Towards using a systems approach in project management practice

Lucian Tipi (l.tipi@shu.ac.uk)
Sheffield Business School at Sheffield Hallam University

John Kawalek
The University of Sheffield

Nigel Garrow
Western SydneyUniversity

Abstract

The purpose of this paper is to advance the theoretical and practical knowledge in project management through the development of an inquiring project management framework.
The data collected in this research shows that project management is a very complex and multifaceted issue, context dependent and in a continue state of flux. The research results in the development of an inquiring project management framework that allows for a high degree of contextualization to take place during its application, to emulate closely the real world. The concept of project system is used to underpin the inquiring project management framework.

Keywords: Project management, Framework, System

Background and Purpose

The purpose of this paper is to advance the theoretical and practical project management knowledge through the development of an inquiring project management framework.

A broad range of literature that illustrates current issues with projects and project management is discussed, with an obvious focus on the high rate of project failures (Anthopoulos et al., 2016; Brookes and Locatelli, 2015).

Project management suffers from many problems related to cost and delays (Cavaleri et al., 2012), to the extent where for example market conditions have changed significantly from the original conditions that gave rise to the project in the first place. Cost overruns for example are one of the most common causes of project failure in industries such as IT and construction (Doloi, 2011), with overruns averaging over 200% in relation to the original estimates. Further evidence of projects not being delivered on time or having failed in the construction industry is shown by Naaranoja and Uden (2007).

The majority of projects will exceed their initial budget (Jørgensen and Wallace, 2000) due to poor estimation of cost factors. Over half of the IT projects investigated will fail on one or more criteria (Keil et al., 2002), while some studies put this figure to

over 75%, with cost overruns of 90% and schedule overruns of 120% being common. Other reports (Ojiako et al., 2008) show that 20% to 30% of projects cannot meet stakeholders specified criteria and are resulting in wasted yearly spending of approx. £75 billion in the US and £70 billion within the EU. Further data shows that public sector IT projects tend to be wasteful and not meeting expectations on a range of factors (Rosacker and Rosacker, 2010) with yearly figures of over $25 billion in expenditure that is locked into poorly performing projects. Other authors put the failure rate of projects at 78% (Lee and Hirshfield, 2006), which represents a worrying figure and correlates well with other studies.

A review of a number of high profile UK based failed projects is discussed by White and Fortune (2009) who argue that the most well-known project management methods are not sufficiently anchored in the complexities and uncertainties emerge from the project's own environments.

Based on this initial examination of the current state of project management, the purpose of this paper is to advance the theoretical and practical project management knowledge through the development of an inquiring project management framework.

This paper is seeking to reconsider project management practice and understand its drivers through an analysis of current practice and issues and will propose a holistic approach to projects.

A review of project management related issues

Project management has historically nearly always relied on hard systems approaches for planning, resource allocation, scheduling and control (Cavaleri and Reed, 2008) driven by economic and engineering models. Therefore, project managers have seen projects as clearly defined systems, with linear and deterministic behaviour, where rational decisions produce highly predictable results.

Research in project management illustrates a continuous dichotomy between the so called "hard" and "soft" approaches levelled at various aspects of projects, from methods to management styles (Karrbom Gustavsson and Hallin, 2014) and this state of affairs is further propagated by the research community by trying to give the impression that hard and soft approaches are very distinct and illustrate opposite traits. It is seen as unhelpful for the provision of new insights into project management to differentiate artificially between hard and soft approaches, as these are after all constructs put in place by the project management researcher and practitioner communities (Staadt, 2012), rather a critical systems thinking approach is preferred.

Abdel-Hamid et al. (1999) identify clearly that goal setting in projects and project management is of crucial importance as project managers do make planning and act in such a way as to fulfil the stated goals of the project.

Anantatmula and Kanungo (2008) identify sustained focus on the project objectives and goals as essential to project performance. The iterative nature of achieving the project goals quality related dimensions is discussed by Bryde (1997).

In certain cases the project management methods proposed by some authors are focused exclusively on very narrowly scoped techniques, for example mathematical programming or analysis models that do not consider the human dimension of the project well (Babu and Suresh, 1996; Tavares, 2002; Xia and Lee, 2005; Yang and Zou, 2014; Zhang et al., 2003).

Current project management methodologies have been designed to work during the manufacturing age (Furlong and Al-Karaghouli, 2010), where much more structured and limited ranges of activities took place. These methods no longer satisfy the needs of project management in the age of complex, information driven organisations. While

methodologies such as Project Management Body of Knowledge (PMBOK) can be of some limited use (Furlong and Al-Karaghouli, 2010), they fail to drive information driven projects to success.

The ability of project managers to address issues beyond the strictly technical issues of project management is seen as important (Biggs and Smith, 2003; Brookes and Locatelli, 2015).

The nature of the project manager role is, some decades after it first emerged, still unclear, with research (Paton and Hodgson, 2016) showing that in many cases project managers are sitting at the threshold between a technical role of some kind that was their primary role and a managerial role necessary for running projects.

The more complex a project, the less suitable the use of solely the hard skills by project managers is (Azim et al., 2010). While a lot of complexity can be found in the technical aspects of a project, it is typical that the complexity found in the relationships between the stakeholders of the project easily exceeds any technical complexity (Cervone, 2005).

While communication is not seen as an actual project deliverable or objective, it is seen as an essential component that contributes to the delivery of projects (Carvalho, 2013; Cervone, 2011; Cervone, 2014; Feeney and Sult, 2011; Gillard, 2005; Tam et al., 2007b).

The traditional approach of using deterministic static models for project scheduling clearly cannot solve cost overruns issues (Jørgensen and Wallace, 2000), managerial flexibility must be built into the process.

Given how much interest there is among the various project stakeholders to deliver success it is surprising to find that in fact project success is still a very ill defined area (Müller and Jugdev, 2012), with no consistent and widely accepted definition being available. Project success is very much stakeholder dependent and while some components of project success have been identified (for example project success factors and criteria), they are poorly understood and not very well related to organisational success (Müller and Jugdev, 2012). This is confirmed by Saleh and Alshawi (2005) who state that holistic models for measuring IS project success are needed, which must be linked to organisational success.

It is impossible to determine a definitive, generic list of project success factors as these will differ from project to project and need to be established within some context of business benefit for various stakeholders (Ojiako et al., 2008).

Forecasting errors in the various aspects of the project is a "technical" major source of cost overruns (Cantarelli et al., 2012a) that may be alleviated by using better contextualized data and information. However, this is not always the case and appraisal optimism (optimism bias) is another major cause and more likely the real cause of cost overruns in projects (Cantarelli et al., 2012b). Often, project planning and forecasting activity is based on a range of assumptions and constraints that project managers and other stakeholders make about the project context and its external environment (Cervone, 2012).

Risk management is seen as an essential part of project management (Cervone, 2006; Gemino et al., 2007; Tam et al., 2007a) and as such the identification of risk factors followed by risk analysis must be carried out and updated continuously.

Cavaleri and Reed (2008) identify that there are clear advantages to looking at projects from a leadership perspective, where systems thinking, knowledge processing, learning, and organisational dynamics play key roles. Most projects are in fact complex, dynamic systems, that do not conform to a linear behaviour, given the human driven activities encountered within. A Soft Systems Methodology (SSM) approach, based on

inquiry, focused on modelling and capturing human related complexity, is advocated as being eminently suitable for organisational activity (Checkland, 1999; Crawford et al., 2003). The idea of a system is an abstract notion that can be applied to any situation, regardless of its complexity, including human organisational activities such as projects and project management (White and Fortune, 2009). Systems thinking is particularly adept at capturing inter-connectiveness and contextualization, as it requires continuous actualization of the system being represented.

The dynamic nature of a mix of project stakeholders is self-evident, as indeed the human mix will introduce a continuous state of flux in terms of all of the project management component areas. Therefore, a suitable research method for dealing with the complexity of the human element related to project management is needed, as the intention is to capture this complexity as lived by the project management practitioners that can offer the best view possible as being the most involved with all aspects of project management

Methodology
The methodological framework is based on an interpretivist philosophy using grounded theory building, as shown by Charmaz (2006), within a systems thinking framework drawing on concepts introduced by Checkland (1999).

According to Glaser and Strauss (1967), grounded theory requires the acquisition of data related to a phenomenon and then it is developed and provisionally verified through further systematic data collection and analysis of data relative to the phenomenon being studied.

Since the original grounded theory emerged, Strauss (1987) changed the original theory and moved towards verification of existing theory in other words while originally grounded theory advocated starting with no preconceived ideas, it is now possible to use existing theory to inform the areas of exploration. This evolution of the grounded theory was continued in the works of Strauss and Corbin (1998) and Corbin and Strauss (2008) and it became known for its rigour and usefulness (Charmaz, 2006) and even, sometimes, for its positivistic assumptions.

The basis of grounded theory analysis is the data coding process, which involves manipulating the data via breaking it down, analysing, comparing and categorising the data so that theory which is grounded in the data can be obtained (Bryman and Bell, 2015; Collis and Hussey, 2014; Saunders et al., 2012).

In this work a Charmaz (2006) grounded theory building and coding approach has been taken as it allows for the most comprehensive and clear building of theory from the data and links with existing theory. The starting point for the inquiry can be provided by the literature review and this is the case in this work. Wu and Beaunae (2014) note the increased popularity of grounded theory in qualitative research.

Given the methodological and research strategy approach taken in this research work a number of interviews were conducted and the process of conducting the interviews was carried out in order to satisfy the requirements of grounded theory (Charmaz, 2006). Interviews are seen as the preferred method for data collection (Wu and Beaunae, 2014) for research based on the grounded theory approach adopted in this work.

The initial discussion points for these interviews are identified from literature, forming, in effect, the basis for the interview framework. The interview data collection instrument has been refined such that it forms the basis for the interviews carried out at this stage. The semi-structured interview framework approach is preferred in this work as it allows for adaptation during the interview process and the exploration of

unexpected paths of questioning that may occur as a result of the dialogue with the interviewees.

There are many advantages (Bhattacharya, 2014; Dean and Sharp, 2006; Richards, 1999) to using computer software to help with the data coding process. Computer software was utilized to help with the coding and data organisation process. QSR International NVivo was used for the initial stages of data coding and organisation. Once the initial coding has taken place the data was exported to Microsoft Excel, as it was found to be more user friendly in terms of manipulating large amounts of data.

A number of 31 interviews were conducted, with a range of interviewees working on complex projects for different organisations in different industry sectors.

Findings

Four main components that constitute the building blocks of the project management framework are identified from data: "The project", "The project manager", "The project stakeholders" and "The project frameworks and methods".

Having established these areas, the next task is to organise the nodes into the four major themes underpinning the framework. These are presented in Table 1:

Table 1 - Organising the nodes under the four project management related themes

Major project management related theme	Node
Project	Barriers when running a project
	Project brief
	Defining project failure and reasons
	Defining project success and reasons
	Defining the project
	Ideal or desirable changes through projects
	Measures for project failure
	Measures for project success
	Assertions on a project's end
	Feasible changes through projects
Project Manager	Running a project - recommended practice
	Communicating a project to others
	Assertions on projects and project management
	Representing a project
	Running a project - interviewee's practice
	Running a project - in an ideal world
	Assumptions made when running a project
	Most important factor when running a project
Project Stakeholders	Engagement and motivation of project stakeholders
	Relationships between the stakeholders in a project
	Main stakeholders in a project
	The real project beneficiaries
Project Management Framework and Methods	Advantages of project management methods
	Assertions on project management frameworks
	Disadvantages of project management methods
	Project management methods employed

A further breakdown of these factors has resulted from the data providing insight into the specific areas of inquiry as well as guidance to the project managers using the framework proposed in this work in relation to the likely nature (e.g. difficult) of each of the areas of inquiry.

The systemic nature of the framework is evidenced by the transformational nature of the framework, its multiple interrelated components and implicit dynamic nature, essential in order to cater for human processes.

It has become obvious to the author that under each of the nodes identified previously some further insights emerge, beyond what the data actually says. These insights allow the further classification of the 157 variables used for analysis (out of the 163 total) sitting under the nodes into four types.

It is proposed to use a semaphore colour coding system to illustrate the variable types that will form the basis of the inquiring project management framework. As such, the proposed colour coding system for variables is presented in Table 2:
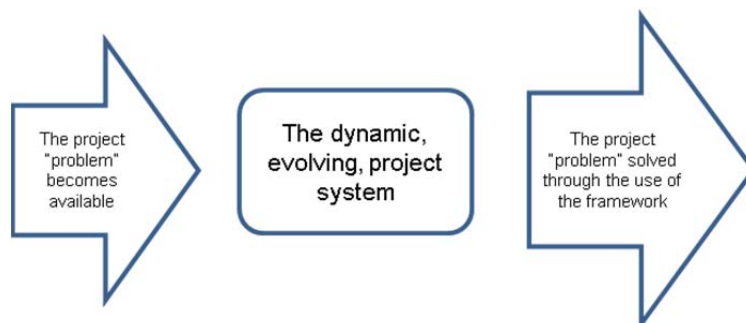
Table 2: Colour coding system for the variables

Variable type	Colour	Description of the variable
Regular variable	Grey	A type of variable that illustrates that there is sufficient consistent data to allow for conclusions to be drawn.
High interest variable	Green	A type of variable that has attracted a lot of content and interest from the interviewees, in other words a lot of data that allows conclusions to be drawn exists under such variables.
Difficult variable	Orange	A type of variable that, based on the data sitting under it, gives the clear message that interviewees find this area difficult to define or to deal with.
Deficient variable	Red	A type of variable that has provided little or inconsistent data from the interviewees, suggesting the need for further inquiry.

"Look-up" tables that contain the various categories of variables for each of the four main themes have been produced. These tables will guide the users of the inquiring project management framework through the process necessary to solve the project "problem", to move the project from its initial state to a final acceptable state.

Developing the new inquiring project management framework
The development of the inquiring project management conceptual framework from the data can now be completed on the basis of the knowledge elicited in the four main project management related themes, as analysed previously in this paper. The concept of project system is used to underpin the inquiring project management framework.

At its simplest, a project management system could be represented as follows:

The project "problem" becomes available → The dynamic, evolving, project system → The project "problem" solved through the use of the framework

Figure 1: The project system as the basis for the inquiring project management framework

The systemic nature of the framework is evidenced by the transformational nature of the framework, its multiple interrelated components and implicit dynamic nature, essential in order to cater for human processes.

However, Figure 1 only gives the highest level view of the project system, we now need to provide a better level of detail for this framework to become useful.

As it is clear from the nodes presented earlier in this paper in Table 1, the four main themes identified from the data are interrelated, thus giving the inquiring project management framework.

The initial framework presented in Figure 1 is therefore developed further, on the basis of the data structures illustrated previously and is represented in Figure 2.
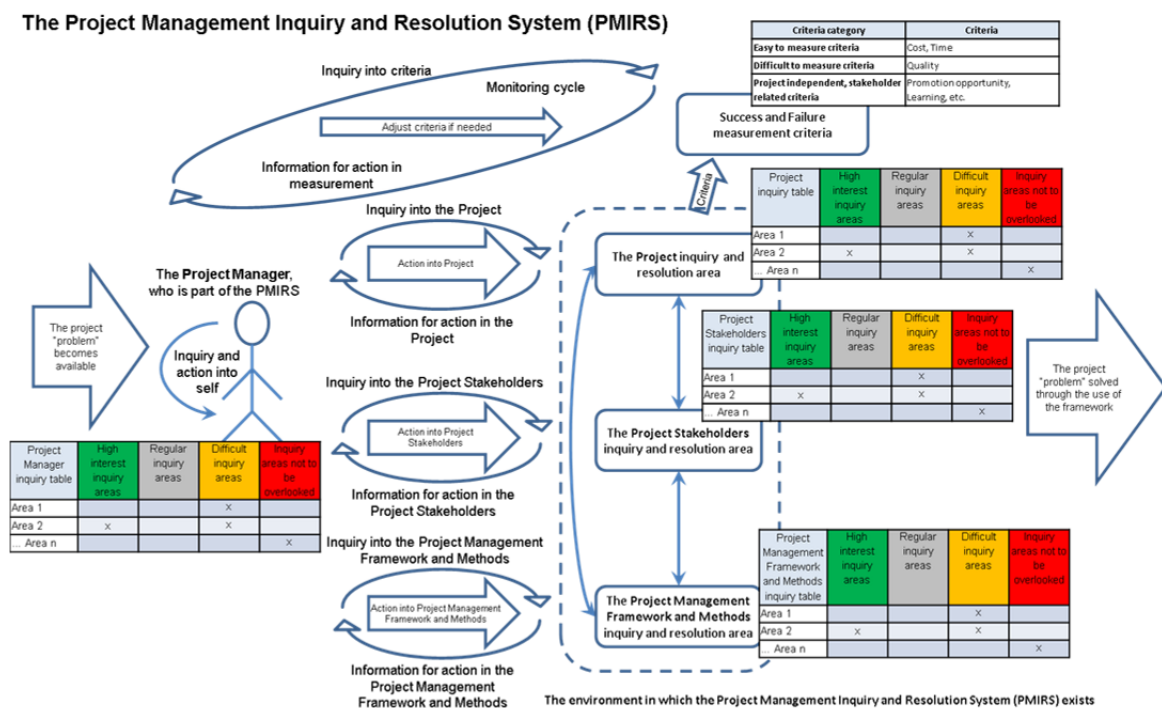

Figure 2 – The inquiring project management framework

The project related performance criteria go well beyond the traditional cost, time and quality and consider the possibility that some of these criteria will be context dependent (i.e. only relevant to certain projects, but not to others).

Given the highly contextual nature of projects it is recommended that project managers using this framework conduct a full inquiry into all of the performance measures identified above as well as looking to capture any others that may be identified during the running of specific projects.

The iterative nature of the framework is evident and has emerged from the data analysis. It is noted that the project manager plays a pivotal role ensuring that the framework produces the desired effect – a successfully delivered project. It is the project manager's role to ensure that all of the areas that make up the project are properly inquired upon, not forgetting the inquiry into the role of project manager itself.

The key interpretation of the project management framework developed in this work is that it constitutes an inquiry framework which is based on the:

- Identification of the four main areas of inquiry ("Project", "Project Manager", "Project Stakeholders" and "Project Management Framework and Methods");
- Identification of project related measurement criteria;

- Inter-related nature of the inquiry areas;
- Contextualization of the application of the framework to each specific project.

Such an approach seeks to remove some of the criticisms that systems thinking in project management is facing in relation to its practical applicability by practitioners, namely a level of conceptual thinking that is at times impenetrable (Sheffield et al., 2012) and the lack of detail which allows to guide the practitioner user through the inquiry process, giving the impression that in effect there is no consistent method (Jackson, 2001) that they can apply to their day-to-day problems.

Contribution

The paper's main claim is towards furthering the project management body of knowledge and practice through the development of an inquiring project management framework. Project management is treated as a human, dynamic activity, where the central idea is that people and context are key to the success of the project and not, for example, the project management method.

This work seeks to fill in a gap, which, according to Shipley and Johnson (2009), exists in the availability of holistic and theoretically grounded project management frameworks that can also be used in practice to guide project managers in their practice.

This work is also able to reposition or confirm some of the project management theory and practice:

- Encourages the capturing of the project context as advocated by Hällgren et al. (2012);
- Confirms the importance the project manager in accordance with Paton and Hodgson (2016);
- Allows for the possibility of equanimity in project management, as identified by Oyegoke (2011), indeed it actively encourages such an approach.

Conclusion

Project management is emerging as a complex and dynamic human driven activity and therefore a flexible, inquiring approach that leads to the possibility of dynamic actualization of the project components is necessary.

Project management is emerging as a complex and dynamic human-driven activity and therefore a flexible, inquiring approach that leads to the possibility of dynamic actualization of the project components is necessary.

Such an approach can be supported by a comprehensive, multilevel project management inquiring framework, which can be used in project management practice, moving beyond providing only a theoretical contribution to the discipline.

References

Abdel-Hamid, T. K., Sengupta, K. & Swett, C. (1999), "The impact of goals on software project management: An experimental investigation", *MIS Quarterly: Management Information Systems*, Vol. 23, No. 4, pp. 531-555.

Anantatmula, V. & Kanungo, S. (2008), "Role of IT and KM in improving project management performance", *VINE*, Vol. 38, No. 3, pp. 357-369.

Anthopoulos, L., Reddick, C. G., Giannakidou, I. & Mavridis, N. (2016), "Why e-government projects fail? An analysis of the Healthcare.gov website", *Government Information Quarterly*, Vol. 33, No. 1, pp. 161-173.

Azim, S., Gale, A., Lawlor-Wright, T., Kirkham, R., Khan, A. & Alam, M. (2010), "The importance of soft skills in complex projects", *International Journal of Managing Projects in Business*, Vol. 3, No. 3, pp. 387-401.

Babu, A. J. G. & Suresh, N. (1996), "Project management with time, cost, and quality considerations", *European Journal of Operational Research*, Vol. 88, No. 2, pp. 320-327.

Bhattacharya, K. (2014), "Coding is not a dirty word: Theory-driven data analysis using NVivo", in HAI-JEW, S. (Ed.), *Enhancing Qualitative and Mixed Methods Research with Technology,* IGI Global, Hershey, Pennsylvania (USA), pp. 1-30.

Biggs, S. & Smith, S. (2003), "A Paradox of learning in project cycle management and the role of organizational culture", *World Development*, Vol. 31, No. 10, pp. 1743-1757.

Brookes, N. J. & Locatelli, G. (2015), "Power plants as megaprojects: Using empirics to shape policy, planning, and construction management", *Utilities Policy*, Vol. 36, No., pp. 57-66.

Bryde, D. J. (1997), "Underpinning modern project management with TQM principles", *The TQM Magazine*, Vol. 9, No. 3, pp. 231-238.

Bryman, A. & Bell, E. (2015), *Business research methods,* Oxford University Press.

Cantarelli, C. C., Flyvbjerg, B. & Buhl, S. L. (2012a), "Geographical variation in project cost performance: the Netherlands versus worldwide", *Journal of Transport Geography*, Vol. 24, No., pp. 324-331.

Cantarelli, C. C., Molin, E. J. E., Van Wee, B. & Flyvbjerg, B. (2012b), "Characteristics of cost overruns for Dutch transport infrastructure projects and the importance of the decision to build and project phases", *Transport Policy*, Vol. 22, No., pp. 49-56.

Carvalho, M. M. D. (2013), "An investigation of the role of communication in IT projects", *International Journal of Operations & Production Management*, Vol. 34, No. 1, pp. 36-64.

Cavaleri, S., Firestone, J. & Reed, F. (2012), "Managing project problem-solving patterns", *International Journal of Managing Projects in Business*, Vol. 5, No. 1, pp. 125-145.

Cavaleri, S. & Reed, F. (2008), "Leading dynamically complex projects", *International Journal of Managing Projects in Business*, Vol. 1, No. 1, pp. 71-87.

Cervone, H. F. (2005), "Influencing: A critical skill for managing digital library project teams", *OCLC Systems and Services*, Vol. 21, No. 2, pp. 105-109.

Cervone, H. F. (2006), "Project risk management", *OCLC Systems and Services*, Vol. 22, No. 4, pp. 256-262.

Cervone, H. F. (2011), "Overcoming resistance to change in digital library projects", *OCLC Systems and Services*, Vol. 27, No. 2, pp. 95-98.

Cervone, H. F. (2012), "Understanding the elements of a digital library project plan: Part 2", *OCLC Systems and Services*, Vol. 28, No. 3, pp. 126-129.

Cervone, H. F. (2014), "Effective communication for project success", *OCLC Systems and Services*, Vol. 30, No. 2, pp. 74-77.

Charmaz, K. (2006), *Constructing grounded theory : a practical guide through qualitative analysis,* SAGE, London.

Checkland, P. (1999), *Systems Thinking, Systems Practice: Includes a 30 Year Retrospective,* John Wiley, London.

Collis, J. & Hussey, R. (2014), *Business research a practical guide for undergraduate & postgraduate students,* Palgrave Macmillan.

Corbin, J. M. & Strauss, A. L. (2008), *Basics of qualitative research : techniques and procedures for developing grounded theory,* Sage Publications, Inc., Los Angeles, Calif.
London.

Crawford, L., Costello, K., Pollack, J. & Bentley, L. (2003), "Managing soft change projects in the public sector", *International Journal of Project Management*, Vol. 21, No. 6, pp. 443-448.

Dean, A. & Sharp, J. (2006), "Getting the most from NUD*IST/NVivo", *Electronic Journal of Business Research Methods*, Vol. 4, No. 1, pp. 11-22.

Doloi, H. K. (2011), "Understanding stakeholders' perspective of cost estimation in project management", *International Journal of Project Management*, Vol. 29, No. 5, pp. 622-636.

Feeney, M. & Sult, L. (2011), "Project management in practice: Implementing a process to ensure accountability and success", *Journal of Library Administration*, Vol. 51, No. 7-8, pp. 744-763.

Furlong, S. & Al-Karaghouli, W. (2010), "Delivering professional projects: The effectiveness of project management in transformational e-government initiatives", *Transforming Government: People, Process and Policy*, Vol. 4, No. 1, pp. 73-94.

Gemino, A., Reich, B. H. & Sauer, C. (2007), "A temporal model of information technology project performance", *Journal of Management Information Systems*, Vol. 24, No. 3, pp. 9-44.

Gillard, S. (2005), "Managing IT projects: Communication pitfalls and bridges", *Journal of Information Science*, Vol. 31, No. 1, pp. 37-43.

Glaser, B. G. & Strauss, A. L. (1967), *The Discovery of grounded theory: strategies for qualitative research,* Aldine.

Hällgren, M., Nilsson, A., Blomquist, T. & Söderholm, A. (2012), "Relevance lost! A critical review of project management standardisation", *International Journal of Managing Projects in Business*, Vol. 5, No. 3, pp. 457-485.

Jørgensen, T. & Wallace, S. W. (2000), "Improving project cost estimation by taking into account managerial flexibility", *European Journal of Operational Research*, Vol. 127, No. 2, pp. 239-251.

Karrbom Gustavsson, T. & Hallin, A. (2014), "Rethinking dichotomization: A critical perspective on the use of "hard" and "soft" in project management research", *International Journal of Project Management*, Vol. 32, No. 4, pp. 568-577.

Keil, M., Tiwana, A. & Bush, A. (2002), "Reconciling user and project manager perceptions of IT project risk: A Delphi study", *Information Systems Journal*, Vol. 12, No. 2, pp. 103-119.

Lee, P. D. & Hirshfield, M. (2006), "Project planning for health care software implementations", *Health Care Manager*, Vol. 25, No. 4, pp. 310-314.

Müller, R. & Jugdev, K. (2012), "Critical success factors in projects: Pinto, Slevin, and Prescott – the elucidation of project success", *International Journal of Managing Projects in Business*, Vol. 5, No. 4, pp. 757-775.

Naaranoja, M. & Uden, L. (2007), "Major problems in renovation projects in Finland", *Building and Environment*, Vol. 42, No. 2, pp. 852-859.

Ojiako, U., Johansen, E. & Greenwood, D. (2008), "A qualitative re-construction of project measurement criteria", *Industrial Management and Data Systems*, Vol. 108, No. 3, pp. 405-417.

Oyegoke, A. (2011), "The constructive research approach in project management research", *International Journal of Managing Projects in Business*, Vol. 4, No. 4, pp. 573-595.

Paton, S. & Hodgson, D. (2016), "Project managers on the edge: Liminality and identity in the management of technical work", *New Technology, Work and Employment*, Vol. 31, No. 1, pp. 26-40.

Richards, L. (1999), "Data alive! The thinking behind NVivo", *Qualitative Health Research*, Vol. 9, No. 3, pp. 412-428.

Rosacker, K. M. & Rosacker, R. E. (2010), "Information technology project management within public sector organizations", *Journal of Enterprise Information Management*, Vol. 23, No. 5, pp. 587-594.

Saleh, Y. & Alshawi, M. (2005), "An alternative model for measuring the success of IS projects: The GPIS model", *Journal of Enterprise Information Management*, Vol. 18, No. 1, pp. 47-63.

Saunders, M., Lewis, P. & Thornhill, A. (2012), *Research methods for business students,* Pearson, Harlow.

Shipley, M. F. & Johnson, M. (2009), "A fuzzy approach for selecting project membership to achieve cognitive style goals", *European Journal of Operational Research*, Vol. 192, No. 3, pp. 918-928.

Staadt, J. (2012), "Redesigning a project-oriented organization in a complex system: A soft systems methodology approach", *International Journal of Managing Projects in Business*, Vol. 5, No. 1, pp. 51-66.

Strauss, A. L. (1987), *Qualitative analysis for social scientists,* Cambridge U.P.

Strauss, A. L. & Corbin, J. M. (1998), *Basics of qualitative research: techniques and procedures for developing grounded theory,* Sage.

Tam, V. W. Y., Shen, L. Y., Tam, C. M. & Pang, W. W. S. (2007a), "Investigating the intentional quality risks in public foundation projects: A Hong Kong study", *Building and Environment*, Vol. 42, No. 1, pp. 330-343.

Tam, V. W. Y., Shen, L. Y., Yau, R. M. Y. & Tam, C. M. (2007b), "On using a communication-mapping model for environmental management (CMEM) to improve environmental performance in project development processes", *Building and Environment*, Vol. 42, No. 8, pp. 3093-3107.

Tavares, L. V. (2002), "A review of the contribution of Operational Research to Project Management", *European Journal of Operational Research*, Vol. 136, No. 1, pp. 1-18.

White, D. & Fortune, J. (2009), "The project-specific Formal System Model", *International Journal of Managing Projects in Business*, Vol. 2, No. 1, pp. 36-52.

Wu, C. H. V. & Beaunae, C. (2014), "Personal reflections on cautions and considerations for navigating the path of grounded theory doctoral theses and dissertations: a long walk through a dark forest", *International Journal of Social Research Methodology*, Vol. 17, No. 3, pp. 249-265.

Xia, W. & Lee, G. (2005), "Complexity of information systems development projects: Conceptualization and measurement development", *Journal of Management Information Systems*, Vol. 22, No. 1, pp. 45-83.

Yang, R. J. & Zou, P. X. W. (2014), "Stakeholder-associated risks and their interactions in complex green building projects: A social network model", *Building and Environment*, Vol. 73, No., pp. 208-222.

Zhang, G. P., Keil, M., Rai, A. & Mann, J. (2003), "Predicting information technology project escalation: A neural network approach", *European Journal of Operational Research*, Vol. 146, No. 1, pp. 115-129.