

## Chapter 8

# Approaches to Cloud Computing in the Public Sector: Case Studies in UK Local Government

**Jeffrey Chang**

*London South Bank University, UK*

**Mark Johnston**

*Julian Campbell Foundation, UK*

### ABSTRACT

*Cloud computing refers to a scalable network infrastructure where consumers receive IT services such as software and data storage through the Internet on a subscription basis. Potential benefits include cost savings, simpler IT and reduced energy consumption. The UK government and local authorities, like commercial organisations, are considering cloud-based services. Concerns have been raised, however, over issues such as security, access, data protection and ownership. This study attempts to investigate the likely impact of cloud computing on local government based on a conceptual framework and case studies of four London borough councils. It reveals that the concept of cloud computing is new and not clearly understood. Local authorities, who face further cuts in government funding, welcome a cloud-based IT infrastructure which may lead to considerable savings. Yet local government is conservative, so with their risk-adverse attitude local authorities are more likely to adopt a hybrid approach to implementation.*

### INTRODUCTION

Cloud computing is held to offer a number of advantages to the organisations which utilise it. These include cost savings, scalable computing services, simpler IT infrastructure and reduced energy consumption. Theoretically the advantages offered are as relevant to public sector organisations as they are for the private sector. Within local government there are pressures, positive and negative, from a decline in IT budgets, a lack of adequate skills in public sector employees and from the centrally imposed e-Government agenda. As a result cloud-based delivery models are rapidly gaining the attention of government. Across the public sector, many IT leaders are carefully considering the implications of cloud

DOI: 10.4018/978-1-5225-8176-5.ch008

utilisation. Software applications, hardware, infrastructure, platforms, services and storage or whether the government should develop its own cloud are issues which require careful consideration. Key concerns include issues such as the security and ownership of data, potential impact on employment within the client organisations and the structural and cultural implications of moving to cloud provision for large, complex and conservative government institutions. As yet, very little research has been carried out on the implications of utilising cloud services for local government. This study, through theoretical analysis using a conceptual framework and four case studies of London-based borough councils, attempts to explore the likely impact of cloud computing use within local authorities. Firstly, the conceptual framework is presented in the context of current literature relating to the subject. This will consider aspects such as driving and resisting forces and potential implementation issues arising within the public sector. Following on from this theoretical discussion case study data from the four boroughs will be analysed using the same framework considerations. Conclusions will be drawn and consideration given to potential next-steps in this specific field of research.

## **THE CONCEPT OF CLOUD COMPUTING**

Cloud computing is a style of computing where IT capabilities are provided as a service delivered over the Internet to a customer's workplace, similar to utilities such as water and electricity which are 'piped' to the customer's premises. Although there is no universally agreed definition, cloud computing has five key attributes according to a group of researchers at Gartner: service-based, scalable and elastic, shared, metered by use and using Internet Technology (Plummer et al, 2009). These attributes are addressed as 'essential characteristics' by the National Institute of Standard and Technology (NIST, 2011).

The key advantages of cloud computing are held to be reduced costs, increased efficiency and a significant reduction in energy consumption leading to cost savings and greener IT (Catteddu, 2010; Armbrust et al, 2010; Foster et al, 2008; Luis et al, 2008; Aymerich et al, 2009; Grossman, 2009; Korri, 2009; Maggiani, 2009; Nelson, 2009). For potential customers cloud computing presents an attractive alternative to buying, setting up and maintaining their own in-house computing infrastructure (Korri, 2009). These advantages are theoretically as applicable to the public sector as to private organisations, and as set out in the Digital Britain (2009) report, the UK government sees the adoption of cloud computing as critical to the success of its plans to increase efficiency in the public sector.

In the private sector, concerns have been expressed both about the security of data management and loss of organisational control of a key resource (Takabi et al, 2010; Buyya et al, 2009; Grossman, 2009). Public sector clients (or potential clients) will be aware of these concerns. Given the confidential and sensitive nature of much of the data held by public institutions, this becomes a particularly important issue (Nelson, 2009).

So in considering the public sector use of cloud computing we see there are opposing forces; potential cost and efficiency savings verses potential, but difficult to quantify, risks to data security.

20 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/approaches-to-cloud-computing-in-the-public-sector/224572](http://www.igi-global.com/chapter/approaches-to-cloud-computing-in-the-public-sector/224572)

## Related Content

---

### Chemometrics: From Data Preprocessing to Fog Computing

Gerard G. Dumancas, Ghalib Bello, Jeff Hughes, Renita Murimi, Lakshmi Viswanath, Casey O. Orndorff, Glenda Fe G. Dumancas, Jacy O'Dell, Prakash Ghimire and Catherine Setijadi (2019). *International Journal of Fog Computing* (pp. 1-42).

[www.irma-international.org/article/chemometrics/219359](http://www.irma-international.org/article/chemometrics/219359)

### Privacy Preserving Text Analytics: Research Challenges and Strategies in Name Analysis

Suresh Veluru, Yogachandran Rahulamathavan, B. B. Gupta and Muttukrishnan Rajarajan (2015). *Handbook of Research on Securing Cloud-Based Databases with Biometric Applications* (pp. 364-385).

[www.irma-international.org/chapter/privacy-preserving-text-analytics/119352](http://www.irma-international.org/chapter/privacy-preserving-text-analytics/119352)

### Smart City Applications: The Smart Leverage of the Internet of Things (IoT) Paradigm

B. Janet and Pethuru Raj (2019). *Novel Practices and Trends in Grid and Cloud Computing* (pp. 274-305).

[www.irma-international.org/chapter/smart-city-applications/230643](http://www.irma-international.org/chapter/smart-city-applications/230643)

### Resource Allocation With Multiagent Trading Over the Edge Services

Yee-Ming Chen and Chung-Hung Hsieh (2022). *International Journal of Fog Computing* (pp. 1-11).

[www.irma-international.org/article/resource-allocation-with-multiagent-trading-over-the-edge-services/309138](http://www.irma-international.org/article/resource-allocation-with-multiagent-trading-over-the-edge-services/309138)

### From Cloud Computing to Fog Computing: Platforms for the Internet of Things (IoT)

Sanjay P. Ahuja and Niharika Deval (2018). *International Journal of Fog Computing* (pp. 1-14).

[www.irma-international.org/article/from-cloud-computing-to-fog-computing/198409](http://www.irma-international.org/article/from-cloud-computing-to-fog-computing/198409)