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Authors	Doyle, Eleanor;McGovern, Damien;McCarthy, Stephen;Perez-Alaniz, Mauricio
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Compliance-Innovation: A Quality-Based Route to Sustainability [PRE PRINT VERSION]

Eleanor Doyle*[a,b], Damien McGovern[c], Stephen McCarthy[d], and Mauricio Perez-Alaniz[e].

* corresponding author

[a] Competitiveness Institute, Department of Economics, University College Cork, Cork T12 T656, Ireland. E: e.doyle@ucc.ie.

[b] Environmental Research Institute, University College Cork, Cork, Ireland.

[c] Founder/Director, Compliance and Risks, Unit 9 Eastgate Avenue, Eastgate Business Park Little Island, Cork, Ireland.

[d] Department of Business Information Systems, University College Cork, Cork, Ireland.

[e] Department of Economics, Kemmy Business School, University of Limerick, Limerick, Ireland.

Abstract

The areas of Governance, Risk and Compliance (GRC) and innovation are under-explored in research generally, and specifically in sustainability-oriented research. In this paper we propose a practice-based concept of *Compliance-Innovation* and set out its significance for sustainability. Development of the concept is based on a literature review and exploratory qualitative research with eighteen practitioners. The concept acknowledges the central role of knowledge integration across business domains as the basis of modern competitive advantage. The absence of such integration in the GRC and innovation domains, revealed in practice, opens opportunities. The governing force for such integration is presented here as sustainability, when applied as a strategic orientation for business. We outline how the integration of GRC and innovation domains drive commercial exploitation for *environmental sustainability* and *business sustainability*. Building on the concept of *Absorptive Capacity* we identify both external and internal sources of knowledge as determinants of organisation's selected sustainability goals, which are relevant across the phases of organizations' innovation activities throughout its *Innovation Value Chain*. We argue that a quality-based orientation is necessary to derive value from the networks employed in applying the concept in practice.

Keywords: sustainability; absorptive capacity; innovation value chain; quality.

Highlights:

- A concept integrating key knowledge contexts of Compliance and Innovation is presented
- The C-I concept integrates imposed regulations and strategic imperatives of business
- Linking Quality and the Innovation Value Chain permits bridging knowledge gaps

1 Introduction

Companies are increasingly conscious of corporate sustainability, from either environmental or social contexts, or both. In the wake of the financial crisis and ensuing global economic recession these pressures have intensified. Evidence from policy and research arenas is also clear with concepts of 'circular economy' and 'inclusive growth' identifying consumption and production systems that are in harmony with society and the environment (Corrigan et al. 2014; Piketty and Goldhammer 2014). A trade-off between environmental quality and economic growth no longer dominates research or policy narratives: now simultaneous targets are identified for growth, sustainability and societal development (Ambec et al., 2013; Porter and Van der Linde, 1995). Sustainability in this context is broadly defined: it is founded on an organization's ability to balance short-term and long-term needs of stakeholders (direct and indirect) through the sale of value-adding goods and services, which are produced in line with the earth's carrying capacity, and exert a maximum positive social impact (Nidumolu et al., 2009, Porter and Van Der Linde, 1995).

Ongoing increases in economic, environmental, and social regulation (e.g. Sarbanes-Oxley Act, Restriction of Hazardous Substances (RoHS), Registration, Evaluation, Authorisation and restriction of Chemicals (REACH), Waste electrical and electronic equipment (WEEE)) have brought Governance, Risk management, and Compliance (GRC) to the forefront of the sustainability agenda as it impinges on firms from external sources (Butler and McGovern, 2008; Dyllick and Hockerts, 2002; OCEG, 2012a). Simultaneously, Boards of Management and CEOs seek ways to increase internally-driven innovation and drive growth to ensure that competitiveness is maintained in dynamic marketplaces (Tzeng, 2009). Although links between GRC and innovation management are seldom made, we contend that a range of inter-linkages between GRC and innovation management point to untapped potential of organising sustainability-focussed business activities around such nodes. The first objective of our study is to delineate the challenges facing business separately around GRC and innovation, and the logic in bringing these concepts together around a sustainability theme. In our focus on the integration of these three areas, our work aligns with the system-based approach to research on sustainability-oriented-innovation identified in Calabrese et al., (2018).

We organise our integration of innovation and GRC around 'Absorptive Capacity' (AC) which relates all processes by which knowledge is acquired, assimilated, transformed, and exploited

by businesses (Cohen and Levinthal, 1990; Zahra and George, 2002). These knowledge-based activities occur across entire organizations to drive innovation and sustainability. In specifically bringing innovation and GRC activities together, AC designates intersections of three fast-moving business targets i.e. (i) new regulations (policy, law, standards) (ii) product/process evolution and (iii) evolving intra-organisational strategic and operational imperatives. The Compliance-Innovation concept we introduce explicitly includes both those externally imposed requirements, i.e. outside direct business control, and internally imposed requirements i.e. resulting from businesses' strategic choices. The second objective of the paper is to propose a practice-based concept, termed Compliance-Innovation, to inform both researchers and practitioners engaged in the design and adoption of systems and approaches to sustainability. We explain how processes enabling conformity with requirements, coupled with processes for commercialisation of knowledge, offer potential for business growth that is sustainable for business within broader social and environmental perspectives. The knowledge gap between manufacturing and service companies identified in Adams et al., (2015) is also addressed in our research as the concept of Compliance-Innovation has practical applicability for all innovating companies, whether manufacturing or service-based.

To achieve both research objectives, we undertook qualitative exploratory research. Based on a review of literature on GRC and innovation management we identified siloed structures as hindrances to perceiving the growth potential from compliance-practices (Albort-Morant et al., 2016). In exploring these aspects in business practice, we engaged in in-depth interviews with eighteen business practitioners (listed in Appendix A) all experienced professionals in GRC fields. The data for the present study was gathered using semi-structured one-to-one interviews of approximately two hours each using a mix of teleconferencing and telephone technologies. Follow-up email communications were used to elicit clarifications. A pragmatic perspective was adopted to the interpretation of data (Creswell 2003: Tashakkori and Teddlie, 1998). As applied by Ihde (1990), this approach gives primacy to the understandings of practitioners. In selecting the practitioners for interview a purposive or convenience sampling approach was used as interviewees with experience and authority were required for the research objectives. Interviewees with information-rich experience were necessary to share understandings of the strategic sustainability orientations of business, and how these related to GRC and innovation activities. The contexts of the interviewees across eighteen separate organisations provide a general rather than homogeneous background for the research (Berg and Lune, 2004). With access to practitioners' perspectives and their wealth of knowledge, substantial grounding of

our research in practical business contexts was facilitated. Therefore, while *Compliance-Innovation* is a conceptual development, it builds on the practice reality of managers actively engaged in addressing innovation and GRC challenges.

Our concept development proceeds in a set of structured elements. The first element directs attention to current paradigms at play in innovation and GRC domains. We identify in Section Two the mismatch between innovation management requirements and GRC practices. We conclude that available opportunities for growth are being overlooked and a move away from distinct GRC systems is required. The integrating concept of *Compliance-Innovation* offers actionable potential for such integration.

The nature and scope of our *Compliance-Innovation* concept is presented in Section Three which outlines how platforms such as Knowledge Management Systems (KMSs) can enhance organisations' AC for sustainability ends (Cohen and Levinthal, 1990; Zahra and George, 2002; Vallance et al., 2011). We proceed in Section Four to outline the specific channels through which *Compliance-Innovation* is enacted within an organization by focusing on innovation activities using the Innovation Value Chain (Hansen and Birkinshaw, 2007). We outline how competitive advantage may be secured through compliance-based innovation across the different innovation phases of idea generation, conversion and diffusion.

The concept of Quality is highlighted in Section Five as the unifying basis of *Compliance-Innovation*. We conclude by outlining that *Compliance-Innovation* is a transformational concept providing organizations with a means to develop stronger Innovation Value Chains through the integration of GRC, innovation and sustainability knowledge bases, in turn supporting commercialisation and business sustainability.

2 Limitations of GRC and Innovation Management Practice

2.1 Balancing the Upside and Downside of Risk

In the wake of the financial crisis and ensuing global economic recession, companies are increasingly conscious of risk management. Increases in economic, environmental, and social regulation (e.g. Sarbanes-Oxley Act, RoHS, REACH, WEEE) have brought compliance and

business sustainability to the forefront of the management agenda (Dyllick and Hockerts, 2002; Butler and McGovern, 2008). Monitoring and reducing risk and meeting compliance requirements are central activities in all areas of decision-making and the GRC function has become a focal point for these tasks.

In essence, risk management arises due to inherent uncertainty around future events and their associated probabilities of occurrence (Tarantino, 2008). Within companies, opinions diverge as to whether risk management should be opportunity (upside) or risk (downside) focused. A risk management survey carried out by KPMG (2011) suggests that CEOs tend to view risk as an opportunity while Boards and Risk Officers are more likely to view risk as a threat - to be reduced at all costs. Furthermore, 66% of respondents said their board "is unable to leverage risk information it receives to improve strategy" and risk management is often focused on a more operational level (KPMG, 2011: 13). This is a worrying statistic, as unless decision makers are fully aware of all the potential business opportunities and risk emanating from internal *and* external contexts they are unlikely to take effective action. It is possible that imminent threats will not be mitigated by businesses and opportunities for innovation will be missed due to lack of strategic insight.

In brief, many companies do not prioritise GRC as an engine for sustainable growth which opens up new opportunities for innovation *and* enhanced decision-making. Opportunities are lost when GRC's full value-adding potential is not recognised. Businesses' perspectives on GRC need to balance *both* the up-side *and* down-side of risk management.

2.2 Misfits: Siloed GRC and Innovation Management Practices

The traditional characterisation of innovation sees R&D located in a separate department (Montoya-Weiss and Calantone, 1994: Burns and Stalker, 1994). However, embedding innovation into day-to-day functions offers possibilities for growth (Gibson and Birkinshaw, 2004: Anthony, Johnson and Sinfield, 2008).

McKinsey (2012) identified that half of organizations segregate their innovation portfolio into distinct innovation functions and so independent silos characterise the functions. With numerous innovation models employed across business units and little, if any, integration across projects, a lack of consistent governance was identified across innovation activities contributing to weak performance-tracking and bounded decision-making across siloed

innovation structures. Little progress is evident relative to an earlier survey on approaches to innovation that found many "leaders lack confidence in their innovation decisions" and they "govern innovation in an ad-hoc way" (McKinsey 2007: 2). Businesses neither felt in control of the innovation process, nor possessed structured approaches for decision making for innovation.

To achieve consistent innovation performance, strong corporate governance is required to influence decisions, allocate resources and exert organizational control for cohesion of purpose. Corporate governance refers to the structured management of processes, systems and controls that contribute to an organisation's operations. Corporate governance can involve activities such as decision-making and resource deployment to protect and balance stakeholders' interests, and meet requirements. In practice, the link between GRC and innovation management is not often made, thereby ignoring implicitly, or explicitly, the potentially positive influence that GRC may exert on a company's innovation processes. Available opportunities for growth can be overlooked.

> *"Compliance should be incorporated in the strategic planning process and is fundamental to innovation. Companies make large investments in R&D and marketing when taking products to market. If compliance requirements are not incorporated in the ideation and go/no-go decision process, this may result in non-compliance with standards and regulations in certain countries. Financial costs associated with downstream product design modifications or product recalls may delay market entry or cause reputational damage. Compliance should be at the forefront of product innovation strategies."*
>
> James Carlo Cascone, Principal at Deloitte & Touche, LLP

As the pace of production of regulations increased over recent years, organizations reacted by enhancing internal risk and control activities. Since many investments were made at tactical and geographical levels by different budget holders, there was often little thought given to the integration of similar activities - governance, compliance, and risk functions were left disconnected across the business (Price Waterhouse Coopers, 2012). In many firms, issues such as siloed structures and resulting data duplication adversely affect the information management practices of GRC functions (OCEG, 2012b; Price Waterhouse Coopers, 2012). In addition, high levels of expenditure are often required to maintain these siloed GRC systems, as process inefficiencies grow in line with increased business complexity.

Decision-making and quality management are also hindered as critical knowledge is not readily accessible and workflow cannot be managed transparently. We conclude that the GRC function, to date, has failed to deliver Boards with a comprehensive profile of its role and potential impact in terms of its ability to contribute to manage the uncertainty around both favourable and unfavourable events.

"Well what I've basically seen (used for managing GRC activities) was typically home-grown solutions. People will track and trace on Excel spread sheets. Some departments have built internet databases; some were using Outlook and its associated tools… And that is typically something that is never as well realised as when you have an automated system which facilitates a complete networking of all this knowledge. Because it breaks down as soon as things rely on email and telephone and there's not a central knowledge system that allows and mandates people to enter things that happen in a certain country, where developments are going…. People change and there's a lot of things that need to happen again and again because the knowledge is not really well managed."

Theo Schoenmakers, Director of Schoenmakers Sustainability Consulting

A new mind-set is required to alter and enlarge the perspective on GRC above and beyond risk aversion to encompass an opportunity-orientated view. A means of achieving this is provided in the form of the concept of *Compliance-Innovation* set out below.

3 Nature of Compliance-Innovation

Our growth-oriented perspective on GRC is termed *Compliance-Innovation* where GRC activities are integrated with innovation processes. The *C-I* concept builds on the practices and theory of innovation management and permits operationalising the concept of AC. Within our concept *Compliance-Innovation*,

- Compliance relates to a process which, if successful, leads to conformance to requirements. We define these to include both legal (involuntary) and supra-legal (voluntary) requirements covering the spectrum from laws, statutory requirements, regulations, all the way to businesses' voluntary codes, guidelines and strategic goals (Doyle, 2007; Tarantino, 2008). Decisions relating to sustainability-related goals and business practices arise here.
- Innovation is a process which, if successful, leads to the *commercial exploitation* of new or existing knowledge (Freeman and Soete, 1997). In essence, innovation involves taking

either a new or pre-existing idea from its conceptual state and orienting it towards satisfying consumer need before finally offering a new product or service to a market.

Both processes rely on the production and consumption of information and knowledge to deliver on their purpose. Conceptual bridging between the compliance and innovation domains is provided by AC since it relates to the information and knowledge that is identified, perceived and how it is acted upon. AC is "a set of organizational routines and processes by which firms acquire, assimilate, transform, and exploit knowledge to produce a dynamic organizational capability" (Zahra and George, 2002:18). Knowledge is a key element and enabler of both innovation and compliance management, while concurrently influencing a firm's value chain and other organizational competencies (Cohen and Levinthal, 1990; Zahra and George, 2002; Butler and McGovern, 2008).

We contend that compliance imperatives, whether driven by external regulations or within-firm objectives, *or both,* offer actionable innovation-related knowledge. Systems that serve as repositories for compliance imperatives, Compliance Knowledge Management Systems (CKMS) can become a fertile source of innovation for companies through the integration of diverse contextual requirements within a single platform. Knowledge workers may then work to commercially exploit information hosted in the central CKMS repository, which can originate from internal or external sources (Amar and Juneja, 2008).

GRC and innovation activities can be directly linked to solidify the notion of growth-oriented GRC as a means to achieve sustainable competitive advantage. Based on this proposition, *Compliance-Innovation* is defined as:

> ***the processes by which the knowledge bases of the GRC and innovation domains are integrated to drive both sustainability and commercial exploitation, through knowledge-enabled decision-making processes.***

To deliver *Compliance-Innovation* requires the coordination and integration of organizational routines in new ways. This demands changes in habits and routines to refocus attention.

3.1 The 'Golden Line' of Absorptive Capacity and Sustainability

The important role of organizational context for cross-functional innovation teams and their performance has been identified (Blindenbach-Driessen, 2015; Edmondson and Nembhard, 2009). Context is a critical component of decision theory referring to the past, present, and future conditions that affect all decision processes, i.e. the characteristics of internal and

external business environments. Sutcliffe and McNamara (2001) argue that decision-making behaviour and judgement are embedded in organisational and sub-unit contexts and, therefore, a chosen course of action is influenced by more than just an individual's experience and cognition. The decision context determines what data and information is useful to decision makers, based on dimensions such as timeliness and completeness. This relates directly to the role and purpose of CKMS since decision context can be augmented to the extent that a corporate memory exists in the form of a knowledge platform and repository.

GRC plays an important function in managing decision-making contexts (OCEG, 2012b). For instance, governance primarily concerns strategy and aims to bring structure to decision-making and resource deployment. Risk management and compliance, meanwhile, are concerned with the uncertainty and binding regulations inherent in day-to-day decision making and organisational behaviour. Therefore, GRC can enable better decision making and help a firm to capture business opportunities while simultaneously mitigating risk.

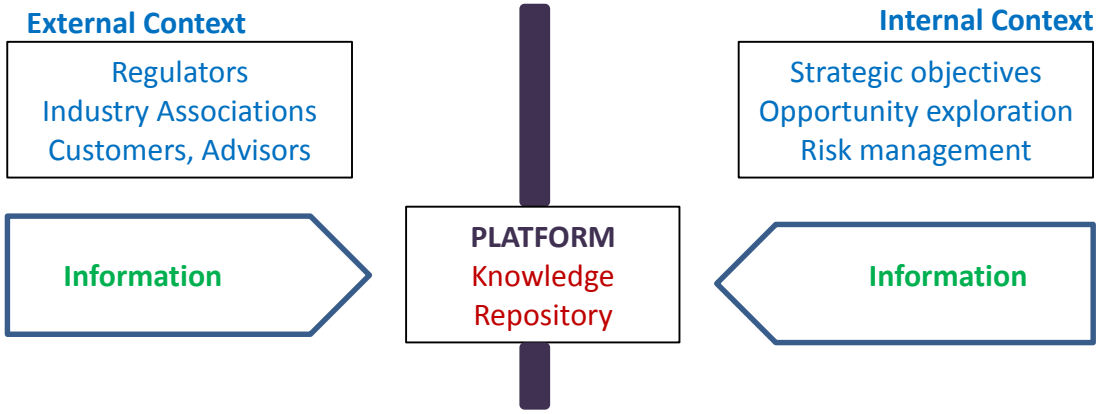
To achieve the organizational objective of sustainable growth, selected organizational requirements must be supported from the entire business environment perspective, including both internal and external contexts (Mintzberg, 1987; Barney, 1991; Penrose, 1995 [1959]). Effective strategy formulation and implementation requires a holistic and consistent view of the internal organization, which includes its *Compliance-Innovation* processes, and its external business environment (marketplace, regulation, competitor positioning etc.). Developing this contextual knowledge-base is needed to ensure that both decision-making processes and action plans are in line with shared meanings of current circumstances (Mintzberg, 1987; Asimakou, 2009).

"In the environmental, compliance, sustainability space, there are two aspects to it generally: one is strategic and the other is implementation. And again for many companies more often than not they react to (requirements) in an implementation way – so here are the requirements now, how do I fix it, how do I continue to sell my products. And it's important to understand – and there are companies that understand this - the strategic part is stepping back and saying things such as how can I organise to make this not only a neutral issue but a benefit… I always say that it's not an either or, it's both."

Ken Jennings, Managing Director K2J Environmental and Adjunct Professor Environmental Management at University of Maryland University College

As it relates to *Compliance-Innovation*, AC emerges as a *golden line* on the border of two knowledge contexts – one relating to internal business objectives, activities and functions and the other to the external regulatory environment, as presented in Figure 1.

Figure 1: The Golden Line of Absorptive Capacity



Once acquired, information from both contexts can be organized and business domains including legal, marketing, environment, design, quality, and CSR can develop their cumulative AC to assimilate and transform contextual knowledge for *Compliance-Innovation* purposes. These purposes are then used to guide and support the organization's innovation processes contributing to the delivery of high quality products and/or services i.e. to a positive customer experience.

This integrating capacity of CKMSs characterizes demands on the contemporary knowledge worker who may be required to make conceptual as well as instrumental use of data - in this case compliance and regulatory data. Instrumental use of information occurs in solving a specific problem. This can be compared to conceptual use which involves using information in a way that changes thinking processes - without necessarily leading to relatively immediate concrete action (Maltz et al. 2001). As a result, rebalancing the use of compliance information towards the conceptual facilitates and supports its potential for strategic purposes to emerge.

"So far the EU was good in generating lots of legal standards and requirements but was lagging behind heavily with its ability to enforce them. We now see a new focus on enforcement – including coordinated market surveillance, sharing of best practice,

development of a support infrastructure. As a consequence, there is an increased likelihood that enforcement authorities will identify non-compliant products, which will trigger an increased demand by companies selling product in the EU for systematic and comprehensive Compliance Knowledge Management Systems."

Ulrich Ellinghaus, Partner, Baker and McKenzie

By developing a central CKMS incorporating GRC and innovation activities, it follows that a company's knowledge workers are better facilitated to acquire, assimilate, transform and exploit knowledge for commercial gain (Alavi and Leidner, 1999; Zahra and George, 2002). The extent to which such potential is realized in sustainability terms is dependent on the organization's strategy and practices.

Firms' strategic sustainability behaviour is heterogeneous with some embracing sustainability-driven strategies, while others selecting to react to regulation by adopting minimum requirements, with a broad range of strategies in between (Saunila et al., 2018; Klewitz and Hansen, 2014). For example, increasing consumer preference for green products has been widely documented (de Medeiros et al., 2014; Marchand and Patenaude, 2014; Revollo-Fernández, 2016; Young et al., 2009). However, Ritter et al., (2015) report that the estimated market for green products remains relatively small, at less than four percent worldwide. Green marketing might not be delivering as expected and other factors are often not equal in consumers' minds (Ginsberg and Bloom, 2004). The literature identifies several mechanisms at work for firms moving from traditional practices to more environmentally-oriented ones:

i. Firms with more environmentally conscious executives are more likely to eco-innovate (Azzone and Noci, 1998; Bossle et al., 2016; Gabler et al., 2015; Schaltegger et al., 2015);
ii. Firms identify environmental orientation with potential new competitive advantages (Aragón-Correa et al., 2008; Rennings, 2000);
iii. Environmental orientation is identified as desirable by firms that make significant efforts to generate insights into the green market (Bossle et al., 2016; Klewitz and Hansen, 2014).

The implications are that the conscious and revealed preferences of consumers and business executives are evident from business strategies, practices and consumer choices. While much attention is devoted to sustainability and the need to transition towards decoupling economic activity from intensive environmental use (e.g. Stiglitz et al., 2009) such fundamental changes are among the most difficult to achieve. Where changes in organisational or consumer

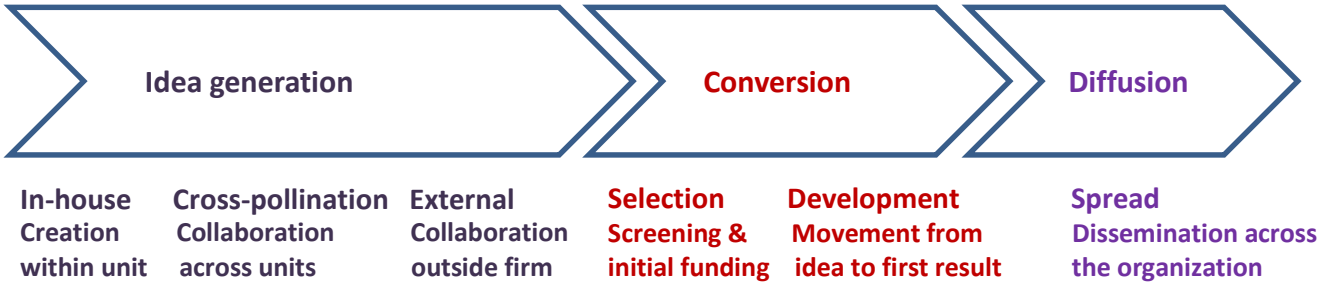
behaviour may be most likely are in cases of non-transformative changes e.g. through recycling schemes or the adoption of cleaner energy (Vallance, 2011). However, more transformative approaches demand fundamental changes to perception in terms of how the environment and broader society are socially constructed (Assefa and Frostell, 2007). In business terms, Hollstedt (2017) identifies that the breadth and complexity of sustainability dimensions hinder the identification of sustainable solutions with difficulties also created due to limited time and data availability especially in early design stages of innovation. These challenges may be addressed through adopting an innovation value chain approach.

4 Delivering with Compliance-Innovation via the Innovation Value Chain

The Innovation Value Chain is used here to identify impacts of *Compliance-Innovation* through transforming GRC into an asset for sustainable growth. Hansen and Birkinshaw (2007) explain that innovation can be viewed analytically from a value chain perspective incorporating three distinct phases: idea generation, conversion and diffusion (see Figure 2). Within the three phases, six knowledge-related activities are identified: "internal sourcing, cross-unit sourcing, external sourcing, selection, development, and company-wide spread of the ideas" (Hansen and Birkinshaw, 2007; pg. 122). Perceiving the Innovation Value Chain as an "integrated flow" where innovation processes transform "ideas into commercial outputs" is how a systemic approach to innovation is enabled (Hansen and Birkinshaw, 2007: 122).

Features of the Innovation Value Chain relate directly to AC in terms of processes of knowledge acquisition, assimilation, transformation and exploitation. These knowledge-related activities are the unifying factor linking the elements within the chain as innovation is pursued. The motivation for firms to engage in the risky, uncertain and costly activity of innovation arises from the attention they pay to shareholder expectations, competitive pressures and opportunities, including those arising from sustainability orientations. In this regard the identification of integrated conceptual links between innovation management and a quality hierarchy (from product, process and enterprise perspectives) in Haner (2002) are operationalised further in relating the compliance and innovation domains more specifically. It follows that the nature and scope of an organisation's innovation orientation is both a cause *and* a consequence of its stance to compliance and GRC activities.

Figure 2: The Innovation Value Chain



Following Hansen and Birkinshaw, 2007.

Given finite resources available to companies and the need to manage risk effectively, managers must ensure the Innovation Value Chain is optimised in all three key areas. Proper and timely management (identification, categorisation, risk assessment, prioritisation, action) of all compliance events demands an IT system capable of facilitating the anticipation of, rather than reaction to, problems.

4.1 Compliance-Innovation across Innovation Phases

Hansen and Birkinshaw (2007; pg. 125) assert that "a company's capacity to innovate is only as good as the weakest link in its Innovation Value Chain", and, therefore, firms must have, or create, an end-to-end view of the chain to optimise innovation. *Compliance-Innovation* offers such a holistic solution by the integration and improvement of each stage of the Innovation Value Chain, through ability to facilitate operational gains *and* solidify strategic positioning. These can be considered for each of the three innovation phases.

Idea Generation: As the compliance environment is always shifting, companies must be able to accurately monitor, assess and, at times, predict market changes to identify opportunities while simultaneously managing risks. To support the development of AC a CKMS must integrate several data sources into one repository and allow cross-functional sharing of ideas for collaboration (Leonard and Sensiper, 1998). By continuously creating, transferring, and applying knowledge within the organisation, innovation groups can solidify knowledge assets and foster a strategic approach to GRC (Alavi and Leidner, 2001) by, for example, evaluating new markets and segments to enter while monitoring product/service performance to ensure quality across portfolios.

By creating and supporting a culture where knowledge recording and sharing is valued and rewarded, a firm can prevent strategic knowledge from leaking out of the company i.e. when a knowledge worker leaves the company (Osterloh and Frey, 2000). This ensures that valuable knowledge, both explicit and tacit, is retained and transferred within company boundaries to ensure that it is made available to all knowledge workers (Leonard and Sensiper, 1998; Amar and Juneja, 2008). This contributes to the AC of later generations of knowledge workers by permitting decision processes, lessons learned and cumulative experience of the GRC and innovation domains to be preserved (Eisenhardt and Martin, 2000; Zahra and George, 2002). Not only is the knowledge leakage that accompanies employee turnover reduced, but increased visibility on decision-making and knowledge generation in the compliance context is enabled.

Idea Conversion: *Compliance-Innovation* aids funding assessment and further development of ideas by providing decision-makers with actionable information to evaluate the viability of action plans in light of commercialisation *and* sustainability goals. CKMS dashboards provide a platform to assess business cases according to their compliance requirements, risks, costs *and* potential for adding value, while also helping executives prioritise investments based on the overarching governance strategy. This generates a more solid and structured approach to business cases analysis overall, supporting the fit between investments and strategic objectives.

This process also promotes business-case accountability and reduces frustration generated in the absence of transparent decision-making. GRC and innovation data can be centrally monitored in real-time to facilitate conformance to all strategic imperatives. *Compliance-Innovation* can, therefore, support a culture of innovation as workers can be motivated to meet GRC and business requirements. Even when projects within the innovation portfolio are (inevitably) cut idea generators can more clearly understand the reason for the decision based on CKMS data and criteria employed.

Idea Diffusion: *Compliance-Innovation* helps generate momentum behind new ideas across an organisation through its integrated CKMS. As *Compliance-Innovation* can offer a useful business cases tool for quantifying potential benefits and risk of projects, the resulting business cases can build a strong value proposition for an innovation project and can foster buy-in across the firm (Hansen and Birkinshaw, 2007). The CKMS's social functionality through, for example, content tagging, forums, and secure messaging, allows a company to spread approved ideas across communication networks, and break down silos (Cohen and Levinthal, 1990;

Alavi and Leidner, 2001). Ideally if the CKMS can also be integrated with key partners' systems then new channels of communication and reporting can open up and enable greater external knowledge collaboration between subsidiaries, trusted buyers, and suppliers, and thus allow extrinsic value chain linkages to be strengthened further (Porter, 1985; Roper et al., 2008).

For instance, the central CKMS repository would house common organisational-wide goals and help ensure that all stakeholders are on the same page through a dynamic knowledge-sharing platform and unlike the siloed partial knowledge-sharing mediums offered by desktop tools (Alavi and Leidner, 2001). Knowledge workers are presented with the opportunity to deliver better business cases that balance both upside and downside risk management. Executives can access quality data for decision-making and implementing selected strategic trade-offs such as those emanating from both the GRC (e.g. selection of markets and territories to target/avoid) and business (e.g. cost or differentiation strategy) domains in a confident, collaborative and cost-effective way.

> *"The more geographical areas you want to start selling into, the more complex your regulatory framework or portfolio becomes and, therefore, the more sophisticated the tool you need to manage that complexity. When you're being innovative you're setting yourself into an extremely vulnerable position, think of it as being very fragile… What that ultimately means is that you as the start-up company have to know your stuff, and have dotted your i's and crossed your t's, and done your compliance homework."*
>
> Andy Baynes, Director Business Development and Energy Efficiency, NA.

The fundamental element of Quality as a unifying principle for *Compliance-Innovation* is set out below.

5 Quality: Unifying Attribute of Compliance-Innovation

We contend that quality is *Compliance-Innovation's* principle attribute offering means to unify departments or functions under an overarching goal of "conformance to requirements" (Crosby 1979: 270). Crosby (1979) emphasized the relation between management maturity and quality and identified five maturity stages, depending on the extent to which management had no problems with quality – and the relevant facts and rationale underpinning their perception. The 'getting it right first time' and 'quality is free' soundbites frequently attributed to Crosby belie

an integrated outcomes-plus-process approach in which change is central; "Changing mindsets [paradigm shifts] is the hardest of management jobs. It is also where money and opportunity lie" (Crosby, 1979: 24). This puts responsibility for quality emanating from the top of the organisation, recognizing that its diffusion is the most difficult, but important, of executive tasks.

Innovation appears to be positively impacted by *sets* of quality-management practices and so the proliferation of quality throughout the organisation, rather than discrete tools or techniques, is required (Kim et al., 2012). Once identified and agreed, selected requirements, e.g. in terms of sustainability choices, are disseminated across the organization. Technology can play a crucial role here and optimally-integrated ICT platforms are essential to fostering strong lines of interdepartmental communication, and more importantly, enabling continuous recording, storage and retrieval of knowledge. However, companies still need clarity of requirements to ensure employees in different functions understand and are committed and enabled to achieve *Compliance-Innovation*. The concept of quality offers such a unifying property for *Compliance-Innovation*. Once a consistent definition has been agreed the notion of quality can be embedded into *Compliance-Innovation* activities which can support cross-functional collaboration throughout the Innovation Value Chain.

> *"I would say that compliance and quality are connected within our company. We have environmental divisions that basically provide advice to engineers, designers, and R&D teams on questions around regulation and quality. Due to the size of our company, compliance and quality have to be integrated in this way. Otherwise it would only take place at a corporate level which would be detached from what is going on in the business units."*
>
> David Scuderi, Environmental Affairs Manager, Samsung

By communicating both selected and imposed requirements, this characterisation of quality can be embedded into *Compliance-Innovation* knowledge and practices; knowledge workers can seek out opportunities in the Innovation Value Chain while continuing to balance risks and business sustainability goals in their daily tasks. Integrated platforms accelerate this cycle by facilitating workers in meeting all quality requirements (Gold et al. 2001). In addition, a company can then begin to analyse knowledge-work processes to identify waste and reshape job structures to support quality management (Crosby, 1979; Drucker, 1999) i.e. automate administration activities through IT, to allow knowledge workers to focus more on value-adding activities such as opportunity recognition or customer service.

5.1 Collaboration through Quality Loops

From our research, cross-functional collaboration is essential to the successful implementation of quality-based *Compliance-Innovation*. Intradepartmental functions must work together to achieve the unified value-adding proposition of quality. Technology is necessary but insufficient in bringing *C-I* about. We use the term *Compliance-Innovation Quality Loops* (CIQLs) to outline the requisite collaborative process needed for *Compliance-Innovation*. Essentially, CIQL teams come together to solve problems or work on opportunities, and typically consist of a team of representatives across different departments or functional areas, set with the task of ensuring quality is accurately defined and implemented across the organization; the exact composition of each Quality Loop varies with the unique context of each organization.

> *"There needs to be collaboration when you are innovating – you'd need the detailed material knowledge, and the ability to test, you'd need to know if you can actually manufacture it, and you'd need to know that it's scalable. I think there would definitely be an opportunity for a technology platform that would share knowledge about innovation in the whole area... There's so much going on that having all the information in the one place is vital."*
>
> Therese Deane, Program Manager (Technical), Environmental Product Compliance, EMC

Figure 3 offers an example of a Quality Loop which revolves around quality. Circles represent departments which are permanently central to the Quality Loop, while squares denote business units which periodically audit how information is being captured so it can deliver value not only at one point in time but for the future i.e. breaking down silos to ensure that knowledge is effectively captured and shared. This characterisation resonates with Moen and Norman (2010) in terms of its evolutionary approach as the only means to ensuring quality-based practices rooted in knowledge-workers' experience, enabling change and innovation. As sketched, the loop involves departments including regulatory affairs, environment, design, engineering, marketing, and sales. Furthermore, Human Resources (HR), IT, and Quality Assurance are involved periodically for audit issues and to verify whether information is being exploited to maximise its usefulness both to current objectives and future value extraction, i.e. from a strategic growth perspective that acknowledges business priorities and agreed requirements.

Figure 3: Compliance-Innovation Quality Loop



The implication is that a collaborative culture must be enabled through effective leadership, freedom to express doubt, and strong communication mechanisms to allow CIQL teams to achieve innovation *while* conforming to requirements (Holland et al. 2000; Lovelace et al. 2001). This allows cross-functional teams to engage more effectively throughout the Innovation Value Chain while also meeting sustainability goals, GRC requirements and budget targets. Collaborative environments also help overcome any inherent resistance to knowledge sharing as team members more readily share information and knowledge when they feel that it would be beneficial to the team's common goal (Leonard and Sensiper 1998; Osterloh and Frey 2000; Gold et al. 2001).

6 Discussion

Many firms host siloed structures and data duplication adversely affecting information management and knowledge development practices. Yet siloed orientations, structures and practices are at odds with a world where knowledge integration is increasingly the basis of

competitive advantage. When sustainability concerns are central to business strategy, the concept of *Compliance-Innovation* offers a means to address related challenges. The organizational meaning of sustainability must first be known and shared (Arena et al., 2009) and derived from long-term and strategic perspectives (Hallstedt et al., 2013). In that context *Compliance-Innovation* offers the ability to integrate, build, and reconfigure knowledge assets from across GRC and innovation domains using the phases of the Innovation Value Chain to target sustainable competitive advantage. Scope exists for evaluation of this concept in practice following, e.g., the compliance indexing approach outlined in Hallstedt (2017) or under a lean approach, as outlined in Doyle et. al., (2016).

Through the integration of GRC and innovation activities opportunities for the GRC function in terms of assessing new ideas for product, process, marketing or even organisational/administration innovation, can be facilitated. Firms can scan their environment to acquire new compliance-related events or information, assimilate it, and apply it within the context of current market and technological knowledge bases to use it for productive opportunities e.g. by assessing the potential revenue and cost streams from entering into a new market within the context of its strategic imperatives. Individual organizations will have selected the preferred sustainability dimensions they wish to conform with from across environmental (Galdeano-Gomez et al., 2013), social (Khan et al., 2016), institutional (Lozano, 2015) and economic (Svensson and Wagner, 2015) options. Innovation and compliance choices are related to these preferences and are determined systemically with them.

In explicitly linking two separate and distinct knowledge contexts of compliance and innovation, we bring both internal business objectives and their subsequent knowledge flows (Del Rio et al., 2015) and the external regulatory environment together (Chang, 2016). Without the addition of quality, however, the informational contexts alone may serve to attract attention, rather than focus on their systemic potential. This integrating capacity of *Compliance-Innovation* is what Maltz et al. (2001) identify as conceptual knowledge work where information is used in a way that *changes* thinking processes - without necessarily leading to relatively immediate concrete action. As a result, we see rebalancing the use of compliance information towards the conceptual as facilitating and supporting its potential for strategic purposes to emerge i.e. in terms of its innovation-enhancing potential. With a quality-based *Compliance-Innovation* approach, a company's knowledge workers are better facilitated to

acquire, assimilate, transform and exploit knowledge for commercial gain. This is true not only for the initial product development phase identified as a crucial element in building organisations' sustainability targets (Hallstedt, 2017) but also for the subsequent innovation phases. As outlined in Crossan and Apaydin (2010) studies of innovation as process remain under-developed in the literature and emphasis beyond this important initial phase is necessary (Kaebernick et al., 2003). Attending to growth with sufficient focus on sustainability is also challenging in the face of increasing demands on Boards and Directors to address not only considerably more but increasingly complex types of risks. In the context of demands to change mindsets, this may be where the greatest barriers to sustainability-focussed strategies reside. In driving green innovation practices, for example, engaged and concerned management has been identified as the most important driver – so leadership from the top is a prerequisite (Qi et al., 2010). Enabling engagement and communication around strategic choices is required.

Delivering innovation in how knowledge workers are supported and how their contributions at work are validated represents a quality approach to human resources and may require business-practice innovation. Building cross-functional collaboration, for instance through Compliance-Innovation Quality Loops, or implemented through Six-Sigma processes (Doyle et al., 2014) offers routes to driving systematic changes in organizations' GRC and innovation practices through negotiating innovation goals and organizational targets. Such cross-functional networks, to be successful, must allow social contracts to develop across members based on the development of trust and where reciprocity features large (Ring and Van De Ven, 1994).

By involving the GRC unit centrally in innovation activities, a firm can improve its decision-making processes across the various stages of its Innovation Value Chain i.e. idea generation (in-house, cross-pollination, external), conversion (selection, development), and diffusion (spread). The infrastructural use of CKMS supports this process by holding all innovation ideas, strategies, and contextual requirements in one central repository enabling continuous recording, updating, storage and retrieval of information and the generation of knowledge.

Further evolution of GRC is needed to create and sustain an enterprise-wide footprint with active pursuit of growth opportunities jointly through *both* GRC *and* innovation activities. Absent this development, strategic growth opportunities are being, and will be, missed. Our

perspective on GRC demands an integrated Compliance Knowledge Management (CKM) approach adaptable to the needs of teams of knowledge workers. The impact of this approach would be to substantially increase the likelihood of capitalising on investments in the various aspects of the compliance function through recognising and acting on the cross-cutting activities and knowledge flows that relate to compliance and innovation processes.

7 Conclusion

This research paper contributes to research sustainability-oriented innovation with a focus on how integration of GRC and innovation perspectives and practices may be achieved through agreed sustainability goals with a fundamental quality orientation. Based on our review of related literature, few studies address these overlapping areas and their potential for business impact remains largely overlooked. This gap is addressed in our contribution of a practice-based concept, termed Compliance-Innovation, that allows for the systemic relationships between GRC, sustainability and innovation to be jointly addressed across separate innovation phases from development to exploitation. The concept proposed has the additional benefit of being appropriate to both manufacturing and to service activities.

The nature and extent of knowledge flows within organizations have been found to stimulate innovation (Huang et al., 2016) and systems to support the data and information integration needs, as envisaged here, are increasing in both availability and application (e.g van den Broek and van Veenstra, 2018). While these enabling processes and infrastructures have the power to increase organizational AC, they are insufficient to ensure value is delivered, even when management is committed to driving sustainability agendas. A quality focus is required to drive de-siloization and direct organization of people and resources around networks of reciprocal co-ordination. While these do not assure outcomes, they address development of the interdependencies that underpin compliance-innovation and its potential to support organizational transformation structured rather than ad-hoc approaches too evident in practice. Further research should focus on the conditions under which such networks generate positive organisational outcomes.

Appendix A

Interviewees Consulted for the Research

Name	***Role*** ***Organization***
Andy Baynes	Director Business Development and Energy Efficiency NA
James Carlo Cascone	Principal Deloitte & Touche, LLP
Etienne Celis	Environmental Regulatory & Standards Compliance Manager GE Industrial Solutions, Energy Management
Paul Coebergh van den Braak	Senior Director Standardisation Philips
Jean Cox-Kearns	Director of Compliance - Global Takeback Dell
Therese Deane	Program Manager (Technical), Environmental Product Compliance EMC
Ulrich Ellinghaus	Partner Baker and McKenzie
Hudson Hollister	Founder and Executive Director Data Transparency Coalition
Corrine Holmes	Senior Environmental Compliance Engineer Microsoft
Ken Jennings	Managing Director; Adjunct Prof. Environmental Management K2J Environmental; University of Maryland
Lettemieke Mulder	Vice President Sustainability First Solar
Sake Niemeijer	Global Product Stewardship Director Automation and Control Systems Honeywell
Michelle O'Neill	Vice President Government and Public Affairs EMEA Ingersol Rand
Theo Schoenmakers	Director and Founder Schoenmakers Sustainability Consulting
David Scuderi	Environmental Affairs Manager Samsung
Dirk Segers	Regulatory Affairs Compliance Program Manager EMEA Agilent
Darrel Stickler	Corporate Social Responsibility Cisco Systems
Donal Sullivan	Third-Party Program Leader Tyco International

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