

THE UNIVERSITY OF HULL

Enhancing the Successful Delivery of Service Operations

being a Thesis submitted for the Degree of Doctor of Philosophy (PhD)

in the University of Hull

by

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Profile of candidate

The candidate, Udechukwu ‘Udi’ Ojiako was born in London on 8 November 1971. He holds the following qualifications: BEng (Hons) Civil Engineering (University of Nigeria, 1988-1994), MSc Construction Management (South Bank University, London, 1995-1997), Postgraduate Certificate (PCAPL) Academic & Professional Learning (University of Northumbria at Newcastle, 2006 to 2007), and PhD Project Management (University of Northumbria at Newcastle, 1999-2005). The candidate also attended the Adjutant General’s Corp Centre - Pirbright, attaining his Basic Police Course qualification with the Royal Military Police in 1996. The candidate is currently Professor of Project Management at the British University in Dubai holding concurrent positions as Visiting Professor of Management at Hull University Business School and Visiting Scholar at the School of Mechanical, Aerospace and Civil Engineering (MACE), University of Manchester. The candidate had previously held the following academic positions; Professor of Business Development & Project Management, 2013-2014, University of Johannesburg; Associate Professor of Project Management, 2012-2013, University of the Witwatersrand; Lecturer in Project Management, 2009-2012, University of Southampton and Senior Lecturer in Project Management, 2006-2009, University of Northumbria at Newcastle.

Declaration

The candidate confirms that neither this material as a whole nor in any part has been previously or is currently submitted for any degree at this or any other university, anywhere in the world. The candidate also acknowledges that although the initial foundation for the majority of concepts that form the submission for this thesis was established while working towards his initial PhD at the University of Northumbria at Newcastle, all the 16 publications, which constitute this thesis, were published after the PhD was awarded in 2005. The candidate also confirms that no publication which emerged directly from the PhD awarded by the University of Northumbria at Newcastle has been included in the submissions that accompany this thesis. As such, this thesis represents a collection of the candidate's prior publications developed and carried out in the period from 2006 to date (2015) in the area of *service operations project management*. The papers presented to support this thesis - as will be shown - have primarily focused on three major themes: (i) Information Systems/Information Technology (IS/IT) as a firm resource for service operations, (ii) the implementation of service operations projects - that is project management, in particular its failure, and (iii) failure mitigation - through teaching and learning of project management and the management of associated risk – management of risk.

Acknowledgements

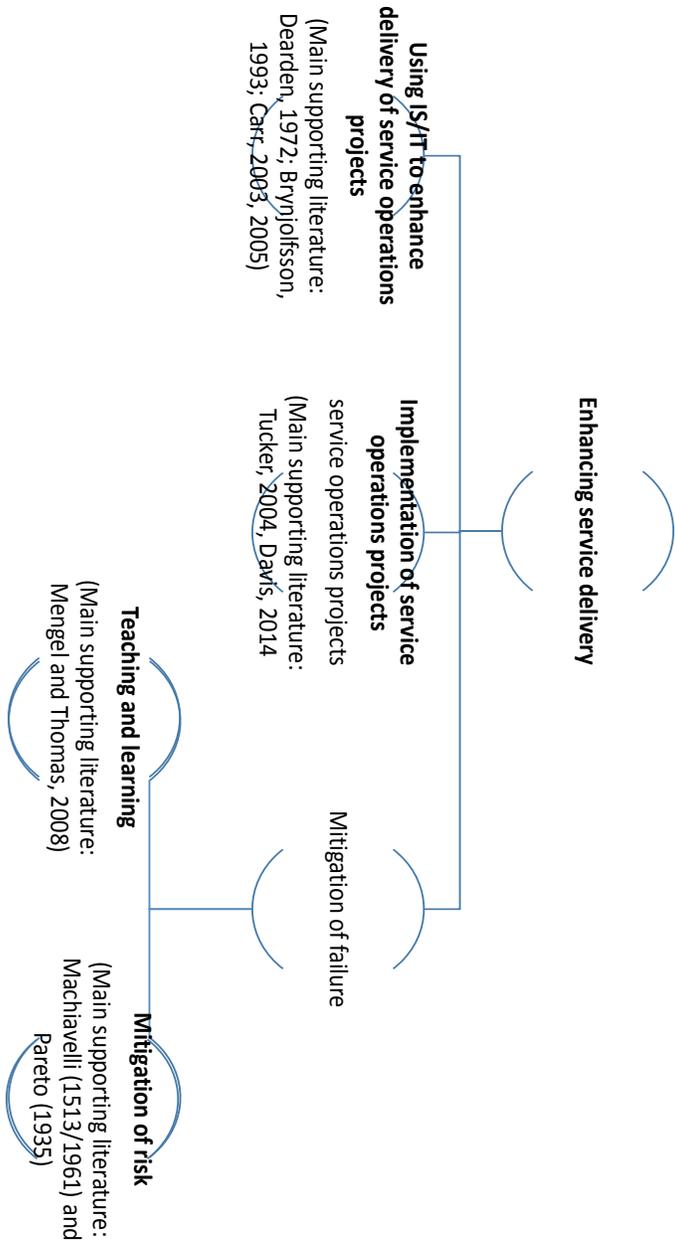
While the candidate attests to having played a major contributing role in the publications listed to support this application, and thus will later indicate his share of the work in the statement of originality and contribution, he stresses that he fully recognises the crucial roles and contribution of colleagues with whom he has collaborated over roughly a ten-year period.

On the current endeavour, the candidate's inspiration to complete this thesis has been drawn from his late father, Gordian Udechukwu Ojiako (1933-2009), Emeritus Professor of Civil & Environmental Engineering, Federal University of Technology, Owerri – Nigeria, whose tenacious desire for learning remains a source of pride and inspiration. The candidate is particularly indebted to his PhD supervisor, mentor and former 'boss', Professor Terry Williams, Dean of Hull University Business School for, without his support and encouragement, this endeavour would have remained a pipe dream. The candidate also acknowledges the support of his colleagues at the British University in Dubai, specifically Professor Ashly Pinnington and Professor Mohammed Dulaimi who both reviewed initial drafts of this thesis. The candidate is indebted to his core research collaborators, in particular Dr's Maxwell Chipulu, Alasdair Marshall, Melanie Ashleigh and Yue Wu (all of Southampton Business School, University of Southampton), Dr Stuart Maguire (Sheffield University Management School, University of Sheffield) - who supervised his initial PhD thesis alongside Professor David Greenwood), and Dr Thanos Papadopoulos (School of Business, Management and Economics, University of Sussex), each of whom has been very supportive of this endeavour. He is indebted to Stuart in particular; for making the suggestion in the first place to explore the possibility of undertaking this PhD programme and to Thanos who, on being informed of the candidate's intention, replied ...“Go ahead...I do deeply appreciate you as you know”.

1.0 Statement of originality and contribution

In this thesis, what is of interest to the candidate is to address the question; *how can the delivery of service operations projects with substantial Information Systems/Information Technology (IS/IT) functionality be enhanced?* To explore this overarching research question, three dimensions (themes) of the candidate's prior, ongoing and future work are explored – i) the use of IS/IT as a firm resource for service operations, ii) the implementation of service operations projects and failure mitigation - through teaching and learning of project management, and iii) the management of associated risk. The theoretical foundations of these three research themes are encapsulated in various studies. For example, as relates to *the use of IS/IT as a firm resource*, the candidate has drawn upon earlier works of Dearden (1972), Brynjolfsson (1993) and Carr (2003, 2005) while on the question of *heterogeneity of success and failure perceptions and service operations failure*, the candidate has drawn upon the works of Tucker (2004) and Davis (2014), respectively. In terms of the third and final theme of the candidate's work, interest revolves around *failure mitigation*, to which there are two approaches; one dealing with teaching and learning, of which the work of Mengel and Thomas (2008) provides the main theoretical foundation, and the other dealing with the management of risk. Here, to better understand behaviour within an operational context at a micro-level (see Croson *et al.*, 2013), the candidate draws upon the classical works of Machiavelli (1513/1961) and Pareto (1935). Figure 1.0 below is a diagrammatic representation of how the three different themes within the study fit into the overarching research question.

Figure 1.0 Conceptual framework



The importance and role of Information Systems/Information Technology (IS/IT) in supporting service operations and the need for enhanced delivery of service operations projects is widely acknowledged in the literature, suggesting (i) a possible optimal level of beneficial investment in IS/IT (Brynjolfsson, 1993), (ii) that IS/IT has a significant and positive impact upon service operations, and that (iii) service operations projects face considerable human-driven challenges during implementation (Mills and Moberg, 1982; Collier, 1983; Brunson and Walley, 1997; Maguire *et al.*, 2012; Ojiako *et al.*, 2013a). Service operations projects also face challenges related to the efficiency and effectiveness of service transfer, the timeliness of its availability, and the need for transparency in its articulation. It also has to be acknowledged that some scholars suggest that – at best – possible benefits from investment in IS/IT may occasionally be overestimated (see Dearden, 1972; Brynjolfsson, 1993; Carr, 2003, 2005). Thus, the proposition that increasing investment in IS/IT does not necessarily guarantee significant enhancement of service performance is supported, the reason being that benefits from IS/IT investment are generally only realised years, if not decades after project go-live date. In effect, in some cases it is quite difficult to accurately measure the return-on-investment (ROI) because not only project scope but also expectations about the project are likely to change over time.

Compounding the issue is that service operations project managers are limited in their scope to make enhanced decisions because they often do not have comprehensive information in the present to make decisions relating to the future of the project (see Ojiako *et al.*, 2014a; 2015). The implication of this is that project costs and benefits are regularly under- or overestimated (see Flyvbjerg, 2008; Flyvbjerg *et al.*, 2009). The third point to note is that literature (see Melville *et al.*, 2004) suggests that there is limited evidence that the IS/IT functionalities of service projects are appropriately and coherently aligned with business value. In most cases, there appears to be a

preference to emphasise the technical nature of service operations projects, although most tend to fail for primarily ‘softer’ and more social reasons (Zimmer and Yasin, 1998; Bendoly et al., 2006; Rudolf *et al.*, 2008; Croson *et al.*, 2013). This unfolding scenario sets the scene for the first research question (RQ1): *What level of IS/IT support is needed to enhance functionalities being delivered through service operations projects?*

Drawing upon the works of Turner and Müller (2003), Stal-Le Cardinal and Marle (2006) and Klein *et al.* (2015) who provide ‘generic’ definitions of a ‘project’ drawn around keywords such as ‘temporal’, ‘novelty’, ‘unique’ ‘constraints’ and ‘objectives’ and also the works of scholars such as Frei and Harker (1999), Johns (1999) and Cook *et al.* (2002) who articulate the concept of ‘service’ around keywords and phrases such as ‘exchange’, ‘actions’, ‘being in receipt of...’, the candidate defines a service operations project as a “*temporary endeavour with a significant exchange orientation that is characterised by a definite start and also definite finish encompassing platforms for resource allocation required for the enactment of beneficial and creative exchange of service*”.

The primary objective of project management is to develop knowledge that facilitates an in-depth understanding of *why*, *when* and perhaps most importantly, *how best* to approach the planning, co-ordination and control of the often complex and diverse range of activities and associated risks (and issues) that constitute modern business. The relationship between project management and strategy is demonstrated by Longman and Mullins (2004) who suggest that “...any strategy session that is worth its salt ultimately distils vision [statements] into critical business issues, and if the organization is really serious, these issues get distilled into projects”. According to Maylor *et al.* (2008), projects are key processes in modern operations, which are in and of themselves, value-adding transformational processes (see Lovejoy, 1998). Hayes (2002)

points out that, overall, project management has a critical role to play within the operations management realm. In particular, project management provides the control structures and mechanisms required for the effective management of operations.

What is perhaps needed at this juncture is clarity on how exactly service operations project failure is being conceptualised by the candidate. Firstly, it is highlighted that a number of service operations are delivered in the form of projects (Ojiako *et al.*, 2015). Secondly, studies suggest that service operations projects fail on a regular basis (see Craighead *et al.*, 2004; Tucker, 2004; Gliatis *et al.*, 2013; Tucker *et al.*, 2013) due to their complex nature (Ramasesh and Browning, 2014), and the intensity of the emotions usually associated with what customers expected from these projects (see Ojiako *et al.*, 2013). Studies (see Maguire *et al.*, 2010; Tucker, 2004; Tucker *et al.*, 2013) suggest that a substantial amount of service operations project failure occurs in the form of a large number of small(er) and lower-impact problems as against fewer, higher-impacting problems as experienced in non-operational environments. However, Davis (2014) points out that different stakeholder groups maintain different perceptions of project success. This scenario creates particular challenges when employing project management methodologies in the delivery of service operations projects. This is because projects have traditionally been presented by professional institutions as normative procedures (because a smaller problem implies an emphasis on workarounds (Tucker, 2004)). In addition, project management methodologies tend to focus on attaining control - seen to be critical to mitigate against a small number of larger problems; but not against a large number of smaller problems. Thirdly, service operations projects are often conceptualised years and, in the case of projects in the public sector, decades before implementation commences (see Maguire and Ojiako, 2008; Ojiako and Maguire, 2009).

Earlier work undertaken by the candidate as part of his first doctoral study¹ had sought, through industry comparisons, to develop an understanding of how service operations projects can be assessed for success and failure. While the outcome of that first doctoral study is not particularly relevant in the context of this current study, the implications are relevant in as much as the study brought to light a number of challenges associated firstly with ideas relating to the possible application of universal measures of success and failure to projects, and secondly with ideas relating to perceptions of instrumentality associated with project management methodologies. These methodologies include the Association for Project Management's (APM) Body of Knowledge (see APM, 2012), the Project Management Institute's (PMI) Guide to the Project Management Body of Knowledge (see PMI, 2013), and the Chartered Institute of Building's (CIOB, 2014) Code of Practice for Project Management for Construction and Development. As the literature suggests (see, for example, Geraldi *et al.*, 2011), all these methodologies are traditionally presented by professional institutions as universal, normative, and to some extent linear procedures, which assumes that project objectives could be attained when such methodologies are utilised in a sequential manner. In fact, Hodgson (2002, 2005) points out that project management has positioned itself as a universal set of techniques able to be conveniently employed to control discontinuous work processes in any number of industry sectors.

The reality is, however, much more complex and, as scholars do highlight, the reality is that methodologies are unable to offer such guarantees (see Fincham, 2002; Hodgson, 2002; Hodgson and Cicmil, 2006). More specifically, "...the creation of such fixed standards... embodies particular political imperatives: in particular, a *technicist* and instrumental rationality which focuses upon means-ends logic and an ideology of control" (Hodgson and Cicmil, 2006, p.

¹ Awarded in 2005 by the University of Northumbria at Newcastle

31). The reasons for this relate to the reality of behaviour and the need for recognising that the context of most service operations projects deals primarily with people. Accordingly, noting that "...the enactment of project management is part of human action; it is therefore inexorably shaped by context" (Green, 2006, p. 235), it can only be prudent for scholars to depart from such a mechanistic view of service operations projects; hence the point made by Green (2006, p. 235), that "...attempts to codify 'bodies of knowledge' comprising universally applicable axioms in isolation from the context at which they are aimed are therefore deeply flawed".

Thus, noting the increase in the number of critics of (arguably) narrow and dominant normative approaches to implementing service operations projects - specifically those focused on the core elements of management - planning, organising, co-ordination and control - and the reality that such projects are complex and ambiguous in nature, the submissions under the section exploring the implementation of service operations projects, *Project Management*, collectively represent the candidate's views on three core knowledge areas within operational (project) environments, and the relationships of these knowledge areas with both traditional ideas on possible best practice and context-dependent rationality in projects. It is therefore the intention of the candidate to utilise this thesis to highlight a number of seemingly disparate ideas which, when brought together, represent a possible holistic means of dealing with the *multipleness* (heterogeneity) of service operations projects, thus driving the second research question (RQ2): *How does heterogeneity influence the outcome or perception of outcomes of service operations projects?*

Understanding both the possible levels of IS/IT functionality needed to enhance service operations projects and also how heterogeneity possibly influences the outcome or perception of outcomes of service operations projects on its own still leaves the question of how possible service

operations failure may be mitigated against. As is shown later in the thesis, there are economic reasons for such interest, including for example the contribution to UK national GDP of the service economy. This being the case, though, the thesis also shows that the failure rate of service operations projects is quite high and regularly emanates from (in a number of cases) a range of sources such as human error. It is the human side of failure mitigation that is of interest to the candidate. Driven by scholarship on the operations management research agenda in general and project management in particular, two approaches have been of particular interest; the first relates to teaching and learning project management while the second relates to the management of risk. Brought together, both dimensions of failure mitigation lead to the third and final research question posed in this thesis (RQ3): *How can failure of service operations projects be mitigated against?* More specifically, the candidate believes that addressing this research question serves as a key means to better understand failure mitigation behaviour of service operations project managers. Ultimately, understanding such behaviour will facilitate enhanced design, management and improvement of service delivery projects and their associated processes.

2.0 Summary of the work submitted

In line with the criteria for the award, only peer-reviewed publications (journals) are submitted for consideration. However, only 16 out of the candidate's current publication list of 92² peer-reviewed journal publications constitute the submission for this award. Furthermore, the 16 publications are categorised into the three major themes in order to meet the award criteria set out by the University of Hull to "...constitute separate publishable works on aspects of related topics and that these works have been published in peer review journals traceable in ordinary catalogues of published works"; and at the same time serve as evidence that "...the work submitted makes a significant contribution to scholarship³" by addressing an overarching research question: *How can the delivery of service operations projects with substantial Information Systems/Information Technology (IS/IT) functionality be enhanced?* Publications that fall outside this categorisation are not submitted for this award although the candidate's entire publication list is presented in Appendix A.

In summary, recognising literature which suggests that research collaboration (for example, joint authorship of academic papers) leads to scholarly output of a greater quality than that achievable by an individual (see Hudson, 1996; Acedo *et al.*, 2006), the candidate highlights the fact that the 16 publications submitted as part of this thesis have been produced as part of formal collaborations; more specifically, as joint papers that have emerged from working within research groups (Katz and Martin, 1997; Laband and Tollison, 2000). However, evidence is provided by a number of individual collaborators to attest to the fact that, in each of the

² Publications as of 05/05/15.

³ Of the 16 publications that form the submission of this thesis, one is published in a 4* journal, five are published in 3* journals, seven are published in 2* journals while three are published in a 1* journal. The * rankings are drawn from version 5 of the Association of Business School (ABS) Academic Journal Quality Guide published in 2015. The three papers from the 1* journal are all published in Project Management Journal, the flagship journal of the Project Management Institute (PMI), the largest professional project management professional body in the world.

publications, the candidate made a significant contribution to the authorship, writing and compilation, and editing of the publication. For the papers where the candidate is listed as first author, he (the candidate) was the primary driving force and catalyst for the associated study and had led in the conceptualisation of not only the study but in the initial articulation of the problem. In papers where the candidate is cited as second author, he was the either the main or joint catalyst to the development and writing of the paper. In other papers where the candidate as author is listed as third, fourth or otherwise, he made significant contribution to all aspects of the publication. Finally, in over 80% of the publications that accompany this thesis, the candidate was the corresponding author (even when not the first or second author).

In the next section, the thesis is positioned within the context of operations, service operations management, and their respective research agendas (Section 3). This is followed by Section 4 where the candidate articulates the methodological basis of each of the three research themes. In Section 5, the candidate presents the three main areas of his publications in the area of *Information Systems/Information Technology (IS/IT)*. This section primarily explores IS/IT as a firm's resource for service operations. In Section 6, the candidate's work in the area of *Implementation of Service Operations Projects* - that is, project management - is summarised; his scholarly activities in this area have focused predominantly on project failure (and success). The final body of work presented in Section 7 is on *Project failure mitigation*. In this area, the candidate's publications focus on two aspects of failure mitigation; one explores the pedagogical issues relating to the imperatives of teaching and learning of project management, and the second addresses the management of risk, primarily at corporate/organisational levels. The thesis concludes in Section 8 with a brief overview of the candidate's future research directions and plans.

3.0 Operations, service operations management and the research agenda

According to Stevenson (1986), 'operations' along with marketing and finance is one of the three major constituent functional areas of businesses. Operations is primarily concerned with the transformation of resources, whether they be humans or other physical resources, into goods and services. As such, since management seeks to facilitate efficiency through enhancement, operations management therefore represents a body of knowledge focused on providing us with the theories to underpin production and operations activities (see Johnston, 1994). We can thus claim that operations management primarily focuses on providing a theoretical understating on how organisations may produce goods and services efficiently, effectively, and optimally.

From a very basic perspective, operations traditionally consist of two elements; one focused on the 'product' and the other focused on 'services' (Nie and Kellogg, 1999). This does not necessarily imply, though, that 'products' and 'services' reside at well-set-out and explicit opposite ends of the operations management continuum. In fact, scholars (see Sullivan, 1982; Iravani *et al.*, 2005; Sampson, 2012) have historically pointed out that a service is purchased by customers in a manner that reflects its dual nature; one reflecting service as an intangible entity and one reflecting it as part of a product-facilitating service.

Notwithstanding, it must be noted that although operations management had emerged from a tradition rooted in product and manufacturing (see Meredith and Amoako-Gyampah, 1990; Johnston, 1994; Sprague, 2007), much earlier on, in recognition of the vital role of services to national economic development (see Sullivan, 1982; Collier, 1983; Chase, 1996; Menor *et al.*, 2002; Karmarkar, 2004), scholars had emphasised the need for more dedicated research focused on service operations management. The economic reasons for this are evidenced; for example in the United Kingdom, the importance of service cannot be over-emphasised. According to Sentence

and Kupelian (2013), not only do services contribute significantly to UK national GDP (over 80% in 2012, up from 55% in 1970) but, also, the UK is the world's second largest exporter of services (after the United States). Service exports also account for over 12% of the UK's GDP (Sentence and Kupelian, 2013). Thus, perhaps not surprisingly, the need for dedicated research on service operations has been highlighted by operations management scholars ranging from Buffa (1980) in the first article published in the *Journal of Operations Management* to more recent studies (see Table 1). This places service operations at the heart of operations management scholarship.

Table 1: Publications identifying Service Operations as a key area for Operations Management research

Buffa, E. (1980), "Research in Operations Management", <i>Journal of Operations Management</i> , Vol. 1, No. 1, pp. 1-8.
Chase, R. (1980), "A classification and evaluation of research in operations management", <i>Journal of Operations Management</i> , Vol. 1, No. 1, pp. 9-14.
Miller, J., Graham, M., Freeland, J., Hottenstein, M., Maister, D., Meredith, J., and Schmenner, R. (1981), "Production/Operations Management: Agenda for the '80s", <i>Decision Sciences</i> , Vol. 12, No. 4, pp. 547-571.
Chase, R., and Prentis, E. (1987), "Operations management: a field rediscovered", <i>Journal of Management</i> , Vol. 13, No. 2, pp. 351-366.
Parsons, R., and Globerson, S. (1987), "Content modification in operations management", <i>Operations Management Review</i> , Vol. 5, No. 3, pp. 1-10.
Amoako-Gyampah, K., and Meredith, J. (1989), "The operations management research agenda: an update", <i>Journal of Operations Management</i> , Vol. 8, No. 3, pp. 250-262.
Meredith, J., and Amoako-Gyampah, K. (1990), "The genealogy of operations management", <i>Journal of Operations Management</i> , Vol. 9, No. 2, pp. 146-167.

Filippini, R. (1997), "Operations management research: some reflections on evolution, models and empirical studies in OM", <i>International Journal of Operations & Production Management</i> , Vol. 17, No. 7, pp. 655-670.
Pannirselvam, G., Ferguson, L., Ash, R., and Siferd, S. (1999), "Operations management research: an update for the 1990s", <i>Journal of Operations Management</i> , Vol. 18, No. 1, pp. 95-112.
Bayraktar, E., Jothishankar, M., Tatoglu, E., and Wu, T. (2007), "Evolution of operations management: past, present and future", <i>Management Research News</i> , Vol. 30, No. 11, pp. 843-871.
Sprague, L. (2007), "Evolution of the field of operations management", <i>Journal of Operations Management</i> , Vol. 25, Vol. 2, pp. 219-238.
Craighead, C., and Meredith, J. (2008), "Operations management research: evolution and alternative future paths", <i>International Journal of Operations & Production Management</i> , Vol. 28, No. 8, pp. 710-726.

The very basics of service operations theory suggests that the customer is core to service (Chase, 1977, 1996; Johnston, 1999, 2005) and that, to produce a service, there must be an interaction between the provider and the customer. In effect, customer interaction is critical to service operations. Literature suggests that because of the peculiar nature of services, such as its intangibility (Chase, 1996; Nie and Kellogg, 1999; Voss *et al.*, 2008), customer perceptions of service are considerably dependent on the capabilities of firms to simultaneously create, deliver, and facilitate the consumption of services.

As earlier indicated, the candidate intends to demonstrate that the publications that constitute the current submission respond to earlier lines of enquiry and interest raised by scholars seeking to articulate the research agenda within service operations management. Table 2 shows the history of topics that have formed the service operations research agenda while, in Table 3, a taxonomy is presented articulating how the three main chapters of the thesis fit both existing and evolving research agendas within service operations management.

Table 2: Historical Development of Service Operations Research Agenda (topics of interest to candidate)

Publication	Key themes of interest identified in SOM research agenda
Mabert, V. (1982), "Service operations management: Research and application", Journal of Operations Management, Vol. 2, No. 4, pp. 203-209	Technology in service operations
	Behavioural considerations in service operations
Sullivan. R. (1982), "The Service Sector: Challenges and Imperatives for Research in Operations Management." Journal of Operations Management, Vol. 2, No. 4, pp. 211-214.	Behavioural considerations in service operations
	Technology in service operations
Collier, D. (1983), "The service sector revolution: The automation of services", Long Range Planning, Vol. 16, No. 6, pp. 10-20.	Technology in service operations
Johnston, R. (1999), "Service operations management: return to roots", International Journal of Operations & Production Management, Vol. 19, No. 2, pp. 104-124.	People management – Human Resources Management
	Technology in service operations, e.g. difficulties with implementation and adoption
	The service encounter/service experience
Johnston, R. (2005), "Service operations management: from the roots up", International Journal of Operations & Production Management, Vol. 25, No. 12, pp. 1298-1308.	People management – Human Resources Management
	Technology in service operations, e.g. difficulties with implementation and adoption
	The service encounter/service experience
	Service operations within the public sector
Nie, W., and Kellogg, D. (1999), "How professors of operations management view service operations?", Production and Operations Management, Vol. 8, No. 3, pp. 339-355.	Technology in service operations
Heineke, J., and Davis, M. (2007), "The emergence of service operations management as an academic discipline", Journal of Operations Management, Vol. 25, No. 2, pp. 364-374.	Technology in service operations
	The service encounter/service experience
	People management – Human Resources Management- Skill and competency development

Roth, A., and Menor, L (2003), “Insights into service operations management: a research agenda”, Production and Operations Management, Vol. 12, No. 2, pp. 145-164.	People management – Human Resources
	Management- Skill and competency development
	The service encounter/service experience
	Implementation/Project management
Chase, R., and Apte, U. (2007), “A history of research in service operations: What's the big idea?”, Journal of Operations Management, Vol. 25, No. 2, pp. 375-386.	Behavioural considerations in service operations
Machuca, J., del Mar Gonzalez-Zamora, M., and Aguilar-Escobar, V. (2007), “Service operations management research”, Journal of Operations Management, Vol. 25, No. 3, pp. 585-603.	Service selection and design - The service encounter/service experience
Karmarkar, U. (2015). OM Forum—The Service and Information Economy: Research Opportunities. Manufacturing & Service Operations Management, tp://dx.doi.org/10.1287/msom.2015.0525.	Technology in service operations

Table 3: Service Operations Research Agenda and Thesis Chapter Mapping

Key themes of interest identified in SOM research agenda (see Table 2)	Chapter within thesis that addresses key theme
Technology in service operations	Chapter 4
The service encounter/service experience	
Service operations within the public sector	
Service selection and design - The service encounter/service experience	
Implementation/Project management	Chapter 5
People management – Human Resources Management - Skill and competency development (teaching and learning)	Chapter 6
Behavioural considerations in service operations (management of risk)	Chapter 6

4.0 Research methodology

While traditional service operations management research continues to focus on the relationships that exist between organisations and their customers (Johnston, 1999, 2005; Voss *et al.*, 2008), their strategic and service operational intentions, the distillation of such intentions into projects, their successful implementation and ultimately *operationalisation*, it is of no surprise that scholars (Chase and Zhang, 1998; Soderlund, 2004a,b; Linderman and Chandrasekaran, 2010; Holweg and Srai, 2013) have emphasised, and continue to emphasise the need for research which reflects the reality of the challenges faced by managers, which, as scholars contend, is non-discipline-specific (see Ackoff, 1960; Knights and Willmott, 1997; Van den Ven, 2007; Turkulainen and Ketokivi, 2012).

According to Meredith *et al.* (1989), Filippini (1997) and Carter *et al.* (2008), methodological diversity draws upon a wide range of disparate research methods in order to provide greater insight into service operations that possibly transcend paradigms, thus developing more widely applied solutions for challenges faced by industry. Methodological diversity in operations management research is recognised for its ability to facilitate greater understanding as it increases the “robustness, predictive accuracy and overall usefulness” of management models (Tokar, 2010, p. 89). Methodological diversity also ensures that knowledge within the management discipline (Kickul *et al.*, 2011) and, more specifically, operations management (Meredith *et al.*, 1989; Stock, 1997; Carter *et al.*, 2008; Pilkington and Meredith, 2009; Malhotra *et al.*, 2014) is developed beyond its traditional frontiers of scholarship which, for a number of reasons, including its history and heritage, has traditionally favoured research that has involved either quantitative modelling or statistical analysis.

In acknowledging the role of customers in enacting services and the ensuing interest within

the discipline of the importance of ‘people’ and the associated departure of the discipline from a mechanistic view of the organisation, scholars (Bendoly *et al.*, 2006; Croson *et al.*, 2013) are, however, increasingly willing to explore alternative research paradigms and methodologies. Specific studies which have adopted such alternative research paradigms (in this case - historical textual analysis) includes the works of Lewis (2007), Singhal and Singhal (2007) and Voss (2007). As such, the candidate’s submission responds to lines of enquiry raised by scholars such as Khan and Burnes (2007) who discuss how other research approaches can inform our existing understanding of phenomena. In response to this question, the publications presented herein represent the convergence of three distinct areas of research and personal interests which, taken together, highlight not only the importance of the topic of service operations project failure but also articulate the candidate’s contribution to scholarship in the form of prior published works in peer-reviewed journals.

Thus, this research is partially driven by the presence of heterogeneity (variety) which exists not only because of its intangible nature but also because of the intensity of human involvement in its articulation, configuration and delivery and also articulated research agenda, and specifically responds to long-standing calls for more methodological diversity in service operations research (see, for example, Sullivan, 1982; Linderman and Chandrasekaran, 2010, and Holweg and Srari, 2013).

The research methodology that has been adopted in the selection of papers that are drawn from to support this thesis has been multi-dimensional in nature. In effect, the employed methods represent a mixture of qualitative and quantitative approaches; thus a multi-method approach is taken that lends weight to the thesis through triangulation. More specifically, in the case of the three papers submitted to support work on the first theme (IS/IT as a firm resource for service

operations), and noting interest in “what are the key issues?” (Stuart *et al.*, 2002, p. 422), the three papers took the forms of single and multi-case studies, a research method which is widely employed in service operations management research (Stuart *et al.*, 2002, Voss *et al.*, 2002, Barratt *et al.*, 2011). The methodological approach adopted in the papers that support the second theme (the implementation of service operations projects) was of a quantitative nature using survey research (see Forza, 2002). The data had been obtained from a worldwide questionnaire survey of service operations practitioners gathered as part of a research project undertaken by the candidate utilising a research grant obtained from the Project Management Institute. In total, over 1313 questionnaire surveys were received from approximately 31 countries. Finally, in the case of the third research theme (failure mitigation), the research methodology employed in support of the teaching and learning of project management dimension was of a quantitative nature based on a survey of 409 individuals studying project management. For the second dimension of the third research theme – dealing with the management of risk - the research approach adopted was mainly exploratory and therefore discursive.

In summary, while a good number of these studies have been undertaken based on empirical data, some have been predominantly theoretical; however, woven together, the studies serve as evidence for and highlight the importance of the candidate’s contribution to scholarship within the area of service operations management. The candidate contends that the diversity of research methodologies adopted in the various papers submitted to support this thesis represent the complex relationships that exist between and among the various core concepts that are incorporated herein.

5.0 Utilisation of IS/IT in service

There continues to be considerable interest among scholars in the notion of service operations (Johnston, 1999; Voss, 2003). To some organisations, service is so important to their competitive and operational positioning that it forms the fundamental motivation for re-designing entire strategic models and structures. The aim of these organisations is to create the necessary competencies to support their capacity to enhance service-related capabilities (Ojiako, 2012). Although there is interest in this area, it is evident that, conceptually, existing definitions of ‘service’ within operations environments remain opaque. This problem continues to exist despite numerous research studies. In papers that constitute this theme within the submission, the lack of a generally accepted definition of ‘service’ has noticeably created considerable challenges in the exploration of a number of factors, one of which relates to how service may be enhanced. Information Systems/Information Technology (IS/IT) is a core competitive, strategic and operational competency for organisations (Ojiako, 2012; Ojiako *et al.*, 2013) since, arguably, the capacity of Information Systems/Information Technology (IS/IT) to pervade all aspects of operations subsequently creates opportunities to explore the utilisation of IS/IT in service enhancement, thus motivating the studies under this theme within the submission. In particular, IS/IT has the ability to reconfigure value chains within services (Ojiako, 2012; Ojiako *et al.*, 2013); consequently, it is increasingly being infused into service propositions. It is therefore of no surprise that scholars in the field of service operations have identified the role of technology (as a constituent element of IS/IT) in service operations as a key area of research interest (see Table 2 and Table 3, above); thus the research question (RQ1): *What level of IS/IT support is needed to enhance functionalities being delivered through service operations projects?*

The strategic importance of IS/IT to service has been explored in a number of studies by

the candidate. In drawing reference from scholars such as Chase (1977), Collier and Meyer (1998) and Voss (2003), papers addressing this theme posited that the peculiar characteristics of services make their effective utilisation highly dependent on not only its (the theme's) confluence with Information Systems/Information Technology (IS/IT), but also on the development of a holistic outlook on IS/IT infusion into service (Maguire *et al.*, 2012).

Although IS/IT is recognised as a core intellectual component of any organisation's resilient infrastructure, in various studies, the candidate (Maguire *et al.*, 2012; Ojiako, 2012; Ojiako *et al.*, 2013) has gone to great lengths to emphasise that the introduction of IS/IT into service was not necessarily a characteristic of a technical endeavour; rather it is an endeavour that should focus on softer and more people-oriented organisational issues. Ojiako (2012) discussed the need for firms to articulate the role of IS/IT almost at the local point of service delivery rather than at much higher corporate levels. The rationale behind this is that organisations were more likely to draw upon locally tailored resources, experience and knowledge to be able to facilitate appropriate utilisation of IS/IT.

Maguire *et al.* (2012) emphasised the need for service co-production between customers and service providers reflecting the simultaneous production and consumption of services. This message was reiterated by Ojiako (2012) and by Ojiako and colleagues in their 2013 study that emphasised how the softer perspectives enhance experiences of IS/IT-driven service engagements. Such softer perspectives were associated with the need for organisations to explore the 'true' (Ojiako, 2012, p. 584) and 'real' (Ojiako *et al.*, 2013, p. 532) roles of IS/IT in service delivery and enhancement; in effect addressing how IS/IT is utilised in service operations and what trade-offs are made between expenditure (which continues to grow exponentially) and acquisition of functionality.

In summary and in response to the research question, *What is the optimal level of IS/IT support needed to enhance functionalities being delivered through service operations projects?*, the conclusions drawn from Ojiako (2012) and Ojiako *et al.* (2013) were that, in frontline private and public service encounters and operational environments (identified as key areas of research interest - see Table 2 and Table 3, above), greater beneficial service enhancement within operational environments was more likely to emerge, although this was not necessarily achieved through increased infusion of IS/IT into the service or the development of more IS/IT-based functionality, but from the development of customer-focused service philosophies. In effect, because customer service experiences were challenged by the multi-dimensional nature of service (Ojiako, 2012), optimality of IS/IT support in service operations projects was heterogeneous and dependent on specific customer needs. Thus, the need for service operations projects to encompass service frameworks jointly developed between the purveyors of projects and the stakeholders involved (Maguire *et al.*, 2012) emerged. The candidate took into consideration the complex social, historical, political and cultural interactions and challenges that exist within organisations' service operations, and which permitted service operations firms, (see Maguire *et al.*, 2012; Ojiako, 2012; Ojiako *et al.*, 2013), to actually focus on enhancing human interaction in the context of customer demands. To date, the most notable failure of an opposing service philosophy (i.e. emphasis on technical functionality) is the now defunct National Programme for IT (NPfIT), which failed for a number of reasons including an over-emphasis on technology over human interaction (see Ojiako *et al.*, 2013). The UK government had focused on bringing modern computer systems into the National Health Service (NHS) under a philosophy variously referred to as 'zero-touch', 'real-time', or 'self-service' (Ojiako *et al.*, 2013, p. 532). The expectation was that the initiative in the form of Electronic Patient Records (EPRs) would provide patients with access to their personal

care information while providers were to have instant access to health records. To support this new service philosophy, the NHS had spent perhaps as much as £20 billion deploying IS/IT infrastructure and supporting processes. Ultimately, the initiative failed and was eventually cancelled, not primarily because of technical reasons, but due to a number of ‘softer’ service issues, which included privacy concerns relating to patient record access.

5.1 Supporting references (candidate authored on Utilisation of IS/IT in service)

Maguire, S., **Ojiako, U.**, Papadopoulos, T., Shafti, F., Koh, SCH., and Kanellis, P. (2012),

“Synchronicity and Alignment of Productivity: The Real Value from Services Science?”

Production Planning & Control, Vol. 23, No. 7, pp. 498-512.

Ojiako, U. (2012), “Using IS/IT to enhance service delivery”, Industrial Management and Data

Systems, Vol. 112, No. 4, pp. 584 – 599.

Ojiako, U., Maguire, S., and Chipulu, M. (2013), “Thematic elements underlying the delivery of

services in high-contact public service encounters”, Production Planning and Control, Vol.

24, No. 6, pp. 532-545.

6.0 The implementation of service operations projects - Project management

Project management is an essential aspect of operations management. For example, in 1996, the *Journal of Operations Management* published a special issue on project management (see Vol. 14, No. 3, 1996). In particular, project management plays an important role in providing the structure and control mechanisms that facilitate the transformation of organisational strategic objectives into operational ventures (Lord, 1993; Pellegrinelli and Bowman, 1994). However, although the role of project management in operations management has been well acknowledged in operations management literature (see Rolstadas, 1994, 1999; Meredith, 2001; Bryde, 2003; Ramasesh and Browning, 2014), and has been identified as a major topic of interest (see Tables 2 and 3, above), it appears that the amount of time that operations management academics do dedicate to the study of project management has been relatively limited compared to other aspects of operations (see Hayes, 2002; Geraldi *et al.*, 2011).

Scholarship exploring the emergence of service operations has tended to emphasise the transformation of operations management from a factory focus to a discipline focused on service networks and relationships (Sullivan, 1982; Meredith and Amoako-Gyampah, 1990; Johnston, 1994; Chase, 1996; Sprague, 2007; Gunasekaran and Ngai, 2012). It is within this transition that project management plays a key role as the primary delivery implementation mechanism within the management of operations (Rolstadas, 1994; Maylor *et al.*, 2008). Despite differing from other areas of operations management in terms of the dominance of statements of best practice emanating from professional bodies such as the Association of Project Management and the Project Management Institute (see Geraldi *et al.*, 2011), project management has a particularly important role to play in service operations management because its configuration, processes and

relationship networks are generally more discontinuous than those of manufacturing-focused operations. In complex settings, the failure of service operations may be deemed a regular occurrence.

Earlier literature describes ‘success’ in projects as “the degree to which the dominant objectives have been met” (De Wit, 1988, pp. 164, 166). On the other hand, ‘failure’ in projects is defined as those projects that are “both cancelled and completed with a very poor product or process quality”...that are likely to “... deliver[s] something other than what was originally specified or expected” (Jorgensen, 2014, p. 157). Failure can also relate to an inability to reconcile not only explicitly- but implicitly-stated project objectives (Ojiako *et al.*, 2014). High project failure rates have been reported within service operations environments (see Tucker, 2004; Tucker *et al.*, 2013). Service operations failures may occur in different forms; they may range from minor and more common errors to wholesale company-wide operational disruptions causing significant damage to, for example, company reputation. Drawing upon the earlier cited body of literature on service (Frei and Harker, 1999; Johns, 1999; Cook *et al.*, 2002), projects (Turner and Müller, 2003; Stal-Le Cardinal and Marle, 2006; Klein *et al.*, 2015) and operational failures (Tucker, 2004; Davis, 2014), service operations project failure may be defined as “the degree to which the dominant project objectives of a service operation have not been met, leading to some instances of service cancellation”. Attention to the topic of project failure in IS/IT service operations projects is of importance due to the complexity of the interactions between the existing systems and new systems being introduced; hence the need for such failure to be brought to the attention of managers. The factors driving interest in the topic of project failure in service operations projects include the idea that, to ensure successful delivery of strategy, organisations are expected to distil their vision into projects (Longman and Mullins, 2004). Thus, because projects rather than

businesses form the basis for most value-adding competencies of organisations, projects need to be able to support the attainment of business strategy. Service operations projects are also prone to various overruns and a high probability of not meeting the expectations of stakeholders. There is also concern about whether there is enough scholarship to ensure that such projects do not fail (see Ojiako *et al.*, 2015). In addition, service operations projects are known to be generally complex and are characterised by their often highly emotional nature which renders them particularly susceptible to conflicting perceptions (Ojiako *et al.*, 2015). There is also an acknowledgement in the literature of the highly complex nature of not only how service operations projects are conceptualised, but of both ‘success’ (Davis, 2014) and ‘failure’ as two distinct concepts (see Tucker, 2004). An additional point is that, although service operations ‘failure’ is associated with a plethora of assessment criteria and ‘factors’, the utilisation of traditional success and failure criteria dominates research in the ‘success/failure’ space, although its value has remained limited. These factors are further complicated by the multiple and sometimes conflicting perceptions which exist within service operations projects among various stakeholders (see Ojiako *et al.*, 2015).

The literature (Scott and Shepherd, 2002) informs us that about a quarter of all service-oriented projects with major IS/IT functionality are enterprise-wide and associated with a high rate of failure. What has emerged from other studies is that there is still a need to formulate a more precise understanding of the heterogeneous complexities associated with service operations projects (Hayes, 2002; Tucker, 2004; Geraldi *et al.*, 2011; Davis, 2014). Among the complexities identified are the need to appreciate decision judgments, and the specific issues related to understanding how heterogeneity in demography may impact upon such decision judgments. Here, heterogeneity refers to the level of the degree to which individuals may differ across a range of

decision judgements (Miller *et al.*, 1998, Simons *et al.*, 1999, Olson *et al.*, 2007). Thus, the research question (RQ2) is posed to understand: *How does heterogeneity influence the outcome or perception of outcomes of service operations projects?* There are several justifications for presenting this question; for example, research suggests that the effectiveness of managers in decision judgements is dependent on a number of factors such as personality (Clarke, 2010), professional competency (Cheng *et al.*, 2005), emotional intelligence (Lindebaum and Jordan, 2012; Zhang and Fan, 2013), and knowledge (Koskinen *et al.*, 2003). Studies also suggest that how managers experience specific phenomena will drive decision judgments (Schuler, 1980; Walsh, 1988; Reber *et al.*, 1998).

The theory underpinning heterogeneity in judgement is set out in the cognitive diversity literature wherein scholarly opinion appears inconclusive on whether diversity positively or negatively affects judgement. Thus, while scholars such as Miller *et al.* (1998) and Horwitz and Horwitz (2007) suggest that such diversity positively impacts upon team and project performance because of the uniqueness in terms of the perspectives that different team members bring to the project - in effect, heterogeneity in judgements enhances creativity and innovation in projects, which in itself can only positively affect projects - others suggest that it only has negative and adverse effects (Tziner, 1985). The argument is that heterogeneity in judgement is more likely to negatively impact upon project decision-making and team harmony. Jehn (1995), for example, suggests that heterogeneity has an adverse effect on social integration; while Baiden and Price (2011) identify social integration as critical to project team effectiveness. Such harmony is likely to exist when project team members share a single or similar (homogeneous) perspective that is likely to enhance project group cohesion and trust and, ultimately, project performance. However, the sometimes-contradictory findings on the relationship between heterogeneity and social

integration must be noted; an example of such a study is that of Smith *et al.* (1994) who found no relationship between heterogeneity and team cohesion. At the same time, Jehn (1995) found that heterogeneity did not affect the performance of individuals or groups. Extended to the context of the candidate's ongoing research, it might be argued that there is very limited evidence to suggest that the effectiveness of project-related judgements is impacted by heterogeneity.

In summary, findings from the papers submitted in support of this strand of the thesis suggest that, although demographic factors such as the age and role of project managers served as factors of influence when forming or revising (changing) decision judgments at stages of the project lifecycle, gender was not found to show any significant effect (Ojiako *et al.*, 2014). Chipulu *et al.* (2014) found that the levels of importance assigned to project control and extra-organisational goals by that project managers, and to project team management and intra-organisational goals, was dependent on age, gender and cultural values assessed against Hofstede's (1983, 2001) dimensions of culture. A further study by Ojiako *et al.* (2015) found that agreements among different project stakeholders may be influenced by age and role heterogeneity, but not by gender. Thus, in response to the research question, the candidate finds that heterogeneity in the demography of project management practitioners, specifically relating to differences in gender, age, project role (Ojiako *et al.*, 2014, 2015) and national culture (Chipulu *et al.*, 2014) may lead to differences in certain types of project-related decision judgements.

6.1 Supporting references (candidate authored on Implementation of service operations projects)

Chipulu, M., **Ojiako, U.**, Gardiner, P., Williams, T., Mota, C., Maguire, S., Shou, Y., Stamati, T. and Marshall, A. (2014), “Exploring the impact of cultural values on project performance”, *International Journal of Operations and Production Management*, Vol. 34, No. 3, pp. 364-389.

Ojiako, U., Chipulu, M., Gardiner, P., Williams, T., Mota, C., Maguire, S., Shou, Y and Stemanti, T. (2014), “Effect of project role, age and gender differences on the formation and revision of project decision judgements” *International Journal of Project Management*, Vol. 32, No. 4, pp. 556-567.

Ojiako, U., Chipulu, M., Marshall, A., Ashleigh, M., Maguire, S., Williams, T., Obokoh, L., (2015), “Heterogeneity and Perception Congruence of Project Outcomes”, *Production Planning & Control*, <http://dx.doi.org/10.1080/09537287.2014.994684>, In press.

7.0 Mitigation of failure

The likelihood that a good number of service operations projects will fail on at least one success criterion (see Tucker, 2004; *Tucker et al.*, 2013) continues to suggest that more attention is required when assessing how service operations projects, particularly those with major IS/IT components, are managed. Although research (see Carroll *et al.*, 2002) suggests that a good number of organisations struggle to learn from the failure of service operations and also operational failures, there appears to be general agreement among scholars that improving a service operation's project delivery requires reflection and 'learning', particularly from mistakes of the past (Tucker and Edmondson, 2003; Nembhard and Tucker, 2011). Organisations expect service operations and project management practitioners to make enhanced decisions directed at mitigating failure against a number of operational and project-related issues; for example, in areas such as service design and evaluation. In a number of published works, the candidate has explored two possible approaches to mitigating against such failure.

7.1 Mitigation of failure: Teaching and learning of project management

The literature informs us that failure of service operations and projects emanates from a number of sources that include human error (Stewart and Chase, 1999; Tucker *et al.*, 2012; Tucker, 2014). Scholars (see Zimmer and Yasin, 1998; Bendoly *et al.*, 2006; Rudolf *et al.*, 2008; Croson *et al.*, 2013) also suggest that service operations fail for predominantly human (softer) reasons. Zimmer and Yasin (1998) suggest that these human (softer) reasons contribute to around 77% of the reasons why projects fail. It can be suggested that the high prevalence of failure of service operations projects creates a demand for project managers who have a specific level of depth and creativity in thought which can be enhanced through education and, more specifically, learning (Ramasesh

and Browning, 2014). Teaching and learning project management can therefore facilitate the mitigation of project failure in operational environments (see Tables 2 and 3), an issue of importance acknowledged in published operations management literature in special journal issues dedicated to teaching and learning (see Schwarz and Singhal, 1998; Brandon-Jones *et al.*, 2012) and perhaps, most importantly, a number of studies dedicated to exploring pedagogic issues relating specifically to service operations management (see Harvey, 1998; Nie and Kellogg, 1999; Behara and Davis, 2010). It is also noteworthy to highlight the existence of specialist dedicated journals such as the *INFORMS Transactions on Education* (established in 2001), and *The Decision Sciences Journal of Innovative Education* (established in 2003). In 2010, the *INFORMS Transactions on Education* published two special issues focused on teaching and learning in service [and retail] Operations Management (see Vol. 10, No. 3, 2009 and Vol. 11, No. 1, 2010).

Although the role of teaching and learning in practitioner development is well recognised in the literature and remains a popular discipline for study (see Thomas and Mengel, 2008), questions have been raised by scholars (Hartman, 2008; Thomas and Mengel, 2008; Egginton, 2012) on the appropriateness of current teaching and learning engagements. Hartman (2008), for example, claims that over the last few decades, the teaching of project management has failed the profession because of its prescriptive, methodological and toolset-focused approach – highlighted as earlier mentioned by Geraldi *et al.* (2011) in their discussion on the dominance of professional bodies on the project management profession. Thomas and Mengel (2008) go further to point out that, although taught programmes in project management may bring students up to the standards required by professional institutions, these programmes generally fail to prepare students to deal with the reality and level of complexity associated with current project environments. Taking note of these shortcomings and constraints, in a series of studies, the candidate sought to understand

how practitioner learning experiences can be enhanced in order to develop project management practitioners who possess competencies that organisations regard as necessary to manage the successful delivery of service operations projects.

Studies suggest that, for a number of reasons including the relatively recent history of the project management profession (see Egginton, 2012), research interest in the education and training of project management practitioners has been quite limited (even with the existence of ‘generalist’ project management journals such as the *International Journal of Project Management* and *Project Management Journal* and more specialist journals such as the *INFORMS Transactions on Education* and *The Decision Sciences Journal of Innovative Education*). This is perhaps evidenced by a review of literature drawn from works published between 1973 and 2006 on project failure by Hartman (2008) which suggests the frequent recurrence of drivers of project failure factors in projects which arguably could have been mitigated through competency development facilitated through - among other approaches - teaching and learning (see El-Sabaa, 2001; Barron, 2005; Hartman, 2008; Sauer and Reich, 2009, and Chipulu *et al.*, 2013). In service operations environments, this cannot be over-emphasised for, according to Hayes (2002, p. 24), the management of operations projects represents “a very different kind of process than the ones we have traditionally focused on. The learning curve, if any, for that kind of process is more discontinuous and much less amenable than traditional processes”. This is particularly true when noting the need for project managers to learn from a number of different scenarios, including from surprising outcomes associated with unexpected outcomes (see Ramasesh and Browning, 2014). It could be construed from this that considerable scholarly attention needs to be paid to the challenges associated with the [teaching and] learning of project management applicable to service operations.

The candidate's work on teaching and learning in project management commenced with a study by Ojiako and colleagues (2011a); this explored how considerations of project management pedagogy may impact on the experience of students studying project management in British universities. This study focused on two Russell Group institutions and was based on a survey of management students taking project management courses. The framework for the study had been developed from earlier work in teaching and learning, specifically that of Ainley (2001), Ginns and Ellis (2007), and Kember and Leung (2009). Reference had been made to Ainley (2001) in terms of extricating measures of student experience (which had been largely developed from marketing literature on service experience), and to Ginns and Ellis (2007) and Kember and Leung (2009) whose works focused on perceived quality of teaching and learning. The study found that two key components of learning in project management existed; one focused on transferable skills and the second focused on online (virtual) learning. It is noteworthy that a parallel study by the candidate (see Chipulu *et al.*, 2013) found that, based on a content analysis of 2306 project management job advertisements across eight different countries, typically, the industry emphasised generic skills over specific project management expertise during recruitment.

The initial teaching and learning study (see Ojiako *et al.*, 2011a) was quickly followed by additional studies employing the original dataset. In Chipulu *et al.* (2011), the interdependency between the two key components of learning project management was explored. In Ojiako *et al.* (2011b), five major influencers of transferable skills learning - (1) pedagogy, (2) learning resources, (3) interactive environments, (4) learning outcomes and (5) effect of technology - were identified. Ashleigh *et al.* (2012) explored the implications of a blended learning pedagogical approach for project management. Over the years, while expanding the dataset to include engineering students studying project management (see Ojiako *et al.*, 2014), differences in learning

approaches between management and engineering students have been explored within the context of project management.

In summary, in response to the research question (RQ3-sub 1), *How do considerations of teaching and learning enhance the ability of practitioners to successfully deliver projects and enrich project management practice?*, the candidate's work on teaching and learning suggests the need for scholars and those who teach project management to acknowledge differences in pedagogical approaches that are complemented by efforts to address the concerns of industry, but also the desired student experiences. The result of such effort is likely to involve a teaching and learning philosophy which emphasises conjunction of practical activity and theory building. Such a philosophy - the candidate has argued (see Ojiako *et al.*, 2014) - is likely to address a key challenge faced by project management teaching and learning; that is, how to address the specific characteristics of service operations projects that make them so difficult to manage (e.g. intangibility) from a perspective of project management that emphasises, through its various methodologies, a control perspective that invariably suggests the existence of a simple cause and effect relationship between the rigid dependency on project management methodologies and the success of projects-task outcomes.

7.2 Mitigation of failure: Management of risk

A review of the literature suggests interest among operations management scholars in the management of risk (see, for example, Cohen and Kunreuther, 2007 and Franklin, 2011). The management of risk is important to operations because poor decisions relating to risk have the potential to completely derail the ability of organisations to attain their strategic objectives. As perhaps expected, the importance of risk management is acknowledged in operations management

literature with the publication of special issues in operations management journals such as *Production and Operations Management* (Vol. 14, No. 1, 2005 - see Seshadri and Subrahmanyam, 2005).

The management of risk in service operations is particularly important because most operations are designed as highly interdependent systems (see Holweg and Pil, 2008; Kanda and Deshmukh, 2008) where failures can quickly occur with considerable negative consequences (Tucker and Edmondson, 2003; Tucker, 2004). Thus, the managing of projects in operational settings poses numerous challenges associated with risk and uncertainties (Ramasesh and Browning, 2014). It is therefore of no surprise that literature has long suggested that the management of risk is important to service operations management (Khan and Burnes, 2007; Narasimhan and Talluri, 2009). Two areas are of particular importance: the first is the need to manage the interdependency that exists between and within service chains and relationships, and the second is the need to explore views of risk held by (arguably) the major actor in service operations projects - *the project manager* (Wilemon and Cicero, 1970; Hambrick and Mason, 1984; Munns and Bjeirmi, 1996; Cheng *et al.*, 2005; Ramasesh and Browning, 2014). It is this second stream of research which fits into the behavioural stream of operations management research (see Tables 2 and 3), that has drawn the interest of the candidate.

As the candidate suggested above, a number of different definitions of risk have attracted debate within the literature. For example, risk has been defined as ‘things’ which are unanticipated and may represent some form of threat (Marshall and Ojiako, 2013). Drawing upon the works of Marshall and Ojiako (2013), Ojiako (2012), Ojiako *et al.* (2012) and Papadopoulos *et al.* (2012), the candidate currently conceptualises risk as being *an essential and unknown event that may probably occur within the service operations environment in the future*. Risk becomes something

that increases whenever social interactions within service operations environments are disturbed, and constitutes two main types. The first type is risk to which probabilities of occurrence may have been assigned, and the second type is risk to which probabilities of occurrence may not have been assigned or measurable. These types of risk are referred to as *uncertainty*. The literature (see Ramasesh and Browning, 2014) points out that within operational environments, there are two types of such risks or uncertainties; the first is referred to as ‘known-unknowns’. These are those uncertainties of which project managers are aware and to which a conventional risk management approach can most likely be applied. There are also uncertainties referred to as ‘unknown-unknowns’ which are risks which are not only unrecognised, but also those which the project manager may be unaware of. These uncertainties are particularly problematic within a service operations environment. The reason for this is simple; *the lack of probability or knowledge of a risk does not mean that that risk does not exist*. For this reason, successful risk management within service operations environments is likely to make demands on managers to re-interpret information in their projects in order to generate innovative outlooks to events, thus enhancing their ability to unveil ignorance of risk.

Within the literature, it is suggested that the creation of an innovative outlook to risk management is dependent on a strong learning orientation existing within an organisation’s operations (Hurley and Hult, 1998). Learning is, however, particularly challenging in the service operations management environment because of its discontinuous nature that makes this environment less amenable to traditional learning processes. The challenges associated with managing risk in service operations projects thus present the candidate with the second of the sub-questions within the third research question (RQ3-sub 2): *How can project managers negotiate and conceptualise the risks that exist in highly complex and discontinuous service operations*

environments where such risks may be unknown? The candidate posits that a behavioural approach to the management of risk may provide necessary insight to address this question. This behavioural approach earlier identified as a key research stream within operations management (see Tables 2 and 3) has, at its core, an emphasis on “better understand[ing] behaviour” (Croson *et al.*, 2013, p. 1).

To address this research question, in theoretical papers offered primarily to stimulate scholarly debate and encourage future empirical testing, the candidate argues that a ‘realist’ view of risk may enable scholarship to manage risk through the veil of ignorance. In Marshall and Ojiako (2013, p. 1227), the candidate suggests that risks are “objectively real potentialities that owe nothing to human subjectivity for their existence”. More specifically, with risk, there is the existence of “...an outside reality...but not necessarily an objective reality” (Jaafari, 2003, p. 49), and this means that managers will have to draw upon their individual cognitive (thinking) models to develop their own perceptions of this reality. The implication of this is that, although the objective nature of risk must be acknowledged, it is important to explore subjective views of risk held by (arguably) the major actor in service operations projects - the project manager (Hambrick and Mason, 1984).

In Marshall and Ojiako (2013), the notion of the ‘veil of ignorance’ surrounding risk was explored. This concept focused on exploring whether, in acknowledging the risk subjectivities (bias – an identified area of behavioural operations management interest– see Bendoly *et al.*, 2010) of managers, the management of risk could be improved by encouraging managers to occasionally make decisions from the perspective of an original position which was hypothetical – in effect a position in which the decision maker was blocked off (with a veil) from acquiring knowledge as to whether the decision over the longer term will, or will not be beneficial to the project. At the

same time it is important to acknowledging that such ignorance may stem from possibly ignoring information that, on the surface, appears unappealing or unimaginable. Using the 'veil of ignorance' as an analytical prism, the candidate suggests that because of the 'messiness of the social world' (Law, 2004) and the fact that projects can be construed as battlefields (Singh and Singh, 2002, p. 24), it was imperative that temporary oases of calm or inactivity were created to encourage project managers to set aside time to regroup and reflect. This message (as relates to reflection) is one of the key imperatives identified in the 'rethinking project management' agenda (Crawford *et al.*, 2006).

To summarise, in order to address the research sub-question (RQ3-sub 2): *How can project managers negotiate and conceptualise the risks that exist in highly complex and discontinuous service operations environments where such risks may be unknown?*, the candidate posits that exploring the subjectivities of project managers will go a long way in addressing (i) consistently advocated propositions made by scholars such as Green (2001) that the management of risk in project environments should pay additional attention to social interactions that exist within highly complex and discontinuous service operations environments and (ii) calls by scholars such as Croson *et al.* (2013) for research within operations management to focus on acquiring a better understanding of behaviour. Findings suggest that exploring the subjectivities of project managers points to a need for project management practitioners to embrace 'realism' if they are to manage risk effectively. Such a position implies seeking to uncover the 'effectual truth' of risk scenarios; it implies being objective and seeking (or at least, recognising the need) to overcome mind-dependency challenges associated with project management practitioners being members of a social group that is characterised by a series of behavioural and cognitive norms; that is, ways of thinking. Thus, realism comes into play as it facilitates a more objective understanding over a

subjective mind-dependent understanding of possible risk scenarios. Such a view is important as an objective reality will ensure that subjective understandings which occur because of heterogeneity in interpretation of phenomena among different stakeholders are minimised.

7.1.1 Supporting References (candidate authored on Teaching and learning)

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Chipulu, M., **Ojiako, U.**, Ashleigh, M., and Maguire, S (2011), “An analysis of interrelationships between project management and student experience constructs”, *Project Management Journal*, Vol. 42, No. 3, pp. 91–101.

Chipulu, M., Neoh, J.G., **Ojiako, U.**, and Williams, T. (2013), “A multidimensional analysis of project manager competences”, *IEEE Transactions on Engineering Management*, Vol. 60, No. 7, pp. 506-517.

Ojiako, U., Ashleigh, M., Chipulu, M., and Kai Wang, J. (2011a), “The Criticality of Transferable Skills Development and Virtual Learning Environments Used in the Teaching of Project Management”, *Project Management Journal*, Vol. 42, No. 4, pp. 76-86.

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7.2.1 Supporting References (candidate authored on the Management of risk)

Marshall, A., and **Ojiako, U.** (2013), “Managing Risk through the Veil of Ignorance”, *Journal of Risk Research*, Vol. 16, No. 10, pp. 1225-1239.

Marshall, A., and **Ojiako, U.** (2010), “From the Myth of Prometheus to Strategic Resilience: two cognitive paradigms linking risk and innovation”, *Prometheus*, Vol. 28, No. 4, pp. 343-360.

Ojiako, U., Papadopoulos, T., Thumborisuthi, C., and Yang, Y (2012), “Perception variability for categorised risk factors”, *Industrial Management and Data Systems*, Vol. 112, No. 4, pp. 600-618.

Papadopoulos, T., **Ojiako, U.**, Chipulu, M., and Lee, K. (2012), “The criticality of risk factors in CRM Projects”, *Project Management Journal*, Vol. 43, No. 1, pp. 65–76.

8.0 Conclusions

Research in the field of operations management, specifically research that focuses on the intersection of Information Systems/Information Technology (IS/IT), service operations management, and project management, is of critical relevance not only to operations management scholars, but also to operations management research and practice. For scholars, knowledge gleaned from research is likely to provide a platform for the development of practical, applied and relevant solutions to critical service operations challenges. Management practice is best developed by encouraging scholars to draw on and learn from a number of insights, including those extended from different disciplines (Merchant *et al.*, 2003; Agarwal and Hoetker, 2007).

The objective of the candidate was primarily to address an overarching research question: *How can the delivery of service operations projects with substantial Information Systems/Information Technology (IS/IT) functionality be enhanced?* To address this question, a thesis was presented that wove together and contextualised prior and current research by the candidate in three distinct areas of service operations management research - (i) IS/IT as a firm resource, (ii) implementation, and (iii) the mitigation of failure - through teaching and learning, and the management of risk. In addition to presenting this thesis as representative of a cohesive corpus of work within service operations management, the candidate has sought to demonstrate a significant contribution to scholarship.

The first research theme addressed in the thesis related to IS/IT as a firm resource. Its main theoretical foundations had been drawn from earlier works by Dearden (1972), Brynjolfsson (1993) and Carr (2003, 2005) with their primary proposition being that there was little evidence of accrued return-on-investment (ROI) from IS/IT as relates to a firm's productivity. The candidate's contribution to knowledge is to draw upon this body of literature to propose a research

question: *What is the optimal level of IS/IT support needed to enhance functionalities being delivered through service operations projects?* Utilising case studies situated within large organisations such as the National Health Service (NHS), the candidate's contribution to this theme is the finding that increased infusion of IS/IT or IS/IT functionality into a service is unlikely to enhance customer experiences of service operations without active customer participation in the articulation of service and operational requirements. A number of thematic elements that influence the exploitation of IS/IT in service operations environments are identified. The candidate argues that the pervasive nature of 'service' creates the need for scholars to develop much-needed frameworks that will enhance the investment-production relationship between IS/IT and service operations. Prior to such frameworks being developed, organisations need to have a clear understanding of the shifting dynamics created by stakeholder value expectations and changes as relate to firms and technology, and also to national culture and their interdependencies.

To summarise, studies undertaken by the candidate within this theme showed the existence of generic challenges faced by organisations in relation to system changes, processes and the ways customers are managed that greatly mitigated against organisations deriving substantial benefit from their investment in IS/IT. The inability to derive such benefits - as shown - negatively impacts upon the successful implementation of service operations projects. One possible approach to mitigating against this problem would involve, for example, the reassessment of project measurement criteria in service operations projects based on drawing possible distinctions between project performance measures and assessments of project progress.

As expected, there are limitations to these studies. One such limitation relates to the challenges associated with generalising findings from case studies. Another limitation of the studies undertaken as part of this theme relates to the difficulty of quantifying the thematic

elements which emerge from the study in the general absence of confirmatory quantitative data. However, these limitations provide a major motivation for future work. At present, the candidate is undertaking comparative work focused on quantitative articulation of the specific elements that emerged from the works of Maguire *et al.* (2012), Ojiako (2012) and Ojiako *et al.* (2013). Practitioners will be particularly interested in the outcome of such studies; for example, acquiring an understanding of whether the level of saliency associated with specific elements of IS/IT utilisation is dependent on industry sector - specifically between private sector and public sector operational environments. The candidate is also likely to increasingly focus his research attention on exploring how a firm's capabilities, specifically its dynamic capabilities, are likely to have an impact on not only the exploitation of IS/IT as a firm's resource for service operations but also on its implementation. Particular interest lies in such capabilities within Small and Medium Sized Enterprises (SMEs). The Dynamic Entrepreneurial Capabilities (DEC) framework developed by Lanza and Passarelli (2013) equips the candidate with a conceptual framework within which to locate such studies. Of particular interest are the benefits of such resources to SMEs in developing countries operating within what can be described as the 'Internet Cultural Era', an era where the internet has become a major source of operations – for example, the cloud. At present, conceptual studies are being undertaken in this area.

The second research theme focused on implementation, and more precisely project management. The main foundations of this theme were drawn from service operations failure literature, specifically that of Tucker (2004), which discusses stakeholder experiences with service operations failures and the importance of organisations learning from such failure. However, in order to avoid what may appear as engaging in prescriptive advice on both the nature of such failure and strategies for their reduction, the candidate instead chose to focus his work on exploring

the complexities associated with failure decision judgments in service operations within this theme. Drawing upon cognitive diversity literature, the candidate presented a research question: *How does heterogeneity influence the outcome or perception of outcomes of service operations projects?* To answer this question, large-scale data samples were obtained from a worldwide sample of service operations project practitioners. The candidate found that project-related judgements and the revisions of such decisions were not only heterogeneous – in effect, they differed among project stakeholders - but that individual demographic heterogeneity (difference) in age, gender, project role and national culture does indeed influence project-related judgements on failure.

The studies undertaken within this theme were also associated with limitations, which again present the candidate with directions for future investigation. The limitations within this theme of the thesis are, however, associated with conceptualisation. For example, in acknowledging that individuals duly exhibit cognitive differences in their assignment of weighting to specific decision criteria (in as much as two different individuals will assess performance differently), future studies may need to articulate more precisely how individual decision judgements are to be appraised by respondents prior to the commencement of data-gathering. Other factors which were not taken into consideration in these studies relate to project context and, perhaps most importantly, the impact of implicit perceptions on decision judgments. Such studies, which are currently being planned and scoped out, are likely (see Croson *et al.*, 2013) to be best achieved utilising experimentation based on the current strands in the literature.

Finally, noting literature which emphasises that the concepts of ‘failure’ and ‘success’ are not mirror images and therefore need to be aggregated (see Mahrng and Keil, 2008; Bharadwaj *et al.*, 2009), future comparative studies will be seeking to explore whether (and to what extent)

assessment of the two different concepts may impact upon heterogeneity. Such studies will be of particular interest to practitioners, in terms of clarifying which assessment (success or failure) is being undertaken at a particular time. Arguably, such an understanding will also benefit organisations. More specifically, because ‘success’ and ‘failure’ are not mirror images of each other (although most authors did discuss them as such), their measurement and assessment criteria may differ (Ojiako *et al.*, 2008, 2013b). Thus, with success and failure being two separate constructs, the impact of each one, individually, is likely to have different strategic implications for an organisation’s operational strategy.

Finally, in presenting the research question, *How can failure of service operations projects be mitigated?*, the third theme within the thesis sought to explore possible means of mitigating against service operations projects which had been shown in the literature to be associated with very high failure rates. Based on prior and current literature discussing the research agenda within operations management, the candidate focused on two possible approaches to this: teaching and learning, and the management of risk. Two sub-questions were also presented. For teaching and learning, the following question was presented - *How do considerations of teaching and learning enhance the ability of practitioners to successfully deliver projects and enrich project management practice?*, while for the sub-theme of management of risk, the following question was presented; *How can project managers negotiate and conceptualise the risks that exist in highly complex and discontinuous service operations environments where such risks may be unknown?* The research method adopted for the sub-theme on teaching and learning was empirical and drawn from a UK-wide survey of individuals studying project management in both business and engineering schools.

Drawing from literature on re-thinking project management (Jugdev *et al.*, 2001; Cicmil *et al.*, 2006; Winter *et al.*, 2006a, 2006b; Sauer and Reich, 2009; Svejvig and Andersen, 2015), the

candidate suggests that the practical implications of the study lie in understanding how industry emphasis on the training of project management practitioners with generic skills (as against “project management knowledge/expertise”) can be balanced against teaching and learning philosophy within project management that had not traditionally focused on articulating any relationship between generic skills development and students’ learning experiences. The findings have practical implications, suggesting that teaching and learning project management will need to acknowledge what the candidate now terms a form of ‘pedagogic heterogeneity’ (difference). Although accepting some form of methodological uniformity within project management, learning differences among those who study project management must be taken into account.

The candidate is at present conducting further research within this theme; ongoing studies focusing on both the critical dimensions of students’ learning experiences and the relative salience of these dimensions have recently progressed to draw international comparisons related to the working experience of the candidate (specifically how project management is taught and how the learning experiences are articulated in the United Kingdom, South Africa and the United Arab Emirates (UAE) - all countries in which the candidate has held academic appointments). The major point of departure of this emerging research work is that, as across-country rather than within-country comparisons, the new studies are likely to exhibit a much greater variance (differentiation) in level of perceived salience, thus providing those researchers who are interested in the teaching and learning agenda within project management with a much stronger statistical dataset to identify how specific factors impact upon students’ learning experiences. Comparative data also allow for the identification of systematic heterogeneity in factors that impact upon learning experiences across different countries, providing much deeper insights into the relationship between, for example, national culture and students’ learning experiences.

The second dimension of failure mitigation focused on the management of risk. The research approach adopted in this sub-theme was predominantly discursive and theoretical in addressing the research question: *How can project managers negotiate and conceptualise the risks that exist in highly complex and discontinuous service operations environments where such risks may be unknown?*

The candidate employed a theoretical prism rooted in realism to present a behavioural perspective of the management of risk. In moving away from classical risk management research that focused on, for example, the identification and categorisation of risk factors, the candidate explored how risk could be better managed from a social perspective. A number of insights emerged from the studies including the need for a greater understanding of the risk subjectivities of managers, particularly as these relate to the juxtaposition of ‘risk’ and ‘innovation’; and how to pierce the ‘veil of ignorance’ surrounding risk was also explored. Projects that were, for example, innovative were not always necessarily risky, thus emphasising the need for project managers within service operations environments not to always attribute risk to innovation. Both perspectives - the candidate argues - enable project managers to seek an ‘effectual truth’; in other words, an understanding of how risks actually manifest as against how they ought to be.

While findings from this sub-theme presented an alternative perspective of the management of risk, they present the candidate with particular research challenges. One such challenge relates to how realist perspectives of risk can be aggregated into variables that ‘measure’ the subjectivities of service operations managers. This is an area of research to which the candidate is at present applying great thought and reflection. For example, it will be of interest to explore how service operations project managers deal with threats to operational integrity. The candidate’s initial readings of social theory literature (Machiavelli, 1513/1961; Pareto, 1935) generate

intriguing food for thought. Machiavelli (1513/1961), for example, argued that human nature brings about enduring and repetitive behavioural patterns that are quite common and that, because of their influence on mental flexibilities, these behavioural patterns - aggression and guile - had the potential to provide valid indications of whether managers will be successful or not. Pareto (1935) extended Machiavelli's work further to suggest that these "inherited behavioural traits" (Pareto, 1935; §1845) could be activated in environments where social threat (risk) was perceived. It appears that Pareto's contribution to Machiavelli's work was to suggest the existence of a seesaw human nature. Within the context of the proposed future studies, the candidate ponders on whether specific risk environments could trigger similar (or different) risk behaviour among project managers. Could such behaviour be influenced by demographic factors; for example, age? Gender? Race? Religion? or Operational Role? The outcomes of such studies are likely to prove intriguing.

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Appendix A: Index of candidate's complete publications⁴

Journal publications

1. Ojiako, U., Chipulu, M., Marshall, A., Ashleigh, M., and Williams, T (2015), "Project management learning: A comparative study between engineering students' experiences in South Africa and the United Kingdom", Project Management Journal, Accepted for publication.
2. **Ojiako, U.**, Papadopoulos, T., Stamati, T., Anagnostopoulos, D., and Marshall, A. (2015), "Collaborative governance in Greek infrastructure projects", Proceedings of the Institution of Civil Engineers: Management, Procurement and Law, Accepted for publication.
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Appendix B: Attested contribution to publications by various co-authors

Attestation from Professor Terry Williams, University of Hull

Please see attachment.

Attestation from Dr Maxwell Chipulu, University of Southampton

Please see attachment.

Attestation from Dr Alasdair Marshall, University of Southampton

Please see attachment.

Attestation from Dr Stuart Maguire, University of Sheffield

Please see attachment.

Attestation from Dr Athanasios Papadopoulos, University of Sussex

Please see attachment.