A MODEL TO EXPLORE CIRCULAR ECONOMY ACTIVITIES IN HOTELS AND RESTAURANTS

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ABSTRACT: This work explores the different frontline and offline activities during the use of hotels and restaurants -represented as the touchpoints of a customer journey- to establish what circular actions could be implemented by stakeholders throughout the process, which lead to more circular business models that integrates the seven R's (redesign, reduce, reuse, renovate/repair, refurbish/remanufacture, recover/return and recycle) to achieve more efficient and sustainable performance. From the reservation step to the customer satisfaction evaluation, the interactions of hotels or restaurants with suppliers from many different economic sectors determine a variety of activities in their value chain that creates synergies, enhance circularity, and add value to the tourism sector through the implementation of sustainable practices or the acquisition of sustainable products and services. Based on the literature, reports and lessons learned in the sector through specific Focus Groups previously carried for the research team, the proposed model can help hotels and restaurants decision-makers to take steps toward circular economy.

Keywords: Circular economy; Sustainability; Tourism; Hotels; Restaurants

1. PURPOSE OF THE PAPER

The aim of this analysis is to provide a model that could help hotels and restaurants in their transition to a circular business model, specifying the activities in the frontline and offline touchpoints of a customer journey. We summarize all these activities and visualize them for a clearer understanding through infographics.

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The work is part of the Innoecotur project, that "seeks to thrust the Circular Economy in the Tourism Sector through the transfer of results and incorporation of eco-innovations and circular economy actions, in terms of product and process, business model or organizational practices" (https://innoecotur.webs.upv.es/en/el-proyecto/).

2. RELATED WORK

Circular economy (CE) is defined like the system that replaces 'the end-of-life' concept of the existing linear model, promoting the reduction, reusing, recycling and recovering materials (Kirchherr et al., 2017). In other words, it is an opportunity to create value in ways that benefit society, business and environment while contribute to delivery of the sustainable development goals (SDGs). According to the Ellen MacArthur Foundation, the framework widely used in the CE research, relies on three principles driven by design: eliminate waste and pollution, circulate products and materials and regenerate nature (EMF, 2021). The Capgemini Research Institute (2021) summarizes EMF framework for enabling a CE, in 7R's that can help organizations to assess their current impact: reduce, reuse, redesign, repair/renovate, refurbish/remanufacture, return/recover, recycle. Practices related to CE might be adapted to each kind of businesses. The tourism industry is a vast complex industry covering a variety of sectors and connecting with multiple other industries and value chains (Font and Lynes, 2018; Einarsson and Sorin, 2020; Rosato, et al., 2021). In this case, this paper offers a study about the way that the tourism sector could integrate these kinds of practices among their organizations; specifically, hotels and restaurants assessing their customer journey to identify where in the value chain is possible to implement more sustainable practices, either directly or through its suppliers (Image 1).

Image 1. Eco-mugs in a hotel

3. METHODOLOGY

A qualitative method is used for exploring these circular activities. After reviewing the literature, some reports from companies and organizations, and the experiences of some companies through focus group interviews (De Miguel et al., 2022), service process models have been applied to follow all the steps that could contribute to a circular model (Kirchherr et al., 2017; Geissdoerfer, 2017). For representing the flow of these services processes, we have used customer journey (Tueanrat et al., 2021; Lemon & Verhoef, 2016) and infographics (Gareau et al., 2015).

4. FINDINGS

Tables 1-9 represent all the circular activities that hotels and restaurants could perform thoughout their service process. Moreover, the specific codes of the National Classification of Economic Activities, CNAE (INE, 2007), are provided to connect these activities with different suppliers that could create synergies in the tourism sector.

Table 1. Reservation process (hotels/restaurants)

Process	Interacting Elements	Circular Practices	Supplier Activity and CNAE
Search, comparison and booking of hotels/restaurants	Search engines (Google, Trivago, Booking, etc.) Website or corporate social networks// Reception (telephone reservation, walk-in, mail) // Booking engine	Webpages with environmental awareness (e.g., compensate carbon footprint with tree plantations)	Accommodation/reservations-specific software (J)
Reservation payment	Online payment through websites// payment at reception (with cards or money) // bank transfers	Reduce document printing // online vouchers	Electronic payment systems (K)

Table 2. Travel process (hotels/restaurants)

Process	Interacting Elements	Circular Practices	Supplier Activity and CNAE

Travel to the service	Private or rented car, public transport	The search engine or the corporate website propose sustainable transport (e.g., train, hybrid vehicles, electric vehicles, etc.)// agreements with environmentally responsible companies// encourage their clients// provide public transport cards	Sustainable mobility (H)
Parking	Private or rented car + Parking	The car park has electric chargers for customers// offers bicycles for local transport	Electric chargers for vehicles (D)

Table 3. Check-in process (hotels/restaurants)

Process	Interacting Elements	Circular Practices	Supplier Activity and CNAE
Queue to be served (or self-check in)	Reception	Using digital systems to avoid paper	Accommodation/reservation -specific software (J)
Collection/review of data (names, DNIs, etc.)	Reception	Using digital systems to avoid paper	Accommodation/reservation -specific software (J)
Key delivery along with a cardboard envelope (hotels)	Digital keys, physical keys, etc.	Reduce the use of cartons, envelopes, etc.// If used, they are made of recycled material// digital locks// reusable cards	With fingerprint (J), recycled and reusable plastic (C), recycled and reusable paper (C)
Delivery of paper with keys for the wifi	Physical documents	Reduce the use of cardboard, envelopes, paper etc.// In case of using it, that are made of recycled material// use of QR codes// include this information in other contacts	QR codes (J), recycled and reusable paper (C)
Delivery of welcome gifts// amenities (hotels)	E.g. water bottle	Delivery of sustainable gifts (e.g. auara water bottles)// facilitate the use of products with less impact// eliminate single-use plastics	Lower impact amenities (C)

Table 4. Access process (hotels/restaurants)

Process	Interacting Elements	Circular Practices	Supplier Activity and CNAE
Elevator ride up	Lift	Energy-efficient electrical and lighting systems// renewable energy// power generation	Renewable energies (D), Efficient systems A (C)
Stairs climb on foot	Stairs	Efficient lighting systems (e.g. LED, with people detector, etc.)	Efficient systems A(C)

Table 5. Room use process (hotels)

Process	Interacting Elements	Circular Practices	Supplier Activity and CNAE
Open suitcases	Furniture to locate suitcases, cabinets, etc.	Furniture made using circular practices (e.g., furniture made with waste from plastic bottles)// furniture of recyclable materials	Recycled and reusable furniture (C)
Hanging clothes in the closet	Hangers	Hangers made using circular practices	Recycled and reusable plastic (C)
Check hotel services (restaurant)	Book or brochure with the services// menu of the restaurant	Digital system// In case of being physical, it is made with paper and recycled materials	QR codes (J), recycled and reusable paper (C)
Food request via room service (restaurant)	Hotel kitchen	Avoid single-use plastics// sustainable and reusable utensils and dishes	Cutlery and utensils of recycled and reusable materials (C)
Shower and hygiene	Sanitary water, shampoos, soaps, towels, paper, hygienic bags offered by the hotel	Hygiene developed through sustainable practices// avoid single-use plastics// water consumption reduction systems (e.g., aerators in taps, pushbuttons in bathroom taps, small toilet cisterns)// awareness of water consumption// products purchased in bulk (minimum packaging)//eco-textiles	Water reuse systems (C, E), Renewable energy (D), eco chemicals (C), reusable packaging (C), Eco textiles (C)
Hair drying	Private hairdryer or offered by hotel	Installation of dryers with energy efficiency seal	Efficient systems A (C)

Rest	Bed, sheets, pillows, mattress, duvet, other products	The textile materials have been treated under circular practices	Textiles eco (C)
Comfort/ room temperature	A/C and heating systems	Equipment with energy efficiency certification// awareness of energy consumption// use of home automation or other technologies to avoid use when there is no one or open windows// sustainable heating sources	Efficient systems A (C), renewable energies (D)
Use of minibar	Fridge minibar and products inside	Energy-efficient refrigerators// Sale of products in the minibar that come from sustainable brands// choose recyclable containers// offer filtered water instead of bottles	Renewable energy (D), eco food and beverages (A, C), reusable packaging (C)
Cleaning of the room	Chemicals used for cleaning, gloves, garbage bags, replacement of hygiene products	Raising awareness for customers to use towels and sheets again// Use of cleaning products made under sustainable criteria (e.g. garbage bags that are easily recyclable)// cleaning chemicals with low impact on the environment// reusable or returnable packaging// containers to separate waste	Water reuse systems (C, E), eco chemicals (C), recycled and reusable packaging (C)
White washing	In-house laundry or external provider	Energy-certified machines // minimum water consumption// supplier with sustainable standards // detergent with low environmental impact// reuse of wash water	Efficient systems A (C), Water reuse systems (C, E), Renewable energies (D), eco chemicals (C)

Table 6. Table process (restaurants)

Process	Interacting Elements	Circular Practices	Supplier Activity and CNAE

Consult menu	Menu of the restaurant	Digital system (QR, tablet, screen)// In case of being physical, it is made with paper and recycled materials	QR codes (J), recycled and reusable paper (C)
Food Request	Kitchen	Process that unites energy, food/drink, and physical elements	Efficient systems A (C), renewable energies (D), Cutlery and utensils of recycled and reusable materials (C), Eco textiles (C), eco food and beverages (A, C), reusable packaging (C)
Bathrooms	Sanitary water, soaps, towels, paper, hygienic bags	Sustainable hygiene products// avoid single-use plastics// water consumption reduction systems (e.g., aerators in taps, pushbuttons in bathroom taps, small toilet cisterns)// awareness of water consumption// use of products purchased in bulk (minimum packaging)/ Use of paper with dispenser, not rol // Eco textiles	Water reuse systems (C, E), Renewable energy (D), eco chemicals (C), reusable packaging (C), Eco textiles (C)
Comfort/ temperature	A/C and heating systems	Equipment with energy efficiency certification// awareness of energy consumption//sustainable heating sources	Efficient systems A (C)
Cleaning	Chemicals used for cleaning, gloves, garbage bags, replacement of hygiene products	Sustainable cleaning products (e.g., garbage bags easily recyclable)// cleaning chemicals with low impact on the environment// reusable or returnable evases// containers to separate	Water reuse systems (C, E), eco chemicals (C), recycled and reusable packaging (C)

		waste	
White washing	In-house laundry or external provider	Energy-certified machines// minimum water consumption// supplier with sustainable standards // detergent with low environmental impact// reuse of washing water// ECO materials in tablecloths for sustainable washing	Efficient systems A (C), Water reuse systems (C, E), Renewable energies (D), eco chemicals (C)

Table 7. Check-out process (hotels)

Process	Interacting Elements	Circular Practices	Supplier Activity and CNAE
Queue to be served (or self-checkout)	Reception	Digital system for self-checkout	Accommodation-specific software (J)
Delivery of key together with a cardboard envelope by the customer	Reception	Reduce the use of cartons, envelopes, etc.// If used, they are made of recycled material// digital locks // reusable cards	Key with fingerprint (J), recycled and reusable plastic (C), recycled and reusable paper (C)
Delivery of the invoice	Reception	Reduce document printing // online vouchers// use of recycled paper	Recycled and reusable paper (C), Specific software for accommodations (J)
Delivery of customer satisfaction survey	Reception	It can be filled out digitally //have tablets at the same reception// send an email to the customer// reply directly to the person at the reception (short survey)	QR Codes (J), Recycled and Reusable Paper (C), Accommodation-Specific Software (J)

Table 8. Others (hotels)

Process	Interacting Elements	Circular Practices	Supplier Activity and CNAE

Gym	Gym, machines, implements	Energy-efficient machines// LED lighting system// Sustainable towels // sustainable implements	Efficient systems A (C), renewable energies (D), eco textiles (C)
Swimming pool/SPA	Changing rooms, swimming pool, jacuzzi,	Environmentally friendly chemical products// Minimum efficient pool size// Sustainable heating systems (efficient boilers, biomass boilers, solar panels for domestic hot water, photovoltaic panels for lighting, etc.)	Water reuse/reduction systems (C, E), Renewable energy (D), eco chemicals (C)
Bicycles	Bicycle parking	Promote their use// offer parking for own bicycles and guests// sustainable manufacturing	Manufacturers (C)

Table 9. Cross-sectional actions (hotels/restaurants)

Process	Interacting Elements	Circular Practices	Supplier Activity and CNAE
Construction	Building materials	Durable building materials// Techniques that promote energy efficiency (e.g. insulation, ventilation, etc.)// building certification	Sustainable construction (F)
SPA	Technology for power generation	Renewable sources (e.g., solar)// renewable energy guarantee certificates from electricity companies// energy certification// diversify energy sources and required fuel// heat recovery	Renewable energies (D), Efficient systems A (C)
Suppliers	Supplier Management	Promotion of procurement of goods and services from local and environmental certificated suppliers// sustainability standard applied to suppliers// collaborate to improve supplier practices	Sustainable mobility (H), local suppliers (A, C, G, R)

Water	Technology for water recovery and saving	Wastewater or rainwater reuse systems for irrigation// water consumption reduction systems (e.g., aerators in taps, pushbuttons in bathroom faucets, small toilet cisterns)	Water reuse/reduction systems (C, E)
Sensitization of guests and hotel staff	Elements of communication and strategy	Posters// conferences and events// sustainability in advertising// communicate sustainable practices// examples in place// sustainability at the strategy level	Environmental Consulting (M)
Waste separation and management	Containers // municipal withdrawal // external company	Waste separation containers// recycling management// return of returnable materials to suppliers// compost bin// manage the end of life of utensils and furniture	Waste managers (E, O)
Appearance of the hotel	Furniture and decoration	Recyclable materials // sustainable manufacturing	Recycled and reusable furniture (C)
Textile Recycling	Textiles	Recycling of whites (sheets, towels) and uniforms	Recycled and reusable textiles (C)

5. LIMITATIONS AND IMPLICATIONS

From the methodology point of view, we have not tested the model, however we will do it in the course of the Innoecotur project. As we are working hand-in-hand with the tourism sector, we have proposed our model to hotels and restaurants, especially SMEs, as well as different suppliers that could work with them. Moreover, we have created some infographics (Figures 1 and 2) to visualize the processes in a clear and easy way to show how they could develop an integrated circular model. Small and medium hotels and restaurants in the Valencian Community have little access to information on these kinds of practices, therefore we provide a clear and understandable model that can help them, as well as contribute to the literature on the CE in the hospitality sector.
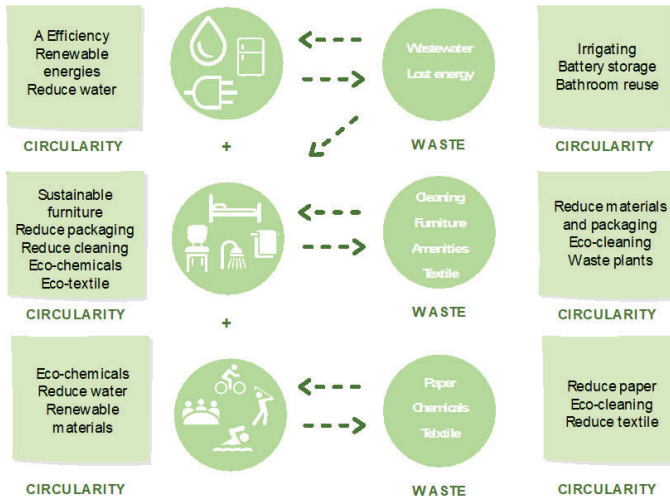
Figure 1. Circular operations in a hotel

The qualitative data obtained through the realization of three Focus Groups with stakeholders in the tourism sector are from the Valencian Community in Spain, specifically, and for this reason the results of this work might not be representative in all geographic areas. The results of this work will be used to develop a platform were hotels and restaurants can find all kind of suppliers of a variety of solutions with different approaches on sustainable practices to facilitate the implementation of circular actions in the Valencian Community.
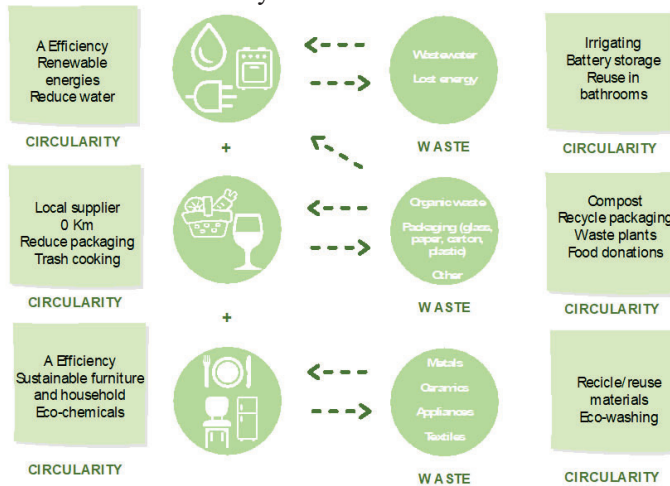
Figure 2. Circular operations in a restaurant

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AUTHOR CONTRIBUTIONS

J. Sánchez Planelles: Data curation; Formal analysis; Methodology; Y. Trujillo-Adriá: Investigation; Roles/Writing - original draft; B. Silva Cárdenas: Investigation; Writing - review & editing; M. de Miguel Molina: Conceptualization; Supervision; Visualization; Roles/Writing - original draft.

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