

A PERFORMANCE MEASUREMENT FRAMEWORK FOR IT SERVICE
MANAGEMENT

Submitted by

Francis Njoroge Gacenga BA (KU), MBA (UON), Graduate Diploma MIS
(Greenwich)

School of Information Systems

Faculty of Business and Law

University of Southern Queensland

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Abstract

The use of Information Technology (IT) has become more pervasive and, progressively, there has been a shift from a technology focus to a service focus in managing IT. The performance measurement of IT service management (ITSM) is a major challenge faced by organisations adopting best practice frameworks. The extensive adoption of ITSM frameworks by organisations may point to the acceptance by IT service managers that best practice frameworks such as Information Technology Infrastructure Library (ITIL®) and standards such as ISO/IEC 20000 can deliver real operational efficiencies, ultimately translating into business benefits. Some organisations implementing ITSM initiatives have reported realisation of benefits in cost savings and standardisations in delivery of IT service.

Despite the appeal and the potential to realise benefits, the implementation of ITSM initiatives is complicated by the complexity in measuring performance.

Measurement of the performance of ITSM is critical due to the size of the investment and the crucial importance of IT services to organisations. Few guidelines on the performance measurement of ITSM exist for industry practitioners; and scant academic research has been conducted on the performance measurement of ITSM. The objective of this research is to develop a framework that can be used to measure the performance of ITSM and, hence, contribute to ITSM initiatives in organisations.

To achieve this objective, the study uses a mixed-method and multi-paradigm approach to develop an ITSM performance measurement framework and contingency theory for the performance measurement of ITSM. The study uses a survey of ITSM benefits and performance measurement to identify ITSM performance measurement practices. A survey was conducted on the ITSM performance measurement practices of members of the IT Service Management Forum of Australia (itSMFA). The survey findings were used to identify six ITSM performance measurement exemplar organisations for case study. The case studies provided further insight into ITSM performance measurement practices. The results of the literature review, survey and case studies formed the basis for the design of the ITSM performance measurement framework. The design science approach of Design Science Research Methodology (DSRM) and the design method of Matching

Analysis Projection and Synthesis (MAPS) were used to develop the ITSM performance measurement framework.

The study provides a comprehensive literature review on the performance measurement of ITSM. A review of the existing industry and academic literature showed a gap in theory for performance measurement of ITSM. There was also a lack of a contextualised performance measurement framework for ITSM. The study developed categories for types of organisation level and process level ITSM, and categories for types of ITSM performance metrics. The performance measurement framework developed by the study is structured using the Balanced Scorecard (BSC) and can be used to quantify benefits and link organisational level benefits and metrics with process level metrics. The developed framework includes a consolidated ITSM metrics catalogue structure. The study identified the internal and external organisational factors that influence the selection of ITSM performance metrics and proposes a contingency theory for the performance measurement of ITSM. The study makes theoretical and practical contributions in ITSM performance measurement by extending ITSM performance measurement theory, IS design theory and developing a holistic multi-level ITSM performance measurement framework that can be used by organisations.

This dissertation is a result of a study funded by an Australian Research Council (ARC) linkage project grant in partnership with Queensland Health (QH) and the IT Service Management Forum (itSMF) Australia. The study contributes to the linkage project by addressing the complex interactions of benefits, performance metrics and methods to enable Chief Information Officers (CIOs) and IT service managers to measure the performance of IT service management.

Certification of Thesis

I certify that the ideas, analyses, results, and conclusions contained in this thesis are original and entirely my own effort, except where otherwise acknowledged. I also certify that this work has not been previously submitted for any other award. To the best of my belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

During the course of the research, a number of research papers and a book chapter were published.

I was the primary author of the following co-authored papers:

Gacenga, F., Cater -Steel, A., Toleman, M. & Tan, W-G. 2012, 'A proposal and evaluation of a design method in design science research', *The Electronic Journal of Business Research Methods*, vol. 10, no. 2, pp. 89-100.

Gacenga, F., Cater-Steel, A., Tan, W-G. & Toleman, M. 2012, *Alleviating Design Silence in Design Science Research: a Proposal of a Design Method*, Academic Publishing International, University of Bolton, UK, 28-29 June 2012.

Gacenga, F., Cater-Steel, A., Toleman, M & Tan, W-G. 2012. 'Measuring IT service management performance: a model development', in Belkhamza, Zakariya & Wafa, Syed Azizi (eds.) *Measuring organizational information systems success: new technologies and practices*, Business Science Reference (IGI Global), Hershey, PA, USA, pp. 102-119. ISBN 9781466601703.

Gacenga, F., Cater-Steel, A., Tan, W-G., and Toleman, M. 2011, '*IT service management: towards a contingency theory of performance measurement*', ICIS 2011: International Conference on Information Systems, 4-7 December, Shanghai, China.

Gacenga, F., Cater-Steel, A., Toleman., M & Tan, W-G. 2011, 'Measuring the performance of service orientated IT management', *Sprouts: working papers on information environments, systems and organizations*, vol. 11, no. 162.

Gacenga, F., Cater-Steel, A., Toleman, M & Tan, W-G. 2011, '*Measuring the performance of service orientated IT management*', 2011 SIGSVC Workshop, 29 November, Shanghai, China.

Gacenga, F., Cater-Steel, A. & Tan, W-G. 2011, 'Towards a framework and contingency theory for performance measurement: a mixed-method approach', PACIS 2011: Quality Research in Pacific Asia, 7-11 July, Brisbane, Australia.

Gacenga, F. & Cater-Steel, A. 2011, 'Performance Measurement of ITSM: A Case Study of an Australian University', PACIS 2011: Quality Research in Pacific Asia, 7-11 July, Brisbane, Australia.

Gacenga, F., Cater-Steel, A., Toleman, M & Tan, W-G. 2011, 'Keeping score: measuring ITSM performance', 14th National Conference of IT Service Management Forum (itSMF) Australia, 17-19 August 2010, Perth, Australia. (Unpublished)

Gacenga, F., Cater -Steel, A. & Toleman, M. 2011. 'Cut Once, Measure Twice: A Case Study of Performance Measurement Practices', *Informed Intelligence*, Bulletin of itSMF Australia, Autumn.

Gacenga, F., Cater-Steel, A. & Toleman, M. 2011, 'Measuring the Performance of IT Service Management', 12th Global Information Technology Management Association World Conference, Las Vegas, USA, pp. 208-214.

Gacenga, F, Cater-Steel, A & Toleman, M 2010, 'An International Analysis of IT Service Management Benefits and Performance Measurement', *Journal of Global Information Technology Management* (13:4), Ivy League Publishing, Marietta, pp. 28-63.

Gacenga, F & Cater-Steel, A 2010, 'What's Your PMF Challenge', *Informed Intelligence*, Bulletin of itSMF Australia, Melbourne, Winter pp. 15-17.

Gacenga, F & Cater-Steel, A 2010, 'Delivering Value through IT Service Management Metrics', *Informed Intelligence*, Bulletin of itSMF Australia, Melbourne, Summer pp. 8-9.

I was co-author in the following presentations and publications:

Lepmets, M, Cater-Steel, A, Gacenga, F & Ras, E 2012, 'Extending the IT Service Quality Measurement Framework through a Systematic Literature Review', Challenges and Advances on Service Quality Aspects, the Special Issue of *Journal of Service Science Research*, vol. 4, no. 1, pp. 7-47.

Cater-Steel, A, Kolbe, LM., Marrone, M. & Gacenga, F. 2010, 'Achieving value through IT service management transformation: an international perspective', itSMF Australia, Queensland Branch Seminar, State Library of Queensland, Brisbane, December, <<http://www.itsmf.org.au/modules/resource/file.php?id=699>>.

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Francis Gacenga

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“Ad majorem Dei gloriam”.

(To the greater glory of God)

- St. Ignatius Loyola

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Table of Abbreviations

Abbreviation	Description
ACIS	Australasian Conference on Information Systems
AGIMO	Australian Government Information Management Office
AIS	Association for Information Systems
AMCIS	Americas Conference on Information Systems
ANT	Actor Network Theory
ARC	Australian Research Council
ARC	Australian Research Council
BPMN	Business Process Model and Notation
BSC	Balanced Scorecard
BYOD	Bring Your Own Device
CAB	Change Advisory Board
CEO	Chief Executive Officer
CIO	Chief Information Officer
CMDB	Configuration Management Database
CMMI®	Capability Maturity Model Integration
CMS	Configuration Management System
COBIT	Control Objectives for Information and Related Technology
CPU	Central Processing Unit
CSF	Critical Success Factors
CSV	Comma Separated Values
DESRIST	Design Science Research in Information Systems and Technology
DMAIC	Define, Measure, Analyse, Improve, and Control
ECIS	European Conference on Information Systems
ECRM	European Conference on Research Methodology for Business and Management Studies
EJBRM	Electronic Journal of Business Research Methods

Abbreviation	Description
EJIS	European Journal of Information Systems
ERP	Enterprise Resource Planning
GE	General Electric
GFC	Global Financial Crisis
GITMA	Global Information Technology Management Association
GQM	Goal Question Metrics
HDI	Help Desk Institute
HICSS	Hawaii International Conference on System Sciences
HP® ITSM	HP IT Service Management Reference Model
HR	Human Resources
IaaS	Infrastructure as a Service
IBM®	International Business Machines
IBM® SMRM	IBM Service Management Reference Model
ICIS	International Conference on Information Systems
ICSM	Institute of Certified Service Managers
ICT	Information and Communication Technology
IOSM	Institute of IT Service Management
IS	Information Systems
DSRM	Design Science Research Methodology
ISFS	IS Functional Scorecard
ISO 27001	Information security management system (ISMS) standard
ISO/IEC 20000	International Organization for Standardization/International Electrotechnical Commission ITSM standard
ISR	Information Systems Research
IT	Information Technology
ITIL®	Information Technology Infrastructure Library
ITSCM	IT Service Continuity Management
ITSM	Information Technology Service Management

Abbreviation	Description
itSMF	Information Technology Service Management Forum
itSMFA	Information Technology Service Management Forum Australia
itSMFI	Information Technology Service Management Forum International
ITUP	IBM Tivoli Unified Process
JAIS	Journal of Association for Information Systems
JGITM	Journal of Global Information Technology Management
JIT	Journal of Information Technology
JMIS	Journal of Management Information Systems
JSIS	Journal of Strategic Information Systems
KPI	Key Performance Indicator
MAPS	Matching Analysis Projection and Synthesis
MIS	Management Information Systems
MISQ	Management Information Systems Quarterly
MOF®	Microsoft Operations Framework
NRA	Normatively Regulated Activities
OGC	Office of Government Commerce
OH&S	Organisation Health and Safety
OWL	Web Ontology Language
PaaS	Platform as a Service
PACIS	Pacific Asia Conference on Information Systems
PAM	Process Assessment Model
PI	Performance Indicator
PMBOK	Project Management Body of Knowledge
PMF	Performance Measurement Framework
PPPT	People, Process, Partners, Technology
PRINCE	Projects in Controlled Environments
PRM	Process Reference Model

Abbreviation	Description
QH	Queensland Health
RBV	Resource Based View
RFC	Request for Change
ROI	Return on Investment
RQ	Research Question
SaaS	Software as a Service
SACM	Service Asset and Configuration Management
SCM	Service Catalogue Management
SIGSVC	Special Interest Group on Services
SLA	Service Level Agreement
SLM	Service Level Management
SLR	Systematic Literature Review
SOA	Service-Oriented Architecture
SPM	Service Portfolio Management
SPOC	Single Point of Contact
SPSS	Statistical Package for Social Sciences or Statistical Product and Service Solutions
UK	United Kingdom
UML	Unified Modelling Language
US/USA	United States of America
USQ	University of Southern Queensland

Table of Standards

Standard	Description
ISO9000	Quality management systems standards
ISO/IEC 20000	International standard for IT service management
ISO/IEC15504	Information technology — Process assessment standards