

From the Ubiquity of M2M to the Internet of Things

M2M Forum

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Brief Introduction to Beecham Research

- Beecham Research based in Cambridge, UK and Boston, US
- Specialists in M2M and Internet of Things market analysis, research and consulting.
 - Website: <http://beechamresearch.com>
 - *Significant prior commercial and general management experience in industry*
- Researching M2M market for over a decade, since 2001.
 - *Key Specialties: Primary Research – user/market player surveys in multiple languages; Market Forecasting and Modelling*
 - *More recently, providing deep technology insight. Technology Director with 30 years semiconductor and software experience*
- Recent research:
 - *M2M/IOT Platforms: Fast Time to Market*
 - *M2M Solution Security: Right-Sizing for the M2M market*
 - *Wearable Technology: Towards Function with Style*

A Quick Agenda . . .

1. **Current Market Snapshot**

2. Major Market trends over the next few years

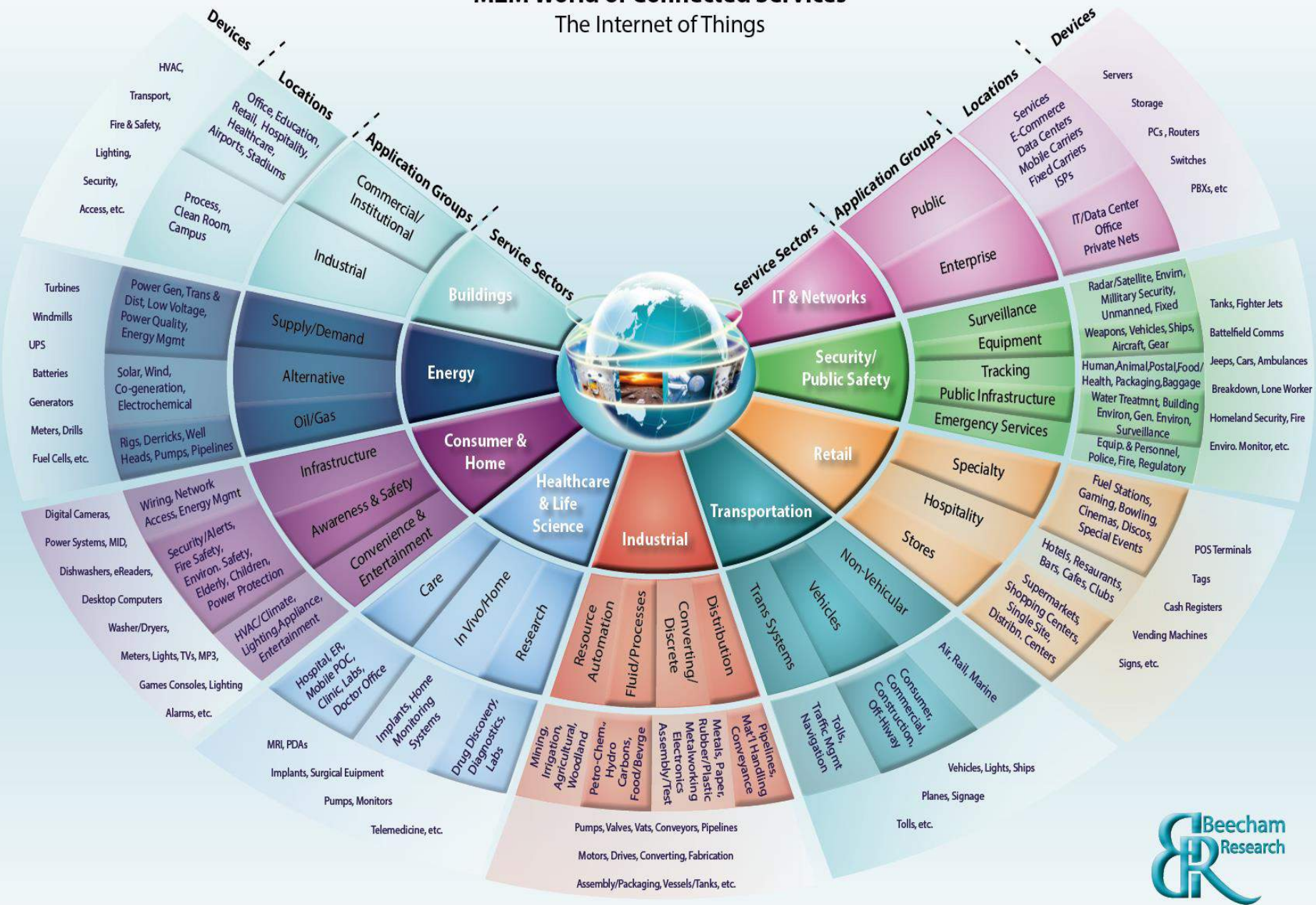
3. Major technology trends over the next few years

4. Market growth prospects

5. Conclusions

M2M World of Connected Services

The Internet of Things



M2M Application Categories – Cellular M2M examples

After-Market Applications

- Low/Medium volume per application
- Add-on networking: retrofit
- Medium/High cost per unit
- Often requires high level of support
- Good fit for MVNOs/resellers



Vending

Car Wash



Vineyard Monitoring

Regulatory

- Medium/High Volume during install
- Embedded networking
- Low cost per unit
- Favours tendering process
- Good fit for MNOs
- eCall a crossover (see note below)



Toll Collect

Meter Reading



eCall

Line Fit

- Medium/High Volume
- Embedded networking
- Low cost per unit
- Increasingly requires international coverage
- Fit with international MNOs and MVNOs



OnStar/
Telematics

Handheld
Tracking



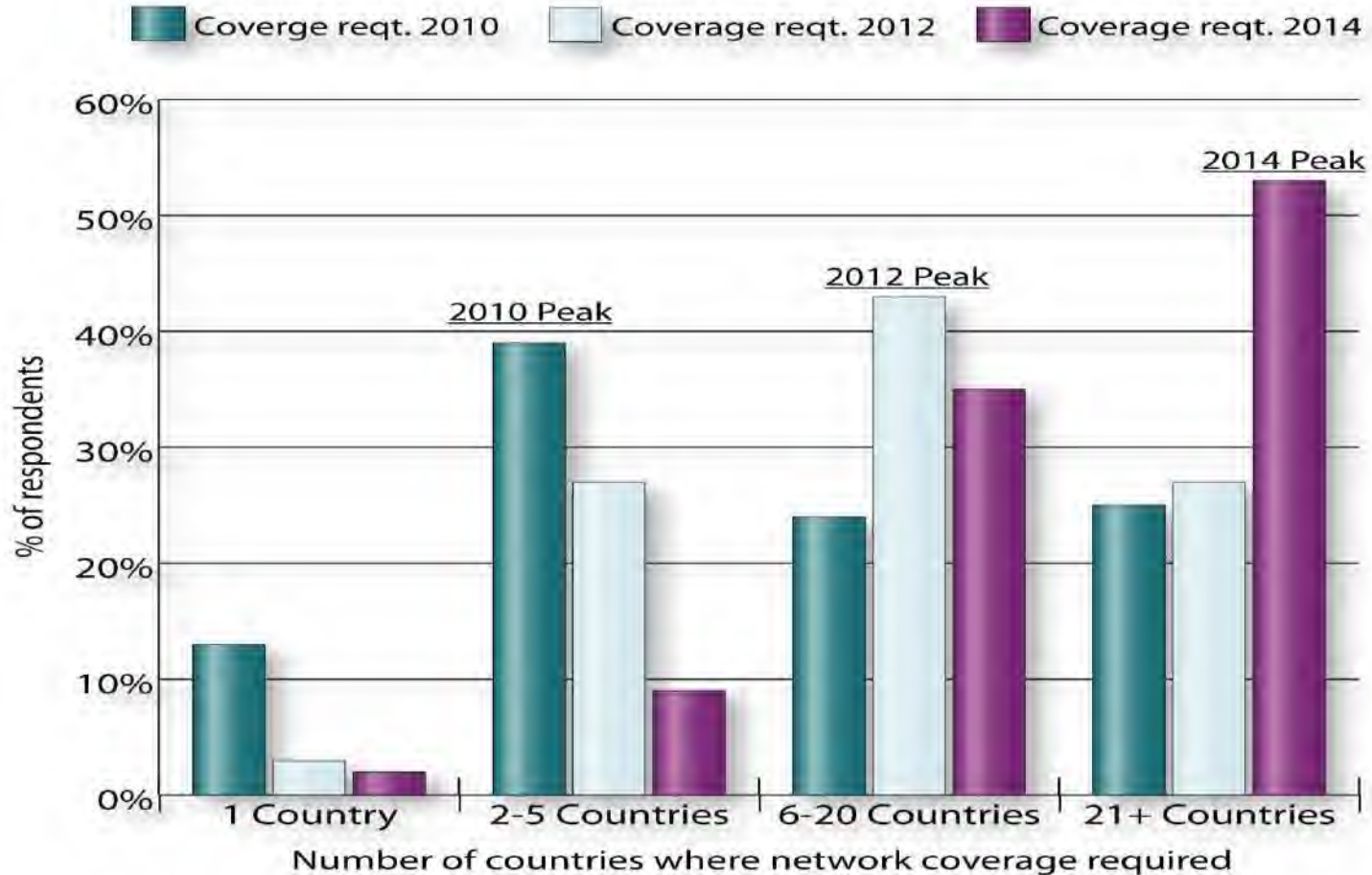
Pumps

Source: Beecham Research

Note: eCall in EU is now a unique crossover of Regulatory with Line Fit characteristics

Adopter Survey

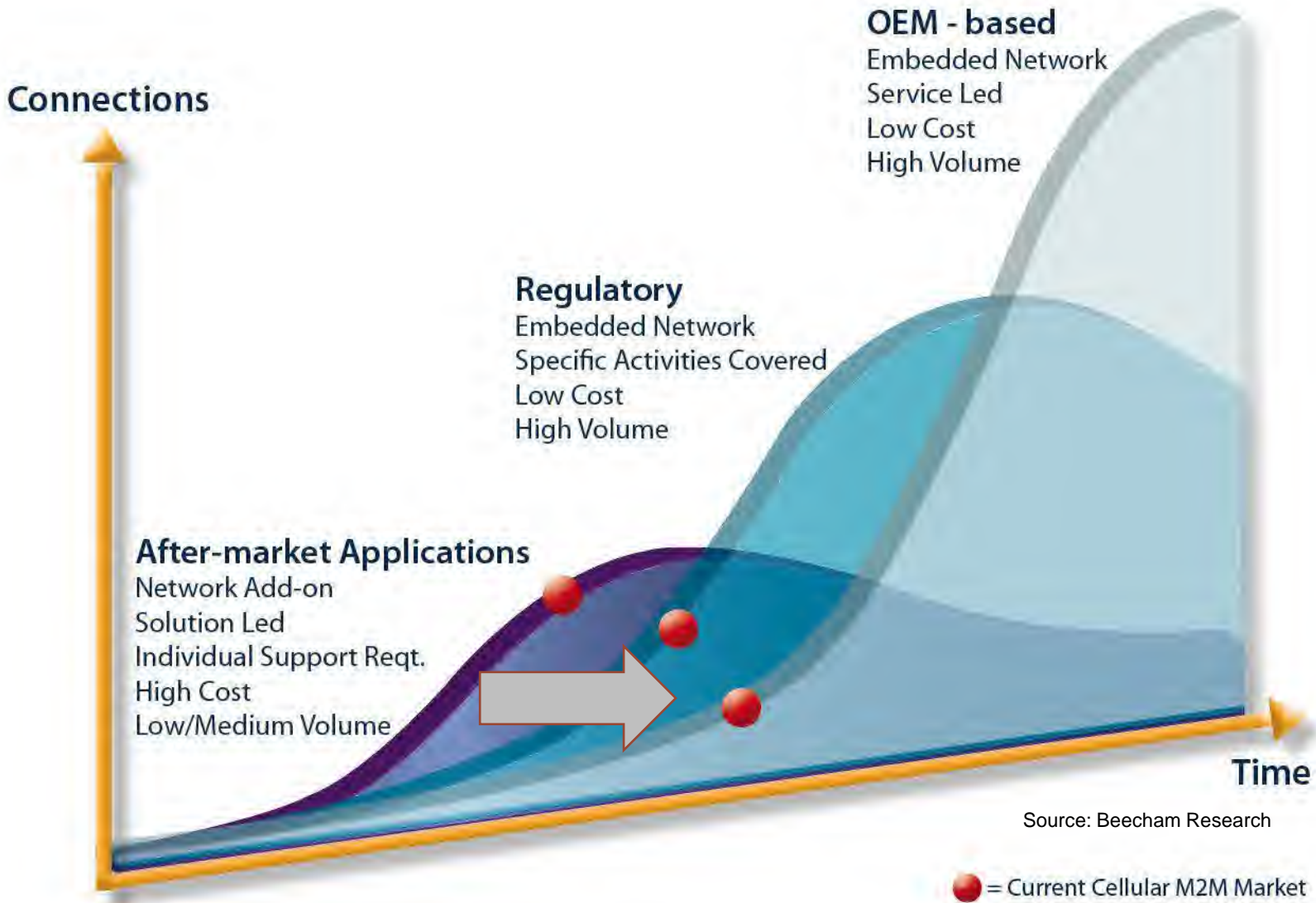
Number of countries worldwide where products required to be connected



Source: 210 adopters worldwide, 2011 survey

Growing need for wider international coverage for M2M solutions

Cellular M2M Market Development – Current Position

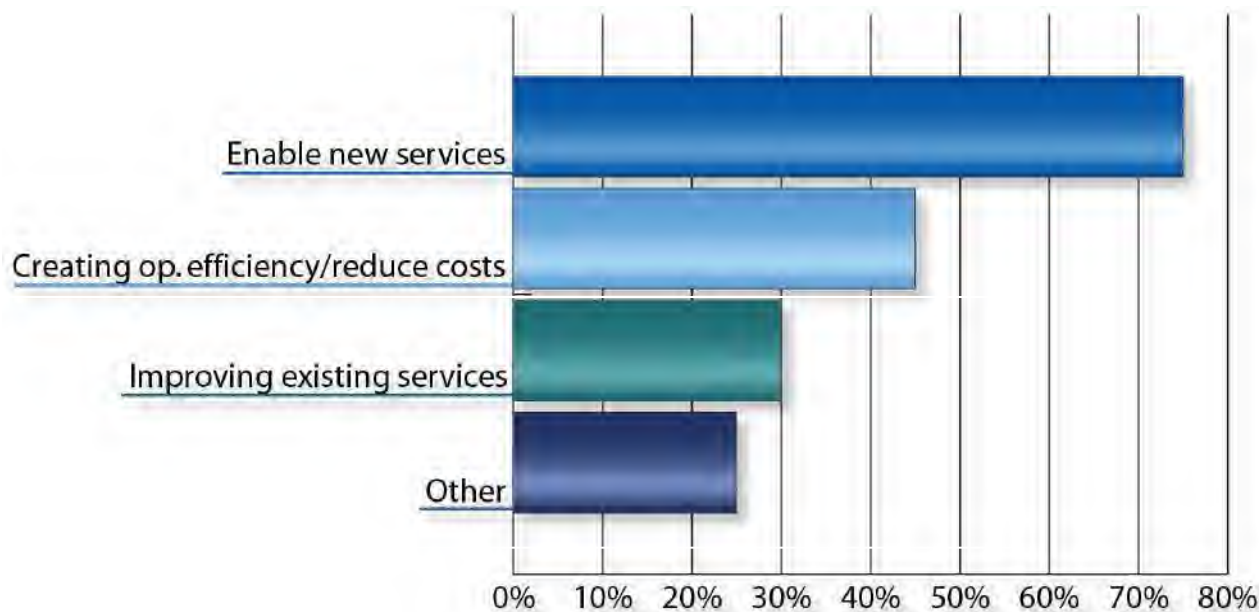


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What are the primary drivers behind your M2M projects now?

Survey of M2M Solution Providers:

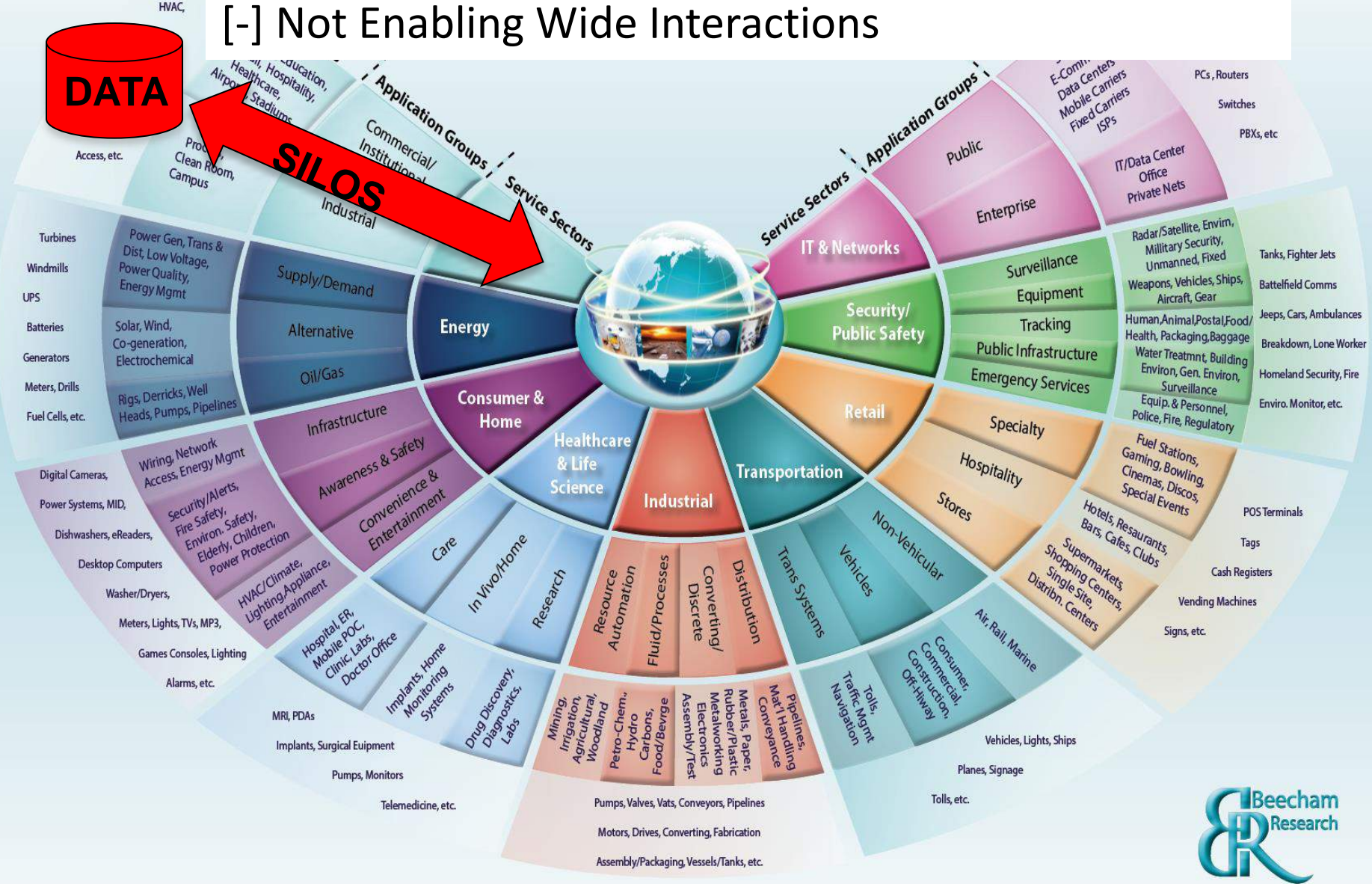


Source: Beecham Research Sept 2012 for Oracle

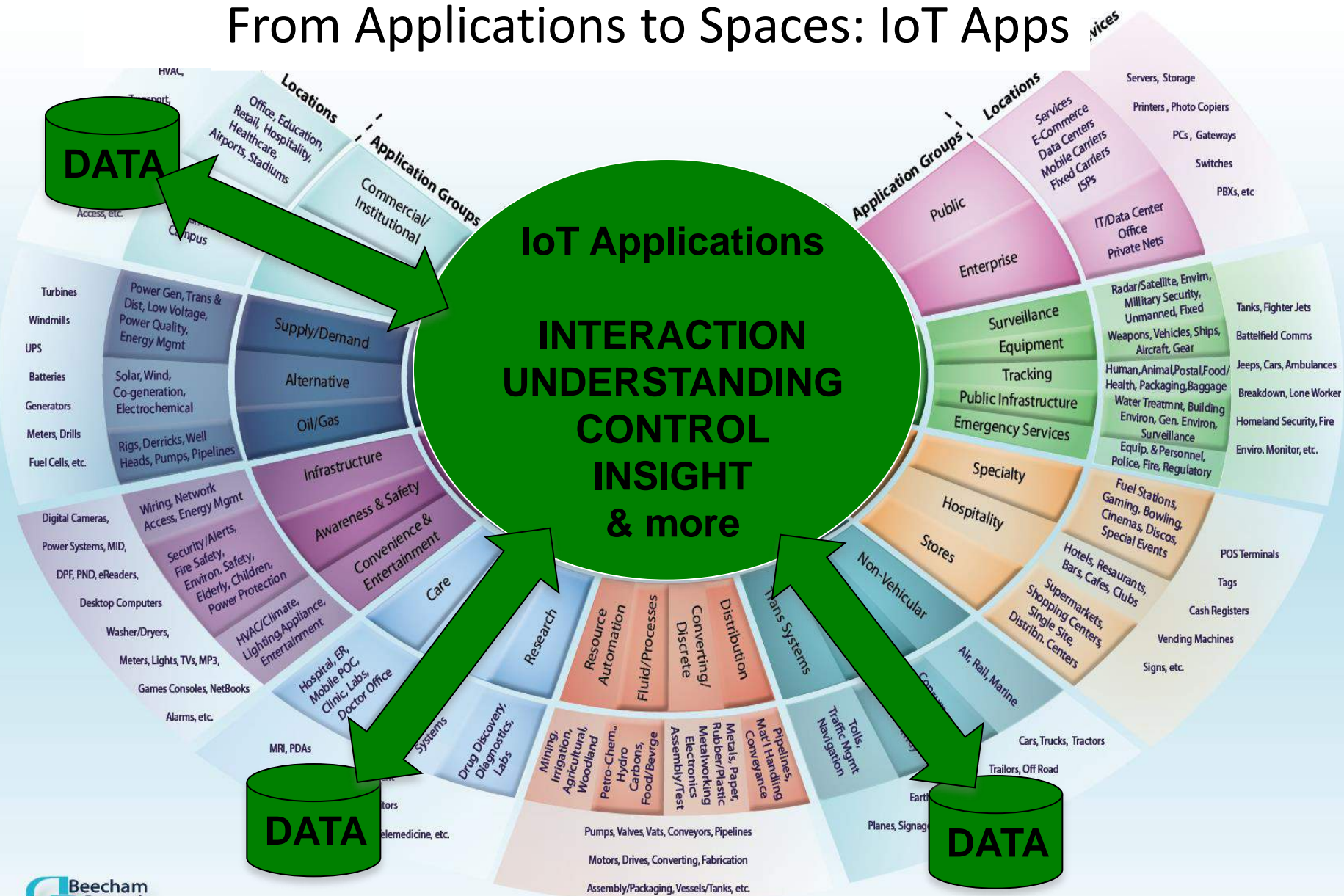
- M2M has always been about creating new differentiation in the market
- M2M used to be about operational efficiency, and reducing costs
- Now increasingly seen as enabler for new services

[+] Focusing on Sector needs - securely

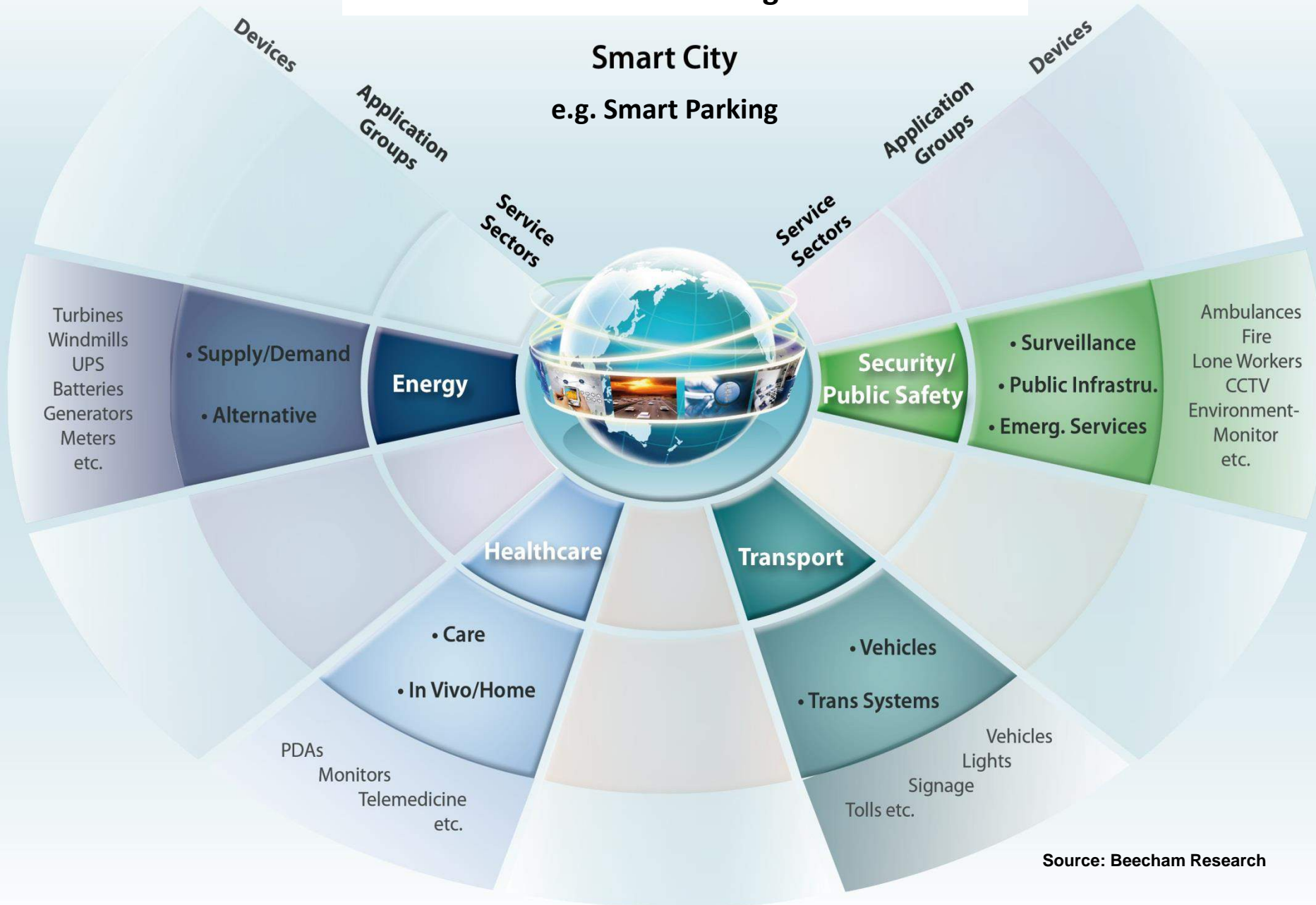
[-] Not Enabling Wide Interactions



From Applications to Spaces: IoT Apps



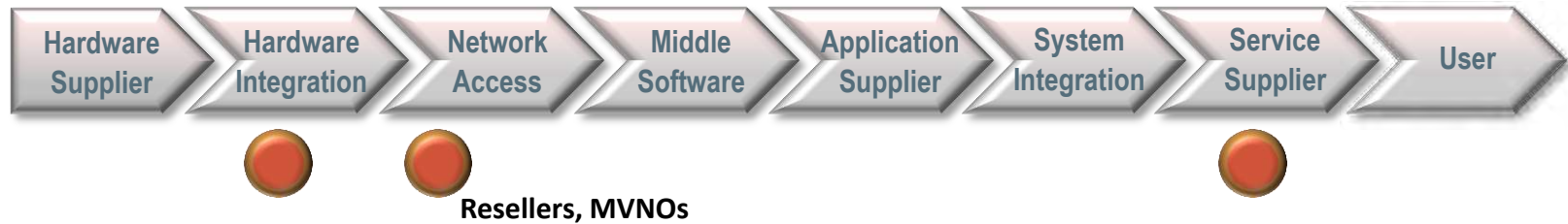
In Future: Cross sector and high volume B2B2C



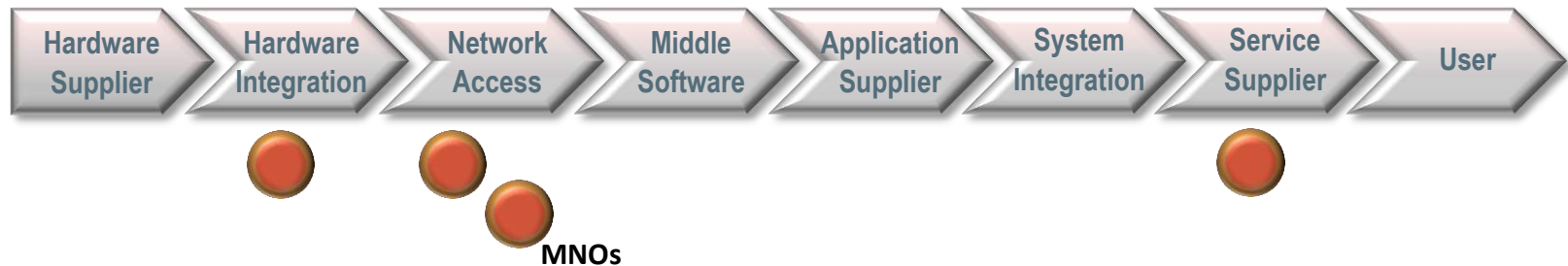
Source: Beecham Research

2. M2M Value Chain – Who's driving the market?

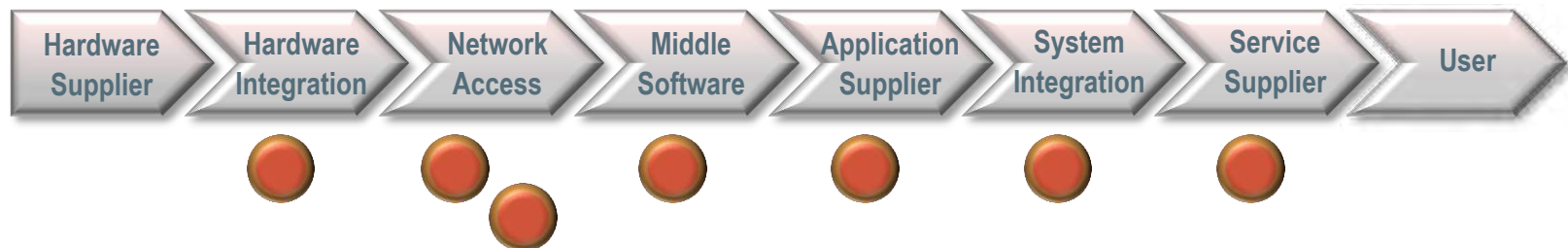
Early M2M market:



M2M market now:

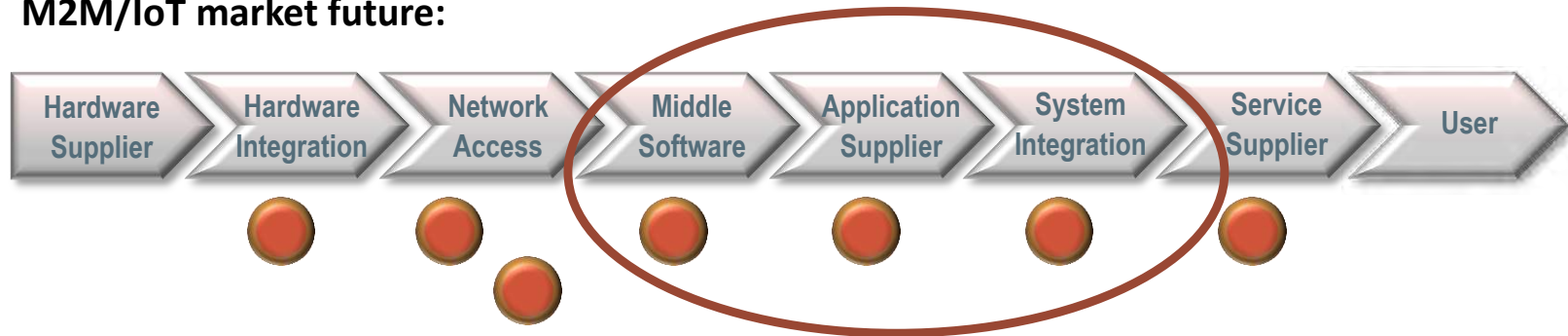


M2M/IoT market future:



2. M2M Value Chain: New Trend in M2M Market

M2M/IoT market future:



New type of players

Examples:

SAP

Oracle

Cisco

Google

CA Technologies

Microsoft

...

Consumer Technology Evolution



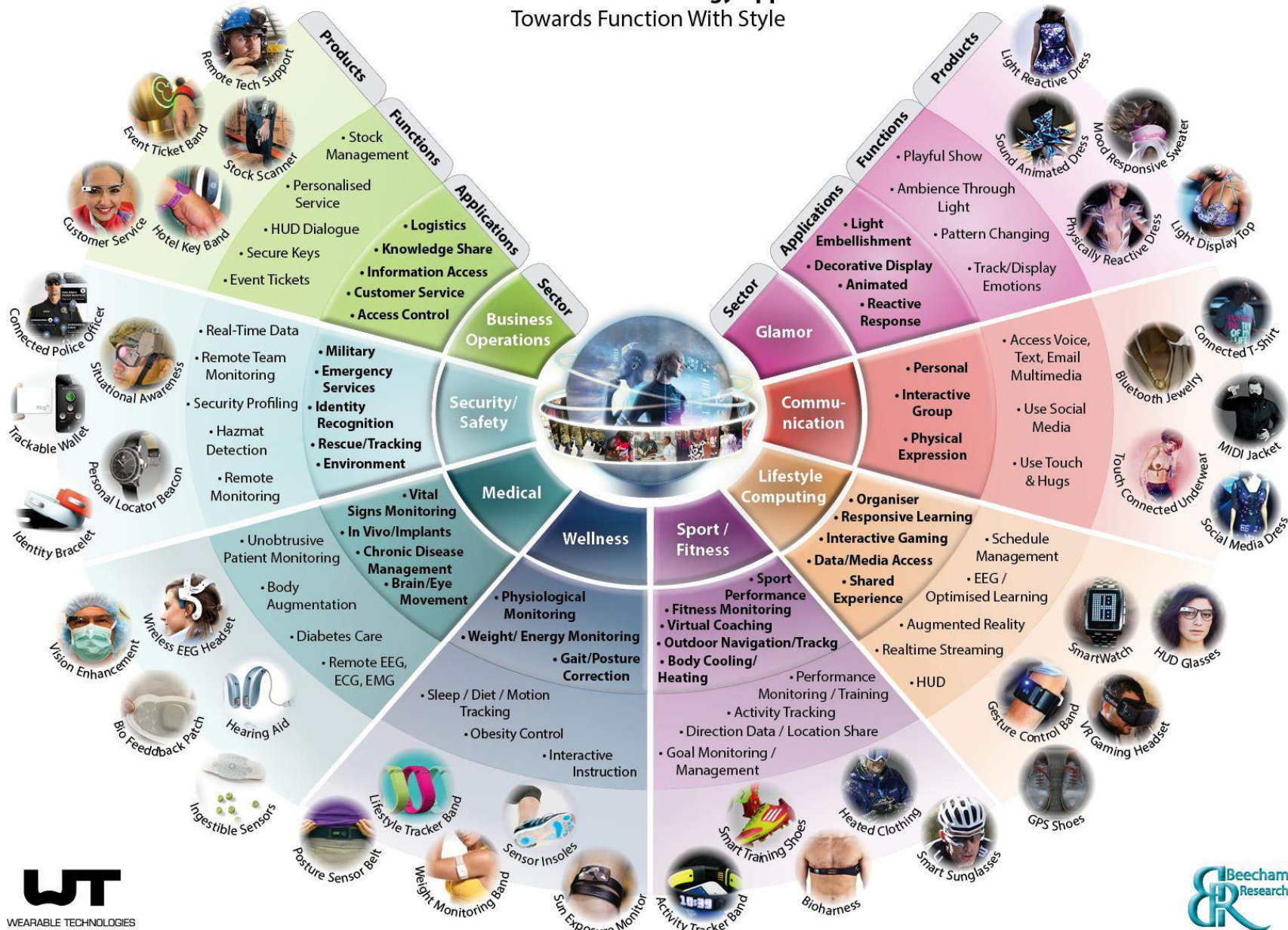
From Functional

to Usable

to Wearable



World of Wearable Technology Applications: Towards Function With Style



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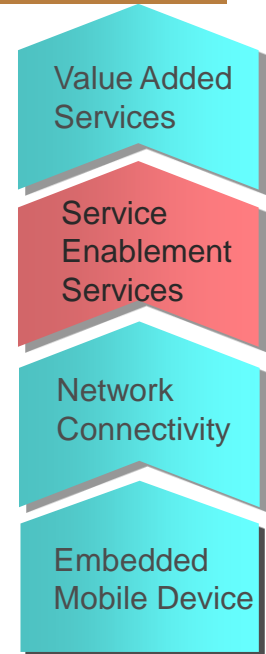
M2M Service Enablement – Service Delivery Platforms

1. Examples:

- a. Remote enable/disable of devices in the field
- b. Managed update of remote devices with application software
- c. Storage and processing of remote device data
- d. Integration with enterprise systems

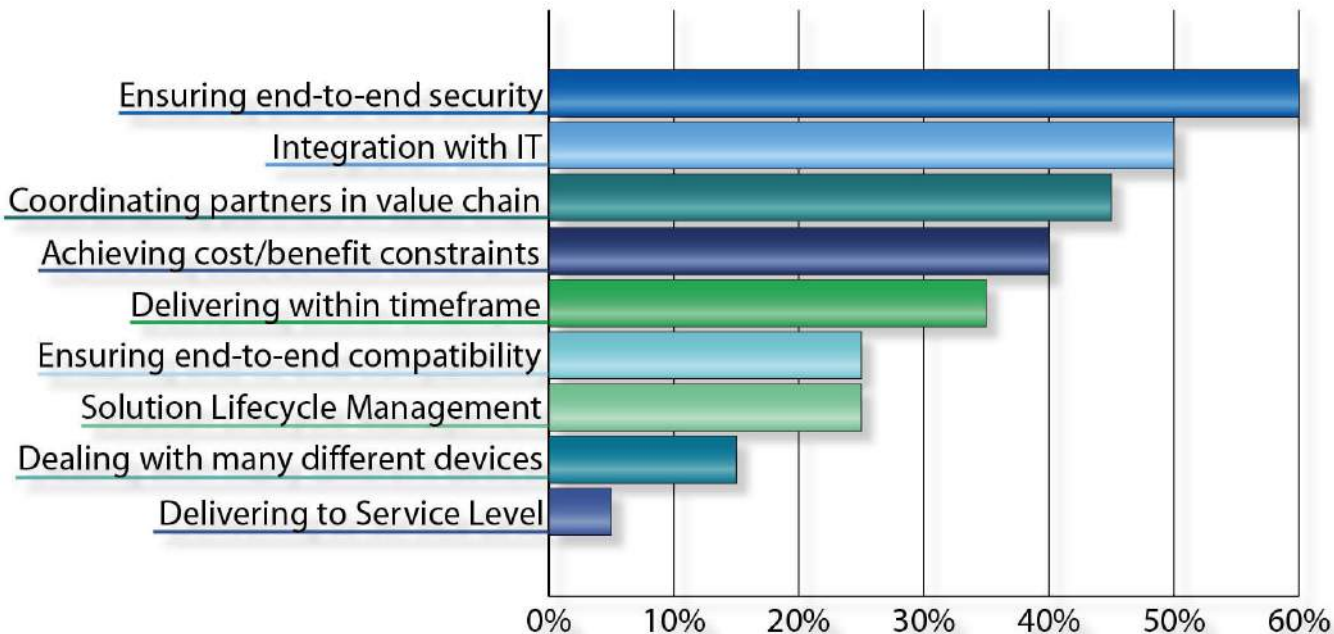
2. Why focus on SES?

- a. No longer appropriate to sell network airtime on its own without connectivity management (SES service): now a standard offering
- b. Without SES, M2M products/services take longer and cost more to get to market
- c. SES represents a new revenue opportunity
- d. SES likely to become a key differentiator in M2M market
- e. The increasing role of data analytics in SES



Which of these are the Top 3 priorities in delivering M2M projects?

Survey of M2M Solution Providers :

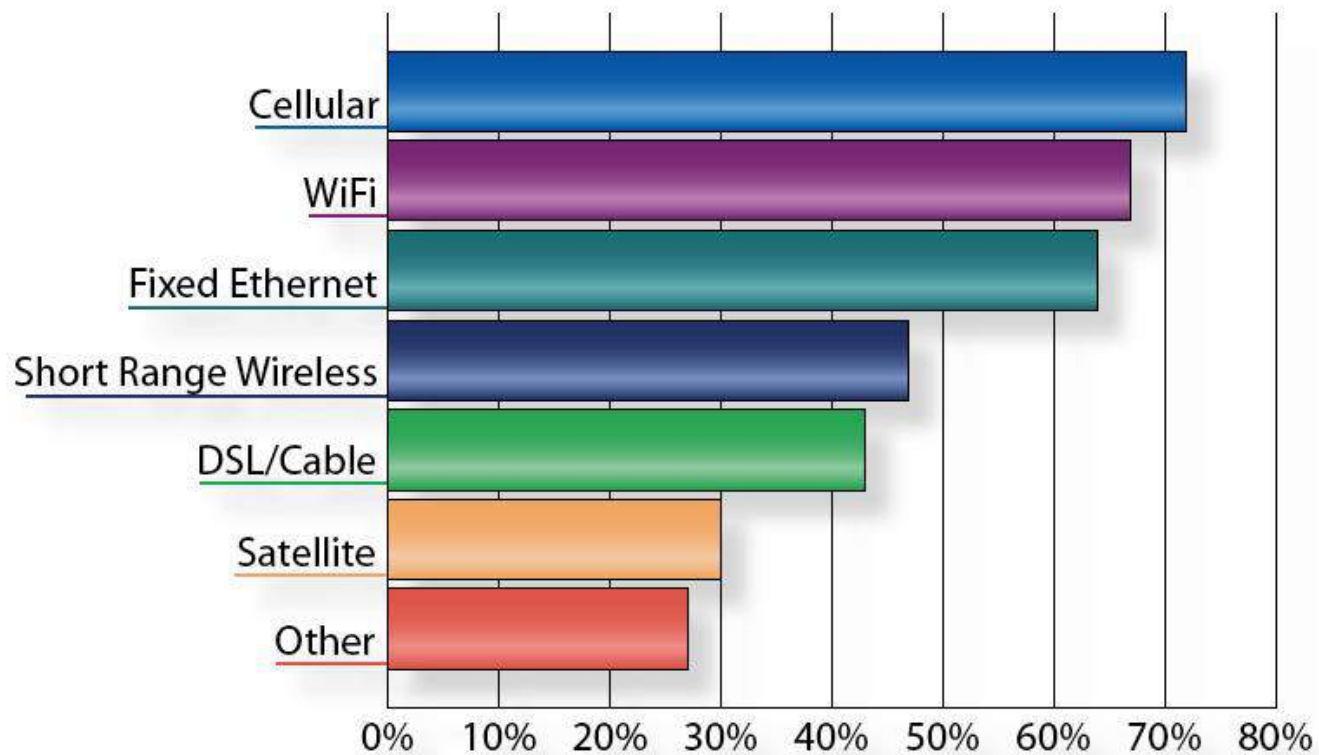


Source: Beecham Research for Oracle

- Top 3 priorities seen as:
 - Ensuring end-to-end security
 - Integration with IT
 - Coordinating partners in value chain

Connectivity

Degree of Usage of Different Connectivity Technologies:

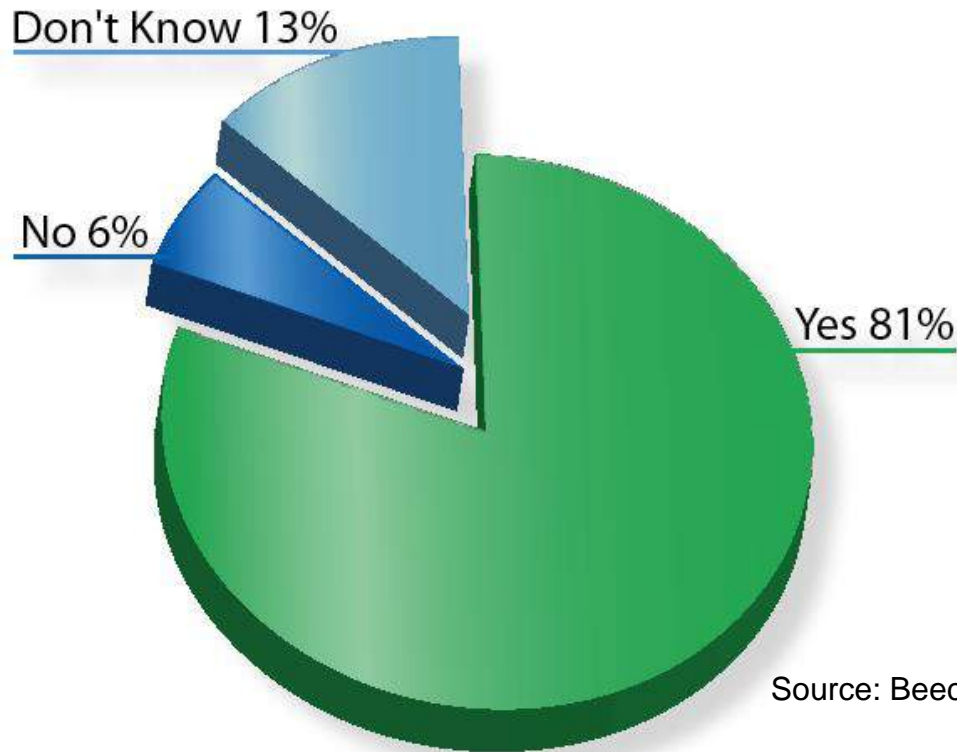


Source: Beecham Research

All Connectivity types need to be supported for M2M/IoT, increasingly within one solution

Application Intelligence Increase

Do you see an increasing need for real time decision-making influencing a move to more intelligence required at the network edge?

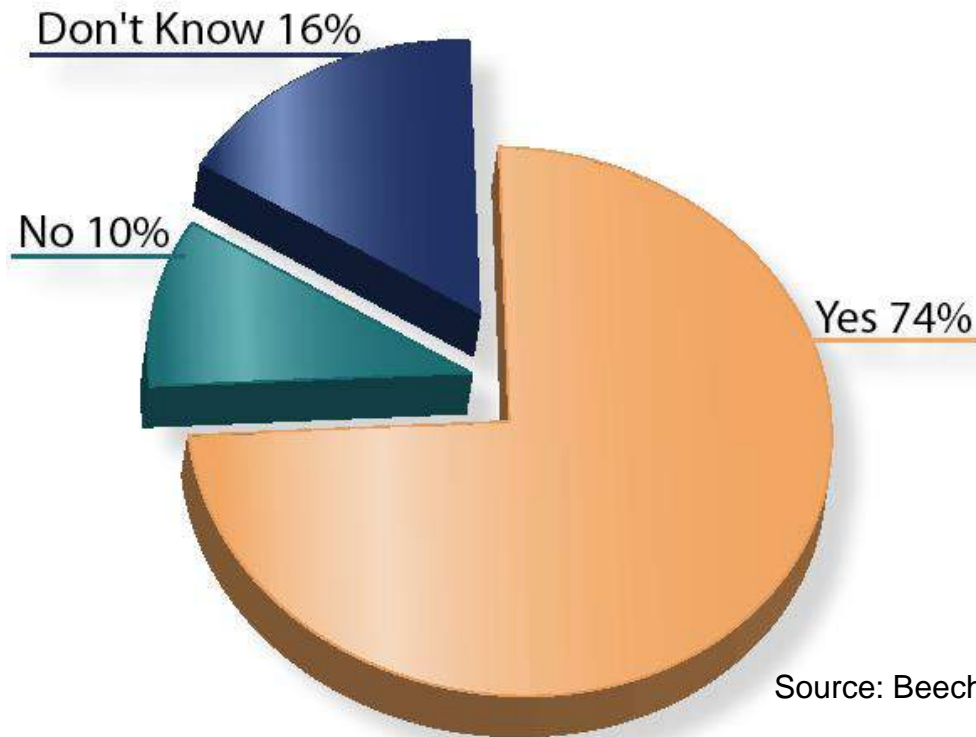


Source: Beecham Research for Oracle

Substantial expectation of need for real time decision making at the edge

Device Security

Do you expect the need for security in edge devices to increase over the next few years?



Security at edge to increase – greater use of intelligence at the edge to cater for this

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Technology disruptors . . .
4. Market growth prospects
5. Opportunities for market players

Hardware cost decline . . . Connectivity diversity . . .

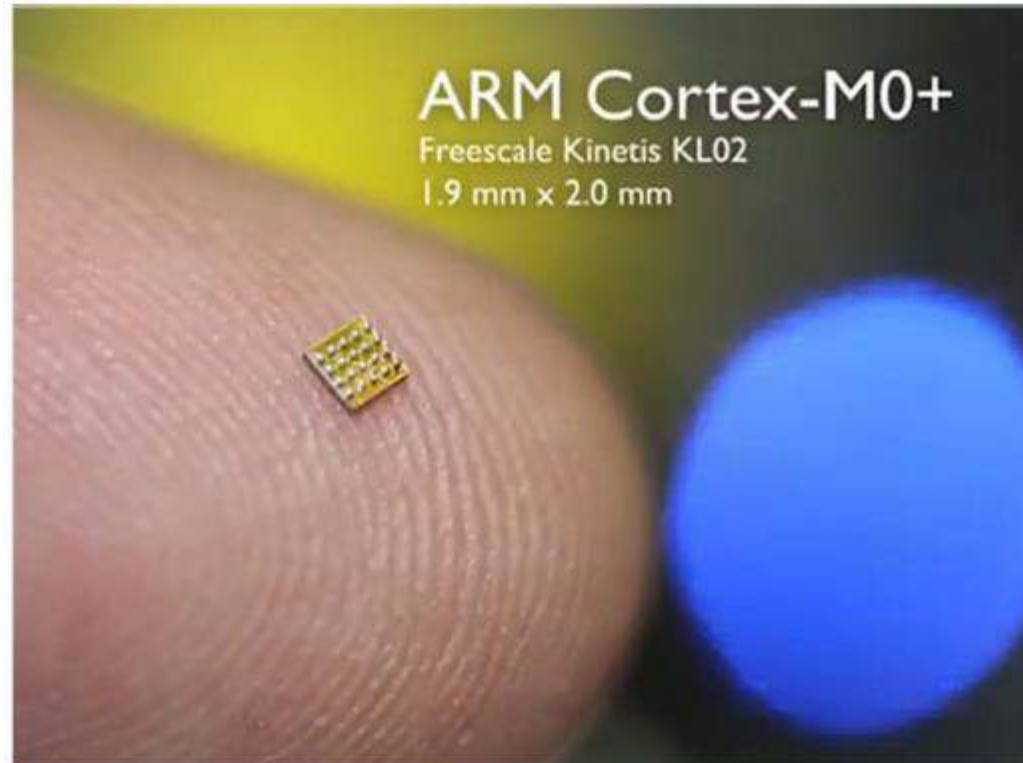
Low, low, hardware costs....

	2012	2016
▪ ARM® Cortex-M0 microcontroller	\$0.49	<\$0.30
▪ Wi-Fi	\$1.30	\$0.80
▪ Bluetooth	\$0.75	\$0.35
▪ MEMS Sensor (vibration/accelerometer)	\$1.30	\$0.95
▪ Camera (1.8 MP CMOS image sensor)	\$1.70	\$1.10
▪ GPS	\$1.15	\$0.65

Source: Gartner (2013), ARM Estimate

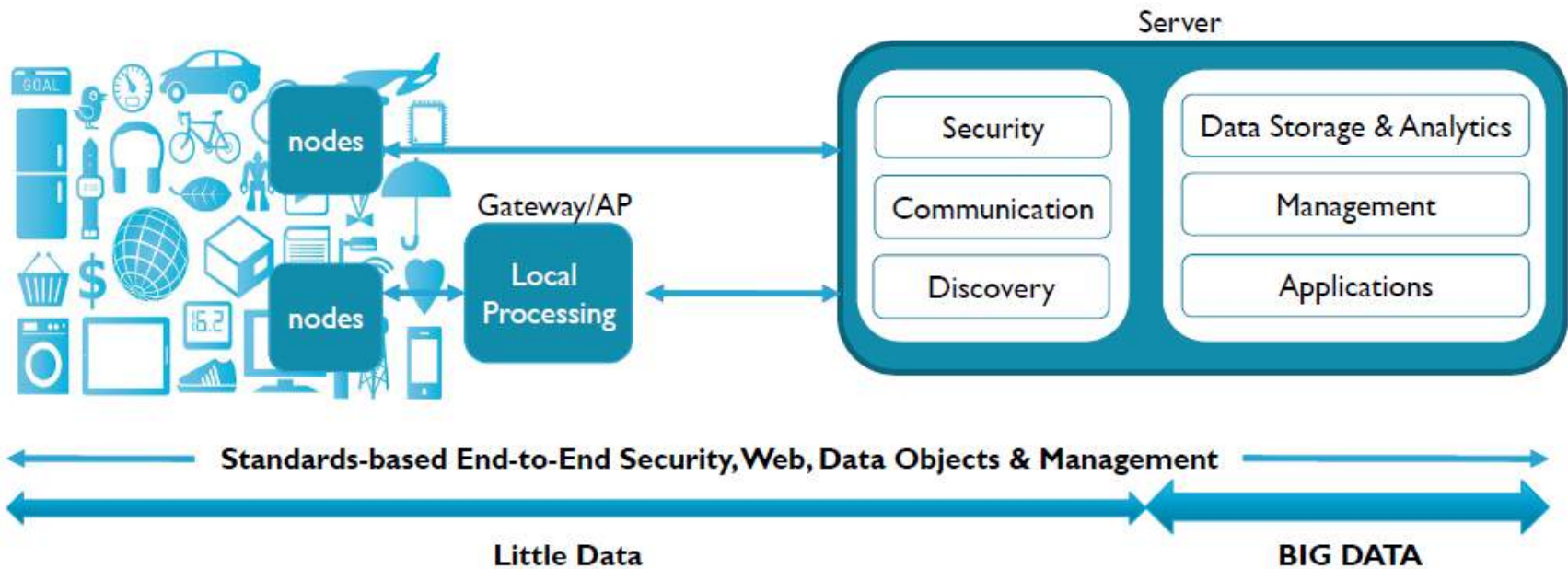
Getting tiny . . .

Efficient Sensor Nodes



Combining edge with cloud

IoT Architecture



Everything connected . . .

In 2020 and the average family of four ...



50

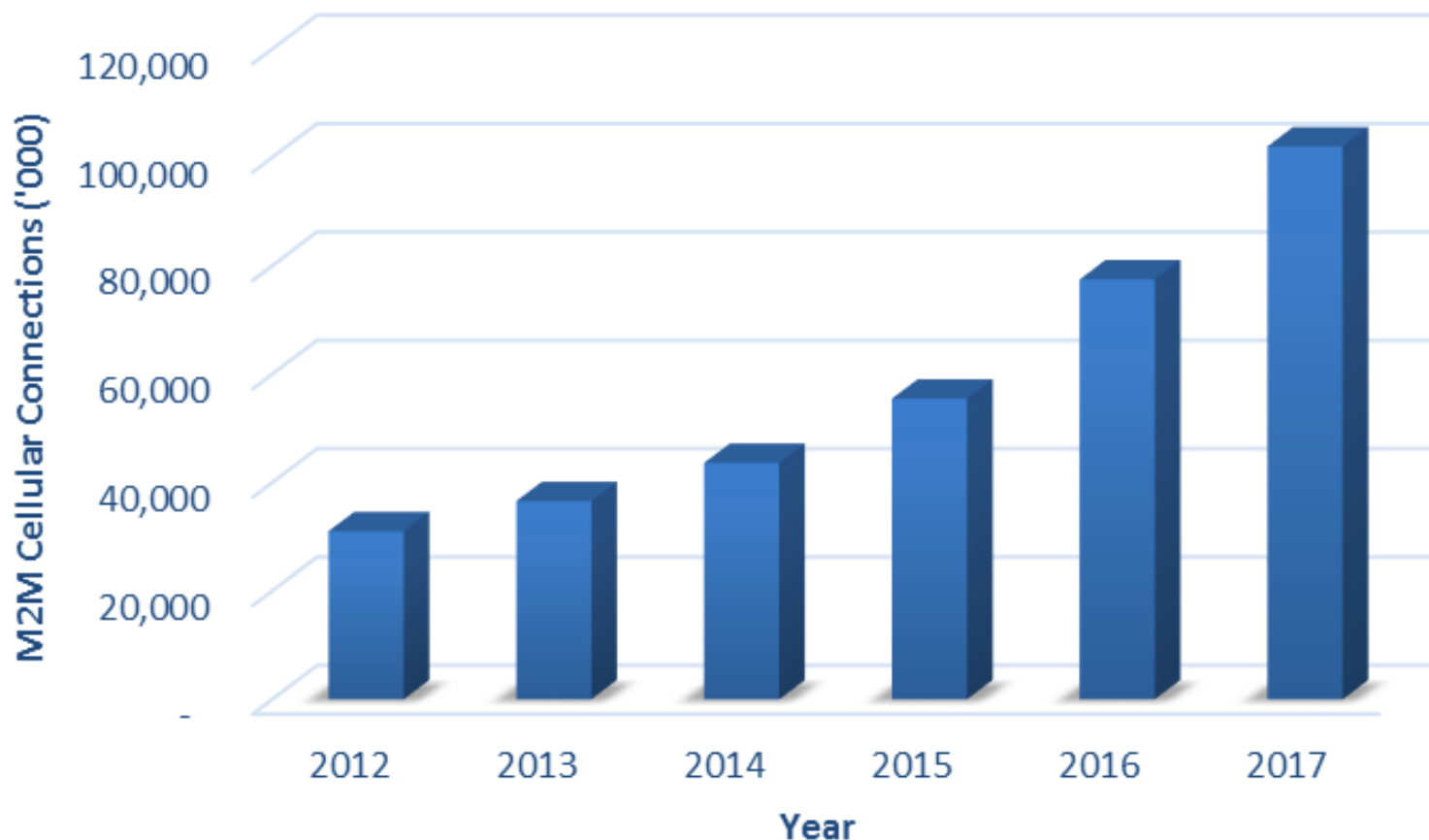
The number of Internet-connected devices projected to be in the home of the average family of four (with two teenage children) in 2020 — up from an average of about 10 connected devices in 2012.

Everything connected:
Using multiple forms of connectivity . . . short range, long range, low data rate, high data rate

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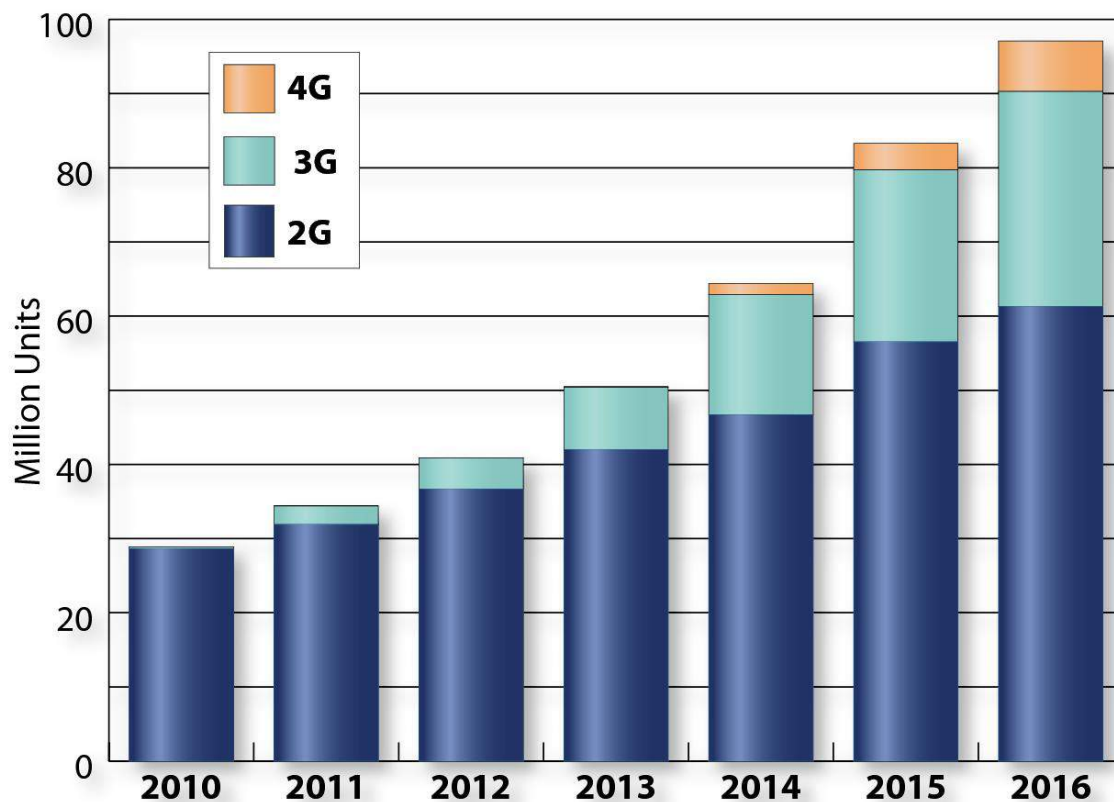
Europe - Cellular M2M Connections – 2012-2017



Source: Beecham Research 2014 - Provisional



North America - Cellular M2M Connections Forecast: From 2G to 3G to 4G

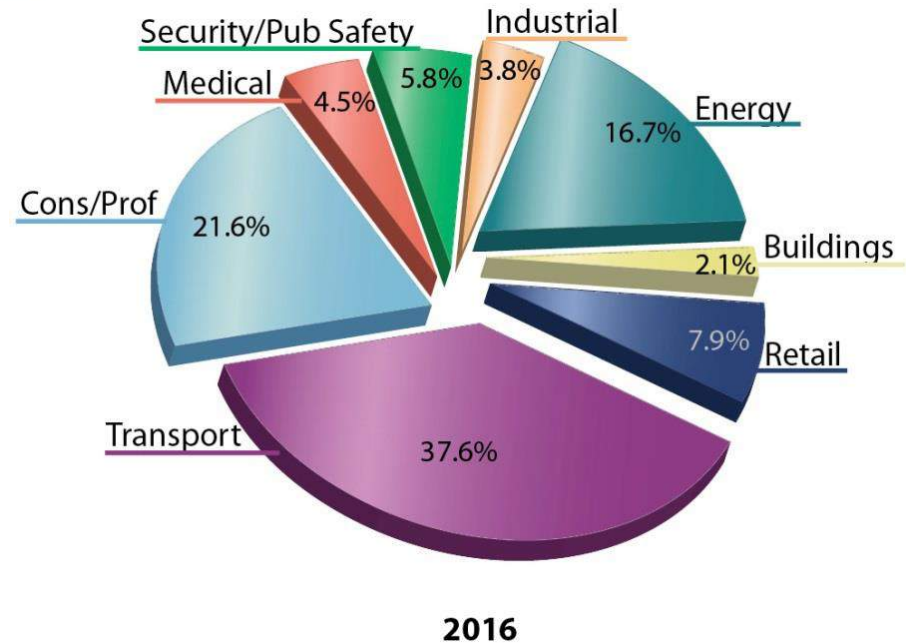
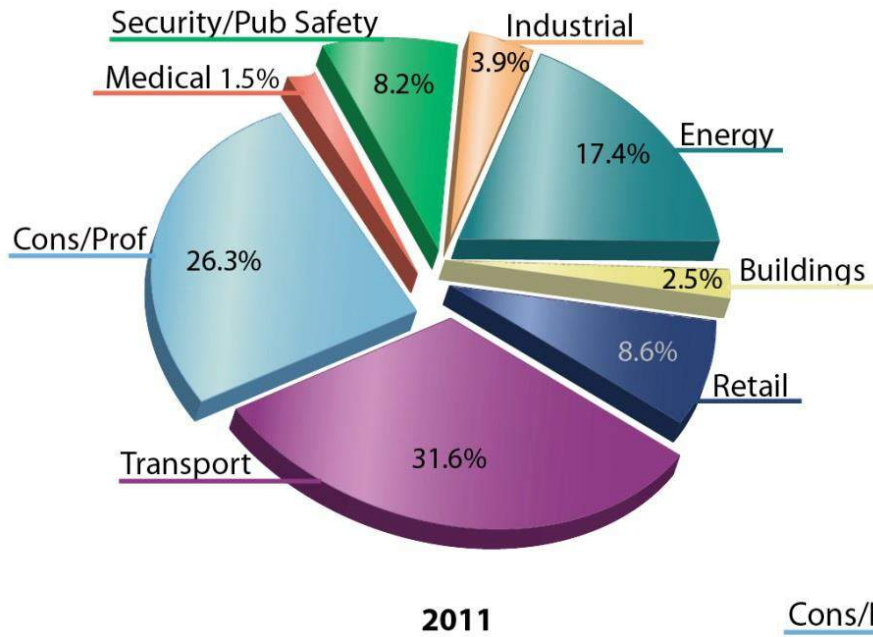


	2010	2011	2012	2013	2014	2015	2016	CAGR 2013-16
2G	28.6	31.9	36.7	42.0	46.7	56.5	61.3	10.4%
3G	0.3	2.5	4.2	8.4	16.2	23.2	29.0	40.3%
4G	0.0	0.0	0.0	0.1	1.5	3.6	6.8	230.2%
Total	28.9	34.4	40.9	50.5	64.4	83.3	97.1	18.1%

Source: Beecham Research 2014 - Provisional



M2M Connections, Vertical Market Shares



Source: Beecham Research 2014 – North America – Provisional

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10 important trends developing now in the M2M/IoT market

The development of the M2M/IoT market is now creating new trends, including the following:

1. The need for combining all forms of connectivity technology in one solution – cellular, satellite, fixed line, short range – and interoperability with partners point to more **complex solutions**
2. The need for closer integration of Connected Device data with **enterprise IT systems**.
3. Greater emphasis on creating **new services** from Connected Device data rather than just the traditional operational cost savings
4. These new services are essential for revenue generation for the business, so are more likely to be mission critical. M2M solutions overall are becoming more **mission critical**, even for service support
5. As a result of these changes, there is an increasing need for **holistic approaches to security**. This also raises the prospect of new opportunities for added value created by new security services
6. Also as a result, M2M solutions are moving from being tactical “nice to have” to **strategic necessity**. They are now visible to Executive Boards internally and to customers and public externally.
7. At a service level, M2M solutions have always been about improving the break/fix time. In future they will be more about **optimization of operations** – moving from monitoring to control
8. This will require much **larger amounts of real time data**, processed and acted upon rapidly.
9. There will be increasing **intelligence at the network edge** as well as in the cloud, with direct device/device communication at the edge. Cloud processing will be just part of future solutions
10. There will be increasing use of **data across sector boundaries** to create new services and efficiencies – breaking the silo-based approach of traditional M2M

Thank you very much

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