What's Next for the Internet of Things?

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Based on a commonality and variability analysis of the market, our R&D team came up with a list of the top 9 IoT trends that are worth investment. Relying on the global economy, companies, and their level of engagement with the Internet of Things, this graph enumerates IoT trends in order of priority, from the most frequently addressed aspects down. Sources are listed from global economy entities down to local levels.

	Sensor Network	Devices Mesh	Cognitive Computing	Big Data/Cloud	Autonomous Robots	Additive Manufacturing	Advanced UX	Virtual Reality	Security
WEF			✓		✓	✓			
Bain & Co	✓	✓		✓					
BCG	✓	✓		✓	✓	✓		✓	✓
PwC	✓	✓	✓						
KPMG	✓			✓				✓	
McKinsey & Co	✓				✓				
Forbes	✓	✓	✓		✓	✓	✓		
Gartner	✓	✓	✓		✓	✓	✓		
IDC	✓	✓	✓	✓					✓
O'REILLY Radar			✓	✓					

Some of the IoT trends mentioned are not new: Big Data/Cloud, Advanced UX, and Security have set their foot in the business world with a range of well-developed competencies across the IT industry. Some other trends, namely Sensors, Devices Mesh, Cognitive Computing, and Virtual Reality, still have a long way to go, but have already been seasoned in 2015.

To synchronize with business continuity and opportunities uncovered by the beginning of 2016, here are the four primary focus areas to work on in terms of the Internet of Things (IoT), Artificial Intelligence (AI), and Virtual Reality (VR):

- Sensor Network (IoT)
- Cognitive Computing
- Devices Mesh (IoT)
- Virtual Reality

There are two more areas which heat up the tech market, but require special attention: Autonomous Robots and Additive Manufacturing.

Sensor Network and Device Mesh

The Internet of Things (IoT) is a technological trend that won't lose its buzz in the market for at least five more years. It is a new paradigm shift from human-to-machine communication to machine-to-machine communication, where devices are getting smaller, autonomous, and able to communicate with each other without human involvement. The primary goal and the main motivation for IoT research is Device Mesh Networks. Devices connectivity and communication is a basic platform for every IoT use case:

- Sensor networks (gathering data from areas that are hard to reach)

- Assembling pipelines (car manufacturing pipelines)

- Smart house (smart lighting, smart locking)

- Smart city (traffic flow control, waste management, water quality, smart lighting)

- Automotive (vehicle-to-vehicle communication, road safety)

2016 will drive Internet of Things initiatives with a focus on Mesh Networking, along with technologies for these areas:

1. Sensors networks based on mesh technology

2. Fog Computing with edge connected devices

3. Car accident avoidance

Cognitive Computing

Cognitive Computing refers to the simulation of human thinking processes in a computerized model, which involves self-learning systems using data mining, pattern recognition, and both supervised and unsupervised machine learning to mimic the way the human brain works. The research is stimulated by Cognitive Computing as a groundwork of technologies such as Affective Computing, Robotics, Data Science, etc. Typical application cases for cognitive computing include the following:

1. **Business Intelligence** - improving user experience, creating interactive reports with deeper competitive insight, meaningful dashboards, and scorecards.

2. **Computer Vision and Object Recognition** - acquiring, processing, and analyzing images and high-dimensional data from the real world.

3. **Speech Recognition** - identifying words and phrases from audio signals.

4. **Natural Language Processing** - processing and analyzing textual information to derive meaning from human or natural language input.

5. **Predictive Analytics** - exploiting patterns found in historical and transactional data to identify risks and opportunities in order to make plausible predictions of the future.

6. Recommender Systems - information-filtering technology that enables selection of the items of interest to the user, based on comparing their own profile with the whole community of users.

7. Decision Analysis - identifying, clearly representing, and formally assessing important aspects of a decision, for prescribing a recommended course of action in various business areas.

8. Data Segmentation and Cluster Analysis - techniques for data partitioning so that it can be used more efficiently within marketing and other business domains.

9. Social Network Analysis - discovering social structures through the use of network and graph theories.

10. Fraud Detection - identifying suspicious patterns which indicate fraud or security threats and minimizing risks and preventing damage through enabling real-time reaction.

11. Anomaly Detection - identifying items, events or observations which do not conform to an expected pattern in data.

Technologies involved:

- Voice/Speech recognition
- Facial expression recognition
- Gesture recognition
- EEG, ECG, EDA, reography
- Sensors fusion

- Digital signal and image processing
- Context recognition
- Deep learning
- Data visualization

Virtual Reality

Virtual Reality (VR) is an artificial environment created with software and presented to a user in such a way that belief is suspended and VR is accepted as a real environment. On a computer, Virtual Reality is primarily experienced through two of the five senses: sight and sound.

There was a slow trickle of AR/VR investments from 2006 until late 2014. Then M**agic Leap** raised $542 million from Google and other tech giants becoming a starting gun for investment acceleration, with nearly $1 billion being poured into the sector in 2015, **according to Digi Capital**.

With Samsung Gear VR, Oculus, PlayStation VR and others set to hit the market, 2016 is going to be a big year for virtual reality. The industry is expected to see a big windfall over the next few years, and a **report from TrendForce estimates** that the virtual reality market could grow to US$70 billion in 2020.

Besides VR headsets, the VR applications and games market is growing, as is VR content, and consumer 3D cameras are approaching the market. The area where VR can be used is very wide: Military, Education, Healthcare, Entertainment, Fashion, Heritage, Business, Engineering, Sport, Media, Scientific Visualization, Telecommunications, Construction, Film, and Programming Languages – even the sky is not the limit.

During our investigation at SoftServe, we tend to work with **Unity IDE** and **Oculus SDK**. Some of our demo projects were related to porting existing games into VR or porting real CAD objects into a VR Scene.

Out of a wide range of technology trends that are rocking today's market, the Internet of Things seems to develop at the greatest possible speed.

The IoT Service Offering

At SoftServe we understand that the concept of the IoT is not enough; also knowing how to design for it, targeting both humans and machines, is essential. We provide ready-made identification and miniaturization solutions as well as IoT research services to computerized enterprises to help them maximize the reliability and responsiveness of their infrastructure and networks, connect equipment and assets, ensure smart energy consumption, and automate business processes. For more information please visit: **http://www.softserveinc.com/en-us/services/internet-of-things/**

About SoftServe

SoftServe is a leading technology solutions company specializing in software development and consultancy services. Since 1993 we've been partnering with organizations from start-ups to large enterprises to help them accelerate growth and innovation, transform operational efficiency, and deliver new products to market. To achieve this we've built a strong team of the brightest, most inquiring minds in the industry, and we form close, collaborative relationships with our clients so we can really understand their needs and deliver intuitive software that exceeds their expectations. Our experience stretches from Big Data/Analytics, Cloud, Security and UX Design to the Internet of Things, Digital Health and Digital Transformation, we have offices across the globe and development centers across Eastern Europe. For more information please visit **www.softserveinc.com.**

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