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Creating a culture for sustainability and quality – a lean-inspired way of working

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Even though much research has been carried out regarding various sustainability issues, the research into cultural aspects of sustainability and quality is very limited. The purpose of this study is to explore the culture of an award-winning company that is successfully working with sustainability and quality. The ambition is to contribute to the development of sustainable quality management. In order to identify and describe their ways of working, a case study was carried out at Sky Factory, an award-winning innovative manufacturing company which utilises Lean principles. In-depth interviews were performed with the CEO and a number of employees focusing on exploring their way of working as well as their value base, attitudes and practices regarding quality and sustainability. The data collection also included document studies and observation. The research was inductive, based on the Grounded Theory methodology and the data was analysed with the constant comparative technique. The analysis revealed a set of categories in the form of dimensions which, combined with theory, resulted in a tentative framework. One limitation is that the study only included a single company, which may limit the possibilities for generalisation. Nonetheless, the dimensions that were identified and the framework that integrates them should be useful as a vantage point for further research.

Keywords: sustainability; quality management; organisational culture; lean; grounded theory

Introduction

There is continuously escalating pressure on organisations to pursue more complex and often inconsistent aspects of performance (Prajago & McDermott, 2005). Therefore, organisations need to be flexible and adapt different management styles allowing them to swing between control and flexibility as well as between internal and external orientation.

Sustainability has emerged as a new competitive factor since reducing negative environmental and social impact is crucial (Wong & Wong, 2014). However, so far, limited amounts of research have been carried out in the field. The need for more empirical research has been raised (Siva et al., 2016), especially on the interface between QM and sustainability (Eriksson et al., 2016) and research gaps have been identified in the context of SMEs (Cherrafi, Elfezazi, Chiarini, Mokhlis, & Benhida, 2016). Much remains unclear and therefore worth further exploration (Zairi, 2002). Moreover, a crucial challenge organisations face today is to create a strong culture based on quality (Henri, 2006; Prajago & McDermott, 2005). This is necessary since the culture restrains the way quality management (QM) practices are both designed and delivered (Prajago & McDermott, 2005).

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Furthermore, the organisational culture influences the degree to which creativity and inno-vation are stimulated in an organisation (Martins & Terblanche, 2003).

The purpose of this study is to explore the culture of the innovative manufacturing company Sky Factory, USA, and their ways of working. The company is an award-winning company, started in 2002 as an experiment – the founder wanted to create a beau-tiful corporation with the intention to run it according to everything he has learnt about art and ignore his business knowledge in order to create a culture that is beneficial for employ-ees, customers, investors as well as founders. The revenues of the company have been growing continuously. Between 2006 and 2013, the growth of revenues increased from the previous year by an average of 11.8%. In 2012, Sky Factory became Iowa´s first entirely solar-powered business, the first net-zero company in this state. The purpose is broken down into the following research questions:

RQ1: How does the company work with quality and sustainability?
RQ2: How does the company develop their culture?

The remainder of the paper is structured as follows. First, some relevant contributions from theory and previous research into quality management, lean manufacturing, organisational culture and sustainability are briefly reviewed. Next, the methodology employed is described. The findings, based on document studies and interviews, follow. Subsequently, the categories that emerged from the analysis of the data are presented. They are then ana-lysed and a model depicting the company's culture and ways of working for quality and sustainability is created. A discussion and conclusions section and a note on the limitations conclude the paper.

Quality management

Many authors hold the view that there are different levels of QM (Dale, 2003; Dale & Las-celles, 1997; Hellsten & Klefsjö, 2000; Lagrosen & Lagrosen, 2003). Our view is that there are three levels of increasing degree of profoundness (see Figure 1).
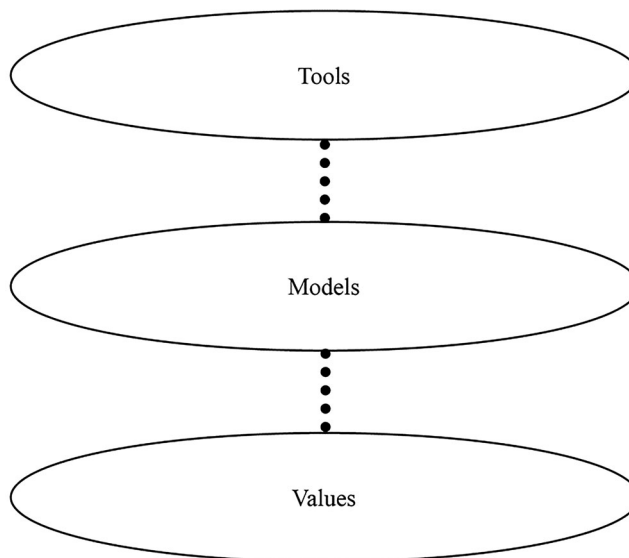

Figure 1. The levels of quality management.

The deepest level of quality management consists of values. The values that are included vary, but those that we have found to occur most frequently are 'leadership commitment', 'customer orientation', 'participation of everyone', 'process orientation', 'continuous improvements' and 'base decisions on fact' (Lagrosen & Lagrosen, 2005; Sila & Ebrahimpour, 2002). They are deep-lying assumptions or notions of how the organisation should function. NIST (2006) states that these values and concepts are embedded beliefs and behaviours found in high-performing organisations. They are the foundation for integrating essential performance and operational requirements within a results-oriented framework that creates a basis for action and feedback. The more superficial levels of models and tools can be seen as ways of working within the organisation in order to establish the values and manifest them in the daily activities of the organisation. These levels can also be viewed as interdependent components in a continuously evolving management system (Hellsten & Klefsjö, 2000).

Lean manufacturing

Lean Manufacturing (LM) can be viewed alternatively as a set of principles, philosophy, approach, programme, system or paradigm (Bhamu & Sangwan, 2014) with the goal to be highly responsive to customer demands through reduction of waste. Therefore LM have many similarities with the values of TQM (Bergman & Klefsjö, 2010) and are sometimes claimed to have evolved from QM (Byrne, Lubowe, & Blitz, 2007). Lean implementations have been shown to lead to an improvement in production lead time, defects, inventory and equipment effectiveness as well as effective communication, job satisfaction and team decision-making (Bhamu & Sangwan, 2014).

From a comprehensive literature review, Bhamu and Sangwan (2014) conclude that the adoption of LM in SMEs requires external support, involves uncertainty regarding future benefits and is therefore not widespread. Moreover, the success of LM is dependent on both the culture and prevailing work practices. One LM principle concerns establishing a culture which is doing things right from the beginning where fundamental principles are to standardise, make processes transparent and visualise (Liker, 2004).

Organisational culture

Total quality management (TQM), emphasising a system's approach (Eriksson et al., 2016), can be seen as the culture of an organisation committed to customer satisfaction through continuous improvement (Kanji & Yui, 1997). At the same time, TQM practices result as manifestations of the culture (Prajago & McDermott, 2005). Specifically, the behaviours in an organisation in relation to the values mentioned above have been used as a means to explain and diagnose a quality culture (Cronemyr, Bäckström, & Rönnbäck, 2017). Bortolotti, Boscari, and Danese (2015) showed that successful organisational culture in lean plants had higher institutional collectivism, a humane orientation, future orientation and a lower level of assertiveness. LM is more successful when a nurturing organisational culture has been developed.

The works of Schein (1992) offer a holistic approach to describing organisational culture (Martins & Terblanche, 2003). Schein (1992) claims that there are three different levels, degrees of visibility, of the organisational culture:

(1) *Underlying assumptions* – deeply embedded basic assumptions which are the essence of the culture. This is the most profound level.

(2) *Espoused values* – embodied values, norms and rules of behaviour that management attempts to implement in the organisation

(3) *Artefacts* – tangible and overt manifestations such as manner of speaking, styles of dressing and stories about the organisation. This is the most superficial and thus the most obviously visible level.

Among these levels, the models and especially the tools are the most tangible levels of quality management, and thus they both seem to fit the most visible level of culture which Schein (1992) denotes artefacts. On the other hand, the espoused values are most congruent to the values grown from the quality movement (Lagrosen 2006). Nevertheless, the core values in the model are more basic human notions than the quality management values. Some attempts have been made to go beyond the quality management values in order to find their roots. For instance, Jabnoun (2001) identifies respect, empathy and responsibility as driving values of continuous improvements. Similarly, Edgeman, Park Dahlgaard, Dahlgaard, and Scherer (1999) found core values underlying leadership to be trusting and trustworthiness (Edgeman & Dahlgaard, 1998). Covey (1991) calls the underlying level principles, exemplifying it with fairness, justice, equity, honesty, integrity and trust. He considers them to be natural laws in the human dimension, being as real and unchanging as gravity is in the physical dimension. Talwar (2009) highlights the effectiveness of espoused values if arising from core values which are human values. Similarly, a significant relation between core values and the factor 'commitment/loyalty' has been found (Dahlgaard-Park, 2009). The link went from core values via core competencies and personal attitudes to commitment.

For a more overarching model of quality culture, a combination of Schein's model and our model presented in Figure 1 should be useful. Such a combination is shown in Figure 2.

In the Figure, tools and models are combined since they both can be seen as different forms of artefacts in Schein's terminology. The quality management values correspond to
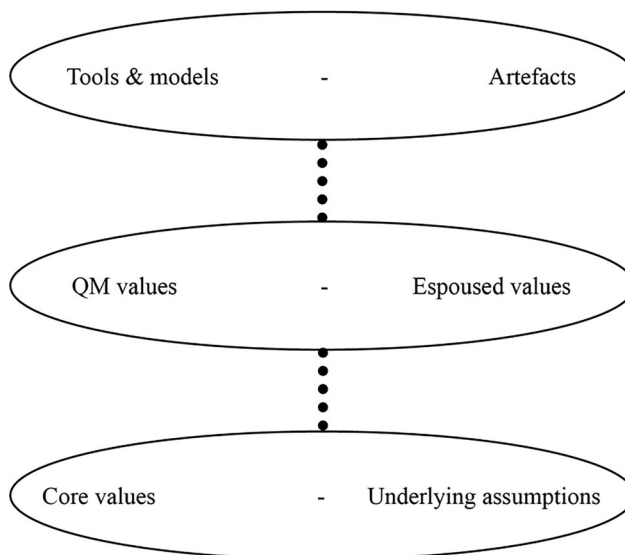

Figure 2. The levels of quality management combined with the levels of organisational culture according to Schein (1992).

the phenomena that Schein calls espoused values – values of a more concrete kind that management strives to install in the organisation. Finally, we have added an even deeper level consisting of the core values that underlie the quality management and which can be likened to the underlying assumptions in Schein's terminology.

Sustainable quality management

Sustainable development has been defined as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (Brundtland, 1987). Thus, there is a 'triple bottom line' underpinning sustainability: people, planet, and profit (Gladwin, Kennelly, & Krause, 1995). Gorman and Krehbiel (1997) describe the relationship between sustainability and quality management arguing that quality management is only one important part of the concept of sustainability which is broader, extending to communities and ecosystems affected by the actions of their particular organisations. Several authors have found quality management to lead to sustainability of advantage (Bergman & Klefsjö, 2010; Flynn, Schroeder, & Sakakibara, 1995; Reed, Lemak, & Mero, 2000), and since continuous improvement over time is a prerequisite for quality management to be successful, sustainability becomes a crucial factor (Bergman & Klefsjö, 2010; Curry & Kadash, 2002).

The QM values 'customer focus' and 'continuous improvement' are included in the Aquilani, Silvestri, and Ruggieri (2016) model of value co-creation processes towards sustainability stressing that mutual awareness of each other is of benefit for both. The following seven factors of sustainable quality management have been identified which can create a sustainable advantage when working in harmony (Zairi, 2002): Leadership and top management commitment, Strategic planning and policies, Information analysis, Customer resources, Partnership and resources, People management and Process management.

Wong and Wong (2014) conclude that Lean facilitates sustainability. However, also negative effects have been raised regarding the integration of lean manufacturing and sustainability; a continuous improvement does not necessarily mean a sustainable improvement, e.g. concerning emissions in the environment (Cherrafi et al., 2016).

Methodology

The methodology of the study can be characterised as case study research (Yin, 1994). This research approach is particularly appropriate in new research areas for which existing theory seems inadequate (Eisenhart, 1998). The study was inductive and based on grounded theory methodology (Glaser & Strauss, 1967). Thus, the empirical material was collected first. Then it was analysed and related to research and theory in quality management and sustainability. In-depth interviews (Patton, 1990) with several managers at the company were carried out. In addition, documents were studied and activities were observed. The empirical data were then interpreted and analysed with the constant comparative method from the grounded theory approach (Glaser, 1992; Glaser & Strauss, 1967).

Using open-ended questions is particularly suitable for research in new areas (Bryman, 2001). The following open questions were used in the in-depth interviews.

- How do you work with quality in your organisation?
- How do you work with sustainability?
- How does learning takes place?
- How is the culture at this company?

Follow-up questions were asked, depending on what came up during the interviews. The CEO and four employees from different teams were interviewed (see Table 1).

The company

Sky Factory is located in Fairfield, Iowa, USA and has partners in over 40 countries. Their business idea is to introduce static Sky Ceilings, Luminous Virtual Windows and related products that mimic real views of sky and nature in enclosed interiors of buildings which lack natural windows. They have also developed dynamic, digital cinema SkyV and eScape products that introduce hours of moving high definition 'skylights' and 'windows' views, and natural sounds, into interior spaces.

Their business covers designing, manufacturing and marketing these illusions of nature or biophilic illusions. Even though they operate with a factory-direct business model in North America, they even think of themselves as a fine art company since they aim to apply a basic principle of great art – *the whole is more than the sum of its parts.* Their goal is simply biophilic engagement, to create these illusions of nature that have the ability to trigger profound physiological changes, a relaxation response, in those exposed to them. Healthcare facilities are their largest market and others are commercial, retail and residential spaces. The companýs vision is to enrich and sustain life. Their second goal is profitability since it is needed in order to fulfil the vision. They consider growth to be the essence of life, which underlies their policies.

The company started in 2002, has 43 staff members and consistently growing annual revenues. Sky factory has received awards for their sustainable products. In both 2014 and 2015, they received the prestigious Architizer A+ Awards which is the largest awards programme focused on promoting and celebrating architecture and products. Finalists and winners are recognised as the year's most influential visionaries.

The company's culture is considered to be the outcome of an interactive process that involves everyone. Culture is considered to the company similarly as DNA is to the life of living organisms. The unit of the culture is the people, and the company culture is considered to be the collective culture of the employee unit. The Sky Factory is therefore built around six cultural principles. The first three are interrelated. The aim of these principles is to engage the employees as owners, not as employees.

The expressed cultural pillars or business practices are (1) *transparency*, (2) *flat management*, (3) *consensus*, (4) *service*, (5) *performance* and (6) *leadership*. They are elaborated below.

Transparency

With the exception of individual compensation and HR matters, all information is open, accessible and distributed uniformly throughout the company. Weekly all-company

Table 1.   The respondents in the study.

Role in company	Duration
Accounting, finance, project management, product release, implementing lean	48 min
CEO	1 h 19 min
Design, sales, HR (human resource)	58 min
Public relationship, coordinating research projects, education materials etc.	1 h 5 min
Production, lean	50 min

meetings include a collective review of the companýs as well as the teams' financial and performance metrics. Significant business issues and decisions are also handled at these meetings. Once a month a more thorough review of the month's financials is carried out. Many benefits are perceived with this practice. When all information is shared, power too is uniformly distributed removing the risk of controlled information. The company's big picture, the whole as well as the parts, are perceived to strengthen attention, facilitating coherence among teams.

Flat management

This means being an organisation without a hierarchical system of management; apart from a president and a CEO, no other managers or supervisors are assigned. Self-motivated networking individuals participate in multiple job-teams and take periodic responsibility as the 'facilitator' for one or several functional groups. The company consists of five different teams (production, engineering, marketing, finance and fine art) and individuals rotate between jobs and teams. Moreover, they have cross-functional teams, e.g. one cost of goods reduction team, with members from finance, production and the engineering team. They are temporary project-based teams often with a duration of six months.

Consensus

All business decisions are made by means of consensus of the entire company or within small teams. Transparency and employees' alertness of business activities and company goals combined with flat management facilitate gaining consensus, making it an efficient practice. Being an open book company, all employees look at the finances together. However, this is considered to be the most challenging cultural pillar. Every week, they have a company-wide meeting. The functional teams have short daily group meetings in the morning and consensus is easier in these small groups. As one employee in production explained:

> We 'debate' a lot but when the day is over nothing is left. That is how we address problems, we talk it out – and everybody is a part of that process.

The benefits of this practice are to get a maximum input of group intelligence resulting in insightful decisions.

Service

This means the foundation that underlies the relationships that each company member has with all others including customers, the corporation, the community and the world. They extend their experience of service since they perceive themselves as engaging in service spontaneously without consideration of return – truly non-contractual or 'selfless' service. Their operational business philosophy is summed up in 'We before me' and when customer care is put in focus, the foundation for long-term profitability is considered to be established.

Performance

This pillar implies that evaluation is done on individual, team and corporate levels. Financial issues but also quality, ethical and aesthetic considerations are counted. Individual compensation is performance-based. They do not schedule raises in salary which range

is only 2.8–1. Instead, improved performance of the company is expressed through increased profit-sharing. Profit-sharing, which is half of the net profit, is generally distributed monthly. It accounts for at least one-third of total compensation and is experienced not as the primary driver but as a driver for performing at best. All full-time employees are involved in a performance-based ownership plan; the goal is to redistribute 40% of the company's ownership to the employees. They use timesheets for tracking and analysing time spent on various tasks for making it possible to evaluate real performance regarding internal processes and products.

Leadership

This concerns first seeing a need, and second willingness and ability to take appropriate actions. The third step which characterises a leader in this flat consensus-based environment is to gather support and assistance. If there is a deadlock and they are stuck at something, the CEO can break standstills if needed.

Leadership was added as a pillar due to the need that came up when the founder recently retired. The founder was a main driver, never hesitating to ask questions, express opinions and demand performance. He had a sense of urgency to accomplish as much as possible as fast as they could. His unconditional commitment to do whatever was needed to assure the business success and ethical correctness of the company has been expressed to be one success factor in building this viable company. Leadership with one new CEO and one President restored clarity and re-established a pattern of healthy growth for the entire company.

Underlying mechanisms

The following underlying categories emerged when the data were analysed utilising the constant comparative technique from the grounded theory methodology (Glaser & Strauss, 1967). Since the data was collected with the aim to explore the culture for sustainable quality management, the categories with their properties could be viewed as the underlying mechanisms of sustainable quality management, which build up the expressed cultural pillars mentioned above. The dimensions are 'commitment', 'equality', 'dynamic innovation', 'sustainable thinking' and 'openness to learning'. They are further elaborated below.

Commitment

Commitment to the highest quality possible is permeating the company. There is a focus to choose the best possible materials which are environmentally friendly and continuously strive to update themselves in material and engineering methods. They standardise their manufacturing processes, even setting industry standards. Using reliable shippers and with the help of LM, they nowadays ship on time in contrast to before when this was a problem. Quality of the instructions is assured regarding installations, focusing on simplicity and ease. As one interviewee expressed:

We are on the higher edge of quality compared with our competitors.

The essence of their brand is to accurately display the way nature works – their aesthetic priority. They try to execute their vision with respect to content, design, composition, colour, resolution and honest perspective. One interview claimed:

> We continuously refine – (our pictures, our products) – none of our competitors does that. Visually we want to be very clean and very realistic.

Their focus on quality goes even further, including business ethics – to never knowingly conduct business with unethical parties. A focus is also to make their high-quality products affordable. Moreover, employees seem to be very committed to their vision. As one employee expressed:

> If I had all the money I needed, I would still do this, promoting healing and helping customers to feel better.

And another:

> You have a collective consciousness of people working towards the same goal. We utilise the collective intelligence and work towards a wholeness.

Moreover, they make sure that customers have good experiences since it is very important with positive feedback. The majority of customers are positive. As one interviewee expressed:

> It is my and the companýs reputation. When we have negative feedback, I take it very personally. That could even be a fault financially to us but I do anyway anything to correct it.

Equality

The company is value-based, emphasising empathy, honesty, flexibility, clarity and helpfulness in communication. Everyone has a voice, a vote and a responsibility also to use it. Respect is built in the company – everyone is supposed to respect each other as well as everything else including all of nature. They consider that if you start from such respect including care and love for each other, great things can indeed happen. Trust is considered to be the crucial component in the transparency principle. Regarding their values one interviewee expressed:

> Probably we do not talk so much about the values but practice them a lot.

Some of the practice is seen during company meetings but also in everyone's job. No one is considered to be more important than anyone else; therefore, they have no formal titles – and they view themselves as more than the sum of its parts. One newly employed interviewee expressed:

> I felt very comfortable at the company. Everyone's personality was really easy-going, very honest and very unselfish. I do not know if that is a function of not having titles.

Hiring the right people is essential for maintaining their culture. The turnover was around 33% when only relying on conventional methods of recruiting. Now about 20 interviews are conducted with new applicants. Each interview relies on two methods of evaluation, one more intuitive involving right-brain language with feelings and the heart, and one analytical assessing skills and personality traits. This new way has resulted in a 3% turnover in recent years.

Innovative dynamics

Awareness of the need to change and adapt is permeating the company. They constantly identify developmental issues that they also respond to. For instance, when the founder who was the main driver retired, a need to change a bit of the organisational structure emerged and the cultural pillar leadership was added to the other principles. They always strive for perfection working with lean philosophy to constantly improve. As one respondent stressed:

> If we are not constantly changing we are not growing as a company. Our success is built on keeping things as simple as possible.

One newly employed interviewee compared with previously working-places and expressed:

> Here you feel that everyone is moving at the same speed. Everyone feels responsible to do their part … more of a sense of ownership … things will happen because you will make it happen … and you feel more connected to the other people.

Rotation and incremental job protocol improvements give continuity for the company and more job satisfaction among the employees. This leads to an enhanced capability to handle sudden temporarily increased production needs on ordinary working time. Job rotation makes the company more flexible since employees can more easily help each other if needed. It also helps with safety since many eyes looking are better than two eyes.

Working with lean manufacturing, a focus on finding and implementing ways to improve their performance is perceived to lead to incremental innovation and truer vitality to the workplace. They experiment with LM themselves doing research online to become more familiar with the concept. However, introducing change in production can be a challenge causing some resistance with comments such as 'this is too much work'. They simply solve these issues by showing these employees a product and explain how much time and money they can save doing it in the new way. Thus, they convince people to get on board, to be more motivated, to keep changing and growing. They serve different customers all the time, creating a dynamic working enviroment. One interviewee explained:

> We use lean manufacturing standards, not only for efficiency and cost savings, but also for creating that environment of less stress and more time and focus for the quality of our products.

A thorough documentation book, where every production job is laid out in detail, serves as a learning tool for production persons. It was invented by the team and then spread to the entire company.

The company focus is on less structure rather than more. Many employees work with multiple projects and they often can choose what to do on most days. Rather than trying to manage each other, they try to help each other. This is the purpose of the daily team meetings in production, to check who needs help and who does not. The teams are empowered to make group decisions. One of the most important factors that seems to unify them into an ever-growing productive team is their sense of being beginners and remaining beginners including permanently open to learning. As one interviewee expressed:

> The culture is inspiring but we need some more work regarding systems … everyone needs to understand how much time and money things take.

Another expressed:

> There are businesses nearby that have adopted a lot of what we have done … we can reveal what we do, that is nothing that special. Very intuitive is our way. This is the way it should be done so for us it is special.

In addition, Sky Factory engages in cooperative scientific research in order to explore possible mechanisms of benefits of their products and gather quantitative verification. Such collaboration with for instance Texas Tech University, a landmark study in neuroarchitecture, earned a prestigious International Research Project Award in Toronto in 2014. A couple of such studies have been published in international journals. Even though they have not commissioned agents or formal networks they work closely with different lighting professionals and have relationships throughout the industry.

Sustainable thinking

The company has set up a non-profitability sustainability research institute to promote sustainable agriculture. One full-time employee, a farmer, has built up on their territory an infrastructure of self-supporting systems that promote water retention, soil fertility and pest control. This project is of an educational value as other companies and communities outside the company come and learn, see the solar array and get inspiration. In addition, the staff have fresh vegetables as an added bonus throughout the year. Thus, as one interviewee expressed:

> We are philanthropic in a very focused manner.

Their financial policy reflects their culture and adds to assuring social sustainability, which is considered to be a must at the root of any truly sustainable company. Money is of interest as a scorekeeper allowing them to measure the effectiveness of what they do as a company, but it is not considered to be the main driver. With the help of LM, they have been able to have the same number of employees over the six previous years although they have brought in more products. As one respondent stated:

> If we had worked according to the old standards we would probably have hired additional four people.

Frugality is on the agenda, avoiding waste of resources. However, there is no limit when it comes to fixing them if mistakes have been made.

One cross-functional group instigates and reviews programmes for a non-profit research centre which aims at inventing solutions to solve the most challenging problems today and look ahead to the needs of the future. Since their vision is to enrich and sustain life, they strive to grow in sales and market share only as long as it makes sense. There is an awareness of the whole production cycle, e.g. the customers can return the tiles, when needed, for recycling and the company sends a new one. One respondent expressed:

> We are not only thinking of selling, selling and selling … which is not so good for the environment, we also think of follow-up.

Moreover, sustainability is highly embedded in their products themselves with the aim to help to make contemporary buildings more sustainable from inside with their biophilic design.

Openness to learning

Participating in the company team and 'learning by doing' was not considered to be enough. Therefore, a Sky Factory handbook was written as an introduction to the company's culture and business practice. This is a systematic way to clarify fundamentals and details for both existing and new staff. It comprises over 200 pages filled with guidelines, principles, commentaries as well as stories covering 'how' and 'why' things are done, mostly from employees at the company. However, the commentaries are mostly from the founder and aim at giving a feel of the company's culture but also formal policies and procedures.

Mostly, learning takes place by learning from each other, at the workplace. One interviewee described:

> In the beginning I was feeling quite anxious of what to do but what helped was the culture. People were very willing to explain to you … so in that sense, learning is adapted to the way you think you learn – some people learn by talking a lot, other want to sit down and read.

Learning also results from their mistakes since mistakes are costly for everyone. They are eager to make corrections to safeguard failure to happen again.

Workspaces are constructed as open cubicles instead of rooms with closed walls. Everyone is trained to learn how to run a business in order to involve everyone for coming up with creative solutions. All feedback is welcomed and no question is considered stupid.

Their in-house educational programmes can be described as eclectic where ideas, style or taste are derived from a broad and diverse range of sources. Everyone needs to really understand financial terminology for the transparency to be true. Educational programmes range from courses taught by experts regarding financial issues, English for business, art history, to reading books by themselves discussing thoroughly their contents. For instance, the book *Good to Great* by Jim Collins was read one chapter a week and discussed in a group one morning each week for an hour.

One employee commented:

> Learning comes from being self-motivated and self-starting … and wanting to dive deep into why. The atmosphere of participation and working towards a common goal drives me primary to be self-motivated.

In addition, members of the company meet students in business and from a university nearby, the local chamber of commerce in business and also visit fares. New employees get a 90-day training and trial period, and a mentor.

A model of sustainable quality management

Based on the findings of the study, we propose the conceptual model of the culture needed for sustainable quality management depicted in Figure 3. The basis is constituted of the five categories describing the underlying mechanisms that emerged in the study: *commitment, equality, innovative dynamism, sustainable thinking and learning*. They constitute the deepest layer of the culture, the core values or the underlying assumptions in Schein's (1992) terminology which must be present for quality management to be sustainable. The six expressed cultural pillars *transparency, flat management, consensus, service, performance* and *leadership* guides the behaviour of the organisation and are on the level of the quality management values or espoused values compared with the framework in Figure 2. The challenge is to make the espoused values really living values in practice – their theory in use. For this purpose, the underlying mechanisms are the prerequisites and the pillars expressed in a highly promoted handbook are the means. This is in line with Talwar (2009) who claims that espoused values can be effective only if they are based on human core values.

Discussion and conclusion

Sky Factory has a modest number of defined rules and procedures but in practice they rely to a very high extent on their culture for guidance. The culture is their sense of mutually shared, collective and largely internal value-derived principles.

Especially the written manuals but also to some extent the handbook assures that the company learns to 'do things right' applying single-loop learning (Bessant, 1997). The handbook, filled with 'stories' and the weekly meetings facilitate double-loop learning since a great deal of reflections are present. Necessary adoptions are made continuously; thus it seems that they also 'do the right things'. Usually through consensus they both agree and implement change, another sign of double-loop learning (Argyris, 1999).

The expressed company culture is characterised by minimisation of hierarchy, consensus-based decision-making and establishment of an ownership culture. As mentioned above, they do not have titles that label status in the organisation, instead employees
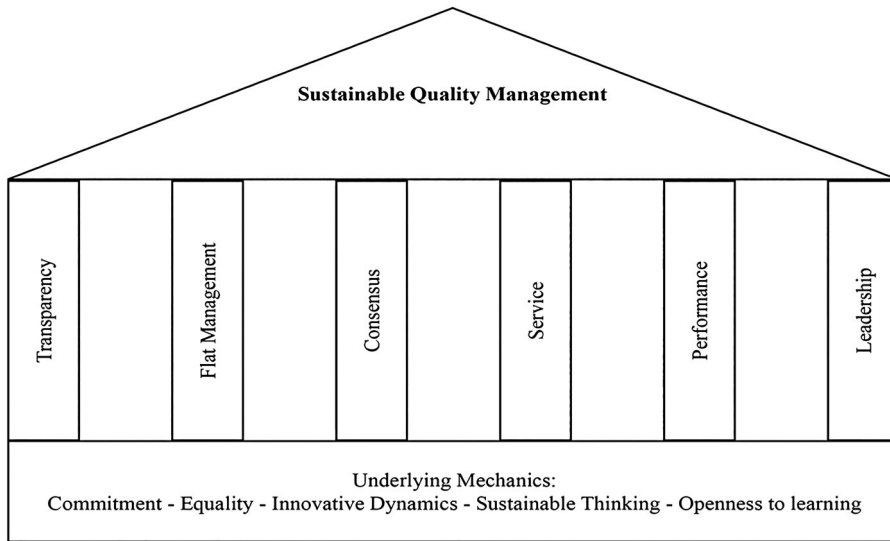
Figure 3. Sustainable quality management as practised by the case company.

come up with their own titles for business cards etc. This mirrors their underlying assumption that no one is more important than anyone else – they are more than the sum of their parts. Also, they feel more like friends towards each other than co-workers. This is in line with research showing that successful organisational culture in lean plants had higher institutional collectivism, a humane orientation and a lower level of assertiveness (Bortolotti et al., 2015). Moreover, empowerment has been shown to be an important ingredient for successful Lean implementation (Bhasin & Burcher, 2006).

Five categories depicting the underlying mechanics of how sustainable quality management is handled were extracted from the empirical data. They also constitute the foundation for the cultural pillars that the company promotes. These were *commitment, equality, innovative dynamics, sustainable thinking, openness to learning*. The categories and pillars were formed into a model explaining the mechanisms of sustainable quality management.

Striking similarities exist regarding the culture at Sky Factory and several of the most innovative companies described by Steiber and Alänge (2016) in their Silicon Valley model with features such as dynamic capabilities, continuous innovation and passionate employees.

Limitations and suggestions for future research

A single company, which was not randomly selected was studied, thus generalisability cannot be ascertained. An appropriate way of discussing the extent of generalisation could be 'transferability' (Lincoln & Guba, 1985). If a rich and 'thick' description of the case is made, it may be applicable to transfer the results to other cases. However, Lincoln and Guba (1985) state that it is up to the readers to judge ' … the degree of congruence between the sending and receiving contexts'.

For further research, studying other award-winning companies regarding quality management and sustainability in other countries as well as in other industries should be fruitful. The proposed framework that this study resulted in can be a vantage point in these endeavours. Learning from others is important in order to adapt to future demands (Bäckström,

Ingelsson, & Wiklund, 2011). It could also be a basis for broader studies involving large numbers of companies, utilising quantitative methodology and statistical analysis.

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