

Article

Background on the Sustainability of Knowledge

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Abstract: For years, sustainability has been on the minds of professionals, organisational leaders and everyone involved in everyday life. There has been a lot of research on different areas and processes of corporate operations, and more and more initiatives are emerging to address nature conservation, environmental protection and climate change issues. However, little research addresses the potential for sustainability of organisational knowledge, a factor that fundamentally influences the functioning of organisations. Beyond the steps of the knowledge management process, organisational culture, working conditions, the organisational environment and the organisational leadership that manages them are also at the forefront. The aim of this study is to highlight the supporting role of sustainable management for the sustainability of knowledge and to show the context of further supporting conditions. Previous research has identified sustainable management as an alternative management style that can significantly change organisations and society by deepening understanding of natural and economic systems and their interdependencies. Accordingly, it ensures market performance in a holistic approach based on the concept of sustainable knowledge and with a view to the efficient use of the company's internal resources. The cornerstones of these interrelationships and the conditions of the relationships are presented here in a theoretical approach.

Keywords: learning organisation; knowledge management; sustainability; sustainable leadership; sustainable knowledge; techno-stress



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1. Introduction

Sustainability is one of the most commonly used terms in relation to the way organisations operate. It encompasses the environmental consciousness of management, the expected behaviour of managers and staff, and their values and mindset.

Sustainability is of growing interest and importance in business circles, as it promises to be a source of competitive advantage [1]. Finding new sources of competitive advantage is important because today's market is intensely competitive; companies now have to innovate continuously in order to meet and satisfy the needs and expectations of the market and of societal customers, which in turn makes corporate activities and considerations extremely complex.

The characteristics of organisations operating along sustainable principles have become increasingly clear in recent years, both in theoretical and practical research [2,3]. Sustainable organisations often outperform their peers, e.g., in social responsibility, employee satisfaction and even financial aspects [4]. They are often ranked among the best employers, which means that they manage to attract the most talented employees. Behind sustainable organisational performance lies the characteristics of leadership according to the principles of sustainability, which fundamentally influence the performance of the organisation. In order for more and more businesses and economic actors to operate according to the principles of sustainability, they need to understand a few important interlinkages, which will be discussed in the rest of the paper.

The irresponsible way in which humans exploit natural resources and pollute the planet threatens the survival of the Earth. In order to address the resulting environmental problems, a rethinking of organisational functioning and governance is needed [5]. Business

and society have a role to play in this process. If business does not operate in a sustainable way, its impact on local communities will be problematic. Thus, the question is what can leaders of organisations do to create and manage businesses that are more sustainable, both in terms of their internal operations and their external impacts. Organisations that create value for themselves, their environment and society are needed. Sustainable management is therefore about helping organisations to stay at the forefront of their industry, regardless of what is happening in their environment, by focusing on the requirements of sustainability [6,7]. The research questions that this theoretical study seeks to explore are:

- Q1. Why do sustainability-minded organisations outperform their competitors in the long run while experiencing the same problems, crises and market competition in their environment?
- Q2. Why are they better able to adapt to changes, cutting-edge technologies and challenges while still performing well?
- Q3. Can the operational successes of these organisations be identified?
- Q4. What is the role of knowledge and knowledge sustainability in sustainable organisational performance?

In the following sections, with a view to answering the research questions, this paper presents the basic concepts of sustainability, the concept of sustainable management, its foundations, the characteristics of sustainable knowledge, the relationship between the two and the conditions for combining them.

2. Research Method

This research uses a qualitative research method based mainly on argumentative, philosophical and documentary approaches. The research emphasises the importance of knowledge sustainability, the steps of the knowledge management process, the need for leadership behaviour, the organisational cultural expectation system and learning organisation conditions to make it effective. The constructivist model, as the main objective of the research, is based on previous empirical research findings, theoretical models and my own experiences. In building the logic of the model, I have taken into account the most well-known journal articles on knowledge management and sustainability, especially literature synthesis studies [8,9], which are indexed in major databases e.g., Scopus, WoS. As very few relevant studies were found, I expanded the search to include papers and textbooks and their chapters from professional conference publications. I took as a starting point the results of previous research by other authors that mainly emphasize the role of knowledge management in sustainability and/or link a specific discipline to the importance of sustainability (such as HR and sustainability, organizational functioning, organizational culture, leadership style and sustainability, etc.). I complemented the results described in these studies with the results of my own previous research [10–16], my personal experiences and my constructivist ideas [17]. In the absence of a definition of sustainable knowledge, a few months ago I launched a research project to map the opinions of experts from different international professional communities using the Delphi method, with the aim of creating a definition of sustainable knowledge formed by the expert community and summarizing the experts' opinions. As this research is ongoing, I will report its results in a forthcoming paper confirming or refuting the constructivist model I have developed. In a theoretical study, as in the present case, the theoretical model can generate cognitive consistency which may not be visible in everyday life [18].

3. The Concept of Sustainability

Sustainability is defined in the literature in several ways [19–21]. If we focus on ecosystems, the most commonly used definition was formulated in 1987 by the UN World Commission on Environment and Development (WCED), known as the Brundtland Commission. It is defined as meeting the needs of the present generation without compromising the ability of future generations to meet their own needs [22]. This definition means that while the present population can use what it needs from the Earth's resources, it must

do so in a way that leaves sufficient resources for future generations. The three pillars are environmental, economic and social policy, i.e., ensuring a balance between economic growth, environmental quality and social equity. This requires an integrated policy and a cross-sectoral institutional framework rather than isolated policies [23]. The report, for all its merits, is flawed in that it does not declare that the potential for growth depends on the carrying capacity of the environment. Politicians are fond of using the term ‘sustainable economic growth’, even though it is not possible to grow infinitely in a finite world [24,25]. The report has been criticised further, yet in its time it was revolutionary in raising awareness. In its enhanced version, sustainable development is defined as improving the quality of human life while remaining within the carrying capacity of supporting ecosystems [26].

Today, the most widely accepted term is circular economy [27], which in a sense goes beyond the need for sustainability. In essence, it is a return to the order of nature, as in nature almost all materials are involved in cycles and there is no waste: the end product of each process is the starting material for another process. While the idea is a kind of illusion, responsible organisations and their management can do much to make this illusion a reality [27]. This idea brings with it the need for organisations that practice sustainable or circular management to have management and decision-makers who understand and manage their organisations in the spirit of these expectations. These are what the literature today calls sustainable leaders.

4. The Link between Sustainability and Knowledge in Research

Today, sustainability is growing into a science in its own right. Sustainability science provides a critical framework for sustainability. It focuses on the interactions between human, environmental and man-made systems, with the aim of understanding the complex challenges to the future of humanity and the integrity of the planet’s life-support systems [28]. In their study, Caniglia and colleagues [29] addressed an integrated approach to action-oriented knowledge for sustainability. In their view, sustainability science needs more systematic approaches. Mobilising knowledge requires supporting interventions that can create successful change. They argue that action-oriented knowledge about sustainability is created when knowledge representations that are involved in both the design and implementation of change are addressed in an integrated way. The pluralistic and integrated approach they present rejects technocratic solutions to sustainability challenges and focuses on individual and social learning. They argue that sustainability researchers should focus on creating the conditions for experimentation with the possibilities of knowledge and learning. In doing so, they promote sustainable development for sustainability-centred learning. Mauser and colleagues [30] propose an integrated approach based on collaboration between natural and social sciences. Such collaboration is based on transdisciplinarity and integrated research concepts. In their study they shed light on the dimensions of the integration of different knowledge and propose a common platform for global research. In their view, integration is an iterative process involving reflection by all stakeholders. Another aspect of sustainable knowledge has been investigated in several studies through the behaviour of university students and the change of purpose of teachers and education [31–34]. The literature review study by [35] logically combines the need for the above-mentioned preparation phase (education, training) and the factors that influence the conditions of organizational functioning from the perspective of knowledge management. The research reviewed in the study (albeit narrowly) addresses the need for cultural conditions for successful knowledge management and the justification for the use of learning organisation characteristics. Lopes and colleagues [36] add the idea of open innovation to the need to apply knowledge management as a condition for sustainable knowledge continuity. The different aspects of the relationship between knowledge management and sustainability are examined by [9] in their literature review. Among the authoritative keywords, climate change, learning, communities of practice, teamwork and knowledge base development emerged as the main focus. The impact of the social network structure on knowledge flows has been studied by [37]. They draw attention to three

challenges: defining the boundaries between knowledge and action; characterising power distributions; and identifying barriers to knowledge sharing and network collaboration. In their research, they identify the links between networking and knowledge flows for knowledge sustainability. In their studies, Ordieres-Meré and colleagues [38] link the role of digitalisation, so much discussed today, to the need for knowledge creation and sustainability. Their research highlights the supportive role of leadership in managing change processes and conceptualises the quality of leadership for knowledge sustainability through the definition of expected competencies [39]. They summarise the expectations of required leadership behaviours in six points, which they predict will result in sustainable organisational performance. These are simple focus and direction, respect for the well-being of people and employees, creation of an environment of absolute trust and empowerment, innovation and entrepreneurship, full managerial support, and generous rewards and recognition for achievements.

Although the research results presented here are far from a complete overview of the interconnections examined, the diversity of the various aspects is noticeable, showing that leadership behaviour and cultural characteristics are the most prominent criteria.

5. Sustainable Leadership

Being a leader today is fraught with challenges that were unimaginable a decade ago [40,41]. Today, political, corporate and government leaders face issues such as climate change, social responsibility, talent shortages, volatile financial markets, and food and water crises in many parts of the world. These are all challenges of a dynamic, global, interconnected and high-tech world more than a decade old. The context, the environment and the decision situation for management have changed [42].

In the long term, the successful operation of an organisation requires a leader and/or management that is aware of the concept of sustainable development and is able to interpret it in a complex way in decision-making [43]. Sustainability has become a critical management task for success. Research to date has identified sustainable leadership (SL) as an alternative management style that can significantly change organisations and society by developing a deeper understanding of natural and economic systems and their interdependencies [44]. Sustainable leaders see the role their organisations play in a larger context beyond immediate short-term benefits. They define strategies and deliver results that meet the triple bottom line of social, environmental and financial performance [45]. This triple requirement covers the requirements of environmental stewardship (ES), expected behaviour, values (EBV) and conscious thinking (CT) (Figure 1).

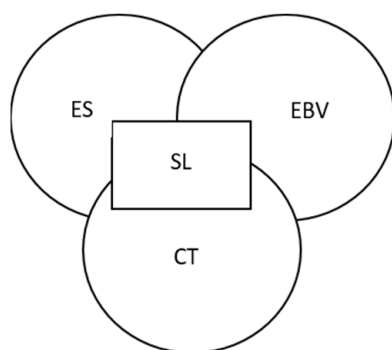


Figure 1. Elements of sustainable management.

A sustainable leader creates lifelong value and long-term prosperity for all stakeholders, going beyond following the expectations of “greening” and social responsibility to meet the requirements of sufficient profit for growth, business resilience and a sustainable planet at the same time. The sustainable leader challenges the neoliberal economic approach that seeks only to maximise profits [46]. Accordingly, this approach is a holistic one, taking a long-term view and focusing on the efficient use of the company’s internal resources

in order to ensure market performance based on the concept of sustainable knowledge. This refers to achieving visions of futures in which people live within their ecological and social potential without exploiting it [47,48]. The Sustainability Leadership Institute [49] offers another definition, characterising sustainable leaders as individuals who are driven to achieve change by consciously deepening their relationship with the world around them. In doing so, they adopt new ways of doing things (vision, thinking and interaction) that result in innovative, sustainable solutions. According to the Institute, leadership for sustainability is “leadership for sustainability”, which is not a separate school of leadership, but a distinct blend of leadership. The Cambridge Impact Leadership Model, as one of the most widely referenced models, describes the kind of leadership needed to create value for business, society and the environment. In their words, “A sustainability leader is someone who inspires and supports action to improve the quality of life”. This model was developed in several phases [50,51], with the final relationship diagram shown in Figure 2 below.

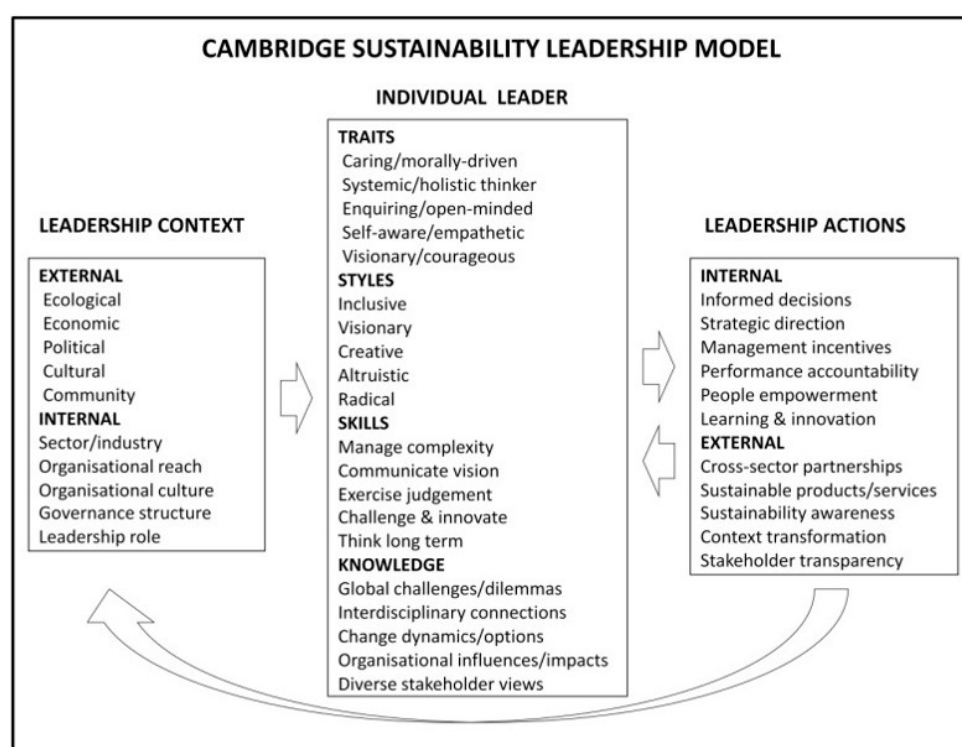


Figure 2. Cambridge Sustainable Management Model [52].

The model emphasises the contextual/environmental focus of leadership, the expected qualities, style, skills and knowledge of the leader, and the external and internal actions to be taken.

Tiedeman and colleagues [7] compiled a seven-element model with elements that similarly summarise the expectations of sustainable leadership. Table 1 summarises the desirable elements and explains their commonly used concepts in business.

Sustainable leadership is not about altruism or charity work or just thinking “green”. According to the World Business Council for Sustainable Development (WBCSD) [53], sustainable leadership makes organisations more competitive, resilient, responsive and attractive to customers. It helps attract talented employees and makes businesses more attractive to investors. Examples of sustainable business leadership can be found all over the world. In their book “Sustainable Leadership”, ref. [54] compare two extreme examples of leadership to the operating mechanisms of animal colonies in nature, illustrating the results of leadership thinking and behaviour. The most extreme form is a locust-like philosophy, a business behaviour and decision-making mechanism that involves hard, ruthless, asocial and profit-driven leadership. Managers achieve their goals by polluting

the environment, driving competitors out of business, paying pittance wages or using tax evasion and avoidance methods. Unethical behaviour is part of the “global economic game”. The locusts’ philosophy [51] is based on the premise that benefits can only be achieved if others suffer as a result of their pursuit of their interests. Contrary thinking and management philosophy is modelled on the behaviour of a community of bees (known as the “Honeybee”), sophisticated, interest group-oriented, social and divisive. It focuses on the long term and achieves results responsibly. The management is based on the premise that an organisation can only be sustainable if its operating environment is sustainable and if the basic needs of all stakeholders and the interests of future generations are taken into account. They strive to protect the planet, care for local communities and protect the organisation’s image and brand through ethical behaviour. The honeybee approach is holistic in nature, favouring a value-based approach to stakeholders.

Table 1. Elements of sustainable management.

Elements of Sustainable Management	Concepts Used in Economics and Business
Context	Recognition of interdependence; complexity; ambiguity; interconnectedness; resource constraints; regulators; megatrends
Consciousness	Mindsets; world views; beliefs; mental models; attitudes
Continuity	Long-term horizon; courage; strength; common purpose; centrality; change processes
Relatedness	Serving the needs of all stakeholders; influencing in the long and short term; cooperation; trust; fairness; altruism; kinship; needs rather than wants
Creativity	Innovation for sustainable shared value creation; sustainable business models; new value measurement models; flow
Collectivity	Increasing collective impact; embedding sustainability in business. structure; sustainable consumption

In her book *Leadership for Sustainable Futures*, ref. [50] identified 19 elements that characterise the honeybee leadership philosophy. Avery and Bergsteiner’s [51] sustainable leadership philosophy builds on Avery’s work and identifies four additional elements that influence long-term organisational performance. These are employee engagement, self-management, trust and employee appreciation. Overall, the enhanced philosophy thus includes 23 desirable elements to achieve the goals of sustainable management. The elements listed form a pyramid-like shape, with 14 expectations (from a managerial perspective) providing the foundations. This is built upon by a further six elements (which can be assessed through the employee perspective), followed by the key performance determinants, which represent the customer focus. At the top of the pyramid is sustainability (performance outcome), which by definition represents the interests of ownership. The pyramid is a logical mapping of the sustainable management criteria, the interconnectedness of which demonstrates how the honeybee philosophy contributes to the competitive advantage of organisations. A diagram illustrating the logic of the thinking is shown below (Figure 3). The basic elements corresponding to the numbering at the bottom of the pyramid include.

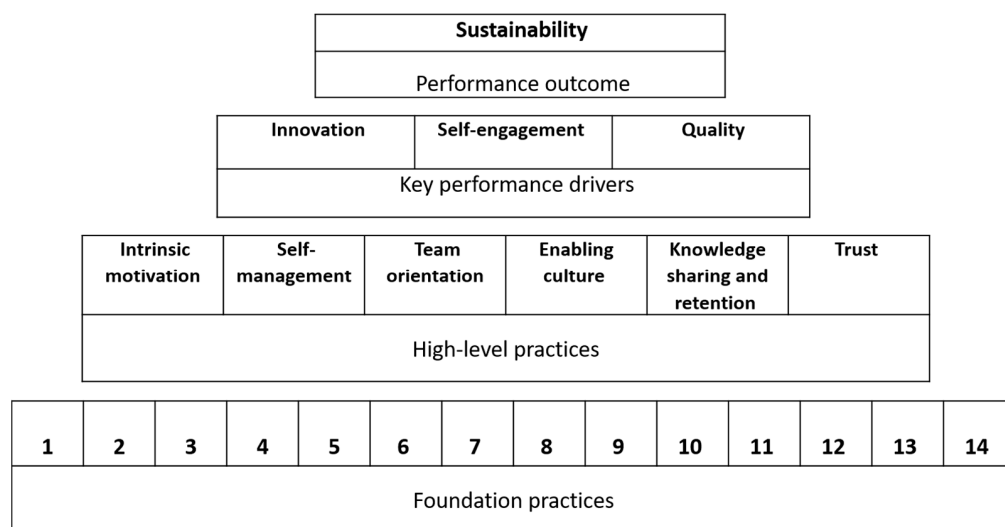


Figure 3. The sustainable leadership pyramid.

Basic elements

1. Appropriate driving style
2. Attracting and retaining talent
3. Continuous development
4. Internal succession planning
5. respect, diversity and inclusion
6. ethics and virtues
7. good governance
8. long-term thinking
9. Considered organisational change
10. independence from external disruptions
11. Environmental responsibility
12. Social responsibility
13. Broad stakeholder focus
14. Strong shared vision and purpose

The elements of the pyramid are discussed in more detail in the section on the link between sustainable leadership and sustainable knowledge.

6. Sustainable Knowledge

Today, it is safe to say that knowledge is the key to economic development. Such knowledge enables productive enterprises to operate on renewable energy sources, and finds ways to use other natural resources more efficiently [55]. As knowledge indisputably belongs to humans, it is safe to say that human capital is indispensable. Good professionals and talent are needed by all organisations, and today's employees and managers need to broaden their horizons to collaborate with professionals from other disciplines [56]. To achieve this collaboration, significant investments in education are needed. A social model must be developed in which it is natural for people to learn and develop their skills throughout their lives. In previous years, there have been a number of initiatives [57] aimed at lifelong learning which have been forgotten after the usual 'hype' and new fads have washed away the importance of their necessity. The building and functioning of knowledge management systems requires the provision of up-to-date knowledge and its integration into everyday practice [58,59]. The triple requirements (people (PE), process (PR), technology (T)) for the functioning of a knowledge management system (KMS) are shown in Figure 4.

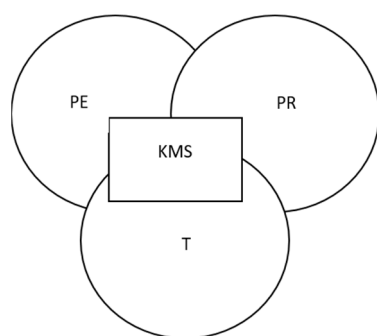


Figure 4. Elements of a knowledge management system.

Building on the elements of the knowledge management system, the steps of the knowledge management process ensure the smooth acquisition, flow, use and retention of knowledge, which, once assessed, confirms the strategy's delivery or indicates gaps. A coherent set of steps in the knowledge management process (knowledge strategy—knowledge identification—knowledge acquisition—knowledge development—knowledge sharing—knowledge storage—knowledge use—knowledge evaluation) is the key to sustainable knowledge [60]. Among the steps in the process, the knowledge storage phase is worth highlighting as a prerequisite for sustainable knowledge. It consists of two parts, a 'container' (IT) provided by technical means, which serves to capture and preserve explicit knowledge (sometimes as a basis for sharing), and the organisational memory (OM), which contains tacit knowledge and ensures its long-term sustainability [61]. The problem of the viability of the technical backbone can be caused by so-called techno-stress, which can arise from excessive workload, expectations, and a sense of the need to be constantly ready and learning [62]. Therefore, from one point of view the technical backbone is an essential requirement for knowledge sustainability, while from another point of view it is the condition that is considered most critical. It can be influenced by technical, human, software and artificial intelligence (AI)-generated problems. The three conditions necessary for a knowledge repository to function are shown in Figure 5.

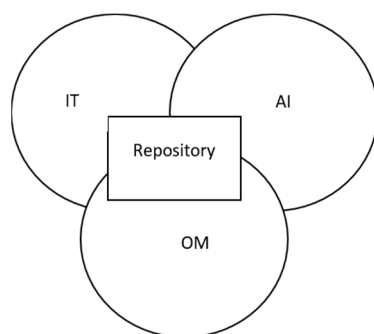


Figure 5. Elements of a knowledge base.

Sustainable knowledge is therefore inevitably intertwined with the knowledge management concept, which is based on meeting the requirements of a learning organisation culture (LCO) in terms of organisational embeddedness and functionality. The principles of learning organisations are summarised in five points by [63], which he categorises into three core competences. These are Aspiration (AS), Dialogue (D) and Complexity Management (CM). Aspiration includes two core principles (out of the five); these are Personal Vision (formerly called Personal Direction) and Shared Vision. Dialogue includes two principles, thought patterns and group learning. Complexity management can be identified with systems thinking. The criteria for learning organization functioning are shown in Figure 6.

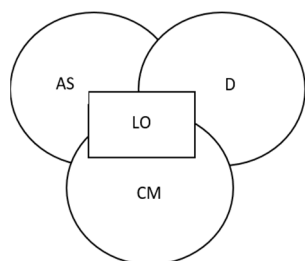


Figure 6. Elements of a learning organisation.

The question may arise of how can the philosophy of sustainable development can be linked to learning organisations. In other words, do learning organisations automatically contribute to the idea of sustainable development through systems thinking? Organisations and groups within them use systems thinking tools primarily to understand the complexity of their narrow business environment. If we think at a higher level and consider the Earth as a system, systems thinking is essential [64,65]. and this is certainly needed from a sustainability perspective. As a system, the Earth must strive for a new equilibrium, for which the idea of sustainable development can point the way. Through systems thinking we understand the current state of the organisation and the forces that influence its functioning. The thought patterns provide the framework conditions, and through personal guidance and group learning we arrive at the target state defined by the shared vision [66]. Learning organisations do not develop and become what they are by themselves; they are determined by the personal example, values and professionalism of the leader and are shaped by well-selected and knowledgeable staff [67]. In the economic sphere, good examples of sustainable development exist and best practices can be demonstrated [68,69]. This means that the knowledge for sustainability is already largely available and demonstrated. Depending on the context, it is acquired by organisations through knowledge sharing or through the creation of new knowledge. In order for an organisation to become sustainable, in addition to the development of a learning organisation culture, innovation is in most cases required. Learning organisations tend to have a significant capacity for innovation, since they are learning organisations precisely because they create knowledge [63]. Freedom of access to knowledge is also very important for the success of sustainability. The right leadership style, a broad stakeholder focus, open-mindedness, ‘permissive’ behaviour, long-term planning, foresight and transparency greatly facilitate knowledge sharing and/or knowledge creation based on learning organisation operations for sustainability [70].

Building on these ideas, in the next section I review the relationship between the elements of sustainable leadership mentioned earlier, the criteria for a learning organisation and sustainable knowledge.

7. The Contact System

Of the models and characteristics of sustainable management presented earlier, Avery and Bergsteiner’s [54] pyramid is the closest to the concept of sustainable knowledge. In the following, I look at the possible linkages between them. The pyramid summarises the necessary elements of sustainable management from the basics to the final outcomes. In examining the basic elements of the pyramid, 11 of the 14 elements set out expectations that can be classified as characteristics of a learning organisation culture. Two articulate the steps of the knowledge management process (talent/knowledge acquisition and continuous improvement), and the first declares the management style itself. This means that the basic requirement of sustainable leadership is both based on the learning organisation characteristics and identifies the steps of the knowledge management process as necessary. If we move to a higher level of the pyramid, five of the six elements are again attributes of the learning organisation culture, while one of the six elements consists of the knowledge management steps (knowledge sharing and retention). The next level builds on the previ-

ous ones and includes the key factors that drive performance, namely, quality, employee engagement and innovation. Assessing the elements of this level from a knowledge management perspective, knowledge development/embedding leads to innovation, knowledge application and measurement ensures quality, and employee engagement serves the requirements of knowledge sharing and retention. As previous research on the functioning of knowledge management systems (TMR) has already demonstrated [66,71] that a learning organisation culture is a prerequisite for the successful functioning of TMR, it follows from the description that most of the criteria for sustainable leadership (see pyramid) include the characteristics of the learning organisation and the steps of the knowledge management process. Thus, sustainable management for sustainable organisational functioning should aim at developing an organisational culture that favours those elements of the knowledge management process that contribute most to the sustainability of knowledge. The following Table 2 illustrates the relationship.

Table 2. Relationships between sustainable leadership, learning organisations and knowledge management.

Elements of Sustainable Leadership	Characteristics of a Learning Organisation	Steps in the Knowledge Management Process
Foundation practices		
Appropriate leadership culture/style	x	
Talent recruiting & retaining staff		x
Developing people continuously		x
Internal succession planning	x	
Respect, diversity & inclusion	x	
Ethics and virtues	x	
Good governance & accountability	x	
Long-term horizon	x	
Considered organisational change	x	
Independence from outside interference	x	
Environmental responsibility	x	
Social responsibility	x	
Broad stakeholder focus	x	
Strong shared vision and purpose	x	
High-level practices		
Intrinsic motivation	x	
Self-management	x	
Team-orientation	x	
Enabling culture	x	
Knowledge retention and sharing		x
Trust	x	
Key performance drivers		
Innovation		x
Staff engagement		x
Quality		x
Performance outcome		
Sustainability	x	x

Based on this table, it can be said that among the steps of the knowledge management process, the acquisition of knowledge (attracting the right people/talents) and the continuous improvement of the acquired knowledge should be considered basic elements of sustainable knowledge. The integration of the knowledge management process into organisational operations also requires the implementation of further steps in the process, and knowledge sharing and retention can be considered as a higher-level requirement for sustainability. From the point of view of sustainability, the key elements are knowledge development/implementation (innovation), knowledge application and measurement (quality), knowledge sharing, and knowledge retention (employee engagement). In order to ensure the sustainability of knowledge through sustainable organisational operation and sustainable management, it is necessary to formulate a strategy that is able to translate the above expectations into implementation measures under the conditions of everyday expected behaviour and conduct. This requires the building and continuous maintenance of a learning organisation culture. The (inverted) pyramid of sustainable knowledge (following the logic of the sustainable leadership pyramid) is shown in Figure 7. Figure 8 shows the harmony of the elements of the two pyramids

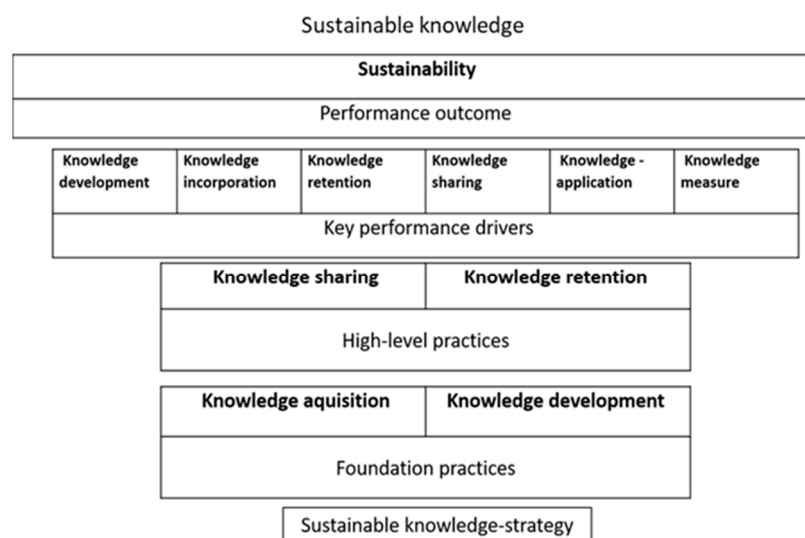


Figure 7. The inverted pyramid of sustainable knowledge.

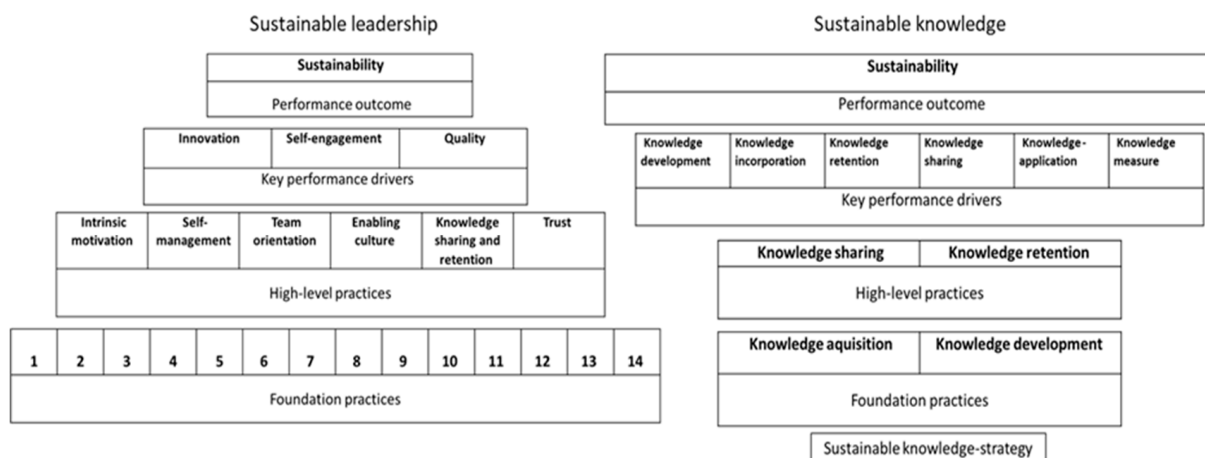


Figure 8. Relationship between sustainable leadership and knowledge pyramids.

Each of the four conditions (learning organisation (LO), sustainable leadership (SL), knowledge management system (KMS), knowledge repository) can be further broken down in detail (as we have seen before), as they all represent complex entities. A full description

of these elements is beyond the scope of this study. However, the models presented above demonstrate that the interplay of the four prerequisites can ensure sustainable knowledge. The area requiring the broadest base and most extensive attention among the conditions is sustainable management and its tools. The four conditions together are shown in Figure 9. Figure 10 illustrates the links between the elements of sustainable knowledge.

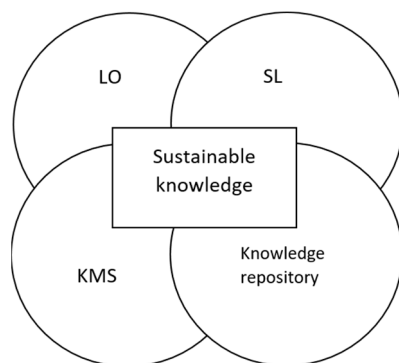


Figure 9. Elements of a sustainable knowledge background.

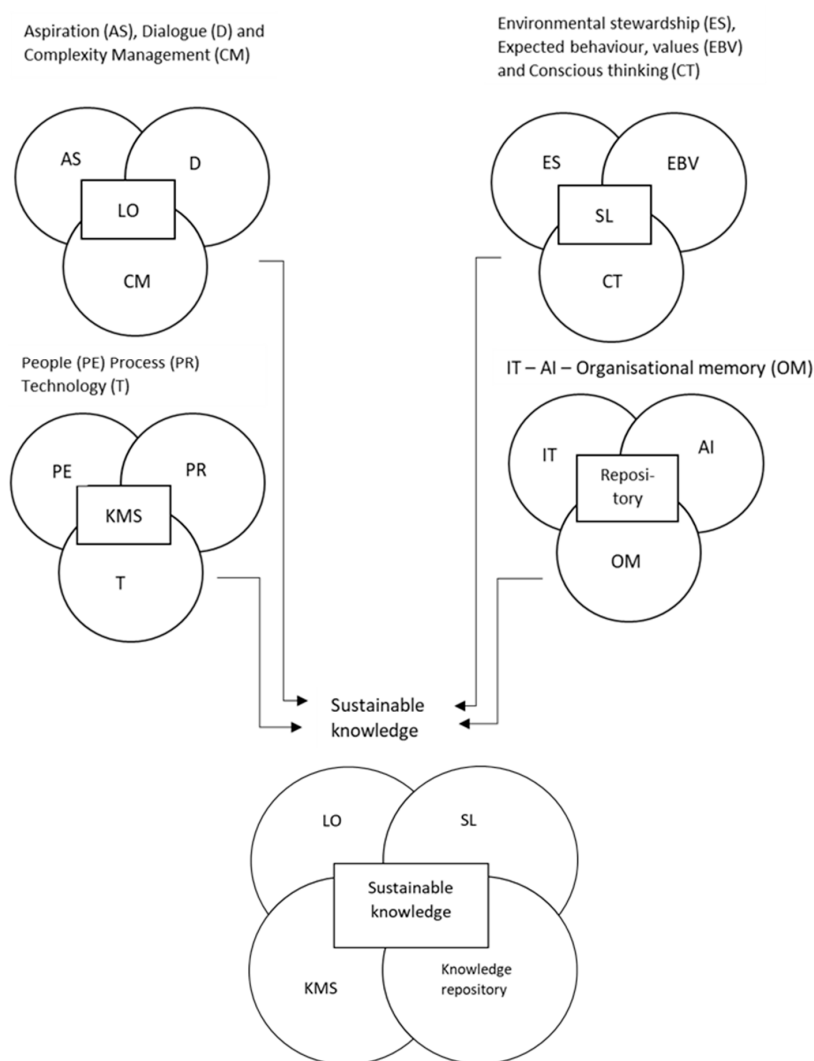


Figure 10. An overview of the sustainable knowledge model that is composed of the above elements.

8. Discussion

In light of the relatively small number of publications in the literature on the sustainability of knowledge, comparisons with the results obtained offer limited possibilities. Ref. [8] published a comprehensive theoretical study reviewing articles on the intertwined areas of knowledge management and sustainability. Knowledge management research on sustainability relies on nine basic clusters. These are sustainability practice, social network, corporate performance, knowledge sharing culture, green innovation, sustainability assessment framework, global warming, knowledge management and innovative performance. The article concludes with a new theory that summarises existing knowledge on sustainability knowledge management. The paper summarises many valuable ideas, building on a large body of research, and fundamentally emphasises the role of knowledge management for sustainability. This approach runs counter to the ideas of this paper. Ref. [9] provide a comprehensive review of the literature on TM and sustainability research. Their article provides a baseline against which future developments in TM and sustainability research can be benchmarked. The book, edited with [72], brings together the ideas of several authors and is specifically based on the importance of people as creators and managers of knowledge. They emphasise the importance of the current digital age in achieving sustainability, where the individual is seen as the centre of knowledge and the starting point for environmental, social and economic development. The role of the human being, the knowledge host, and the challenges of the digital age are somewhat close to the logic of the model I have set up here. The research approach of [29] helps to answer the questions posed earlier. They emphasise complex thinking by involving employees who support the sustainability-based implementation of knowledge-driven change in both their thinking and in their behaviours through an integrated approach to organisational functioning that aligns internal and external conditions. Ref. [30] support what the present research emphasises, that is, the importance of integrated thinking and conscious behaviour of staff and managers as prerequisites for successful long-term and sustainable operations. Joint research allows for mutual use of results and complementarity of each other's work. This creates transparency for all stakeholders. Looking at the possibility of sustainable knowledge from the focus of learning and education training [31–34] indirectly supports the focus of this study, as the success of organizational operations is influenced by the education, socialization, behavior and values of young employees and prospective employees in the background. Then, the openness to training, willingness to learn, and functioning of knowledge networks to ensure the up-to-dateness of knowledge in the workplace influence the sustainability of knowledge. The studies by [35] (albeit narrowly) address the need for cultural conditions to ensure the successful functioning of knowledge management and the justification for the use of learning organisation characteristics. This underpins the answer to one of the main questions of this research, namely, the need for learning organisation characteristics. The approach of [36] also supports this line of thought by integrating creativity, systems thinking and collaboration into a triad. Ref. [9] highlight the importance of knowledge management (based on their processing of the literature base), identifying it as a similarly important link, as formulated in this paper. In their research, ref. [37] demonstrate the importance of networking as a means to attain knowledge sustainability through a practical example. Knowledge flows, whether in terms of networks or within an organisation, can be linked to staff and leadership behaviour, trust and ethical behaviour. These characteristics are the criteria for learning organisation functioning and are key to successful change, foresight and sustainability. The findings of [38] reinforce this, as they conclude that digitalisation and its opportunities support knowledge creation, and thus ongoing sustainability. A six-point summary of the expected behavioural patterns of leadership for knowledge sustainability confirms all of the previous findings [39]. It can be seen that a number of studies confirm and support the above knowledge sustainability criteria, even if the aim of these studies can often only be indirectly classified as studies investigating the target topic.

9. Conclusions

This review of the theory and the models, supplemented by my own reflections, provides a comprehensive picture of the necessary conditions for sustainable knowledge as well as their interconnections, in which sustainable management plays an emphasised role. These provide an opportunity to answer the research questions formulated in the introduction.

Q1. *Why do organisations with sustainability in mind outperform their competitors in the long run while experiencing the same problems, crises and market competition in their environment?*

Sustainable organisations gain an advantage as a result of sustainable leaders' ability to enforce the fundamentals, which results in a competitive advantage in the marketplace. We have seen that shaping culture is a powerful force in itself. This cultural atmosphere ensures that the members of the organisation are cooperative, balanced, well-informed, open to each other's ideas and have a common vision and goals. Such organisations perform better without the demands of sustainability. They think long-term, and can attract and retain young talent because young people see career opportunities. These cultural characteristics guarantee the sharing and transmission of knowledge, i.e., its sustainability. When combined with the right leadership style, ethical behaviour and due diligence, this ensures that sustainable organisational operations are successful. Independence from external influences while at the same time integrating their important characteristics, environmental and social responsibility help to ensure balanced development that produces results in the longer term, rather than a preference for short-term success (i.e., profit-seeking only).

Q2. *Why are they better able to adapt to changes, cutting-edge technologies and challenges while still performing well?*

Willingness to change, patterns of thinking and confidence as learning organisation criteria determine the way staff think about change and the flexibility of their attitudes. Mutual help and support, leadership patterns, and ethical management principles put potential worries and conflicts in the background, and a permissive management attitude (i.e., it is possible to make mistakes) is particularly helpful in a changing situation. The basic elements of sustainable leadership include judiciously managed change management, the fulfilment of which supports the adaptation of staff and the organisation as a whole. Excellent people, their knowledge, skills, values, respect, diversity and inclusion all help to overcome problems and challenges in changing situations while maintaining the quantity and quality of output.

Q3. *Can the operational successes of these organisations be identified?*

The answer to this question is clear. The secret to the success of these organisations lies in the principles of sustainability. As described above, these organisations are driven by an organisational culture and management values that are reflected in management decisions, the image of the organisation, and the image it presents to society. Their social and environmental responsibility is visible and appreciated by all. Thus, sustainable organisations do not hide the secrets of their success, but rather set an example, build networks, open up innovation, and thus best practice, which should not be 'copied'. Of course, the internal events, rules and processes are not necessarily public, but the philosophy behind their success, the essential elements, are an example for the outside world to follow. In addition, attention is paid to ensuring that young people and prospective employees entering the organisation are equipped with the skills and values that will ensure their integration, acceptance of the organisational values and their long-term support.

Q4. *What is the role of knowledge and knowledge sustainability in sustainable organisational performance?*

It has been known for many years that knowledge is a crucial element for successful organisational functioning. The requirements of a learning organisation culture and the principles of the knowledge management system make it essential to keep knowledge up to date and to develop it continuously. Knowledge shared through joint work, information

captured in IT systems, the building of a knowledge base and organisational “secrets” (tacit knowledge) in organisational memory are the guarantees of sustainable organisational functioning. Forgetting knowledge that has become redundant is a success factor for the professional management of well-considered organisational change. Incorporating knowledge into everyday operations, trust-based community behaviour and ethical leadership all contribute to the long-term use and sustainability of knowledge. In this way, successors can enjoy the benefits of the results achieved and do not need to invest new resources in acquiring the knowledge already available.

10. Research limitations and Future Directions

The main limitation of the present research is that it only summarises at a theoretical level the interconnectedness of sustainable knowledge and the conditions for its creation. As the research has only recently started, empirical data collection has not yet taken place. It is also limited by the fact that the available literature has not extensively addressed the context of the study in recent years, and therefore the number of references is limited. This limitation can point the way for future research. Previous models in different disciplines focus explicitly on the problem of knowledge sharing for sustainability. The model set up here illustrates that the sustainability requirement is much more than that. This study adopts a new holistic approach that complements the knowledge sustainability research known from the literature. A future aim is to test the theoretical model in practice, which will provide an opportunity to fill the literature gap from several perspectives. We hope to report on these results in our next study.

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