March 2015

IoT market analysis: Sizing the opportunity

Author – Knud Lasse Lueth

This report is aimed at IoT professionals who are looking for a detailed understanding of the Internet of Things market, segments, and forecasts

Executive summary

1. ***General market forecast (devices):*** For every person living on earth, there will be at least 2, maybe even 6 connected "things" by 2020
2. ***General market forecast (revenue):*** Revenue opportunities for companies are larger than combined revenues of Apple, Google, and Facebook today.
3. ***General market forecast (economic impact):*** IoT value to surpass the economic output of Germany within the next 10 years
4. ***Segment-specific forecasts:*** Manufacturing and healthcare the biggest opportunities
5. ***Segment-specific surveys:*** Oil&Gas and home automation stand out

IoT Analytics

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The starting point of market analysis is usually a sound understanding of general market parameters like market size, segments, and forecasts.

The Internet of Things is such a fresh phenomenon, however, and it has such strong dynamics that there is a lack of sound and proven market analyses.

This whitepaper summarizes the major IoT-related market forecasts and market segmentations that exist today, visualizes them in a comprehenisve way, and interprets the data.

1. General market forecasts (devices)

"50 billion devices will be connected by 2020"

Cisco's prediction for the Internet of Things

Two technology companies have published data around the IoT market potential in connected devices: Cisco and Ericsson. Both foresee around 50 billion connected devices by 2020. In addition, the global and established research companies Gartner, IHS Global Insight, ABI research and IDC as well as the specialized IoT research firm Harbor Research have developed their own forecasts.

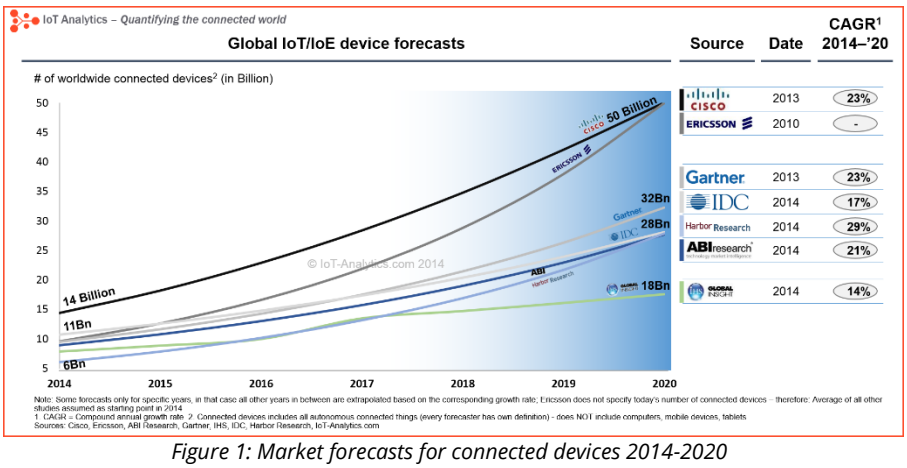


Figure 1: Market forecasts for connected devices 2014-2020

Today we have roughly between 6 and 14 billion autonomous connected devices or "Things" that are connected via some form of communication. These figures do not include smartphones, tablets, computers, and similar. The exact definitions of the research companies vary slightly.

Annual growth rates for connected devices between 14% and 29%

Up to 6 connected devices for every person on earth by 2020

In general, what forecasters agree on:

- ***Strong growth***. We will see a massive increase in connected devices in the next years. The expected growth rates are well beyond those of most other industries that are being forecasted (Annual growth rates ranging from 14% to 29%). For every person living on earth, there will be at least 2, maybe even 6 connected "things" by 2020.

- ***More things than smartphones.*** "Things" will clearly be the majority of all connected devices by 2020. Today the number of connected devices that are not "Things" (i.e. smartphones, computers, tablets, etc.) is almost equal to the number of connected things. (e.g., ABI says there are 7 billion smartphones, PCs and similar today). "Things" are expected to outgrow smartphones, computers, and the like by a landslide.

Where forecasters diverge:

- ***Absolute numbers***. The number of connected devices by 2020. The low estimate is 18 billion connected devices, the most bullish forecast states 50 billion devices. That is a massive difference of 275% from the point of view of the lowest forecast. One should note that both Cisco and Ericsson, which provide the highest estimate, have a direct interest to attain this number. Both are selling solutions in the IoT field and are betting on this industry. Therefore it is questionable how "objective" their forecasts are.

The research companies have taken a traditional top-down modelling approach to evaluating these markets. Gartner for example describes their methodology by saying they triangulated their forecast using three different approaches: A Long-Tail Product Category Analysis, a number-per-population study, and an economic envelope analysis.

Cisco, however has taken a different approach. The company quantified the industry completely bottom-up. Cisco analyzed 50 use cases for IoT in the private sector, calculated these individually and then approximated their potential in case of a world-wide roll-out.

2. General market forecasts (revenues)

Five companies have estimated how much revenue will be generated from companies that are active in the IoT industry: IDC, Visiongain, Harbor Research, Markets&Markets, and Gartner.

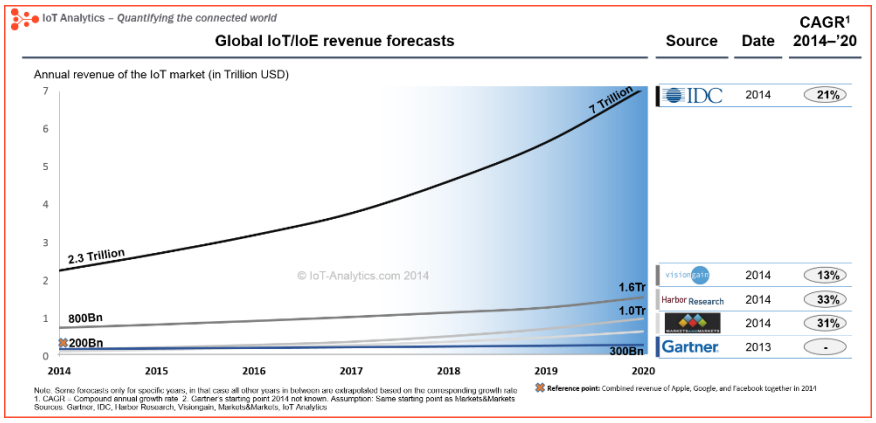


Figure 2: Market forecasts for revenues from connected devices 2014-2020

In general, what forecasters agree on:

- ***Strong revenue growth.*** We will see a massive increase in IoT generated revenue in the next years with double-digit growth.

Where forecasters diverge:

- ***The starting point today***. While Markets&Markets reports $129Billion of revenues in 2014, IDC already reports that it is a $2.3Trillion industry. That is an incredible difference of 1760% from the point of view of Markets&Markets. Clearly the definition of "Internet of things"-industry varies significantly.

- ***Where markets are headed***. While Gartner is talking about a $300Billion industry in 2020, IDC believes in a 7 trillion industry.

3. General market forecasts (economic impact)

Cisco, GE, Gartner, and McKinsey have published forecasts of the "value" of the Internet of Things for our economy.

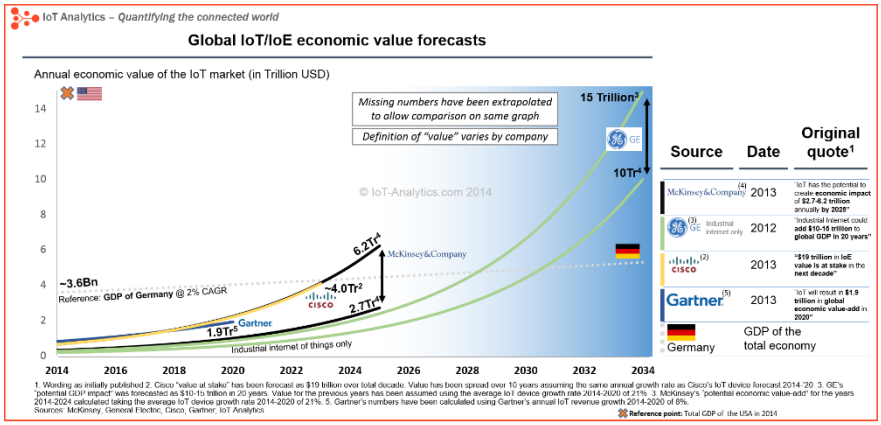


Figure 3: Market forecasts for revenues from connected devices 2014-2020

Before interpreting the data one should note that:

- ***The definition of "value" differs for all forecasts***. For Cisco it is "Value at stake", for McKinsey "potential economic value", for GE "potential global GDP for industrial internet only", and for Gartner "global economic value-add".

- ***Different time horizons***. Gartner, GE, and McKinsey give a forecast for the annual impact at a certain point in time (2020, 2025, and 2034 respectively). Cisco only provides a total of $ 19 trillion for "the next ten years".

- ***No starting point.*** No company provides a starting point and a growth rate. Therefore the growth rates of the device forecasts have been taken as a proxy to determine the value of all the years between now and 2034.

Global value of IoT to surpass total economy of Germany within 10 years

<u>In general, what forecasters agree on:</u>

- ***IoT will have a massive economic impact***. In both Cisco's and McKinsey's scenarios, the global value of IoT would surpass the total economy of Germany in less than 10 years. If GE's high forecasts becomes reality, the value of the industrial internet in 20 years will roughly reach the size of the US economy today.

Where forecasters diverge:

- Forecasts diverge a lot less than they do with connected devices or industry revenue.

One should note that both McKinsey and GE have provided a high and a low scenario.

4. Segment-specific forecasts

IoT Analytics uses the following segmentation to analyze the IoT ecosystem.

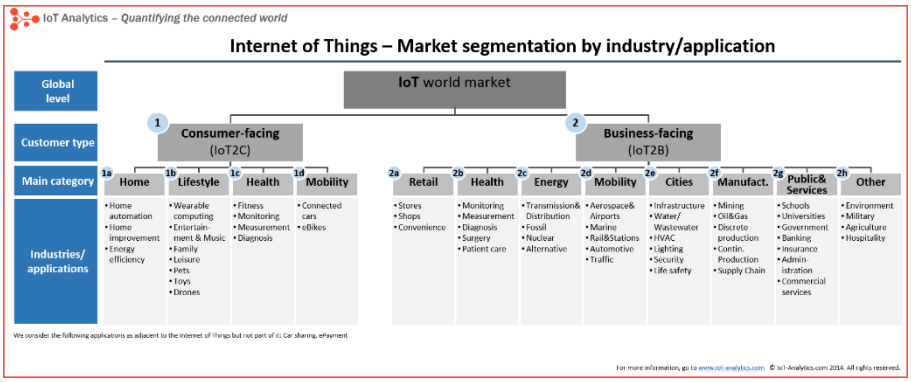


Figure 4: IoT Analytics definition of IoT market segements

The above segmentation distinguishes between consumer-facing IoT and business-facing IoT to take into account that there are two distinctly different customer groups: End customers and businesses.

IoT Analytics compared 4 publicly available reports that try to forecast revenue or device specific development per IoT segment.

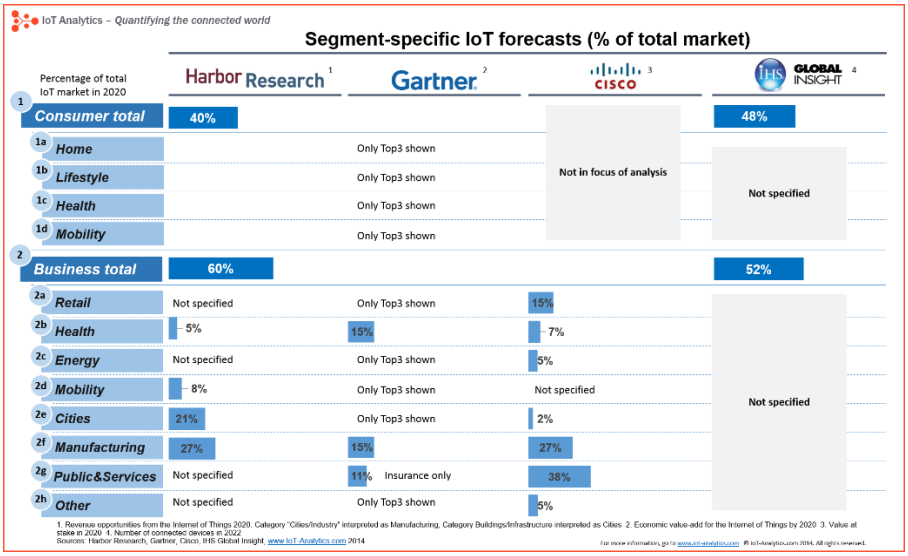


Figure 5: Segment-specific market forecasts overview

The picture is by no means complete and it seems that Cisco and Harbor have missed disclosing information about important segments. Gartner has not missed them. The company is only publicly disclosing the top 3 segments.

Interpretation of the numbers:

Business-facing IoT has the largest potential

- ***Business vs. consumer.*** The IoT potential in business applications is larger than in consumer applications (~55% vs. 45%)
- ***Largest segments.*** Manufacturing will supposedly be the largest segment of IoT (potentially more than ¼ of the total IoT market).
- ***Other important segments.*** Healthcare will be another important area (potentially between 5% and 15% of the total IoT market)
- ***Role of services.*** There are vastly different opinions about the potential of public and commercial services cases, however, are not yet as advanced as the business cases listed above.

5. Segment-specific surveys

In addition to the forward-looking segment-specific market forecasts, there are a number of surveys that are examining where money is being invested and what the industry/application adoption rate is.

a. Consumer IoT: "Automated home" applications with highest projected adoption

A notable survey on the consumer side was performed by the Acquity group, a subsidiary of Accenture. Acquity polled more than 2000 US consumers to estimate the likely adoption of different technologies over the next 5+ years.

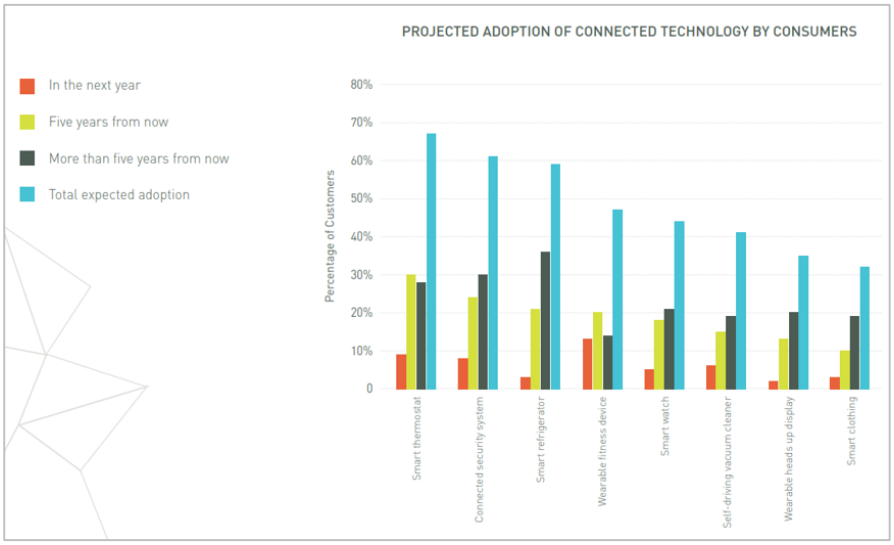


Figure 6: Projected adoption of connected technology by consumers (Source: Acquity Group)

Interpretation of the numbers:

- ***Wearable hype over?*** Wearable fitness devices that are currently dominating the consumer lifestyle category are getting the most attention but the hype seems to be over now

- ***Smart home coming up?*** Home applications will dominate the consumer IoT market in the next years (smart thermostats, security systems, and refrigerators)

Unfortunately the survey did not poll about any consumer health applications such as remote health monitoring.

Further analyses on consumer IoT:

- ***Home automation***

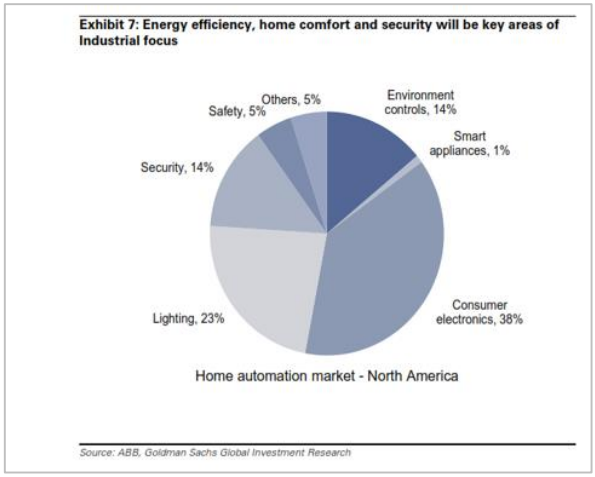


Figure 7: Home automation market (Source: Goldman Sachs)

Since the acquisition of Nest by Google earlier in 2014, the broad public has become aware of home automation. Goldman Sachs

predicts that it will be mainly consumer electronics as well as lighting that will emerge as the "key areas".

- ***Smart lighting***
  The Dutch company Philipps was one of the first to introduce internet-connected light bulbs. While their light bulb starter pack called Philipps HUE which includes 3 bulbs still retails around $200 today, these prices are expected to drop sharply in the future. OnWorld is predicting that by 2020 there will be 100 million internet connected LED lights, up from only 2 million today.

- ***Wearables***
  On the topic of wearables, Juniper predicts that the number of wearable devices shipped will explode from 14 million in 2014 to ten times that (140 million) in 2018. This study stems from 2013 however.

b. Business IoT: Energy, mobility, and manufacturing are leading the way

There are a number of business-facing Internet of Things surveys. In contrast to the market forecasts, these surveys don't rank the different market segments in terms of size but in terms of business activity. In order to facilitate their interpretation, the surveys are plotted into one graph below.

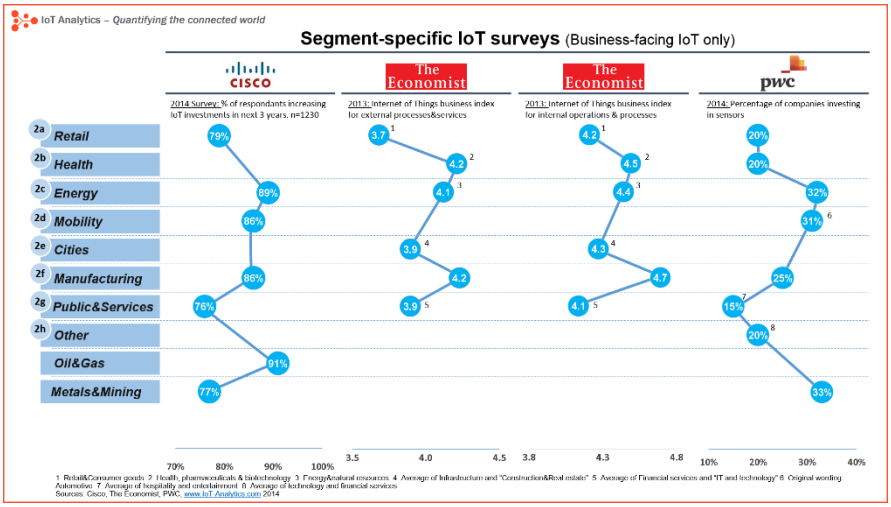


Figure 8: IoT market segment surveys (Business-facing IoT)

Interpretation of the numbers:

- ***Leading adopters.*** Consistently, energy, mobility, and manufacturing are leading the way in IoT adoption/investments

- ***O&G strong subsegment.*** The latest Cisco survey highlights Oil&Gas as a key industry within "Manufacturing" that is currently strongly increasing IoT investments

- ***Laggards.*** Retail as well as cities, the public sector and commercial services such as "financial services" are lagging behind in IoT investments and adoption.

- ***Divergent survey results.*** The view on healthcare as well as metals&mining IoT market segments is very divergent: While the Economist rates the business index in healthcare as rather advanced, PWC sees little sensor investment in this area. And while PWC is measuring the highest sensor investment rate in metals&mining, Cisco is measuring the second lowest investment activity, compared to other industries.

Further analyses on business IoT:

- ***Energy***
  One of the large topics within energy are smart grids and smart meters. Navigant research predicts that worldwide smart meter shipments will reach their peak in 2018. The revenue from smart meters is expected to reach $7.4bn, up from $4.4bn in 2013 and will decline slowly after 2018 again.

- ***Mobility***
  Connected cars are a large application within the mobility sector. IHS Automotive predicts that by 2020, 152 million cars will be connected to the internet

- ***Manufacturing***
  It is perhaps no surprise that two of the keynote speakers at the 2014 IoT World Forum in Chicago came from Oil&Gas as well as mining companies. Both John McGagh, Head of Innovation at Rio Tinto, as well as Arjen Dorland, VP of technical and competitive IT at Shell, highlighted the enormous potential of IoT in their industries. It is the ability to perform remote operations on extremely high-value assets that makes the IoT business case so compelling for these industries. On his desktop in Chicago, John McGagh showed how he could visualize operations data in one of Rio Tinto's mine in Utah in real-time. He showcased remote monitoring of tire pressure, fuel level, and vehicle load for all the vehicles in the mine in real-time. According to him it allows Rio Tinto to make smarter dispatching and maintenance decisions.

If you have feedback on these market insights, make sure to stop by www.iot-analytics.com . Check out our other publications and perspectives or sign-up for our newsletter.

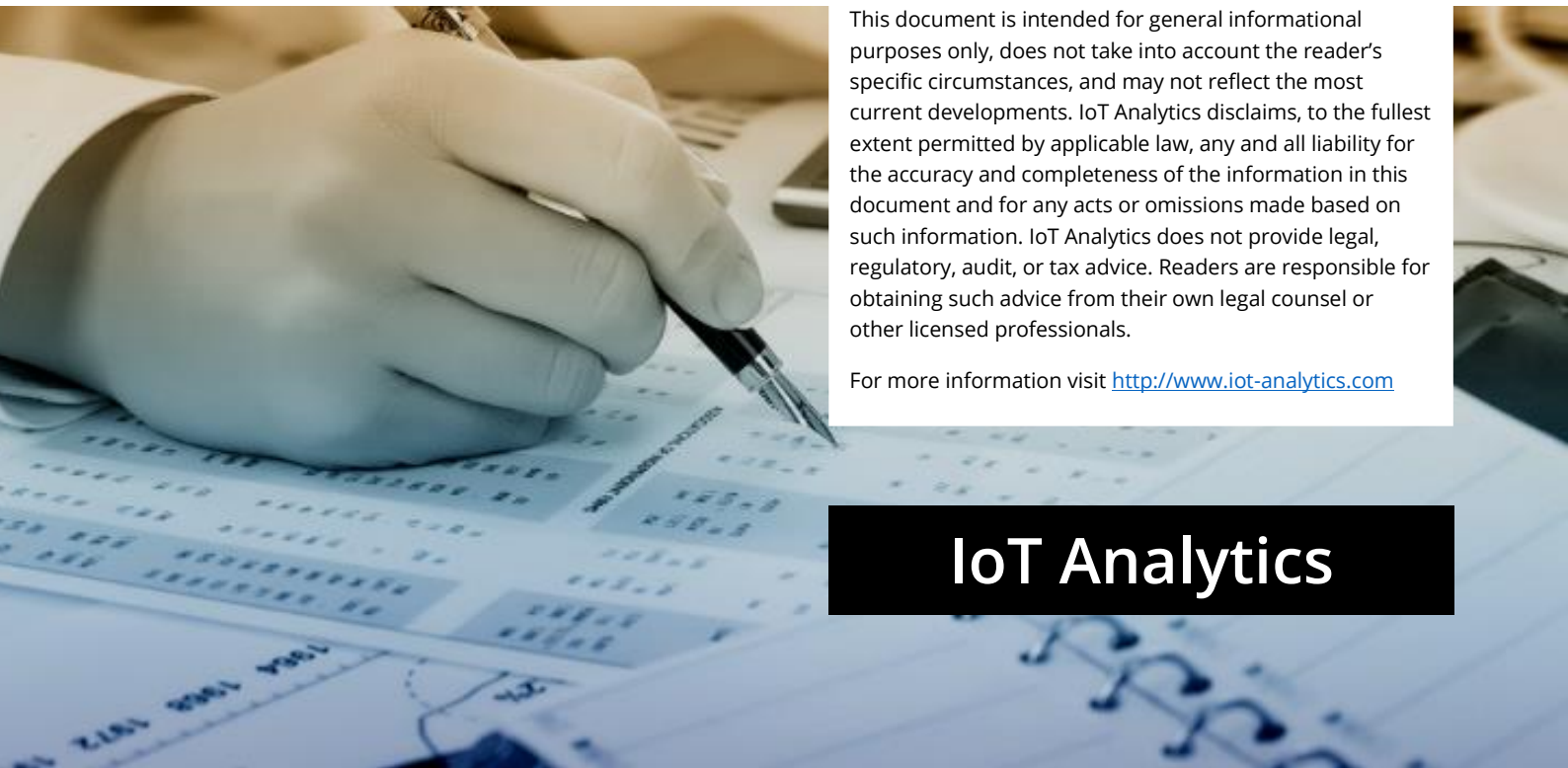
Knud Lasse Lueth

About the author

Knud Lasse Lueth is the founder and CEO of IoT Analytics. He builds on 5 years of strategy consulting in industrial companies at BCG and a manufacturing background. His focus areas are the Industrial internet and Industry 4.0

IoT Analytics is a leading provider of market insights and competitive intelligence for the Internet of Things (IoT).

For more information visit http://www.iot-analytics.com



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