



ALCHEMY RESEARCH AND ANALYTICS™

**IIoT**

**AN OVERVIEW**

**Alchemy Research and Analytics**

# Table of Contents

## 01 MARKET TRENDS

- Key Trends
- Developments

## 02 ECOSYSTEM

- IIoT STRUCTURE
- MARKET
- VERTICALS

## 03 M&A ENVIRONMENT

- M&A TRENDS
- RECENT
- TRANSACTIONS KEY
- TRANSACTIONS

## 04 FUNDRAISING

- RECENT FUNDRAISINGS

## 05 PUBLIC PEERS

- SNAPSHOT
- PUBLIC PEERS ANALYSIS

**CLOUD COMPUTING**

- Cloud computing in industrial IoT is gaining traction for its prominent applications in data storage, processing, analytics and networking. With cloud computing, there is a greater scope for implementing cost-effective automation in the systems through real-time control and data monitoring. Together with the offerings in analytics, the combination of IIoT and cloud computing yields major benefits including scalability for device data, higher efficiency in the daily tasks, and faster use and distribution of apps.
- IIoT presents a substantial opportunity for the central cloud as a service model for software, platforms, and infrastructure businesses. It is also key for the distributed computing wherein IIoT edge computing will enable the ICT industry to utilize real-time processing and analytics.

**DIGITAL TWINS**

- The most discernible impact of digital twin technologies lies in improving the collaboration and workflows across diverse groups such as across product design, sales, maintenance, and engineering. Furthermore, with the IoT sensors in place, it becomes feasible to deliver real-time system prescriptions and a timely maintenance.
- Some of the major applications of digital twins in the Industrial IoT context include – process planning and optimization (integration of historical data in manufacturing line to detect inefficiencies), predictive maintenance (holistic equipment view for deviations; it also enables OEMs’ service-based revenue stream), product design and virtual prototyping (simulations base on empirical data and customized equipment offerings).

**ARTIFICIAL INTELLIGENCE AND ANALYTICS**

- Analytics is at the core of IIoT applications, due to the expanding ambit of Artificial Intelligence (AI) and Machine Learning-based technology deployments. Progressively, the IIoT ecosystem has hyper-automation implemented through a combination of AI and robotic process automation. The pandemic helped create the inflection point of enabling commercial use-cases of such technology options.
- Importantly, the AI implementation is being undertaken at the edge, substituting the conventional mode of running such applications in the computing / power-intensive systems. Two major developments that fueled such a trend are – rationalization in cost of semiconductors that enable getting AI to the smallest of the devices, and efficiency in the computing power of the AI algorithms

**FOCUS ON CYBERSECURITY WITH RISE IN TECHNOLOGY DEPLOYMENT**

- The IIoT-led intersection of physical and digital environment also exposes enterprises to vulnerabilities in unsecured devices, systems, applications, unauthorized data exfiltration and intellectual property loss. Gartner’s projections indicate the progressively the cyberattacks are likely to be in the operational technology environments (such as in manufacturing or infrastructure) where the interconnected systems enable a wider damage.
- The need for security systems might just enhance with upgrades in network connectivity to standards at 5G and above. Mitigation of such risks entails a gamut of measures including development of governance standards, better IIoT visibility, expansion in network segmentation capabilities, and an integration of operation technology and information technology on threat management frameworks.



### THE STRUCTURE OF INDUSTRIAL INTERNET OF THINGS

- **Focus on manufacturing operations:** Optimizing manufacturing operations in the factory setting holds the maximum share of value addition that can be realized from potential IoT rollouts. As per McKinsey estimates, it is worth \$0.5 trillion – \$1.3 trillion.
- **The B2B vs B2C technology application:** B2B applications are projected to account for about two-thirds of the total economic value realized from IoT technology deployment. At the same time, the competing applications in B2C grew faster than expected.

- **Networks among the major tailwind factors:** 4G networks have spread in reach to meet requirements at higher efficiencies, while 5G deployments gain traction. With improved network protocols, there is a wider range of options for requirements in terms of capacity, speed, latency, etc.
- **Central role of real-time analytics in driving value:** The tools enabled by the Artificial Intelligence and Machine Learning technologies find critical deployment in combination with cloud computing for the visibility and insights on operational efficiency.

END MARKETS	DEVICES / SENSORS	NETWORK	PLATFORMS	ANALYTICS	SECURITY
 Manufacturing	 HUAWEI  ANALOG DEVICES AHEAD OF WHAT'S POSSIBLE™  EUROTECH	 antenova®  iNGENU	 aeris  greenWAVE systems™	 AUGURY  data iku  MAANA	 ARMIS.  CISCO
 Smart City	 CISCO  DIGI Connect with Confidence  NVIDIA	 cradlepoint  FLUIDMESH NETWORKS	 ALTIZON The Industrial IoT Company  Kneron  Atos	 ARUNDO  Seeq®	 FORTINET  auth0
 Smart Grid	 RL RED LION  Qualcomm  ADLINK LEADING EDGE COMPUTING	 REDPINE SIGNALS® DRIVING WIRELESS CONVERGENCE®  secomea	 aws  ptc  IoTium	 QO  FOGHORN	 VERA CITY  NOZOMI NETWORKS
 Smart Grid	 MOXA®  AAEON	 Schneider Electric  synaptec	 ORACLE  Alibaba Cloud  KORE	 bigml  C3.ai	 OspreyData  rapidminer
 Smart Grid	 ADVANTECH  XILINX.	 EXABLAZE  RIGADO	 LOSANT  Davtra™  BRAINCUBE	 OspreyData  rapidminer	 SCADAfence  DRAGOS
 Retail	 TEXAS INSTRUMENTS  NATIONAL INSTRUMENTS	 ACCENTURE  NimbleLink™  libelium	 nebbiolo technologies  LITMUS  AVEVA	 DASHBOARD INTELLIGENT INDUSTRY™  KONUX	 FORESCOUT.
 Healthcare	 SIERRA WIRELESS®  Micron®	 everactive	 Microsoft  TULIP  Flutura	 CURIOUS AI  Sixgill.	 SECURIX THINGS
 Automotive	 Hewlett Packard Enterprise  Cal/Amp®	 everactive	 Neuron soundware  TULIP  PubNub	 UPTAKE  OSARO	 CLAROTY
				 Flexciton  TACHYUS	

## M&amp;A TRENDS




















➤ Enhance an existing product line with new features and functionality.

➤ Vertically integrate a strategic supplier or proven SI partner.

➤ Add capabilities & expertise in a strategic high-growth area.

➤ Enter an adjacent segment with a technology that disrupts the incumbents.

## RELEVANT M&amp;A TRANSACTIONS

DATE	TARGET	BUYER	TARGET DESCRIPTION	VALUE (\$ MILLION)
23-Feb-22			Provider of low-cost and low-power industrial IoT tracking solutions for non-powered mobile assets.	N/A
11-Oct-21			Developer and supplier of embedded hardware and software intended to serve the industrial internet of things.	\$208.2M
15-Sep-21			Provider of price optimization and management software for manufacturing, distribution, high-tech and industrial service companies.	N/A
12-Sep-21			An industrial IoT platform to build RTLS UWB based applications for supply chain visibility, optimization & navigation.	\$6.6M
01-Sep-21			Global provider of Machine-to-Machine (M2M) and industrial Internet of Things (IIoT) solutions	\$1,187M
09-Aug-21			Provider of industrial automation services to transportation and logistics industries.	\$301M
07-Aug-21			Specializes in simplifying establishing and managing secure network infrastructure for Industrial IoT.	\$22M
12-Jul-21			Developer of a cloud-based platform for the procurement and management of industrial facilities and maintenance services.	\$1,200M
22-Jun-21		Investor Group	Developer of an AI-powered data infrastructure platform designed for commercial and industrial IoT.	\$6.5M
03-Nov-20			Specializes in optical water quality sensing solutions and pioneer in developing accurate, and industry-enabled sensors.	\$31.4M

Source: Various press releases and websites

## KEY TRANSACTIONS TO HIGHLIGHT

## HITACHI Acquired GlobalLogic

Deal Value: \$9.6 Bn

Valuation: 12.3x(EV/Sales)

### About the transaction:

**July 2021:** GlobalLogic, a California-based software engineering firm focused on helping customers implement digital twins while working on AI initiatives.

### Backdrop and rationale:

"Hitachi expects the addition of GlobalLogic's advanced digital engineering capabilities, and its solid client base including major technology companies, to strengthen the digital portfolio of "Lumada." Press Release

## Rockwell Automation Acquired PLEX

Deal Value: \$2.2 Bn





























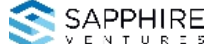



























Valuation: 14.6x(EV/Sales)

### About the transaction:

**September 2021:** Michigan-based Plex System, which offers a cloud-native smart manufacturing platform.

### Backdrop and rationale:

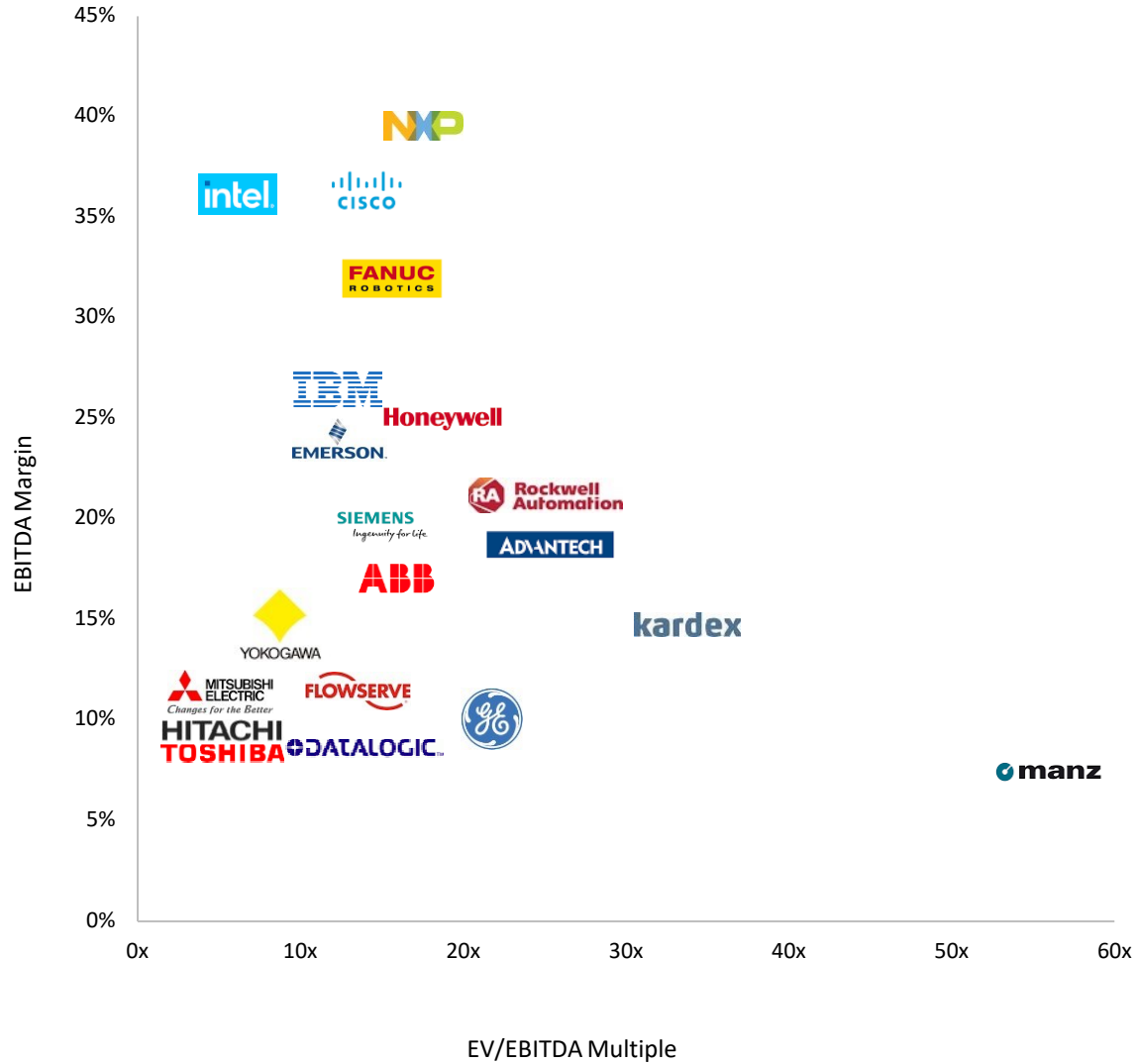
"Plex's software capabilities will be further differentiated by Rockwell's global market access, complementary industry expertise, and ability to turn real-time data into actionable insights." Blake Moret, Chairman & CEO of Rockwell Automation

CATEGORIES	DATE	ORGANIZATION	FUND RAISED	LEAD INVESTORS	TOTAL FUNDING
DATA ANALYTICS/ APPLICATION	10-Mar-22	 Cybus	\$8.8M	 pwc  bto  Pfannenberg ELECTRO-TECHNOLOGY FOR INDUSTRY	\$8.8M
	21-Oct-21	 Flexciton	\$20.7M	 BACKED  eTi  ENTREPRENEUR FIRST	\$29M
	09-Mar-21	 crosser	\$3M	 Montan-Ventures-Saar  42 CAP  Industriefonden	\$8.7M
	5-May-21	 Industrial	\$6M	 Lineage  CLEAN ENERGY VENTURES  ENGIE New Ventures	\$7.7M
	3-Nov-20	 apporchid Enterprise AI	\$2.5M	 MV. MONETA VENTURES	\$8.9M
SOFTWARE BACK-END	12-May-22	 xage SECURITY	\$40.2M	 OurCrowd  CITY LIGHT  PIVA	\$61.2M
	3-Mar-22	 PROAXION	\$1.7M	 VENTURESOUTH  TAP TRIANGLE ANGEL PARTNERS  RTPCapital ASSOCIATES LLC	\$2.8M
	4-Nov-21	 PubNub	\$65M	 RAINE  SAPPHIRE VENTURES  BOSCH Israel - Japan - Mexico - Russia - USA	\$134.1M
	08-Sep-21	 SEE ID	\$1.1M	NA	\$1.1M
	06-May-21	 长扬科技 CHANGYANG TECH	\$27M	 深圳市创新投资集团有限公司 SHENZHEN CAPITAL GROUP CO., LTD.  Cornerstone CAPITAL GROUP  Baidu.ventures 百度风投	\$82.3M
GATEWAY AND NETWORK	02-May-22	 fw federated wireless	\$14M	 LIGHTSHED  FORTRESS  cerberus	\$205.7
	01-Dec-21	 ESWIN	\$392.6M	 IDG Capital  金石投资 Goldstone  IIF 中国互联网投资基金 CHINA INTERNET INVESTMENT FUND	\$1,138.8M
	01-Aug-20	 everactive	\$16M	 FLUKE  3M  ERICSSON	\$114.1M
HARDWARE	30-Jun-21	 DETECT TECHNOLOGIES	\$12M	 Accel  ELEVATION  BlueHill FUND	\$15.3M
	10-Jun-21	 LEDGER	\$380M	 anim8ca BRANDS  MACSF  10T  MVP	\$468M

COMPANY	ENTERPRISE VALUE	MARKET CAPITALIZATION	% ABOVE 52 WEEK LOW	52-WEEK PRICE CHANGE	REVENUE (LTM)	EBITDA MARGIN	EV/EBITDA	EV/REVENUE
Advantech	8,222	8,576	8.70	-11.7%	2,177	18.8%	21.83x	4.12x
Cisco Systems	172,913	183,610	8.62	-19.7%	51,581	31.4%	10.66x	3.35x
Datalogic	507	425	10.16	-63.9%	674	13.5%	6.11x	0.83x
Emerson Electric	54,084	50,009	10.55	-14.5%	18,908	23.3%	12.29x	2.86x
FANUC	27,967	32,246	9.86	-13.9%	6,315	31.5%	16.59x	5.21x
Flowserve	4,669	3,913	11.59	-28.2%	3,505	9.0%	14.64x	1.33x
General Electric	86,538	75,241	14.07	-32.8%	74,051	-	13.31x	1.17x
Hitachi	68,108	47,656	19.88	3.5%	87,510	12.4%	7.31x	0.91x
Honeywell International	133,678	123,390	8.31	-21.0%	34,314	26.9%	14.47x	3.90x
IBM	159,426	115,613	12.20	-4.8%	64,045	19.3%	13.46x	2.73x
Intel	158,676	160,125	10.19	-26.1%	74,505	41.0%	4.98x	2.04x
Kardex Holding	1,263	1,395	19.20	-27.3%	521	14.8%	18.26x	2.71x
Manz	320	281	18.56	-46.8%	267	0.4%	247.74x	1.35x
Mitsubishi Electric	20,880	23,356	8.09	-1.1%	38,196	10.3%	6.17x	0.63x
Rockwell Automation	29,528	25,573	15.72	-26.5%	7,321	17.6%	22.96x	4.03x
Sarcos Technology and Robotics	324	523	35.73	-65.8%	-	-	-	55.71x
Siemens	128,930	89,337	12.63	-23.5%	75,542	15.3%	12.45x	1.90x
Toshiba	17,958	16,991	13.76	11.7%	28,384	7.9%	9.19x	0.74x
Yokogawa Electric	4,229	4,645	16.32	41.5%	3,312	12.4%	11.90x	1.48x
ABB	61,113	55,801	10.62	-22.2%	28,811	23.3%	8.98x	2.12x
NXP Semiconductors	53,861	45,720	24.09	-11.3%	12,348	-	12.83x	4.63x
<b>Median</b>	<b>29,528</b>	<b>32,246</b>	<b>12.20</b>	<b>-21.0%</b>	<b>18,908</b>	<b>16.4%</b>	<b>12.64x</b>	<b>2.12x</b>

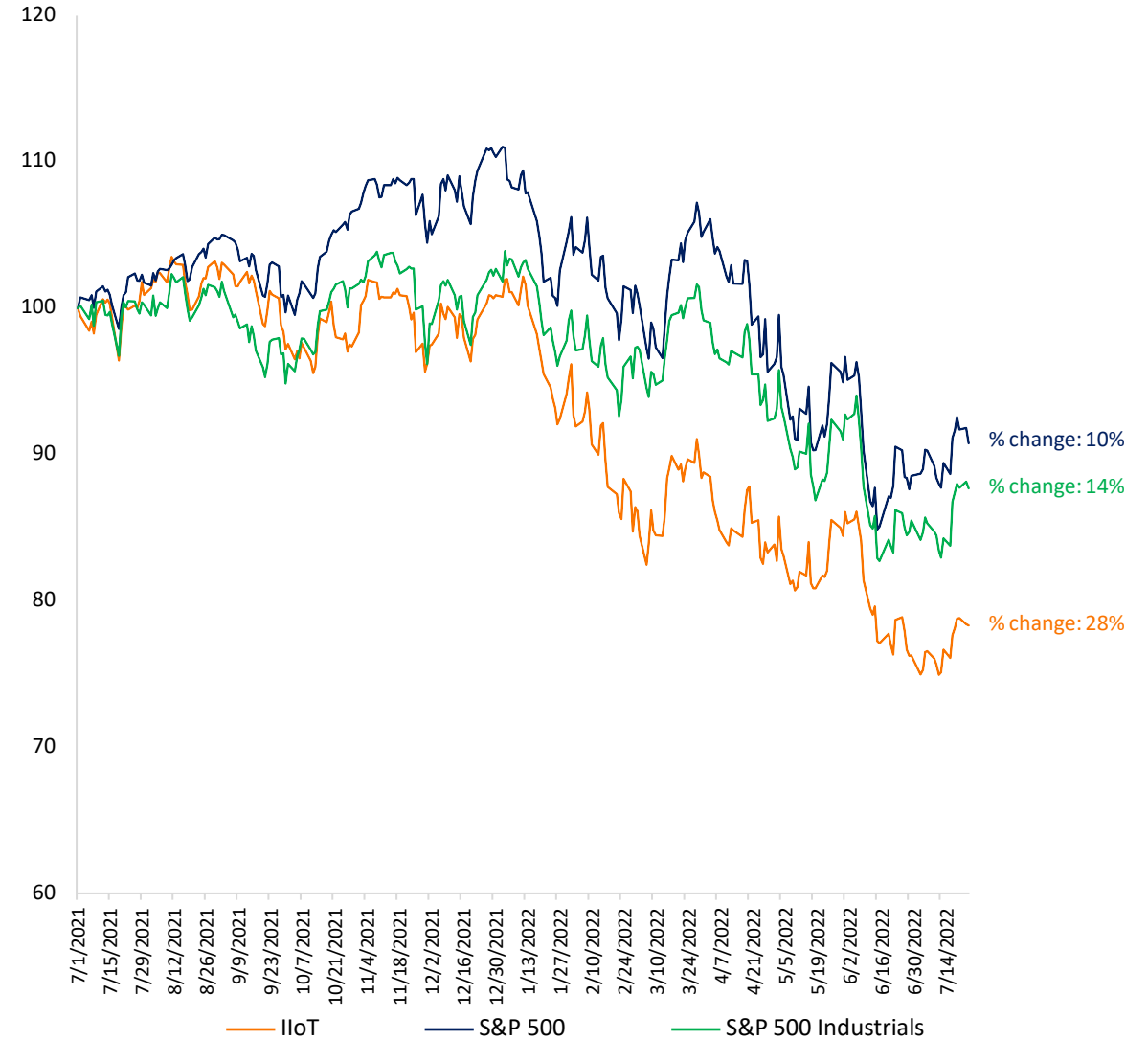
As of July 27, 2022 (\$ millions)

VALUATION MULTIPLES VIS-À-VIS EBITDA MARGIN



Source: Refinitiv Eikon, Company Websites

IIoT INDEX RELATIVE TO MAJOR STOCKMARKET INDICES



Source: Refinitiv Eikon, Company Websites





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