

## Contents

<b>Foreword .....</b>	<b>3</b>
<b>Editorial .....</b>	<b>5</b>
<b>Opinion: Robots, Jobs and the Future of Work.....</b>	<b>8</b>
<b>Contents .....</b>	<b>12</b>
<b>Executive Summary World Robotics 2017 Industrial Robots .....</b>	<b>15</b>
<b>1 Introduction.....</b>	<b>26</b>
1.1 Sources and methods.....	26
1.1.1 Compliance.....	26
1.1.2 Coverage .....	26
1.1.3 Data sources and reliability of data .....	27
1.1.4 Operational stock and accumulated annual sales .....	28
1.1.5 Interpretation of the concepts of shipments, sales and supply .....	28
1.1.6 Revision of time-series data on the robot stock and annual supply .....	29
1.1.7 Data coverage and where to access data for previous years.....	30
1.2 Industrial robots - definition and classification .....	31
1.2.1 Definition (ISO 8373:2012) and delimitation .....	31
1.2.2 Classification by types of robots .....	33
1.2.3 Classification by industries .....	42
1.2.4 Classification by applications.....	44
1.3 Definition and classification of service robots.....	45
1.3.1 Definition.....	45
1.3.2 Classification of service robots by application areas .....	46
<b>2 Worldwide Distribution of Industrial Robots .....</b>	<b>50</b>
2.1 Unit sales.....	51
2.2 Worldwide operational stock of industrial robots .....	57
2.3 Estimated worldwide market value of robots in 2011-2016 .....	62
2.4 Analysis of the effects of the business cycle on investments in industrial robots.....	64
2.5 Analysis of the development of robot density in selected countries .....	66
2.5.1 Definition of robot density .....	66
2.5.2 Measurements of robot density based on the total number of persons employed in the automotive industry and in all other branches.....	71
2.6 Analysis of the supply and the stock of multipurpose industrial robots in 2011 – 2016 by major application areas.....	76
2.7 Analysis of the supply and the stock of multipurpose industrial robots 2011 – 2016 by major industrial branches.....	86
2.8 Comparison between the automotive industry and all other industrial branches.....	96

2.9	Supplies of multipurpose industrial robots in 2015 and 2016 by types of robots and by countries .....	108
<b>3</b>	<b>The Structure of the Distribution of Industrial Robots in Individual Countries .....</b>	<b>120</b>
3.1	Introduction .....	120
3.2	Americas .....	121
3.2.1	Brazil .....	130
3.2.2	North America (USA, Canada, Mexico) .....	136
3.2.3	Rest of South America .....	164
3.3	Asia /Australia .....	169
3.3.1	People´s Republic of China .....	178
3.3.2	India .....	192
3.3.3	Indonesia .....	201
3.3.4	Japan .....	207
3.3.5	Republic of Korea .....	222
3.3.6	Malaysia .....	236
3.3.7	Singapore .....	242
3.3.8	Taiwan, Province of China .....	249
3.3.9	Thailand .....	258
3.3.10	Vietnam .....	265
3.3.11	Hong Kong and Other South East Asia .....	271
3.3.12	Australia and New Zealand .....	275
3.4	Europe .....	280
3.4.1	Czech Republic and Slovakia .....	289
3.4.2	Hungary .....	307
3.4.3	Poland .....	316
3.4.4	Romania .....	325
3.4.5	Russian Federation .....	334
3.4.6	Balkan Countries .....	340
3.4.7	Other Eastern Europe .....	345
3.4.8	Austria .....	350
3.4.9	Belgium and the Netherlands .....	358
3.4.10	France .....	371
3.4.11	Germany .....	381
3.4.12	Italy .....	397
3.4.13	Portugal .....	409
3.4.14	Spain .....	419
3.4.15	Switzerland .....	429
3.4.16	United Kingdom .....	436
3.4.17	Denmark .....	446
3.4.18	Finland .....	456
3.4.19	Norway .....	465
3.4.20	Sweden .....	474
3.4.21	Turkey .....	484

3.4.22	All other European Countries .....	492
3.5	Africa .....	494
3.5.1	South Africa .....	494
3.5.2	Rest of Africa .....	501
3.6	Other Countries .....	503
<b>4</b>	<b>Forecast of Worldwide Investment in Industrial Robots 2017-2020</b>	<b>506</b>
4.1	Incentives to use robots are Excellent.....	506
4.2	Technical robotic trends and customer trends.....	508
4.3	Conclusion and forecast 2017-2020 .....	514
<b>5</b>	<b>The Profitability of Industrial Robots .....</b>	<b>522</b>
5.1	Introduction .....	522
5.2	Case study 1: Robot-assisted automation of a cold rolling mill .....	525
5.3	Case study 2: Standstill is not a solution .....	529
5.4	Case study 3: FANUC Robots Deliver A Sound Solution For Speaker Cabinet Manufacture .....	533
<b>6</b>	<b>Industrial robot standardization activities in ISO/TC 299 .....</b>	<b>538</b>
<b>7</b>	<b>Annex A .....</b>	<b>544</b>