Project title: Me Robot, You Human. How can we make this world a better (work)place?

Project leader: Prof. Dr. Anita Van Gils

Function: Professor in Family Business and Strategic Entrepreneurship (For more information or application, please send an e-mail to a.vangils@maastrichtuniversity.nl, specifying the title of the project and adding a CV and Motivation letter)

Collaborators: Prof. Dr. Martin Wetzels (EDHEC, France), Prof. Dr. Dominik Mahr, Dr. Yannick Bammens

Proposal: Advances in robots' sensors and in artificial intelligence (AI) have enabled robots to now also participate in complex interaction processes with human and other robots, shifting beyond the traditional usage in manufacturing facilities for discrete tasks. For example, robots can move autonomously around in unstructured environments and in this way assist human employees with the supply of material, with lifting of heavy or dangerous objects, or with computer vision supported inventory management. Also in the service industry, robots now welcome guests, serve food, or keep inhabitants of elderly homes physically engaged. Nevertheless, a content analysis showed that actually only a small number of academic articles have focused on these new technologies, predominantly covering social media and big data, or to quote Rindfleisch et al (2020, p. 129):

"In contrast, research on other emerging technologies such as augmented reality, artificial intelligence, blockchain, robotics, and 3D printing have received little attention to date (see Rindfleisch et al.'s, 2017 recent essay on 3D printing for an exception)"

Robots and automation have played a key role in manufacturing in last decennia. The global rise of robots in manufacturing is predominantly due to the automotive sector and electronics sector. For instance, in the automotive sector we find more than 2000 installations per 10000 employees. Increasingly, the so-called "lights out" concept, in which all manufacturing operations are completely automated, is gaining traction. This not only allows companies to free human workers from repetitive tasks, increasing quality and performance, but also reducing costs. Moreover, due to economies of scale productions costs for robots have fallen by 50% making robots more widely available for a wide diversity of industries.

Most robots in manufacturing are stationary installations and require safety measures to protect human workers. A new generation of robots, collaborative robots (cobots), will work together with human workers using sensors to allow for effective teamwork between humans and cobots. Currently, the number of cobots shipped is still relatively small, but the cobot market is predicted to exceed $ 24 billion by 2030 (with a CAGR of 28.6%). For instance, using cobots like "Kiva" allows AMAZON warehouse workers to spend 80% of their time on order fulfillment. Moreover, recent technological progress, especially in sensors, computer vision and artificial intelligence have allowed robots to acquire new capabilities. This development will allow robots to interact with humans beyond the manufacturing context focusing on the social human-robot interaction. Especially, in services social robots have been recently adopted. For instance, in health care, elderly care, hospitality, services, supply chain management and education. Social robots cannot only perform more sophisticated operations, they can also engage in social interactions with humans.

The aim of this research project is to further study how humans and cobots interact in the customer, employee and cobot triad and how their cooperation can help (human) employees to improve their performance, enhance their jobs satisfaction and increase their well-being. We will study human-cobot teams to advance our knowledge on the

interplay between robot technology and human skill development conducive to this human-robot interface. We will explore the factors that contribute to the adoption of cobots in work settings, including interaction with employees and customers.

Setting and Methods: Social Robotics, Cobots, Behavioral Measures/Tracking, Experiments, Visual Analysis. Textmining

Requirements candidate: Marketing, Strategy, Information Systems, Psychology, Computer Science

Keywords: Frontier Technologies, Information Technology, Humanities and Social Sciences, Social robotics, Cobots, Customer, Employee and Cobot Triad, Human-Machine interaction

Top 5 selected publications by the supervisory team

Aguirre-Lopez, E., Grewal, D., **Mahr, D.**, Ruyter, K. de & **Wetzels, M.G.M.** (2018), "The Effect of Review Writing on Learning Participation in Channel Partner Programs," *Journal of Marketing*, 82 (2), 64-84. IPF2021: 9,462

Bammens, Y. (2016). Employees' innovative behavior in social context: A closer examination of the role of organizational care. *Journal of Product Innovation Management*, *33*(3), 244-259. IPF2021: 9,885

Bammens, Y. & Collewaert, V. (2014). Trust between entrepreneurs and angel investors: Exploring positive and negative implications for venture performance assessments, *Journal of Management*, 40(7), 1980-2008. IPF2021: 13,508

Bammens, Y., Hünermund, P. & Andries, P. (2022). Pursuing gains or avoiding losses: The contingent effect of transgenerational intentions on innovation investments, *Journal of Management Studies*, 59(6), 1493-1530. IPF2021: 9,720

Bammens, Y., Notelaers, G., & **Van Gils, A.** (2015). Implications of family business employment for employees' innovative work involvement. *Family Business Review*, *28*(2), 123-144. IPF2021: 7,575

Ludwig, S., Ruyter, J.C. de, Brüggen, E.C., Pfann, G. and **Wetzels, M.G.M.** (2013), "More than Words: The Influence of Affective Content and Linguistic Style Matches in Online Reviews on Conversion Rates," *Journal of Marketing*, 77 (1), 87-103 *(Awarded with Emerald Citation of Excellence Award 2016).* (**Awarded with Emerald Citation of Excellence Award 2016**). IPF2021: 9,462

Ludwig, S., Ruyter, J.C. de, **Mahr, D.**, **Wetzels, M.G.M.**, Brüggen, E.C. and Ruyck, T. de (2014), "Take Their Word for it": The Symbolic Role of Linguistic Style Matches in User Communities*," MIS Quarterly*, 38 (4), 1201-1217 *(Top 10 Key Publication, School of Business and Economics, Self-Assessment Report of Research 2008-2014, June 2015).* (**Top 10 Key Publication, School of Business and Economics, *Self-Assessment Report of Research 2008-2014, June 2015***). IPF2021: 7,198

Mennens, K., **Van Gils, A**., Odekerken-Schröder, G. & Letterie, W. (2018). "Exploring antecedents of service innovation performance in manufacturing SMEs," *International Small Business Journal*. *36*(5), 500-520. IPF2021: 6.413

Villarroel-Ordenes, F., Ludwig, S., Ruyter, K. de, Grewal, D. and **Wetzels, M.G.M.** (2017), "Unveiling What Is Written in the Stars: Analyzing Explicit, Implicit and Discourse Patterns of Sentiment in Social Media," *Journal of Consumer Research*, 43 (6), 875-894. IPF2021: 8,612

Villarroel-Ordenes, F., **Mahr, D.**, De Ruyter, K., **Wetzels, M.G.M.,** Ludwig, S., and Grewal, D. (2019), "Cutting through Content Clutter: How Speech and Image Acts Drive Consumer Sharing of Social Media Brand Messages," *Journal of Consumer Research*, 45(5), 988-1012. IPF2021: 8,612

Approved Head of Department OSE,

20 September 2022

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