Actors' roles in service robotics ecosystems
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Purpose –The rise of research in the field of Artificial Intelligence (AI), Natural Language Processing (NLP), and development platforms such as the Robotic Operating System has enabled the rise in a class of robots called Service Robotics. These kinds of robots are primarily designed to interact with people (Wirtz et al., 2018) in a consistent human social manner, involving healthcare, education, media, entertainment and retail.
In service research, scholars investigated the acceptance (Wirtz et al., 2018), anthropomorphism features (Goudey and Bonnin, 2016) and drivers on which service robotics impact (Xiao et al., 2021). Leveraging on S-D logic, service robots can be conceptualized as operant resources, which means that technology can act on other resources (Akaka and Vargo, 2013) and facilitates and limits human action through interpretative schemes, structures and norms. Service ecosystems embeds the actors who are part of them to cooperate with each other through shared exchange logics and thus stimulate and facilitate the integration of resources. This leads to the creation of a 'network value' and, that is, the possibility of creating benefits for all the actors who are part of the network (Gummesson, 2008). With this in mind, there is a need to understand how service robots can be integrated into hospitality services as a means to facilitate interpersonal interactions to create value for all the actors involved (developer, users, provider etc..) (Lu et al. 2019). Further, current research on service robots is fragmented and largely conceptual (Lu et al., 2019) and still lacks to adopt an ecosystem perspective in understanding the development and the adoption of service robotics.

Methodology – The study aims to map the service robot ecosystem to understand the roles and interactions that take place between the actors following a multi-level approach, (Akaka e Vargo, 2014): micro and, therefore, the company providing a service through the use of service robots; at the meso level, that is, within the identified technological context and finally, at the macro level and, therefore, the institutional context.
To answer this aim, we use the qualitative methodology of case study as it provides a tool for studying complex phenomena in their contexts (Yin, R.K., 1992). This was undertaken by an empirical investigation of multiple case studies and, in particular, we chose evidence from hospitality context (eg. restaurant, hotel etc..), followed by an analysis of the collected data (Stake, 2005).

Findings – Producers and designers develop the social robots, starting from the technologies available on the market, making sure to offer companies a "standard machine" that can be later adapted to as many needs as possible, thus reaching a broader set of potential customers. The possibility of designing social robots that are "general purpose" does not exist and, therefore, it is necessary an additional step before the solution is ready to be adopted in the market. Responsible for this step are the robot developer companies, positioned between the customer companies and the manufacturer, that acquire the "standard machine" and adapt and customize the technology on the basis of its intended use, bridging the gap in the basic robot functionalities. Therefore, the relevance assumed by developer companies that adapt robots to the specific needs of user companies - and their consumers - emerges.

Research limitations/implications - Our study is not without limits, which can be considered as fundamental preconditions for the development of future academic research. First, future research could broaden our analysis sample and carry out a larger scale study. Second, future researchers could expand the context of analysis by extending research to other industries by validating our current findings. Finally, it could be interesting to expand the study with a more in-depth analysis on value co-creation processes.

Keywords – Service science, Service robot, Value co-creation, Ecosystem, Artificial intelligence

Paper type – Research paper

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