

Case study: Urban Deli's digital tool use and sustainability vision

SEI report
February 2023

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Cover photo: Urban Deli, Stockholm © Jorge Franganillo / flickr

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DOI: <https://doi.org/10.51414/sei2023.006>

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Executive summary

We present a comprehensive qualitative case study conducted at Urban Deli, a Swedish food retailer with a strong sustainability vision, through which we investigate the relevance of digital tools in supporting the retailer with necessary information to become more sustainable in their processes.

Addressing sustainability in a business model is not an easy endeavour (Azapagic, 2003) because it requires the consideration of economic, ecological, and social values into a company's operations (Porter & Derry, 2012). Digitalization has been treated as a promising avenue to facilitate this work (Ordieres-Meré et al., 2020). This report focuses on the intersection of these trends and addresses the potential of digital tools to support the delivery of a food retailer's environmental sustainability vision.

Digital tools are still in a nascent stage to support environmental sustainability decision-making. At Urban Deli, we found that the use of digital tools remained unconnected to the delivery of their sustainability vision. The food company's difficulty in unlocking the full potential of these digital tools illustrates challenges that are most likely faced by other retailers.

We found that the use of sustainability information also remains a challenge for Urban Deli and other retailers. Despite having increased access to information through the use of digital tools, Urban Deli and other companies fail to use that information throughout their operations for sustainability purposes. These findings confirm previous research showing that more information is effective only if users have the capability and willingness to use it (Gardner et al., 2019).

Using Urban Deli's network of digital partners allowed us to see how actors in the food system tend to push responsibility for sustainability to others, despite the increased availability of information necessary to act. Retailers and digital service providers in this case study were found to be grappling with the same challenges that their individual consumers face: competing interests, complex trade-offs, and potentially high costs for implementing improved systems. These challenges, faced by consumers as well as corporate actors, point to the importance of a regulatory framework to achieve increased sustainable consumption at the pace of change required.

This research is one step towards filling a gap in the scientific literature, which has mostly focused on end-consumers of food products – individual or household food purchasers. More research needs to be done to show how retailers, which serve as the central node connecting end-consumers to supply chains, act in this space and what their impacts can be. We also encourage further investigation of other actors' roles in achieving more sustainable food consumption patterns, such as supply chain actors and industry associations driving legislative changes.

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Actors in the food system tend to push responsibility for sustainability to others, despite the increased availability of information necessary to act.

1. Context for the research

Household consumption of goods and services contributes to about 60% of global greenhouse gas emissions (Ivanova et al., 2020), directly contributing to global warming and environmental degradation (Poças Ribeiro et al., 2019). The focus on sustainable consumption and production has increased in the past decade as a necessary means to transition towards more sustainable societies. Food systems emit about a third of global humanmade greenhouse gas emissions (Crippa et al., 2021; Poore & Nemecek, 2018), in addition to using large amounts of land, water, and contributing to biodiversity loss, acidification and eutrophication (FAO, 2019; Foley et al., 2011; Hoekstra, 2017; Poore & Nemecek, 2018).

Achieving a deep shift in consumption patterns to reach a sustainable food system requires the involvement of all actors along the food value chain (Hoek et al., 2021; Mol, 2015; Tjærnemo & Södahl, 2015). The idea that consumer choices would put pressure on the market to shift towards more sustainable production has been repeatedly questioned by scholars, due to consumers' difficulties in translating their own positive attitudes towards sustainable consumption to their actual purchase behaviours (Akenji, 2014; Gisslevik, 2018; Prothero et al., 2011; Young et al., 2009).

Retailers act as central nodes of influence for sustainable consumption by connecting their suppliers to their customers (Bartels et al., 2015; Grubb et al., 2020; Willett et al., 2019). They can play an important role in using their purchasing power to influence their suppliers and promote certain food products to consumers (Ekelund et al., 2014; Tjærnemo & Södahl, 2015). For instance, Grubb and colleagues (2020) found that retailer interventions have a high potential impact on sustainable food consumption patterns.

Implementing sustainability is complex, and retailers need strong visions for achieving sustainability (Coleman, 2013). A vision can be defined as a "corporate pitch to convey enduring values and lasting purpose in a pithy and effective way" (Kantabutra, 2020, p. 2). Visions provide the framework for engaging internal stakeholders and strengthening external stakeholder relationships (Kantabutra & Ketprapakorn, 2020; Oruc & Sarikaya, 2011). More specifically, a strong vision can lead to successful implementation of a company's sustainability ambitions (Ulrich & Brockbank, 2016).

However, when delivering on their sustainability vision, retailers may face numerous challenges, some of them related to information. These can include the access of information (Astill et al., 2019), the knowledge to understand, interpret and act on this information (Röös et al., 2014), and internal and external communication abilities (Reilly & Hynan, 2014; Röös et al., 2014).

Through improved environmental information, actors can perform more effectively to reach their sustainability ambitions. One way in which information can be more easily collected and shared is through new digital technologies. Digital technologies have contributed to rapid advances in the collection, monitoring, disclosure and dissemination of data (Astill et al., 2019; Gardner et al., 2019). These advances could facilitate sustainability governance and decision-making (Gardner et al., 2019), including increased amount and accuracy in data (e.g. Zhang et al., 2020), as well as information sharing and communication (Bumblauskas et al., 2020; Musa et al., 2014; Xu et al., 2015) within supply chains and with consumers (e.g. Atkinson, 2013). In this report, we refer to "digital tools" as digital technologies and information tools that may not be digital themselves but can be digitally scanned and read, such as barcodes (Bodeklint & Unosson, 2019; Li et al., 2017).

For retailers, digital tools offer an opportunity to increase the availability and accuracy of relevant environmental information (Astill et al., 2019) to facilitate their sustainability ambitions. Despite the rapidly growing number of such tools, relatively little research has investigated how retailers can use digital tools to support the delivery of their sustainability vision; the barriers they face in adopting these tools; and their potential to bring more sustainable consumption patterns (Annosi et al., 2021; El Bilali & Allahyari, 2018; Mieras et al., 2019).

Retailers act as central nodes of influence for sustainable consumption by connecting their suppliers to their customers.

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The above context has been investigated in three related fields of research that shape our work: the impact of corporate or organizational sustainability visions, the impact of sustainability information on behaviour, and digital tool use for delivering information and digitalizing processes. For a literature review that further fleshes out these intersecting fields of study, please see the annex.

Our case study explores to what extent digital tools support retailers in delivering on their sustainability vision. The study is shaped by the following two research questions, from the perspective of a Swedish food retailer:

1. What information-related strengths and weaknesses does a retailer have when delivering on its sustainability vision?
2. To what extent do digital tools support overcoming these information-related challenges?

For this qualitative case study, we partnered with Urban Deli, a Swedish food retailer with a strong sustainability vision, and with a selection of their digital service providers. This involved gathering data via interviews, a focus group and organizational process mapping.

Urban Deli is considered as a case of interest because of the founders' specific motivations. The focus on Urban Deli as a single case offers the opportunity to explore the case in detail and has the potential for relevant insights for other (smaller) retailers facing similar information-related challenges when working with sustainability and introducing digital tools to support their work.

2. Methods and research setting

Urban Deli is a food retailer and restaurant group, founded in 2009 and currently active in four locations in Stockholm, Sweden, employing 180 people as of 2021. The company was founded by a group of friends who shared a passion for food with the business idea to focus on excellent food quality. The company uses products across all operations (e.g. using products from the shop that are getting close to expiration date in the restaurant), to minimize unnecessary food waste. In 2018, Axfood, a Swedish food retail conglomerate, acquired 91% ownership of Urban Deli (Axfood, n.d.)¹. According to our interviews, Urban Deli is working independently of Axfood and sees the majority-owner organization as partners. Axfood allows Urban Deli freedom to experiment and decide over their business. In 2021, three of the four Urban Deli locations had a restaurant and bar, a retail store, and a deli (fresh delicatessen counter in stores). Also, one location has a kitchen producing readymade meal boxes and sauces (Matlabbet).

Urban Deli has expressed high ambitions since its founding, reflected in the vision formulated in 2016: *“Our vision is to make food life easier, tastier and happier. The food must be good for the taste buds and have been produced in a way that is good for people, animals, the environment, and the climate – without unnecessary waste of resources. Diversity should permeate Urban Deli, from personnel to menu and store offerings. As a guest at Urban Deli, it should be easy to make sustainable choices, no matter how you like to eat or shop”* (Urban Deli, 2021). This vision pivots on social and environmental sustainability, with the aim to facilitate sustainable offerings for consumers.

Urban Deli qualified as a suitable single case study because of two criteria. First, the company has had a distinct purpose since its foundation, provided by its vision, instead of adding sustainability aspects at a later stage. This indicates that the core aspects of the vision (i.e. responsible and sustainable consumption of food, minimizing food waste, and diversity) are embedded in the organizational culture from the start. The early introduction of the vision also reduces the risk of hypocritical behaviour regarding their sustainability efforts (Lauriano et al., 2021).

¹ Axfood is a Swedish food retail conglomerate that was founded in 2000 through the merger of several Swedish grocery store chains. They are the Nordic region's largest listed company in grocery trade, with 11 brands.

Second, Urban Deli recently introduced digital tools to support their organizational operations, as well as to facilitate an efficient process for responding to information-related challenges connected to environmental sustainability. Given these criteria, Urban Deli is likely to deliver information-rich insights (Flyvbjerg, 2006) into organizational and innovative activities related to sustainability and digitalization (Eisenhardt & Graebner, 2007) – insights that could be of use to other small retailers working in this space.

2.1 Data collection

We used multiple qualitative research methods (Table 1) to examine complementary aspects of the case study. First, we undertook an exploratory analysis to understand the identity and structure of Urban Deli. Second, we conducted semi-structured interviews with the management team to examine their perspectives on the sustainability vision as well as digitalization efforts. In parallel, practical information on digital tools in use, processes and data flows within the company were collected through process mapping and short interviews with staff members. These activities allowed us to identify key digital service providers that were then interviewed to shed light on the current and future intention to support their users in sustainable decision-making.

Table 1. Data set and methods

Data-collection method	Date	Type of insights
Exploratory analysis (in store observation, virtual presentation by the management team, review of website)	June 2020 – October 2020	Understanding the company identity, structure and organization
Urban Deli management team: semi-structured interviews (11) and one focus group (4 people)	September 2020 – November 2020	Perspectives on the core visions, opportunities and barriers perceived by the management team, mapping digital tools
Digital service providers semi-structured interviews (4)	June 2021	Current and future digital opportunities regarding sustainability
Process mapping (in two locations) through semi-structured interviews with Urban Deli employees (7): head of Matlabbet, chefs and sous-chefs, logistics responsible, head of the store and head of the deli	September 2020 – March 2021	Practical information on processes, data flows and digital tools

For the exploratory analysis, the research team visited different Urban Deli stores. All openly accessible online documentation was reviewed. The management team gave a presentation covering company history, vision, structure and working processes.

Two sets of semi-structured interviews (Kvale, 1996) were conducted in Swedish. The first set covered the management team, and the second a selection of Urban Deli's digital service providers. All interviews were recorded, and notes were taken during the interviews. Interviewees signed consent forms ahead of the interviews, and transcripts were shared with interviewees to verify and confirm the notes. The interviews with the management team lasted for one hour and were conducted digitally. These interviews were divided into two themes, sustainability and digital tools.

Afterwards, four 30-minute interviews with Urban Deli's digital service providers were conducted by video call to better understand current and future digital opportunities available to support retailers' sustainability work. These providers offer various services, including ordering and inventory, product database information, barcoding and digital standard setting. Interviews focused on (1) present integration of sustainability information in their digital services, (2) plans to include such information, (3) practical implementation of such plans and (4) digital service providers' role in supporting retailers through their digital tools, for delivering on retailers' sustainability vision.

Next, a process map was created to understand (1) how data are collected, stored, used and shared within and between Urban Deli entities as well as with suppliers and customers, (2) how food is ordered and managed within and between Urban Deli entities and (3) the use of digital tools in organizational processes. Process mapping consists of constructing a model that shows the relationships between activities, people, data and objects involved in the production of a specified output (Biazzo, 2002) and enables common understanding and analysis of business processes (Aguilar-Savén, 2004). To create the process map, we conducted site visits and interviews with the four Urban Deli channels: restaurant and bar, retail store, deli and Matlabbet. We interviewed seven employees, including a kitchen chef, store manager, deli manager and logistics manager, for about 20 minutes each. Observations were recorded using notes and photographs.

2.2 Data analysis

A SWOT (Strengths, Weaknesses, Opportunities and Threats) structure was chosen to conduct and analyse the interviews. Capable of handling multiple domains through a simple but comprehensive framework, the qualitative research method is commonly applied to organizational assessments to yield strategic insights (Helms & Nixon, 2010; Jacobs et al., 2013; Valentin, 2001). The resource-based view on tangible and intangible resources (Valentin, 2001) was used to structure the internal strengths and weaknesses part, and the PESTLE (political, economic, social, technological, legal and environmental) framework was applied for the opportunities and threats (Jacobs et al., 2013), as displayed in Table 2.

Table 2. Detailed SWOT framework used for management team interviews and staff interviews

SWOT subsection	List of investigated aspects
Internal (Strengths and weaknesses) (Valentin, 2001)	Physical (tangible) and intangible resources: <i>Financial</i> – e.g. cash and access to financial markets <i>Physical</i> – e.g. facilities, equipment, configurations and raw materials <i>Intellectual</i> – e.g. expertise, formulas, discoveries and data <i>Legal</i> – e.g. patents, trademarks and contracts that protect intellectual capital <i>Human</i> – e.g. employees' individual expertise and skills <i>Organizational</i> – e.g. culture, customs, routines, shared visions and values, and working relationships <i>Informational</i> – e.g. customer and competitor intelligence <i>Relational</i> – e.g. strategic alliances; relations with customers, vendors and other stakeholders, which often are affected by bargaining power and switching costs <i>Reputational</i> – e.g. brand names that reduce perceived risk or have symbolic value
External (Opportunities and Threats)	<i>Political</i> – e.g. government stability, taxation policy, foreign trade regulations, social welfare policies <i>Economic</i> – e.g. business cycles, interest rates, inflation, unemployment, money supply <i>Societal</i> – e.g. demographics, income, lifestyle changes, attitudes, consumerism, education level <i>Technological</i> – e.g. new discoveries, speed of technology transfer, rates of obsolescence, government spending on research <i>Legislative</i> – e.g. competition law, employment law, health and safety, product safety

Notes from interviews were read and checked against the recordings. These were then read iteratively, and responses related to sustainability and digital tools were coded in Excel against the SWOT framework. A focus group consisting of the management team was organized in November 2020 for checking and finalizing the validity of findings (e.g. Kvale, 1995).

The data collection during the process mapping allowed identification of and logging opinions about digital tools in use at Urban Deli, which were then coded according to the SWOT framework.

Finally, the interviews with digital service providers were transcribed, verified, and coded according to reoccurring topics: current and planned integration of sustainability information, and incentives and barriers to doing so.

3. Results

While Urban Deli can be seen as progressive for having its founding sustainability vision, the young company faces challenges in achieving that vision. Below we discuss the observed strengths and weaknesses for delivering that vision, the company's digital tool use and its conception of digital tools, and the company's digital service providers.

3.1 Delivering on the sustainability vision

When looking at the number of statements, the Urban Deli management team reported an even spread of strengths and weaknesses when discussing the company's sustainability vision and capacity to deliver on that vision. The respondents connected the delivery on the sustainability vision to internal aspects such as shared ethos, the internal circular supply chain, and the relationship to suppliers, rather than including external factors such as societal trends, politics or other similar influences. Supportive illustrative quotes for this section can be found in Table 3.

Notably, respondents indicated that the sustainability vision is "engrained in the company's DNA", instead of being added to an existing organizational culture. While the company has a clearly formulated official vision, its workers also have an internal shared understanding of which aspects of the vision are most relevant: reduction of waste (food and packaging), best quality of food, and supporting sustainable decision-making for consumers. Such internal understanding stems from the shared vision of the founders, and these aspects broadly match the main criteria of the official vision. Respondents also reported locally produced food to be part of the company's vision, even though it is not written in any official documentation. Respondents showed a clear perception of shared values within the management team in connection to Urban Deli's sustainability ambitions, translating into a common understanding of motivations to work towards their sustainability vision.

In terms of information-related challenges, respondents reported the following across the SWOT categories: limits to accessing information; their knowledge to understand, interpret and act on this information; and internal and external communication abilities. These replies show that despite shared ambition and goodwill, Urban Deli is faced with complex decision-making situations, connected to economic, societal, intellectual and technological situations. This in turn can lead to sometimes divergent views in the organization. For example, the interviews showed divergent views regarding the level of ambition and speed to implement their sustainability vision.

Access to information was described as an opportunity: respondents perceived increased availability of general information about food products and their environmental impacts, but that Urban Deli did not make use of it sufficiently. However, limitations in terms of knowledge competence were also brought up as weaknesses: some respondents pointed to a lack of in-house knowledge about sustainability both at management level and among the staff; the difficulty of keeping up with sustainability trends such as concerns around plastics or palm oil, which get regular media coverage; and understanding the complexity of food environmental impacts, as well as balancing the trade-offs of food-related environmental issues. These weaknesses are directly connected to an external threat: the lack of detailed data for understanding the impact of decisions, the lack of transparency, and definitions of "sustainable food", for example, as well as the continuously changing information on food sustainability.

Table 3. Main findings from the SWOT analysis of the sustainability vision with illustrative quotes

SWOT category	Main finding	Framework code	Quote
Strengths	Shared ethos	Organizational	<i>"That is what we want to feel, to have a clean conscience in our work. Everyone in management came to some understanding of this a few years ago."</i>
	Relationship with suppliers	Organizational	<i>"A strength is that we see our suppliers as partners, and we have very responsive suppliers."</i>
	Internal circular supply chain	Organizational	<i>"Our obvious competitive advantage is that we have our own small food chain."</i>
	Brand image and customer base	Reputational	<i>"Our typical consumer is aware and can pay a little more and embraces our thinking about sustainability."</i>
	Influence on suppliers	Organizational	<i>"We are quite big so we can have high requirements on our supply chain."</i>
Weaknesses	Prioritization	Organizational	<i>"To live it we need some motivation to get there. It is not that we don't want to do it well, but we struggle with finding time and making it a priority."</i>
	Implementation	Organizational	<i>"One of the problems is implementation and keeping something alive over time."</i>
	External communication	Intellectual	<i>"We are bad at communicating with our customers about how we choose our products."</i>
	Internal communication	Organizational	<i>"But information hasn't been carried along to all the staff, we have a high staff turnover, we don't have introductory manuals, but we are working on this."</i>
	Complexity of sustainability	Intellectual	<i>"There are a thousand questions that are difficult to answer. Difficult for us means it's at least as difficult for the consumer."</i>
Opportunities	Broad consumer base	Reputational	<i>"We want to help the customer make a better choice, but we do not exclude anyone."</i>
	Consumer base	Societal	<i>"The consumers generally have demand on us, and they expect us to be market leaders and makers in this."</i>
	Incentives through policy	Legal	<i>"It would be good if there was a more political framework, with laws and regulations we have to follow."</i>
Threats	Trends	Societal	<i>"We are incredibly fast at keeping up with trends."</i>
	Difficult to keep up with latest research	Technological	<i>"The information changes frequently and new findings are constantly emerging. It's almost impossible to keep up."</i>
	Consumers knowledge	Societal	<i>"Then there is consumer behaviour ... they also do not know what is good or bad."</i>
	Consumers preferences	Societal	<i>"The amount of people that do the right thing even when it tastes bad is very small, it must taste good."</i>
	Consumer base	Reputational	<i>"For us, the biggest external pressure is the risk of losing our customer base."</i>
	Alternative options	Technological	<i>"It is also a matter of available products that we have to choose from. Often what is available on the market is limited in big volumes."</i>

The challenges connected to knowledge were described as a need to better communicate their sustainability work to customer-facing staff, which is currently a weakness due to the difficulty of effectively communicating about complex issues. This communication challenge is further complicated by the general high staff turnover in Swedish food retailing.

Strongly connected to knowledge and skills, respondents reported internal and external communication challenges. Difficulties with internal communication and lack of adequate issue prioritization were considered to limit the team's ability to move from vision to implementation, due to lack of motivation over time and clear common goals communicated to all levels of the organization.

More specifically, internal communication was described as unstructured and rapid, following no strict procedures. This, however, also provides the opportunity to adapt behaviour quickly. Such methods reflect the start-up culture still in place at Urban Deli at the time of the study. Respondents reported that this way of internal communication potentially leads to an increased risk of knowledge loss over time, meaning that some decisions are not traceable for future decision-making.

For external communication, the management team considered relationships with suppliers to be a key strength for delivering on the sustainability vision. For instance, close, long-lasting relationships help Urban Deli influence their suppliers and bypass potential disadvantages, such as economic leverage due to their relatively small size compared to other food retailers in the market. Communication to their consumers was reported as a major challenge. More specifically, respondents reported different stances regarding prioritization of sustainability efforts over other types of targets, as well as the level of ambition and boldness in how to implement and communicate about their sustainability vision.

One reason for this divergence is the contradicting feedback from their consumers. Some perceived that consumers appreciate Urban Deli's sustainability work and demand higher ambition, but sales data indicated an intention-action gap, with for example, the relatively high carbon footprint dishes remaining one of the bestselling options. Therefore, Urban Deli's consumer base was both described as a driver and a limitation in delivering on their vision. Urban Deli's sustainability efforts were a selling point to win and retain new consumers as well as a risk that could entail the loss of a wider consumer base at the same time.

3.2 Digital tool use and opportunities

Mapping all digital tools in use at Urban Deli showed that the company currently uses 10 different digital tools (Table 4). However, no information was systematically collected or used through these tools for sustainability purposes. Rather, such information was collected and acted upon in an ad hoc manner, due to the close relationship with Urban Deli's suppliers. The data produced and collected by Urban Deli was quantity, price and sales, through the barcode and cashier systems.

A recent addition to the digital tool portfolio was an ingredient-ordering app for Matlabbet, the restaurants and delis. Respondents said that using a digital ordering system has been valuable for Urban Deli in efficiency terms because they could considerably reduce the number of suppliers and improve the coordination across entities (e.g. between the restaurant and deli). Having all orders collected in one digital system also offers the opportunity to monitor and assess the impact of orders. According to an interview, one restaurant chef would like to see environmental information embedded in the tool, which would likely impact how the chef designs the menu.

Urban Deli is present online through its website and social media and makes use of several different digital tools that target consumers, such as takeaway purchasing apps, and an online store. Generally, respondents mentioned that Urban Deli had good knowledge about how to work with consumer-facing digital tools and has been successful in early trials of such tools. The new website was implemented in 2020 and added a new distribution channel to the business. It offers opportunities to label items online, better target consumers through tailor-made offers or filters, as well as potentially communicating additional sustainability information to consumers through labels, filters or educational material.

One digital tool used by Urban Deli directly supported their sustainability vision by facilitating the reduction of food waste. The consumer-facing app allows Urban Deli and other retailers to sell food that is approaching its expiration date, at a discounted price.

3.3 Urban Deli's vision for digital tools

We found little reflection about how the use of digital tools might support the delivery of Urban Deli's sustainability vision, and no overarching digitalization vision or strategy has been formulated.

The respondents indicated that they believed in the benefits of introducing digital tools to make their business more efficient, save costs, and collect and communicate more information about sustainability. Digital tools have been continuously integrated in recent years in an ad hoc manner, and respondents stated the intention to continue implementing digital tools.

Table 4. Digital tools in use at Urban Deli

Tool description	Captured data
Ingredient ordering app and platform for restaurants and retailers allowing to order from suppliers through one central platform	Order date and total price
Online product information database where producers and suppliers enter product information in a standardized manner, accessible for free to anyone	Manual use to collect or verify information such as ingredients, allergens, weight, origin, energy, etc.
Ordering website for business customers, including internal orders	Orders can be exported to an Excel sheet
Barcodes for every product connected to scanners and cashier system	Stores name and price on every product and enables recording of sales data
Product information system connected to the cashier system	Stores price data and records sales data
Web platform for online shop	Records sales data on online store
Tool for producing in store signage, using product information stored in the selling system, including the barcode	None
Customer ordering website; QR codes are placed on tables, scanning opens the website	Records sales data
Customer takeaway ordering and transportation system	Orders
Customer purchasing phone application for sales of food that would otherwise be thrown away	None

Currently, digitalization processes are mostly connected to the website and the new online shop. Furthermore, digital tools were perceived to support access of information, knowledge sharing and retention, and internal and external communication. Also, they were seen as a new potential way of reaching consumers. Hence, digital tools were recognized as an opportunity to increase efficiency and build new business models, such as tailor-made offers, or “click and collect” for products. Supportive illustrative quotes can be found in Table 3.

The trusting relationship with suppliers and the ownership by Axfood was seen as an essential strength for accessing, trialling and implementing new digital tools, such as Urban Deli’s new ordering app.

Respondents noted several weaknesses in adopting and using more digital tools such as financial, knowledge and human resources. Examples of weaknesses included a lack of in-house expertise, having trouble keeping up with the speed of innovations, a lack of time and budget, and a lack of clear goals in terms of what the tools should achieve. One respondent reported thinking that they have good knowledge of what should be done, contradicting other respondents’ perceptions. Additionally, the relatively small size of the company was perceived as a hindrance for trialling a new digital information tool that other larger actors may be able to invest in.

Threats were mainly related to the challenge of keeping up with fast moving societal trends. The digital world triggered feelings of being overwhelmed and of constantly having to play catch-up, creating a form of decision paralysis. Furthermore, the availability, choice, implementation and costs of digital tools were mentioned as a barrier. For instance, respondents discussed having trouble finding a back-office digital tool suitable for Urban Deli’s different activities. Also, implementing new tools would come with a risk of getting “locked in” into expensive infrastructures, so decisions had to be made very carefully.

3.4 Digital service providers

The digital service providers interviewed included an ingredient ordering and inventory provider, a product database information provider, and a barcoding and digital standard setting provider. Illustrative quotes from the interviews are provided in Table 5. We found that these service providers have been working with integrating additional sustainability information in their tools. For example, a carbon footprint calculator has recently been integrated to the ordering tool, allowing restaurateurs to estimate the carbon footprint of the dishes on their menu. The provider of the food product database reported working on adding detailed product origin information to its service. Finally, the barcode provider is developing new barcodes and tracking systems

Table 5. Main findings from the SWOT analysis of the digitalization vision with illustrative quotes

SWOT category	Main finding	Framework code	Illustrative quote
Strengths	Good relationship with suppliers	Relational	<i>"We have a digital relationship with our suppliers. We try to consider them less as suppliers and more as partners. They often have good product knowledge, and they know our values, so we try to do better together."</i>
	Good relationship with Axfood	Relational	<i>"We have a good collaboration with Axfood around digitalization."</i>
	Knowledge of what should be done	Intellectual	<i>"I think that we have good knowledge of what we should and are going to do for digitization"</i>
	Knowledgeable staff	Intellectual	<i>"we have people in the management team with the capacity"</i>
Weaknesses	Lack of expertise	Intellectual	<i>"We don't have the expertise of which is the best loyalty system for us, or how to make business decisions using data on what people buy, do, we are not data driven" "We don't have the internal competences for it"</i>
	Lack of time	Organizational	<i>"Time is a limiting factor"</i>
	High cost	Financial	<i>"It costs a lot of money, that's probably the barrier"</i>
	Vision	Organizational	<i>"But it is not only about the money, it is also a priority thing."</i>
	Difficult to translate the Urban Deli experience digitally	Reputational	<i>"If you send a product home [rather than eating on-site], you only get a third of the experience, so that's what's difficult with digitalization."</i>
	Vision	Organizational	<i>"We probably need to work more long-term"</i>
	Cost of implementation	Organizational and financial	<i>We are 400 people working, we can't just say 'oh we try this' as you have to put a lot of time and efforts into something. So you have to be sure that it will work beforehand."</i>
Opportunities	Increase competitiveness	Economic	<i>"What is exciting about digitalization is that we can make a more tailor-made consumer offer."</i>
	Communication	Societal	<i>"I think that there is still the opportunity for digitization to be an information carrier for a product."</i>
	Growth opportunity	Economic	<i>"Digitalization is an opportunity of course, it can improve efficiency, to also sell more and the website is a good example of that."</i>
Threat	Technology availability	Technological	<i>"I've been trying to find a programme that would work for me in the production, something that could just be implemented, but I just can't find one that is suitable for our kind work. It is an issue of availability."</i>
	Cost of digitalization	Economic	<i>"Digital back-office systems are expensive for small businesses."</i>
	Following digital consumer trends	Societal	<i>"It's tough, we're not good at social media or technology in general." "It is difficult for UD [Urban Deli] to drive new solutions, because we have to follow what is already there, we don't have the muscle to do it ourselves."</i>
	Pressure of consumer digital tool trends	Societal	<i>"We would rather not be on [named food order app] ... [for ethical reasons], but we were forced a little into this."</i>
	Difficulties keeping up with speed of digital improvements	Technological	<i>"We can do improvements, but we must choose, we have to choose where to make the most of it. The choosing is the difficult part because the techniques are evolving so fast."</i>

More legislation and standards are needed to create a level playing field for all food suppliers to enhance transparency in food supply chains.

that could allow for enhanced accessibility and granularity of product information. Respondents highlight the potential for improved information flows, which in turn could be used to incentivize sustainable behaviours.

However, the respondents pointed out several barriers for digital service providers to integrate environmental sustainability information. They underscored the lack of available data to make carbon footprint calculations more precise. Two of the interviewed service providers mentioned that many food suppliers are reluctant to share more detailed environmental information about their product. This hinders the integration of detailed and comprehensive data in the tools, but also causes difficulties for the providers to balance the wishes of food retailers – who are demanding more data – and the reluctance of food suppliers to share data. Interviewees highlighted a lack of standardized methods to calculate environmental impacts. Another aspect that came across was the difficulty in working with the various complex facets of sustainable food consumption, such as food waste, water footprints, carbon footprints and organic sourcing.

Interviewed service providers agreed that more legislation and standards are needed to create a level playing field for all food suppliers to enhance transparency in food supply chains.

4. Discussion and conclusions

Based on the central role that retailers can play in a sustainable food transition (Bartels et al., 2015; Grubb et al., 2020; Willett et al., 2019), this study set out to explore to what extent digital tools support retailers in delivering on their sustainability visions. Drawing from a comprehensive qualitative case study, the results suggest that even though the retailer, Urban Deli, may have a strong sustainability vision, digital tools are not yet used to their full potential to deliver this vision.

We found in this case study that having a sustainability vision which is embedded in the organizational culture is insufficient, in opposition to what prevalent literature suggests (Ulrich & Brockbank, 2016). Previous research suggests that the engagement by management aids the promotion of a vision (Holton et al., 2010). However, in this study, despite such engagement, the vision remains splintered. Several information challenges appear to remain despite potentially facilitated access to information through tools, in line with previous findings. These challenges are the access to product-specific data (Astill et al., 2019), the knowledge and capability to understand this information (Röös et al., 2014), as well as internal and external communication (Reilly & Hynan, 2014; Röös et al., 2014).

Notably, while data availability and the knowledge and capability to use that information were reported as challenges, access to information did not appear to be seen as a major information challenge for the retailer in this case study. This is also in accordance with previous studies (e.g. Astill et al., 2019). Greater access to information was rather perceived as an opportunity for the organization due to an increasing number of channels available to access information.

A major weakness, confirming previous research (Röös et al., 2014), was the lack of understanding of the information, knowledge and its retention within the organization, and acting upon the knowledge. This confirms previous research stating that more information is only effective if users have the capability and willingness to use it (Gardner et al., 2019). We also found that these knowledge challenges directly connected to the internal and external communication challenges about the sustainability vision.

In the case of Urban Deli, we found that the use of digital tools was not intended to support sustainability ambitions and remained unconnected to the delivery of the company's sustainability vision. Instead, one of the main benefits for Urban Deli in implementing new digital

Several information challenges appear to remain despite potentially facilitated access to information through tools.

tools at the time of this study was to reduce costs by reducing the number of suppliers through the ingredients ordering tool and by improving their interfaces with consumers through the website and online store.

More generally, the retailer showed a rather ad hoc manner of implementing new digital tools. Urban Deli lacked a long-term digital strategy to support the delivery on the sustainability vision, and this could be a reason for the lack of implementation of tools that support and change the way the retailer takes decisions, such as choice of suppliers or menu design, that have implications for sustainable consumption and production. Furthermore, we see that the perceived risk combined with unclear business advantages from investing in these new technologies creates inertia in the retailer's digitalization efforts.

Interviews with digital service providers revealed that the tools they sold to Urban Deli had the potential to facilitate the access to, and sometimes the interpretation of, environmental information. However, intentions to integrate environmental sustainability information in the tools were still in a nascent stage and met with challenges, such as the lack of detailed data due to suppliers' willingness to report information and a lack of standards to refine the information provided by their tools. In addition, the digital service providers were found to be grappling with similar challenges as Urban Deli, namely managing expectations of their suppliers and consumers and managing the complexity of environmental impacts of food products.

The findings indicate that the potential benefits of digitalization have not yet fully reached all retailers, contradicting previous research (Bulović & Čović, 2020; Ordieres-Meré et al., 2020). Indeed, we found that despite Urban Deli's strong sustainability vision and willingness to work with digital tools, the current digital tools did not directly help overcoming the retailer's information-related challenges to deliver on their sustainability vision. The findings also indicate that digital service providers likely will be relied on by retailers to deliver digital tools that can help improve retailers' sustainability governance. Choosing new digital tools requires time to engage with two complex and overwhelming fields: digital tools development and sustainable food systems. Investing in and implementing these tools requires intellectual (e.g. knowledge to understand, interpret and act on information) and financial (e.g. monetary investments) capabilities on the retailer's side, as well as making it a clear priority.

The potential benefits of digitalization have not yet fully reached all retailers to deliver increased sustainability.

These findings point to the question of whether information is one of the main limiting factors for retailers to deliver on their ambitious sustainability visions. Indeed, beyond the effort to implement new digital tools, we find that the willingness to act upon the information these tools could provide is crucial. Furthermore, previous research has shown that increased information can backfire, paralysing well-intended decision-makers in the face of the amount and complexity of sustainability challenges (Gardner et al., 2019).

In addition, increased transparency does not ensure that companies make changes towards making their activities and supply chains more sustainable (Gardner et al., 2019). While companies are increasingly reporting information about their greenhouse gas emissions, this has not led to decreasing emissions, for example (Belkhir et al., 2017; Dingwerth & Eichinger, 2010).

We find that despite the retailer's perception that more information would allow for better sustainable decision-making, the main barriers to action are connected instead to lack of prioritization, direction to use this information, and trade-offs in connection to their consumer base. Lack of enough information might even be used as an argument for retailers not to act.

Taking the consumer perspective, research has also shown that transparency improves consumer willingness to buy, but that consumers do not leverage that transparency (Egels-Zandén & Hansson, 2016), and that more transparency might not always be best for consumer empowerment (Mol, 2015). Hence, the crucial question is: how can we move from information to action?

Increased sustainable consumption cannot solely rely on organic initiatives from consumers and private actors, given the pace of change required.

This question connects directly to the issue of responsibility for sustainable consumption, and who should bear the costs of the transition. In our case study, we found that the responsibility for acting on the information provided is pushed to others, as found in previous research (Akenji, 2014; Ribeiro, 2019). While there is a consensus that consumers face major challenges to make more sustainable choices despite good intentions (Gisslevik, 2018; Liobikienė et al., 2016), we additionally find that retailers and digital service providers might be grappling with similar challenges: competing interests, complex trade-offs and potentially high costs for implementing improved systems to support sustainable decision-making. Therefore, we find that increased sustainable consumption cannot solely rely on initiatives from consumers and private actors, given the pace of change required, and that additional political support for example through further regulations of food products and the information disclosed about them might be needed.

5. Limitations and future research

Given that Urban Deli is a Stockholm-based restaurant and food retail organization, we acknowledge that this study might not be applicable to other country contexts or to other types of businesses. However, it raises several interesting avenues to explore in other contexts, including using this methodology to study both smaller and larger organizations, or companies with less ambition to work with environmental sustainability.

Future research should explore perspectives of other actors, such as industry policymakers and industry associations driving legislation and standardization that affects retailers. We also encourage researchers to examine supply chain actors and their use of digital tools as part of their environmental sustainability work. To our knowledge, this type of research is still in an early stage (e.g. Büyükoçkan & Göçer, 2018) with a few exceptions (Kittipanya-ngam & Tan, 2020; Mieras et al., 2019), and more work needs to be done to explore the practical opportunities and challenges of environmental information flows from a comprehensive supply chain perspective.

ACKNOWLEDGEMENTS

We partnered with Urban Deli to build this case study project, with funding from Formas. Urban Deli was part of designing the research grant allowing the team to perform this research. The collaboration with Urban Deli gave us unparalleled access to Urban Deli company employees and their partners across the supply chain. However, Urban Deli had no influence on the process and outcome of the research. The retailer read this report ahead of publication and had no comments.

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Annex. Literature review: a nexus

Before we began our work, we looked at the academic research in three related fields for this case study: sustainability visions for organizations, the impact of information on sustainable consumption, and digital tool use to deliver information and other aspects of digitalization. The following shows the state of the art in understanding how visions, information and digital tools interact to achieve more sustainable consumption patterns. This foundation informed our experiments and work with Urban Deli and shaped how we analysed the results.

1.1 Organizational sustainability visions

Retailers play a significant role for sustainability because they are the connection node between producers and consumers (Bartels et al., 2015; Willett et al., 2019). This puts retailers in a powerful but also challenging position because they need to balance various perspectives (e.g. Elg & Welinder, 2022), such as competitiveness (e.g. Bilińska-Reformat et al., 2018), product development (e.g. Nilssen et al., 2019), employee engagement (e.g. Lee & Ha-Brookshire, 2017), supply chains (e.g. Björklund et al., 2016; Sendlhofer & Lernborg, 2018), and consumers (Lehner, 2015).

Addressing environmental sustainability is a complex and rather recent endeavour for many businesses (Richter & Arndt, 2018). Previous research has shown that it is not necessarily multinational corporations that pioneer industry-wide changes for sustainability and digital development (Verhoef et al., 2021). Rather, smaller companies have a considerable impact on improved sustainability (Calogirou et al., 2010) and influence on other actors in the market (Denicolai et al., 2021).

To succeed with their sustainability ambitions (Ulrich & Brockbank, 2016), companies need to develop strong vision statements (Coleman, 2013); ideally, these function as an organizational navigator, including managers and employees in determining and guiding organizational cultures, norms, and behaviour schemes (Hart & Milstein, 2003; Kantabutra & Ketprapakorn, 2020). More specifically, sharing an organizational vision has positive impacts for employee engagement in support of the vision (Gottlieb & Sanzgiri, 1996).

Certainly, a sustainability vision is not universal across companies, and each company designs their own vision. The success of delivering on a sustainability vision can be impacted by the management's willingness to support the implementation of the vision on the operational level (Holton et al., 2010). Companies also need to account for their impacts as they develop a vision (Henriques, 2001). Strong sustainability visions affect a company in the long run, spanning from internal stakeholders to external stakeholders (Oruc & Sarikaya, 2011), with the potential to improve stakeholder relationships (Kantabutra & Ketprapakorn, 2020).

1.2 Sustainability information

A plethora of knowledge exists about how to achieve healthy and sustainable diets, i.e. that both are nutritional and have an environmental impact that does not threaten ecosystems (e.g. Willett et al., 2019). Education and information campaigns are crucial to equip the public with this knowledge (Lindahl & Jonell, 2020; Willett et al., 2019) and can influence consumers to make more sustainable choices (Röös et al., 2014).

Research has shown that a major knowledge gap remains in the awareness of the food sector's impact on climate change (Bailey et al., 2014; Stampa et al., 2020), and that consumers seek both easily accessed and comprehensive information, as well as an in-depth understanding of environmental impacts, before they consider changing behaviour (Lawo, 2021; Ran et al., 2022). Additionally, research has shown the limited potential of relying on consumer decision-making for sustainability (Röös et al., 2020; Willett et al., 2019).

On the other hand, research has shown that retailers have a high potential to support more sustainable consumption (Grubb et al., 2020). Indeed, thanks to their direct contact with suppliers and their interaction with end-consumers, retailers have the possibility to receive, use and share environmental information about the products they sell. However, retailers are intermediate consumers themselves and, similar to end-consumers, need clear and comprehensive information about the environmental impacts of the food products they buy to be able to perform such interventions. Such information can be used by retailers to implement sustainability interventions such as those outlined by Grubb (2020): incentivizing or banning certain products, selecting or setting high requirements for suppliers, and communicating environmental sustainability to end-consumers.

However, environmental pressures are complex to understand and compare, often remaining opaque or confusing, making it hard for retailers and consumers to understand, evaluate, communicate and act upon information provided (Röös et al., 2014). The complexity of food products arises both from the variety of environmental impacts of food production and increasingly intricate globalized food supply chains (Mol, 2015). Ekelund (2014) found that few retailers communicate information on climate change, and that some retailers communicate ambiguous messages, where sustainability issues were confounded with climate; retailers seem to face challenges in understanding the information and communicating it to their customers.

While extensive research on the link between environmental information and consumer behaviour exist, we find a lack of research looking into retailers' access and use of environmental information. A few recent exceptions examined the potential support from digital tools, focused on customers' behaviour (e.g. Fuentes et al., 2021; Fuentes, 2019).

1.3 The role of digital tools in providing supporting information

The increasing complexity of food supply chains has made traceability and transparency crucial to their monitoring (Astill et al., 2019): such monitoring is crucial to enable actors in the food supply chain to recognize and act upon the environmental impacts of the products. Digital technologies such as radio frequency identification (RFID) technology, geospatial data capturing technologies, and sensor technologies (Alfian et al., 2017; Astill et al., 2019; Bosona & Gebresenbet, 2013; Kamilaris et al., 2019) have enabled rapid advances in the collection, monitoring, disclosure and dissemination of data along the food supply chain. These advances contribute to increased traceability and transparency along the food supply chain (Astill et al., 2019; Bumblauskas et al., 2020; Musa et al., 2014; Xu et al., 2015), which can help inform and shape decisions related to sustainability governance (Gardner et al., 2019). Nonetheless, challenges still remain, such as standardization in information and calculation methods when it comes to environmental assessments (Zhang et al. 2020), and digital fragmentation is yet to be resolved (Krishnan et al., 2021; Trienekens et al., 2012; Wognum et al., 2011).

Digital service providers can impact the type and amount of information that is shared between different actors in the supply chain. We define these providers as those who develop and operate digital tools for all actors of the food supply chain. The digital tools they provide have the potential to support retailers and/or consumers to deliver more sustainable decision-making and processes and therefore achieve better sustainability results (Malenkov et al., 2021). Examples of such tools in Sweden are carbon footprint calculators of food products or meals (e.g. CarbonCloud and Klimato) and databases with sustainability information accessed through scanning product barcodes (e.g. Consupedia; see Table A1).

From a retailer's perspective, sustainability and digitalization can either be opportunities for change, or used as pure survival strategies to remain in the market (see Bos-Brouwers, 2010; Bouwman et al., 2018; Isensee et al., 2020; Quinton et al., 2018). The increasing pressure to implement new technologies (Pantano et al., 2018) has led retailers to use digital tools that promote sustainability (Atkinson, 2013; Fuentes et al., 2021). It remains rather unclear, however, to what extent digital tools can support the delivery of a retailer's sustainability vision.

Table A1. Innovative initiatives launched in Sweden that work at the interface between digital information technologies and environmental sustainability

Initiative	Type of initiative	Company	Launch year	Project description	Source
CarbonCloud	Company	CarbonCloud AB	2016	Web-based SaaS solution which enables detailed calculations of climate footprints of food products and their production processes.	(CarbonCloud, 2021)
Consupedia	Company	Consupedia AB	2014	Smartphone application connected to a database with sustainability information on food products, which can be used to scan products and allows you to see their environmental and social impact.	(Consupedia, 2021)
Klimato	Company	Klimato AB	2017	Calculates the climate impact and produces climate labels for meals in restaurants using a web-based platform, with the goal of reducing CO2 emissions.	(Klimato, 2021)
Normative.io	Company	Meta Mind AB	2014	Allows you to measure your company's environmental impact, by automatically calculating the environmental footprint from uploaded accounting data.	(Normative, 2021)
GoClimate	Company	GoClimate Sweden AB	2017	Online-based platform and subscription service, which help users to offset their climate impact.	(GoClimate, 2021)
Worldfavor	Company	Worldfavor AB	2016	Provides different solutions which allowing to manage all kinds of sustainability data. It also enables its users to trace impact, to follow up on its portfolio companies, and to comply with the EU Taxonomy.	(Worldfavor, 2021)
FoodFighters	Company	FoodFighters AB	2018	Online platform which selects the most sustainable and affordable choices for the food choices you want to include in your food shopping.	(FoodFighters, 2021)
Blockchain in the food industry	Company-based project	Axfood and other partners	2017	Project exploring blockchain's potential in the food chain, looking at aspects of transparency and traceability, for purposes such as sustainability of food supply chains.	(Axfoundation, 2021)
Coop Hållbarhetsdeklaration (sustainability declaration)	Company-based project	Coop (for all its stores)	2021	Smartphone app which allows to scan the barcode of its products to retrieve the sustainability declaration for these.	(Coop, 2021)

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