DESCRIBING IT CAPACITY MANAGEMENT: A CALL FOR ACTION

Joe F. Bauer, MS

PhD Student, Eastern Michigan University; Capacity Manager, University of Michigan

IT capacity management has an abundance of literature on best practices and advice, but a paucity of literature describing how its processes practiced. This article is a call for action. It is a call for qualitative and descriptive research inquiries into how IT capacity management processes are implemented and practiced.

Introduction

IT services, solutions, and systems are getting more complex and larger over time. This growing complexity can lead to brittle, change-resistant services (Ross, Weill, & Robertson, 2006, p. 11). Proper technology implementation planning is even more important now in an environment where customers are demanding even more, competition is even stronger, and change is the new constant (Hammer & Champy, 2003, p. 27). IT capacity management plays a role in technology implementation during the planning stages. This is one reason why Capacity Management can be found in the Service Design part of the ITIL service lifecycle (Office of Government Commerce, 2007a). It is IT capacity management's purpose to balance cost and quality as it pertains to the capacity to do work while advancing business goals (Office of Government Commerce, 2007a, p. 85).

Managing the capacity of resources and tools is a practice that is used in several fields and is not unique to IT. It is used in manufacturing to ensure factories and machinery are used efficiently (Asl & Ulsoy, 2002). Hospitals have used capacity management for controlling costs and improving quality (Li & Benton, 2003). Even restaurants utilize capacity management for optimal performance (Sill & Decker, 1999).
There is no shortage of opinions and recommendations on how to implement IT capacity management processes (Augello, 2000; CMMI Product Team, 2010; Grummit, 2009; Gunther, 2010; IT Governance Institute, 2007; Molloy, 2003; Office of Government Commerce, 2007b; Sheldrake, 2009). What is missing from the current literature are descriptions, accounts, or explanations of how organizations have actually implemented IT capacity management processes in practice.

Examples from other fields

Spencer describes in great detail how the Verbatim disk manufacturing company practices capacity management (Spencer, 1997). He describes their production operations, planning processes, capacity planning activities, and how capacity management is related to the rest of the organization (Spencer, 1997).

Sill and Decker authored a case study of a capacity management implementation at a restaurant (Sill & Decker, 1999). In this case an outside consulting group (the authors') was brought in to perform a one-time analysis of the capacity of the restaurant. There

are descriptions of the business processes, goals, and interactions between the capacity management consultants and the organization (Sill & Decker, 1999).

Betts, *et al.* studied the capacity management processes of 12 financial institutions' call centers (Betts, Meadows, & Walley, 2000). Using both qualitative and quantitative methods, they researched and described these organizations' forecasting methods, aggregate decision processes, forecasting accuracy, and capacity strategies (Betts, *et al.*, 2000, p. 188).

Frameworks for best practices

The IT capacity management field has many best practices frameworks to choose from. The Information Technology Infrastructure Library (ITIL) is the most popular framework of best practices, with a 24 percent adoption rate in US companies (Mauricio & Lutz M, 2011, p. 364). The ITIL framework consists of six publications that cover information like practice fundamentals and principles, processes, roles, and critical success factors (Office of Government Commerce, 2007b, p. 6). Capacity management is just one part of ITIL, covered in the *Service Design* publication (Office of Government Commerce, 2007a, p. 85).

The second most popular framework is Control Objectives for Information and related Technology (COBIT) at 14 percent adoption (Mauricio & Lutz M, 2011, p. 364). The COBIT framework describes a "deliver and support" process for managing performance and capacity that focuses on meeting service level requirements, minimizing downtime and making continuous improvement (IT Governance Institute, 2007, p. 109).

The Capability Maturity Model Integration (CMMI) model collection for services describes capacity and availability management as being responsible for ensuring effective performance and effective resource usage in support of service requirements (CMMI Product Team, 2010, p. 124).

Even the enterprise architecture framework, The Open Group Architecture Framework (TOGAF), mentions capacity management from a change management and architecture perspective (TOGAF, 2011, para. 7).

All of these frameworks provide advice for implementing IT capacity management processes. They do not describe how organizations are performing IT capacity management processes in practice.

IT capacity management literature

The Computer Measurement Group (CMG) is a vibrant international community of practitioners, founded in 1974, that aims to advance the field of IT capacity and performance management (Computer Measurement Group, Inc., 2012a). The CMG holds conferences, has a trade journal (*MeasureIT*), and also publishes a peer reviewed journal called the *Journal of Computer Resource Management* (Computer Measurement Group, Inc., 2012b). A survey of the literature from the *Journal of Computer Resource*

Management from 2000 to 2012 finds no articles describing IT capacity management processes as they are found in practice at organizations.

Some of the articles provide detailed descriptions of how to use tools or techniques for capacity management (Wicks, 2009). Some interpreted and re-interpreted the ITIL framework as it pertains to IT capacity management and describe how to implement it, but fall short of describing current implementations (Grummit, 2009; Molloy, 2003). Sheldrake incorporates ITIL frameworks with past experience to propose a modified framework that considers component and service capacity, but does not go into descriptive detail of the processes from the past experience (Sheldrake, 2009, p. 25). Augello draws on experience to propose that processes are required for IT capacity management to reach its full potential and describes what these processes could look like, but does not describe any from examples in practice (Augello, 2000).

In his seminal work, *Guerrilla Capacity Planning,* Gunther proposes a lightweight IT capacity management process for measuring, modeling, designing, building, and deploying IT systems (Gunther, 2010, pp. 21–25). However, he does not describe how these processes have been implemented in any organizations.

The omission of implementation descriptions is not the fault of any of these authors; it was not their focus. As a field, however, IT capacity management has a paucity of literature focusing on how the practice is being performed in organizations. Because of this, the field has many unanswered questions, such as:
• How do organizations define IT capacity management?
• How does IT capacity management function?
• How do IT capacity management processes interact with other organizational processes?
• Who is involved with IT capacity management and where are they within the organizational structure?

A call for action

It is difficult to know if organizations are heeding any of the advice or following any of the best practices frameworks that the leading thinkers in IT capacity management are professing. A fundamental requirement for understanding the discipline of IT capacity management and its effectiveness requires knowing how organizations are actually implementing and practicing IT capacity management. Without this essential knowledge it is difficult to know which frameworks, best practices, or advice organizations are following. One cannot describe the current state of the IT capacity management field without a basic understanding of how organizations are organizing and executing their IT capacity management processes.

This is a call for action to advance the field of IT capacity management. The field needs its best minds and leaders to describe the implementations of IT capacity management they observe. However, this should be carried out methodically and not just anecdotally. The author recommends efforts that follow the qualitative method for describing

phenomena (Leedy & Ormrod, 2010). Specifically, the grounded theory approach may be best suited because of its ability to discover theories from the patterns in observed data (Leedy & Ormrod, 2010, p. 142). Once these theories about how organizations are implementing IT capacity management emerge they can be tested with further quantitative or experimental research. Let us, as a field, build a foundation from which we may go forth, advance, and mature.

References

Asl, F. M., & Ulsoy, A. G. (2002). Capacity Management in Reconfigurable Manufacturing Systems With Stochastic Market Demand (Vol. 2002, pp. 567–574). ASME. doi:10.1115/IMECE2002-32872

Augello, M. (2000). A Corporate-wide Approach to Capacity and Performance Management. *Journal of Computer Resource Management*, (97), 2–5.

Betts, A., Meadows, M., & Walley, P. (2000). Call centre capacity management. *International Journal of Service Industry Management*, *11*(2), 185–196. doi:10.1108/09564230010323840

CMMI Product Team. (2010, November). CMMI for Services, Version 1.3. *Software Engineering Institute Carnegie Mellon*. Retrieved October 9, 2012, from http://www.sei.cmu.edu/reports/10tr034.pdf

Computer Measurement Group, Inc. (2012a). About CMG. *Computer Measurement Group*. Retrieved October 8, 2012, from http://www.cmg.org/national/about-cmg.html

Computer Measurement Group, Inc. (2012b). CMG Publications. *Computer Measurement Group*. Retrieved October 8, 2012, from http://www.cmg.org/national/publications.html

Grummit, A. (2009). Knot-ITIL: How to Solve the Gordian Knot of IT Service Management Using the Sword of Best Practice. *MeasureIT*. Retrieved from www.cmg.org/measureit/issues/mit63/m_63_7.html

Gunther, N. J. (2010). *Guerrilla Capacity Planning: A Tactical Approach to Planning for Highly Scalable Applications and Services*. Berlin: Springer-Verlag.

Hammer, M., & Champy, J. (2003). *Reengineering the Corporation: A Manifesto for Business Revolution*. New York: Harper Collins.

IT Governance Institute. (2007). *Cobit 4.1*. ISACA. Retrieved from http://books.google.com/books?id=u4CiQmnBWucC&lpg=PA110&ots=I7yJKuOH9B&dq=cobit%20capacity%20management%20DS3.1&pg=PA109#v=onepage&q=cobit%20capacity%20management%20DS3.1&f=false

Leedy, P. D., & Ormrod, J. E. (2010). *Practical Research: Planning and Design* (9th ed.). Boston: Pearson.

Li, L., & Benton, W. . (2003). Hospital capacity management decisions: Emphasis on cost control and quality enhancement. *European Journal of Operational Research*, *146*(3), 596–614. doi:10.1016/S0377-2217(02)00225-4

Mauricio, M., & Lutz M, K. (2011). Uncovering ITIL claims: IT executives' perception on benefits and Business-IT alignment. *Information Systems and eBusiness Management*, *9*(3), 363–380. doi:DOI 10.1007/s10257-010-0131-7

Molloy, C. (2003). Using ITIL Best Practices to Create a Capacity Management Process. *MeasureIT*. Retrieved from http://www.cmg.org/measureit/issues/mit08/m_8_3.html

Office of Government Commerce. (2007a). *Service Design*. The Stationery Office.

Office of Government Commerce. (2007b). *The Official Introduction to the ITIL Service Lifecycle*. Norwich, UK: The Stationery Office.

Ross, J. W., Weill, P., & Robertson, D. C. (2006). *Enterprise Architecture as Strategy*. Boston: Harvard Business School Press.

Sheldrake, H. (2009). A Framework For Capacity Planning. *Journal of Computer Resource Management*, (124), 23 – 35.

Sill, B., & Decker, R. (1999). Applying Capacity-management Science The Case of Browns Restaurants. *Cornell Hotel and Restaurant Administration Quarterly*, *40*(3), 22–30. doi:10.1177/001088049904000316

Spencer, M. S. (1997). The Impact of JIT on Capacity Management: A Case Study and Analysis. *Production Planning & Control: The Management of Operations*, *8*(2), 183–193.

TOGAF. (2011). 16. Phase H: Architecture Change Management. *The Open Group*. Retrieved October 9, 2012, from http://pubs.opengroup.org/architecture/togaf9-doc/arch/chap16.html

Wicks, R. (2009). Getting Started in z/OS Capacity Planning. *MeasureIT*, (February 2009). Retrieved from www.cmg.org/measureit/issues/mit56/m_56_10.html