

2017-2023

# Asia-Pacific Industry 4.0 Market & Technologies



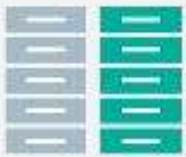
SMART INDUSTRY



ROBOTIC AUTOMATION



3D PRINTING



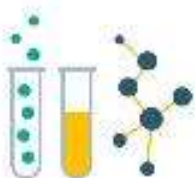
BIG DATA



LOGISTICS



RENEWABLES



NANOTECHNOLOGIES



IOT



SAFETY

Industry 4.0 Research

# Asia-Pacific Industry 4.0 Market & Technologies

## 2017-2023

### Vol.1

**Industry 4.0 Research (A division of HSRC)**  
601 Pennsylvania Ave. Washington D.C., U.S.A  
Tel: 202-740-9606  
[www.Industry40marketresearch.com](http://www.Industry40marketresearch.com)

## Table of Contents

|          |   |           |
|----------|---|-----------|
| <b>1</b> | <b>Executive Summary .....</b>  | <b>8</b>  |
| 1.1      | Findings & Conclusions .....  | 8         |
| 1.2      | Industry 4.0 Market Research Vectors.....                             | 18        |
| 1.3      | Industry 4.0 Market Size - 2016-2023.....                             | 19        |
|          | <b>MARKET BACKGROUND .....</b>  | <b>23</b> |
| <b>2</b> | <b>Introduction.....</b>  | <b>23</b> |
| <b>3</b> | <b>Industry 4.0 Market Background .....</b>                           | <b>32</b> |
|          | <b>MARKET BY INDUSTRY .....</b>                                       | <b>36</b> |
| <b>4</b> | <b>Industry 4.0 Market by Industry – 2016-2023.....</b>               | <b>36</b> |
| 4.1.1    | Industry 4.0 Industry 4.0 Market Size – 2016-2023 .....               | 36        |
| 4.1.2    | Industry 4.0 Market Breakdown – 2016-2023.....                        | 38        |
| <b>5</b> | <b>Aerospace &amp; Defense 4.0 Market - 2016-2023 .....</b>           | <b>40</b> |
| 5.1      | Defense Industry 4.0 Market Background.....                           | 40        |
| 5.2      | Aerospace Industry 4.0 Market Background .....                        | 40        |
| 5.3      | Aerospace & Defense Industry 4.0 Market – 2016-2023 .....             | 42        |
| <b>6</b> | <b>Agriculture &amp; Food Industries 4.0 Market – 2016-2023 .....</b> | <b>45</b> |
| 6.1      | Agriculture 4.0 Market Background.....                                | 45        |
| 6.1.1    | Introduction.....   | 45        |
| 6.1.2    | Agriculture 4.0 Scope .....   | 46        |
| 6.1.3    | Agriculture 4.0 Farm Machinery .....                                  | 48        |
| 6.1.4    | The Added Value for Customers & Farmers.....                          | 49        |
| 6.1.5    | Agriculture 4.0 Conclusions.....                                      | 51        |
| 6.2      | Agriculture & Food Industry 4.0 Market – 2016-2023.....               | 53        |
| <b>7</b> | <b>Automotive Industry 4.0 Market – 2016-2023 .....</b>               | <b>56</b> |
| 7.1      | Industry 4.0 Automotive Industry Market Background.....               | 56        |
| 7.2      | Industry 4.0 on the Automotive Industry: Major Trends.....            | 57        |
| 7.2.1    | Automotive Industry Cloud Computing .....                             | 57        |
| 7.2.2    | Automotive Industry Cybersecurity .....                               | 58        |
| 7.2.3    | Automotive Industry Big Data Analytics.....                           | 58        |
| 7.2.4    | Automotive Industry “Internet of Cars” .....                          | 59        |
| 7.2.5    | Automotive Industry: Opportunities .....                              | 60        |
| 7.3      | Automotive Industry 4.0: Market Drivers .....                         | 60        |
| 7.4      | Automotive Industry 4.0 Market: Key Challenges .....                  | 61        |
| 7.5      | Autonomous Cars 4.0 .....   | 61        |
| 7.6      | Automotive Industry 4.0: Internet of Things .....                     | 62        |
| 7.7      | Automotive Industry 4.0: Machine-Learning.....                        | 63        |

|           |   |           |
|-----------|---|-----------|
| 7.8       | Automotive Industry 4.0: Cloud-based Intelligence .....                                 | 63        |
| 7.9       | Automotive Industry 4.0 Market – 2016-2023 .....  | 64        |
| <b>8</b>  | <b>Chemical Industry 4.0 Market - 2016-2023.....</b>                                    | <b>67</b> |
| 8.1       | Chemical Industry 4.0 Market Background .....   | 67        |
| 8.1.1     | The Chemical Industry.....  | 67        |
| 8.1.2     | Chemical Industry 4.0 Market.....   | 68        |
| 8.1.3     | Industry 4.0 Transformations in the Chemical Industry .....                             | 70        |
| 8.2       | Chemical Industry 4.0 Market – 2016-2023 .....  | 71        |
| <b>9</b>  | <b>Electronic &amp; Electrical Hardware Industries 4.0 Market -<br/>2016-2023 .....</b> | <b>73</b> |
| 9.1       | Electronic & Electrical Hardware: Industry 4.0 Market<br>Background.....                | 73        |
| 9.2       | Electronic & Electrical Hardware Industry 4.0 Market –<br>2016-2023.....                | 77        |
| 9.2.1     | Electronic & Electrical Hardware Industry 4.0: Market<br>Dynamics – 2016-2023.....      | 79        |
| <b>10</b> | <b>Energy, Power, Oil &amp; Gas 4.0 Market – 2016-2023.....</b>                         | <b>80</b> |
| 10.1      | Industry 4.0 Energy, Power, Oil & Gas Market Background .....                           | 80        |
| 10.1.1    | Energy, Power, Oil & Gas Industry Trends.....   | 80        |
| 10.1.2    | The Oil & Gas Industry .....  | 80        |
| 10.1.3    | Industry 4.0 Oil & Gas Sector Environmental<br>Perspective.....                         | 81        |
| 10.1.4    | Industry 4.0 Undersea Oil & Gas Challenge.....  | 81        |
| 10.1.5    | Oil & Gas Big Data .....  | 82        |
| 10.1.6    | Oil & Gas Industry 4.0 Outlook .....  | 83        |
| 10.1.7    | Industry 4.0 Energy and Power Market Background .....                                   | 83        |
| 10.2      | Industry 4.0 & Industrial IoT Energy Productivity .....                                 | 85        |
| 10.2.1    | Introduction.....   | 85        |
| 10.2.2    | Energy and Power Industry 4.0 Remote Monitoring .....                                   | 85        |
| 10.2.3    | Predictive Maintenance .....  | 86        |
| 10.2.4    | Energy and Power Industry 4.0 Advanced Control.....                                     | 86        |
| 10.3      | Energy, Power, Oil & Gas Industry 4.0 Market – 2016-2023 .....                          | 86        |
| <b>11</b> | <b>Machine Manufacturing 4.0 Market – 2016-2023.....</b>                                | <b>89</b> |
| 11.1      | Machine Manufacturing Industry 4.0 Market Background .....                              | 89        |
| 11.1.1    | The Machine Manufacturing Industry .....  | 89        |
| 11.1.2    | Machine Manufacturing Industry 4.0 Market.....  | 91        |
| 11.2      | Machine Manufacturing Industry 4.0 Market – 2016-2023.....                              | 92        |
| <b>12</b> | <b>Pharmaceutical &amp; Biotechnology 4.0 Market – 2016-2023 .....</b>                  | <b>95</b> |
| 12.1      | Pharmaceutical & Biotechnology Industry 4.0 Market<br>Background.....                   | 95        |
| 12.2      | Pharmaceutical & Biotechnology Industry 4.0 Market –<br>2016-2023.....                  | 96        |
| <b>13</b> | <b>Semiconductors 4.0 Market - 2016-2023.....</b>                                       | <b>99</b> |
| 13.1      | Semiconductor Market Background.....  | 99        |

|                              |   |            |
|------------------------------|---|------------|
| 13.1.1                       | Industry 4.0 Semiconductors .....   | 99         |
| 13.1.2                       | Semiconductor Manufacturing Horizontal Integration .....                                    | 101        |
| 13.1.3                       | Semiconductor Industry 4.0: Customization<br>Considerations .....                           | 102        |
| 13.1.4                       | Industry 4.0 Semiconductor Manufacturing Market .....                                       | 102        |
| 13.1.5                       | Conclusions.....  | 103        |
| 13.2                         | Industry 4.0 Semiconductors Market – 2016-2023.....   | 104        |
| <b>14</b>                    | <b>Other Industry 4.0 Markets - 2016-2023 .....</b>   | <b>107</b> |
| <b>MARKET ANALYSIS .....</b> |   | <b>109</b> |
| <b>15</b>                    | <b>Industry 4.0 Market: Drivers .....</b>   | <b>109</b> |
| <b>16</b>                    | <b>Industry 4.0 Market: Inhibitors .....</b>  | <b>112</b> |
| <b>17</b>                    | <b>Industry 4.0 SWOT Analysis .....</b>   | <b>113</b> |
| 17.1                         | Strengths .....   | 113        |
| 17.2                         | Weaknesses .....  | 114        |
| 17.3                         | Opportunities .....   | 114        |
| 17.4                         | Threats.....  | 115        |
| <b>18</b>                    | <b>Barriers to New Entry, Supplier Power, Buyer Power and<br/>Competitive Rivalry .....</b> | <b>116</b> |
| <b>19</b>                    | <b>Business Opportunities .....</b>   | <b>117</b> |

## List of Tables

|  |     |
|--|-----|
| Table 1 - Industry 4.0 Market Size [\$M] by Industry – 2016-2023.....  | 19  |
| Table 2 - Industry 4.0 Market Size [\$M] by Technology – 2016-2023.....  | 20  |
| Table 3 - Industry 4.0 Market Size [\$M] by Revenue Source – 2016-2023.....                                    | 21  |
| Table 5 - Industry 4.0 Market Size [\$M] by Country – 2016-2023.....   | 22  |
| Table 6 - Industry 4.0 vs. Industrial IOT (IIOT).....  | 29  |
| Table 7 - Industry 4.0 Market Size [\$M] by Industry – 2016-2023.....  | 36  |
| Table 8 - Industry 4.0 Market Share [%] by Industry – 2016-2023.....   | 38  |
| Table 9 - Aerospace & Defense Industry 4.0 Market Size [\$M] – 2016-2023.....                                  | 42  |
| Table 10 - Aerospace & Defense Industry 4.0 Market AGRs [%] – 2016-2023.....                                   | 43  |
| Table 11 - Agriculture & Food Industry 4.0 Market Size [\$M] – 2016-2023.....                                  | 53  |
| Table 12 - Agriculture & Food Industry 4.0 Market AGRs [%] – 2016-2023.....                                    | 55  |
| Table 13 - Automotive Industry 4.0 Market Size [\$M] – 2016-2023.....  | 64  |
| Table 14 - Automotive Industry 4.0 Market AGRs [%] – 2016-2023.....  | 66  |
| Table 15 - Industry 4.0 Transformations in the Chemical Industry.....  | 70  |
| Table 16 - Chemical Industry 4.0 Market Size [\$M] – 2016-2023.....  | 71  |
| Table 17 - Chemical Industry 4.0 Market AGRs [%] – 2016-2023.....  | 72  |
| Table 18 - Electronic and Electrical Hardware Manufacturing [\$B] s.....                                       | 73  |
| Table 19 - Electronic & Electrical Hardware Manufacturing [\$B] 7 Market Share by Top Producing Countries..... | 73  |
| Table 20 - Electronic & Electrical Hardware Industry 4.0 Market Size [\$M] – 2016-2023.....                    | 77  |
| Table 21 - Electronic & Electrical Hardware Industry 4.0 Market AGRs [%] – 2016-2023.....                      | 79  |
| Table 22 - Energy, Power, Oil & Gas Industry 4.0 Market Size [\$M] – 2016-2023.....                            | 87  |
| Table 23 - Energy, Power, Oil & Gas Industry 4.0 Market AGRs [%] – 2016-2023.....                              | 88  |
| Table 24 - Machinery Industry Breakdown.....   | 90  |
| Table 25 - Machine Industry 4.0 Market Size [\$M] – 2016-2023.....   | 92  |
| Table 26 - Machine Industry 4.0 Market AGRs [%] – 2016-2023.....   | 94  |
| Table 27 - Pharmaceutical & Biotechnology Industry 4.0 Market Size [\$M] – 2016-2023.....                      | 97  |
| Table 28 - Pharmaceutical & Biotechnology Industry 4.0 Market AGRs [%] – 2016-2023.....                        | 98  |
| Table 29 - Semiconductors Industry 4.0 Market Size [\$M] – 2016-2023.....                                      | 104 |
| Table 30 - Semiconductors Industry 4.0 Market AGRs [%] – 2016-2023.....  | 106 |
| Table 31 - Other Industries 4.0 Market Size [\$M] – 2016-2023.....   | 107 |
| Table 32 - Other Industries 4.0 Market AGRs [%] – 2016-2023.....   | 108 |

## List of Figures

|  |     |
|--|-----|
| Figure 1 - Industry 4.0 Enabling Technologies.....   | 10  |
| Figure 2 - Tech Giants Participating in the Industry 4.0 Market Race.....                    | 14  |
| Figure 3 - Industry 4.0 Market Vectors.....  | 18  |
| Figure 4 - The 4 <sup>th</sup> Industrial Revolution.....                                    | 23  |
| Figure 5 - Industry 4.0 Nine Core Technologies.....  | 24  |
| Figure 6 - Industry 4.0 Activities and Enabling Technologies.....                            | 27  |
| Figure 7 - Industry 4.0 Market Size [\$M] by Industry – 2016-2023.....                       | 37  |
| Figure 8 - Industry 4.0 Market Share [%] by Industry – 2016-2023.....                        | 39  |
| Figure 9 - Aerospace & Defense Industry 4.0 Market Size [\$M] – 2016-2023.....               | 43  |
| Figure 10 - A Networked Farm.....  | 45  |
| Figure 11 - Agriculture & Food Industry 4.0 Market Size [\$M] – 2016-2023.....               | 54  |
| Figure 12 - Industry 4.0 Automotive Production Line.....                                     | 56  |
| Figure 13 - Industry 4.0 Automotive Production Robots.....                                   | 57  |
| Figure 14 - Automotive Industry 4.0 Market Size [\$M] – 2016-2023.....                       | 65  |
| Figure 15 - Chemical Industry 4.0 Market Size [\$M] – 2016-2023.....                         | 72  |
| Figure 16 - Electrical & Electronic Market [\$T] – 2015-2018.....                            | 73  |
| Figure 17 - Electronic & Electrical Hardware Industry 4.0 Market Size [\$M] – 2016-2023..... | 78  |
| Figure 18 - Production of Primary Energy – 1995-2035.....                                    | 83  |
| Figure 19 - Energy and Power Industry 4.0 elements.....                                      | 85  |
| Figure 20 - Energy, Power, Oil & Gas Industry 4.0 Market Size [\$M] – 2016-2023.....         | 87  |
| Figure 21 - Machine Manufacturing Industry 4.0.....  | 91  |
| Figure 22 - Machine Industry 4.0 Market Size [\$M] – 2016-2023.....                          | 93  |
| Figure 23 - Pharmaceutical & Biotechnology Industry 4.0 Market Size [\$M] – 2016-2023.....   | 97  |
| Figure 24 - Semiconductor Manufacturing Value Chain.....                                     | 101 |
| Figure 25 - Semiconductors Industry 4.0 Market Size [\$M] – 2016-2023.....                   | 105 |
| Figure 26 - Other Industries 4.0 Market Size [\$M] – 2016-2023.....                          | 108 |
| Figure 27 - Industry 4.0 Market Competitive Analysis.....                                    | 116 |

# Asia-Pacific Industry 4.0 Market & Technologies

## 2017-2023

### Vol.2

**Industry 4.0 Research (A division of HSRC)**  
601 Pennsylvania Ave. Washington D.C., U.S.A  
Tel: 202-740-9606  
[www.Industry40marketresearch.com](http://www.Industry40marketresearch.com)



## Table of Contents

|   |           |
|---|-----------|
| <b>TECHNOLOGY MARKETS .....</b>   | <b>9</b>  |
| <b>1 Industry 4.0 Technology Markets.....</b>   | <b>9</b>  |
| 1.1 Background.....   | 9         |
| 1.2 The Forth Industrial Revolution Technologies.....                                       | 9         |
| 1.3 Industry 4.0 Manufacturing Technologies .....   | 14        |
| 1.4 Cyber Physical Infrastructure (CPS) .....   | 17        |
| 1.5 Industry 4.0 Big Data and Cloud Computing.....  | 17        |
| 1.6 Augmented Reality, Simulation & Visualization .....                                     | 17        |
| 1.7 Industry 4.0 ICT .....  | 18        |
| 1.7.1 Industry 4.0 Enterprise Resource Planning (ERP) .....                                 | 18        |
| 1.7.2 ERP 4.0.....  | 18        |
| 1.7.3 Quality Management ERP 4.0 .....  | 20        |
| 1.7.4 Supervisory Control and Data Acquisition (SCADA) .....                                | 20        |
| 1.8 On-Demand Industry 4.0.....   | 21        |
| 1.8.1 Programmable Logic Controller (PLC).....  | 21        |
| 1.8.2 Distributed Control System (DCS) .....  | 22        |
| 1.8.3 Embedded ICT Conclusions.....   | 22        |
| 1.9 Industry 4.0 Standardization Languages.....   | 23        |
| 1.10 Visual Intelligence.....   | 23        |
| 1.11 Industry 4.0 Technologies: Conclusions .....   | 24        |
| 1.12 Asia-Pacific Consolidated Industry 4.0 Market, by<br>Technology – 2016-2023 .....      | 25        |
| <b>2 Additive Manufacturing – 3D Printing 4.0 Market - 2016-2023 .....</b>                  | <b>27</b> |
| 2.1 Industry 4.0 Additive Manufacturing - 3D Printing Market<br>Background.....             | 27        |
| 2.1.1 Additive Manufacturing- 3D Printing: Introduction .....                               | 27        |
| 2.1.2 Additive Manufacturing - 3D Printing Technologies.....                                | 27        |
| 2.1.3 3D Printer: 27 Manufacturers .....  | 31        |
| 2.1.4 Categories of Additive Materials.....   | 33        |
| 2.2 Asia-Pacific Industry 4.0 Additive Manufacturing-3D Printing<br>Market – 2016-2023..... | 34        |
| 2.2.1 Industry 4.0 Additive Manufacturing - 3D Printing<br>Market Size – 2016-2023 .....    | 34        |
| 2.2.2 Additive Manufacturing - 3D Printing Industry 4.0<br>Market Dynamics – 2016-2023..... | 35        |
| <b>3 Advanced Human Machine Interface 4.0 Market - 2016-2023 .....</b>                      | <b>37</b> |
| 3.1 Industry 4.0 Advanced Human Machine Interface Market<br>Background.....                 | 37        |
| 3.2 Asia-Pacific Industry 4.0 Advanced Human Machine<br>Interface Market – 2016-2023.....   | 40        |

|          |  |           |
|----------|--|-----------|
| 3.2.1    | Industry 4.0 Advanced Human Machine Interface Market Size – 2016-2023 .....    | 40        |
| 3.2.2    | Advanced Human Machine Interface Industry 4.0 Market Dynamics – 2016-2023..... | 42        |
| <b>4</b> | <b>Artificial Intelligence 4.0 Market - 2016-2023.....</b>                     | <b>44</b> |
| 4.1      | Industry 4.0 Artificial Intelligence Market Background.....                    | 44        |
| 4.2      | Industry 4.0 Artificial Intelligence .....                                     | 45        |
| 4.2.1    | Industry 4.0 AI Automated Planning and Scheduling .....                        | 47        |
| 4.2.2    | Industry 4.0 AI Based Machine Learning.....                                    | 47        |
| 4.2.3    | Industry 4.0 AI in Robotics.....   | 47        |
| 4.2.4    | Artificial Neural Network and Connectionism.....                               | 48        |
| 4.2.5    | Deep Learning.....   | 48        |
| 4.2.6    | Automotive AI .....  | 48        |
| 4.2.7    | The AI Partnership .....   | 49        |
| 4.3      | Asia-Pacific Industry 4.0 Artificial Intelligence Market – 2016-2023.....      | 49        |
| 4.3.1    | Industry 4.0 Artificial Intelligence Market Size – 2016-2023 .....             | 49        |
| 4.3.2    | Artificial Intelligence Industry 4.0 Market Dynamics – 2016-2023 .....         | 51        |
| <b>5</b> | <b>Industrial Robots 4.0 Market - 2016-2023 .....</b>                          | <b>52</b> |
| 5.1      | Industry 4.0 Industrial Robots Market Background .....                         | 52        |
| 5.1.1    | Industry 4.0 Industrial Robots.....  | 52        |
| 5.1.2    | Integration of Robots in Industry 4.0.....                                     | 53        |
| 5.1.3    | Robots Role in Industry 4.0 .....  | 53        |
| 5.1.4    | 4.0 Autonomous Robots Market: Conclusions.....                                 | 55        |
| 5.1.5    | Industry 4.0 Autonomous Robots Market Outlook.....                             | 56        |
| 5.2      | Industrial Robots: Facts and Figures .....                                     | 57        |
| 5.2.1    | Industry 4.0 Delta Robots Market Background .....                              | 60        |
| 5.2.2    | Industry 4.0 Parallel Robots Market Background .....                           | 61        |
| 5.2.3    | Industry 4.0 Articulated Robots Market Background .....                        | 61        |
| 5.2.4    | Industry 4.0 Cartesian & Gantry Robots Market Background .....                 | 61        |
| 5.2.5    | Industry 4.0 SCARA Robots Market Background.....                               | 61        |
| 5.2.6    | Industry 4.0 Collaborative Industry Robots Market Background .....             | 61        |
| 5.2.7    | Industry 4.0 Cylindrical Robots Market Background.....                         | 62        |
| 5.3      | Key Vendors .....  | 62        |
| 5.4      | Asia-Pacific Industry 4.0 Robots Market – 2016-2023 .....                      | 62        |
| 5.4.1    | Industry 4.0 Robots Market Size – 2016-2023 .....                              | 62        |
| 5.4.2    | Robots Industry 4.0 Market Dynamics – 2016-2023.....                           | 64        |
| <b>6</b> | <b>Big Data &amp; Analytics 4.0 Market - 2016-2023.....</b>                    | <b>65</b> |
| 6.1      | Industry 4.0 Big Data & Analytics Market Background.....                       | 65        |
| 6.1.1    | Big Data Analytics .....   | 65        |
| 6.1.2    | Industry 4.0 Big Data & Analytics Market Outlook.....                          | 65        |

|           |   |           |
|-----------|---|-----------|
| 6.2       | Asia-Pacific Industry 4.0 Big Data & Analytics Market – 2016-2023.....                        | 66        |
| 6.2.1     | Industry 4.0 Big Data & Analytics Market Size – 2016-2023 .....                               | 66        |
| 6.2.2     | Big Data & Analytics Industry 4.0 Market Dynamics – 2016-2023 .....                           | 67        |
| <b>7</b>  | <b>Cybersecurity &amp; Cloud Computing 4.0 Market - 2016-2023 .....</b>                       | <b>69</b> |
| 7.1       | Industry 4.0 Cloud Computing .....  | 69        |
| 7.1.1     | Summary .....   | 69        |
| 7.1.2     | Introduction to Cloud Computing .....   | 69        |
| 7.1.3     | Cloud Computing Impact on Industry 4.0 .....  | 70        |
| 7.1.4     | Industry 4.0 Cloud Computing Market Background .....  | 71        |
| 7.1.5     | Cloud Manufacturing Market Background .....   | 72        |
| 7.2       | Industry 4.0 Cybersecurity Market Background .....  | 74        |
| 7.3       | Asia-Pacific Industry 4.0 Cybersecurity & Cloud Computing Market – 2016-2023.....             | 74        |
| 7.3.1     | Industry 4.0 Cybersecurity & Cloud Computing Market Size – 2016-2023 .....                    | 74        |
| 7.3.2     | Cybersecurity & Cloud Computing Industry 4.0 Market Dynamics – 2016-2023.....                 | 76        |
| <b>8</b>  | <b>Horizontal and Vertical System Integration 4.0 Market - 2016-2023 .....</b>                | <b>77</b> |
| 8.1       | Industry 4.0 Horizontal and Vertical System Integration Market Background.....                | 77        |
| 8.2       | Asia-Pacific Industry 4.0 Horizontal and Vertical System Integration Market – 2016-2023 ..... | 77        |
| 8.2.1     | Industry 4.0 Horizontal and Vertical System Integration Market Size – 2016-2023 .....         | 77        |
| 8.2.2     | Horizontal and Vertical System Integration Industry 4.0 Market Dynamics – 2016-2023.....      | 79        |
| <b>9</b>  | <b>Sensors and Industrial IoT 4.0 Market - 2016-2023.....</b>                                 | <b>80</b> |
| 9.1       | Industry 4.0 Sensors and Industrial IoT Market Background .....                               | 80        |
| 9.2       | Industrial IoT (IIoT): Introduction.....  | 80        |
| 9.2.1     | Industrial IoT Market.....  | 81        |
| 9.2.2     | Industrial IoT Cybersecurity.....   | 83        |
| 9.3       | Industrial Internet of Things Market Outlook .....  | 83        |
| 9.4       | Industry 4.0 Sensors Market Background.....   | 84        |
| 9.5       | Industry 4.0 Sensors Communication Protocols .....  | 85        |
| 9.6       | Asia-Pacific Industry 4.0 Sensors and Industrial IoT Market – 2016-2023.....                  | 86        |
| 9.6.1     | Industry 4.0 Sensors & Industrial IoT Market Size – 2016-2023 .....                           | 86        |
| 9.6.2     | Sensors & Industrial IoT Industry 4.0 Market Dynamics – 2016-2023 .....                       | 87        |
| <b>10</b> | <b>Simulation 4.0 Market - 2016-2023 .....</b>  | <b>89</b> |

|           |  |           |
|-----------|--|-----------|
| 10.1      | Industry 4.0 Simulation Market Background .....  | 89        |
| 10.2      | Asia-Pacific Industry 4.0 Simulation Market– 2016-2023.....                              | 89        |
| 10.2.1    | Industry 4.0 Simulation Market Size – 2016-2023 .....                                    | 89        |
| 10.2.2    | Simulation Industry 4.0 Market Dynamics – 2016-2023 .....                                | 91        |
| <b>11</b> | <b>Virtual Reality &amp; Augmented Reality 4.0 Market - 2016-2023 .....</b>              | <b>92</b> |
| 11.1      | Industry 4.0 Virtual Reality & Augmented Reality Market<br>Background.....               | 92        |
| 11.2      | Asia-Pacific Industry 4.0 Virtual Reality & Augmented<br>Reality Market – 2016-2023..... | 94        |
| 11.2.1    | Industry 4.0 Virtual Reality & Augmented Reality Market<br>Size – 2016-2023 .....        | 94        |
| 11.2.2    | Virtual Reality & Augmented Reality Industry 4.0 Market<br>Dynamics – 2016-2023.....     | 96        |

## List of Tables

|  |    |
|--|----|
| Table 1 - Next Generation Industrial Robots: Trends, Challenges & Technology Enablers .....                        | 11 |
| Table 2 - Asia-Pacific Industry 4.0 Market Size [\$M] by Technology – 2016-2023.....                               | 25 |
| Table 3 – Asia-Pacific Additive Manufacturing - 3D Printing Industry 4.0 Market Size [\$M] – 2016-2023.....        | 34 |
| Table 4 – Asia-Pacific Additive Manufacturing - 3D Printing Industry 4.0 Market AGRs [%] – 2016-2023 .....         | 36 |
| Table 5 – Asia-Pacific Advanced Human Machine Interface Industry 4.0 Market Size [\$M] – 2016-2023.....            | 41 |
| Table 6 – Asia-Pacific Advanced Human Machine Interface Industry 4.0 Market AGRs [%] – 2016-2023 .....             | 43 |
| Table 7 – Asia-Pacific Artificial Intelligence Industry 4.0 Market Size [\$M] – 2016-2023.....                     | 50 |
| Table 8 – Asia-Pacific Artificial Intelligence Industry 4.0 Market AGRs [%] – 2016-2023.....                       | 51 |
| Table 9 - Industry 4.0 Industrial Robots Sample: by Model, Manufacturer and Description.....                       | 55 |
| Table 10 – Asia-Pacific Robots Industry 4.0 Market Size [\$M] – 2016-2023 .....                                    | 63 |
| Table 11 – Asia-Pacific Robots Industry 4.0 Market AGRs [%] – 2016-2023.....                                       | 64 |
| Table 12 – Asia-Pacific Big Data & Analytics Industry 4.0 Market Size [\$M] – 2016-2023.....                       | 66 |
| Table 13 – Asia-Pacific Big Data & Analytics Industry 4.0 Market AGRs [%] – 2016-2023.....                         | 68 |
| Table 14 – Asia-Pacific Cybersecurity & Cloud Computing Industry 4.0 Market Size [\$M] – 2016-2023.....            | 75 |
| Table 15 – Asia-Pacific Cybersecurity & Cloud Computing Industry 4.0 Market AGRs [%] – 2016-2023 .....             | 76 |
| Table 16 – Asia-Pacific Horizontal and Vertical System Integration Industry 4.0 Market Size [\$M] – 2016-2023..... | 78 |
| Table 17 – Asia-Pacific Horizontal and Vertical System Integration Industry 4.0 Market AGRs [%] – 2016-2023 .....  | 79 |
| Table 18 – Asia-Pacific Sensors & Industrial IoT Industry 4.0 Market Size [\$M] – 2016-2023.....                   | 86 |
| Table 19 – Asia-Pacific Sensors & Industrial IoT Industry 4.0 Market AGRs [%] – 2016-2023 .....                    | 88 |
| Table 20 – Asia-Pacific Simulation Industry 4.0 Market Size [\$M] – 2016-2023.....                                 | 90 |
| Table 21 – Asia-Pacific Simulation Industry 4.0 Market AGRs [%] – 2016-2023.....                                   | 91 |
| Table 22 – Asia-Pacific Virtual Reality & Augmented Reality Industry 4.0 Market Size [\$M] – 2016-2023.....        | 95 |

|   |    |
|---|----|
| Table 23 – Asia-Pacific Virtual Reality & Augmented Reality Industry 4.0<br>Market AGRs [%] – 2016-2023 ..... | 96 |
|---|----|

## List of Figures

|  |    |
|--|----|
| Figure 1 - Industrial Robots Evolution .....   | 10 |
| Figure 2 - Digital Transformation: Propositions & Enablers .....   | 12 |
| Figure 3 - The Confluence of Key Technologies Enabling the Industrial 4.0<br>Digital Transformation.....               | 16 |
| Figure 4 - Programmable Logic Controller Block Diagram.....  | 21 |
| Figure 5 - Asia-Pacific Industry 4.0 Market Size [\$M] by Technology –<br>2016-2023.....                               | 26 |
| Figure 6 - 3D Printing Processes .....   | 31 |
| Figure 7 - Categories of Additive Materials .....  | 33 |
| Figure 8 – Asia-Pacific Additive Manufacturing - 3D Printing Industry 4.0<br>Market Size [\$M] – 2016-2023.....        | 35 |
| Figure 10 - Industry 4.0 Human Machine Interface Tablet .....  | 38 |
| Figure 11 - Industry 4.0 Human Interface Screen Flow.....  | 39 |
| Figure 12 - Vertical Man Machine Interface .....   | 40 |
| Figure 13 – Asia-Pacific Advanced Human Machine Interface Industry 4.0<br>Market Size [\$M] – 2016-2023.....           | 42 |
| Figure 15 – Asia-Pacific Artificial Intelligence Industry 4.0 Market Size [\$M]<br>– 2016-2023.....                    | 50 |
| Figure 17 - Industrial Robots Application in Aviation Industry .....   | 57 |
| Figure 18 - Robots [000 Units] Asia-Pacific Installed Base –2014-2020 .....  | 58 |
| Figure 19 - Industrial Robots in Use by Industry [000 Units] - 2015.....   | 58 |
| Figure 20 - Industrial Robots 2016 Deliveries [000 Units] by Country.....  | 59 |
| Figure 21 – Asia-Pacific Robots Industry 4.0 Market Size [\$M] – 2016-2023 .....                                       | 63 |
| Figure 23 – Asia-Pacific Big Data & Analytics Industry 4.0 Market Size [\$M]<br>– 2016-2023.....                       | 67 |
| Figure 25 - Cloud Manufacturing Process.....   | 73 |
| Figure 26 – Asia-Pacific Cybersecurity & Cloud Computing Industry 4.0<br>Market Size [\$M] – 2016-2023.....            | 75 |
| Figure 28 – Asia-Pacific Horizontal and Vertical System Integration Industry<br>4.0 Market Size [\$M] – 2016-2023..... | 78 |
| Figure 30 - Wireless Sensors Network in an Industry 4.0 Automotive<br>Production Line.....                             | 80 |
| Figure 31 - Industrial IoT Risks .....   | 82 |
| Figure 32 - Manufacturing Benefits of Industrial IoT .....   | 82 |
| Figure 33 – Asia-Pacific Sensors & Industrial IoT Industry 4.0 Market Size<br>[\$M] – 2016-2023.....                   | 87 |
| Figure 35 – Asia-Pacific Simulation Industry 4.0 Market Size [\$M] – 2016-<br>2023.....                                | 90 |
| Figure 37 – Asia-Pacific Virtual Reality & Augmented Reality Industry 4.0<br>Market Size [\$M] – 2016-2023.....        | 95 |

# Asia-Pacific Industry 4.0 Market & Technologies

## 2017-2023

### Vol.3

**Industry 4.0 Research (A division of HSRC)**  
**601 Pennsylvania Ave. Washington D.C., U.S.A**  
**Tel: 202-740-9606**  
**[www.Industry40marketresearch.com](http://www.Industry40marketresearch.com)**





|          |   |           |
|----------|---|-----------|
| 3.4      | Industry 4.0 Links.....   | 33        |
| 3.5      | Japanese Foreign Direct Investment (FDI) to Malaysia .....          | 33        |
| 3.6      | Japan Industry 4.0 Market .....                                     | 35        |
| 3.6.1    | Japan Market Size by Revenue Source – 2016-2023 .....               | 35        |
| 3.6.2    | Japan Industry 4.0 Market Dynamics – 2016-2023 .....                | 35        |
| 3.6.3    | Japan Industry 4.0 Market Breakdown – 2016-2023 .....               | 36        |
| <b>4</b> | <b>South Korea Industry 4.0 Market – 2016-2023.....</b>             | <b>38</b> |
| 4.1      | Facts & Figures.....  | 38        |
| 4.2      | South Korea Industry 4.0 Market Background .....                    | 38        |
| 4.3      | South Korea, Industry 4.0 Market: Business Opportunities.....       | 41        |
| 4.4      | South Korea, Industry 4.0: Web Resources .....                      | 41        |
| 4.4.1    | Trade Shows .....   | 41        |
| 4.4.2    | Key Contacts .....  | 42        |
| 4.5      | South Korea Industry 4.0 Market .....                               | 42        |
| 4.5.1    | South Korea Market Size by Revenue Source – 2016-2023 .....         | 42        |
| 4.5.2    | South Korea Industry 4.0 Market Dynamics – 2016-2023 .....          | 43        |
| 4.5.3    | South Korea Industry 4.0 Market Breakdown – 2016-2023 .....         | 44        |
| <b>5</b> | <b>Rest of Asia Pacific Industry 4.0 Market – 2016-2023.....</b>    | <b>46</b> |
| 5.1      | Rest of Asia Pacific Market Size by Revenue Source – 2016-2023..... | 46        |
| 5.2      | Rest of Asia Pacific Industry 4.0 Market Dynamics – 2016-2023.....  | 46        |
| 5.3      | Rest of Asia Pacific Industry 4.0 Market Breakdown – 2016-2023..... | 47        |

## List of Tables

|   |    |
|---|----|
| Table 1 - India Industry 4.0 Market Size [\$M] by Revenue Source – 2016-2023.....                 | 11 |
| Table 2 – India Industry 4.0 Market AGRs [%] by Revenue Source – 2016-2023.....                   | 12 |
| Table 3 - China Industry 4.0 Market Size [\$M] by Revenue Source – 2016-2023.....                 | 30 |
| Table 4 – China Industry 4.0 Market AGRs [%] by Revenue Source – 2016-2023.....                   | 30 |
| Table 5 - Japan Industry 4.0 Market Size [\$M] by Revenue Source – 2016-2023.....                 | 35 |
| Table 6 – Japan Industry 4.0 Market AGRs [%] by Revenue Source – 2016-2023.....                   | 36 |
| Table 7 - South Korea Industry 4.0 Market Size [\$M] by Revenue Source – 2016-2023.....           | 43 |
| Table 8 – South Korea Industry 4.0 Market AGRs [%] by Revenue Source – 2016-2023.....             | 44 |
| Table 9 - Rest of Asia Pacific Industry 4.0 Market Size [\$M] by Revenue Source – 2016-2023 ..... | 46 |
| Table 10 – Rest of Asia Pacific Industry 4.0 Market AGRs [%] by Revenue Source – 2016-2023 .....  | 47 |

## List of Figures

|   |    |
|---|----|
| Figure 1 - India Industry 4.0 Market Breakdown [%] by Revenue Source – 2016-2023.....                 | 13 |
| Figure 2 - Pinghu Economic & Industry 4.0 Pedz Development Zone Companies.....                        | 19 |
| Figure 3 - “Made in China 2025” Industries, Domestic Market Share [%] .....                           | 21 |
| Figure 4 - China Industry 4.0 Market Breakdown [%] by Revenue Source – 2016-2023.....                 | 31 |
| Figure 5 - Japan Industry 4.0 Market Breakdown [%] by Revenue Source – 2016-2023.....                 | 37 |
| Figure 6 - South Korea Industry 4.0 Market Breakdown [%] by Revenue Source – 2016-2023 .....          | 45 |
| Figure 7 - Rest of Asia Pacific Industry 4.0 Market Breakdown [%] by Revenue Source – 2016-2023 ..... | 48 |

# Asia-Pacific Industry 4.0 Market & Technologies

## 2017-2023

### Vol.4

**Industry 4.0 Research (A division of HSRC)**  
**601 Pennsylvania Ave. Washington D.C., U.S.A**  
**Tel: 202-740-9606**  
**[www.Industry40marketresearch.com](http://www.Industry40marketresearch.com)**

## Table of Contents

|          |  |           |
|----------|--|-----------|
| <b>1</b> | <b>Vendors</b> .....                             | <b>10</b> |
| 1.1      | 3D Systems Corporation.....                      | 10        |
| 1.1.1    | Key Data.....                                    | 10        |
| 1.1.2    | Company Profile.....                             | 10        |
| 1.1.3    | Industry 4.0 Market: Products & Activities ..... | 11        |
| 1.1.4    | Recent Events .....                              | 11        |
| 1.2      | ABB Ltd.....                                     | 12        |
| 1.2.1    | Key Data.....                                    | 12        |
| 1.2.2    | Company Profile.....                             | 12        |
| 1.2.3    | Industry 4.0 Market: Products & Activities ..... | 13        |
| 1.2.4    | Recent Events .....                              | 15        |
| 1.3      | Advantech Co Ltd .....                           | 16        |
| 1.3.1    | Key Data.....                                    | 16        |
| 1.3.2    | Company Profile.....                             | 16        |
| 1.3.3    | Industry 4.0 Market: Products & Activities ..... | 17        |
| 1.3.4    | Recent Events .....                              | 17        |
| 1.4      | Aibrain Inc.....                                 | 18        |
| 1.4.1    | Key Data.....                                    | 18        |
| 1.4.2    | Company Profile.....                             | 19        |
| 1.4.3    | Industry 4.0 Market: Products & Activities ..... | 19        |
| 1.4.4    | Recent Events .....                              | 19        |
| 1.5      | Alphabet Inc.....                                | 19        |
| 1.5.1    | Key Data.....                                    | 20        |
| 1.5.2    | Company Profile.....                             | 20        |
| 1.5.3    | Industry 4.0 Market: Products & Activities ..... | 20        |
| 1.5.4    | Recent Events .....                              | 21        |
| 1.6      | Arcadia Data .....                               | 21        |
| 1.6.1    | Key Data.....                                    | 21        |
| 1.6.2    | Company Profile.....                             | 21        |
| 1.6.3    | Industry 4.0 Market: Products & Activities ..... | 22        |
| 1.6.4    | Recent Events .....                              | 22        |
| 1.7      | Arm Ltd. ....                                    | 22        |
| 1.7.1    | Key Data.....                                    | 23        |
| 1.7.2    | Company Profile.....                             | 23        |
| 1.7.3    | Industry 4.0 Market: Products & Activities ..... | 23        |
| 1.7.4    | Recent Events .....                              | 24        |
| 1.8      | Beijer Electronics AB .....                      | 24        |
| 1.8.1    | Key Data.....                                    | 24        |
| 1.8.2    | Company Profile.....                             | 24        |
| 1.8.3    | Industry 4.0 Market: Products & Activities ..... | 25        |
| 1.8.4    | Recent Events .....                              | 26        |
| 1.9      | Bosch Software Innovations GmbH .....            | 26        |
| 1.9.1    | Key Data.....                                    | 27        |

|        |  |    |
|--------|--|----|
| 1.9.2  | Company Profile.....                             | 27 |
| 1.9.3  | Industry 4.0 Market: Products & Activities ..... | 27 |
| 1.9.4  | Recent Events .....                              | 27 |
| 1.10   | Cisco Systems Inc. ....                          | 28 |
| 1.10.1 | Key Data.....                                    | 28 |
| 1.10.2 | Company Profile.....                             | 28 |
| 1.10.3 | Industry 4.0 Market: Products & Activities ..... | 29 |
| 1.10.4 | Recent Events .....                              | 30 |
| 1.11   | CyberX, Inc. ....                                | 30 |
| 1.11.1 | Key Data.....                                    | 30 |
| 1.11.2 | Company Profile.....                             | 30 |
| 1.11.3 | Industry 4.0 Market: Products & Activities ..... | 31 |
| 1.11.4 | Recent Events .....                              | 31 |
| 1.12   | Dassault Systèmes .....                          | 32 |
| 1.12.1 | Key Data.....                                    | 32 |
| 1.12.2 | Company Profile.....                             | 32 |
| 1.12.3 | Industry 4.0 Market: Products & Activities ..... | 33 |
| 1.12.4 | Recent Events .....                              | 33 |
| 1.13   | DENSO Corporation .....                          | 35 |
| 1.13.1 | Key Data.....                                    | 35 |
| 1.13.2 | Company Profile.....                             | 35 |
| 1.13.3 | Industry 4.0 Market: Products & Activities ..... | 36 |
| 1.13.4 | Recent Events .....                              | 37 |
| 1.14   | EOS GmbH.....                                    | 37 |
| 1.14.1 | Key Data.....                                    | 37 |
| 1.14.2 | Company Profile.....                             | 37 |
| 1.14.3 | Industry 4.0 Market: Products & Activities ..... | 38 |
| 1.14.4 | Recent Events .....                              | 38 |
| 1.15   | ExOne Company.....                               | 39 |
| 1.15.1 | Key Data.....                                    | 39 |
| 1.15.2 | Company Profile.....                             | 39 |
| 1.15.3 | Industry 4.0 Market: Products & Activities ..... | 40 |
| 1.15.4 | Recent Events .....                              | 40 |
| 1.16   | GE - General Electric Company.....               | 40 |
| 1.16.1 | Key Data.....                                    | 40 |
| 1.16.2 | Company Profile.....                             | 41 |
| 1.16.3 | Industry 4.0 Market: Products & Activities ..... | 41 |
| 1.16.4 | Recent Events .....                              | 44 |
| 1.17   | Honeywell International Inc.....                 | 45 |
| 1.17.1 | Key Data.....                                    | 45 |
| 1.17.2 | Company Profile.....                             | 45 |
| 1.17.3 | Industry 4.0 Market: Products & Activities ..... | 46 |
| 1.17.4 | Recent Events .....                              | 47 |
| 1.18   | HPE - Hewlett Packard Enterprise .....           | 49 |
| 1.18.1 | Key Data.....                                    | 49 |
| 1.18.2 | Company Profile.....                             | 49 |

|        |   |    |
|--------|---|----|
| 1.18.3 | Industry 4.0 Market: Products & Activities .....        | 50 |
| 1.18.4 | Recent Events .....                                     | 51 |
| 1.19   | Huawei Technology Co., Ltd. ....                        | 52 |
| 1.19.1 | Key Data.....   | 52 |
| 1.19.2 | Company Profile.....                                    | 52 |
| 1.19.3 | Industry 4.0 Market: Products & Activities .....        | 53 |
| 1.19.4 | Recent Events .....                                     | 54 |
| 1.20   | IBM - International Business Machines Corporation ..... | 55 |
| 1.20.1 | Key Data.....   | 55 |
| 1.20.2 | Company Profile.....                                    | 56 |
| 1.20.3 | Industry 4.0 Market: Products & Activities .....        | 56 |
| 1.20.4 | Recent Events .....                                     | 57 |
| 1.21   | Intel Corporation .....                                 | 58 |
| 1.21.1 | Key Data.....   | 58 |
| 1.21.2 | Company Profile.....                                    | 59 |
| 1.21.3 | Industry 4.0 Market: Products & Activities .....        | 59 |
| 1.21.4 | Recent Events .....                                     | 60 |
| 1.22   | Intelligent Automation Inc.....                         | 62 |
| 1.22.1 | Key Data.....   | 62 |
| 1.22.2 | Company Profile.....                                    | 62 |
| 1.22.3 | Industry 4.0 Market: Products & Activities .....        | 63 |
| 1.22.4 | Recent Events .....                                     | 63 |
| 1.23   | Intersect Software Inc. ....                            | 64 |
| 1.23.1 | Key Data.....   | 64 |
| 1.23.2 | Company Profile.....                                    | 64 |
| 1.23.3 | Industry 4.0 Market: Products & Activities .....        | 65 |
| 1.23.4 | Recent Events .....                                     | 65 |
| 1.24   | Kuka AG .....   | 66 |
| 1.24.1 | Key Data.....   | 66 |
| 1.24.2 | Company Profile.....                                    | 66 |
| 1.24.3 | Industry 4.0 Market: Products & Activities .....        | 67 |
| 1.24.4 | Recent Events .....                                     | 67 |
| 1.25   | Magic Leap Inc.....                                     | 68 |
| 1.25.1 | Key Data.....   | 68 |
| 1.25.2 | Company Profile.....                                    | 68 |
| 1.25.3 | Industry 4.0 Market: Products & Activities .....        | 68 |
| 1.25.4 | Recent Events .....                                     | 68 |
| 1.26   | Microsoft Corporation.....                              | 69 |
| 1.26.1 | Key Data.....   | 69 |
| 1.26.2 | Company Profile.....                                    | 69 |
| 1.26.3 | Industry 4.0 Market: Products & Activities .....        | 70 |
| 1.26.4 | Recent Events .....                                     | 70 |
| 1.27   | Mitsubishi Electric Corporation.....                    | 71 |
| 1.27.1 | Key Data.....   | 71 |
| 1.27.2 | Company Profile.....                                    | 72 |
| 1.27.3 | Industry 4.0 Market: Products & Activities .....        | 72 |



|        |  |    |
|--------|--|----|
| 1.27.4 | Recent Events .....                              | 73 |
| 1.28   | NEC Corporation.....                             | 74 |
| 1.28.1 | Key Data.....                                    | 74 |
| 1.28.2 | Company Profile.....                             | 74 |
| 1.28.3 | Industry 4.0 Market: Products & Activities ..... | 75 |
| 1.28.4 | Recent Events .....                              | 75 |
| 1.29   | NGRAIN Corporation .....                         | 77 |
| 1.29.1 | Key Data.....                                    | 77 |
| 1.29.2 | Company Profile.....                             | 77 |
| 1.29.3 | Industry 4.0 Market: Products & Activities ..... | 77 |
| 1.29.4 | Recent Event.....                                | 78 |
| 1.30   | Oculus VR.....                                   | 78 |
| 1.30.1 | Key Data.....                                    | 78 |
| 1.30.2 | Company Profile.....                             | 78 |
| 1.30.3 | Industry 4.0 Market: Products & Activities ..... | 78 |
| 1.30.4 | Recent Events .....                              | 78 |
| 1.31   | Oracle Corporation.....                          | 79 |
| 1.31.1 | Key Data.....                                    | 79 |
| 1.31.2 | Company Profile.....                             | 79 |
| 1.31.3 | Industry 4.0 Market: Products & Activities ..... | 79 |
| 1.31.4 | Recent Events .....                              | 79 |
| 1.32   | QUALCOMM Inc.....                                | 80 |
| 1.32.1 | Key Data.....                                    | 80 |
| 1.32.2 | Company Profile.....                             | 80 |
| 1.32.3 | Industry 4.0 Market: Products & Activities ..... | 81 |
| 1.32.4 | Recent Events .....                              | 81 |
| 1.33   | Rethink Robotics Inc. ....                       | 83 |
| 1.33.1 | Key Data.....                                    | 83 |
| 1.33.2 | Company Profile.....                             | 83 |
| 1.33.3 | Industry 4.0 Market: Products & Activities ..... | 83 |
| 1.33.4 | Recent Events .....                              | 83 |
| 1.34   | Rockwell Automation Inc.....                     | 84 |
| 1.34.1 | Key Data.....                                    | 84 |
| 1.34.2 | Company Profile.....                             | 84 |
| 1.34.3 | Industry 4.0 Market: Products & Activities ..... | 85 |
| 1.34.4 | Recent Events .....                              | 85 |
| 1.35   | Samsung Electronics Co. Ltd.....                 | 87 |
| 1.35.1 | Key Data.....                                    | 87 |
| 1.35.2 | Company Profile.....                             | 87 |
| 1.35.3 | Industry 4.0 Market: Products & Activities ..... | 87 |
| 1.35.4 | Recent Events .....                              | 88 |
| 1.36   | SAP SE.....                                      | 89 |
| 1.36.1 | Key Data.....                                    | 89 |
| 1.36.2 | Company Profile.....                             | 89 |
| 1.36.3 | Industry 4.0 Market: Products & Activities ..... | 90 |
| 1.36.4 | Recent Events .....                              | 91 |

|        |  |     |
|--------|--|-----|
| 1.37   | Sensory Inc.....                                 | 92  |
| 1.37.1 | Key Data.....                                    | 92  |
| 1.37.2 | Company Profile.....                             | 92  |
| 1.37.3 | Industry 4.0 Market: Products & Activities ..... | 92  |
| 1.37.4 | Recent Events .....                              | 92  |
| 1.38   | Siemens AG.....                                  | 93  |
| 1.38.1 | Key Data.....                                    | 93  |
| 1.38.2 | Company Profile.....                             | 93  |
| 1.38.3 | Industry 4.0 Market: Products & Activities ..... | 94  |
| 1.38.4 | Recent Events .....                              | 95  |
| 1.39   | SIGFOX SA .....                                  | 96  |
| 1.39.1 | Key Data.....                                    | 96  |
| 1.39.2 | Company Profile.....                             | 96  |
| 1.39.3 | Industry 4.0 Market: Products & Activities ..... | 97  |
| 1.39.4 | Recent Events .....                              | 97  |
| 1.40   | Splunk Inc.....                                  | 99  |
| 1.40.1 | Key Data.....                                    | 99  |
| 1.40.2 | Company Profile.....                             | 99  |
| 1.40.3 | Industry 4.0 Market: Products & Activities ..... | 99  |
| 1.40.4 | Recent Events .....                              | 99  |
| 1.41   | Sri International.....                           | 100 |
| 1.41.1 | Key Data.....                                    | 100 |
| 1.41.2 | Company Profile.....                             | 100 |
| 1.41.3 | Industry 4.0 Market: Products & Activities ..... | 100 |
| 1.41.4 | Recent Events .....                              | 100 |
| 1.42   | Stratasys Ltd.....                               | 100 |
| 1.42.1 | Key Data.....                                    | 100 |
| 1.42.2 | Company Profile.....                             | 101 |
| 1.42.3 | Industry 4.0 Market: Products & Activities ..... | 101 |
| 1.42.4 | Recent Events .....                              | 101 |
| 1.43   | Texas Instruments Inc.....                       | 102 |
| 1.43.1 | Key Data.....                                    | 102 |
| 1.43.2 | Company Profile.....                             | 103 |
| 1.43.3 | Industry 4.0 Market: Products & Activities ..... | 103 |
| 1.43.4 | Recent Events .....                              | 104 |
| 1.44   | TRUMPF GmbH.....                                 | 105 |
| 1.44.1 | Key Data.....                                    | 105 |
| 1.44.2 | Company Profile.....                             | 105 |
| 1.44.3 | Industry 4.0 Market: Products & Activities ..... | 105 |
| 1.44.4 | Recent Events .....                              | 105 |
| 1.45   | U-Blox.....                                      | 107 |
| 1.45.1 | Key Data.....                                    | 107 |
| 1.45.2 | Company Profile.....                             | 107 |
| 1.45.3 | Industry 4.0 Market: Products & Activities ..... | 107 |
| 1.45.4 | Recent Events .....                              | 107 |
| 1.46   | WITTENSTEIN SE.....                              | 108 |

|        |  |     |
|--------|--|-----|
| 1.46.1 | Key Data.....                                    | 108 |
| 1.46.2 | Company Profile.....                             | 108 |
| 1.46.3 | Industry 4.0 Market: Products & Activities ..... | 108 |
| 1.46.4 | Recent Events .....                              | 109 |
| 1.47   | Worldsensing SL.....                             | 109 |
| 1.47.1 | Key Data.....                                    | 109 |
| 1.47.2 | Company Profile.....                             | 109 |
| 1.47.3 | Industry 4.0 Market: Products & Activities ..... | 110 |
| 1.47.4 | Recent Events .....                              | 110 |
| 1.48   | Xerafy Ltd. ....                                 | 111 |
| 1.48.1 | Key Data.....                                    | 111 |
| 1.48.2 | Company Profile.....                             | 111 |
| 1.48.3 | Industry 4.0 Market: Products & Activities ..... | 111 |
| 1.48.4 | Recent Events .....                              | 112 |
| 1.49   | XJET Ltd. ....                                   | 112 |
| 1.49.1 | Key Data.....                                    | 112 |
| 1.49.2 | Company Profile.....                             | 112 |
| 1.49.3 | Industry 4.0 Market: Products & Activities ..... | 112 |
| 1.49.4 | Recent Events .....                              | 112 |

## APPENDICES

|          |  |            |
|----------|--|------------|
| <b>2</b> | <b>Appendix A: Industry 4.0 Smart Maintenance.....</b>   | <b>114</b> |
| 2.1      | Intelligent Maintenance Systems .....  | 114        |
| 2.2      | Predictive Maintenance (PdM).....  | 116        |
| 2.3      | Industry 4.0 Predictive Maintenance .....  | 117        |
| <b>3</b> | <b>Appendix B: How to Convert an Industry 2.0 or Industry 3.0<br/>Business to Industry 4.0 .....</b> | <b>119</b> |
| <b>4</b> | <b>Appendix C: Abbreviations.....</b>  | <b>125</b> |
| <b>5</b> | <b>Appendix D: Terminology .....</b>   | <b>133</b> |
| <b>6</b> | <b>Appendix E: Research Sources &amp; Bibliography .....</b>   | <b>143</b> |
| <br>     |  |            |
| <b>7</b> | <b>Research Methodology .....</b>  | <b>147</b> |
| 7.1      | Scope.....   | 147        |
| 7.2      | Research Methodology .....   | 147        |
| <b>8</b> | <b>Disclaimer &amp; Copyright.....</b>   | <b>149</b> |

## List of Figures

|   |     |
|---|-----|
| Figure 1 - ABB Industry 4.0 Products Integration Topology .....     | 14  |
| Figure 2 - DENSO Industry 4.0 Market: Products & Activities.....    | 36  |
| Figure 3 - Example: Power Plant Intelligent Maintenance System..... | 115 |
| Figure 4 - Introduction of Industry 4.0 .....                       | 122 |