from this provides a first of its kind (fully automated and randomised) overview of the ways in which the CoP has taken a leading role in shaping global discourse where securing consumer IoT is concerned. This is expected to shed light on the global dynamics that underlie internalisation of digital technical standards.

### **Keywords**

cybersecurity standards, social network analysis, Consumer Internet of Things, knowledge discovery

### **Topics**

- Network analysis for security and cybersecurity

**Primary author(s) :** PIAZZA, Anna (University of Greenwich); Dr. VASUDEVAN, Srinidhi (University of Greenwich); Prof. CARR, Madeline (University College London); Dr. DATTA BURTON, Saheli (University College London)

**Presenter(s) :** PIAZZA, Anna (University of Greenwich)

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