

## **Food Waste Management: Can AI Help?**

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### **ABSTRACT**

Food wastage is emerging to be a critical problem globally and has an impact on multiple sustainable development goals. Approximately 40% of food tends to get wasted [2]. One of the main environmental impacts of food waste is related to the final disposal technique of food wastage which ends up in landfills [3]. Apart from environmental and economic implications food wastage also has social implications which tends to focus more on ethical dimensions of food wastage. An earlier study on ethics of food waste has identified groups of people who consume food that has been thrown away so that food waste can be minimized and also the inequality in consumption of food can be reduced [1].

### **INTRODUCTION**

One of the major contributors to this wastage is the hospitality industry. The food and beverage (F&B) outlets are prone to stocking up on perishable ingredients in excess of the demand. On account of hygiene, health and safety reasons that could lead to legal liability, the unused ingredients and prepared meals have to be discarded in compliance with regulatory guidelines and best practices; the excess food can neither be donated nor taken home by the F&B staff. The problem is particularly acute in luxury hotel properties' s outlets which by their very nature have traditionally pivoted to opulence and ostentation.

The industry is aware of this acute problem as it also impacts the businesses' bottomline and the efforts to measure the amount of wastage and use compost bins are on the rise [4]. While these *post hoc* measures have limited impact, application of Artificial Intelligence (AI) solutions for managing food waste holds a lot of promise. AI based solutions have proven to be effective in settings such as buffet restaurants and high volume production kitchens. Against this backdrop, this paper explores the stakeholder perception of the scope of AI based solutions in mitigating food wastage in the F&B outlets of luxury properties in Dubai, which is often positioned as an uber -luxe destination.

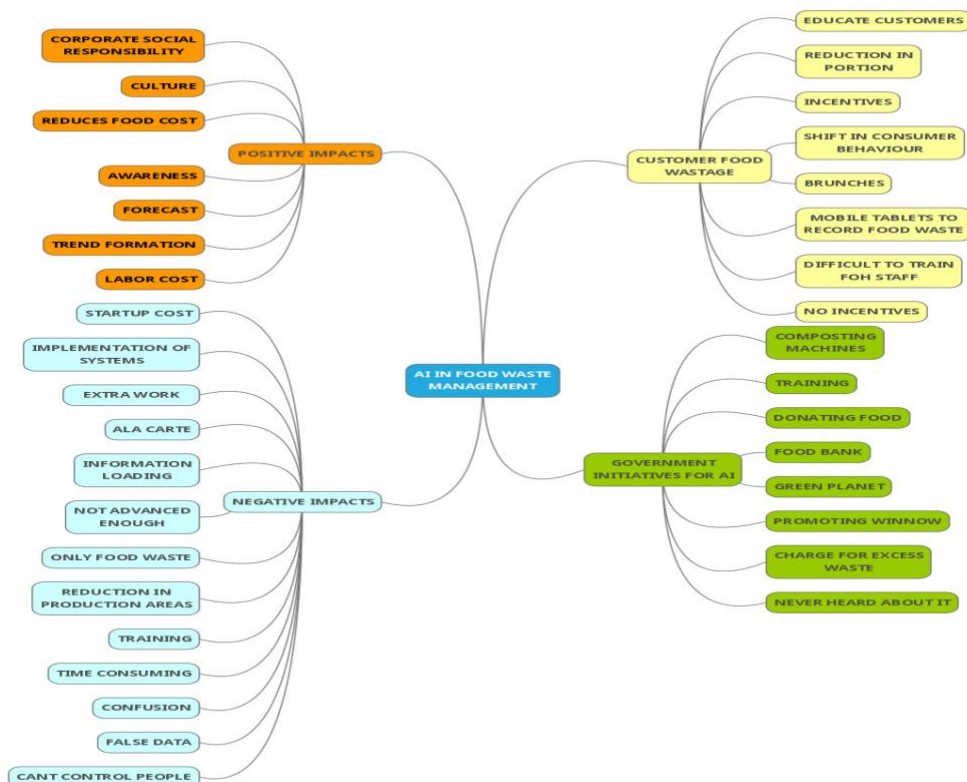
## METHODOLOGY

A qualitative research approach was adopted mandating purposive sampling techniques that included executive chefs, chef de cuisines, culinary directors and general managers who have had experience in luxury and upper upscale F&B outlets. Face-to-face interviews were permissible on account of Covid restrictions were carried out for a scheduled duration of 45 minutes and where not feasible, the interviews were done via video conferencing. The literature review informed the development of the interview questions. The questions probed the interviewees on their perception of the utility value of AI in mitigating food waste in their outlets. The interviewees were invited to discuss the pros and cons and those who had already implemented were asked to provide feedback and recommendations.

## FINDINGS

Content analysis was performed of the transcriptions of the interviews which yielded four core themes and the attendant sub-themes. In the interest of brevity, a visual summary of these themes and sub-themes is provided in Figure 1.

Figure 1 AI in Food Waste Management Themes



## LIMITATIONS

Given the nascent nature of the subject, there is a dearth of academic literature which limited the literature review. Covid restrictions limited the diversity and number of interviewees available, despite the online option.

## References

- [1] Edwards, F., & Mercer, D. (2012). Food waste in Australia: the freegan response. *The Sociological Review*, 60, 174-191.
- [2] Gunders, D. (2012). Wasted: How America is losing up to 40 percent of its food from farm to fork to landfill. *Natural Resources Defense Council*, 26, 1-26.
- [3] Papargyropoulou, E., Steinberger, J. K., Wright, N., Lozano, R., Padfield, R., & Ujang, Z. (2019). Patterns and causes of food waste in the hospitality and food service sector: food waste prevention insights from Malaysia. *Sustainability*, 11(21), 6016.
- [4] Sakaguchi, L., Pak, N., & Potts, M. D. (2018). Tackling the issue of food waste in restaurants: Options for measurement method, reduction and behavioral change. *Journal of Cleaner Production*, 180, 430-436.