IDATE Research

Connected Economy

Smart Metering

A market picking up momentum

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This document is a part of our "Connected Economy" category which includes in 2014:
- 1 dataset in Excel, updated yearly
- 1 state-of-the-art report in PowerPoint, updated yearly
- 4 market reports in Word, each with its synopsis in PowerPoint
- Privileged access to our lead Internet technologies analysts

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DIGIWORLD by IDATE

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Soichi joined IDATE as a senior consultant in January 2009.

His main area of endeavour is the Internet services market, both fixed and mobile, covering a wide range of topics such as VoIP, social networks, net neutrality, advertising and the use of personal data, to name but few. In particular, he specialises in the 'Telco and OTT' perspective, including the analysis of strategies employed by the various players, scenario building and forecasts.

Before coming to IDATE, Soichi worked for NTT DoCoMo, Japan's largest mobile network operator by subscriber numbers, where he played a leading role in the strategic planning of the rollout of Japan's first 3G M2M data-only tariffs.

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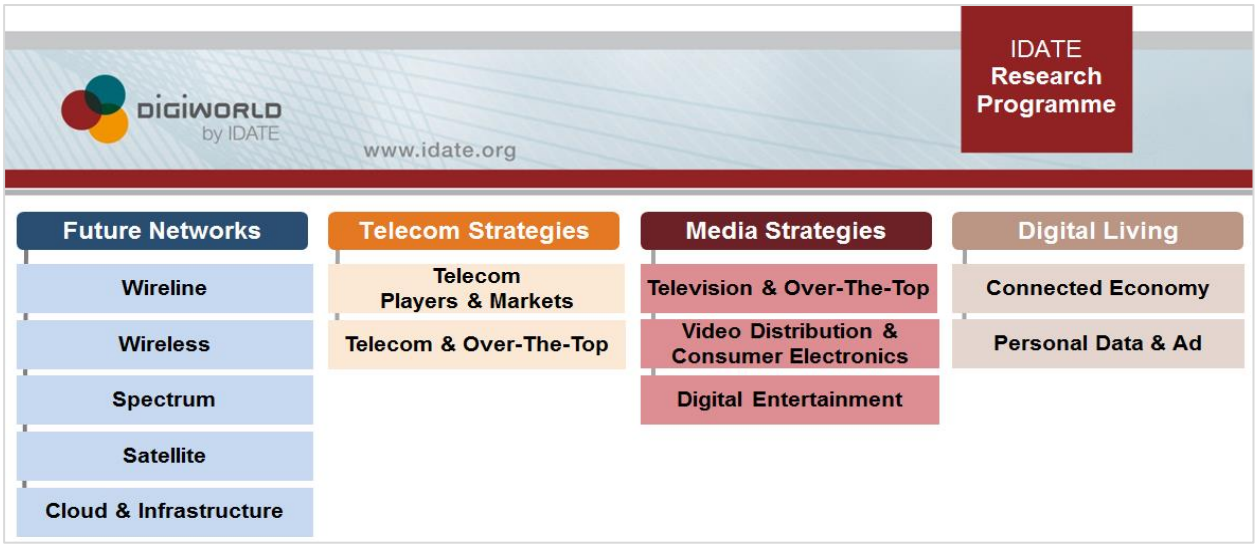
About IDATE and DigiWorld Institute

Founded in 1977, IDATE has gained a reputation as a leader in tracking telecom, Internet and media markets, thanks to the skills of its teams of specialized analysts. Now, with the support of more than 40 member companies – which include many of the digital economy's most influential players – the newly rebranded DigiWorld Institute has entered into a new stage of its development, structured around three main areas of activity:

- **IDATE Research**, an offer of market intelligence publications
- **IDATE Consulting**, time-tested analysis
- **DigiWorld Institute**, a think tank on the digital economy.



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2. Methodology & definitions

2.1. General methodology of IDATE's reports

The methods employed by IDATE's teams of analysts and consultants are based on an approach that combines:

- research and validation of data collected in the field;
- the application of classic industry and market analysis tools: segmentation, competition analysis, strategic strengths, modelling, assessment and forecasts…;
- the expertise of specialists who contribute their own analytical capabilities and those of their network of market analysts.

More specifically, the tools employed by IDATE's teams are as follows:

1/ A multi-disciplinary team of full-time consultants, specialised by sector of activity

IDATE's analyses are performed primarily by our in-house consultants, and very occasionally by freelance market analysts. This approach allows us to capitalise on our pool of expertise through teamwork, sharing knowledge, ideas, contacts, viewpoints and key data. Each report is drafted by a team of specialists, overseen by senior consultants with a proven track record in their field.

2/ Primary and secondary research

IDATE reports and databases are compiled based on primary data obtained from one-on-one interviews with the sector's decision-makers, and on secondary data which is established by cross-referencing public sources and external databases.

3/ An integrated information centre sustained by a number of tools and proprietary databases

Over the past 30 years, IDATE has established working and data organization methods and proprietary databases that trace the central chapters in the history of our sectors of expertise.

- **Companies**: IDATE's in-house data service tracks the latest news and events to come out of the top telecom, Internet and media industry companies around the globe. Innovative firms and start-ups are monitored by the market experts in the different "Practices".
- **Markets**: IDATE's databases are derived from rigorous processing of fundamental economic variables (GDP, investments, exchange rates, demographics, etc.) and their relation to decisive sector-specific and national elements (capex, national market dynamics, etc.).
- **Technologies**: IDATE's organization by Practice provides us with an efficient means of tracking innovation. IDATE's engineers ensure in-depth understanding of the changing shape of products and services and of the latest innovations in the marketplace.

4/ Contents of the published reports

Each IDATE market report details the structures and issues at play in the market being examined, the decisive forces (technologies, regulation, consumption) and the players involved. Particular emphasis is given to market assessments and forecasts, as part of the central premise. All market reports are laid out in a clear and concise manner, and illustrated with tables and graphs of key market data and trends.

The process of drafting of a market report includes the following stages:

- analysis of the information available in the in-house databases, and review of analyses performed in the recent past;
- based on a preliminary segmentation and assessment of the market, and as part of an validated interview guide, analysts conduct interviews that enable them to validate working hypotheses;

- a market model is then established, making it possible to test the hypotheses that have an impact on the market's development, and validated by a new round of interviews;
- and, finally, the report's conclusions are debated with the team responsible for the project and with expert consultants from the various fields involved;
- a final proofreading and editing/revision process, prior to the production of the final version of the report which is delivered to the client.

2.2. Scope and definition

2.2.1. Scope

This report focuses on the deployment of smart meters, in particular from a telco perspective and the potential opportunities this may bring. For the purpose of this report, smart meters are utility meters (electricity, gas and/or water) which can provide two-way communication between the meter itself and the utility.

2.2.2. Technology

By utilising various communication techniques such as cell phone communications, RF mesh, and even broadband over power line (BPL), the smart meters communicate directly with the utility and remove the need for humans to interact with the meters.

Data connectivity in smart metering is generally structured in two tiers:

- **Last mile / HAN:** data collected from the smart meters is aggregated at a local point because this connectivity involves frequent collection (hourly, per minute or per second) and in small-size packets which is poorly suited to direct WAN transport due to pricing issues.
- **Backhaul transport / WAN:** the data aggregated through the last-mile connection is then transported over the WAN to the centralised automated meter management information system of the operator, often referred to as a 'concentrator'.

Put differently, smart metering is not a simple case of one smart meter = one SIM, even for cellular solutions, and in fact the number of cases where the SIM is directly embedded into the smart meter is rare. Depending on the country and/or utilities involved, the concentrator may aggregate data ranging from the level of a single house to even an entire neighbourhood level.

With the large variety of possibilities available for connectivity technology, various technologies are being deployed in different countries. Even taking just France, Germany and the UK, the three largest economies of Europe, the approach is very different.

Table 1: Technologies used for smart metering in France, UK and Germany

Country	Energy type	Regulation	Schedule	Main technology	HAN Main WAN technology
France	Electricity	Yes	2013-2020	PLC	Cellular
France	Gas	Yes	2013-2022	Ondeo	Cellular
France	Water	No	N/A	m2oCity/Ondeo	Cellular
UK	Electricity	Yes	2014-2019	ZigBee	Cellular, long-range radio
UK	Gas	Yes	2014-2019	ZigBee	Cellular, long-range radio
UK	Water	No	N/A	N/A	N/A
Germany	Electricity	Yes	N/A	Wireless RS232	m-Bus, Cellular, DSL, PLC
Germany	Gas	Yes	N/A	Wireless RS232	m-Bus, Cellular, DSL, PLC
Germany	Water	No	N/A	N/A	N/A

NB: More details of the technologies and regulations involved can be found in the corresponding country close-ups later in this report.

Source: IDATE, in *Smart Metering*, July 2014

There is a close connection between regulation and the state of technologies used for smart metering. For example, in the UK, regulation has now been introduced for all electricity and gas meters to be made smart by 2019, with the technologies and providers to be used being specified: Zigbee for the HAN, the Arqiva long-range radio solution for WAN in northern Britain and the Telefónica cellular solution for WAN in other regions. There is thus no decision for the utilities to make.

In the case of France, regulation has also been introduced for electricity and gas meters, but the technology and provider specified is different between electricity and gas. This stems from the fact that in France electricity distribution is 95% dominated by ERDF, and gas 95% by Suez; it is thus their respective technologies that have essentially been selected.

Finally, in Germany, regulation is in place for electricity and gas meters, but without a set timeframe to replace the 'dumb' meters with smart ones as in France or UK. Rather, the regulation requires that all new meters installed since 2010 are smart, and there is no regulation requiring replacing old ones. There are no specific regulations on the technology to be used either, meaning various technologies are used for both HAN and WAN. The choice is very much up to the utilities, using different technologies depending on the characteristics of their supply areas and the costs involved.

In summary, smart metering technology involves two stages: HAN and WAN. There are various technologies which can be deployed, but there are two main factors which decide the technology used: the regulators, and the key utilities. Should regulation exist, then there is no alternative. If there is no regulation on technology, then the choice comes down to the key utilities whose decision will be based on costs and area characteristics. These choices vary from one country to another.

List of potential communication technologies

Below is a summary of the various communication technologies which could potentially be used, with an analysis not just for smart metering but for M2M in general.

Table 2: Analysis of communication technologies

Technology	Advantages	Drawbacks	Most-suitable applications
Copper line/cable	• Very widespread • Not shared bandwidth with other machines • No radio interference	• Not free of charge • Short reach	Industrial Video surveillance Home automation
Fibre	• High bandwidth • Not shared bandwidth • No radio interference	• Not free of charge • Costly deployment • Limited availability	Industrial Video surveillance Home automation
PLC	• Very widespread • Limit throughput • Not shared bandwidth • No radio interference	• Free of charge • Security?	Electricity metering Home automation
Cellular	• Mobility • Long range • Existing infrastructure • Security • No line of sight requirements • High throughput • High QoS • 'Always on' functionality • No interference from unlicensed usage • Two-way features	• Licensed technology (not free of charge) • No private network possibility (MNO required) • Expansive modules • Coverage (such as in cellars)	Almost all
Bluetooth	• Unlicensed (free of charge) • Cheaper modules (than cellular)	• Short range: up to 10m • Not very secure	Home automation Applications requiring a hub (Industrial, for instance)

Technology	Advantages	Drawbacks	Most-suitable applications
Zigbee	• Cheaper and simpler than Bluetooth • Range: up to 100m	• Data rate transfer quite low	Home automation Industrial Medical Applications requiring a hub (Industrial, for instance)
Smart Reach	• Complementary consortium • Long range • Dedicated to smart metering application	• Proprietary solution • Need to build a part of infrastructure (existing Arqiva infrastructure is a good start)	Utilities
SigFox	• Long range • Unlicensed • Low cost • Cheaper modules (than cellular) • Low bitrate	• Proprietary technology • No mobility management • Likely interferences • Security?	Alarms Utilities
Neul	• Broadband technology • Free of charge • Uniformed band across the world • Low throughput • Low consumption	• No mobility management	Alarms Utilities
Wifi	• High throughput • Long range	• No (real) mobility management (no handover) • High consumption (battery life) • Security?	Applications requiring a hub (Industrial, for instance)

Source: IDATE, in *Smart Metering*, July 2014