

Human Resource Management and Circular Economy: A Critical Perspective

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Abstract

While there is an increase in the number of organisations disclosing their commitment or intentions to embrace the circular economy for sustainable futures, the role of individuals found within these organisations and their management remains inconspicuous. Current disclosures on Human Resource (HR) and the role of Human Resource Management (HRM) at firm level Circular Economic (CE) transitions and practices are conceptual and few, which limits both academics and practitioners' understanding regarding the practical implications of CE on organisations HR and how these could be managed. This research, therefore, addresses this gap and intends to provide critical, empirical evidence and interpretations of HR and the role of HRM within organisations CE pursuits – using six organisations (case studies). The case studies included in this paper forms about ten per cent of the cases - to be analysed for the second part of the study. These six case studies are selected to facilitate a pilot study, to test the research approach/methods adopted to derive the research findings. Previous research findings on firm-level CE functional areas has predominantly focused on product and process design, supply chain, marketing and sales management; however, analysis of these case studies found that currently, HRM role as a functional area that includes training, recruitment/selection, performance and rewards management process are not captured in firm-level CE transitions. Nonetheless, in terms of a critical perspective of HR and the role of HRM within CE organisations, the analysis of these case studies captured the broader social outcomes such as job creation, improvement in wellbeing and a change in organisational culture. But it remains to be seen if similar trends would be identified within a wider sample of business cases the researchers intend to examine to extend this research.

Keywords: Human Resource (HR), Human Resource Management (HRM), Role of HRM, Sustainability, Circular Economy (CE)

Introduction

The objective of this paper is to understand the context of Human Resource (HR) and the role of Human Resource Management (HRM) in realising organisations' Circular Economic (CE)

objectives. HR refers to individuals working in and for organisations (Buller & McEvoy, 2012; Armstrong & Taylor, 2017). While, HRM although lacking in a single widely accepted definition and agreed set of practices (Legge, 1989; Keenoy, 1990; Armstrong & Taylor, 2017), it could be understood as the endeavour to integrate or align the management of an organisation's people or human capital with the strategy of the firm, as defined by senior management (Guest, 1990; Legge, 2005; Kerfoot & Knights, 2017). The last but not least important term to this research CE could be seen as a closed-looped model adopted by organisations, whereby post-consumption products, materials and resources forms valuable raw materials for another production and consumption cycle (Webster, 2015; Stahel, 2016; Kirchherr, Reike, & Hekkert, 2017). CE is seen as an offshoot of Sustainable Development (SD) initiatives open to organisations, to respond to current global natural resource shortages, climate change and social inequality (European Commission [EC], 2015; Geissdoerfer, Savaget, Bocken, & Hultink, 2017). According to McKinsey (2017), it is estimated that by adopting of CE models at the macroeconomic level (which also has microeconomic implications), resource productivity within European-Based economies could improve by 3%, in addition to generating a cost saving of 600 billion Euros a year, and 1.8 trillion Euros in other benefits to the European economy by 2030.

In the European Union (EU) action plan for the CE (EC, 2015) beyond the considerations of CE as an operationalisation of SD initiatives within organisations, CE is also seen as a chance to transform the European economy and engender new and sustainable competitive advantages for Europe – through the protection of businesses from volatile prices and scarcity of resources, aiding the creation of new business opportunities and innovative, and additional efficiency in the approach to production and consumption (EC, 2015). That said, the action plan (now dated as it was due to be carried out before 2020, but its principles will linger on) falls short in setting the tune on HR and the role of HRM within organisations when making CE transitions. This assertion is based on the assumption that there are explicit duties for other organisational functions within the action plan – such as product and process design, marketing and sales, procurement, and SCM (EC, 2015). While HR and the role of HRM could be said to be implicit and open to wide varieties of interpretations within the action plan, for example, it is mentioned in passing when discussing the changes to the production process as a result of CE. It is said that there would be social impacts both in EU and non-EU countries; however, what the social impacts will entail or include were not stated. In the section within the action plan that focuses on consumption with significant concerns for marketing and sales functions within organisations, an HR implication of CE is also briefly highlighted, i.e. the possible contributions of CE to contribute to job creation especially in labour-intensive reuse and repair sectors. Again, when discussing needed changes to the approach to procurement by public authorities to foster the actualisation of CE pursuits within these organisations, HR and HRM function of training is only stated as a footnote among other things (EC, 2015).

One the other hand, it is important to note that towards the concluding section of the EU action plan for the CE (EC, 2015, p. 19), it is explicitly stated that the transitions to a CE will “*require a qualified workforce with specific skills, and opportunities for employment and social dialogue*”. Furthermore, it is suggested that to develop the appropriate skills at all levels, this will require support by education and training systems. Admittedly, the EU document is but an action plan, which does not portray the actual activities relating to CE within organisations. That said, in more recent studies on CE within organisations, it is observed that there is a considerable absence of disclosures surrounding HR and the role of HRM (Geissdoerfer et al., 2017). This view is worth taking note of -giving the importance of HR and HRM in realising organisations' objective, which remains to be empirically understood within the context of

CE. Therefore, this paper aims to provide both a managerial “HRM” perspective (i.e. the people-centred practices adopted by managers to improve their organisation’s efficiency and achieve performance targets or profitability). The paper also focuses on a critical perspective (i.e. an analysis of happenings surrounding the management of people that are implicit and unintended or the broader social outcomes of management action or inaction) on HR and the role of HRM in organisations CE drives (Kerfoot & Knights, 2017).

By providing both managerial and critical perspectives on HR and the role of HRM at firm level CE initiatives, the paper not only considers the immediate desires of managers (line managers and HR managers inclusive) to seek the success of their organisations through efficient and effective management of an organisations HR; but also the intended and unintended consequences of management practice that relates to the organisations’ people. As Kerfoot and Knights (2017, p. 160) noted, “*critical approaches therefore brings to the surface issues of management and aspects of organisational life that might otherwise go unacknowledged or be denied*”. This research endeavour is crucial as it is widely acknowledged that HR and HRM could be significant cost and burden to an organisation, but if appropriately managed could be invaluable to organisational sustainability (Huselid, 1995; Kanter, 2003; Paauwe, 2004; Saini & Budhwar, 2008; Buller & McEvoy, 2012). Therefore, this research intends to address the following research objective:

- To establish how HR and the HRM function are captured within CE business cases.

The above research question will be empirically addressed in this study through the examination of six case study organisations implementing CE. Subsequent sections of this paper will be structured as follow: a literature review on key themes found within this study, followed by a methodology section, research findings and discussion and conclusion.

Circular Economy (CE)

Following the review of 114 CE definitions, Kirchherr, Reike and Hekkert (2017, pp.224-225) defines CE as “*an economic system that is based on business models which replace the ‘end-of-life’ concept with reducing (the rethinking and/or redesign of production and/or process to minimise and/or prevent resource use and/or preservation of natural capital). Alternatively, it entails reusing (the exclusion of waste through closing the loop of the product and/or process lifecycle via repair and refurbishment of resources), recycling (remanufacturing and/or reuse of waste) and recovering materials in production/distribution and consumption processes (recovery of energy perhaps through incineration). Thus, it means “operating at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, which implies creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations”* (Kirchherr et al., 2017, p. 225).

This definition of CE is perhaps the most holistic, thorough and yet easy to comprehend, the authors of this paper found in the CE literature. Here is why: the definition does not only capture the conceptualisation of CE as an economic system, which is common amongst most of the other definitions of CE (e.g. Geng & Doberstein, 2008; Geissdoerfer et al., 2017; EMF, 2020). It also captures what is otherwise known as the 4R’s of CE (reduce, reuse, recycle and recover). Rather than CE being simply considered as an economic system the nitty-gritty of the 4R’s in CE is sometimes left out by other authors who define CE, or occasionally they include the first

3R's (e.g. Reh, 2013; Ghisellini, Cialani, & Ulgiati, 2016; Jabbour et al., 2019). It is also imperative to state that the 4R's of CE included in the definition of CE by Kirchherr et al. are based on their levels of importance, i.e. the ultimate goal of CE is reducing and the least objective recovery. Similar views are shared by EC (2008); Webster (2015); Potting, Hekkert, Worrell and Hanemaaijer (2017), noting that without the usage of a resource in the first instance there will be no need for recovery. Also, Kirchherr et al.'s definition of CE acknowledges that CE operates at three deferent levels; micro, meso, macro (this paper will be focusing on the micro/organisational level, although occasionally within the discussions in this study the role of HRM in CE at the meso and macro level will be highlighted).

HR and HRM

HR simply refers to all individuals working in and or for organisations. While HRM involves all aspects of controlling and directing individuals employed by organisations, its practices include but not limited to recruitment and selection, training and development, performance and pay, job evaluation and appraisal, health and safety, employee relations and collective negotiations among others (Kerfoot & Knights, 2017). HRM practices are common in most organisations, although, the theoretical accounts on the practice and the perceptions of HR within organisations could be described along the line of unitarist, pluralist, hard and soft approaches (Storey, 1989; Collings & Wood, 2009).

Unitarist account of HR and HRM assumes that all members of the organisation share the views of top management and that conflict should be seen as a disease instead of a reflection of the difference in individual views and interest. Pluralist focus is the exact opposite of unitarist notions of HR and HRM within organisations. It accepts differences and conflict of interest by the different stakeholders that interact with a business these might include, for example, employees, shareholders, governments, and suppliers (Kerfoot & Knights, 2017). Hard HRM is based on the premise that HR is similar to other inanimate assets at the organisation's disposal, and as such, it should be exploited to yield maximum returns. On the other hand, soft HRM, hinges on the proposition on the difference between HR and other resources found within organisations and that the success of organisations depends on their ability to harness the creative and productive capabilities of employees by treating them more humanely (Collings & Wood, 2009). It is argued that each of these approaches to HR and HRM all have their advantages and disadvantages as there is no one best way in handling HR and HRM issues found within an organisation (Collings & Wood, 2009). Therefore, organisations frequently adopt one of these methods, or a combination of methods to suit their context, their current organisational development phase and general requirements (Storey, 1989; Kerfoot & Knights, 2017).

HR and the role HRM within CE organisations

Perhaps already obvious from preceding paragraphs in this paper on HR and the role of HRM within CE organisation is that it is in its conceptual stages and remains rather unclear. For example, not only has it been mentioned that by making CE transitions, organisations will require qualified workers with specific skills, CE also has the potential to create new opportunities for employment and social dialogue (EC, 2015). According to Geissdoerfer et al. (2017), while EC views on CE are shared; there remains a limited consideration given to social wellbeing by most CE authors. They assert that there is no clear understanding as to the

extent to which CE might contribute to subjective wellbeing – an issue that is further explored within this paper. Worst still, Kichherr et al. (2017) posit a confirmation following an assessment of over a hundred scholarly writings on CE, that the current body of knowledge and understandings of CE mostly neglect the social aspects. In addressing the shortfall on this research phenomenon, Jabbour et al. (2019) employed a ‘green’ approach to consider HR and the role of HRM in CE organisations – by providing a conceptual framework demonstrating the possible intersection/interactions between HR and the role of HRM as well as theoretical frameworks in which studies on HR and the role of HRM at firm level CE practices could be hinged.

Within Jabbour et al.’s (2019) proposed conceptual framework, it is assumed that CE-enabling HRM could be associated with GHRM practices and dimensions, which include recruitment and selection, training, performance assessment and rewards, culture (a climate at work whereby concerns for the environment intensely influence employee workplace behaviour), empowerment and teamwork. According to Jabbour et al. (2019), the practices and dimensions of HR and HRM hypothesised to enable organisational CE practices might be facilitated by top management commitment, managerial leadership, and employee motivation. Furthermore, Jabbour et al. (2019) suggest that the foundations for considering HR and the role of HRM within CE organisations are grounded on two theories underpinning HR and the role of HRM within organisations. The first is Stakeholder Theory (ST), which holds that organisations are made up of different groups of stakeholders including managers, employees, shareholders, customers and the wider public, hence, organisations must consider their various interest in the formulation and implementation of policies. The second theory is the Resource-Based View (RBV), which asserts that an organisation achieves competitive advantage when its resource is valuable, rare and costly or difficult to imitate, with HRM having a significant role to play in ensuring that the organisation’s HR is in line with this criteria. In addition, Guest (1987) and Armstrong and Taylor (2017) collaborated that both ST and RBV are strong theoretical bases for HR and the role of HRM within organisations, hence the adoption of these theories for this current research. Most importantly, the need for subsequent empirical research to be conducted to address this current gap in knowledge has been echoed in the extant literature (EC, 2015; Geissdoerfer et al. 2017; Kichherr et al. 2017; Jabbour et al. 2019), for which this research is preoccupied with.

Methodology

The study adopts a case study research approach (Eisenhardt, 1989; Creswell, 2013; Yin, 2014) in providing a critical account of the role of HR and HRM within CE organisations. The choice of case study approach for this research is based on its tenets of enabling researchers to address the enquiries sought in the study (Creswell, 2013). The validity of this approach in exploring organisational CE practice was echoed in the case studies on CE used in this current study, which essentially adopted a case study research approach (see de Mattos & de Albuquerque, 2018). Also, Jabbour et al.’s (2019) study recommended that future research into firm-level CE operations should adopt a case study research approach, to help deepen scholarship/insight into firm operations. Case study research could involve single or multiple organisations or cases (Yin, 2014). In the selection of cases, sampling strategies are required. Bryman and Bell (2011) describes sampling strategy as a method used in the selection of samples from a given population. In the case of this research, it involves all

organisations adopting CE principles within their operations. Given that it is implausible to determine all organisations adopting CE principles in their operations, this study has employed a non-probability sampling strategy (Blaikie, 2010).

In specific, this study adopted convenience and purposive non-probability sampling techniques in selecting case studies (Creswell, 2013; Kumar, 2014). All of the six cases (see table 2 below) used in this study were derived from the Ellen MacArthur Foundation (EMF) case study database (EMF, 2017, 2019). The six cases represent about 10 per cent of the cases found in the database on the day, in which 63 cases were identified. Only six of the cases are used within this study as they formed the bases of a pilot study of the current research focusing on HR/HRM and CE, from which this paper is written. Following this paper, all 63 cases and perhaps more (as cases are continuously added to the database) will be examined for a broader account into HR/HRM in firm-level CE operations. While the researchers acknowledged that the analysis of the case studies influences the findings of this (pilot) study; this acknowledgement is not intended to diminish the novelty and contribution realised in this scholarship, which specifically explored HR/HRM in organisations CE practice. Thus, the acknowledgement asserts that the paper provides a snapshot of the current state on how HR and the HRM function are represented and portrayed within CE business cases.

According to Yin (2014), through mechanics of a pilot study, researchers can refine their data collection plans, the data gathering instruments and procedures, to enhance the overall outcome of the study. Besides, Thabane et al. (2010) encourage the publication of results from pilot studies, which can provide relevant information on the feasibility of research to the research community, thereby possibly saving resources and effort being spent by other researchers on studies that might not be feasible. This adds to the researchers' ethical and scientific duty to publish the results of all research endeavour (Thabane et al. 2010). Furthermore, it is also essential to note that the EMF – from where these cases studies are selected for this research – is considered a critical and thought-leading stakeholder in the development and propagation of organisational CE discourse globally (EMF, 2017, 2019). This viewpoint is not only shared by numerous CE scholars (Geissdoerfer et al., 2017; Jabbour et al., 2019; Kichherr et al., 2017). Importantly, based on extant literature's overview of CE and the credibility of the EMF data source, the researchers believe that this approach to deriving critical perspectives to organisational *modus operandi* to CE operations is novel to this research. Having discussed the research approach and the source of the research data for this research it is also crucial to describe the method of data analysis adopted for this research (see table 1, for a brief description of the stages adopted in analysing the data).

Table 1: Analytical process

Stage	Actions taken
1. Familiarisation with the data	Reading and re-reading the case studies documents and noting down initial ideas
2. Developing the initial coding framework	Development of initial coding framework (including coding rules), based upon researchers' practical knowledge on the topic and previous studies on HR, HRM, and CE, most of which have been captured in the literature review section of this paper.
3. Coding the data	Independent coding of textual data found within the case study documents systematically, to relevant codes case by case. Also, searching for additional possible coding dimensions within the cases during coding, and patterns across cases
4. Comparison of coding results	Discussion of coded data that at least one coder did not find straightforward to code based on initial coding rules and discussion of differing results; modification of coding rules based on this discussion; discussion on and alignment regarding additional coding dimensions for the coding framework (available on request)
5. Second-round of coding	Independent coding of case study data by both coders based on revised coding framework
6. Comparison of coding results	Discussion of differing results; finalisation of results (final results can include divergent results)
7. Producing the report	Selecting vivid and compelling extract examples, the final analysis of selected extracts from the case studies, relating the analysis to the research question and literature, and the production of a scholarly report of the analysis, i.e. this paper.

Note: The analytical process of the case study data for this research described in table 1 is informed by Eisenhardt (1989); Braun and Clarke (2006); Creswell, 2013; and Kichherr et al. (2017).

It is widely agreed by researchers that there is no codified or broadly accepted approach to the analysis of data generated from case studies (Eisenhardt, 1989; Creswell, 2013). However, the suggestions put forward and found in the case study methodological literature include, first, the within-case analysis and provision of an individual case report or narrative (Eisenhardt, 1989; Yin, 2014). The write-ups from the within-case analysis are primarily descriptive but are considered central to the generation of insights, as it allows for “*unique patterns to each case to emerge before investigators push to generalise patterns across cases*” (Eisenhardt, 1989, p. 540). This is followed by the cross-case analysis, the search for patterns across cases and search for similarities and differences between cases (Eisenhardt, 1989; Yin, 2014). This research is very much akin to building theory from the case study analysis (Eisenhardt, 1989), to fill the current research gap of a lack of critical and empirical studies on HR and the role of HRM within firm-level CE operation. However, being aware of the previous conceptualisations of CE, HR and the role of HRM in CE organisations and organisations in general, a deductive research approach (Bryman & Bell, 2011) is adopted in this research, to empirically test the theories postulated in literature by previous researchers on the subject as these theories are not yet empirically grounded.

A more nuanced expression of the approach to the analysis of the case study data adopted in this research is the description of qualitative analysis of case study data by Creswell (2013), which mirrors Braun and Clarke's (2006) thematic framework. Creswell (2013) states that the key phases of analysing qualitative data as operationalised in this research starts with familiarisation with data through reading and re-reading the data and noting down initial ideas.

Then coding the research data follows, which involves reducing the data into meaningful segments and assigning labels to the segments (codes), and subsequently, the combination of these codes into broader themes (categorical aggregation) (Braun and Clarke, 2006). Creswell (2013) goes on to state that after coding and categorical aggregation of the data from the cases, the themes and inherent codes are then exhibited to allow for comparisons – with the possibility of including the theoretical/conceptual framework from the literature review in the evaluations between the themes and inherent codes from the different cases (Braun and Clarke, 2006). These are all essential features of qualitative data analysis, which guide the analysis of the research data for this research (Creswell, 2013). In practical terms, the analytical process of this research involved familiarisation with data from all six organisational case studies from the EMF database on firm-level CE operations. Data on each of the case study organisations were coded individually by two members of the research team before each of these codes were combined with similar codes to form themes of the study, which according to Eisenhardt (1989), can enhance credibility in the overall research findings.

Findings and Discussion

Findings of this study begin with table 2, which contains the names of businesses whose CE business operations and description have been examined for this research.

Table 2: Names of Case Organisation and a brief description of their CE operations.

Case organisations	Brief description of case organisations CE operations
Winnow (Case A)	This case organisation provides a system by which commercial kitchens can reduce food waste and carbon emissions as the system collects information on food waste generated by commercial kitchens, helping them plan better and make better decisions on the amount of food prepared for customers.
Google (Case B)	This case provides an overview as to how the case organisation adopts CE in the management of its hardware found in its data centres. The CE practices discussed involves reduce, reuse and recycling of parts used in the operations of data centres, which has resulted in cost avoidance and energy efficiency.
Coca Cola Enterprises (Case C)	The case captures efforts to maximise the use and value of the plastics used in the production of bottles by the case organisation through recycling – improving the environmental impact of the case organisations operations.
Danone-Evian (Case D)	The case highlights the initiative embarked upon by the case study organisation to preserve the purity of the water supply for its bottled water production, while it supports other activities in the catchment (area of production). The CE operation centres on the recovery of energy from waste. Local waste is collected through a collection scheme and converted to valuable raw material via an anaerobic digestion plant which produces biogas and transforms hazardous raw manure to benign regenerating bio-solids.
The Plant (Case F)	This business case demonstrates the activities of a collaborative community of food production businesses to repurpose and capture more value from the by-products of their production activities for reuse in further production of food products and energy.
HP Instant Ink (Case G)	The case looks at how the case organisation uses technology (specifically, Internet of things) to increase cartridge recovery and recycling. The model or process involves the use of printers connected to the internet which informs the case organisation to send customers replacement cartridges when customer ink is close to running out. The replacement cartridges are sent with pre-paid envelopes for customers to use in returning used cartridges.

Note: The pseudonym in parentheses “()” are the names that the case organisations will be referred to in subsequent parts of this paper. The purpose of the table is to provide a background to the business cases, in order to pave way for the themes of findings, which are presented next.

CE Operations within Case Study Organisations

It can be gleaned (from table 2) that all six case study organisations are engaged in CE operations, although at different levels or in various forms. These widely capture the most crucial objective of CE, which is CE as an economic system that is based on business models, which replace the current ‘end-of-life’ concept by reducing both material and natural resources used in the production process (Ghisellini et al., 2016; Kirchherr et al., 2017). Within the data set evaluated for this research, considerable text extracts were relevant and included into the thematic theme ‘reduce’, which demonstrated that CE operations in five of the case study organisations except for one (Case D) are broadly captured. In Case A for example, the importance of reducing material and natural resource expended as a result of production was highlighted, to justify the need for organisations to embrace CE operations. Phrase such as *“each year an estimated USD 100 billion worth of food is thrown away by the hospitality industry, mainly due to overproduction (Case A) demonstrate this contention. Similarly, “there are huge benefits in developing tools that help address this and therefore reduce the many issues associated with food waste”*. Also, when mentioning the result of Case A’s product in aiding organisations reduce resource use: *“The result - restaurants that use this system have cut food waste by between 40 - 70%, leading to increases profit margins by 50% or more as well as reducing carbon emissions” (Case A).*

A similar trend of CE aimed at reducing resource use by organisations was also identified in Cases B, C, E and G. In (Case G), one of the statements that reflect that CE effort enables the organisation to reduce its resource use relates to redesign of production: *“Cartridge design and durability is improved to facilitate the business model; packaging use is reduced, eliminating up to 57% of waste”*. Beyond reduce, the other 3R’s (Kirchherr et al., 2017; Potting et al., 2017) of CE operations are represented and portrayed within the CE business data set analysed for this research, although when compared to ‘reduce’, their representation is minimal and in varied proportions. Following from ‘reduce’, ‘recycle’ is the next most common objective of CE operations within the Case organisations. There were illustrations for this in three business cases (Case B, Case C, Case F) evaluated for this research. Kirchherr et al. (2017), describes recycling as one of the fundamental CE operations adopted by CE organisations, and it entails the remanufacturing and reuse of waste. Within the business cases analysed, there are various text extracts which demonstrate the initiatives by several case organisations to ‘recycle’. These examples are captured in the following extracts below:

“In 2015, 19% of servers Google deployed were remanufactured machines” (Case B).

“To date, Continuum has already supplied CCE with enough high quality rPET to include 25% rPET in all its plastic bottles in Great Britain. The facility also recycled around 15 million bottles collected at the London 2012 Olympic and Paralympic Games, returning them to the shelves as new bottles within six weeks” (Case C).

“HP’s Instant Ink is an IoT enabled subscription model for individuals and small businesses that increases cartridge recovery and recycling” (Case F)

Short phrases such as *“19% of servers Google deployed were remanufactured machines” (Case B), “the facility also recycled around 15 million bottles collected at the London 2012...” (Case*

C) and “*increases cartridge recovery and recycling*” (Case F) in the above clusters denote that recycling forms a significant part of CE operations within three of the case study organisations explored. This provision tallies with Webster’s (2015), and EC’s (2015) contention on the significance of recycling within organisations CE operations.

The third most dominant CE operational objective from the case studies was ‘reuse’, which Kirchherr et al. (2017) define within the context of CE business operations as the exclusion of waste through closing the loop of the product and/or process lifecycle via repair and refurbishment of resources. The ‘reuse’ imperative of CE at firm level CE operations was identified in two of the six business cases reviewed for this study: Case B and Case F. From the analysis of the CE operations of Case B and Case F, ‘reuse’ was extensively captured in the following clusters:

“Refurbish/remanufacture: Once servers from data centers are decommissioned, they are sent back to the central hub. At the hub servers are dismantled and de-kitted to their usable components (CPU, motherboard, Flash devices, hard disks, memory modules and other components). After quality inspection, components are stored to be reused as refurbished inventory” (Case B).

“The model successfully demonstrates a component recovery and recycling programme in the consumer electronics sector, as it enables HP to put their cartridges through multiple uses” (Case F).

Text such as “*components are stored to be reused as refurbished inventory*” (Case B), and “*it enables HP to put their cartridges through multiple uses*” (Case F) all demonstrate that the reuse of production parts and materials is part of firms CE operations, which are consistent with the views held in extant literature (Kirchherr et al., 2017) particularly in view of the assumption that “*reuse by another customer of discarded product which is still in good condition and fulfils its original function*” (Potting et al., 2017, p.5).

Last but not least, ‘recover’ form part of the themes on CE operations within the case studies. Recovery of materials in the production/distribution and consumption processes (such as the recovery of energy through incineration) is also one of the practices which can be identified within firm-level CE operations (Kirchherr et al., 2017; Potting et al., 2017). Among the case studies, recovery was only detected in one. Illustrations on recovery can be found in Case D’s CE operations, excerpts that represent recovery are:

“Danone initiated a collection scheme and built an anaerobic digestion plant that produces biogas and converts hazardous raw manure to benign but regenerating bio-solids” (Case D).

“At the heart of the project is the construction of a methanisation unit that produces energy and digestate out of local agricultural effluents. The facility was launched in 2016, producing almost 1 million m³ of biogas each year, which is then refined to biomethane and injected into the local gas network” (Case D).

CE operations of recovery are captured in the above extracts. Short phrases and semantics such as “*built an anaerobic digestion*” and “*construction of a methanisation unit*” (Case D) are clear instances of how the organisation is embracing the ‘recover’ model of CE. These extracts highlight the process by which Case D’s CE operations involves a practice of collecting hazardous raw manure that can potentially contaminate its productions. Thus, through methanisation using anaerobic digestion plant, biogas and biosolids can be generated as energy and vital raw materials for subsequent production – a CE practice that is consistent with the views on recovery – portrayed in the extant literature (Kichherr et al., 2017; Potting et al., 2017). With all of the case study organisations confirmed to adopt CE in their operations in one form or another and varied dimensions (Reduce 5:1; Recycle 3:3; Reuse 2:4; Recover 1:5), this evidence supports the points made by previous CE authors (EC, 2008; Webster 2015; Potting et al., 2017; Kichherr et al., 2017) that the ultimate goal of CE is focused on ‘reduce’. Thus, this entails rethinking and/or redesign of production and/or process to minimise and/or prevent resource use and/or preservation of natural capital, rather than recovery, because, without the usage of a resource in the first instance, there will be no need for recovery. In summary, confirming that the case organisations incorporated in this research adopt CE within their operations forms only a part of the current research endeavour towards understanding HR and HRM in organisations CE pursuits.

HRM Function vs Other Functional Areas

From the review of the six case study organisations, it is evident that functional areas within CE organisations are given minimal consideration/discussion within CE business cases. However, it is also apparent that within the case studies that certain organisational functional areas get more considerations compared to others – even among organisations where these concerns are given minimal considerations. This contradicts views taken by previous CE authors (Batista, Gong, Pereira, Jia & Bittar 2019; Jabbour et al., 2019) – as demonstrated in the EMF businesses cases for current organisational functional areas. These organisational functional areas include SCM (Batista et al., 2019), procurement (EC, 2015), product or process redesign (EC, 2015), HRM (Alese, 2018; Jabbour et al., 2019) and marketing (EMF, 2015). The organisational functional areas from the business cases analysed for this study are covered in the following excerpts captured in table 3:

Table 3: Excerpts from business cases on organisational functional areas

Organisational functional areas	Case organisations	Excerpts
SCM	Case A	<i>“As in the building sector, new IT applications may make it possible to track inefficiencies across the (food) supply chain, enabling much better resource monitoring and management”</i>
	Case B	<i>“Google’s supply chain for servers (Product) consists of components that make a server including: CPU, Motherboard, Flash Devices, Hard Disks, Memory Modules and other components. Since Google manages the manufacturing and assembly operations of its custom built servers, Google is the Product Manufacturer in Google’s server supply chain.”</i>

		<i>“Multiple programs and processes within Google’s Data Center Operations and Supply Chain groups apply key circular economy strategies”</i>
	Case F	<p><i>“The more widespread use of this technology is now allowing performance models - where you pay for the performance of a product rather than owning it - to trickle down to small- and medium-sized enterprise (SME) customers and even individuals, where previously tracking and logistics were prohibitively costly or inconvenient.”</i></p> <p><i>“The model successfully demonstrates a component recovery and recycling programme in the consumer electronics sector, as it enables HP to put their cartridges through multiple uses.”</i></p> <p><i>“The connected printer notifies HP when the cartridge is about to run dry and signals to deliver a new one without the subscriber having to interact. Empty cartridges are collected and returned to HP as part of a ‘closed-loop’ recycling programme.”</i></p>
Procurement	X	X
Product and process design	Case A	<p><i>“Winnow has devised a simple way of collecting data on food waste in commercial kitchens, leading to better decision making in food preparation and increasing awareness in kitchen staff.”</i></p> <p><i>“In the first few weeks of the analysis period, clients are requested to collect data without modifying behaviour, to establish a baseline for future comparison.”</i></p> <p><i>“To add more meaning to this basic measurement, Winnow requests information on food sales during the same time period, so that waste can be normalised against sales, creating a more powerful metric that can be related to ROI and profits.”</i></p>
	Case B	<p><i>“These practices combined with Google’s circular approach to optimising end of life of servers based on Total Cost of Ownership (TCO) principles have resulted in hundreds of millions per year in cost avoidance.”</i></p> <p><i>“Google achieves high utilisation of resources by sharing machines through compute and storage shared services that serve all product areas (as opposed to each product area having its own dedicated machines).”</i></p> <p><i>“Much of our infrastructure is custom designed, from our own high voltage substations, to the on-site electrical distribution systems, to the proprietary cooling systems - all working in conjunction and optimised to provide the highest performance and lowest total cost of ownership computing infrastructure, saving Google over \$1 billion in our operations through energy efficiency alone.”</i></p>
	Case C	<p><i>“Coca Cola Enterprises is committed to maximising the usage and value of the plastics used in bottle production. To help achieve this ambition Coca Cola invested in Continuum Recycling; a plastics reprocessing facility for collecting and reprocessing plastics as a joint venture with ECO Plastics.”</i></p> <p><i>“Through interventions at each stage of the packaging chain (materials, design, disposal, recovery and recycling), CCE is committed to maximising the usage and value of the plastics used in bottle production.”</i></p>

	Case D	<p><i>“Danone initiated a collection scheme and built an anaerobic digestion plant that produces biogas and converts hazardous raw manure to benign but regenerating bio-solids.”</i></p> <p><i>“value is cascaded from organic matter and residual bio-solids are distributed to farmers closing the nutrient loop and regenerating pastureland in the region.”</i></p>
	Case E	<p><i>“The Plant community is currently working on a system which allows them to repurpose and capture more value from byproducts – e.g. spent grain from the brewery is used as growing medium for mushrooms”</i></p>
	Case F	<p><i>“Cartridge design and durability is improved to facilitate the business model; packaging use is reduced, eliminating up to 57% of waste”</i></p> <p><i>“Collecting printer use data helps inform system designs, including packaging and replenishment algorithms to minimise waste; and improve serviceability, durability, and customer satisfaction”</i></p>
HRM	X	X
Marketing and sales	Case A	<p><i>“According to David Jackson, Head of Marketing for Winnow, one of the most important benefits of collecting accurate data is that “it gives businesses the confidence to go out and make public statements about reducing food waste”.”</i></p> <p><i>“For example, the technology has given a huge company like IKEA, which serves 650 million meals each year, the quantitative basis to launch and monitor a campaign that aims to reduce food waste by 50% by the end of 2020.”</i></p>
	Case B	<p><i>“After utilising all internal avenues Google goes through a rigorous process to ensure no proprietary Google technology resides on the components before selling on the secondary market. Google works in close collaboration with selected remarketing partners to look at various market factors for resale... In 2015, Google resold nearly 2 million units into the secondary market for reuse by other organisations”</i></p>

Note: Text boxes where “X” has been inserted denotes that no text was found in the case studies, which can be coded for the particular theme of the functional area focusing on organisational engagement with CE.

Based on the extracts contained in the table, which represent codes and themes of organisational functional areas in CE operation, it appears that the dominant function captured within the six business cases is product/process design. Some of the short phrases that exemplify this contention include: *“has devised a simple way of collecting data on food waste in commercial kitchens”* (Case A), *“much of our infrastructure is custom designed”* (Case B), and *“collecting printer use data helps inform system designs”* (Case C). As can be gleaned from the case study analysis, the dominance of product/process design as an organisational functional area that contributes to firm-level CE operations confirms EC’s (2015) assertions on the importance of this particular function, for achieving organisational CE objectives. According to EC (2015), through improved designs, organisational products can be amenable to change as well as more durable, repairable and upgradable.

The next prominent theme analysed in the case studies is supply chain management (SCM),

which however is less noticeable when compared to product or process design. According to Batista et al. (2018), the pursuit of CE objectives by organisations has SCM implications, and as such, the SCM function within organisations has a role to play. The following short phrases including *“new IT applications may make it possible to track inefficiencies across the (food) supply chain, enabling....resource monitoring and management”* (Case A), *“within Google’s Data Center Operations and Supply Chain groups apply key circular economy strategies”* (Case B) and *“signals to deliver a new one without the subscriber having to interact”* (Case F) collaborate Batista et al.’s (2018) viewpoint on SCM in CE firms.

The least prevalent organisational functional area described in the case studies analysed for this study are marketing and sales. However, this functional area fared better when compared to others such as HRM and Procurement – see table 3, where excerpts representative of the various functional areas captured during the analysis are referred to. EC (2015) and other CE authors such as Webster (2015) view that CE operations within organisations inform how businesses go about marketing and sales of their product, which places the onus on the organisational functional areas of marketing and sales. This view is supported by the following text excerpts from the analysis: *“it gives businesses the confidence to go out and make public statements about reducing food waste”* (Case A) and *“collaboration with selected remarketing partners to look at various market factors for resale... In 2015, Google resold nearly 2 million units into the secondary market for reuse by other organisations”* (Case B). Webster (2015) further points out that the products sold by CE organisations are amenable to maintenance, their value increased by product-life extension, after which, their materials can be recovered as useful components and sub-assemblies, which consecutively - can be refurbished, reused and improved.

The lack of textual evidence from the business cases analysed to support the claim made by EC (2015) on the possible functional role of procurement in contributing to the realisation of organisations CE objectives was unsurprising to the researchers. This is considering that contributions of procurement as an organisational function at firm level CE operations was highlighted in the context of public sector procurement function as opposed to within the private sector where all the cases analysed within this study are centred. That said, the absence of the HRM function following from the analysis of firm-level CE activities in this study was somewhat surprising, especially, given the assertions of notable authors such as EC (2015) and Jabbour et al. (2019), on the possible importance of HRM as a functional area within firms adopting CE in their practice.

Inter alia, the HRM function is charged with providing training to members of the organisations charged with meeting the organisations CE goals (EC, 2015), which is because, as EC (2015, p. 19) points out, the operations of the CE *“will require a qualified workforce with specific skills, and opportunities for employment and social dialogue”*. In support of EC’s (2015) view, the works of prominent HR authors such as Armstrong and Taylor (2017) and Kerfoot and Knights (2017) contend that training is one of the key responsibilities of the HRM function within organisations, which enable employees to develop relevant skills in meeting organisational objectives. Jabbour et al. (2019) go beyond mentioning training in their conceptual paper on HR and the role of HRM function within CE organisations, to suggest that the HRM function could contribute to organisations CE drives through recruitment and selection, performance assessment and reward, and by ensuring that opportunities for

employee empowerment and teamwork are provided where possible. All of these are hinged on the stakeholder view and RBV of HR and the HRM function within organisation (Jabbour et al., 2019).

Managerial vs Critical Perspectives of HR and HRM within CE Business Cases

Compared to managerial perspectives, which was non-existent in the analysis and discussion, accounts on the critical perspective were present in four of the CE business cases evaluated for this research. According to Kerfoot and Knights (2017), the critical perspective of HR and HRM within organisations centres on the dynamic of people's management. The critical perspective of HR and HRM within the CE business cases analysed for this study are captured in the following excerpts:

“Internally, the Continuum facility is now the benchmark for best practice across the entire Coca-Cola System. And thirty new skilled jobs have also been created for the local area as a result of the partnership.” (Case C)

“11 jobs created...The local municipality previously had to export green waste and kitchen waste generated from schools out of the territory, which had both financial cost as well as carbon emission implications. However once the methanisation unit became operational, long distance transportation of organic waste was no longer required, as it could be processed locally. The project also benefits the regional economy through the creation of local jobs” (Case D).

“What makes this smarter - Winnow analytics correlates food waste to sales directly connecting behaviour changes to increased profits...The unexpected bonus? About 50% of workers involved in food production in IKEA have been inspired to reduce food waste when they return home” (Case A).

“is supporting Google to build on existing practices and embed circular economic principles into the fabric of Google's infrastructure, operations and culture.” (Case B)

“Everyone is a winner...Farmers benefit from a 60% reduction in fertiliser expenses, regular advice from experts on grassland management, better relations with neighbours (as digestate is odourless, compared to pungent raw manure) and a reduced workload.” (Case D)

Short phrases such as *“thirty new skilled jobs have also been created”* (Case, C), and *“11 jobs created...benefits the regional economy through the creation of local jobs”* (Case D), demonstrates how the CE operations of some of the organisations contribute to the creation of jobs. Indeed, identifying that firm-level CE operations results in job creation within this study confirms the views of EC (2015) that CE transitions lead to opportunities for employment.

Besides, the critical perspective on HR and the role of HRM within the CE operations of organisations can be captured in the following phrases: *“been inspired to reduce food waste when they return home”* (Case A), and *“better relations with neighbours... and a reduced workload”* (Case D), which perhaps contradicts Geissdoerfer et al.'s (2017) assertions that there is no clear understanding as to the extent to which CE might contribute to subjective

wellbeing. On the other hand, considering that there is an appropriation of a phrase such as “*and embed circular economic principles into the fabric of Google’s infrastructure, operations and culture*” (Case D) in one of cases – collaborates Jabbour et al.’s (2019) submission that the transitions of an organisation from linear economic principles to CE principles are implanted in an organisation’s culture. Admittedly, the representation and portrayal of a critical perspective of HR and HRM within the business cases analysed were not evident in all the business cases analysed for this study, but it was captured in most, which somewhat reiterates the views put forward by Kichherr et al. (2017) that current body of knowledge and understanding of CE mostly neglect the social aspects.

Conclusion

This paper considers the social dimensions of the CE – specifically firm-level CE operations. The paper aimed to address the current gap in CE dynamic through critical and empirical evaluation on HR and the role of HRM in firm-level CE transitions. The overall effort was achieved through the analysis of six business case studies on CE operations – guided by the research objective, which focuses on how HR and the HRM function are captured within CE business cases. Based on the findings of this research relative to other organisational functional areas such as product and process design, marketing and sales, and SCM, the case studies analysis indicate that HRM as an organisational function is currently not captured within organisational CE business concern. Similarly, procurement, which is another important organisational function, has not been given attention in the CE business cases analysed for this research.

Nonetheless, compared to the managerial perspectives of HR and the role of HRM, the case studies analysis captured the critical perspective of HR and HRM in four of the business cases. This was demonstrated in terms of job creation, a change in the behaviour of employees at home, and (in one of the CE business cases) better relations with neighbours (in one community). Lastly, with regards to the critical perspective of HR and HRM within CE transitions in organisations, a change in organisational culture is highlighted in one of the business cases. Both the findings on managerial and critical perspectives of HR and HRM within CE business cases are potentially vital contributions to the current body of scholarship on HR and the role HRM at firm-level CE pursuit, particularly, given that previous studies on this phenomenon were not empirically/critically grounded (EU, 2015; Geissdoerfer et al. 2017; Jabbour et al. 2019), which are implications of this current study.

While there are implications for this study; it is also important to highlight its limitations. First is the research methodology, which involves the use of primary data – sourced via a secondary source. For instance, the data was sourced through EMF database, which contains numerous CE business cases using primary data. Although the EMF is widely viewed as a thought-leading organisation in the development and propagation of organisational CE practices across the globe; it is not entirely possible to defend the assumption that what the platform covers are not entirely the views of EMF and the collaborating organisations. Hence more holistic viewpoints involving more participants would help deepen scholarship on organisational CE dynamic. Secondly, the findings and discussions presented in this paper are only focused on six business cases (ten per cent) found within the EMF database on the 20th of December 2019, and thus, a broader analysis of all the cases found within the database might provide alternative views. Nonetheless, as the researchers hinted, a subsequent paper on this study will involve analysis of all the business cases found in the database. Also, the researchers plan to adopt multiple methods of data collection to enhance the validity of the overall outcomes of

discourse on this phenomenon.

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