

Chapter 8

Towards a Structured Cloud ROI:

The University of Southampton Cost-Saving and User Satisfaction Case Studies

Victor Chang

University of Southampton, UK & University of Greenwich, UK

Gary Wills

University of Southampton, UK

Robert John Walters

University of Southampton, UK

Wendy Currie

University of Greenwich, UK

ABSTRACT

Organisational Sustainability Modelling (OSM) is a new way to measure Cloud business performance quantitatively and accurately, and is a key area offered by Cloud Computing Business Framework (CCBF). OSM combines statistical computation and 3D Visualisation to present the Return on Investment (ROI) arising from the adoption of Cloud Computing by organisations, and makes use of a highly structured and organised process to review and evaluate Cloud business performance. The School of Electronics and Computer Science (ECS), University of Southampton, focusing on cost-savings, is the case study used to illustrate. In addition, i-Solutions and Corporate Planning of the University of Southampton, focusing on user confidence level and service improvement, are another two case studies to support. Data measurements have been taken in the past three years and quantitative analysis has been carefully checked and calculated by OSM to measure ROI. The University of Southampton has achieved cost saving and user confidence with service improvement offered by Cloud adoption and services, which have been deployed by several universities in the adoption of CCBF.

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1. INTRODUCTION

Cloud Computing (CC) provides added value for organisations; saving costs in operations, resources and staff as well as new business opportunities for service-oriented models (Briscoe & Marinos, 2009; Schubert, Jeffery, & Neidecker-Lutz 2010; Chen, et al., 2010). In addition, it is likely that cloud computing focusing on operational savings and green technology will be at the centre of attention. Achieving long-term sustainability is an important success factor for organisations (Chang, Mills, & Newhouse, 2007), particularly in an economic downturn. This makes cost saving a common organisational goal across different sectors. Cost saving offered by CC is a key benefit acknowledged by academia (Buyya, et al., 2009, 2010; Celik, Holliday, & Hurst; 2009; Khajeh-Hosseini, Greenwood, & Sommerville, 2010; Schubert, Jeffery, & Neidecker-Lutz, 2010) and industrialists (Creeger, 2009; Dunn, 2010; Oracle, 2009, 2010).

The definition and deployment of ROI varies in different sectors and research institutes. Our ROI measurement is a systematic and innovative methodology based on:

1. Nobel-prize models such as the Capital Asset Pricing Models, CAPM (Sharp, 1990);
2. the use of economic and statistical computation for data analysis (Chang, et al., 2010b, 2011b, 2011c);
3. the use of 3D visualisation to present cloud business performance (Chang, et al., 2010b, 2011b, 2011c) and finally;
4. a unique way to use Quality Assurance (QA) to improve the quality of data and research outputs (Chang, et al., 2011b, 2011c).

This leads to the development of Organisational Sustainability Modelling (OSM), which is designed to measure cloud business performance (Chang, et al., 2011b, 2011c). Using OSM offers the following two advantages: (1) it allows per-

formance reviews at any time; and (2) it provides strategic directions and added-values for adopting the right types of cloud business for sustainability.

The structure for this chapter is as follows. Section 2 presents a completed framework and how it can be used to measure ROI. Section 3 describes the University of Southampton case study and our methodology to analyse data. Section 4 presents another two case studies from other two departments in the University focusing on User Satisfaction, explaining how data analysis via OSM and 3D Visualisation can be presented. Section 5 lists seven topics of in-depth discussions. Section 6 describes our Conclusions and proposes future work.

1.1. Cost Saving offered by Cloud and Its Influence to Operations Management

Cost saving offered by Cloud Computing is a key benefit acknowledged by academia (Buyya, et al., 2009, 2010; Celik, Holliday, & Hurst, 2009; Khajeh-Hosseini, Greenwood, & Sommerville, 2010; Schubert, Jeffery, & Neidecker-Lutz, 2010) and industrialists (Creeger, 2009; Dunn, 2010; Oracle, 2009, 2010). It is one of the reasons for its popularity and organizational adoption in economic downturn.

From the academia point of view, Buyya et al. (2009) introduced Service Level Agreement (SLA) led cost saving models and explain how to calculate in detail. Further to their work, Buyya et al. (2010) introduce a Return on Investment (ROI) power model, which can calculate power cost-saving and also present it using 3D visualisation. Celik, Holliday, and Hurst (2009) introduce their Broadcast Clouds techniques which allow communications and cost-savings. They use simulations to support their proposal. Khajeh-Hosseini, Greenwood, and Sommerville (2010) use qualitative research methods to explain how industry can save costs. They present case studies of two companies and demonstrate

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