Executive Summary World Robotics 2019 Service Robots

Service robotics encompasses a broad field of applications, most of which having unique designs and different degrees of automation – from full tele-operation to fully autonomous operation. Hence, the industry is more diverse than the industrial robot industry (which is extensively treated in the companion publication World Robotics – Industrial Robots 2019). IFR Statistical Department is currently aware of more than 750 companies producing service robots or doing commercial research for marketable products. A full list is included in chapter 4 of World Robotics Service Robots 2019. IFR Statistical Department is continuously seeking for new service robot producers, so please contact statistics@ifr.org if you represent such a company and would like to participate in the annual survey conducted in the first quarter of each year. Participants receive the survey results free of charge.

Sales of professional service robots on the rise

The total number of professional service robots sold in 2018 rose by 61% to more than 271,000 units, up from roughly 168,000 in 2017. The sales value increased by 32% to USD 9.2 billion.

Autonomous guided vehicles (AGVs) represent the largest fraction in the professional service robot market (41% of all units sold). They are established in non-manufacturing environments, mainly logistics, and have lots of potential in manufacturing. The second largest category (39% of all units sold), inspection and maintenance robots, covers a wide range of robots from rather low-priced standard units to expensive custom solutions. Service robots for defense applications accounted for 5% of the total number of service robots for professional use sold in 2018. Thereof, unmanned aerial vehicles seem to be the application with the highest share. While robotic floor cleaning solutions are already widely used in the domestic area, these machines are still less accepted in professional environments. Sales of powered human exoskeletons were up from 6,700 units in 2017 to 7,300 units in 2018. Exoskeletons support ergonomic working by reducing loads on the worker. There is a high growth potential for this kind of robot. The total number of field robots sold in 2018 was 6,950 units, accounting for a share of 3% of professional service robot sales. Sales of medical robots increased by 50% from 3,400 units in 2017 to 5,100 units in 2018. This is 2% of the total unit sales of professional service robots. The most important medical applications are robot assisted surgery or therapy and rehabilitation systems. Medical robots are among the most expensive service robots.

Service robots for personal and domestic use are produced for a mass market with completely different pricing and marketing channels than professional service robots. So far, service robots for personal and domestic use are mainly in the areas of domestic (household) robots (vacuuming and floor cleaning, lawn-mowing, pool-cleaning) and entertainment robots (toys, hobby systems, education and research). The total number of service robots for personal and domestic use increased by 59% to about 16.3 million units in 2018. The value was up 15% to USD 3.66 billion. This includes more than 12.2

million robots for domestic tasks. The is mainly vacuuming and other indoor floor cleaning robots. More than 11.6 million robot vacuum and floor cleaners were sold in 2018. Today, this kind of service robot is available in almost every convenience store, making it easily accessible for everyone. Many American, Asian, and European suppliers cater to this market. Much like robot vacuums, lawn-mowing robots are nowadays available in most hardware and gardening stores. However, the market potential of this type of robot is currently limited because they still cannot operate on every ground and their range is bound by their battery capacity.

Sales of both, professional and personal service robots will continue to increase strongly.

Professional service robots:

- 2018: 271,100 units, +61%
- 2019: 361,300 units, +33%
- 2020: 495,500 units, +41%
- 2021: 700,100 units, +41%
- 2022: 1,019,300 units, +41%

Service robots for domestic/household tasks:

- 2018: 16.3 million units, +59%
- 2019: 22.1 million units, +35%
- 2020: 30.4 million units, +40%
- 2021: 42.7 million units, +40%
- 2022: 61.1 million units, +40%

Service robots for entertainment:

- 2018: 4.1 million units, +8%
- 2019: 4.5 million units, +10%
- 2020: 4.9 million units, +10%
- 2021: 5.4 million units, +10%
- 2022: 5.9 million units, +10%