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Assessing Corporate Sustainability integration for corporate self-reflection

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ABSTRACT

This article aims to shed light on mechanisms to integrate a strategy on Corporate Sustainability in companies. The analysis is based on a holistic method derived from organisation theory, organisational behaviour theory and strategic management theory. The process of integration into the organisational system is explored by analysing the coalescence of organisational continuous improvement, structure and culture. The coherent use of integration mechanisms is defined as key for a successful CS integration. The LEAPFROCS method is presented to capture the success of integration mechanisms and their application. The method is tested using empirical data from 2 case studies. The results of the data analysis – the patterns – were validated in discussion with company representatives. The results show that the process of CS integration is company-specific, as is the selection of patterns to create a self-reflection of companies on CS integration catalysing future corporate strategies for improving CS integration into the specific company's organisational systems.

1. Introduction

Companies have increasingly attracted attention in the sustainability debate (Cannon, 1994; Elkington, 2002; Hart, 1997), since they play a major role in the generation of negative impacts on the environment, people, and their prosperity (Dunphy et al., 2006). To ensure long-term success, companies have to face pressures to address the current and future impacts on society which they directly or indirectly cause while managing their existing core business (Chen and Kannan-Narasimhan, 2015). Several authors (Baumgartner, 2009; Dunphy et al., 2006; Lozano, 2013) have stressed the increasing importance of Corporate Sustainability (CS) as the process of proactively determining the relative significance of economic, environmental, and social issues (i.e. CS issue dimension of the triple P issues: People, Planet and Prosperity) (Badri Ahmadi et al., 2017; van Dam and van Trijp, 2011; Krajnc and Glavic, 2005) related to business activities (Wells, 2013; Witjes and Lozano, 2016). The need for interpreting this consequential relation between company processes, and their impacts, is complemented by an emphasis on the inter-relations of triple P issues between individuals, the organisation, the supply chain, and the wider society (i.e. CS place dimension) (Vermeulen and Witjes, 2016), taking into account the past, present, and future (i.e. CS time dimension) (Lozano, 2012) (see Fig. 1).

Over the last two decades of scientific work, many scholars in the field of CS (e.g. Cramer, 2005a; Doppelt, 2003; Epstein and Buhovac, 2010) have greatly contributed to the understanding of company practices when addressing CS. The focus of CS research has been developed from, mostly, a technological focus (Freidberg, 2014) and towards a managerial research focus (Baumgartner and Ebner, 2010), adding an understanding of how companies manage to get CS into the heads and hearts of their employees. Consequently, CS research has changed from trying to understand the physical output of corporate processes on CS dimensions towards understanding the physical (e.g. Jawahir et al., 2006; Jayal et al., 2010; Manda et al., 2015) and social outcomes of the organisation as a system, and its effectiveness in adhering to its shared CS strategy (Epstein and Buhovac, 2010; Hahn et al., 2015). With the organisational system entailing the organisational processes, and which outputs create a corporate impact on the three CS dimensions, concepts from different theories (Hatch and Cunliffe, 2013) are needed to analyse the effectiveness of the organisational system in adhering to its shared CS strategy. CS research has changed from understanding the outputs of business activities which impact on triple P issues, towards understanding the outcomes of business activities resulting in effective strategies for transformative change of the organisational system and how these can be spread out and controlled throughout the organisation (Epstein and Widener, 2010) to favourably influence the output of processes and products (Witjes et al. n.d.).

To address CS from an outcomes perspective, when determining the relative significance of the interrelations between the three CS dimensions companies are facing the paradoxical challenges of applying existing capabilities within the organisational system whilst exploring

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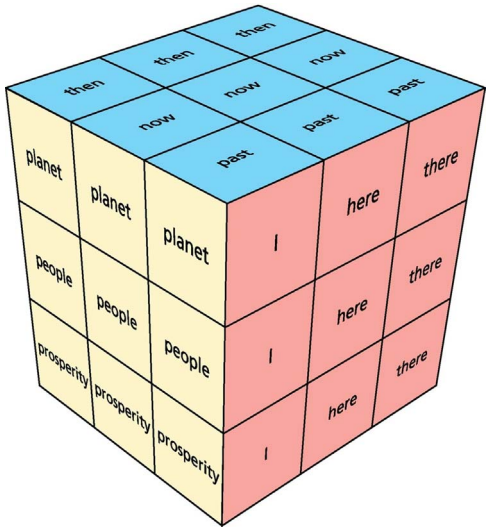

Fig. 1. The three dimensions of CS: issues (planet, people, prosperity), time (past, now, then) and place (I or individual, here and there).

new ones (Danneels, 2002; Jansen et al., 2009; Vera and Crossan, 2004). Addressing CS, therefore, implies making interventions on business activities leading to changes in processes and products, revisions of communication strategies, and adaptation of value and knowledge systems (Azapagic and Perdan, 2005; Epstein and Buhovac, 2010; Siebenhüner and Arnold, 2007). Consequently, CS integration entails the application of such interventions made to internal processes, structure, and management control on the individual, group and organisation level (Lozano, 2007) in order to adhere to an established shared CS strategy.

Understanding the efficiency of CS integration into organisational systems is focussed on the dynamic capabilities that enable companies to satisfy current demands while simultaneously being prepared for tomorrow's developments (Gibson et al., 2004). There has been a dual trend to create understanding of the effectiveness of corporate change strategies supporting corporate dynamic capabilities towards CS integration by combining formal methods, focussed either on the accounting information systems or indicators on, for example, triple P issues (Maas et al., 2016a), or on informal methods, centred on analysing the influence of socio-cultural aspects as key variables (Carenys, 2012; Epstein and Buhovac, 2010). To understand CS integration, methods for analysis should include the setup of corporate processes (i.e. developing the structure of the organisation), performance measurement, and reward systems to measure success and to provide internal and external accountability (i.e. ensure continuous improvement of the organisation) (Maas et al., 2016b), but also the leadership, culture, and peoplés attitudes or values (i.e. the socio-cultural elements of the organisation) to support CS integration (Epstein and Buhovac, 2010). Moreover, these methods need to include cross relations between different theoretical perspectives (Sorge, 2004), often linked to a specific disciplinary background, each stressing their own specific viewpoint on the process of CS integration in time (Székely and Knirsch, 2005). This adheres to the need expressed to develop more holistic methods (Azapagic, 2003; Hahn et al., 2015; Jamali, 2006; Maon et al., 2009) to understand the efficiency of CS integration retrospectively (Hahn et al., 2015). The application of these holistic and longitudinal methods with different theoretical perspectives contributes to the understanding of how past success of CS integration can support companies in developing future strategies on CS integration (Witjes et al., 2016). New insights on the efficiency of CS integration could be gained by analysing historical information on CS integration into the organisational processes. This could be captured by the use of comprehensive methods for longitudinal and a more 'all-inclusive' perspective on CS integration interventions (Azapagic, 2003; Salzmann et al., 2005; Shi et al., 2017; Siebenhüner and Arnold, 2007; Weber, 2008).

This study aims at contributing to an understanding of the functioning of interventions into the organisational system by analysing the integration of CS through a holistic method based on organisation theory, organisational behaviour theory, and strategic management theory. The research focusses on the success of the integration process resulting in improved organisational outcomes leaving the link with an improved output (i.e. improved sustainability performance of the company) for future research. Section 2 explores the process of integration into the organisational system by analysing the coalescence of continuous organisational improvement, structure and culture. Whereas integration mechanisms are proposed for the operationalisational closing of the CS strategy-execution gap, a coherent use of these mechanisms results in the integration of CS into the organisational system. Section 3 presents the LEAPFROCS method as a holistic method to capture the success of integration mechanisms and their application. Section 4 presents the testing of the LEAPFROCS method using empirical data of two case studies. The study finishes with conclusions and proposals for future research.

2. CS integration into the organisational system

The study of interventions into the organisational system is logically based on the concepts of integration and differentiation as originally conveyed by Lawrence and Lorsch (1967): integration is the quality of collaboration within the company that is required to achieve a common goal, through unity of effort as dictated by the demands of the company's internal and external context. Differentiation encompasses the differences in cognitive and emotional orientations among managers in different functional departments, as manifested, for example, in specialized language, different systems of meaning, alternative thoughtworlds, and differences in time-orientation (Bradley, 1997; Griffin and Hauser, 1996; Nambisan, 2002). Although a balance between integration and differentiation is optimal (Lawrence and Lorsch, 1967), an effective integration of a common goal is achieved by reducing differences between goals and tasks, functional departments, business units, product platforms, managerial levels, and organisational processes (Dougherty, 2001; Sheremata, 2000).

The integration of a CS strategy into a company's organisational system (Baumgartner, 2009; Lozano, 2007; Murray et al., 2015) has driven companies to rethink their corporate strategies when facing the strategy-execution gap (Leinwand and Mainardi, 2016), while creating competitive advantages for customers, the company, and society (Lüdeke-Freund, 2010; Porter and Kramer, 2011; Stubbs and Cocklin, 2008). CS integration supports companies aiming for long-term success when faced with the challenges of an ever-changing internal and external context (Jansen et al., 2009). Based on a corporate strategy on CS, appropriate interventions in the organisational system improve the responsiveness of the company to the ever-changing demands of internal and external stakeholders, the adherence to a shared CS strategy (Witjes et al. n.d.), while simultaneously obtaining a differentiation advantage compared to its competitors (Kurapatskie and Darnall, 2013; Eccles et al., 2013; Zangwill and Kantor, 1998). Integration of a corporate strategy is defined as the way a company creates the organisational structures, procedures and activities (i.e. the organisational system) that permit the organisation to engage in activities that are directly related to a set of goals derived from a company's strategy (Hill and Jones, 2011; Ravichandran and Rai, 2000) on, for example, CS. Strategy integration involves assessing demands of internal as well as external stakeholders (Teece, 2010) and, above all, an evaluation of the outcomes and output of the organisational system with a shared CS strategy (Souto, 2015). While effective organisational performance is determined by the fit between an organisation's system and its environment (Hatch and Cunliffe, 2013), improved organisational design from interventions into the current organisational system economises

on operating costs, lowers the costs of value creation activities, and enhances the ability of the company's value creation function to achieve superior efficiency while adhering to stakeholder demands (Hill and Jones, 2011). Although the existing organisational system may stand in the way of integrating a strategy (Hahn et al., 2015; Moon et al., 2011), adjustment of the organisational system enables technological innovation, coordination of value creation activities and pioneering individuals, to create value (Teece, 2010) and to make these consistent (Hill and Jones, 2011).

To steer an organisation toward a common goal and ensure adherence to stakeholder demands, the coordination of the value creation activities of the organisational systems must be aimed at making them interdependent and interrelated (Hill and Jones, 2011; Ravichandran and Rai, 2000). The integration of CS into a company's organisational system, consequently, demands learning from a continuous adjustment of the organisational processes to the ever-changing demands of internal and external stakeholders on CS issues (Hahn et al., 2015; Jamali 2006; Maon et al., 2009). Therefore, continuous changes must be made to both formal and informal processes as part of the social dynamics (e.g. members and their relationships; Linnenluecke et al., 2009), and to the physical dynamics (e.g. chemical and mechanical transformations; Scott, 2012). The integration of CS into the organisational system results in organisational processes constituting these social and physical dynamics in addressing CS issues (Hahn et al., 2015), and a CS strategy seamlessly integrated into the corporate strategy (Amini and Bienstock, 2014; Baumgartner and Ebner, 2010).

CS integration interventions are stratagems for closing the gap between the shared corporate strategies on CS and their execution by every-day business activities. The interventions are aimed at the necessary continuous changes that must be made to a company's formal and informal processes as part of the social and the physical dynamics, based on the ever-changing internal and external stakeholder requirements on CS issues (Cramer 2005a; Hahn et al., 2015). As CS may be specific for each department within the organisational system (Baumgartner, 2014), the change magnitude that CS requires at individual, group and organisational levels makes it unlikely that companies will be able to provide substantive contributions to the sustainable development of society without the willingness and ability of the company to fully understand the CS integration process (Hahn et al., 2015). Interventions should, therefore, be tailored to a company's specific needs, and the context in which it operates, in order to generate the necessary paradigm shift away from the way traditional business is conducted (Azapagic 2003; Hahn et al., 2015; Jamali 2006; Maon et al., 2009). This results in CS becoming an integrated and integrative part of the corporate strategy and processes (Maas et al., 2016a), whereby CS is not considered as an 'add on', but is systematically integrated into all of the formal and informal business activities (Azapagic, 2003) of the organisational system, resulting in CS as an added value to the company's main business goals (Rauter et al., 2017).

2.1. Organisational system design

The design of an organisational system consists in the combination of organisational structure and control systems to shape the way people behave, and determine how they will act in an organisational setting (Hill and Jones, 2011). Since individuals are the sine qua non element of the organisation (Bansal and Roth, 2000), a humanistic approach to organisational structure and control puts people management, including the cultural and learning approach to management, in a pivotal position for organisational design (Wang and Ahmed, 2003). Consequently, organisational design is not conceived as a closed mechanistic system but rather as a system with social connotations and open to the influences of the members of the organisation and its environment (Carenys, 2012). Whereas organisational culture contributes to the identification of the influences of the behaviour of individuals for the organisation's objectives, thus facilitating their achievement (Carenys, 2012), organisational learning contributes to the understanding of the organisational process of continuously acquiring, processing, and disseminating knowledge about markets, products, technologies, and business processes (Ng, 2004). An effective organisational design could reach organisational effectiveness through continuous improvement of assigning responsibilities and roles to organisational members (i.e. organisational structure), and support the behaviour of individuals, groups and the organisation (i.e. organisational culture) (Sinding et al., 2014). Three main interrelated perspectives on the design of the organisational system can, therefore, be distinguished: 1. Continuous improvement of the organisation, 2. Organisational structure, and 3. Organisational culture. We use these three perspectives to understand the integration of CS into the organisational system.

2.1.1. CS integration through continuous organisational improvement

Organisations are seen as learning entities by encoding past interventions into routines that could guide behaviour in the present and for the future (Levitt and March, 1988). Organisational learning influences the behaviour of the members of the organisation (Hill and Jones, 2011), supported by the process of organisational control by which managers monitor the ongoing activities of an organisation and its members to evaluate whether activities are being performed efficiently and, if necessary, to take corrective action (Carenys, 2012). Organisational learning seeks to orient the decision-making process by contributing to the understanding of the organisational processes of continuously acquiring, processing, and disseminating knowledge about markets, products, technologies, and business processes (Ng, 2004). With business strategies needing to go through continuous improvement cycles in order to get closer to the strategy of the company and eventually have a complete match (Bagheri and Hjorth, 2007; Dieleman et al., 2007), a company can only improve its overall performance when the strategies are constantly measured and adapted to the goals visualized in the first place (Azapagic, 2003; Székely and Knirsch, 2005). To support the process of uninterrupted performance adjustment and learning at individual, group and organisation level, organisational processes follow the high level format conceived of as a continuous improvement cycle of four stages: Plan, Do, Check, and Act (Arntz-Gray, 2016; Schmidt et al., 2015), also known as the PDCA cycle (see Fig. 2):

- Plan: The individual, group or organisation recognizes an opportunity and then plans a change. After establishing new goals, there is a need to think how to adapt the related processes to perform the change planned;
- Do: The individual, group or organisation implements the processes and tests the change;
- Check: After monitoring and evaluating the change, the individual, group or organisation reports the outcome, analyses the output/results and identifies the learning; and
- Act: The individual, group or organisation plans and applies actions based on what has been learned during the previous step. If the change was successful, there is a need to incorporate the learning into wider changes. If the change was unsuccessful, the PDCA cycle will be repeated and/or adjusted.

CS integration is an organisational change process based on

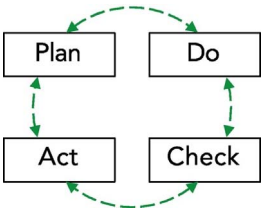

Fig. 2. The cycle of continuous organisational improvement of Plan, Do, Check and Act.

innovative learning models and inspired by the principles that underpin the learning organisation construct based on the PDCA cycle (Jamali 2006; Maon et al., 2010). With a growing awareness that proactivity is likely to improve CS integration (Hahn et al., 2015), enhanced corporate improvement regarding stakeholder expectations, and the specifics of the context, help to ensure that the organisational change is beneficial and supported by appropriate integration mechanisms (Maon et al., 2010). Continuous improvement in the success of interventions into the organisational system encourages companies to be proactive in their approach to addressing CS (Eccles et al., 2014; Zangwill and Kantor 1998). The application of coherent improvement cycles on the success of CS integration interventions are a prerequisite for increasing the level of CS integration (Epstein and Roy, 2001). With integration mechanisms potentially covering the Plan, Do, Check and/or Act stages, full coherence in the continuous improvement of the organisation covers all stages, and closes the current PDCA cycle.

2.1.2. Integrating CS into organisational structure

CS integration is determined by the situation in which any given company finds itself and includes the structural levels of the organisational types that allow a more complete understanding of complex organisational issues (Hatch and Cunliffe, 2013). The structure of an organisation determines how an organisation, as a system of consciously co-ordinated activities that allow groups of people to co-ordinate efforts, achieves shared goals (Sinding et al., 2014). The integration of CS into an organisation would be more successful if the organisational structure is taken into account during the CS integration process, implying the identification of leadership and key personnel, aligning responsibilities through key performance indicators, and communication via internal training and externally reporting the CS performance (Azapagic, 2003). Throughout the evolution of the organisational structure field several researchers (e.g. Mintzberg, 1993; Ouchi, 1978) have proposed generally applicable perspectives on the structure of the organisational system. Within the CS field these perspectives have been refined by, for example, Robèrt et al. (2002) by proposing different system levels (i.e. constitution, outcome, process, actions and tools), Glavič and Lukman (2007) by defining strategies, tactics and principles, and Baumgartner (2014), by taking a strategic management focus defining operational, strategic and normative as three structural levels of the organisation. The structural levels of strategic, tactical and operational (as proposed by Barratt, 2004; Kuhndt, 2004; Ouchi, 1978) are chosen for this article, as they can be applied for individuals, groups and the entire organisation (Lozano, 2014; Sinding et al., 2014). Consequently, the structural levels of strategic, tactical and operational (see Fig. 3) are used for a generally applicable representation of the organisational structure:

Fig. 3. The strategic, tactical and operational levels of the organisational structure.

- Strategic

The strategic level contains planning and executive decision making (Katz and Kahn 1978) on investment and acquisition (Kuhndt 2004; Wrisberg et al., 2002);

- Tactical

The tactical level contains the middle managers with the responsibility to translate the strategic planning and goals into operational actions. They coordinate and control the implementation of these actions. Consequently, these middle managers are the lynch pin between processes at the strategic and operational level of the organisation;

- Operational

The operational level contains the activities related to the core business of the company (Katz and Kahn 1978).

The development of an action plan for CS requires an exchange of views between the board of management at strategic level and the middle managers at tactical level, while the execution of particular actions is an issue for people from all levels of the organization (Cramer 2005a). From an organisational structure perspective, achieving integration of CS, interventions into the organisational system are best leveraged throughout the organisational structure (Epstein and Buhovac, 2014) at individual and group levels. Besides, the integration of CS into the strategic, tactical and operational levels for individuals and groups should lead to integration of the strategy at organisational level (Aldama et al., 2009). With integration mechanisms potentially covering the strategic, tactical and/or operational levels of the organisation, full coherence in the use of integration mechanisms covers all levels.

2.1.3. Integrating CS into organisational culture

Organisational culture is a key factor in ensuring the efficiency of organisational systems. Since organisational culture contributes to the identification of the individuals with the organisation's objectives it also facilitates their achievements (Hill and Jones, 2011). While managers have pluralistic perceptions of organisational culture, aiming for an ideal organisational culture for CS integration should be changed to aiming for a variable and adaptable organisational culture (Harris and Crane, 2002). In both cases achieving coherence between a strong organisational culture, active leadership, and employee commitment supports the company in achieving its strategy (Achtenhagen et al., 2013). While people within an organisation are not only moved by financial motivations, but also by the satisfaction of other needs, the coherence between the organisational culture elements should also include psychosocial mechanisms based on human relations and human information processing (Carenys, 2010). Consequently, enabling and maintaining an adaptable organisational culture can lead to the desired behaviour among employees in support of the corporate change strategy towards CS integration (Hatch and Cunliffe, 2013). With the existence of different subcultures throughout an organisation, members of each subculture can hold different attitudes towards a common corporate strategy which are distinct from that of other subcultures (Harris and Crane, 2002). The culture of a group evolves and changes over time as a result of changes in various influencing factors such as business environment, leadership, management practices and formal and informal socialisation processes between the individuals in an organisation (Carenys, 2012; Baumgartner, 2009). When changing their organisational culture, companies face the challenge of individual employees seeking meaning and coherence in their personal and work lives (Liedtka 2007).

According to Linnenluecke and Griffiths (2010), CS integration requires an adaptable organisational culture on three different levels:

1. Surface level

The integration of CS becomes visible at surface through artefacts. For example, these are visible in the form of: technical solutions, reports, key performance indicators, measures in performance evaluation, training (as also emphasised by Dunphy et al. (2003));

2 Value level

The integration of CS takes place through changes in values and beliefs at individual, group and organisational level towards more ethical and more responsible values (as also concluded by Harris and Crane, 2002), also related to the shared corporate CS strategy, all of which will be discernible from the available documentation of formalised values; and,

3 Underlying level

The adoption of CS principles requires a change in basic assumptions regarding the interdependence of humans and ecological systems (as also stressed by Purser, 1994). These are more difficult to identify, but can be disclosed by applying observation methods or, for example, deep interviews.

Companies with a strategy focussing on every level of the organisational culture demonstrates the business case for integrating of CS in a long-term strategy (Baumgartner 2009). Although changing the deepest level of the organisational culture (i.e. underlying level) is not an easy task, integration mechanisms addressing each level of the organisational culture (Baumgartner 2009) contribute to ensures adherence to the company's CS strategy. Therefore, CS integration focuses on adjusting all three levels of the organisational culture (Linnenluecke and Griffiths, 2010). With integration mechanisms potentially covering surface, value and/or underlying levels of the organisational culture, ƒulĺ coherence of the use of integration mechanisms covers all levels.

2.2. CS integration through integration mechanisms

The identification of mechanisms enables the integration processes (Karlsson et al., 2010) and establishes linkages across differentiated organisational units (Burgers et al., 2009). As a result, new corporate strategies are integrated into core business activities (Chen and Kannan-Narasimhan, 2015; Hill and Jones, 2011). The use of mechanisms to integrate newly developed strategies depends on the complexity and stability of the corporate context (Sinding et al., 2014). Whereas companies addressing CS are faced with the demands of ever-changing internal and external stakeholders (Witjes et al., n.d.), there is a need for the use of many coherent integration mechanisms (Sinding et al., 2014).

Companies have been developing numerous mechanisms to support interventions into the organisational system (Hatch and Cunliffe, 2013; Hill and Jones, 2011). For example, production of policy documents, regular meetings on specific topics, exchange of key performance data, can all be useful mechanisms for creating linkages across organisational units. The use of integration mechanisms entails determining and applying objects, activities or verbal expressions (Hatch and Cunliffe, 2013) leading to adjustments to processes and products, revision of communication strategies, and adaptation of value and knowledge systems (Azapagic and Perdan, 2005; Epstein and Buhovac, 2010; Siebenhüner and Arnold, 2007). Integration mechanisms mediate the relationship between structural differentiation and integration (Jansen et al., 2009) and can be distinguished between formal and informal mechanisms (Burgers et al., 2009; Chen and Kannan-Narasimhan, 2015). Where formal mechanisms are meant to coordinate and integrate differentiated activities through pre-established mechanisms (Ghoshal et al., 1994), informal mechanisms refer to emergent social properties (Galbraith 1973; Tsai, 2002). Besides the formal-informal grouping of integration mechanisms (as discussed by Jansen et al., 2009) or listed examples of possible interventions supporting the closing of the strategy-execution gap (as mentioned by Hill and Jones, 2011), classifications for the operationalisation of the analysis of integration mechanisms lack development (Chen and Kannan-Narasimhan 2015). Consequently, for this study we developed proper classifications of integration mechanisms in the context of CS.

To make these classifications applicable to this research, the classifications are based on fields related to the three perspectives of the organisational system (i.e. continuous organisational improvement, organisational structure, and culture). The continuous improvement of integration mechanisms for CS integration depends on employees who are responsible for accomplishing increased coherence between the stages and levels of all three organisational system perspectives (Pojasek, 2012; Sinding et al., 2014). As an organisation decides to integrate CS, it needs to formulate long-term strategies to achieve this aim (van de Kerkhof and Wieczorek, 2005). CS strategies are formulated to reach objectives on CS output and outcomes, and is partially captured in actions aimed at increasing the integration of CS (Baumgartner and Ebner, 2010). While actions alone do not fully explain the integration of CS in an organisational system, the integration of CS also emerges from the interactions amongst, and in the thoughts of, employees in the organisation (Eccles et al., 2011). Moreover, the exchange of organisational process data, as expressed in their CS impact, can form a feedback for the organisation's individuals on its effectiveness (Searcy, 2012). Consequently, activities, interactions, thoughts and data exchange, as collections of integration mechanisms, embody what of CS is to be integrated:

1. Activities

Actions that happen at a specific moment in time with regard to activities, operations, programs, initiatives carried out by an organization (Hatch and Cunliffe, 2013);

2 Interactions

The organisational system is affected by the conditions for interaction (Marion and Uhl-Bien, 2001): communication between the individuals and/or groups within the organisation, or with individuals and/or groups outside of the organisation;

3 Thoughts

The rationale of individuals at different levels within an organisation before taking action or communicating. Rationale, and associated processes of 'knowing', allow firms to innovate, and are essential for competitive strategy and performance (Eisenhardt and Santos, 2002); and,

4 Data exchange

The exchange of organisational process data, and their impact on the three CS dimensions (i.e. triple P issue dimension, time dimension and place dimension), is related to company requirements or specifications, that can form feedback for individuals in the organisation on the effectiveness of the processes and, therefore, change the processes at hand (Searcy, 2012).

2.2.1. A coherent use of integration mechanisms

Effective organisational performance occurs when the elements of the three perspectives on the organisational system are coherently addressed by integration mechanisms increasing the synergetic worth of the contributing corporate activities (Csikszentmihalyi, 2008). The concept of 'coherence' is generally used in scientific literature without making it operational. From the view of strategic management, coherence is seen as a critical capability for continuous corporate growth

(Achtenhagen et al., 2013). Our view on the coherent use of integration mechanisms seems to mirror configurational perspective literature, in that it uses the idea of coherence as a consistent set of relations between elements (Demil and Lecocq, 2010). We, therefore, define coherent as the use of interventions as mechanisms that adhere to the full cycle of continuous organisational improvement (i.e. Plan, Do, Check AND Act), thereby covering all organisational structure levels (i.e. strategic, tactical, AND operational), and all levels of the organisational culture (i.e. surface, value, AND underlying).

The coherence between the elements (i.e. stages of continuous organisational improvement and levels of organisational structure and culture) of the three perspectives of the organisational system is key for the contribution of an integration mechanism to close the strategy-execution gap. The coherent use of integration mechanisms directly supports the improvement of the performance of the other processes of the organisational system and, consequently, the performance now and in the future of the company as a whole (Demil and Lecocq, 2010). Consequently, increasing the coherent use of integration mechanisms is a key strategizing action (Achtenhagen et al., 2013) resulting in CS as an added value to the main business goals (Rauter et al., 2017). A continuous improvement of the coherent use of integration mechanisms can be sustained by learning from the success of past and present interventions in the organisational system (Epstein and Buhovac, 2010). An understanding of the success of the coherent use of integration mechanisms is, therefore, a prerequisite for increasing the level of CS integration into the organisational system. To understand the success of integration mechanisms used by companies to integrate CS into their organisational system, a holistic method based on the elements of organisation theory, organisational behaviour and strategic management was developed, as explained in the following section.

3. The LEAPFROCS method: its framework and application

The LEAPFROCS method was developed to contribute to CS integration research supporting an outcome-focused analysis of the efficiency of CS integration into the organisational system (as emphasised by Azapagic, 2003; Hahn et al., 2015; Jamali, 2006). The acronym LEAPFROCS refers to: **L**eadership **E**nabling **A**ccelerated **P**erformance by **F**erreting out **R**etrospectively the **O**rganisational Integration of **C**orporate **S**ustainability and the verb "to leapfrog". The application of the LEAPFROCS method supports companies in making, smaller or bigger, 'leapfrogs' towards adhering to their strategy on addressing CS by an analysis of the past success of corporate actions on addressing CS. By gathering and analysing, retrospectively, the integration mechanisms related to CS integration in a company, this covers the need for a method to capture CS integration longitudinally (as underlined by Hahn et al., 2015; Maon et al., 2009; Siebenhüner and Arnold, 2007). The method contributes to the development of holistic methods (Hahn et al., 2015; Jamali 2006) for analysing both formal and informal processes (as emphasised by Carenys, 2012; Epstein and Buhovac, 2010) related to the integration of CS, by uniting the three perspectives on the organisational system (i.e. continuous organisational improvement, organisational structure and organisational culture). The success of the integration mechanisms in reaching CS integration by its coherent use (as proposed by Achtenhagen et al., 2013; Demil and Lecocq, 2010) is based on the categorisation of the integration mechanisms on the elements of the three perspectives (see Fig. 4).

3.1. The application of the LEAPFROCS method

The LEAPFROCS method was developed during 10 trans-disciplinary case studies. With the existing need for theory building on CS integration (Linnenluecke and Griffiths, 2013), case study research, as a valid method for theory building (Eisenhardt and Graebner, 2007; McCutcheon and Meredith, 1993), facilitates the exploration of CS integration into organisational systems. The outcomes of the case studies served as practical knowledge to support strategic goals of the 10 participating companies as well as theoretical knowledge to support the development of the LEAPFROCS method. The final version of the LEAFPROCS method, as presented here, was tested through its application in two specific case studies: companies A and B (see Section 3). Whereas the output of this research cannot be considered as generally applicable, its intention is to provide a theoretical perspective for the examination of CS integration cases (as emphasised by Yin, 2009).

The development and application of the LEAPFROCS method also includes the development of academic courses and research mentorship opportunities. Whereas academic curricula related to sustainability should include real-world learning opportunities (Bootsma et al., 2014), the creation of course content based on LEAPFROCS and the inclusion of students in the LEAFPROCS method is aimed at shaping future

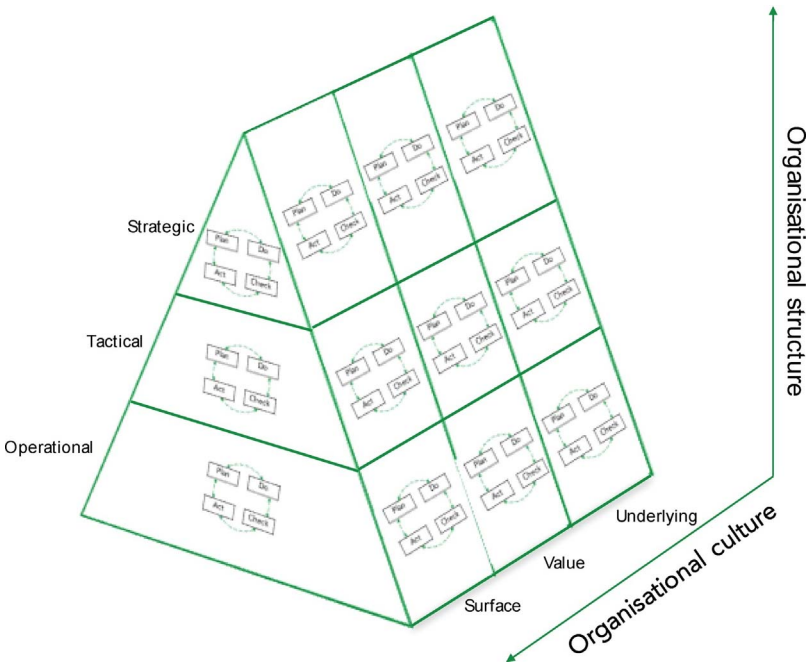

Fig. 4. The three perspectives of the LEAPFROCS method (i.e. continuous improvement, organisational structure and organisational culture) with the corresponding elements.

change agents for CS integration. In both the development cases and the test cases the data was gathered and analysed by Master's students resulting in course reports and peer reviewed Master's theses (e.g. van Denzel, 2016; Fikkert, 2015; Luiten, 2015; Pannatier, 2014; van der Berg, 2016). Students from Master's programmes on Sustainable Development and Sustainable Business & Innovation at Utrecht University were invited to participate in the development and testing of the method because the content of both Master's courses addresses CS. In preparation of their roles as LEAPFROCS researchers, the students detailed their knowledge on theoretical fields related to the three LEAPFROCS perspectives and the methodological implications of their role in a trans-disciplinary case study research project. This preparation resulted in a peer reviewed research proposal of each of the students. As personal guidance for the students, the main LEAFPROCS researcher, and author of this thesis, was the first supervisor of their Master's theses. The scientific and societal validity of the research proposal and thesis reports are checked by a second reader: an academic from fields related to sustainability, business and/or innovation. A formal guideline for the application of the LEAPFROCS method supported the students to apply the LEAPFROCS method. The guideline existed of 7 steps:

3.1.1. Selection of the CS focus and projects

The researcher meets with the company representatives to select a guiding focus for the participation of the researcher. This focus is chosen from the company's broad corporate strategy on CS merely based on the company's interests and materiality analysis. Moreover, company projects that contribute to the chosen focus are identified for the student's participation. The projects are selected depending on the company's interests and the available time for the participation of the student (i.e. 6 months).

3.1.2. Selection of the interviewees

15 company employees related to the identified projects are selected from top management to shop-floor level and throughout all company departments related to the identified projects to be interviewed ensuring data gathering on integration mechanisms throughout the organisation. Depending on the focus and projects, the students develop a specific interview protocols and questions.

3.1.3. The research proposal

The students write a proposal supporting the validity of the project based on LEAPFROCS-related literature and the outcomes of the meeting with the company (i.e. focus, projects, interviewees). After this 8-week proposal-period, the scientific and societal validity of the proposal is checked by the second-reader.

3.1.4. Data gathering through participation in company projects

The student participates in the project(s) to gather additional data from the planned interviews (e.g. documents, notes from observations and informal conversations) related to the research focus. To capture both the physical and the social organisational dynamics of CS integration, and field based data (as proposed by Baumgartner, 2009; Hahn et al., 2015; Heijden et al., 2012; Lozano, 2012) is collected. Whereas most research on CS integration has been conducted using short term data gathering methods and, for example, questionnaires or checklists (e.g. Aya Pastrana and Sriramesh, 2014; Cramer, 2005b; Jenkins, 2006; Klewitz and Hansen, 2014), the 6 months of participation of the student in company-projects results in long term qualitative data (i.e. documents, observation-notes) on past, present and planned integration mechanisms. This additional data was gathered through the application of participatory action research (PAR). PAR is a research method that permits transdisciplinary/co-productive research by simultaneously gathering case study evidence for theory building as well as to participate in organisational change processes (Bradbury-Huang, 2010; Cassell and Lee, 2012). The student is, therefore, embedded in the organisations' change processes to collect multiple sources of evidence: documents and observation notes. Together with the data from the interviews, this evidence creates the broad data sampling necessary for trans-disciplinary research (as emphasised by Scholz and Tietje, 2002). Gathering data on the underlying levels of the organisational culture in the past implies gathering evidence on interventions by collecting data on, for example, intentions, feelings and emotions (according to Schwartz, 1999). Whereas data from corporate documents, interviews, and observation notes generally covers the evidence needed for the application of LEAPFROCS, integration mechanisms related to underlying organisational culture levels, but also thoughts in the past (i.e. retrospective point of view) demand an increased thoroughness of, especially, the interviews and observations (as also emphasised by Eisenhardt and Santos, 2002). Here we need to bear in mind that the method is aimed at creating a self-reflection on CS integration and to be a catalyser for further transformative learning, providing input for discussion on the collected data analysis with the company. For that reason, there is no need for full data coverage on the organisational system of the case study companies, but it needs to enable recognition and self-reflection by key stakeholders within the company.

3.1.5. Data analysis

The student analyses the data via interpretation and comparison (as emphasised by Zillman, 1999). Interpretive analysis leads to an understanding of why phenomena come about and how these unfold over time (Elliott and Timulak, 2005). Mostly, the interpretation of activities, interactions, thoughts or exchange of data – as integration mechanisms related to the focus and projects – are clear. However, in some situations the research data is less clear and thus the analysis is based on the students' interpretation of the philosophy and its underlying mind-set. Some mechanisms could entail other mechanisms. For example, compiling a sustainability report could entail company meetings on a specific topic and the exchange of process data (see Fig. 5). The success of the sustainability report as a mechanism for CS integration depends, consequently, on the success of the meetings and the exchange of process data. In all cases the students interpreted the collected data to find the lowest level of integration mechanisms. The interpretative analysis was supported by triangulation and comparison: data from the different sources (i.e. interview, documents and notes from observations) was assessed to justify the interpretation.

The analysis results in classification and categorisation of the integration mechanisms:

- Classification of the integration mechanisms – what kind of integration mechanism?

The integration mechanisms are classified according to type (i.e. activities, interactions, thoughts and/or exchange of data, their focus on organisational dynamics) (i.e. physical and/or social), and the time perspective (i.e. past, present and/or future). Whereas the time perspective as a dimension of CS reflects when the impact of a business activities occurs (i.e. time perspective as a process output dimension), the time perspective as an integration mechanism classification

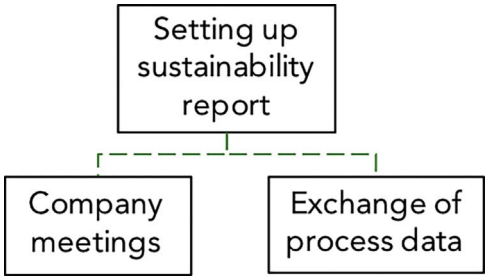

Fig. 5. An example of different integration mechanisms.

indicates when the integration happened (i.e. time perspective as a process outcome classification). The classification of the integration mechanisms aims at understanding the kind of mechanism (i.e. non-normative).

- Categorisation of the integration mechanisms – how and where do the integration mechanisms apply?

The integration mechanisms are categorised according to the elements of the three LEAPFROCS perspectives of continuous organisational improvement (i.e. Plan, Do, Check and/or Act), organisational structure (i.e. strategic, tactical and/or operational) and organisational culture (i.e. surface, value and/or underlying). The categorisation aims at understanding the success of the coherent use of the integration mechanisms.

A coherent use of the integration mechanisms results in a high success rate: the more the integration mechanism is categorised on each of the elements of the three LEAPFROCS perspectives, the higher its success rate of coherent use. Consequently, a successful and coherent integration into the organisational system requires the integration mechanism to be:

- Planned, executed, checked AND adjusted (i.e. the Plan, Do, Check, Act of the continuous organisational improvement perspective of LEAPFROCS)
- Found implemented at strategic, tactical AND operational level (i.e. organisational structure perspective of LEAFPROCS); AND
- Found at the surface, value AND underlying levels (i.e. organisational culture perspective of LEAPFROCS)

For the success of the coherent use of an integration mechanism, the number of coded categories for one specific integration mechanism can, therefore, be divided by the maximum number of categories, i.e. ten: four continuous organisational improvement elements (i.e. plan, do, check and act); three organisational structure elements (i.e. strategic, tactical and operational); and three organisational culture elements (i.e. surface, value and underlying). So far, the representation of the success rate of integration mechanisms is plausible, and can be represented in the following formula:

$$Integrationmechanismsuccesrate = (\sum Codedelementsoncontinuousorganisationalimprovement + \sum Codedelementsonorganisationalstructure + \sum Codedelements onorganisationalculture)/10asmaximumcodedelements$$

By classifying and categorising the integration mechanisms found during the case study research (i.e. the analysis of the integration mechanisms on their coherent use and consequent support for CS integration) this research intends to recognize patterns of relationships (as emphasised by Eisenhardt and Graebner, 2007) among the elements of the LEAPFROCS perspectives: the LEAPFROCS patterns. The LEAPFROCS method permits analysis of these patterns among the elements of the categorisation (i.e. of the three LEAPFROCS perspectives) using the different classifications of the intervention mechanisms, or the success-rate of the coherent use of the particular integration mechanism. For example, the patterns of the coherent use of the thought-type integration mechanism can be different from the interaction-type integration mechanism, the patterns of the coherent use of the integration mechanism of the mechanisms related to physical dynamics of the organisation can be different from the those related to the social dynamics of the organisation. The same analysis can be done from a time perspective: integration mechanisms from the past can have a different pattern of coherent use from current ones, or from prospective integration mechanisms. Consequently, the LEAPFROCS method can generate different patterns. The patterns depend on the support a specific company needs to improve their CS integration. For the testing of the LEAFPROCS method in this study (see Section 3), the patterns of the coherent use of the integration mechanisms, according to their integration success and the time perspective, resulted in both case study companies needing to define actions to improve their CS integration.

3.1.6. Outcome discussion

The outcomes of the analysis of the integration mechanisms are input for a discussion with the student, the researcher, and the representatives of the company. By discussing the LEAPFROCS patterns with the company representatives, the research analysis (the classification and categorisation of the identified integration mechanisms) was adjusted and/or validated assuring useful and acceptable outcomes (as underlined by Carew and Wickson, 2010). Moreover, discussion on these patterns encourages self-reflection on the part of the company with respect to CS integration, and is a catalyser for future corporate strategies for improving their CS integration.

3.1.7. Final reporting

In a final presentation to the company the recommendations are also validated by the company representatives. Subsequently, the outcomes of the discussion with the company are included in a report. The report includes a literature review, a critical explanation of the method, presentation of the LEAPFROCS data, the analysis (i.e. classification and categorisation of the integration mechanism, their success rate and applicable patterns), discussion of the data, considering the literature cited, the conclusions, and finally, the recommendations to the company.

3.2. Background information on the case study companies

The two case study companies used for testing the LEAFPROCS method proactively requested support on CS integration. These companies proved to be aware of the importance of sustainability for their businesses and had converted this awareness into action. Company A is a commercial cooperation of horticulturists; company B is a governmentally funded research institute on public health and sustainability. To preserve the anonymity of the companies, their real names are not mentioned.

Company A currently employs 360 people and has been engaging in CS practices for the past three years. Founded in 2005, company A is a Dutch technical service provider for the horticulture industry, manufacturer of substrate, and a supplier of horticulture tools and supporting products (e.g. fertilizer/pesticides). It is supportive of three main sectors: greenhouse vegetables; potted plants; and cut flowers. The company is part of a cooperation, in which the co-operative is the single shareholder. For this co-production action research, company A chose to focus the research on shared value creation. Three projects were selected, whose activities, in collaboration with supply chain partners, could lead to interventions in the organisational system of Company A and, therefore, to increased adherence to their CS strategy. The student participated in these three projects. Although people external to the Company A were also related with the identified projects, only Company A employees were interviewed, and further data only on Company A was collected. The main representative of Company A was the commercial manager.

Company B, with a total of approximately 1500 staff, carries out independent research on infectious diseases, public health, and consumer safety and it provides policy advice to assist government authorities. The main commissioning clients of company B are several Dutch ministries, governmental inspections, the EU and the UN. Since 2011, company B has a sustainability strategy for its own operations, and aims to become the most sustainable research institute in the Netherlands. For this co-production action research, company B chose their 2020 strategic plan as the focus. Company B wanted to know to what extent activities related to this strategic plan were successfully

integrated into the organisational system. The student participated as a member of the sustainability department in projects related to this strategic plan. The main representatives of Company B were members of the sustainability team.

4. Testing the LEAFPROCS method

The researchers in both case studies gathered LEAPFROCS data on the integration mechanisms of the two case study companies while participating in the defined projects. The overall data resulted in 85 integration mechanisms for company A and 66 for company B, as can be seen in Tables 1 and 2. The analysis of the data can result in many plausible observations. The challenge is to recognize patterns in the data that can support each company to improve its strategy for integrating CS into its organisational system. With the integration mechanisms prioritized in accordance with their success rate, Tables 1 and 2 enable recognition of patterns (as described in 2.1.5) of the coherent use of the integration mechanisms. Tables 3 and 4 present additional patterns of integration mechanisms, from the time perspective. Whereas many more perspectives on the integration mechanisms can be generated from the data in Tables 1 and 2 (e.g. an integration mechanism-type perspective, or an organisational dynamic perspective), the discussions with company A and B showed the time perspective to be very useful to reflect on the use of the integration mechanisms. Consequently, patterns from all four Tables can create self-reflection on the use of CS integration mechanisms resulting in actions for improving CS integration into their organisational systems.

4.1. The integration mechanisms according to their successful coherent use

Tables 1 and 2 each consists of two main parts; classification AND categorisation. The first column of each part represents the integration mechanisms found. The coding of an integration mechanism on the elements of the classifications (i.e. what kind of integration mechanism?) and categorisations (i.e. how and where does the integration mechanism apply?) is represented with a “1”. The percentages in the last column of the categorisation part of both Tables represent the success-rate according to the formula in Section 2.1.5. The integration mechanisms of companies A and B are ranked as per their success rates.

As an example, integration mechanism # 28 of company A (see Table 1); company A decided on optimizing the teamwork of its employees by switching from a product-based to a sector-based approach. This integration mechanism was classified as an activity (type of integration mechanism; the decision was taken and implemented) influencing the social dynamics of the organisation (organisational dynamics, the teamwork that is influenced by the integration mechanism) in the present and for the future (when did the integration mechanism take place? It was implemented during the research project and was planned to reach into the future). The student and researcher categorised this integration mechanism at the plan-and do-phase of the continuous organisational improvement, while the integration mechanism was recently planned and implemented, but not yet checked or adjusted. The integration mechanism was found at the tactical and operational levels of the organisational structure, while the decision to implement it was taken at middle management (i.e. tactical) level, thus influencing teamwork at both tactical and operational levels. Finally, the adjusted teamwork focus was found at the surface, value and underlying levels, meaning that the change to a sector-focus was visible in practice, connected to the shared company values of the employees, and conforming to the beliefs.

As can be seen in Table 1, the ten most successful integration mechanisms of company A show an almost coherent use of the mechanisms, mostly being activities related to both the physical and social dynamics of the organisational system over time (i.e. past, present and future). The last four of this group of ten are more related to the physical dynamics, and show a gap at the strategic organisational level.

The second ten most successful integration mechanisms of company A show, again, predominantly activities that are, generally, equally distributed among the physical and social dynamics. These mechanisms were more often found in the present and future than in the past. Gaps in their coherent use can be seen in the continuous organisational improvement in the Check and Act phases, the organisational structure, and, specifically, on the strategic level, but also at the tactical and operational levels. The organisational culture shows gaps in the value level.

Further down the list of integration mechanisms, activities are taken over by thoughts but the equal distribution over the physical and social dynamics is maintained. Although mechanisms for the future are maintained, mechanisms from the past were rarely found. The coherent use of the integration mechanisms shows big gaps in the Check and Act phases of the continuous organisational improvement and on the operational level of the organisational structure. The coherence with the levels of the organisational culture shows big gaps at surface level, but with smaller gaps at the value level.

As can be seen in Table 2, the ten most successful integration mechanisms for company B are mostly based on activities, with some data exchange examples. The mechanisms are predominantly related to the social dynamics of the organisational system over time (i.e. past, present and future). The categorisation of this group of ten integration mechanisms shows coherence with the continuous organisational improvement and organisational structure, but with a gap at the underlying level of organisational culture.

The second ten most successful integration mechanisms for company B show both activities and data exchange, predominantly related to the social dynamics of the organisational system over almost all time perspective phases (i.e. past, present and future). Gaps in their coherent use can be seen in the continuous organisational improvement on Check and Act phases, in the organisational structure at several levels, and in the organisational culture on value and, more predominantly, the underlying level.

Further down the list of integration mechanisms thoughts take over, especially in present. The distribution over the physical and social dynamics becomes more equal. The coherent use of the integration mechanisms shows big gaps in the check and act phases of the continuous organisational improvement, and at the operational and tactical levels of the organisational structure. The coherence with the organisational culture shows gaps at all levels, with the gap at the underlying level being the most prominent.

4.2. The integration mechanisms as per the time perspective

In Tables 3 and 4, the classified and categorised integration mechanisms are grouped in columns for the past, present, and/or future phases indicating when the integration happened. This grouping results in patterns for the coherent use of an integration mechanism from a time perspective. Tables 3 and 4 both comprise of two parts: classification; and the categorisation of the integration mechanisms. The percentages shown in both Tables represent the outcomes of integration mechanisms from a specific time perspective (i.e. past, present or future phase) that were coded for each class or category, divided by the total number of integration mechanisms (i.e. 85 for company A and 66 for company B). The percentages in the last column of the categorisation part of both Tables represent the success rate according to the formula in Section 2.1.5. For the categorisation of the integration mechanisms the “perfect” pattern shows: 1. equal distribution of percentages between the elements of one LEAPFROCS perspective based on the aimed at coherent use of the integration mechanism; and, 2. high percentages.

As can be seen from Table 3 on the integration mechanisms of company A, activities such as integration mechanisms decrease, while thoughts increase, when going from past, via present to future mechanisms. Integration mechanisms in all time-phases show an equal relationship with the physical and social dynamics of the organisational

Table 1
The classification and categorisation of the integration mechanisms of Company A.

Integration Mechanism	Classification - What kind of integration mechanism?									Integration Mechanism	Categorisation - How and where does the integration mechanism apply?									
	Type				Organisational system		Time				Continuous Improvement				Structure			Culture			
	Activity	Interaction	Thought	Data exchange	Physical dynamics	Social dynamics	Past	Present	Future		Plan	Do	Check	Act	Strategic	Tactical	Operational	Surface	Value	Underlying	
1	1	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100.0 %
2	1	0	0	0	0	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	100.0 %
3	1	0	0	0	1	0	1	1	1	3	1	1	1	1	1	1	1	1	1	1	100.0 %
4	1	0	1	0	0	1	1	1	0	4	1	1	1	1	1	1	1	1	1	1	100.0 %
5	1	0	0	0	1	0	1	1	1	5	1	1	1	1	1	1	1	1	0	1	90.0%
6	1	0	0	0	0	1	1	1	1	6	1	1	1	1	0	1	1	1	1	1	90.0%
7	1	0	0	0	1	0	1	1	1	7	1	1	1	1	0	1	1	1	1	1	90.0%
8	1	0	0	0	1	0	1	1	1	8	1	1	1	1	0	1	1	1	1	1	90.0%
9	1	0	0	0	1	0	1	1	1	9	1	1	1	0	0	1	1	1	1	1	80.0%
10	0	0	1	1	1	0	1	1	1	10	1	1	0	0	1	1	1	1	1	1	80.0%
11	1	0	0	0	1	0	0	1	1	11	1	1	1	1	1	1	1	1	0	1	90.0%
12	1	0	0	0	1	0	1	1	1	12	1	1	1	1	0	1	0	1	1	1	80.0%
13	1	0	1	1	1	0	0	1	1	13	1	1	1	0	1	1	1	1	0	1	80.0%
14	1	0	1	0	0	1	0	1	1	14	1	1	1	0	1	1	1	1	0	1	80.0%
15	1	0	0	0	0	1	0	1	1	15	1	1	1	1	0	1	1	1	0	1	80.0%
16	0	1	0	0	0	1	1	1	1	16	1	1	0	0	0	1	1	1	1	1	70.0%
17	1	0	0	0	0	1	1	1	1	17	1	1	1	0	0	0	1	1	1	1	70.0%
18	1	0	0	0	1	0	1	1	1	18	1	1	1	1	0	0	1	1	0	1	70.0%
19	1	0	0	0	0	1	1	1	1	19	1	1	0	0	0	1	1	1	1	1	70.0%
20	1	0	0	0	1	0	0	1	0	20	1	1	1	1	1	1	0	1	0	1	80.0%
21	1	0	0	0	1	0	1	0	0	21	1	1	1	0	1	1	1	1	0	1	80.0%
22	0	0	1	1	1	0	0	1	1	22	1	1	0	0	0	1	1	1	1	1	70.0%
23	0	0	1	0	0	1	0	1	1	23	1	1	1	0	1	1	1	0	0	1	70.0%
24	1	0	1	0	1	0	0	1	1	24	1	1	0	0	1	1	1	1	0	1	70.0%
25	1	0	0	0	0	1	1	1	1	25	1	1	0	0	0	1	1	1	0	1	60.0%
26	1	0	1	1	1	0	1	1	1	26	1	1	0	0	1	1	0	0	1	1	60.0%
27	1	0	1	0	1	0	1	1	1	27	1	1	0	0	1	1	0	0	1	1	60.0%
28	1	0	0	0	0	1	0	1	1	28	1	1	0	0	0	1	1	1	1	1	70.0%
29	1	0	1	1	1	0	1	1	1	29	1	1	0	0	0	1	1	1	0	1	60.0%
30	0	0	1	0	0	1	1	1	1	30	0	1	0	0	1	1	1	1	0	1	60.0%
31	1	0	1	0	0	1	0	1	1	31	1	1	0	0	0	1	1	1	0	1	60.0%
32	0	0	1	0	0	1	0	1	1	32	1	0	0	0	1	1	1	0	1	1	60.0%
33	0	0	1	0	0	1	0	1	1	33	1	1	0	0	1	1	0	0	1	1	60.0%
34	0	0	1	0	0	1	1	0	1	34	1	1	1	0	0	1	0	1	0	1	60.0%
35	1	0	1	1	1	0	0	1	0	35	1	1	1	0	0	1	1	1	0	1	70.0%
36	1	0	1	0	1	0	0	1	0	36	1	1	0	0	1	1	1	1	0	1	70.0%
37	0	0	1	0	1	0	0	1	1	37	1	1	0	0	0	1	1	1	0	1	60.0%
38	0	0	0	1	1	0	0	1	1	38	1	1	0	0	1	1	0	1	0	1	60.0%
39	1	0	1	0	0	1	0	1	1	39	1	1	1	1	0	1	0	1	0	0	60.0%
40	0	0	1	0	0	1	0	1	1	40	1	1	0	0	1	0	1	0	1	1	60.0%
41	0	0	1	0	1	0	0	1	1	41	1	1	0	0	0	1	0	1	0	1	50.0%
42	0	1	0	0	0	1	0	1	1	42	1	1	0	0	1	0	0	1	0	1	50.0%
43	0	1	0	0	0	1	0	1	1	43	1	1	0	0	0	1	0	1	0	1	50.0%
44	1	0	1	0	0	1	0	1	1	44	1	1	0	0	0	1	1	0	0	1	50.0%
45	1	0	0	0	1	0	0	1	1	45	1	1	0	0	0	0	1	1	0	1	50.0%
46	1	0	0	0	0	1	0	1	1	46	1	1	1	0	0	1	0	0	0	1	50.0%
47	1	0	1	0	0	1	0	1	1	47	1	1	0	0	0	1	0	0	1	1	50.0%
48	0	0	1	0	0	1	0	1	1	48	1	1	0	0	1	1	0	0	0	1	50.0%
49	0	0	1	0	1	0	0	1	1	49	1	0	0	0	1	1	0	0	1	1	50.0%
50	1	0	0	0	1	0	1	1	1	50	1	1	0	0	0	0	1	1	0	0	40.0%
51	1	0	1	0	0	1	0	0	1	51	1	1	0	0	0	1	0	1	0	1	50.0%
52	0	0	1	0	0	1	0	1	1	52	1	0	0	0	1	0	0	0	1	1	40.0%
53	1	0	0	0	0	1	0	1	0	53	1	1	0	0	1	1	0	0	0	1	50.0%
54	1	0	0	0	1	0	0	1	1	54	1	0	0	0	1	0	0	0	1	1	40.0%
55	0	0	0	1	1	0	0	1	1	55	1	1	0	0	0	1	0	0	0	1	40.0%
56	0	0	1	0	0	1	0	1	1	56	1	0	0	0	1	0	0	0	1	1	40.0%
57	0	0	1	0	1	0	0	1	1	57	1	0	0	0	1	1	0	0	0	1	40.0%
58	0	0	1	0	1	0	0	0	1	58	1	0	0	0	1	1	0	0	0	1	40.0%
59	0	0	1	0	1	0	0	0	1	59	1	0	0	0	0	1	0	0	1	1	40.0%
60	0	0	1	0	0	1	0	0	1	60	1	0	0	0	1	0	0	0	1	1	40.0%
61	0	0	1	0	1	0	0	0	1	61	1	1	0	1	0	0	0	0	1	0	40.0%
62	0	0	1	1	1	0	0	0	0	62	1	1	0	0	1	1	1	0	0	0	50.0%
63	0	0	1	0	1	0	0	0	1	63	1	0	0	0	1	0	0	0	1	1	40.0%
64	0	0	1	0	1	0	0	0	1	64	1	0	0	0	0	1	1	0	0	1	40.0%
65	0	0	1	0	0	1	0	0	1	65	1	1	0	0	0	0	1	0	0	1	40.0%
66	0	1	1	0	0	1	0	0	1	66	1	0	0	0	1	0	0	0	0	1	30.0%
67	0	0	1	0	1	0	0	0	1	67	1	0	0	0	1	0	0	0	0	1	30.0%
68	1	0	0	0	1	0	0	0	1	68	1	0	0	0	0	1	0	0	0	1	30.0%
69	1	0	0	0	1	0	0	0	1	69	1	0	0	0	1	0	0	0	1	0	30.0%
70	0	0	1	0	0	1	0	0	1	70	1	0	0	0	1	0	0	0	0	1	30.0%
71	0	0	1	0	1	0	0	0	1	71	1	0	0	0	0	1	0	0	0	1	30.0%
72	1	0	0	1	1	0	1	0	0	72	0	1	0	0	0	0	1	1	0	0	30.0%
73	0	0	0	1	1	0	1	0	0	73	0	1	0	0	0	0	1	1	0	0	30.0%
74	0	0	1	0	1	0	0	0	1	74	1	0	0	0	0	0	1	0	0	1	30.0%
75	0	0	1	0	0	1	0	0	1	75	1	0	0	0	0	0	1	0	0	1	30.0%
76	0	0	1	0	0	1	0	0	1	76	1	0	0	0	0	1	0	0	0	1	30.0%
77	0	0	1	0	0	1	0	0	1	77	0	1	0	0	0	0	1	0	0	1	30.0%
78	0	0	1	0	0	1	0	0	1	78	0	1	0	0	0	0	1	0	0	1	30.0%
79	0	0	1	0	0	1	0	0	1	79	1	0	0	0	0	1	0	0	0	1	30.0%
80	0	0	1	0	1	0	0	0	1	80	1	0	0	0	0	0	1	0	0	1	30.0%
81	0	0	1	0	0	1	0	0	1	81	1	0	0	0	1	0	0	0	1	0	30.0%
82	0	1	1	0	0	1	0	0	1	82	1	0	0	0	1	0	0	0	1	0	30.0%
83	0	0	1	0	1	0	0	0	1	83	1	0	0	0	1	0	0	1	0	0	30.0%
84	0	0	1	0	0	1	0	0	1	84	1	0	0	0	0	1	0	0	1	0	30.0%
85	0	0	1	0	0	1	0	1	1	85	0	0	0	0	1	0	0	0	1	0	20.0%

Table 2
The classification and categorisation of the integration mechanisms of Company B.

Integration Mechanism	Classification - What kind of integration mechanism?									Integration Mechanism	Categorisation - How and where does the integration mechanism apply?										
	Type				Organisational system		Time				Continuous Improvement				Structure			Culture			
	Activity	Interaction	Thought	Data exchange	Physical dynamics	Social dynamics	Past	Present	Future		Plan	Do	Check	Act	Strategic	Tactical	Operational	Surface	Value	Underlying	
1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100.0%
2	0	0	0	1	0	1	0	1	1	2	1	1	1	1	1	1	1	1	1	1	100.0%
3	1	0	0	0	0	1	1	1	1	3	1	1	1	1	1	1	1	1	1	0	90.0%
4	1	0	0	0	0	1	1	1	1	4	1	1	1	1	1	1	1	1	1	0	90.0%
5	1	0	0	0	0	1	1	1	1	5	1	1	1	1	1	1	1	1	1	0	90.0%
6	0	0	0	1	1	0	1	1	1	6	1	1	1	1	1	1	1	1	0	0	80.0%
7	1	0	0	0	1	0	1	1	1	7	1	1	1	1	1	0	1	1	1	0	80.0%
8	0	0	0	1	0	1	1	1	1	8	1	1	1	1	1	1	1	1	0	0	80.0%
9	1	0	0	0	0	1	1	1	0	9	1	1	1	1	1	1	1	1	0	0	80.0%
10	1	0	0	0	0	1	1	1	1	10	1	1	0	0	1	1	1	1	1	0	70.0%
11	1	0	0	0	0	1	0	1	1	11	1	1	1	1	0	1	1	1	1	0	80.0%
12	0	0	0	1	0	1	1	1	0	12	1	1	1	1	1	1	1	1	0	0	80.0%
13	0	0	0	1	0	1	0	1	1	13	1	1	1	1	0	1	1	1	1	0	80.0%
14	1	0	0	0	0	1	1	1	1	14	1	1	1	0	0	0	1	1	1	1	70.0%
15	1	0	0	0	0	1	1	1	1	15	1	1	0	0	1	1	1	1	0	0	60.0%
16	0	0	0	1	1	0	1	1	1	16	1	1	1	1	1	0	0	1	0	0	60.0%
17	0	0	1	0	1	0	0	1	1	17	1	1	0	0	1	0	1	1	1	1	70.0%
18	0	0	0	1	0	1	0	1	1	18	1	1	0	0	1	1	1	1	0	0	60.0%
19	1	0	0	0	0	1	1	1	1	19	1	1	0	0	1	0	1	0	1	0	50.0%
20	1	0	0	0	0	1	1	1	1	20	1	1	0	0	1	1	0	0	1	0	50.0%
21	0	0	0	1	1	0	1	1	0	21	1	1	1	1	1	0	0	1	0	0	60.0%
22	0	0	0	1	1	0	1	1	0	22	1	1	1	1	1	0	0	1	0	0	60.0%
23	0	0	0	1	1	0	0	1	0	23	1	1	0	0	1	1	1	1	0	0	60.0%
24	0	0	1	0	1	0	0	0	1	24	1	0	0	0	1	1	1	1	0	0	50.0%
25	1	0	0	0	0	1	1	1	0	25	0	1	0	0	0	1	1	0	1	1	50.0%
26	0	0	0	1	0	1	1	1	0	26	1	1	0	0	1	1	0	1	0	0	50.0%
27	0	0	0	1	1	0	1	1	0	27	1	1	1	1	1	0	0	0	0	0	50.0%
28	0	0	0	1	0	1	1	1	0	28	1	1	1	1	1	0	0	0	0	0	50.0%
29	0	0	1	0	0	1	0	1	1	29	1	0	0	0	0	1	1	1	1	0	50.0%
30	1	0	0	0	0	1	0	1	0	30	1	1	0	0	1	1	0	1	1	0	60.0%
31	1	0	0	0	0	1	1	1	0	31	1	1	1	1	1	0	0	0	0	0	50.0%
32	0	0	1	0	1	1	0	1	1	32	1	1	1	1	1	0	0	0	0	0	50.0%
33	1	0	0	0	0	1	1	1	0	33	1	1	1	1	1	0	0	0	0	0	50.0%
34	0	0	0	0	0	1	1	1	1	34	1	1	0	0	1	0	0	0	0	0	30.0%
35	0	0	1	0	0	1	0	1	1	35	1	1	0	0	1	0	0	1	0	0	40.0%
36	0	0	1	0	0	1	1	1	0	36	0	0	0	0	1	1	1	0	1	0	40.0%
37	0	0	1	0	1	0	0	1	0	37	1	1	0	0	1	1	0	0	0	0	40.0%
38	0	0	0	1	1	0	1	1	0	38	1	1	0	0	1	0	0	0	0	0	30.0%
39	0	0	1	0	1	0	0	1	1	39	1	0	0	0	1	0	0	0	1	0	30.0%
40	0	0	1	0	0	1	0	1	1	40	1	0	0	0	1	0	0	0	1	0	30.0%
41	0	0	1	0	1	0	0	1	0	41	0	0	0	0	1	1	1	0	1	0	40.0%
42	0	0	1	0	1	0	0	1	0	42	1	1	0	0	0	1	0	0	1	0	40.0%
43	0	0	1	0	1	0	0	1	0	43	0	0	0	0	1	1	1	0	1	0	40.0%
44	0	0	1	0	0	1	0	1	1	44	1	1	0	0	1	0	0	0	0	0	30.0%
45	0	0	1	0	0	1	0	1	0	45	1	1	0	0	1	0	0	1	0	0	40.0%
46	0	0	1	0	0	1	0	1	0	46	0	0	0	0	1	1	1	0	0	1	40.0%
47	0	0	0	1	0	1	0	0	1	47	1	0	0	0	1	0	0	0	1	0	30.0%
48	0	0	0	1	1	0	0	0	0	48	1	1	1	0	1	0	0	0	0	0	40.0%
49	0	0	1	0	1	0	0	0	1	49	1	0	0	0	1	0	0	0	1	0	30.0%
50	0	0	1	0	1	0	0	0	1	50	1	0	0	0	1	0	0	0	1	0	30.0%
51	0	0	1	0	1	0	0	1	0	51	0	0	0	0	1	1	0	0	1	0	30.0%
52	0	0	1	0	1	0	0	1	0	52	0	0	0	0	0	1	1	0	0	1	30.0%
53	1	0	0	0	0	1	0	0	0	53	1	1	0	0	1	0	0	1	0	0	40.0%
54	1	0	0	0	0	1	0	0	0	54	1	1	0	0	0	1	0	1	0	0	40.0%
55	1	0	0	0	0	1	0	0	0	55	1	1	0	0	0	1	0	1	0	0	40.0%
56	0	0	0	1	1	0	0	0	0	56	1	1	0	0	1	0	0	1	0	0	40.0%
57	0	0	1	0	0	1	0	0	1	57	1	0	0	0	1	0	0	0	1	0	30.0%
58	0	0	1	0	0	1	0	0	1	58	1	0	0	0	0	0	1	0	1	0	30.0%
59	0	0	0	1	0	1	0	0	0	59	0	1	0	0	1	0	0	1	0	0	30.0%
60	0	0	1	0	0	1	0	0	1	60	0	0	0	0	1	0	0	0	0	1	20.0%
61	0	0	1	0	0	1	0	1	0	61	0	0	0	0	1	0	0	0	1	0	20.0%
62	0	0	1	0	0	1	0	1	0	62	0	0	0	0	1	0	0	0	1	0	20.0%
63	0	0	0	1	1	0	0	0	0	63	1	0	0	0	1	0	0	1	0	0	30.0%
64	0	0	1	0	0	1	0	1	0	64	1	0	0	0	1	0	0	0	0	0	20.0%
65	0	0	1	0	0	1	0	1	0	65	0	0	0	0	0	0	1	0	1	0	20.0%
66	0	0	1	0	0	1	0	1	0	66	0	0	0	0	0	0	1	0	1	0	20.0%

Table 3
The classified and categorised integration mechanisms of company A from a time perspective. The black bar chart represents the percentages for each cell.

Classification - What kind of integration mechanism?						
Company A	Type				Organisational system	
	Activity	Interaction	Thought	Output	Physical dynamics	Social dynamics
Past	80%	4%	28%	20%	64%	36%
Present	64%	5%	51%	20%	51%	49%
Future	43%	7%	64%	9%	49%	51%

Company A	Continuous Improvement				Structure			Culture			Succes of CS integration
	Plan	Do	Check	Act	Strategic	Tactical	Operational	Surface	Value	Underlying	
Past	88%	100%	56%	40%	40%	80%	84%	92%	60%	88%	73%
Present	96%	87%	38%	25%	53%	82%	62%	67%	47%	95%	65%
Future	95%	64%	25%	17%	46%	66%	50%	47%	43%	88%	54%

system. Looking at the categorisation, Table 3 shows that past integration mechanisms are related to the Plan and Do phases of continuous improvement, with the Check and Act phases making a lower contribution. Whereas present and future integration mechanisms show a decreasing relation with the Do, Check and Act phases, the relation to the Plan phase remains high. Past integration mechanisms were found at tactical and operational level. Although this changes from present to future mechanisms to a more equal distribution, the percentages are lower, resulting in the future phase showing an almost equal distribution over all organisational structure levels. From an organisational culture perspective, the integration mechanisms were, are, and will be strongly related to the underlying level. Integration mechanisms related to surface and value levels decrease when going from past, via present to future, resulting in an unequal distribution of the integration mechanisms. Finally, the categorisation of the integration mechanisms from a time perspective results in a decrease in the success of the

Table 4
The classified and categorised integration mechanisms of company B from a time perspective. The black bar chart represents the percentages for each cell.

Classification - What kind of integration mechanism?						
Company B	Type				Organisational system	
	Activity	Interaction	Thought	Output	Physical dynamics	Social dynamics
Past	54%	0%	4%	38%	27%	73%
Present	31%	0%	40%	27%	33%	69%
Future	34%	0%	41%	22%	28%	75%

Categorisation - How and where does the integration mechanism apply?											
Company B	Continuous Improvement				Structure			Culture			Succes of CS integration
	Plan	Do	Check	Act	Strategic	Tactical	Operational	Surface	Value	Underlying	
Past	92%	96%	65%	62%	92%	54%	58%	62%	42%	12%	63%
Prese	79	73	40%	38	83%	54%	54%	50%	52	12%	54%

coherent use of the integration mechanisms when going from past, via present to future mechanisms.

As can be seen in Table 4 on the integration mechanisms of company B, activities and data exchange are higher in the past, but decrease in present and future phases. This leaves thoughts as the main integration mechanism in present and future phases. Integration mechanisms are more related to the social organisational dynamics for all time perspective phases. Looking at the categorisation, Table 4 shows that, from a continuous improvement perspective, integration mechanisms of all time perspective phases are more related to Plan and Do phases, rather than the Check and Act phases. Whereas present and future integration mechanisms show a decreasing relationship with Do, Check and Act phases, the relationship to the Plan phase remains high, especially for integration mechanisms related to the future. Distribution of the integration mechanisms over the three levels of the organisational structure remain the same over time, and most mechanisms are related to the strategic level and less to the other two levels. From an organisational culture perspective, the integration mechanisms were, are, and will be, more related to the surface and value levels than to the underlying level. Finally, the categorisation of the integration mechanisms from a time perspective results in a quite stable success rate for the coherent use of the integration mechanisms when going from past, via present to future mechanisms.

4.3. Actions for improving future CS strategies

The analysis of patterns of the coherent use of the integration mechanisms and on integration mechanisms from a time perspective show different outcomes for both companies. The discussion of the patterns with the representatives of both companies resulted, therefore, in different consequential decisions for each company on improving CS integration into their organisational systems.

Company A chose to focus the research on shared value creation and let the student gather data on related integration mechanisms by participation in three shared value creation projects. The resulting data on 85 integration mechanisms show that Company A can improve their coherent use of integration mechanisms by closing gaps in all LEAPFROCS perspectives. From a continuous organisational learning perspective, Company A needs to include mechanisms for Check and Act into their strategy, while maintaining an equal distribution in relation to the physical and social dynamics of the organisational system. Besides, these integration mechanisms should present an increased focus on the strategic level while maintaining the focus at the tactical and operational levels. And lastly, an equal distribution of the three organisational culture levels can be obtained by more integration mechanisms related to the value and artefacts levels of the organisational culture.

While analysing and discussing the LEAPFROCS patterns with the representatives of Company A they reflected on the support for employees with the control (i.e. Check) and evaluation (i.e. Act) of initiatives related to the CS strategy. Moreover, the company expressed the will to create a bridge between strategies and policies at strategic level, and initiatives at the other two organisational structure levels, while developing integration mechanisms that would make CS a more shared corporate value (i.e. at value level) and tangible (i.e. at surface level). This self-reflection of company A resulted in the appointment of the student, who gathered the research data, as the new business development manager after finishing his thesis. The student was assigned to support colleagues with integrating CS into their daily business activities and developing and executing integration mechanisms with an increased coherence of use, according to the above-mentioned needs, and related to the CS strategy.

Company B wanted to know how activities related to their strategic plan on CS resulted in successful CS integration into the organisational system. Consequently, the student gathered data on related integration mechanisms by being a member of the sustainability department in projects related to this strategic plan. The resulting data of 66 integration mechanisms show that Company B can improve the coherent use of integration mechanisms by closing gaps at all LEAPFROCS perspectives. Company B has a challenge to develop integration mechanisms for closing the cycle of continuous improvement, especially by mechanisms in Do, Check and Act phases. Whereas Company B has been seeking CS integration, especially in the social dynamics-related integration mechanisms, there is a need for more integration mechanisms related to the physical organisational dynamics. Moreover, these mechanisms should aim for an equal distribution of CS integration over all levels of the organisational structure. From an organisational culture perspective, company B should increasingly emphasise the underlying level of the organisational culture.

While analysing and discussing the LEAPFROCS patterns with the representatives of Company B, they discussed how to support the organisation while reflecting upon and learning from (i.e. continuous organisational improvement) past CS integration. Additionally, they reflected upon the current high number of socially oriented mechanisms not connecting to the individual employees (i.e. underlying organisational culture level). Company B translated this self-reflection into developing an additional research study on how the psychological factors and personality characteristics of the internal change agents related to successful integration mechanisms. With this additional research, Company B aims at improving their understanding of the kind of person they should hire to lead the integration of CS into their organisational system.

5. Conclusions

This article presents the LEAFPROCS method as a more holistic, retrospective and longitudinal research approach to understand successful integration of CS into organisational systems. The trans-disciplinary approach enables the LEAPFROCS method to support companies in improving the integration of CS into their organisational systems. A coalescence of elements stemming from different fields (as was proposed by Maas et al. (2016b)) (i.e. organisational theory, organisational behaviour and strategic management) forms the basis of the LEAPFROCS method. Additionally, the LEAPFORCS method permits analysis of the success of the integration of CS into the organisational culture as was emphasised by, for example, Epstein and Buhovac (2010). The concept of integration mechanisms is used to cross-relate the different elements, as was underlined by Sorge (2004), and facilitates the CS integration process. Whereas integration mechanisms lead to transformative changes throughout the organisational system (as underlined by Epstein and Widener, 2010), the coherent use of the mechanisms shows their contribution to the filling of the gap between a CS strategy and its execution (as concluded by Csikszentmihalyi, 2008; Achtenhagen et al., 2013), resulting in CS being an added value for business goals (as concluded by Rauter et al., 2015).

To gather retrospective data on the link between integration mechanisms and continuous organisational improvement, and organisational structure and organisational culture, the researcher should be embedded in an organisation's change processes. Whereas other researchers (Hahn et al., 2015; Maon et al., 2009; Siebenhüner and Arnold, 2007) propose to capture CS integration longitudinally, the LEAPFROCS approach contributes by applying a participatory action research approach. The testing of the LEAPFROCS method with the two case study companies that proactively chose support with their CS integration shows that integration mechanisms for successful integration of CS are different in classification and categorisation: the coherence of its use.

The proposal of a formula to represent the success rate of integration mechanisms (see Section 2.1.5) reflects the goal to reduce differences within the organisational system on a specific strategy (as emphasised by Dougherty, 2001; Sheremata, 2000) leading to actions for the integration of the strategy at all levels of the organisation (as

concluded by Cramer, 2005a). Whereas the focus on the coherent use of integration mechanisms is directly supporting performance improvement of related processes (as underlined by Demil and Lecocq, 2010), learning from the success of past integration mechanisms (as proposed by Epstein and Buhovac, 2010) contributes to the improvement of the corporate strategy (as concluded by Achtenhagen et al., 2013). In this way, the application of the LEAPFROCS method enables verification of the conclusions by, for example, Searcy (2012) and Engert et al. (2016) that integration of CS into the organisational system is different for each company. For the two case studies the representatives of the company, the students and the researchers chose a research focus based on each companýs CS strategy. This focus helped the students to gather specific data on integration mechanisms, and related the integration mechanisms to the LEAFPROCS classes and categories.

The data analysis is aimed at the recognition of useful patterns of relationships (as underlined by Eisenhardt and Graebner, 2007) between the LEAPFFROCS elements. For the two case studies, we decided to analyse two types of pattern: 1. patterns of coherent use of the integration mechanisms; and, 2. patterns for integration mechanisms from a time perspective. Whereas many more patterns on the integration mechanisms can be generated from LEAPFROCS data, the discussion of the data with both company A and B showed that these two patterns would suffice for them to take consequential decisions on improving CS integration into their organisational systems. The discussion on these patterns creates self-reflection by the companies on their CS integration mechanisms, becoming a catalyst for future corporate strategies for improving CS integration. Moreover, the participation of master students equipped future CS change agents with detailed knowledge of real-world CS integration cases (as emphasised by Bootsma et al., 2014), and of the methodological implications of a trans-disciplinary case study (as underlined by Bradbury-Huang, 2010; Cassell and Lee, 2012).

Whereas the LEAPFROCS method was developed under the aegis of CS, it may also be applicable for other transformative changes to the organisational system. In general, it supports proactive and forward-thinking companies in their challenge to increase the coherent use of integration mechanisms while integrating specific corporate strategies into their organisational systems, with a possible consequent, beneficial, exploitation of their business potential.

Suggestions for further research

To further develop the theory of company CS integration, the application of the LEAPFROCS method should be extended to include the gathering of data in cooperation with companies from different sectors, and by increasing the geographical scope to include companies from other countries. Besides, the LEAPFROCS method should be improved to gather evidence on social interventions at individual, or even basic assumption level: for example, an understanding of personal characteristics or world views on the success of integration. Moreover, we recommend extending the method to make the link between the output (i.e. the impact of the organisational processes on the three CS dimensions) and outcome (i.e. the efficiency of the organisational system based on the coherence between the organisational process elements) of CS integration more explicit. This proposed extension would broaden the research scope for determining the contribution of the outcomes of business activities that favourably influence the output of processes and products resulting in a positive impact on the CS dimensions.

We also recommend extending the geographical range of students participating in this research. Whereas the research for this study included collaboration with, and participation of, students of different levels, including students from other countries extends the development of academic courses and research mentorship opportunities as approaches to science and community action, and to foster future CS researchers or practitioners on a wider geographical scale.

The overall challenge is to create a critical mass of research data on CS integration in companies by the application of the LEAPFROCS method, as a trans-disciplinary research approach. The academic community needs to play an essential triple role here: partly supplying approaches and tools for CS integration; partly critically analysing the progress made and testing the assumptions about effective strategies for transformative change towards CS integration; and partly educating present and future CS integration change agents. This study presents several steps, but it has also created a wide collaboration with academic and market actors in this common challenge as a basis for future trans-disciplinary theory building activities on CS integration.

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