

Institutional work in food waste reduction:

Start-ups' role in moving towards a circular economy

Elina Närvänen* (elina.narvanen@tuni.fi), Malla Mattila, Nina Mesiranta

Tampere University, Faculty of Management and Business, Finland

1. Introduction

Food waste—defined here as comprising both “food waste” and “food loss” (Parfitt, Barthel, & Macnaughton, 2010) as well as “surplus food” (cf. Garrone, Melancini, & Perego, 2014a)—is a key factor in the current unsustainable food system. It has been shown to emerge as a system-level imbalance between food production and consumption (Papargyropoulou, Lozano, Steinberg, & Wright, 2014), touching all phases of the food supply chain (e.g., Parfitt et al., 2010; Xue et al., 2017). Dealing with food waste is a major concern for the food system in the transition towards a circular economy (CE) (Aschemann-Witzel & Peschel, 2019; Jurgilevich et al., 2016; Zucchella & Previtalli, 2019) and an inherent part of the EU’s effort to advance such an economy (Prieto-Sandoval, Jaca, & Ormazabal, 2018).

CE is a regenerative and restorative economic model, where the value of materials and resources is retained as long as possible (Ranta, Aarikka-Stenroos, Ritala, & Mäkinen, 2018). It is a solution for businesses looking to balance economic growth with the need to sustain biological and social systems for future generations (Bocken, de Pauw, Bakker, & van der Grinten, 2016; Hobson, 2016). However, while knowledge exists on the practical and technical flows of materials and energy that minimise waste, emissions and energy leakage in CE (Geissdoerfer, Savaget, Bocken, & Hultink, 2017, p. 777), the broader social and institutional changes needed to transition into a CE are currently underdeveloped (Ghisellini, Cialani, & Ulgiati, 2016; Hobson, 2016; Korhonen, Honkasalo, & Seppälä, 2018; Merli, Preziosi, & Acampora, 2018). In other words, instead of focusing directly on resource loops and

mechanisms of reducing, reusing, recycling and repurposing, there is a need for understanding the drivers and barriers underlying them as well as the actors involved in the transition. Institutional theory holds untapped potential for analysing the transition to a CE from a more holistic perspective (Ranta et al., 2018) by considering the interplay between actors and institutional structures (Lawrence, Suddaby, & Leca, 2009).

Food waste involves the loss of and/or waste of resources throughout the food supply chain—from primary production to retail and distribution, the catering and hospitality sectors and households (see, e.g., Papargyropoulou et al., 2014; Parfitt et al., 2010). Alongside the efforts of more established actors, such as the food manufacturing industry and retailers, new *born sustainable* start-ups (Todeschini, Cortimiglia, Callegaro-de-Menezes, & Ghezzi, 2017) have emerged in recent years to address the food waste issue. Examples of these are businesses that utilise digital platforms to broker between organisations that produce waste and those that utilise it as a resource (Ciulli, Kolk, & Boe-Lillegraven, 2019; Mattila, Mesiranta, & Heikkinen, in press). Some start-ups promote technological innovations related to agriculture, food manufacturing and packaging, or target consumers to help them plan and store food, such as through the use of intelligent fridges and mobile applications (Hebrok & Boks, 2017). Many of these start-ups are based on the basic principle that what is perceived as waste for one may become a resource for another (Perey, Benn, Agarwal, & Edwards, 2018). While the CE literature has highlighted that novel business models and value-adding economic actors, such as new companies, are needed (Pieroni, McAloone, & Pigosso, 2019; Roos & Agarwal, 2015), the role of start-ups in bringing about institutional change has not been examined in food waste research.

This paper argues that start-ups may have an influential role not only in directly reducing food waste throughout the food supply chain but also in facilitating and driving social and institutional changes towards a CE (Merli et al., 2018). Institutions are defined as the

elements of social life that influence the thoughts, feelings and behaviours of individuals and collectives (Lawrence & Suddaby, 2006), consisting of norms, rules, symbols and meanings, as well as practices and routines (Baron, Patterson, Maull, & Warnaby, 2018; Scott, 2008). Institutions largely determine the “rules of the game” (North, 1991), including the actors’ positions within the food supply chain (Michel, Saucède, Pardo, & Fenneteau, 2019), which ultimately differentiate profitable from non-profitable activities (Moreau, Sahakian, Van Griethuysen, & Vuille, 2017). While institutions guide actors’ behaviour, actors can also transform and change these—through institutional work (Lawrence & Suddaby, 2006). Institutional work can be conducted, for example, to mobilise resources for an emerging field or to establish legitimacy for new technologies (Binz, Harris-Lovett, Kiparsky, Sedlak, & Truffer, 2016; Lawrence & Suddaby, 2006), but in this paper, we concentrate on a business perspective: the institutional work that is necessary for the start-ups to succeed, create new demand for their offerings and ensure profitability in the long run.

The purpose of this paper is to analyse the forms of institutional work conducted by start-ups to prevent and reduce food waste. We address this purpose through utilising both netnographic and interview data. The article contributes to food waste studies and CE research by introducing the lens of institutional work to better understand and conceptualise the social and institutional changes needed to address this problem.

2. An institutional lens on food waste reduction

2.1. Solutions for food waste reduction and prevention

In food waste research, the focus has only very recently shifted from reasons for food waste to solutions for tackling the problem (Närvänen, Mesiranta, Mattila, & Heikkinen, 2020). The food waste hierarchy (FWH) has been proposed as an overall strategy for action related to food waste reduction (Papargyropoulou et al., 2014). According to this hierarchy, the most

preferable solutions concern food waste prevention, followed by its preparation for reuse, recycling and recovery, with disposal as the least favourable option. Transforming food waste into energy (Pagotto & Halog, 2016), valorising agricultural food waste (Garcia-Garcia, Stone, & Rahimifard, 2019; Principato, Ruini, Guidi, & Secondi, 2019) and utilising food waste from cruise ships as animal feed (Strazza, Magrassi, Gallo, & Del Borghi, 2015) have all been investigated as solutions in line with a CE to deal with existing food waste. However, these solutions do not attempt to change the institutions that lead to waste, as they only focus on recycling and reuse.

The suggested solutions for preventing food waste further along the supply chain have centred on households and consumers, such as improving the effectiveness of food waste reduction campaigns (Aschemann-Witzel, de Hooge, Almlı, & Oostindjer, 2018a; Ellison, Savchenko, Nikolaus, & Duff, 2019; Young, Russell, Robinson, & Chintakayala, 2018) and behavioural interventions (Stöckli, Niklaus, & Dorn, 2018). Research has also considered retailers' abilities to affect consumer-related food waste through packaging and pricing strategies as well as through their unique mediating position in the food supply chain (Aschemann-Witzel, de Hooge, Amani, Bech-Larsen, & Oostindjer, 2015; Bech-Larsen, Aschemann-Witzel, & Kulikovskaja, 2019; Filimonau & Gherbin, 2017; Gruber, Holweg, & Teller, 2016). New companies can operate as “circularity brokers” between supply chain actors, utilising digital platforms and mobile applications to transfer and recover food in the chain (Ciulli et al., 2019; Harvey, Smith, Goulding, & Illodo, 2019). However, the focus of these studies has been on the more direct effects on the supply chain rather than on the institutional change taking place as a consequence of their activities.

Previous research has suggested that the everyday practices that lead to emerging food waste, for example, planning, grocery shopping, storing and preparing and serving food, need to be reconfigured (Hebrok & Boks, 2017; Hebrok & Heidenstrøm, 2019; Moser, 2019). In the

CE literature, domestic life and quotidian practices are, however, under-researched (Hobson, 2016; Holmes, 2018; Mylan, Holmes, & Paddock, 2016). Finally, some studies have focused on the role of non-profit actors, such as non-governmental organisations (NGOs) and food banks, in cooperation with retailers, in reducing food waste (Baron et al., 2018; Bech-Larsen et al., 2019; Gollnhofer, 2017; Ribeiro, Sobral, Peças, & Henriques, 2018). Baron et al.'s study (2018) importantly opened an avenue for an institutional perspective in the food waste context by illuminating how the food redistribution service ecosystem is influenced by several institutions. However, their study did not consider the institutional work conducted by for-profit actors. ~~in the wider food supply chain.~~

In summary, previous studies have addressed various solutions from different perspectives and phases of the food supply chain, especially focusing on single actors and managing existing food waste through closing loops. Hence, as in many CE contexts, the majority of the suggested solutions target upholding the institutions related to recycling and reusing rather than on reduction itself (Ranta et al., 2018). A more extensive change in the food system, though, would require robust solutions that challenge the existing structure (Mourad, 2016). We argue that one potential way to advance strong sustainability solutions is through institutional work, where the food system is seen to comprise various institutional arrangements.

2.2. Institutional work conducted by start-ups

Institutional work can be defined as “the purposive action of individuals and organizations aimed at creating, maintaining and disrupting institutions” (Lawrence & Suddaby, 2006, p. 215). This concept shifts attention to the agency of actors in processes of institutionalisation rather than viewing them as passive (Phillips & Lawrence, 2012). In the context of sustainability transformations, institutional work has been suggested as an ideal framework for capturing how change processes occur (Beunen & Patterson, 2019). It takes into

account not only the business model of the start-up but also its surrounding institutional environment—the “rules and requirements to which individual organizations must conform in order to receive legitimacy and support” (Scott, 1995, p. 132). This environment both “supports and inhibits the adoption of and transition to a CE” (Ranta et al., 2018, p. 72). In line with institutional theory, there are three institutional pillars that can be worked upon by actors: the regulative (rules and laws), the normative (norms) and the cultural-cognitive (beliefs and meanings), all of which contribute to the existence of an institution (Scott, 2018). Even though a lot of attention has been directed towards regulative work to facilitate a CE, studies suggest that changing the regulative pillar alone is not enough to shift the institutional environment (Ranta et al., 2018; Scott, 2008). Efforts are especially required with regard to the normative and cultural-cognitive pillars, which is why we concentrate on these in the present study. The institutional work conducted by start-ups is particularly relevant in understanding these efforts, as these actors are not generally involved in political lobbying, that is political work, but rather, much more in the reconfiguration of actors’ belief and meaning systems (Zvolska, Palgan, & Mont, 2019). In studying institutional work, the focus should be on the “messy day-to-day practices” (Lawrence, Leca, & Zilber, 2013) of actors, as well as the discursive dynamics—how perspectives, ideas and beliefs are communicated (Beunen & Patterson, 2019, p. 24). In Table 1, we explicate forms of institutional work that are especially relevant in terms of changing the normative and cultural-cognitive pillars in the food waste context.

Table 1. Summary of forms and types of institutional work with CE-driven examples

Form of institutional work	Type of institutional work	Definition (adapted from Lawrence & Suddaby, 2006, p. 221)	Examples
Creating	Constructing new identities	Defining the relationship between an actor and the (business) environment in which that actor operates	Urban sharing organisations attempting to construct their identities as catalysts for sustainable innovation (Zvolska et al., 2019)
	Changing normative associations	Creating new connections between established practices and the moral and cultural	Cooking from leftovers is presented by food bloggers as a creative activity (Närvänen et

		foundations for those practices	al., 2018)
	Mimicry	Leveraging established institutions (practices, technologies and rules) when creating new ones, facilitating the adoption of new institutions	Organisations mimicking each other's innovative practices, such as the use of mobile technology as an enabler (Zvolska et al., 2019)
	Theorising	Developing and specifying new names, abstract categories, concepts and stories	Actors utilising scientific research to provide legitimacy for the new practice of drinking potable water (Binz et al., 2016)
	Educating	Actors providing knowledge and skills for other actors to understand and embed the new institutions, such as new practices, into their daily lives	Eataly educating customers on high-quality Italian food that it also sells in its stores (Koskela-Huotari et al., 2016)
Disrupting	Disassociating	Disassociating the practice, rule or technology from its moral foundation as appropriate within a specific cultural context	Organisations questioning ownership as the only appropriate way to consume by promoting access-based consumption as a sustainable and democratic option (Zvolska et al., 2019)
	Undermining assumptions and beliefs	Decreasing the perceived risks of innovation and differentiation by challenging core assumptions and beliefs	Fairphone undermining trends in smartphone design by making easily repairable and disassemblable phones (Bocken et al., 2016)
Maintaining	Valorising	Producing positive images of the institution for public consumption	Actors using celebrities to promote the use of potable water (Bintz et al., 2016)
	Mythologising	Creating and sustaining (moral) myths about the origin of the institution, such as a start-up's founding story	Patagonia utilising the story of its founder as a person interested in sustainability (Bocken et al., 2016)
	Embedding and routinising	Actively infusing the foundations of an institution into people's daily routines. This may also require resolving conflicts and repairing imbalances between the old and new institutions (Vargo et al., 2015)	Food bloggers embedding food waste reduction into their everyday practices (Mattila et al., 2018)

The actors who participate in institutional work related to food waste reduction range from start-up entrepreneurs, consumer-citizens and NGOs to politicians. The key prerequisite is that they have the resources and/or power to influence institutions and are actively doing so (Lawrence & Suddaby, 2006). However, in this paper, our focus is on the start-ups, which are needed because the businesses of the mature food supply chain actors (e.g., food manufacturers

and retailers) are reliant on the current institutional environment and lack the initiative to holistically change it. Often, these established actors rely only on “weak food waste prevention” initiatives (Mourad, 2016). In contrast, start-ups have the opportunity to base their business models on strong sustainability, often utilising new technologies and opportunities provided by digitalisation (Ciulli et al., 2019; Harvey et al., 2019; Michelini, Principato, & Iasevoli, 2018; Närvänen et al., 2019). In conducting institutional work, the start-ups need to balance the three pillars of sustainability—economic, environmental and social. Hence, to be innovative, they need to maintain some aspects of the institutional arrangements while disrupting others (Koskela-Huotari, Edvardsson, Jonas, Sörhammar, & Witell, 2016). In order to do this, the start-ups need to create new, sustainable value propositions to attract and engage customers, investors and other stakeholders (see, e.g., Bocken, Short, Rana, & Evans, 2014; Calabrese, Castaldi, Forte, & Levialdi, 2018; Franca, Broman, Robert, & Basile, 2017; Närvänen et al., 2019). Focusing on how these actors create, maintain and disrupt institutions, we build a more nuanced understanding of the transition towards a CE in the food system.

3. Material and methods

Our study is based on qualitative research methodology and an extensive, multiple-case study approach (Dubois & Gibbert, 2010). This methodology was chosen as it allows the application of a holistic perspective to the research phenomenon and the investigation of it within the context in which it occurs (Eisenhardt & Graebner, 2007; Yin, 2009). Case study research is well suited for studies that are positioned in the “context of discovery”—developing new theory—rather than in the “context of justification”, which relates more to the testing and generalising of established frameworks (Yadav, 2010). This study uses the chosen approach instrumentally; it offers a way to identify common patterns and characteristics rather than intensively examining one or a few single cases in depth (Gummesson, 2017). In studying

institutional work, speaking and writing practices are both considered important (Lawrence & Suddaby, 2006); hence, interviews and written documents are legitimate sources of data for the study (see also Binz et al., 2016).

The data generation was part of a three-year netnography (Kozinets, 2015) of the emerging food waste reduction business (conducted in 2016–2019), where the researchers were continuously involved in monitoring and observing online websites, news media and social media regarding the topic of food waste in general and food waste solutions and businesses in particular. These observations were conducted through online searches using Google, as well as through being actively involved in social media by following accounts related to sustainability and food waste. This allowed us an in-depth understanding of the study's context.

For the present study, data generation and analysis took place in two phases. In the first, the three authors discussed, evaluated and then selected the cases to be studied (Eisenhardt & Graebner, 2007). The primary selection criterion was based on theoretical categories regarding food waste in the food supply chain (Parfitt et al., 2010) and the FWH (Papargyropoulou et al., 2014), as well as in terms of their ability to illuminate and extend the logic of reasoning beyond the research context. To focus our attention on the most sustainable and innovative solutions, we selected cases that can be positioned at the higher levels of the FWH (Papargyropoulou et al., 2014). Hence, we selected those that focus on food waste prevention as well as reuse for human consumption. We also decided to focus only on for-profit and “born sustainable” companies operating in the Global North, where the food waste problem is largely connected with the end of the food supply chain—retailing and consumption. The materials for the fifteen cases selected comprise, for example, news, company web pages and project reports. We utilised these data to familiarise ourselves with the way the start-ups operate, how they address the problem of food waste, who their key partners and customers are, what kind of value

propositions they create and how they tell their story in various media and marketing communication channels. The cases for the first phase are presented in Table 2.

Table 2. Cases selected for the first phase of the study

Case/country	Food supply stage/FWH	Type of business	Short description	Website
CogZum (CozZo), Bulgaria	Consumption/Prevention	B2C	This company, established in 2017, offers a mobile application that helps consumers to manage their shopping and inventory. Currently available in several countries.	https://cozzo.app/
Demetra (Green Code), Italy	All levels, from post-harvest to consumption/Prevention	B2B	Green Code, established in 2016, offers a way to inhibit the ripening process of fruits and vegetables through a biotechnological solution, Demetra (a natural post-harvest treatment).	http://www.g-code.it/
Fiksuruoka.fi, Finland	Retail/Reuse	B2C	Established in 2016, this company runs an online discount grocery store selling packaged groceries bought from other Finnish food industries, importers and wholesalers. These items would otherwise have been a waste risk (e.g., due to outdated packaging or too large stocks).	https://www.fiksuruoka.fi/
FoPo (food powder), Germany	Food processing/Reuse	B2C	This company, established in 2014, produces powder from rejected fruits and vegetables collected from local markets and grocery stores.	https://www.myfopo.com/
Instock, The Netherlands	Food services/Prevention and Reuse	B2C	Established in 2014, this company collects surplus food from local supermarkets and other producers and prepares dishes to serve in their restaurants or food truck. In addition, they make products out of surplus food.	https://www.instock.nl/
KromkKommer, The Netherlands	Food processing/Reuse	B2C	A social enterprise, established in 2012, that produces soups from crooked vegetables collected from growers.	https://www.kromkommer.com/
Mimica Lab (Mimica Touch), United Kingdom	Consumption/Prevention	B2B	This company, established in 2017, offers an “intelligent” label, which detects the freshness of food and thus helps consumers to assess the freshness of purchased food items.	https://www.mimicalab.com/
MyFoody, Italy	Retail/Prevention	B2B	Established in 2015, this company offers an application for retailers to advertise offers on products that are about to expire. Also, the company provides a waste management system for retailers so that they can better monitor their stock.	https://myfoody.it/
Oddbox, United Kingdom	Agriculture/Prevention	B2C	Established in 2016, this company buys surplus food (misshapen fruits and vegetables) from farmers and packages and resells them to consumers.	https://www.oddbox.co.uk/
Olio, United Kingdom	Consumption/Reuse	B2B, B2C	This company, established in 2015, offers a mobile application that enables shops and cafeterias to list their surplus food, which volunteers then collect and redistribute. Also, consumers can use the app to share their leftover food.	https://olioex.com/
Ovie,	Consumption/	B2C	Launched in 2018, this company provides	https://ovie.life/

United States	Prevention		“Smarterware,” a stock management system for the home. The system is connected to different applications that together help consumers to prevent food waste, for example, through better planning and food preparation.	
Querfeld, Germany	Agriculture/Prevention	B2B	Established in 2014, this company buys “ugly” organic fruit and vegetables from farmers and resells them to business customers.	https://www.querfeld.bio
Re-Belle, France	Food processing/Reuse	B2C	This start-up company (born out of a social movement in 2015) produces jams from surplus fruits and vegetables collected from stores.	http://www.confiturerebelle.fr/
ResQ Club, Finland	Food services/Reuse	B2B, B2C	This start-up company, established in 2015, provides an online service for food services to sell their leftovers meals to consumers at a discount.	https://www.resq-club.com/
“WasteMaster”, Finland	Food services/Prevention	B2B	Launched in 2016 as a digital experiment by environmental management company Lassila & Tikanoja, the “WasteMaster” application helps to reduce food waste in food services by producing data on internal processes (visualising the amount and origin of food waste). Use of this app also includes personnel training on practices relating to food waste.	https://havikkimestari.lassila-tikanoja.fi/

After collecting the data in the first phase, we conducted an initial round of analysis. The analysis process was a collaborative effort by all the authors. It consisted of within-case and cross-case analyses (Eriksson & Kovalainen, 2016, p. 130), which we related with theory on institutional work. In the within-case analysis, we produced short descriptions of the cases by reading the case materials and discussed their characteristics together. The cross-case analysis consisted of comparing the cases with each other to find commonalities and differences between them. As a result of the data analysis, we identified four categories of institutional work conducted by the start-ups (quantity of food, appearance of food, edibility of food and living with food).

In the second phase, we generated interview data to gain further insights into each identified category by conducting nine semi-structured interviews with company representatives (see Table 3). Research assistants helped in carrying out some of these interviews, which were conducted in both English (international start-ups) and Finnish (Finnish start-ups). Interviews were carried out either face-to-face or with Skype, depending on the

location of the interviewee and his/her preference. The interview questions concerned the companies' stories and development, also focusing on their stakeholder relationships, missions and how they aim to address the food waste problem. Hence, these questions aimed to get the interviewees talking about institutions and institutional work without directly asking about them. All of the companies were contacted initially, and at least one company from each of the four identified categories was interviewed. Interviewees were either founders, CEOs or people in charge of marketing and service development, which ensured that they had high-level authority in terms of decision-making and strategy and were knowledgeable regarding the company's history, business model and vision.

Table 3. Company representative interviews

Company	Position in the company	Duration of the interview	Type of business
CogZum	Co-founder & CEO	1h 7 min	B2C
Fiksuruoka.fi	CEO	46 min	B2C
FoPo	Co-founder & CEO	30 min	B2C
Mimica Lab	CEO	32 min	B2B
Olio	Co-founder & COO	29 min	B2B, B2C
ResQ Club	Leader of the Nordic marketing team	61 min	B2B, B2C
	Co-founder & Software Developer	15 min	
"WasteMaster"	Business Manager	31 min	B2B
	Former Service Manager	27 min	

The interviews were recorded and transcribed. Interviewee's original language has been retained in the data excerpts and Finnish data quotations have been translated into English by the authors. Next, another round of analysis was conducted to focus more in depth on the forms

of institutional work in each of the four categories. Theoretical insights from institutional theory were utilised to sensitise us to different types of institutional work (creating, maintaining and disrupting). All data analysis was conducted through several interactive, collaborative sessions between the authors. In discussing the findings, we present excerpts from both types of data. We have aimed to ensure the research quality through following established assessment criteria for case study research (Dubois & Gibbert, 2010; see also Järvensivu & Törnroos, 2010), including providing a transparent description of the research process, utilising different types of data, presenting data-driven argumentation and giving voice to all participants, as well as through creating new, usable knowledge. In addition, preliminary research findings have been presented to the scientific community at academic conferences as well as to the study participants.

4. Results

Our analysis resulted in the identification of four categories in which institutional work—maintaining, creating and disrupting—was conducted by start-ups related to food waste reduction: appearance of food, edibility of food, quantity of food and living with food (see Figure 1).

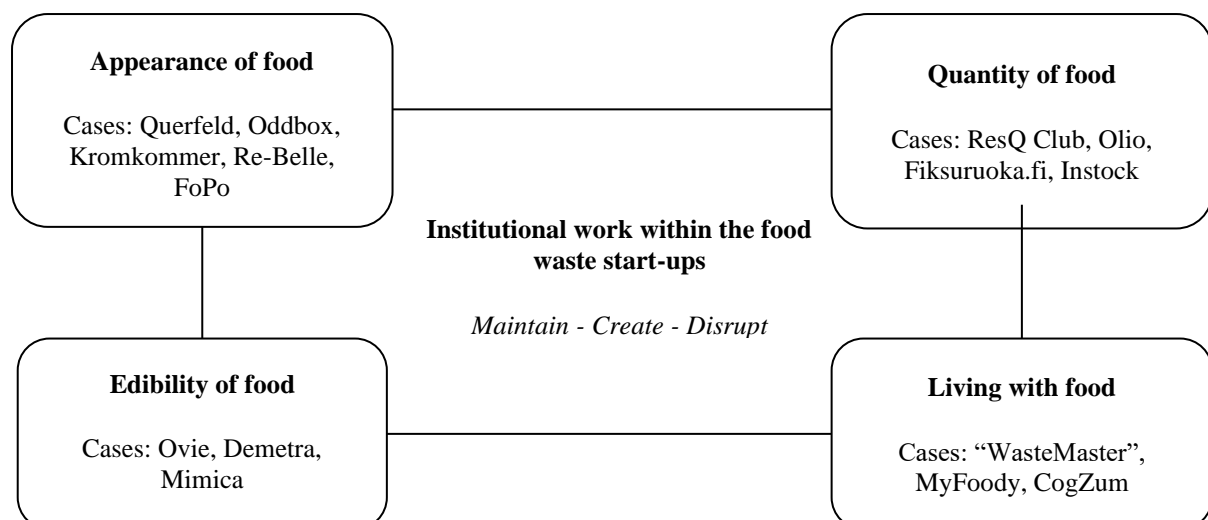


Figure 1. Institutional work: Four categories

4.1. Appearance of food

The institutional work in the first identified category, appearance of food, focuses firstly on *disrupting a rule or norm from its moral foundations*, such as quality standards and regulations related to food products, especially regarding (misshapen and/or discoloured) fruits and vegetables. The original aim of these standards was to facilitate packaging and transportation, but one of their consequences has been that farmers' second-grade produce has been rejected by retailers (see Devin & Richards, 2018; Garrone, Melacini, & Perego, 2014b). As a result of the institutional work conducted by the start-ups in this category, all food can be considered "beautiful" in its true nature and therefore (always) edible no matter the size or shape.

It's madness that perfectly edible and delicious produce is being left on the plant or ploughed back into the field because it doesn't meet strict specifications. We are **making it worthwhile for farmers to pick this imperfect produce** by paying them a fair price and by doing so, we have rescued 150 tonnes of food from being wasted. We have big ambitions to grow to the whole of London and beyond with a target to save 500,000 tonnes of UK and EU fruit and veg waste by 2022. Come and join **the wonky veg revolution!** (Oddbox, South West Farmer website, 17th July 2018)

Institutional work also results in disassociating the appearance of food items from their quality: an abnormal or strange appearance is presented as a purchasing criterion for inclusion rather than exclusion. This includes *valorising* the work that Oddbox does by aestheticising misshapen fruit and vegetables; for example, on its Instagram profile, the company publishes images of these products, sometimes anthropomorphising them by adding eyes, smiley faces or other human-like features.

'We started initially with the produce that goes inside our boxes to give customers an idea of what was available, and then we started posting misshapen fruit and vegetables and giving them characters',

explains co-founder Ravindran. ‘As we progressed, we found that **people responded well to stories**, both information as well as characters. We think fruit and veg have character, and that they are objects, but they also have some kind of history to them.’ (Oddbox, Evening Standard website, 22nd Aug 2017)

Anthropomorphising misshapen fruit has been suggested as possibly having a positive impact in point-of-purchase situations (Cooremans & Geuens, 2019). In this way, Oddbox both disrupts existing assumptions about appearance and creates new meanings for misshapen produce. Hence, in contrast to selling misshapen fruit at a discounted price (see, e.g., Aschemann-Witzel, Giménez, & Aresl, 2018b), which creates an assumption about them being of poor quality and having less value, Oddbox proposes that there is symbolic value in misshapen fruit that makes them even more desirable than standard, regular produce. In this way, the Oddbox brand can be considered a symbolic cultural resource with which institutional work can be facilitated (Michel et al., 2019).

Second, the cases of Querfeld and Oddbox are also related to *constructing new identities* in the supply chain. In addition to constructing a position for themselves as an alternative to the traditional grocery retailer or wholesaler, they envision new benefits for other actors as well. Traditional grocery retailers or wholesalers are not necessary because consumers or restaurants can buy their vegetables and fruit directly from producers. While Oddbox’s customers are consumers, Querfeld is a company that sells misshapen, organically produced food to restaurants.

The marketing of ugly fruits aims to reduce avoidable food waste and make resources more efficient.

The exploitation **opens up additional income for the farmers. Consumers benefit** because the ‘ugly fruits’ can be offered cheaper than ‘normal’ fruits and vegetables. This allows, for example, institutions with a tight purchasing budget to buy organic food. (Querfeld, SCE website)

In this category of institutional work, certain positive aspects of the current institutional arrangements are *valorised*. These include appealing to customers by saving the planet through a zero waste philosophy and by emphasising a healthy lifestyle in which eating fruits and

veggies (usually purchased from local growers) is encouraged. Hence, the aim is to *embed* and *routinise* the new practices as part of an already existing healthy lifestyle.

The cases of Querfeld and Oddbox create new institutions with the institutional work of *theorising*. They productise goods that have previously been viewed as commodities or raw materials, utilising marketing and branding techniques. Also, established market actors have begun to monetise suboptimal foods—as these items have become more accepted and even trendy, it is easier to sell them at a profit to customers (Gollnhofer & Boller, 2019). Bhatt et al. (2018) studied how labels and product descriptions influence consumers' acceptance of products made from surplus food and found that consumers had the most positive reaction to those products presented as “upcycled”. Hence, previously marginalised and discarded fruits and vegetables become normalised and desirable. Gollnhofer (2017) has studied how marginalised practices related to leftovers and food waste can become normalised in the context of food sharing. The illustrative cases identified by us normalise the ingredients themselves and bring them to mass markets. In contrast, Kromkommer, Re-Belle and FoPo transform the categories of food items, from fresh vegetables into soups, jams or powders—hence, also increasing their shelf lives.

Our powder—you have for four euros roughly two avocados in powder format. It's **very comparable, and you have the benefit of not having the pressure to use it immediately** [...] So, you didn't have guacamole in a jar until like two years ago, maybe, or a year ago. And there was a bunch of new products, so it takes some time for people to get used to the idea, but they actually want what they learned to eat fresh in a more convenient form, but it's natural and healthy and all. (FoPo, co-founder interview)

The co-founder of FoPo speaks about its product being an incremental innovation in a series of products, from fresh avocados to guacamole in a jar and, eventually, avocados in powder form. This requires them to *educate* consumers to learn new consumption habits and meanings related to food. The institutional work conducted by FoPo, therefore, gradually

pushes consumers to use the food powder as an alternative to meeting their needs for healthy and sustainable food.

4.2. *Quantity of food*

Cases in the second category, quantity of food, are based on utilising the food surplus by creating new uses and channels for food waste at different stages of the supply chain. Previous studies on food surplus have focused mainly on non-profit organisations, such as food banks (Lohnes & Wilson, 2018) and voluntary food-sharing organisations (Baron et al., 2018; Gollnhofer, 2017). The food bank system has become institutionalised globally as retailers have found it matches their need to engage in corporate social responsibility and dispose of their food waste at the same time (Lohnes & Wilson, 2018). The cases in this category are start-ups that disrupt this institutional arrangement, where the food surplus is donated for free, through *undermining assumptions and beliefs*. Instead of donations, they have identified a business opportunity in selling surplus food for profit. While in traditional food banks the surplus has been directed at those in need or suffering from food insecurity, the start-ups target paying, even affluent, customers.

Some of the cases studied are based on digital platforms that bring together different actors (Ciulli et al., 2019; Harvey et al., 2019; Mattila et al., in press), including ResQ Club and Olio. Food is a perishable material with a low transaction value. Therefore, digital platforms offer new opportunities for sharing food surplus because they enable quick and effortless local transactions. These cases use *mimicry* to imitate basic institutional arrangements of the platform economy and create new institutions for food waste reduction.

So, we [the founders of Olio] began actively looking for an environmental challenge that we could tackle [...] **looking for opportunities where we could disrupt those industries with new technology.** [...] There are a lot of rules and norms that have changed over the years. People used to litter, throw trash on the ground. People never would have, you know, let [...] strangers stay on their bed in an Airbnb. [...]

There are lots of things that people have changed. But **we believe that wasting food will become as taboo as littering the ground** in the next five years. (Olio, founder interview)

These start-ups also maintain the newly established institutional arrangements of the platform economy through *embedding* and *routinising* them as part of the daily lives of consumers, including peer exchange between strangers, the ability to use geolocation data to connect users with services they need and building on already established practices using mobile applications.

All the cases in this category also redefine the actors' roles and *construct new identities* for them (see Koskela-Huotari et al., 2016). Regarding redefining the roles of existing actors, Instock is not only a restaurant; by publishing cookbooks and campaigning in schools, it also *educates* and instructs consumers on how to reduce food waste in their homes. Fiksuruoka.fi *educates* its customers about the differences between use-by and best-before labelling, for example, on their social media channels and webstore. Furthermore, Olio redefines the roles of consumers (volunteers) in terms of acting as “food waste heroes”, trained in food hygiene and safety, that operate as intermediaries between businesses with surplus food and other consumers using Olio.

The only way we generate revenue is from businesses. They pay us to organise and train volunteers to collect the unsold food at the end of the day [...] **The volunteers are called ‘food waste heroes’** and we know that they're trained on health and safety, so they could safely collect the food. They take it back to their houses, put it in the fridge, add it to the app, and then their neighbors come to their house and collect it. [For businesses] it makes their staff feel better, they are doing a good thing by giving food to their local community. (Olio, founder interview)

This institutional work done by the consumers can be considered as a new actor category (Dolbec & Fischer, 2015) in the food system. It further emphasises the role of symbols and meaning-making in institutional work by calling the new actors “heroes”, associating them with salvation and rescue. Olio creates a new and convenient channel for distributing surplus food; restaurants and other businesses do not need to use their resources to deal with surplus

food or food waste, and instead, volunteers' resources, such as fridges, are utilised to distribute it.

Another example of institutional work related to *constructing new identities* is how Fiksuruoka.fi crafts a position for itself as a new type of retailer between manufacturers, importers, wholesalers and customers (see also Michel et al., 2019).

It certainly is our suppliers' waste which is the problem that we are solving. So we help manufacturers and importers and wholesalers to reduce food waste. [...] The main reason for their food waste is when the best-before date is soon, and then the big retailers don't want to buy them, so **they don't have a channel for selling them.** (Fiksuruoka.fi, CEO interview)

Thus, the start-up offers an alternative solution to the problem caused by the established, powerful position of the retailers, who can sometimes dictate their purchasing conditions without concern for other actors (Devin & Richards, 2018; Filimonau & Gherbin, 2017).

An additional form of institutional work related to the cases in this category is *disassociating a practice from its moral foundations*, with regard to using food services and distributing surplus food. For example, instead of selecting his/her restaurant meal from an extensive menu, a ResQ Club consumer will choose based on what meals are currently available as surplus at their local restaurants. Similarly, practices related to the pricing of restaurant meals are disassociated (meals are always discounted), as well as those related to restaurant eating (meals are available only as takeaways). Olio's focus has been on *changing the normative associations* of eating leftovers. Food sharing is commonly perceived as something taking place between family and friends, rather than strangers (Belk, 2009). Olio disrupts these cultural norms related to the shareability of food (see also Harvey et al., 2019). The founder of Olio describes the challenge of getting people to share food as follows:

It seems that there are a lot of people out there who are happy to pick up food from their neighbours and business donations. The hardest part is getting an average person to think about their own food waste.

Everyone first thinks that they don't have any food waste, which is ridiculous. [...] **The hard part is changing people's perception of what they have to getting them to share it.** Of course, if you've got food that you wait to get moldy, that's food waste, right? That's not for sharing. Being able to make the mental calculation to say: "Salad and tomatoes need to be eaten by tomorrow. Oh, but wait, I just booked a dinner for tomorrow. Yeah, I'm not actually going to be around to eat. It's still good for some hours. Let's just put them on the app; someone will be around in an hour and take them into a good home. I don't need to worry about them." [...] It's **hard to demand consumer mindset shifts that will need to take place** for Olio to reach their ambition. (Olio, founder interview)

Hence, Olio has identified that it is not only the cultural norms related to sharing food that need to be disrupted but also people's conceptions of what food and food waste are. Even though food waste heroes determine the edibility of food shared through Olio, the initial donor must still make the decision to share the food early enough for it to remain edible. The boundary between food and waste is therefore always negotiable and susceptible to modification (Evans, 2012; Mattila et al., 2018). Furthermore, Olio needs to conduct this institutional work to reach a critical mass of users for its application.

In the case of Instock, the norms that are being disrupted are related to fine dining in a restaurant. For example, its menu changes on a daily basis as it is based on the ingredients available for collection. Furthermore, food waste is seen as an important part of a sustainable, trendy lifestyle, where consumers are looking for new, fun experiences that are simultaneously sustainable.

Most people who visit our restaurant come because they're **intrigued by the concept**. Very often, they expect simple food. However, after they've enjoyed a three course meal that didn't only taste delicious but also looked amazing, most people are quite shocked to realise that the food they just ate normally would have been thrown out. [...] We believe that the only way to make current beliefs about the importance of addressing the food wastage problem more mainstream is by **reaching as many people as you can in a fun, delicious and accessible way**. (Instock, Impact Hub website)

As this quote shows, Instock also engages in *valorising* the positive aspects of its business, hence maintaining the existing institution of fine dining. Norms are disrupted not

only from the perspective of food consumption but also from the perspective of food distribution. ResQ Club, for example, presents food waste as an opportunity for restaurants to earn extra income. As the ResQ Club representative said in the interview, “for the restaurants, there’s no better tool available to earn extra revenue from your food waste, create additional business and get new customers, while operating in a really environmentally friendly way.” Similarly, Fiksuruoka.fi *disassociates* the rule about what is saleable in grocery retailing *from its moral foundations*, through *mimicking* discount grocers. For example, when selling nuts in faulty packaging, it explicitly informed its customers about why these packages were sold at a discount and not available in other stores through its webstore and social media channels. As a result of telling the story, the nut brand owner gained positive publicity for its corporate sustainability efforts, and the consumers learned more about the often-invisible aspects of the food retailing business; hence, it is an example of *educating* as well.

4.3. Edibility of food

The third identified category, edibility of food, concentrates on extending the life of food products through technological innovations. Earlier food waste studies identified smart fridges and packaging innovations in reducing consumer food waste in particular (Hebrok & Boks, 2017). Therefore, rather than relying on static information provided by official authorities regarding the edibility of food, the cases in this category innovate alternative ways to indicate and extend edibility. In this way, they *undermine assumptions and beliefs* related to edibility. Green Code uses technology to extend the natural life of produce through biohacking with its product, Demetra.

‘We have **learned from nature how to act regarding the hormonal physiology of climacteric fruit** (apples, pears ...), using the same tools available to the plants’, Guzzonato continues. ‘This means **intercepting and exploiting biological mechanisms that exist in nature and replicating them on a large scale, without intervening chemically or with GMO products.**’ (Green Code, Impresa Mia

website, 10th May 2017)

Utilising biotechnological solutions, Green Code thus engages in institutional work by creating new standards for the shelf life of fruits and vegetables.

The other cases relate more to packaged food items, and they conduct institutional work by *disassociating* a practice—date labelling—from its moral foundations. The system of date labelling was formed to ensure the safety of different (produced and packed) food products, but it is now one of the main causes of food waste at the retailer and consumer levels (see, e.g., Milne, 2012; Verghese, Lewis, Lockrey, & Williams, 2015; Watson & Meah, 2012; Yngfalk, 2016). Ovie enables consumers to utilise the Ovie buttons in their food packages at home rather than trust the labels provided by the industry. The system is partly based on creating a new institution through *mimicry*, utilising the traffic light system familiar to all consumers from other contexts.

Each tag features a light ring to give instant at-a-glance visual cues showing the freshness of every tagged item in the fridge. For instance, the light starts off **green** meaning it's safe to eat, then turns **yellow** to show it should be eaten soon and then ultimately to **red** when it's time to throw it out. "We designed our smart tags to not only track food for notification purposes, but also to provide visual indicators **to anyone in the household**," said Dave Joseph, co-founder and head of product design. [...] Ovie is also designed to **integrate with Alexa and other smart home hubs**, as well as recipe and grocery apps. It will keep track of everything tagged and will send reminders to a smartphone when food is about to go bad. It will also provide tips on how to eat it, recipe ideas using other tagged items in the fridge and even connect with grocery apps to allow users to order missing ingredients to complete a recipe. (Ovie, Gourmet Insider website, 22nd May 2018)

As the quotation above highlights, the institutional work conducted by Ovie is also related to *educating* consumers in an easy manner and facilitating their food waste reduction practices. Mimica, meanwhile, uses gelatine buttons in pre-packaged food items to more accurately signal the actual edibility of food. This form of institutional work takes into account the consumer practices of storing food, for example, at different temperatures, thereby

supporting consumer agency in determining the edibility of food. Consumers become more active participants in the household rather than being excluded from the process.

Consumers agree that often they're throwing products away when they don't know if they're still good or not. They're throwing more out just because **the date tells them to do so**. They think it [products with Mimica Touch] would reduce their waste at home. [...] This drives them to purchase those products that have our indicator [...] For instance, for mueslis and milk, we've got a product that goes into the can of, say, a milk carton, so when the consumer opens it, in fact, it's not when they open it, it's after they've opened it and then reclosed it, that's when our product starts working. So, **the consumer can tell whether a product is still fresh or not**. (Mimica, CEO interview)

This work conducted by consumers in their homes is not without effort or cost as it involves different types of practices in a race against the decay of foodstuffs (Mattila et al., 2018). Having Ovie or Mimica Touch in the home may greatly facilitate practices related to leftovers, helping to *embed* and *routinise* them. In addition, the food manufacturing brands that cooperate with Mimica are seen to benefit from improved brand image as their packaging becomes more appealing to consumers. Hence, this type of institutional work maintains the current practices of branding through "intelligent" product packaging. Instead of being considered a cause of food waste (Williams, Wikström, Otterbring, Löfgren, & Gustafsson, 2012), food packaging plays an important role in solving the problem.

Mimica also enables stores to extend the printed expiry dates. One version of its product calculates a new, alternative date based on the condition where the food item has been stored before it is opened. This allows retailers to keep products that are nearing their use-by dates in stock longer:

So that means that if they extend that date, there's much less waste in stores, because they don't have to throw it away at the end of the day, or they don't have to reduce the price. [...] We've got test results on hundreds of millions of packages of food that tell us that if you can extend the dates, you will cut waste in stores by around 50 percent, and you can drive sales up by about 10 percent. [...] There's nothing, as far as we know, around or in development, that tells the user whether food is still good to eat

or not. So it [other products] will say it's been in the wrong temperature, but it doesn't say whether it's good to eat. (Mimica, founder interview)

4.4. *Living with food*

The fourth identified category—living with food—connects food waste with everyday practices in homes and organisations. Previous studies have identified that food waste often emerges from these mundane practices and routines rather than as a result of conscious decisions or behaviour of individuals (Evans, 2012; Mylan et al., 2016; Southerton & Yates, 2015). The cases in this category help consumers and employees more consciously observe and reflect on their routine practices to shift them towards increased sustainability (Hargreaves, 2011).

A common factor in this category's cases is that they use data and data management to facilitate the reduction of food waste. Hence, they *undermine assumptions* about food waste as inevitable and invisible in the everyday lives of consumers and organisations. CogZum utilises smartphones to offer consumer households a stock management system *mimicking* those used by retailers.

Becoming a home food manager is something that people are initially scared of [...] because they kind of imagine that their home is now like a warehouse and we're warehouse managers, and that sounds scary (laughing). And finally, [...] they understand that with this information in their hands, when they're in the supermarket, they're going to make much better decisions. **But they also want to see the net effect of all those things.** That's why we actually created our reports. In the beginning, we just created the report for the things that they wasted, but very quickly we were asked to add additional reports about the food that is used up, because they want to know, you know, 'alright, how much food we're buying, what percent of it we're throwing away?' [...] And now they're asking us to show them how much money they're saving. (CogZum, founder interview)

CogZum facilitates consumers' daily food practices and food waste prevention by providing them with a tool to manage their domestic food warehouse as well as plan their

shopping. The application also provides customers with reports that encourage them to pay further attention to food waste prevention, thus making the previously invisible items hidden in cupboards, fridges and freezers visible to a device—their mobile phone—throughout the day. At the time of the interview, CogZum was developing a report that shows monetary savings as well.

“WasteMaster” aims to reduce food waste in food services by utilising the techniques and tools of data-based and lean management. It provides information about the bottlenecks in daily operations that create food waste, thus enabling new practices for food waste reduction to be implemented and taught throughout the organisation. This conducts the institutional maintenance work of *embedding* and *routinising* food waste prevention as part of the organisation’s daily functioning.

Another form of institutional work performed by the cases in this category relates to *constructing new identities* for actors. With the help of “WasteMaster”, the customer’s kitchen staff become innovators and information providers when dealing with food waste. In their daily work, they engage in monitoring where and how food waste occurs, reporting this at staff meetings and together, innovating solutions to address these bottlenecks in workshops organised by the “WasteMaster” service provider. The aim of CogZum, meanwhile, is to *educate* consumers about date labelling, proper food storage and food-related routines.

We realised that nowadays **people just don’t have any idea how long a particular type of food is okay for**, [...] they decide based on looks and on the printed dates. [...] We started building our own database. [...] We suggest the most appropriate place for a particular product to be stored and what the realistic shelf life is if it’s put there. [...] We are **helping them to build their knowledge about how to store things that they have**. [...] When they start using our app, we want to explain to them **how the app fits into their current routines**. Because technology by itself cannot drastically change routines [...] people that we look at [...] are in their 30s, 40s, and they have already established routines, they have some ideas about what works and what doesn’t work, you know. We want to give them information on our view, and [...] **our view is supported by a lot of research**, a lot of feedback. (CogZum, founder interview)

As the above quotation shows, the company has understood the routine nature of people's everyday lives and how food waste depends on both material infrastructures and shared social and cultural conventions and norms, which cannot be changed easily (Mylan et al., 2016). Furthermore, by employing a professional chef and utilising research, it engages in *theorising* to support the new practices it is suggesting.

Another type of institutional work that the cases in this category are conducting is *undermining assumptions* about practices related to retailing and waste management businesses. First, the start-up, MyFoody, challenges the practices related to product shelf placement by helping grocery store staff collect together potential food waste items, such as soon-to-expire foods, in special areas of the store. This practice of continuously monitoring is part of the store floor operations and provides a good way of reducing food waste (Moser, 2019). It also disrupts consumers' rationales and practices of habitually buying products as they are guided to take into account potential food waste as a purchasing criterion.

Inside the sales point, there is often **an anti-waste area**, such as a co-branded shelf portion, where these types of products are arranged and the **store's commitment to reducing waste is communicated**. The user has the opportunity to express his/her preference on the points of sale that interest him/her by putting a little heart inside the app, so as he/she is notified as soon as the preferred points of sale load the offers on these types of products. [...] The social part is enhanced by the possibility, on the site, of making donations to some non-profit associations. (De Gustare website, date n.a.)

Originating from a digital start-up project of a traditional waste management company, "WasteMaster" also *undermines assumptions* about traditional waste management businesses, by changing from a "take-make-dispose" economy of production and consumption towards a CE (recycling) and a zero waste philosophy (waste reduction).

5. Discussion

Institutional work conducted by food waste start-ups plays an important role in the transition towards a CE. In this article, we demonstrate the nature and types of this work within four categories (appearance of food, edibility of food, quantity of food and living with food). This work is able to boost CE resource loops by inventing various new ways to reduce existing food waste as well as reuse and recycle surplus food, to create new value for businesses (Bocken et al., 2016) However, the start-ups are not only creating and exploiting business opportunities but also changing the food system. Through adopting the institutional perspective, this study goes beyond examining resource flows to account for the interplay of the actors and structures surrounding them that eventually enable the transition to a CE.

Our findings extend recent research on food waste start-ups that mediate between the food supply chain actors, redistributing food with the help of digital platforms and mobile applications (Ciulli et al., 2019; Harvey et al., 2019). While these studies focused on how the start-ups that utilise digitalisation influence the food supply chain, our findings elaborate on the impact of these actions on the institutional environment more holistically. They also extend the circular business model literature (Pieroni et al., 2019) by focusing on the societal, institutional environment wherein businesses, especially “born sustainable” start-ups, operate, rather than on the organisational elements of the business model as such. Hence, our findings go beyond analysing CE business models to consider the role of the new start-ups in social and institutional change.

The institutional work detailed in our findings particularly relates to the normative and cultural-cognitive pillars of institutions (Scott, 2008). While the CE literature has focused more on the regulative pillar (Ranta et al., 2018), the other two pillars are also important in the transition, and start-ups may have an influential role in them. Studies on institutional work often concentrate on how institutions are created and disrupted to enact institutional change

(Zvolska et al., 2019), but we support the view that maintenance work is also important, especially in supporting the newly emerging institutions (Vargo et al., 2015). Our findings also show that, in many cases, the different forms of institutional work are occurring simultaneously; for example, *educating* and *valorising* can be utilised together to tell customers and the public about the positive aspects of the start-up's business model and mission. In the following, we further elaborate on and develop aspects of our findings.

5.1. Empowering other actors through institutional work

Our findings show that the institutional work conducted by the start-ups results in empowering other actors in the food system to reduce food waste. Our findings thus highlight the connections between the actors engaged in institutional work and their interplay (Beunen & Patterson, 2019, p. 24). Empowerment happens, for example, through the redefinition of actors' roles (Koskela-Huotari et al., 2016). Actors that are usually considered peripheral for CE transition, such as kitchen staff, retail store employees and consumers, gain agency through solutions provided by the start-ups. Our findings thus provide empirical support for the suggestion that engaging citizens in CE through their everyday practices (e.g., Hebrok & Heidenstrøm, 2019; Hobson, 2016; Mylan et al., 2016) is an effective way to bring about institutional change. A recent study suggested that consumers may be willing to participate in closing CE loops if sufficiently incentivised (Borrello, Caracciolo, Lombardi, Pascucci, & Cembalo, 2017). Through MyFoody, for instance, retail store employees who are concerned about food waste (Gruber et al., 2016) gain a concrete tool to manage it. Furthermore, through using Ovie, Mimica Touch and CozZo, consumers participate in the practice of date labelling, previously reserved exclusively for the food packaging industry. Many of the solutions operate through mobile applications, which are found to give consumers agency and the capacity to act ethically in their personal or professional lives (Fuentes & Sörum, 2019), not only as users but also as doers of sustainable practices (Mylan et al., 2016). At the heart of these practices is the

reframing of food waste as a resource: instead of being seen as a cost, it becomes an economic resource for generating revenue and a symbolic resource for creating social and environmental value.

5.2. Enacting new meanings through branding

Meaning-making is an important dimension of institutional work (Lawrence & Suddaby, 2006), and communications are the “aspect through which beliefs and ideas are created, shared and sustained” (Beunen & Patterson, 2019, p. 24). This aspect is demonstrated strongly in our findings. The messages that the start-ups craft for their businesses, for example, in their marketing communications and branding, focus on new, more sustainable practices with a positive tone, including emphasising the creativity, aesthetics and ethics of food waste (Närvänen et al., 2018). This contrasts with the meaning-making efforts of public bodies and organisations that have traditionally informed consumers about the need to reduce food waste. Many of these have relied on evoking guilt to raise awareness about unsustainable practices (Aschemann-Witzel et al., 2017; Sutinen, 2019). Making food waste visible instead of hiding it is another dimension of meaning-making. For example, MyFoody brings the potential food waste items to the front stage, distinguishing them from regular items and making them more tangible and attractive to customers. The material dimensions of the store have a significant impact on food waste (Alhonnoro, Leipämaa-Leskinen, & Syrjälä, 2019), and hence, affecting the store layout and dimensions is part of the meaning-making institutional work. Our findings thus support the claim that a brand can be an important symbolic and cultural resource for institutional work (Michel et al., 2019), also in the context of sustainability and a CE. Furthermore, although we did not discuss the institutional work of mythologising directly in the results section, it is involved in all the categories identified. This is seen in the stories that founders tell about their personal awakenings to the ethical problem of food waste, which led

them to their business ideas. These myths thus legitimise the profit-making of the start-ups as they portray the founders as heroes.

5.3. Engaging in collective effort

Although many of the cases in our research are small and struggling to become profitable, their collective effort in conducting institutional work can be considered significant. An individual technology or company cannot make an impactful change alone. In sustainability transformations, institutional work is carried out by multiple actors, and it is the “sum of actions that matters” (Beunen & Patterson, 2019, p. 24). Hence, instead of viewing each other as competitors, the start-up entrepreneurs see value in the ways in which they together help change the cultural-cognitive and normative pillars of institutions related to food waste. These efforts boost demand for the sustainable, commercial solutions that they offer. Before the start-ups can make a profit, there needs to be sufficient momentum, created largely through media visibility and current political agendas, to address sustainability and a CE. For example, the CozZo app by CogZum was launched in the UK first, despite being based in Bulgaria, as stronger momentum was found there.

5.4. Tensions in CE transition

Our findings indicate that there are several tensions involved when the start-ups conduct institutional work to transition towards a CE. Key among these is the tension between profit-making and sustainability. The current institutional environment reinforces the existence of food waste in the food supply chain. Those businesses that reuse food waste rely on its existence, often generating more income the more waste is produced. Hence, they maintain some of the crucial institutions in the food system that cause food surpluses. For these start-ups to succeed, they need a continuous supply of surplus food. Even though the start-ups are in line with CE thinking as they slow material and energy loops, they are more focused on recovering waste to be used as resources, which is one of the key criticisms of CE models

(Gregson et al., 2015; Ranta et al., 2018). Therefore, this type of institutional work is more complementary in nature and “aligns and provides support to existing structures without challenging or changing them” (Gollnhofer & Kuruoglu, 2018, p. 306). The ideal state of “zero waste” is, however, perceived as unrealistic by many of the interviewed company representatives, and as such, they believe that their business models will continue to be profitable and sustainable.

Another tension in solving the food waste problem identified in our findings exists between technology and human effort. The cases in the edibility of food category particularly valorise and maintain the “techtopian” discourse (Kozinets, 2007) of how technology improves people’s quality of life. Technology is seen as a solution that will help humankind solve the problem of food waste. The opportunities provided by the Internet of things, radio-frequency identification, artificial intelligence and other advanced technologies are highlighted, but it is not yet clear how they will ultimately help in the CE transition (Pagoropoulos, Pigosso, & McAloone, 2017). However, technology alone does not change people’s everyday practices; a lot more needs to happen for people to alter their daily routines, even though technology may facilitate this process. Furthermore, reducing food waste is a continuous effort (Mattila et al., 2018). The fact that food cannot be digitised and is perishable problematises the issue further.

6. Contributions, limitations and future research

6.1. Theoretical contributions

The study offers three key theoretical contributions. First, our findings contribute to food waste studies, which have only recently shifted from producing knowledge on the phenomenon and its causes towards research-based solutions to addressing the problem. Instead of developing the understanding of retailers or consumers, our perspective offers a holistic view of possible solutions, especially from the perspective of new businesses and start-ups. Our findings identify four broad categories in which institutional work can be conducted

to reduce and prevent food waste. Furthermore, we highlight the value of new companies alongside established actors in addressing the problem, not only through providing novel technological innovations and raising awareness but also through redefining actors' roles and responsibilities as well as incentivising them to reduce food waste as part of their business or personal goals. Hence, future food waste studies would benefit from the institutional approach and could examine, for example, the efforts of non-profits, consumer-citizens, activists or politicians in participating in institutional work alongside the for-profits.

Second, our study extends the use of the institutional perspective in CE research. While the literature on a CE has investigated the transition mainly from technical and business model perspectives, the institutional approach provides an as yet underutilised but more holistic way of understanding this transition. We follow Ranta et al. (2018) in highlighting in particular the roles of cultural-cognitive and normative pillars of institutions in driving the transition, as regulative efforts alone will not be enough to achieve the changes in beliefs, meanings and everyday practices required in the shift (Mylan et al., 2016). Furthermore, by building on the concept of institutional work rather than institutional theory more broadly, as others have done (Ranta et al., 2018), our findings allow for new insights regarding the CE actors and their roles in institutional change. The communication and discursive dynamics involved in this have been highlighted as important aspects of institutional work yet have not been studied much (Beunen & Patterson, 2019). Our findings show many examples of changing normative associations, educating, theorising and valorising as institutional work conducted through communication (e.g., marketing communication and workshops), where novel ideas and beliefs are communicated to stakeholders.

Third, based on our findings, we argue that one potential way to advance a CE in a more radical manner is through institutional work—the conscious effort of key actors to instigate changes in the institutional environment in which they operate. From this perspective, a variety

of institutional arrangements (Vargo et al., 2015) need to be disrupted and new institutions created to facilitate this shift. Our findings show these efforts in the context of “born sustainable” food waste start-ups. We argue that these start-ups may actually have a bigger impact than first expected as they are continuously disrupting established assumptions and norms and creating new, better institutions to mediate between the food supply chain actors, as well as engaging consumers and employees alike to do their parts in solving the food waste issue.

6.2. Managerial contributions

Several managerial implications can be drawn from our study. First, our findings help “born sustainable” start-ups identify further opportunities to advance CE transition (see also Michel et al., 2019). The four identified categories where institutional work can be conducted offer opportunities to link the business model to an important area of food waste reduction. Furthermore, this may help entrepreneurs identify areas to which they need to pay attention in the institutional environment, for example, gaining more in-depth knowledge of the everyday routines of consumers or access to important decision-makers in a grocery retail chain. For established companies in the food industry, the findings offer insights for identifying opportunities to develop, reframe and refocus their future businesses.

6.3. Limitations and future research

The current study has limitations as it focuses mainly on European for-profit food waste start-ups. Extending the research to different CEs and start-ups around the world would expand the view on how start-ups conduct institutional work in the transition to a CE. Furthermore, because a CE is about resources and material flows, a further theoretical opportunity would be to focus on the material aspects of the institutional work required (e.g., Katila, Laine, & Parkkari, 2017); for example, how do different technologies and appliances, as well as the biological nature of food (its perishability), affect institutional work to reduce food waste?

Finally, our study focuses on changing and evolving factors. Future research should be conducted on the efforts of actors to resist change. Whether the efforts of actors are successful in changing the institutional arrangements in the long term would also be a fertile area for longitudinal research.

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