Foreword

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Dear Reader,

The challenges caused by the Corona pandemic continued in 2021 – for many of us much longer and tougher than we had expected back in the summer of last year. However, after many "lessons learned", with a variety of new concepts and many compromises in private and professional everyday life we approach the "New Normal". This summer, first meetings and business travels are possible again, more and more people are vaccinated, and we hear some good news about the worldwide economic recovery.

"Good news" is an appropriate buzzword for the service robotics market. As it is the case with every edition of the "World Robotics Service Robots", the version you are now looking at presents numbers and market data from the previous year. As was the case in prior years, we are seeing significant growth figures in some sectors. The service robotics market is a broad field that is sometimes developing in very different ways. Large growth markets are contrasted by small, highly specialized niche markets, with many startups joining the fray and other companies unable to establish themselves on the market.

In close cooperation, Fraunhofer IPA and IFR are now observing more than 1000 companies worldwide offering service robotics solutions (amongst them are about 17% startups). Thanks to this overview, we deemed it necessary to adapt the category system used so far for the classification of service robots. We believe with these adjustments we can better represent the market. In addition, we hope that we will make it easier for the companies that support our statistics with their figures to position themselves in the category system. Nevertheless, the classification of such a broad market as service robotics is always "work in progress". We look forward to hearing from you if you see further opportunities for improvement.

One of the most prominent applications for fighting the Coronavirus is cleaning and disinfection robots. Increased hygienic demands have helped opening this new niche for service robots. More than 50 companies are now offering disinfection robots. We even see some product evolution already, with recent UV disinfection robots being smarter than the old ones, e.g. being equipped with infrared cameras to detect humans in the environment and avoid harming them with the UV light. Companies delivering food or purchases are facing a rapidly growing demand. Due to this growing interest, a worldwide spread of food and medication delivery robots could be observed this year. That is also why the market for robots supporting last mile deliveries should face a remarkable growth. This growth strengthens an already successful market, since AGVs and mobile

robots have been among the fastest growing segments in service robotics during the last years.

Besides the mentioned areas experiencing a strong push through the pandemic, several other domains within service robots for professional use are on the rise. Considering the number of units sold, medical, construction and demolition as well as search, rescue and security robots show significantly rising numbers. With respect to the systems' value, logistics, medical, and field robots are leading the market.

Consumer robots have also experienced strong global growth thanks to three mass-market product categories: floor-cleaning robots, robo-mowers and robots for edutainment and interaction. In addition, as in the previous years, the variety of assistive robots available to support handicapped or elderly people continues to increase.

Both, the professional and the consumer service robotics domain benefit from recent technical innovations: Fundamental developments in the fields of digitization, cloud technologies, 5G and artificial intelligence, specifically in machine learning, are leading to a technology push in service robotics. On the other side, we see a strong market pull, specifically for professional service robots. Besides Corona, this is caused by current challenges, such as the lack of skilled workers in several professions, demographic changes, or sustainability requirements. Using service robots can help companies to improve their competitiveness and innovative strength. New business models at the same time significantly lower the financial barriers to decide for the use of a service robot in volatile markets. A prominent example is "Robot-as-a-service" which means that the user only pays for the tasks the service robot fulfilled successfully.

"World Robotics Service Robots" has established itself as the widely acknowledged reference publication in statistics, forecasts, market analysis, and profitability of robot investments. Robot suppliers, media, government bodies, financial analysts and technology scouts are among its readers. It specifically provides profiles of the numerous service robot manufacturers worldwide. The many hyperlinks pointing to online resources invite you to further investigate your topic of interest by looking into selected publications and company websites.

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In case you have any suggestions or further inquiries related to service robotics, please do not hesitate to contact us!

Best wishes,

Dr. Birgit Graf, Dr. Kai Pfeiffer