

Association for Information Systems

AIS Electronic Library (AISeL)

UK Academy for Information Systems
Conference Proceedings 2017

UK Academy for Information Systems

Spring 4-5-2017

Yet Another 'List' Of Critical Success 'Factors' For Enterprise Systems: Review Of Empirical Evidence And Suggested Research Directions (2)

Deepak Saxena
Trinity College Dublin, saxenad@tcd.ie

Joe Mcdonagh
Trinity College Dublin, jmcdongh@tcd.ie

Follow this and additional works at: <https://aisel.aisnet.org/ukais2017>

Recommended Citation

Saxena, Deepak and Mcdonagh, Joe, "Yet Another 'List' Of Critical Success 'Factors' For Enterprise Systems: Review Of Empirical Evidence And Suggested Research Directions (2)" (2017). *UK Academy for Information Systems Conference Proceedings 2017*. 66.
<https://aisel.aisnet.org/ukais2017/66>

This material is brought to you by the UK Academy for Information Systems at AIS Electronic Library (AISeL). It has been accepted for inclusion in UK Academy for Information Systems Conference Proceedings 2017 by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

YET ANOTHER ‘LIST’ OF CRITICAL SUCCESS ‘FACTORS’ FOR ENTERPRISE SYSTEMS: REVIEW OF EMPIRICAL EVIDENCE AND SUGGESTED RESEARCH DIRECTIONS

Deepak Saxena

Trinity Business School, Trinity College Dublin, Dublin 2, Ireland

Email: saxenad@tcd.ie

Joe McDonagh

Trinity Business School, Trinity College Dublin, Dublin 2, Ireland

Email: jmcdonagh@tcd.ie

Abstract

Critical Success Factors (CSF) remain the most-researched areas within the Enterprise Systems (ES) domain over the years and has resulted in a long ‘list’ of such factors. Consequently, many ‘factors’ are not more than ‘variables’ belonging to the same management area. Therefore, this paper argues for going back to the original definition of CSFs as few key areas and reviews empirical evidence in each CSF area. Thereafter, the paper notes other limitations of the CSF literature and suggests research directions to provide a deeper explanation of the ES phenomena. These include tracing CSFs across time, taking a change-centric view of the ES lifecycle, unpacking interrelationship among CSFs, paying attention to the implementation context, and moving from a list of CSFs to the identification of their underlying mechanisms. We hope that our suggestions will provide a roadmap to ES researchers on conducting focussed research on CSFs.

Keywords: Enterprise Systems, Critical Success Factors, ERP, CSF, Mechanism

1.0 Introduction

Last year, Huang & Yasuda (2016) published a review on Enterprise Systems (ES) research. The highlight of the review was that this was a meta-review based on ninety-six reviews on ES research, of which twenty-one were reviews of Critical Success Factors (CSFs) for ES implementations. This amounts to more than one CSF review per year since the publication of first CSF review (Esteves & Pastor, 2000). This tells us about the proliferation of CSF studies in the ES domain. At the same time, however, this also indicates the limitations of the CSF concept as applied in the ES research. In this context, this paper has two major aims. First and immediate aim is to review the available empirical evidence for individual CSFs. Second and broader aim is to note the limitations of extant CSF research and suggests possible research directions based on the limitations identified.

Remainder of the paper is organised as follows. Section 2 briefly discusses the concept of CSFs as originally conceptualised in the literature. It notes the context-dependence of CSF concept and its conceptualisation as a key ‘area’ rather than being

a 'variable'. Next in Section 3, to give an idea about proliferation of CSF approach in the ES research, we provide a 'list' of commonly cited CSFs based on a content analysis of extant CSF reviews and argues for returning to the original conception of CSF as few key 'areas'. However, to move beyond a CSF list, we provide a review of extant empirical evidence associated with specific CSF areas. Section 4 notes the limitations of existing CSF studies and suggests possible research directions to deal with these limitations. Finally, section 5 concludes this paper.

2.0 Conceptual Background of CSF Research

The concept of 'success factors' was first introduced by Daniel (1961) in his seminal HBR article 'Management Information Crisis'. He differentiates among three types of useful data for companies – environmental, competitive and internal – and argues that a company's information system (IS) must be discriminating and selective in reporting internal data. An IS should focus on success factors, which according to him usually are *three to six* for most of the companies in an industry and are defined as those key jobs which must be done exceedingly well for a company to be successful. Rockart (1979) refined the concept further and introduced the notion of CSF defining it as those *few critical areas* where things must go right for the business to flourish. If the results in these critical areas are found to be inadequate, the organisation's efforts for the period are bound to be less than desired. He notes that the CSF areas should receive constant and careful attention from leadership and management. Despite the CSF method's alleged limitation of bias towards top management (Davis, 1979), it gained immense popularity. Though originally proposed for designing management information systems (Daniel, 1961; Rockart, 1979), the CSF approach has been extensively used in diverse areas of IS and business, including ES research. The next Section reviews the CSF research within the ES domain.

3.0 CSF Research within the ES Domain

Most of the reviews of ES literature note that critical factor research remains the most-researched area within the ES implementation research with estimates ranging from 27% (Nazemi et al, 2012) to 57% (Cumbie et al, 2005; Pairat & Jungthirapanich, 2005) depending on the review duration and review basket. However, the concept of

CSF seems to be over-used in the ES domain. A content analysis of twenty-one CSF review papers from the year 2000 to 2015 resulted in 36 different CSFs (see Table 1).

CSF	Frequency	Other Terms
Change Management	21	Cultural and Structural Change, Resistance to Change, Managing Cultural Change
Project Team	21	Dedicated Project Team, Project Team Competence, Project Team Composition, Best and the Brightest, Balanced Team, Project Team Skills, Project Team Compensation, Execution Team, Teamwork, Small internal team of best employees, Team Morale and Motivation, Technical and Business Knowledge, Employee Turnover, Training of Project Team
BPR	19	Process Management, Job Redesign
Top Management Support	19	Sustained Management Support, Management and Leadership, Top Management Involvement, Top Management Participation
Business Plan and Vision	18	Visioning and Planning, Clear Goals Focus and Scope, Clear Objectives and Goals, Business Case, Strategic Thinking and Planning
Project Management	17	Experienced Project Manager, Steering Committee, A formalised project approach and methodology
User Education and Training	17	User Characteristics
Communication	15	Strong Communication inward and Outward, Open and Honest Communication
Project Champion	14	Project Heroes
User Involvement and Participation	14	Client Consultation
Package Selection	14	ERP Version, System Quality
Legacy System	12	
Vendor Aspects	12	Vendor Relation, Vendor Support, Vendor Partnership, Vendor Quality, Vendor Tools, Trust between Partners, IT Supplier
Consultants	11	Adequate Use of Consultants, Experienced Consultants, Consulting Services, External Advisory Support
Performance Management	11	Performance Monitoring, Performance Evaluation, Measurable Goals, Post-Implementation Evaluation
Testing and Troubleshooting	11	System Integration, System Testing
Organisational Culture	8	
Customisation	7	Vanilla ERP, Minimum Customisation

Data Related Aspects	7	Data Quality, Data Analysis, Data Conversion, Data Accuracy, Data Management, Information Quality
Interdepartmental Dynamics	7	Interdepartmental Coordination, Interdepartmental Communication, Interdepartmental Collaboration, Enterprise-wide communication and cooperation
Implementation Strategy	6	Big Bang Implementation, Roll-out
Project Scope	6	Deliverable Dates, Smaller Scope, Time
Process Fit and Alignment	5	Dealing with Organisational Diversity
Empowered Decision Makers	4	
Financial Management	4	Project Cost Planning and Management, Project Justification based on cost and economics, Detailed Cost
Managing Expectations	4	Unrealistic Expectations
Project Planning	4	Formalised project plan/schedule
Technical Complexity	4	Software Complexity, Complex Architecture and High Number of Modules, Defining the Architecture
National Culture	4	
IT Infrastructure and Resources	4	IT Systems, IT Maintainability
Configuration	3	
IT Skills and Experience	3	
Localisation Requirements	3	Country Related Functional Requirements
Industry Environment	3	Competitive Pressure
Organisation Size	2	
Knowledge Management	2	

Table 1. Critical Success Factors for ES Implementation

For a practitioner, identification of too many factors creates a puzzle rather than solving her problems. As Martin & Huq (2007) note, there are too many factors to consider and it seems that we know ‘too little about too many’ variables. It may be noted from Table 1 that many variables that are considered a ‘factor’ are indeed closely related (e.g. project management, project scope, project champion, project planning) and should not be seen in isolation. On top of that, the notion of success is also contested and open to interpretation (Mayere et al.,2008; Saxena et al, 2016). In such a case, perhaps it would be a good idea to return to the original definition of

CSFs as a few critical ‘areas’ (Rockart, 1979) instead of working with different variables in isolation. Therefore, this section is structured in terms of those key ‘areas’ where existing ES literature provides empirical evidence. For this reason, instead of citing the studies that provide a list of critical factors, this section cites the research conducted on specific factor in leading IS journals. It should be kept in mind, however, that as per original conception, CSFs are industry specific, company specific and sometimes manager specific (Daniel, 1961; Rockart, 1979; Boynton & Zmud, 1984) and therefore are not amenable to ‘one-size-fits-all’ approach. Irrespective of this, our point remains the same that CSF research should focus on key areas rather than working with variables.

3.1 Change Management

Most of the studies/prescriptions on ES-associated change management recommend training and communication as two-pronged strategy for successful change management. In terms for *training method*, Noudoostbeni et al (2009) find lecture, on-the-job-training, computer-based training, and team training as preferred training method and suggest a combination of these for successful change management. Koh et al (2009) find that test database and training CDs, software release notes, and telephone support to users act as effective support tools for ES training. Sykes (2015) also report efficacy of traditional training, online support, and help desk support as a significant predictor of ES outcomes for the employees. However, the most important predictor for employee ES outcome is found to be peer advice ties or social capital (Chou et al, 2014; Sykes et al, 2014; Sykes, 2015) that facilitates knowledge sharing among employees. For the *timing of the training*, Karuppan & Karuppan (2008) report that the employee performance worsens as the time elapsed between training and system roll-out increases. In fact, Lee & Lee (2004) recommend additional training after the system roll-out since often there is a performance dip immediately after the go-live (Deloitte, 1998; Wagner et al, 2010). They argue that the post-implementation training supports the users in overcoming the shock created by the new system and processes. In terms of *training content*, Coulson et al (2003) find that including the system integration and workflow concept in the training with the procedural training significant improves the users’ mental model accuracy over time. This is because it allows the users to put the knowledge in context. Davis & Hikmet (2008) also find that since ES implementation usually brings significant changes in business logic and

processes, procedure based training (such as training for data entry or report preparation) would not be sufficient in preparing the employees for the higher order changes that accompany ES implementation. Therefore, to be effective, they suggest training which results in the development of tacit knowledge, supports its transfer and which makes use of social capital.

Second part of change management strategy is *ES related communication*. Huq et al (2006) suggest the use of multiple communication channels, interactive media, and continuous communication with the users. Sedmark (2006) suggests media like posters, intranet sites, project meetings, and away days to increase organisation-wide communication regarding the project. The communication channels may also depend upon the phase and stakeholders of the project. For example, Finny (2011) reports that while the acquisition related decisions could be communicated to all the users through e-mails, face to face communication should be preferred method thereafter, especially during the training. Like training, timing is important also for communication associated with ES implementations. Huq et al (2006) argue that since it takes a long time for employees to understand the implications of change and to adjust to the change, ES communication plans should offer enough lead times to the employees to get them used to the new systems and processes. On the other hand, Kemp & Low (2008) remind that if there is too much gap between different stages of the implementation, communication may be required to assure staff members that the ES is still being implemented and it would be rolled out whenever it is ready. Sedmark (2006) also stresses on the importance of keeping the users informed by updating them about the project status and changes to keep them engaged with the project.

3.2 Business Process Reengineering

Business process reengineering (BPR) is the re-design of business processes of the organisation for achieving maximum efficiency (Hammer, 1990; Davenport and Short, 1990). BPR may also be conducted without ES implementation but it is often an initial stage of ES implementation (Davenport, 1998; Davenport et al, 2004). In fact, some scholars (Koch, 2001; Huq et al, 2006; Huq & Martin, 2006) argue that there are more chances of BPR success if it is driven by an ES. One stream of BPR research within the ES domain focuses on developing tools and algorithms for business process configuration for ES (Dreiling et al, 2006, 2008; Xu et al, 2008) and is more technical in orientation. However, majority of the research on BPR in IS

domain focuses on ES-organisation fit/misfit. Hong & Kim (2002) offer an organisational fit perspective for ES implementation. They note three types of ES-organisation fits (data fit, process fit, and usage fit) and find that ES-organisation fit significantly affects ES success in the organisation. Soh & Sia (2004) and Sia & Soh (2007) discuss the ES-organisation misalignments generating due to imposed (external) and voluntary acquired (internal) context. They find that while most imposed misalignments are resolved via package customisation, misalignments related to voluntary context are more often resolved via BPR.

3.3 Top Management Support

Apart from change management and BPR, top management support (TMS) remains one of the most cited CSF for ES implementations. In terms of empirical evidence, Sarker & Lee (2003) find TMS as the necessary condition for a successful implementation. Similarly, Dezdar & Ainin (2011) find that TMS has stronger implication of ES impact than enterprise-wide communication and user training. Young & Jordan (2008) also report that TMS has a stronger impact on project success compared to the impact of project management. However, Ifinedo (2008) find the relation between TMS and ES success only moderately supported, as opposed to strong support for positive impact of external expertise and business vision on ES success. In terms of TMS activities, Martin & Huq (2007) contend that if top management focuses its effort on managing cultural and contextual factors, there are high chances of implementation success. Dong et al (2009) classify TMS activities into three sets of actions – resource provisioning (supplying key resources such as funds, technologies, staff and user training programs), change management (fostering organisational receptivity of new IS), and vision sharing (ensuring that lower-level managers develop a common understanding of the core objectives and ideals for the new system). They report that resource provisioning affects project completion, change management has an impact on formation of user skills and attitudes, and vision sharing helps in middle manager buy-in.

3.4 Business Vision and Strategic Alignment

One of the important activities identified for top management is developing a business vision and ensuring that there is strategic alignment between business goals and ES implementation (Davenport, 1998). Although this remains an oft-cited CSF,

surprisingly very few studies focus on business vision or strategic alignment in the context of an ES implementation. Ifinedo (2008) reports business vision to be positively related to project success. Velcu (2010) finds that the more the ES strategy is aligned with the business strategy, the more likely it is that the project is completed within budget and on time. Based on the findings of a case study, Grant (2003) argues that although strategic alignment is considered important by managers, it is extremely difficult to attain. He further argues that exact alignment may be almost impossible given the volatile and dynamic business and technological environments surrounding organisations in present times. Lee & Myers (2004) echo the same point in their critical ethnography of an ES implementation. They find that the translation from development of strategic objectives to strategy execution by the ES is by no means straightforward. During the implementation, the strategy of the firm itself may change. At the time of completion, an ES project may be reflecting the vision developed then top management during adoption decision, but may be completely at odds with the business vision at the time of project completion. Therefore, Velcu (2010) suggests that in the long run, changes in business strategy must be coordinated with those available in the ES.

3.5 Project Management

Weston (2000) is perhaps the first article which discusses ES implementation in the context of project management. He discusses different project management activities during different stages of an ES project and stresses that the use of project management software is a critical requirement for an ES project. Based on the analysis of four case studies, Sammon & Adam (2010) confirm the oft-repeated advice that the *project team* members should be the best and the brightest and should have both the technical and the domain knowledge. Rothenberger et al (2015) also empirically find that an experienced multi-skilled team that consists of experts in both organisational and technical knowledge is crucial for the success of an ES project. In this regard, Gallagher et al (2012) report that for the transfer or assignment of personnel, the negotiations of the project manager with the functional unit managers are very crucial for project team formation. Apart from the skill-sets, Gefen & Ridings (2002) report that the responsiveness of the project team towards the users and the nature of the social exchange during the implementation also positively affect the project success. Using ES implementation data from 141 organisations, Santamaria-

Sanchez et al (2010) find that, in terms of *project scope*, business support modules (e.g. Accounting and Finance, Human Resource Management) take less time compared to the implementation of value-chain modules (e.g. Production and Supply Chain modules). This happens due to complex inter-dependencies in the value-chain modules. They also confirm earlier findings that the size and the complexity of the implementation negatively affect the implementation outcome.

3.6 Knowledge Management

Knowledge Management (KM) remains somewhat better-researched area compared to other CSFs. The issue of knowledge management in ES project is considered at all three levels – knowledge transfer from the consultants to the client, knowledge management within the implementation team, and the knowledge transfer from the implementation team to the end users. This may require role and responsibility redistribution, new knowledge requirements for the end users and, often a new knowledge structure in the organisation (Lee & Lee, 2000). Haines & Goodhue (2003) provide evidence from the case studies that knowledge transfer from the consultants to the internal experts remains a key CSF for the organisations. Hung et al (2012) report that top management support and the internal incentives offered by the client organisation have a positive impact on creating a conducive knowledge transfer climate for the knowledge transfer from the consultant to the client. From the consultants' side, they find that the consultants' industry experience and their project management capabilities have a positive impact on transferring the knowledge to the clients.

Within the organisation, Volkoff et al (2004) find that super-users or power-users as the most important mechanism that facilitate knowledge transfer from the ES implementation team to the end users. These super-users are the example of 'train the trainer' approach where super users are trained first, and then they train the end users (Haines & Goodhue, 2003). Super-users are often the members of the user community with their respective business roles, but are also part of the implementation team working as an interface between business and ES team. Since usually, there is a lack of common goals and common language between ES team and the end-users, super-users act as a bridge and, at the same time, also allow each group to pursue their own agenda.

3.7 Partner Relationship

An ES implementation is usually a tripartite relationship among implementing organisation/client, ES system provider/vendor, and ES implementation partner/consultants. In some cases, the vendor and the consultant may be the same entity. ES literature on the partner relationship outlines the role of trust and the quality of interactions during the implementation phase. Gefen (2004) reports that usually *trust* in the implementation partner increases the client's assessment of the business relationship as worthwhile. Client's trust in the implementation partner is found to be positively associated with shared cultural characteristics, institution-based guarantees and good process-based experience. Shared cultural characteristics ensure that client and the implementation partner share the same reference frame. Ko et al (2005) also report that shared understanding is an antecedent of effective knowledge transfer between the consultants and the client. Institution-based guarantees (such as a service quality certification of the implementation partner) reduce social uncertainty by testifying to the ability and character of the consultants. Process-based trust is the result of earlier experience with the implementation partner. Ko (2014) and Ko et al (2005) also report that trust between the client and the implementation partner positively affect their evaluation of the ES project outcomes. Apart from trust, Tsai et al (2011) find that the implementing organisation's satisfaction with the ES is highly associated with the degree of satisfaction with the *service quality* of the ES vendor and the consultants.

3.8 Organisational Factors

Most of the CSF reviews cite organisation culture and organisation structure having an impact on ES implementation. *Organisation culture* may include learning and development, decision making style, power sharing, support and collaboration, and tolerance for risks and conflicts (Ke & Wei, 2008). Jones et al (2006) also find that dimensions of organisation culture also have an impact on knowledge sharing during an ES implementation. In terms of *organisation structure*, Ifinedo (2007) finds that organisation size is positively associated with success, with larger enjoying more implementation success. In terms of structure, he finds that ES success may be higher where specialisation and formalisation are well-entrenched, and where a command and control structure is in place. Morton & Hu (2008) also argue that machine bureaucracies with high degree of formalisation and low degree of decentralisation are

most suited for an ES implementation. Apart from formal organisation structure, Sasidharan et al (2012) report that the group-level social capital (knowledge sharing between members of the group) have an impact both on organisation-level ES outcomes as well as individual-level ES outcomes. Therefore, they suggest moving beyond training and including learning via social interactions in the ES implementation plans.

3.9 Macro Factors

Some studies focus on macro-level factors that affect the ES implementation process. Sheu et al (2004) report that factors such as language, culture, politics, government regulations, management style, and labour skills have an impact on ES implementation process in different countries. Krumbholz et al (2000) discuss the impact of different *national and corporate cultures* inherent in the ES package and those prevalent in the organisation. Using the case study data from UK and Scandinavian plants of a large pharmaceutical company, they find the evidence for an association between corporate culture and ES implementation problems. Kaniadakis (2012) also argues against restricted project-based depiction of ES implementations and empirically presents an ES implementation within a broader *socio-economic context* of the agora (Greek word for marketplace) of techno-organisational change.

Institutional theory, particularly the idea of *institutional isomorphism* (DiMaggio & Powell, 1983) has sometimes been used to explain the impact of macro-level factors on the ES implementation. Put simply, theory of institutional isomorphism argues that various pressures operating at a sectoral or institutional level induce organisations to become like their competitors. This may be due to three different but inter-related mechanisms – coercive pressure, mimetic pressure, or normative pressures. While coercive and normative pressures often come from outside entities (e.g. a regulator) with no scope for non-conformance, the mimetic pressure is often from within to imitate the competitors' strategy. Benders et al (2006) add the idea of 'technical isomorphism' to it, which refers to the structure and processes embedded in the ES artefact. Together, they argue, institutional and technical isomorphism dictate the trajectory of an ES implementation.

3.10 User Engagement

For engaging with end-users, *user involvement* is cited as a CSF in most of the CSF lists. It is assumed that involving the users in the implementation process will enhance their commitment for the ES. However, Wagner & Newell (2007) argue that user involvement in the early stage of the implementation is neither feasible nor productive. It may be infeasible because during the early stages of the implementation, users find it difficult to see beyond their current practices. Due to their lack of exposure to the new system and limited technical knowledge of the ES artefact, they fail to anticipate how things could be done differently if they get new tools to enable more integration across the business. Even genuine attempts made by the users to be involved may fall short because they may be busy with their day to day responsibilities (Wagner & Piccoli, 2007). Similarly, user involvement during customisation and configuration may be counter-productive since they may look for automating their business process instead of obliterating it (Hammer, 1990) since their conception of work practices is rooted in the existing ones. Perhaps that is why, Lyytinen & Newman (2015) report a case management and the implementation team marginalised the user community to successfully implement the ES. Although there were opportunities for users to express their views and system requirements, most of their requests were dismissed during the implementation process to enforce a technical-managerial view of the organisation. Willis & Chaisson (2007) also report similar situation where users were silenced using a normative grammar focussing on ‘a new way to manage’ and ‘best practices’, despite which, the project was considered a success by the management.

3.11 Risk Management

Risk management is noted as one of the important CSFs in most of the reviews. However, existing ES research focuses more on identification of risk factors (Aloini et al, 2007; Sumner, 2000) often dubbed as ‘critical failure factors’, rather than focussing on the ways of managing risks. For the most part, lists of risk factors include lack of or inadequate execution of certain CSFs, e.g. lack of top management support, lack of change management program, inadequate BPR, poor data quality, and so on. In terms of research on managing risk, extant ES literature does not go beyond offering prescriptions (e.g. steering committee, project sponsor, adequate testing) based on the identified risk factors. Based on a case study, Ojala et al (2006) put

forward a risk management approach that involves risk assessment in adoption, acquisition, and implementation phases of the ES lifecycle. During use and maintenance phase, they suggest re-assessment of risk each year. Zafeiropoulos et al (2005) offer a dynamic risk management tool to support in the modelling, optimal adaptation and implementation of an ES. Chang et al (2014) develop and empirically test a twelve-dimensional *audit* framework for internal control of ES projects. These dimensions relate to various controls at data, systems, and process level.

Although the limitation related to too much fragmentation of CSFs may partly be resolved by going back to its original conception of CSF as key areas (Daniel, 1961; Rockart, 1979), there exist other limitations of CSF research in the ES domain. The next section brings out these limitations and suggests possible research directions to alleviate the limitations.

4.0 Moving Beyond CSFs – Research Directions

This section notes other limitations of CSF research and suggests possible research directions based on the limitations identified. In doing so, this section also provides some examples from the extant ES research which report findings in the suggested research directions.

4.1 Tracing CSFs across time

A major limitation of CSF studies is that by and large, extant studies do not pay adequate attention to implementation stages (Shaul & Tauber, 2013). Although some CSF *reviews* provide a list of CSFs based on the ES lifecycle phases (e.g. Al-Mashari et al, 2003; Bajwa et al, 2004; Esteves & Pastor, 2006; Nah et al, 2001) based on the synthesis of existing studies, very few studies (e.g. Ang et al, 2002; Somers & Neloson, 2004) empirically report CSFs as per ES lifecycle phases or as per implementation stages. Only recently, ES studies have started paying attention to temporal aspects of specific CSFs. For example, although it is generally assumed that top management support will be consistent throughout the project, recent findings contest such assumptions. Elbanna (2013) reports that top management support may not be readily passively available. Dong (2008) and Dong et al (2009) report that top managers adjust their support following the dynamics of the implementation process

and they change the level and content of the support with time to guide the implementation. This finding is echoed by Boonstra (2013) who reports that top management may vary or even withhold their support depending on various conditions. It may withhold support due to resource scarcity, due to the change in goals, or due to a lack of clarity about the type of support needed.

If we consider BPR, Wei et al (2005) classify ES-misalignments based on ES lifecycle phases based on case study. They find that Industry, business, and regulation related misalignments are a consideration in the pre-implementation phase. The implementation phase is usually associated with more system-specific misalignments such as user interface, business process flow, and reporting misfits. Post-implementation misalignments are found to be associated with information and functionality misfits. They also report that the misalignments and corrective actions typically have a cascading impact on the ES outcomes. Similarly, Rose & Schlichter (2013) trace the change in stakeholders' trust on the implementation team as ES implementation unfolds. Based on a longitudinal case analysis, they find that trust among stakeholders changes as the implementation proceeds and it may even break-down at some point. Therefore, they suggest that instead of keeping them waiting for the big outcome, often a series smaller outcomes help in gaining back stakeholders' trust as opposed to focussing on the eventual roll-out of the system.

4.2 Taking a change-centric view of the ES lifecycle

Recent works on ES related change management also suggest that change management is crucial *across* the ES lifecycle, rather than just being important towards the end of the implementation. Based on a survey, Somers & Nelson (2004) find change management as relevant to all the ES stages. Finny & Corbett (2007) also support this contention that while many of the ES success factors are important, the need to approach the implementation from a change management perspective is central to the success of any ES project. Ash & Burn (2003) and Huq et al (2006) empirically show the importance of change management activities to create cultural readiness and support the cultural transformation for the ES project. Using a longitudinal case study, Kemp & Low (2008) underscore the importance of change management activities to sustain employee interest in case of delays in implementation. Lee & Lee (2004) specifically bring out the importance of change management activities in the post-implementation phase to sustain the initial

performance dip immediately after go-live. Perhaps therefore, Loonam & McDonagh (2005) consider it vital that issues related to change management are dealt with in tandem with ES implementation, not after the project is completed. Taking a change-centric view of the ES lifecycle, thus, will allow the researchers and supervisors to attend to change management issues emerging at various levels and stage of the implementation process.

4.3 Unpacking interrelationship among CSFs

McDonagh (2016) stresses that while extant CSF studies highlight strategic, organisational, and technological factors associated with the introduction and exploitation of such systems, the links between such factors have been rather under-explored. The only exception in this regard are Akkermans & van Helden (2002) and Wainwright & Shaw (2013). Akkermans & van Helden (2002) empirically show that appointment of a project champions positively affects project management which in turn positively affect interdepartmental communication and collaboration. Wainwright & Shaw (2013) report similar findings in a public-sector context. Beyond these works, this issue at best is addresses indirectly. For example, the three important set of activities identified by Dong et al (2009) for top management support are – resource provisioning, change management, and vision sharing – which could be considered a CSF in themselves. Huq et al (2006) also find training, communication and change management as important activities for top management. Similarly, knowledge management is found to be closely associated with partner relationships (Haines & Goodhue, 2003; Hung et al, 2012). Therefore, more research is needed in the ES domain to explore interrelationships among CSFs.

4.4 Paying attention to the implementation context

Even though CSFs were originally conceived as being context-specific (Daniel, 1961; Rockart, 1979; Boynton & Zmud, 1984), most of the CSF studies tend to underplay the sectoral context (Shaul & Tauber, 2013). Although there have been calls for adopting a context-aware perspective (Howcroft et al, 2004) in ES research, very few studies pay adequate attention to implementation context. Some scholars discuss the issue of ES-organisation fit in the context of niche organisations. For example, Pollock & Cornford (2004) and Wagner & Newell (2004) find that ES implementations often create tensions in the university environment since the rigid

structure imposed by the ES often doesn't match the relatively flexible structure found in most of the university departments. Studies conducted in other public service organisations also conclude that although some of the CSFs (e.g. top management support, change management) apply across all types of organisations, the institutional context of public service organisations offer other factors (e.g. highly political environment, public accountability) that may prove crucial to the ES implementation (Wagner & Antonucci, 2009; Kaniadakis, 2012; Wainwright & Shaw, 2013). Therefore, attention to implementation context is deemed crucial for ES research to present a richer picture of the ES phenomena.

4.5 Moving from CSFs to Underlying Mechanisms

McDonagh (2016) observes that by and large, existing factor studies only focus on the surface pathologies and do not pay attention to underlying mechanisms driving the implementation process. Perhaps this is the reason why we end up with so many CSFs. To deal with this limitation, Saxena & McDonagh (2016) suggest the use of process-based explanatory mechanisms (Van de Ven and Poole, 1995) in the ES domain. For example, Robey et al (2002) and Soh & Sia (2004) employ the mechanism of dialectics to explain ES phenomena. The affordance mechanism has also been used by scholars (Nandhakumar et al, 2005; Leonardi, 2011; Volkof & Strong, 2013) to explain the ES phenomena. Williams et al (2013) have used teleological mechanism to explain the process of ES implementation as an iterative and reflexive process. Thus, rather than being determined by antecedent static conditions (i.e. CSFs) the consequences of the implementation process are treated as indeterminate in a mechanism based analysis, which allows for potential explanation of a greater variety of outcomes. Rather than a long list of CSFs, identification of key mechanisms may also prove useful to the practitioners.

5.0 Conclusion

This paper noted the proliferation of CSF studies in the ES domain and argued that perhaps moving back to the original definition of CSF as a 'key area' would help the researchers and practitioners in focussing their efforts. Treating CSF as a key area, the paper discussed the available empirical evidence associated with each key area. The paper also identified other limitations of existing CSF literature and suggested

possible research directions to alleviate those limitations. The suggested research directions include tracing CSFs across time, taking a change-centric view of the ES lifecycle, unpacking interrelationship among CSFs, paying attention to the implementation context, and moving from a list of CSFs to the identification of their underlying mechanisms. We hope that our suggestions will provide a roadmap to ES researchers on conducting focussed research on CSFs.

References

- Akkermans, H., & van Helden, K. (2002). Vicious and virtuous cycles in ERP implementation: a case study of interrelations between critical success factors. *European journal of information systems*, 11(1), 35-46.
- Al-Mashari, M., Al-Mudimigh, A., & Zairi, M. (2003). Enterprise resource planning: A taxonomy of critical factors. *European Journal of Operational Research*, 146(2), 352–364.
- Aloini, D., Dulmin, R., & Mininno, V. (2007). Risk management in ERP project introduction: Review of the literature. *Information and Management*, 44(6), 547–567.
- Ang, J. S. K., Sum, C. C., & Yeo, L. N. (2002). A multiple-case design methodology for studying MRP success and CSFs. *Information and Management*, 39(4), 271–281.
- Ash, C. G., & Burn, J. M. (2003). A strategic framework for the management of ERP enabled e-business change. *European journal of operational research*, 146(2), 374-387.
- Bajwa, D. S., Mooney, T., Garcia, J. E., & Deepinder s. bajwa, J. E. G. (2004). an Integrative Framework for the Assimilation of Enterprise Resource Planning Systems: Phases, Antecedents, and Outcomes. *The Journal of Computer Information Systems*.
- Benders, J., Batenburg, R., & Van Der Blonk, H. (2006). Sticking to standards; Technical and other isomorphic pressures in deploying ERP-systems. *Information and Management*, 43(2), 194–203.
- Boonstra, A. (2013). How do top managers support strategic information system projects and why do they sometimes withhold this support? *International Journal of Project Management*, 31(4), 498–512.
- Boynton, A. C., & Zmud, R. W. (1986). An Assessment of Critical Success Factors. *Sloan Management Review*, 25, 17–27.
- Chang, S. I., Yen, D. C., Chang, I. C., & Jan, D. (2014). Internal control framework for a compliant ERP system. *Information and Management*, 51(2), 187–205. <https://doi.org/10.1016/j.im.2013.11.002>
- Chou, H. W., Lin, Y. H., Lu, H. S., Chang, H. H., & Chou, S. Bin. (2014). Knowledge sharing and ERP system usage in post-implementation stage. *Computers in Human Behavior*, 33, 16–22.
- Coulson, T., Shayo, C., Olfman, L., & Rohm, C. E. (2003, April). ERP training strategies: conceptual training and the formation of accurate mental models. In *Proceedings of the 2003 SIGMIS conference on Computer personnel research: Freedom in Philadelphia--leveraging differences and diversity in the IT workforce* (pp. 87-97). ACM.

- Cumbie, B. A., Jourdan, Z., Peachy, T., Dugo, T. M., & Craighead, C. W. (2005). Enterprise resource planning research: where are we now and where should we go from here? *Journal of Information Technology Theory and Application (JITTA)*, 7(2), 4.
- Daniel, D. R. (1961). Management Information Crisis. *Harvard Business Review*, 39(5), 111–121.
- Davenport, T. H. (1998). Putting the enterprise into the enterprise system. *Harvard Business Review*, 76(4), 121–131. <https://doi.org/Technical Report>
- Davenport, T. H., Harris, J. G., & Cantrell, S. (2004). Enterprise systems and ongoing process change. *Business Process Management Journal*, 10, 16–26.
- Davenport, T. H., & Short, J. E. (1990). The new industrial engineering: information technology and business process redesign.
- Davis, G. B. (1979). An Opinion... Comments on the Critical Success Factors Method for Obtaining Management Information Requirements in Article by John F. Rockart, Chief Executives Define Their Own Data Needs, *Harvard Business Review*, March-April, 1979.
- Davis, C. J., & Hikmet, N. (2008). Training as regulation and development: An exploration of the needs of enterprise systems users. *Information and Management*, 45(6), 341–348.
- Deloitte Consulting (1998). ERP's Second Wave-Maximizing the Value of ERP-Enabled Processes. ISBN 1-892383-36-5.
- Dezdar, S., & Ainin, S. (2011). The influence of organizational factors on successful ERP implementation. *Management Decision*, 49(6), 911-926.
- DiMaggio, P., & Powell, W. W. (1983). The iron cage revisited: Collective rationality and institutional isomorphism in organizational fields. *American Sociological Review*, 48(2), 147-160.
- Dong, L. (2008). Exploring the impact of top management support of enterprise systems implementations outcomes: Two cases. *Business Process Management Journal*, 14(2), 204–218.
- Dong, L., Neufeld, D., & Higgins, C. (2009). Top management support of enterprise systems implementations. *Journal of Information Technology*, 24(1), 55–80.
- Dreiling, A., Rosemann, M., van der Aalst, W. M. P., & Sadiq, W. (2008). From conceptual process models to running systems: A holistic approach for the configuration of enterprise system processes. *Decision Support Systems*, 45(2), 189–207.
- Dreiling, A., Rosemann, M., van der Aalst, W. M. P., Heuser, L., & Schulz, K. (2006). Model-based software configuration: patterns and languages. *European Journal of Information Systems*, 15(6), 583–600.
- Elbanna, A. (2013). Top management support in multiple-project environments: an in-practice view. *European Journal of Information Systems*, 22(3), 278–294.
- Esteves, J., & Pastor, J. A. (2006). Organizational and technological critical success factors behavior along the ERP implementation phases. *Enterprise Information Systems VI*, (2000), 63–71. https://doi.org/10.1007/1-4020-3675-2_8
- Esteves, J., & Paster, J. A. (2000). *Towards the unification of critical success factors for ERP implementations*. 10th Annual BIT Conference, Manchester, UK.
- Finney, S. (2011). Stakeholder perspective on internal marketing communication: An ERP implementation case study. *Business Process Management Journal*, 17(2), 311–331.

- Finney, S., & Corbett, M. (2007). ERP implementation: a compilation and analysis of critical success factors. *Business Process Management Journal*, 13(3), 329–347.
- Gallagher, K. P., “Jamey” Worrell, J. L., & Mason, R. M. (2012). The negotiation and selection of horizontal mechanisms to support post-implementation ERP organizations. *Information Technology & People*, 25(1), 4-30.
- Gefen, D. (2004). What makes an ERP implementation relationship worthwhile: Linking trust mechanisms and ERP usefulness. *Journal of Management Information Systems*, 21(1), 263–288.
- Gefen, D. & Ridings, C. M. (2002). Implementation team responsiveness and user evaluation of customer relationship management: A quasi-experimental design study of social exchange theory. *Journal of management information systems*, 19(1), 47-69.
- Grant, G. G. (2003). Strategic alignment and enterprise systems implementation: The case of Metalco. *Journal of Information Technology*, 18(3), 159–175.
- Haines, M., & Goodhue, D. L. (2003). Implementation Partner Involvement and Knowledge Transfer in the Context of ERP Implementations. *International Journal of Human Computer Interaction*, 16(1), 5–22.
- Hammer, M. (1990). Reengineering Work: Don't Automate, Obliterate. *Harvard Business Review*, 104–112.
- Hong, K. K., & Kim, Y. G. (2002). The critical success factors for ERP implementation: An organizational fit perspective. *Information and Management*, 40(1), 25–40.
- Howcroft, D., Newell, S., & Wagner, E. (2004). Editorial: Understanding the contextual influences on enterprise system design, implementation, use and evaluation. *Journal of Strategic Information Systems*, 13(4 SPEC. ISS.), 271–277.
- Huang, T., & Yasuda, K. (2016). Comprehensive review of literature survey articles on ERP. *Business Process Management Journal*, 22(1), 2-32.
- Hung, W. H., Ho, C. F., Jou, J. J., & Kung, K. H. (2012). Relationship bonding for a better knowledge transfer climate: An ERP implementation research. *Decision Support Systems*, 52(2), 406–414.
- Huq, Z., & Martin, T. N. (2006). The recovery of BPR implementation through an ERP approach: A hospital case study. *Business Process Management Journal*, 12(5), 576–587.
- Huq, Z., Huq, F., & Cutright, K. (2006). BPR through ERP: Avoiding change management pitfalls. *Journal of Change Management*, 6(1), 67-85.
- Ifinedo, P. (2008). Impacts of business vision, top management support, and external expertise on ERP success. *Business Process Management*, 14(4), 551–568.
- Ifinedo, P. (2007). Interactions Between Organizational Size, Culture, and Structure and Some IT Factors in the Context of an ERP Success Assessment. *The Journal of Computer Information Systems*, 47(4).
- Jones, M. C., Cline, M., & Ryan, S. (2006). Exploring knowledge sharing in ERP implementation: An organizational culture framework. *Decision Support Systems*, 41(2), 411–434.
- Kaniadakis, A. (2012). ERP implementation as a broad socio-economic phenomenon. *Information Technology & People*, 25(3), 259–280.
- Karuppan, C. M., & Karuppan, M. (2008). Resilience of super users' mental models of enterprise-wide systems. *European Journal of Information Systems*, 17(1), 29–46.

- Ke, W., & Wei, K. K. (2008). Organizational culture and leadership in ERP implementation. *Decision Support Systems*, 45(2), 208–218.
- Kemp, M. J., & Low, G. C. (2008). ERP innovation implementation model incorporating change management. *Business Process Management Journal*, 14(2), 228-242.
- Ko, D. G. (2014). The mediating role of knowledge transfer and the effects of client-consultant mutual trust on the performance of enterprise implementation projects. *Information and Management*, 51(5), 541–550.
- Ko, D. G., Kirsch, L. J., & King, W. R. (2005). Antecedents of knowledge transfer from consultants to clients in enterprise system implementations. *MIS quarterly*, 59-85.
- Koch, C. (2001). BPR and ERP: Realising a Vision of Process With IT. *Business Process Management Journal*, 7(3), 258–265.
- Koh, S. C. L., Gunasekaran, A., & Cooper, J. R. (2009). The demand for training and consultancy investment in SME-specific ERP systems implementation and operation. *International journal of production economics*, 122(1), 241-254.
- Krumbholz, M., Galliers, J., Coulianos, N., & Maiden, N. A. M. (2000). Implementing enterprise resource planning packages in different corporate and national cultures. *Journal of Information Technology*, 15(4), 267–279.
- Lee, J. C., & Myers, M. D. (2004). Dominant actors, political agendas, and strategic shifts over time: A critical ethnography of an enterprise systems implementation. *Journal of Strategic Information Systems*, 13(4 SPEC. ISS.), 355–374.
- Lee, Z., & Lee, J. (2000). An ERP implementation case study from a knowledge transfer perspective. *Journal of Information Technology*, 15(4), 281–288.
- Leonardi, P. M. (2011). When flexible routines meet flexible technologies: Affordance, constraint, and the imbrication of human and material agencies. *MIS quarterly*, 35(1), 147-167.
- Loonam, J., & McDonagh Joe. (2005). Exploring Top Management Support for the Introduction of Enterprise Information Systems : A Literature Review. *Irish Journal of Management*, 1(26), 163–178.
- Lyytinen, K., & Newman, M. (2015). A tale of two coalitions - marginalising the users while successfully implementing an enterprise resource planning system. *Information Systems Journal*, 25(2), 71–101.
- Martin, T. N., & Huq, Z. (2007). Realigning Top Management’s Strategic Change Actions for ERP Implementation: How Specializing on Just Cultural and Environmental Contextual Factors Could Improve Success. *Journal of Change Management*, 7(2), 121–142.
- Mayère, A., Grabot, B., & Bazet, I. (2008). The Mutual Influence of the Tool and the Organisation. In *ERP Systems and Organisational Change* (pp. 1-11). Springer London.
- McDonagh, J. (2016). Why Change Programmes Don’t Produce Change: The Case of IT-Enabled Change in Public Service Organisations. In *Project Management: Concepts, Methodologies, Tools, and Applications* (pp. 2095–2116).
- Morton, N. A., & Hu, Q. (2008). Implications of the fit between organizational structure and ERP: A structural contingency theory perspective. *International Journal of Information Management*, 28(5), 391–402.
- Nah, F. F. H., Lau, J. L. S., & Kuang, J. (2001). Critical factors for successful implementation of enterprise systems. *Business Process Management Journal*, Vol, 7(3), 285-296.

- Nandhakumar, J., Rossi, M., & Talvinen, J. (2005). The dynamics of contextual forces of ERP implementation. *Journal of Strategic Information Systems*, 14(2), 221–242.
- Nazemi, E., Tarokh, M. J., & Djavanshir, G. R. (2012). ERP: A literature survey. *International Journal of Advanced Manufacturing Technology*, 61(9–12), 999–1018.
- Noudoostbeni, A., Yasin, N. M., & Jenatabadi, H. S. (2009, April). A mixed method for training ERP systems based on knowledge sharing in Malaysian Small and Medium Enterprise (SMEs). In *Information Management and Engineering, 2009. ICIME'09. International Conference on* (pp. 244–247). IEEE.
- Ojala, M., Vilpola, I., & Kouri, I. (2006). Risks and risk management in ERP Project-cases in SME Context. *Proceedings of 9th International Conference on Business Information Systems (BIS 2006)*, (August 2016), 179–186.
- Pairat, R., & Jungthirapanich, C. (2005). A Chronological Review of ERP Research : An Analysis of ERP Inception , Evolution , and Direction. In *IEEE International Engineering Management Conference, 2005.* (pp. 288–292).
- Pollock, N., & Cornford, J. (2004). ERP systems and the university as a “unique” organisation. *Information Technology & People*, 17(1), 31–52.
- Robey, D., Ross, J. W., & Boudreau, M. (2002). Learning to Implement Enterprise Systems : An Exploratory Study of the Dialectics of Change. *Journal of Management Information Systems*, 19(1), 17–47.
- Rockart, J. F. (1979). Chief executives define their own data needs. *Harvard Business Review*, 81–94.
- Rose, J., & Schlichter, B. R. (2013). Decoupling, re-engaging: managing trust relationships in implementation projects. *Information Systems Journal*, 23, 5–33.
- Rothenberger, M. A., Srite, M., & Jones-Graham, K. (2010). The impact of project team attributes on ERP system implementations: A positivist field investigation. *Information Technology & People*, 32(1), 80–109.
- Sammon, D., & Adam, F. (2010). Project preparedness and the emergence of implementation problems in ERP projects. *Information & Management*, 47, 1–8.
- Santamaria-Sanchez, L., Nunez-Nickel, M., & Gago-Rodriguez, S. (2010). The role played by interdependences in ERP implementations: An empirical analysis of critical factors that minimize elapsed time. *Information & Management*, 47, 87–95.
- Sarker, S., & Lee, A. S. (2003). Using a case study to test the role of three key social enablers in ERP implementation. *Information & Management*, 40, 813–829.
- Sasidharan, S., Santhanam, R., Brass, D. J., & Sambamurthy, V. (2012). The Effects of Social Network Structure on Enterprise Systems Success : A Longitudinal Multilevel Analysis The Effects of Social Network Structure on Enterprise Systems Success : A Longitudinal Multilevel Analysis. *Information Systems Research*, 23.
- Saxena, D., Dempsey, B. & McDonagh, J. (2016). *Beyond the One-dimensional Construct of Failure: The Curious Case of Enterprise System Failure Rates*, UK Academy of Information Systems Conference 2016, Oxford
- Saxena, D. & McDonagh, J (2016). *Critical Realism as an Underlying Philosophy for Explaining Technology-Mediated Change Processes*. British Academy of Management Conference 2016, Newcastle University

- Sedmak, M. (2006). *The role of communication in enterprise system implementation*. PhD Thesis, Cranfield University
- Shaul, L., & Tauber, D. (2013). Critical Success Factors in Enterprise Resource Planning Systems : *ACM Computing Surveys*, 45(4).
- Sheu, C., Chae, B., & Yang, C. L. (2004). National differences and ERP implementation: issues and challenges. *Omega*, 32(5), 361-371.
- Sia, S. K., & Soh, C. (2007). An assessment of package – organisation misalignment : institutional and ontological structures. *European Journal of Information Systems*, 16, 568–583.
- Soh, C., & Sia, S. K. (2004). An institutional perspective on sources of ERP package – organisation misalignments. *Strategic Information Systems*, 13, 375–397.
- Somers, T. M., & Nelson, K. G. (2004). A taxonomy of players and activities across the ERP project life cycle. *Information & Management*, 41, 257–278.
- Sumner, M. (2000). Risk factors in enterprise-wide / ERP projects. *Journal of Information Technology*, 15, 317–327.
- Sykes, T. A. (2015). Support structures and their impacts on employee outcomes: A longitudinal field study of an enterprise system implementation. *MIS Quarterly*, 39(2), 473–495.
- Sykes, T. A., Venkatesh, V., & Johnson, J. L. (2014). Enterprise system implementation and employee job performance: Understanding the role of advice networks. *MIS Quarterly*, 38(1), 51–72.
- Tsai, W. H., Shaw, M. J., Fan, Y. W., Liu, J. Y., Lee, K. C., & Chen, H. C. (2011). An empirical investigation of the impacts of internal/external facilitators on the project success of ERP: A structural equation model. *Decision Support Systems*, 50(2), 480-490.
- Van de Ven, A. H., & Poole, M. S. (1995). Explaining development and change in organizations. *Academy of management review*, 20(3), 510-540.
- Velcu, O. (2010). Information & Management Strategic alignment of ERP implementation stages: An empirical investigation. *Information & Management*, 47(3), 158–166.
- Volkoff, O., Elmes, M. B., & Strong, D. M. (2004). Enterprise systems , knowledge transfer and power users. *Strategic Information Systems*, 13, 279–304.
- Volkoff, O., & Strong, D. M. (2013). Critical Realism and Affordances: Theorizing IT-Associated Organizational Change Processes. *MIS Quarterly*, 37(3), 819-834.
- Wagner, W., & Antonucci, Y. L. (2009). The ImaginePA Project : The First Large-Scale, Public Sector ERP Implementation. *Information Systems Management*, (26), 275–284.
- Wagner, E. L., & Newell, S. (2004). “Best” for whom?: the tension between “best practice” ERP packages and diverse epistemic cultures in a university context. *Strategic Information Systems*, 13, 305–328.
- Wagner, E. L., & Newell, S. (2007). Exploring the Importance of Participation in the Post-Implementation Period of an ES Project : A Neglected Area. *Journal of the Association for Information Systems*, 8(10), 508–524.
- Wagner, E. L., Newell, S., & Piccoli, G. (2010). Understanding project survival in an ES environment: a sociomaterial practice perspective. *Journal of the Association for Information Systems*, 11(5), 276.
- Wagner, E. L., & Piccoli, G. (2007). Moving beyond user participation to achieve successful IS design. *Communications of the ACM*, 50(12), 51-55.

- Wainwright, D. W., & Shaw, C. S. (2013). Modernising pathology services : modelling effective IT project collaboration. *International Journal of Public Sector Management*, 16(4), 268–282.
- Wei, H., Wang, E. T. G., & Pei-Hung Ju. (2005). Understanding misalignment and cascading change of ERP implementation : a stage view of process analysis. *European Journal of Information Systems*, 14, 324–334.
- Weston, F. (2001). ERP implementation and project management. *Production and Inventory Management Journal*, 42(3/4), 75.
- Williams, J., Williams, M. D., & Morgan, A. (2013). A teleological process theory for managing ERP implementations process theory. *Journal of Enterprise Information Management*, 26(3), 235–249.
- Willis, R., & Chiasson, M. (2007). Do the ends justify the means?: A Gramscian critique of the processes of consent during an ERP implementation. *Information Technology & People*, 20(3), 212–234.
- Xu, L., Tan, W., & Zhen, H. (2008). An approach to enterprise process dynamic modeling supporting enterprise process evolution. *Information Systems Frontiers*, 10, 611–624.
- Young, R., & Jordan, E. (2008). Top management support: Mantra or necessity?. *International Journal of Project Management*, 26(7), 713–725.
- Zafeiropoulos, I., Metaxiotis, K., & Askounis, D. (2005). Dynamic risk management system for the modeling, optimal adaptation and implementation of an ERP system. *Information Management & Computer Security*, 13(3), 212–234.