

An Integrated Innovation and Risk Management Framework for the ICT Industry

Full Paper

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Abstract

Innovation and risk management may seem contradictory: the former seeks to encourage flexibility to stimulate new ideas while the latter can be seen as stifling such innovative thinking. However, the high failure rate of innovations implies that organisations could benefit from more structured innovation approaches, using risk management. The research objective was to establish what risk and innovation factors could inhibit or stimulate more efficient products and service delivery to customers in a highly innovative industry. Action research was conducted over several years in a large organisation operating in a high-technology environment that launches many diverse products and services. A generic and empirically validated integrated Innovation and Risk Management Framework (IRMF) is proposed to guide new product and service development by considering both best practices and risks. Additionally, key risks believed to be typical for many organisations in the ICT-industry were identified in the case organisation.

Keywords

Innovation, Risk Management, Action Research, Framework, Service Innovation.

Introduction

Innovation is a key driver of successful sustainable organisations and a primary indicator of organisation performance and an important source of revenue generation, especially in the ICT industry (Crossan and Apaydin, 2010). However, despite the considerable investment, consumer innovations are subject to an 80% failure rate (Cooper and Brentani, 1991). The risk profile of a New Product and Service Development (NPSD) is elevated due to pressures introduced by competitive and time pressures, new technology, IS development risks and changing business models. Success in new P&S launch can be increased by dealing effectively with risk i.e. introducing proper Risk Management (RM) (Oehmen, et al. 2010). Whilst the study of innovation is becoming increasingly popular, several areas remain under-researched. The launch of services (rather than products) is understudied (Evanschitzky, et al. 2012); comprehensive frameworks for managing risks in innovation are scarce (Yen, et al. 2012); and few studies exist on how RM can effectively be introduced into a P&S environment (Oehmen, et al. 2010).

The main research objective of this research was to create a detailed, comprehensive and practical Innovation and Risk Management Framework (IRMF) grounded in the academic literature but empirically refined and validated using an expansive empirical bases. A secondary research objective is to apply the IRMF to the industry as a whole and identify the primary risks facing NPSD in a typical ICT organisation.

This objective was achieved by privileged position, intensive five-year formal Action Research (AR) intervention inside a large telecommunications company. Interventions were implemented over three cycles with over 160 new services being launched annually. The research should be of practical relevance to innovation-driven organisations by bridging the disconnection gap between research and practice (Sein, et al. 2011). The objective is to assist organisations in being more proactive and effective in addressing the challenges of NPSD. The innovation and risk literature is used to establish best practices and risks in NPSD and three AR cycles led to a proposed comprehensive and practical framework which can be used as guidance for ICT organisations. This research enhances academic IS knowledge by obtaining a deeper understanding of how IS, RM, NPSD and human elements influence NPSD decisions. This study also confirms and advances the interdisciplinary nature of IS by integrating literature from several reference

disciplines, including risk management, new product/service development and innovation in an ICT context (Ives, et al. 1980).

Literature Review

A comprehensive definition of innovation is given as the 'iterative process initiated by the perception of a new market and/or service opportunity for a technology-based intervention which leads to development, production and marketing tasks striving for the commercial success of the invention' (Garcia and Calantone, 2002, p. 112). An invention becomes an innovation only when it was successfully introduced in the marketplace. Services differ from products in terms of the 'IHIP' characteristics, namely: Intangibility; Heterogeneity; Inseparability of service from the supplier; and Perishability (Parry, Newnes and Huang, 2011). While there is no consensus that research on tangible products can be generalised to service contexts, the synthesis approach is mainly followed by service innovation studies on the assumption that the underlying critical success factors are similar but that the importance of the dimension fluctuate depending on whether it is a product or service (Spohrer and Maglio, 2008). Viewing P&S as combined systems delivers more value to the customer and offers potential for designing innovative combinations (Parry et al. 2011).

Innovation researchers have grouped product innovation success factors in various dimensions and generally cannot agree on the dimensions or the variables of the dimensions. The researchers followed the four-dimensional framework of Montoya-Weiss and Calantone (1994) consisting of 'strategic, market-environment, development process and organisational factors', despite later expansion of Szymansky and Henard (2001) to include product characteristics and Kahn, et al. (2006) added an additional dimension 'learning' while Barczak and Kahn (2012) created a distinct commercialisation dimension.

Supporting Factors Essential for Innovation

A *strategy* that focus on innovation determines how the organisation will compete by means of NPSD plans (Dyers and Song, 1998), considers organisational competencies and indicates how resources, including market, technology, human resources and research and development (R&D) activities will be aligned to address the competitive marketplace (De Brentani, et al. 2010). An effective strategy is a primary determinant of NPD performance (Cormican and Sullivan, 2004) and the second-most important indicator of a successful NPD programme (Cooper, et al. 1998).

Portfolio management is a key theme that emerges from strategy (Cormican and O'Sullivan, 1991). While organisational strategy focuses on the organisation-wide choices to compete in a market, portfolio management has a narrower focus within the NPSD organisation to evaluate and select strategic NPD projects in terms of how well they contribute to the overall objectives and strategy of the organisation. Less than 21% of organisations consider portfolio management to be well executed (Cooper, et al. 2002). Portfolio management could be even more important for service innovation due to the rapid consumption of resources during the innovation process (Crossan and Apaydin, 2010).

Market orientation refers to understanding the competitor and target market opportunities (and risks) as well as key stakeholder and customer needs to enable effective design, communication, marketing and promotion of the product (Evanschitzky, et al. 2012). Three key themes underlie the market dimension: (1) understanding of the market and competitive environment; (2) mindfulness of customer and stakeholder needs; and (3) marketing activities (Evanschitzky, et al. 2012). For services, a good understanding of the market has been found to be a critical success indicator since inadequate research into customer needs and limited market testing can lead to a lack of customer acceptance (Edvardsson, et al. 1995). Understanding the market and customers are also, in effect, risk reduction strategies.

A robust *NPD innovation process* allows product, project, financial and other supporting activities to be performed proficiently to ensure a quality P&S. Aligning to an efficient NPD process is considered critical to ensure successful innovation (Szymanski and Henard, 2001). Cooper (2004) considers a formal NPD process as the main predictor of whether a product will be successful. It is however estimated that between 21% of organisations do not adhere to formal NPD processes (Cooper et al. 1999) whilst Adams-Bigelow (2004) suggests that as many as 60% of organisations do not adhere to formal stage/gate processes. A

formal NPD process has distinct stage/gate processes with milestones, checkpoints and stop/go decision points (Cooper, 2001). Retaining valuable information during the various projects that simultaneously take place requires effective Knowledge Management (KM) (Pitt and Clarke, 1999). For service development, it was established that a structured development process is even more beneficial (De Brentani, 1995).

An *organisational culture* that is supportive of a climate of innovation fosters a favourable work environment, by supportive leadership, encouraging open communication, cross-functional teamwork and sufficient allocation of resources to support the product during its entire NPD lifecycle (Cormican and O'Sullivan, 2004). Senior management support in promoting innovation is an important indicator of innovativeness (Crossan and Apaydin, 2010). Skilled resources stimulate successful NPD (Cormican and O'Sullivan, 2004). The propensity to take risks is also a key factor in service innovation (Yen et al. 2012).

Risk Management

The ISO 31000 RM standard (2009, p. 9) defines risk as the 'effect of uncertainty on objectives'. Not only does this include uncertainty caused by ambiguity and lack of information, it also infers that risk can introduce both positive and negative impacts on objectives. The IS literature traditionally has a more negative view of risks, focusing on negative outcomes (Barki, et al. 2001). When only negative risks are considered the idea that an organisation needs to take on risks in pursuit of its objectives is overlooked.

The risk studies in NPD have several shortcomings and often contain a limited number of dimensions (Barczak and Kahn, 2012) and a small subset of NPSD risks (Oehman, et al. 2010) and cannot be considered to offer a comprehensive view. Lyytinen, et al. (1998, p. 234) states that IS: "...lack systematic frameworks to organise risk assessments and to generate risk resolution tactics". Four classical IS risk approaches exist: the Alter and Ginzberg (1978) implementation approach, McFarlan (1982) portfolio approach, Davis (1982) contingency approach and Boehm (1991) software risk approach. Lyytinen, et al. (1998) finds key differences between these approaches in terms of how they define the concept of risk and focus on risk items and resolution items. There are six widely used RM standards but the framework supporting this study is ISO 31000 since Olechowski, et al. (2012) has shown its effective application to the NPSD process.

The four dimensions that contribute to successful P&S (strategy, market, process and organisation) represent the best use of opportunities. Two additional dimensions are presented as a result of the risk review: (1) technology, and (2) risk management (and governance).

An inadequate understanding of the technology supporting the P&S, especially if the P&S is principally dependent on this technology, can lead to major risks (Keizer, et al. 2002). The use of unproven, inflexible and slow technologies can inhibit innovation (Leithead, 2000). The main risk of obsolescent technologies is that they could prevent the delivery of functionality to satisfy the sophisticated demands of customers (Davis, 2002). Innovative technology requires more technical knowledge and capabilities to reduce risks (Olechowski, et al. 2012). Changes to existing technology introduce additional uncertainties (Leithead, 2000). Technology resources are severely impacted when multiple simultaneous NPSD projects take place, seen as operating in the 'suicide-square' where high levels of uncertainty exist on multiple fronts (McDermott and O'Connor, 2002). Technology risks are also introduced by poorly integrated systems, software threats and technical solution design risk (Lyytinen, et al. 1996).

Olechowski's, et al. (2012) study indicates a strong relationship between effective Risk Management (RM) and overall P&S performance. Wider risks should be considered, including public perception regarding the accepted social values such as health, safety and the environment (Keizer, et al. 2002). Further risks include legal risks and Intellectual property (IP) risks (Nada, et al. 2010). The regulatory environment could impact on the probability of commercial success within a market (Ali-Qureshi and El Maraghy, 2011).

Research Approach

The Action Research (AR) approach used was based on Iversen's et al.'s (2004) methodology, consisting of: (1) an iteration phase during which the researchers conducted literature reviews, collaborated with risk practitioners to understand the problem situation and select the risk approach that guided the

interventions that were delivered during the iteration; (2) an iteration phase during which planned actions, including the development of an Integrated Risk Management Framework (IRMF) and risk processes and supporting artefacts, were applied and evaluated. These activities took place in three cycles; and (3) a closing phase, consisting of an exit, assessment of usefulness and research results. The researchers, in collaboration with practitioners reflected on the IRMF, the risk interventions and the risk processes implemented. The findings are reviewed collaboratively and are empirically validated. The AR study conformed to a comprehensive list of assessment criteria specified by Lau, 1999; Mathiassen, 2002; Iversen, et al. 2004.

The research organisation is a large mobile communications operator that provides converged solutions to both consumer and business customers in various African countries in a highly competitive market. The organisation is an early adopter of leading-edge technologies and also the innovator of various telecoms P&S that have been adopted worldwide. The organisation has also expanded to new markets with ventures such as mobile health, insurance, financial services and mobile money services. At the start of the AR cycles, a lack of formal NPSD development existed intensified by high-risk tolerance. The CEO bestowed a written mandate authorising risk practitioners to stage problem interventions and prevent the launch of P&S, which served as an expansion of the researcher-client agreement, a fundamental criterion to support effective AR. The objective of the transformation process was to seek improvement in the NPSD organisation. The lead author was in charge of the risk management unit and thus enjoyed a unique AR status and privileges.

The risk approaches were selected at full-day sessions, held off-campus utilising brainstorming and Delphi techniques. Three AR cycles took place in an iterative manner. The risk framework developed during the literature review was expanded and several additional second-level constructs were introduced based on risk incidences arising during the AR iterations. The IRMF was enhanced with each subsequent cycle. New knowledge was continually introduced as new risk strategies, such as methods to prioritise P&S, emerged. Risk incidences that informed the framework and risk lists were gathered from incidents, surveys and interviews conducted with NPSD practitioners and post-implementation reviews performed by risk practitioners. The applied interventions were evaluated during collaborative experiences. Apart from the IRMF, another artefact was produced, namely a risk management dashboard. This contribution is detailed elsewhere (Joubert & Van Belle, 2016).

The study is based on a unique, huge, real set of observations: more than 160 projects each year for 5 years eventually covering virtually the entire portfolio of new products and services delivered by this large, multinational telecoms operator, including technology-diverse P&S to the consumer, business, financial services, insurance, m-health, e-commerce and m-commerce applications, accounting for billions in turnover. The organisational context expanded gradually during the iterations: initially the IRMF was only applied to the B2C organisation. The context of NPSD increased to encompass B2C during AR iteration two and ultimately during iteration three, to financial services and general IT/IS projects too. The first two iterations closed with interviews and questionnaires with NPSD practitioners. Valid inferences were first drawn from the qualitative and quantitative data separately and then the findings were merged to validate the second order constructs employing methods of bracketing and bridging (Venkatesh, et al. 2013).

Innovation and Risk Management Framework (IRMF)

The IRMF is a functional, flexible and consolidated reference framework categorised according to business activities that produce P&S. The IRMF has three objectives: (1) to be as comprehensive as possible; (2) introduce flexibility according to P&S types, the NPSD lifecycle and business activities performed by the organisation and (3) provides for actionable, efficient NPSD implementations that can be used for learning and improvements in the organisation. The framework is explained with the assistance of Figure 1. The framework has eight elements presented in a cohesive, supported structure. For large high-risk projects, insufficient attention to any one of the components may impact on the structural integrity and lead to risks not being realised or improvement opportunities not exploited. The high-level constructs of the framework are subsequently discussed.

- *Product and Service Portfolio Classification*: During the AR practice, a P&S portfolio classification was designed featuring four main classifications for P&S as ‘new market, new venture, enhancement and

new development’. This categorization determines the type of risk assessment strategy that would be applied, as well as the significant risk factors.

- **Strategy, Market, NPSD functions and ICT:** These four high-level constructs are the main operational constructs of NPSD. Each high-level construct has associated second-level constructs, which can be flexibly combined according to the requirements of the NPSD lifecycle as well as the unique characteristics of the P&S.
- **Organisational Culture:** Culture was validated as an important component of NPSD during the literature review. It is indicated as a high-level construct that permeates the whole IRMF and influences all NPSD activities.
- **Governance, Risk Management and Compliance (GRC):** GRC informs all NPSD deliverables and was predominantly based on incidences arising from the AR cycles, but in some cases was also validated by the risk literature. New Product and Service Development Lifecycle: New risks and opportunities could materialise during subsequent phases of the NPSD lifecycle.

The contents of the lengthy framework provide the second-level constructs as aligned to the high-level constructs, definitions and objectives of constructs, provide generic risks as the basis for developing risk lists and risk strategies as well as offer particular risks that are more relevant to the development of physical products, consumer services and business services respectively.



Figure 1. Innovation and Risk Management Framework (IRMF)

The detailed IRMF sub-dimensions and risk evaluation

A more detailed overview of the 23 sub-dimensions of the framework is given in Table 1. Given that the final framework covers more than 40 pages, the discussion is summarized in a tabular format. Only the 9 sub-dimensions marked with * were a result of the literature review; the others emerged from the action research.

Framework sub-dimensions	Risk evaluation
Organisational strategic alignment*	Evaluates how well the P&S are aligned with the organisation strategy in terms of aligning to projects that differentiate the organisation from the competition and enable them to effectively compete in the marketplace.
Portfolio management*	Evaluate effectiveness of portfolio selection of P&S that most effectively invest NPSD resources to achieve the organisational strategy ensuring that sufficient capacity exist in terms of

Framework sub-dimensions	Risk evaluation
	resources, funding and time.
Competitor and Marketplace*	Consider proactive understanding of competitor activity and market potential by driving market leadership and responsiveness. Targeted and informed identification of particular market segment.
Customer*	Research superior understanding of the customer needs within the market segment and translating these requirements into valuable customer functionality while considering any potential risk impacts.
Marketing* and Sales	Assess marketing and sales strategy ability to promote the objective of the P&S by effectively targeting and promotion to the intended market, by utilising effective marketing and communication channels.
Investors and stakeholders	The risk evaluates the extent to which key stakeholders have been identified that may have a significant influence on the P&S and strategies considered to proactively foster enabling relationships and turn detractors into assets.
Public Relations and Communications	The risk evaluates the extent to which public relations are adequately prepared to communicate new P&S releases to stakeholders and can respond timeously to reputational risks.
Product Management*	The product performance and the extent to which the product manager facilitate effective P&S performance throughout all the NPSD lifecycles.
Project* and Knowledge management	Conformance of individual projects to best practices whilst applying KM to retain best practices and knowledge for the to improve future P&S.
Financial Management*	The extent to which the financial analysis and management of the P&S are adequately performed to correctly understand the cost elements, revenue advantages & commercial viability derived from the implementation of the P&S.
Business model and value chain	Understand the value propositions of business models and value chains with the objective of creating value for customers and organisation to generate profitable and sustainable delivery channels and revenue streams.
External providers	Management of the business relationship with external providers to ensure adequate service delivery and continuous support of the P&S during NPSD lifecycle and after implementation.
Customer Relationship Management	The risk evaluates the extent to which customer relationship management (CRM) strategies are applied and customer interactions are planned to adequately and optimally service the client.
Business rules, Pricing, Revenue Assurance	Define and maximise value derived from business rules and the most suitable pricing strategy is applied. Consider exposure to revenue leakages by ensuring accurate billing for transactions, in accordance with contracts and tariff plans.
Business processes	The risk evaluates the extent to which adequate management, operational and support processes have been defined and conform to best practises including the NPSD process.
Commercialisation	The risk evaluates the extent to which the total solution was adequately tested and includes activities intended to take the P&S to the market including testing.
ICT Security	The risk evaluates the extent to which the organisations data and information are protected and ensures potential vulnerabilities are adequately mitigated.
ICT Solution Development and Maintenance	The risk evaluates the extent to which the technical implementation of the solution conforms to the documented business requirements to ensure the P&S performs as intended extending its useful lifecycle.
ISO ICT Standards Conformance	The risk evaluates the extent to which capacity and BCM, IT/IS service level management, control and release policies and procedures are in place and conform to best ICT standards.
Legal & Regulatory Compliance*	Compliance with external laws and regulations that govern the organisation including anticipation of future changes in the external legal and regulatory environment.
Privacy	Protection of customer's right to privacy, including personal information and confidential communications and considering of privacy risk exposures to consumers.
Governance	Existence of sound governance principles including ethics and application of responsible practices towards people, planet and profit (3Ps); Corporate Social Responsibility (CSR).
Fraud, AML & security	Extent that potential fraud, AML and security implications for the P&S are identified and mitigated to secure the interest of the organisation, assets and information.

Table 1. High-level overview of sub-dimensions of the IRMF

Case study findings

The second research question requested identification of the primary risks facing NPSD within an ICT industry. Since there are too many to list here, only the most significant findings are summarised in table 2, using the six high-level constructs of the IRMF.

High-level construct	Risks
Organisation culture	Leadership concerns Lack of clear strategy Not creating an innovative environment Reward structures not linked to drive innovation performance Organisational restructuring
Strategy and Portfolio Management	Lack of tools and robust criteria for portfolio management Too many projects / lack of focus / work overload Lack of innovation and uncompetitive
Market Orientation	Shareholder interests both opportunities and constraint Reputational risk incidences especially pertaining to price-sensitivity Extensive customer participation
Innovation process	Lack of product and project managers with strong ICT experience No robust criteria for measuring project performance Project managers unable to influence projects Lack of best PM practices Inability to cost service development and financial viability analysis. Lack of KM leading to lost opportunities and not learning The P&S process drives quantity not quality Not having reliable external providers to provide quality services on time. Not analysing risk in tenders' especially unprofitable long-term contracts.
Information and Communications Technology	Technology support in service development is underestimated. Not having a single view of customer or targeted market information due to insufficient data warehousing and data mining Supporting systems and processes being deficient due to lack of automation Poor quality service due to poor testing and insufficient technology testing environment. Privacy incidences due to lack of technology security controls not entrenched. Technology development, architecture and platform design risk, systems integration, legacy systems, inflexible systems, scalability, lack of adherence to change control and release processes Incomplete functional specifications Not entrenching technology security during systems development cycle Skills development to support new technologies
Governance, Risk and Compliance	Regulatory compliance drives technology procurement Not understanding risks related to new technology such as IoT Lack of awareness of Fraud, CML and security Lack of knowledge from NPSD teams regarding risk and compliance Reactive and forced compliance at a minimum compliance level

Table 1: Risks facing NPSD grouped according to IRMF high-level constructs

Innovation practitioners do not agree on the relative importance of dimensions (Cooper and Kleinschmidt, 1995; Kahn, et al. 2012). In this study, the high-level construct of 'process' was listed as the biggest concern of NPSD practitioners. It can be assumed that the importance of the dimensions changes according to the maturity and requirements of the organisation. From the researchers' experience, 'organisational culture' could be the most important high-level construct as it influences all of the other constructs.

Conclusion

This research highlighted the complexity of innovation and presents the requirements to have an organising framework that will support innovation but is sufficiently flexible to cater for diverse needs. We presented a detailed IRMF that can be used "off-the-shelf" by companies operating in innovating ICT

companies. The integrated IRMF was grounded in an extensive literature basis but has been empirically refined, extended and validated following a sound AR practice and is grounded in more than 500 new B2B and B2C service innovations and hundreds of interviews. It provides a theory-grounded approach to assessing risks and opportunities by succeeding to operationalize the academic literature. The framework allows the examination of the different characteristics of P&S and provides support for analysing the contextual changes that take place during the NPSD lifecycle. The framework acknowledges the complexity of NPSD and presents a logically coherent, yet comprehensive structure, to assess risks enhancing the chances of P&S to reach their stated objectives.

Recommendations for Developing Organisational Innovation Capabilities

The following suggestions can support high-technology service organisations to be more effective at innovation. Leadership should set the tone for following best practices in NPSD. Appoint executives that will relentlessly drive a culture of innovation and commit to best NPSD practice. This can be achieved by linking performance of teams to best NPSD practices allowing for the formalisation of KPIs that can be applied across the business. Executive management should be disciplined and brave to institute robust portfolio management practices to establish true focus in the organisation by reducing the number of projects and focus on quality. Additionally, free-up resources by retiring non-performing P&S. Invest in technology that can support NPSD to drive strategy and increase performance. These include workflows, KM systems, and Data Mining. Any manual processes need to be examined for associated risk. Exploit customer understanding (within a framework of privacy) to drive innovation. Applying KM practices can save time and cost and prevents reinventing the wheel. Innovation requires time: to unlock innovation capacity, allow employees free time and resources to experiment with new ideas and business models. Do not only focus on the immediate service but also, the supporting environment to improve efficiencies such as supply chain and business processes. Follow a robust but flexible NPSD process customised according to the risk profile and type of P&S according to a comprehensive framework as recommended in this paper. Ensure that technology skilled resources are appointed in NPSD, including risk practitioners. Exploit opportunities in compliance and do not only focus on the negative side of risk. Having a defined framework that considers both opportunities and risks, will improve the capability of the organisation to deliver improved P&S. It seems that most organisations only pay lip service to best practices in innovation and RM.

Generalizability of the Framework

Generalizability (or transferability) refers to the extent to which the research can claim to be of practical value to other organisations. It must first be noted that the study was based on a huge number of real-world observations, more than 800 projects over 5 years, and was conducted in an ICT organisation that launches technology-diverse P&S to the consumer, business, financial services, insurance, m-health and m-commerce applications. The research has also been applied in other countries in which the organisation operates, and is based on existing bodies of knowledge based on innovation and RM. These are all criteria that support the argument for generalisation of studies. The study furthermore complies with an internationally recognised risk standard that introduces further elements of transferability. Thus the IRMF can provide a generic platform from which more customised frameworks can be developed. Smaller organisations than the one under study would not have access to specialised risk resources, but the framework also allows the flexibility of consolidating second-level constructs to reflect the context of particular organisations.

Limitations and Future Study Opportunities

Organisational Culture needs further research in particular how to foster an innovation culture within the organisation. Some of the new second-level constructs introduced by the research require additional exploration and validation, such as shareholder and stakeholder risks, reputational risk and providing valid costing assumptions that guide complex, multifactorial, integrated, multi-disciplined and technology systems development and integration aspects is required. Developing cooperative structures between business partners and external providers could lead to more innovative business models. In particular, IoT innovations will be driven by business model innovation.

This study acknowledges that the contribution of KM and its associated advantages are underestimated in NPSD. CRM has not received much attention from the innovation literature, either. It is probable that short-term, P&S restricted views will not deliver sustainable competitive advantages. While the NPSD process has received much attention in NPSD literature, other supporting processes that could stifle innovation have not been researched. The integration of Business Process Reengineering (BPR) with development practices of NPSD can deliver competitive advantages to a service organisation. Technology support for NPSD activities has also been neglected. Further research is necessary for supporting green IT projects during NPSD. Such frameworks will guide developments from a business perspective and provide a holistic risk and opportunity analysis and encourage systemic thinking about opportunities.

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