Orange: A player in the Internet of Things and Big Data
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Introduction

The digitisation of the physical world will have an impact on every economic sector and create brand new markets. This move to «turn the world into data» is also going to trigger a widespread transformation in the set of players and business models as well as accelerate the emergence of data pools that cover a very wide range of fields.

Orange will play a structuring role as a mediator of these data by collecting, processing, securing and exposing them to market players while ensuring privacy protection. These data constitute an informational heritage that is a lever for companies in improving their knowledge about their customers and internal processes and in innovating new services.

Amid the unending flow of data that will need to be exchanged, a massive amount will come from connected objects. Some studies estimate that by 2020, there will be several tens of billions of connected objects and the volume of data will number in the zettabytes (1,000 billion gigabytes).

Connected objects are increasingly invading our lives at various levels and changing how we use them. The private day-to-day bond between humans and these objects should be created within a safe environment where we trust digital technology. It should also be able to rely on adapted networks that are reliable, fast and available – networks that will interconnect the objects and transmit growing quantities of data.

This phenomenon is also going to speed up the creation of personal data pools as all of our digital traces accumulate, offering immense potential for innovation and requiring special care when it comes to conserving and protecting.

At the individual level, they are going to change people’s environment and practices in a number of areas, particularly in terms of healthcare, well-being and fitness, automobiles, homes and security. At the level of neighbourhoods, cities, rural areas or regions, they will optimise how we manage energy, make transport more fluid and places more secure, and provide people with relevant context-based information. These sensors will also enhance existing services within companies to optimise business processes and the industrial chain. Finally, they will help us tackle major planetary challenges in terms of the climate, demographics, public health and economic development around the world.

We are witnessing a new era called the Internet of Things that, along with Big Data and cloud computing, is one of the key foundations for Orange of the Internet of the future.
Context and market

The Internet of Things: An emerging market with great promise

According to McKinsey, the Internet of Things is estimated to represent over $6,000 billion of the global economy in 2025. In addition to the market for connected objects in the home, plus the fitness and well-being devices we are already seeing today, there is also expected to be a major boom in connected objects for cars. Currently only 10% of cars are connected. Estimates suggest that 90% of them will be connected in 2020. On a broader scale, the connected vehicle trend will have an impact on the transport sector. New services will also be introduced in the healthcare sector, for example, medical monitoring solutions.

Technological shifts usher in the new era of the Internet of Things

Along with the expansion of the Internet of Things and Big Data, three technological shifts will help turn the data into useful information for making decisions at the right time in complete security:

- The rapid expansion of smartphones forces the cost of sensors down and creates a boom in a whole series of connected objects with myriad built-in sensors that are generating data.

- Higher performing networks in terms of speed and/or energy consumption to move these data.

- The improvement of algorithms in data processing and handling rapidly increasing volumes.

Sources say that in 2020, there will be between 25 and 50 billion connected objects worldwide. These objects will foster the digital transformation of a long list of business activities, not only in terms of how they are used but also, and most importantly, because the data they generate will trigger deep-rooted changes and the emergence of brand-new services.

According to International Data Corp (IDC), the global market for the Internet of Things is expected to virtually triple by 2020 to $1,700 billion (€1,525 billion). It defines the Internet of Things as «a network of networks of uniquely identifiable endpoints (or «things») that communicate without human interaction using IP connectivity.» This market is estimated to be worth $655.8 billion in 2014 and is expected to have an average compound annual growth rate of 16.9%. While connected objects are a mass consumer market, there are still opportunities in the enterprise and public sector markets.
The French are proactive in innovating for the Internet of Things

After the United States, France is considered to be a land of innovation when it comes to the Internet of Things. In June 2015, it built the Connected Objects City in Angers, the largest space in Europe dedicated to innovation for the Internet of Things. The building complex contains all the tools needed to test and promote French inventions plus it serves as an open forum where industry businesses can share ideas. French Tech also signed a charter with eight distribution companies, including Orange, to endorse connected objects created by French start-ups. Orange will be opening its stores to new entrants from French Tech, help start-ups market their connected objects, promote them in its stores and online, and take part in communications campaigns to raise public awareness about the value of connected objects. There are now over 40 French start-ups eager to participate in this initiative, which is open to any products manufactured or designed in France. Furthermore, there is a host of entrepreneurs in France who have made a name for themselves in the Internet of Things and are expanding internationally or attracting venture capital. 100 exhibitors out of the 350 that attended the last CES Las Vegas conference from the world of connected objects were French.
Developmental challenges for the Internet of Things

Watches, activity monitor wristbands, calorie counters, scales, thermostats, lights, cars – a little more every day, ordinary objects and devices are adopting built-in communications. Even though connected objects are now part of our daily lives, the potential of the Internet of Things is still yet to come. A wide range of players are propping up this market, like start-ups, mass consumer electronics makers and even telecommunications operators. Building a rational ecosystem around these players will help usher in the new era of the Internet of Things.

Interoperability

In an effort to get the tens of billions of connected objects expected in the coming years to communicate and connect, either with each other or with information systems, the key to the boom of the Internet of Things is interoperability. Every object, software solution, communications module or network has to be designed with the same communications gateway between all the relevant operators and players. Putting together interoperable objects and services is a measure of success for perpetuating their use and ensuring continuity between objects.

Economic challenges

Investment in technology can be costly for companies due to short innovation cycles that can quickly make equipment obsolete. If companies are to invest for the long term, they first have to consider the type of object to be connected in terms of its autonomy, energy consumption and connectivity specially designed for each object and the environment in which objects are managed. The challenge in this case is finding the right business model between object design and its connectivity to achieve cost control in terms of the investment needed to roll out new projects for connected objects.
Challenges with security and privacy protection
A priority for device makers and companies developing services around connected objects must be the ability to reassure the owners of connected objects that the information transmitted and stored is secure and remains confidential. They all have to be transparent with the general public in terms of how their data will be used and do everything possible to guarantee end-to-end protection.

Challenges with responsible service
Securing the boom of the Internet of Things means more than just selling a connected object, so companies need to think about and structure themselves to offer users end-to-end services. If the Internet of Things is to last, the players involved have to agree on concepts of responsibility in the event of malfunctions or simply the after-sales service that will be provided. From manufacturer and distributor to operator and publisher, everyone involved in the value chain must determine their own accountability.

In 2018, it is estimated that 420 millions connected cars will be in circulation.

In 2023, the global healthcare sector will be using 847 millions connected devices.

57% de 190 décideurs interrogés par le cabinet Markess placent le Big Data et l’analytique dans leurs principaux enjeux de gestion de l’information.

82% des décideurs estiment que les fonctions analytiques peuvent améliorer leurs processus métiers (Markess).

Selon l’étude mondiale réalisée par Capgemini et EMC intitulée Big & Fast Data: The Rise of Insight-Driven Business:

43% des entreprises se sont déjà restructurées ou se restructurent actuellement pour exploiter le potentiel du Big Data.
Orange and the Internet of Things

Connected objects are one of the diversification arms of Orange's strategic plan Essentials2020. Through this strategy, Orange is confirming its desire to become the trusted partner for companies in their digital transformation and the benchmark operator of the Internet of Things. The target sales objective in this market is almost €600 million by 2018.

The Group's vision and commitment entail fostering the creation of an active and profitable ecosystem for the Internet of Things by:

- Facilitating open innovation.
- Accelerating the development of our regions
- Providing operational solutions to guide businesses through their digital transformation plans.
- Offering anyone and everyone a constantly growing selection of connected objects to change their daily lives.

Covering the entire value chain

By offering services to both the general public and enterprise markets, Orange covers the entire value chain:

- Connectivity solutions designed for each type of use.
- Distribution of connected objects in a catalogue of best products.
- Provision of value-added services for these objects in healthcare, well-being, the connected home and even meter-reading and vehicle fleet management.
- Collection, storage, security, processing and availability of data generated by multiple sources, including by connected objects.

Guaranteeing trust

It goes without saying that responsibility is required when expanding data and the IoT. The protection of personal data, such as corporate data and respecting the privacy of our customers, is a vital interest for a telecom operator like Orange whose mobile and fixed networks are transmitting a mounting volume of data. As a trusted operator, Orange aims to position itself in this market with constant vigilance.

The Group has made clear and firm commitments on personal data protection and respecting the privacy of its customers. As an operator, data security has naturally always been Orange’s priority.

Orange is currently doing everything in its power to ensure the security of the data sent over its networks and platforms and will continue to do so going forward.
Building an active ecosystem

Orange believes that the sheer magnitude of the transition calls for close partnerships within a wide proactive ecosystem that Orange wants to help build. To do this, Orange has to promote cross-functional collaboration between everyone involved in the value chain, with the aim of providing its customers simple and efficient solutions, whether it be for businesses, public institutions or the general public.

This will require partnerships at every stage, possibly with operators for network sharing, with leading industrial groups, device manufacturers, network component suppliers and startups.

From this perspective, Orange has committed to helping French Tech and supporting and promoting French connected object start-ups grouped under the umbrella called French Tech Connected Objects.

- On 21 October, Orange signed a charter designed to promote French Tech’s connected objects.
- For the occasion, Orange attended the national week-long French Tech Connected Objects event with seven other distribution companies to shine a spotlight on these products.
- French Tech connected objects were given a place of honour in six of the large Orange stores and on Orange.fr.
- Orange continues to promote and distribute these certified objects in the majority of its distribution network and on Orange.fr. (Parrot, AwoX, Withings, Sen.se, Netatmo).

Doing our part in research and standardization to prepare for the future

A key component of the IoT market boom will be the interoperability between the objects themselves and between objects and services. In fact, connected objects will number in the billions by 2020. Customers will not be equipped by a single supplier, so they will need companies like Orange to help them manage the variety and the interfacing between multiple objects. Orange is playing an active role in these efforts through its research and standardisation projects both in Europe and worldwide.
Orange’s advantages

The network expert: Connectivity solutions designed for each type of use

Through its 2G/3G/4G networks, Orange has been a Machine-to-Machine (M2M) operator for nearly 10 years. To supplement its cellular networks, over the last few months the Group has been investing in a LPWAN based on LoRa technology in an effort to complete its connectivity offer and lay the groundwork for the future of the Internet of Things.

LPWANs are meeting new needs in which the very low power consumption of sensors and the cost of communication modules are critical (sensors in buildings or houses, industrial equipment tracing systems, animal monitoring, and even sensors in cities to manage lighting and power systems, etc.).

Orange’s LoRa network will be rolled out gradually across France beginning in the first quarter of 2016 in the following 17 urban areas: Angers, Avignon, Bordeaux, Douai and Lens, Grenoble, Lille, Lyon, Marseille, Montpellier, Nantes, Nice, Paris, Rennes, Rouen, Toulon, Toulouse and Strasbourg.

At the same time, Orange is continuing standardisation work on future cellular networks (2G/4G)2, optimised for the Internet of Things, which will be operational in 2017. Indeed, by the end of the year Orange and Ericsson will perform the first trial of the use of 2G/4G networks. The technical tests will focus primarily on coverage in difficult areas such as basements and on sensor life.

The capacity to widely distribute connected devices

Connected object distribution adds value to the Orange network (4G speed or coverage), increases traffic in the stores and is also a driver for expanding its services business and, going forward, data analysis.

Orange distributes a selection of devices to enhance its network offers by capitalising on its network of stores to introduce consumers to these new devices and serve as a digital coach for its customers. Alone or with partners, Orange also provides value-added services for these objects in healthcare, well-being, the connected home, connected cars and Smart Cities.

Orange is a key player in France for cloud computing

The Internet of Things and processes related to Data Intelligence require a capacity to rely on high-performance flexible infrastructures that meet the demand in terms of volume, real-time responsiveness and speed ramp-ups. Orange’s strength lies in it being a cloud computing services provider well-known in the private and hybrid cloud market in France and worldwide, plus it supports European companies in securing and hosting their data through sovereign cloud capacities.

Currently, more than 1,000 major customers of IaaS solutions (Infrastructure as a Service) and over a total of 10,000 in the cloud put their trust in Orange’s services. Orange offers them a range of infrastructure and secure management solutions in «as a Service» mode, particularly a Big Data platform.
Native integration of security and privacy protection management
Responsibility is a requirement in the world of data and connected objects. As a network operator, Orange is transmitting a growing volume of data and aims to gain recognition from its customers, users and partners as a «trusted operator».

Orange has defined four key trust strategies:

■ Security by design: Data security means working at every step, but also in an end-to-end cross-functional manner to ensure overall consistency and constant vigilance. Security is never final; it is an ongoing commitment.

■ Intelligibility: Companies must be more responsible and not only show transparency in how data is used and shared, but even more clarity so consumers see their commitments as straightforward and comprehensible.

■ Control: Companies need to give consumers tools that allow them to control how their data is used and particularly to be able to manage their consent on whether they are used for activities like direct marketing.

■ Guidance: Companies should clearly be educating their customers on the new risks that come with digital technology and the various ways data are used so that consumers have peace of mind as they evolve within the digital ecosystem.

Software expertise and systems integration
Orange benefits from the knowledge of Orange Applications for Business, the French digital services enterprise (ESN, formerly the computer engineering services company (SSII)) at Orange Business Services that specialises in systems integration and providing customized or SaaS (Software as a Service or on-demand cloud-hosted software) software services. It has positioned itself as the IT and telecom partner for the digital transformation at companies focusing on their business performance.
There are 2,800 people Orange Applications for Business who help nearly 20,000 companies every day (8,000 of them with SaaS solutions) throughout the entire lifecycle of their projects (consulting, design, development and operations) in customer experience, data/analytics and connected objects.
The digital transformation is a crucial concern for companies, whether it involves improving the customer experience, boosting operational performance or facilitating the introduction of new services. Two great accelerators of this digital transformation are connected objects and data. Orange Business Services is positioned as the partner for the enterprise digital transformation by offering its industry know-how in the following areas:

- Cloud infrastructures
- Collaborative and mobile work modes
- Systems integration and software in customer experience, data/analytics and connected objects
- Networks and their potential for innovation (hybrid networks, SDN, network function virtualisation)
- Cybersecurity

Orange Business Services uses its expertise to orchestrate, operate and optimise this transformation:

**orchestrate**

assembling different technological services and packages to provide an intuitive seamless service

**operate**

service networks and platforms

**optimize**

24/7 IT and telecom services

Orange offers businesses a model that is both local and global because the enterprise transformation is supported locally yet operates globally.

The expertise of Orange’s teams positions the integrator-operator at the cutting-edge of the customer experience and their capacity for innovation puts it at the forefront of digital uses.
Smart Cities: The digital transformation in cities and regions

Since 2011, Orange Business Services has also been providing its know-how to support the digital transformation of cities and regions. Through a variety of partnerships with major stakeholders in industry, energy and cities as well as with innovative start-ups, Orange Business Services is fulfilling the needs for new services and uses expressed by cities and their inhabitants. At an increasing rate, urban populations are asking for real-time information, connectivity anywhere at any time and a reduction in public spending.

This has led to a number of new projects in smart grids to optimise energy consumption, smart buildings to create the intelligent buildings of the future, transport to make public transport more fluid and simpler, smart agriculture to develop digital services for the farming sector, information and optimisation services to help inhabitants get around, etc.

The digital transformation of businesses revolves around connected objects and data

Opportunities in every sector
Connected objects and data can improve operational performance in many sectors of activity or represent a distinguishing feature for creating brand-new innovative functionalities.

A few examples:

- **Transport/logistics**: Optimise rounds and traceability for goods
- **Smart Cities**: Smart grids, smart buildings, connected public transport
- **Automotive**: Deployment of new on-board services in vehicles
- **Insurance**: Automated incident reporting to reduce risks such as fire, water damage and intrusions
- **Energy**: Remote meter reading and network supervision
- **Retail**: Improve customer knowledge
- **Healthcare**: Connected medical devices and remote health data monitoring
- **Industry**: Preventive maintenance
According to an IDC study, almost 75% of corporate decision-makers have implemented or planned to put in place IoT solutions and 58% of those decision-makers consider these projects a strategic move.

**A new technological environment to manage**

While the new structured and mature projects on the Internet of Things and Data Intelligence are a sure sign that companies are paying attention to these topics, overcoming the new challenges created by this data transformation will require grasping a new technological world and upgrading the decisional and organizational structures.

This new world of services brings up a host of questions:
- How are these data identified, stored and analysed?
- How do you build a data environment that contains multiple data sources?
- How do you use them to your advantage to create new value-added services?
- How do you connect your machines and objects to increase operational efficiency?
- How can you be sure that these projects meet the stringent criteria on security and personal data protection?
- How do you put all this into a decision-making environment that is simple, centralised and secure?

While everyone agrees on the challenges and benefits, diving into projects like these takes very careful planning. According to a 2015 study by Gartner, only 13% of companies manage to create any traction for Big Data projects started in the organisation and 60% of data/analytics projects will have failed by 2017.

Successfully completing an IoT project requires:
- The right connectivity in the right place.
- Intermediation platforms to manage connectivity and read the data from objects.
- Software and expertise to make these data smart and incorporate them in enterprise processes so they can be exploited.

Therefore, the right approach is to:
- Detect the actual problems that need to be resolved and plan a project that has the greatest impact and the quickest rewards.
- Involve management at the highest level: this is a cultural shift where the thought process should focus on the input.
- Hire new talent in business and IT.
Orange Business Services has a goal to help companies tap into the full potential of Big Data and the Internet of Things

Datavenue: Orange’s answer to businesses’ needs
The Datavenue programme was created in 2014 and has since been bringing together the Orange Group’s expertise to focus on the world of data and analytics. After achieving its first milestone of building and coordinating a vast ecosystem of technological partners, innovative start-ups and companies looking to begin seriously considering the potential of their data, Datavenue has entered its second phase. It is now focused on providing businesses a full catalogue of solutions and services for data and connected objects, one of the key suppliers of data.

At the same time, Datavenue is part of a co-innovation project by way of coordinating ecosystems that includes startups and partners from the academic, economic and industrial communities.

In a world where the pace of innovation is getting faster, an open approach is crucial for generating more dialogue, increasing the potential of value creation and keeping development cycles to a minimum. The agile methods that underpin open innovation are powerful levers for acceleration and synergies. Orange’s user-centric approach stems from guiding businesses through a co-design process to fulfil their interests by using the input and connected objects to improve operations and create new services.

The purpose of this continuous innovation cycle will also be to enhance the Datavenue catalogue for companies, thereby ensuring they are accessing the most advanced solutions on the market.
Datavens’s solutions and services: Two new offers: Live Objects and Flexible Data.

**Live Objects: A menu of IoT services**

In terms of connected objects, businesses need a catalogue of certified objects, solutions for connectivity, interconnection and hosting, as well as operating interfaces for the data generated by these objects. That is what Live Objects offers.

With Live Objects, Orange Business Services is guiding companies at every stage of their IoT projects using a secure solution that is modular and scalable. Live Objects connects enterprise machines and objects to their business applications and IT environment in every sector for any desired use while collecting and hosting the data they produce. Live Objects contains four service packages:

<table>
<thead>
<tr>
<th>Service Package</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live Objects Select</td>
<td>Companies choose from a catalogue of Orange-certified sensors and connected objects to put together their offer of services in industry, remote support, home automation (smoke detectors, leak detectors, etc.)</td>
</tr>
<tr>
<td>Live Objects Connect</td>
<td>Companies choose the connectivity solutions they require to connect their objects to the most suitable network. This may be through cellular solutions (3G/4G networks), dedicated networks like LoRa or local access solutions (car box, my plug, etc.).</td>
</tr>
<tr>
<td>Live Objects Manage</td>
<td>High-capacity platform that companies can use to collect and host the data generated by the objects, machines, sensors, vehicles, etc. they decide to connect.</td>
</tr>
<tr>
<td>Live Objects Control</td>
<td>Orange offers businesses solutions for viewing these data, whether by integrating them into the company’s existing business applications or through dedicated interfaces specially designed for this purpose.</td>
</tr>
</tbody>
</table>
Flexible Data: Big Data for everyone

Flexible Data offers enterprise customers a set of services to build a Big Data environment adapted to their needs and maturity level. They can explore and execute new services and get the most out of their data in a secure and controlled Web environment. Flexible Data contains three service packages:

<table>
<thead>
<tr>
<th>Market Place</th>
<th>Data sinks that enable companies to combine their own data with reliable external data (Orange Business Services serving as a trusted third party) or monetise their data after an anonymisation process.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytics</td>
<td>Companies can analyse their data with access to a series of the best Data Intelligence applications on the market.</td>
</tr>
<tr>
<td>Platform</td>
<td>Businesses are given a private customer space accessed on a cloud infrastructure in «as a Service» mode that stores and processes their data or any third-party data they use.</td>
</tr>
</tbody>
</table>

Flexible Data partners Prédicsis and Splunk

Prédicsis is a French startup that specialises in artificial intelligence. A product of the Orange R&D centre in Lannion, France, it developed a specialised predictive analysis tool based on bulk data processing. The solution gives companies capabilities such as customer behaviour forecasting and retention campaign planning or actions like targeting the best prospects for an ad campaign to reduce churn. Prédicsis received an award at the i-Lab competition held by the French Ministry of Education and Research and was ranked by EBG (Electronic Business Group) among the top 10 most innovative start-ups. At Amazon's annual convention, it was recognised as one of the four start-ups to watch and the company's 20 experts have already won some major clients such as EDF, Orange, Renault and Sodexo.

Splunk is a software publisher located in Silicon Valley. It supplies Flexible Data with software for collecting and correlating any volume of data in any format and from any source. It can be any type of source data: structured, unstructured, or generated from databases, logs or network flows. The data can come from operating systems, specific software programmes, servers, connected objects, the cloud, mobile applications, etc. Once the data is collected and indexed, it can be used for website user behaviour analysis, IT or industrial infrastructure capacity planning, real-time implementation of marketing activity dashboards, etc.

Splunk already has over 10,000 business and government clients, 75% of which are in the Fortune 100 and mostly located in the United States. It won the Horizon Award when it was founded in 2006 and for the third year in a row, Fast Company just named it one of the 10 most innovative companies in Big Data.
Flux Vision: Operator data enhancing customer knowledge

First introduced in 2013, Flux Vision is a solution for measuring population movements and traffic in geographic zones using technical data generated by the Orange mobile network. Flux Vision can thereby quickly and regularly use reliable statistical data for things like analysing attendance at an event, tracking tourist visits through a given area, understanding, evaluating and optimising a region’s activity and attraction centres (transport infrastructure, activity zones, etc.) and even optimising and developing a network of retail outlets (best traffic analytics, store location, infrastructure adaptation, etc.). Flux Vision relies on exclusive irreversible and anonymisation processes. These processes eliminate any possibility of directly or indirectly identifying data about an individual at any stage of data processing.

The data generated by Flux Vision are also part of third-party data that can be accessed through the Flexible Data Market Place module.

Feedback on the Internet of Things and Big Data

Orange offers enterprise support in the industrial, insurance and mass distribution sectors as they set up their IoT and Big Data projects.

Internal process optimization for a major industrial group

Challenges

Improve internal performance by capturing, processing and integrating data on production tools worldwide.

Orange Solution

With Live Objects, Orange worked on the entire value chain for the company’s production data and installed solutions enabling it to capture, process, integrate and exploit these data and do so anywhere in the world.

Results obtained

Predictive maintenance was enhanced, process optimised and resource management improved (human resources and processing time).

Improves performance through predictive data analysis for a major industrial group

Challenges

Reduce configuration time for all of its production machines and improve their quality.

Orange Solution

This industrial player was concerned about accelerating the launch of new products, so Orange fitted out its production machines with sensors (Live Objects) and provided it with a turnkey predictive analysis solution for the data collected (Flexible Data). Orange gave the company the power to analyse hundreds of parameters and model them to fine-tune configuration and reduce the number of pre-runs.

Results obtained

New products were launched at an accelerated pace and pre-run costs reduced.
**Inventing new services for a major insurance company**

**Challenges**

Distinguish itself from its competitors with new innovative services using connected objects.

**Orange Solution**

With Live Objects, Orange helped a large insurance company develop new personal services based on availability of connected devices that meet customer needs. If any problems arise at someone’s home, they can press the emergency button on the device that connects them to a secure platform through an IoT router. The platform retrieves, aggregates and processes the information and the alerts received, then integrates them into the insurance company’s CRM tool. Any alerts on battery problems or connection interruptions are automatically detected and reported to the platform. The insurance company then has an option to immediately take the appropriate actions. At the same time, reports on any fire or leak alerts help then attenuate the risks. The resulting reduction in insurance pay-outs for damages is then passed on to the company’s customers.

**Results obtained**

The company set itself apart with new value-added services, can predict and reduce risks (fires, problems, etc.) and thereby the related service costs.

**Enhancing the customer experience for a mass distribution company**

**Challenges**

Consolidate the data generated by all its sales channels, improve knowledge on buying behaviour and fine-tune its marketing strategy.

**Orange Solution**

Orange is helping this company with its improvement strategy for customer knowledge. Using Flexible Data, Orange helped this large corporation consolidate all the data coming from its different sales channels (brick-and-mortar and online stores), process all of these data and in turn helped improve its sales and customer relations strategy (improve the multichannel process, better target customers with relevant offers, improve inventory management, etc.). Orange is also now able to offer this company a catalogue of additional third-party data that will help it anticipate customer demand based on factors like weather data. The company was able to better understand the buying behaviour of its customers and fine-tune its marketing strategy.

**Results obtained**

- Consolidate both the online and brick-and-mortar communities.
- View product-related activity.
- Customise customer clickstreams on the website.
- Improve its customer relations strategy.
- Improve its inventory management.
Services for the general public

The connected object ecosystem has created several opportunities for Orange

Orange is looking to build a presence across the whole value chain based on types of objects, and more specifically:

- Distribute devices to enhance network offers by capitalising on the network of stores to introduce consumers to these new objects and serve as a digital coach for its customers;
- Provide value-added services for these objects, particularly in healthcare, well-being and the connected home;
- Manage data generated by connected objects with an open intermediation platform.

Homelive’s success has encouraged Orange to continue making progress in this area and enrich its services even more in its various European markets.

Datavenue will gradually build up this ecosystem as it compiles data generated by these connected objects as well as with third-party data and it is prepared to form partnerships to improve services and create new services while protecting user privacy.
Distribution of connected objects in stores
For a long time now, Orange has been investing to distribute connected objects and support start-ups. Orange already distributes nearly 50 connected objects in its 846 stores in mainland France and on Orange.fr.

Orange offers a wide range of connected objects in a variety of sectors, which is directly aligned with the drivers outlined in Essentials2020.

An adapted distribution network and customer support for new uses Brick-and-mortar stores offer local access for customers seeking new ways to use technology. Orange is modernising its store network in many European countries, particularly by opening a Smart Store in Paris, France in September and another Smart Store in Romania.

This new Smart Store concept was designed as an invitation to an experience, a place of introduction and explanation where customers feel at home and can better envision themselves using these new digital objects.

The Smart Store unveils themed worlds that are highly stylised and user-friendly, directly in line with the Essentials2020 action drivers. It offers connected objects for a range of worlds: travel, entertainment, work, well-being and the home. Orange’s objective is to roll out this new concept to showcase connected objects at 1,000 of its European stores.

About 10 Mood stores enhance the operator’s store network. They do not offer any telecom services like plans and subscriptions, yet serve as rich learning laboratories that feed the budding connected object retail approach.

Orange services and offers
Since October 2014, people have been using the Homelive solution to control their homes with a mobile phone. With a single application, Homelive makes it easy to interact with the connected devices in your home. Homelive will eventually be able to control energy consumption in the home, activate the interior with connected equipment for the home and take care of members of the household.

Homelive is a home automation solution that is easy to install and use, plus it remotely connects you to your home and ensures the household is safe. Homelive covers an entire range of connected objects like motion detectors, surveillance cameras, water leak detectors, smart plugs, thermostats and the rolling shutter module. Orange pays close attention to navigation and accessibility (installation and use) for the Homelive connected objects, which are easy to activate. They are designed to be inconspicuous and stylish so they blend in with every living space.

It is a scalable solution that gives users the option to build an environment that meets their individual desires, needs and lifestyle to make daily life and well-being easier for loved ones.

My Plug 2 lets users remotely turn electric devices on and off, receive text alerts if the power goes out and when it is restored, track a device’s energy consumption in real time as well as control connected objects.

Orange Beacon automatically displays geo-localized messages on nearby smartphones. Orange Beacon emits a Bluetooth Low Energy signal that can be received by most mobile devices and has autonomy of several years.

Homelive is a home automation solution that is easy to install and use, plus it remotely connects you to your home and ensures the household is safe. Homelive covers an entire range of connected objects like motion detectors, surveillance cameras, water leak detectors, smart plugs, thermostats and the rolling shutter module. Orange pays close attention to navigation and accessibility (installation and use) for the Homelive connected objects, which are easy to activate. They are designed to be inconspicuous and stylish so they blend in with every living space.

It is a scalable solution that gives users the option to build an environment that meets their individual desires, needs and lifestyle to make daily life and well-being easier for loved ones.

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A commitment to French Tech
As part of its commitment to French Tech, Orange is distributing products developed by innovative start-ups and continues to form partnerships to constantly add more functionalities to its connected objects. Orange continues to promote and distribute these certified objects in the majority of its distribution network and on Orange.fr.

**AwoX** is a French company based in Montpellier that was co-founded in 2003 by Alain Molinié and Éric Lavigne, who had previously started Smartcode Technologies. It designs professional software and connection technologies for A/V devices. Orange sells a range of three AwoX lamps, including the Aroma LIGHT Color, a Bluetooth essential oil diffuser built into a low-consumption LED bulb.

**Withings** was founded in June 2008 by engineers Éric Carreel, Cédric Hutchings and Frédéric Potter. Withings set a goal to rethink consumer electronics by enhancing new services with an Internet connection. To track your daily physical activity, Orange is exclusively offering a Withings pack that includes a watch and two bracelets for the price of the grey watch alone.

**Parrot** is a company founded in 1994 by Henri Seydoux that designs, develops and sells consumer products and high technology for smartphones and tablets. Orange sells three of the brand’s drones, including the Parrot Cargo Mars drone, a rugged, shock resistant and customizable minidrone.

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Orange: A player in the Internet of Things and Big Data
Sen.se was developed in 2010 by Rafi Haladjian, who is mostly known as the co-inventor of the Nabaztag talking rabbit, one of the pioneer objects on the Internet of Things. Sen.se is a platform of objects that collects lifestyle data and makes sense of them. Orange sells the Mother Sen.se and its four motion cookies, a home automation solution that covers all your daily needs: healthcare, fitness, security and comfort.

Created in 2011, Netatmo is a French company that specialises in connected objects. It was founded by Fred Potter and Jean-Pierre Dumolard, co-founder and president of the supervisory board. Netatmo and Orange also signed a partnership to embed the Netatmo weather station in Homelive in July 2015 and the Netatmo thermostat in October 2015.

The need for a very high-speed fibre and 4G network
These new business lines will also enjoy the enhanced connectivity Orange is going to offer. For example, fibre and 4G latency times are particularly suited to connected devices, which must react almost instantaneously to commands. Connectivity is like oxygen for these devices.
Coordinating and supporting start-ups and developers

For the Group, supporting start-ups is an important part of Essentials2020 aimed at accelerating innovation primarily for the Internet of Things, the cloud and Big Data. By 2020, the Group also intends to support 500 startups around the world through its programmes using a very hands-on approach focused on quickly developing commercial partnerships and in some cases joint ventures.

Orange Fab is an international accelerator network of Orange start-ups

Starting a new company is truly challenging and large groups can play a major role in supporting start-ups at that crucial stage of development to help them become champions. That is why Orange has made a commitment to these start-ups to guide them as they grow their businesses. Backed by its international reach, in 2013 Orange created a startup acceleration network called Orange Fab. Its two objectives are to accelerate innovation for Orange customers and accelerate growth for start-ups. With accelerators in the United States (Silicon Valley, March 2013), Europe (France, November 2013, Poland, February 2014, Spain, end of 2015), Asia (Japan, February 2014, South Korea and Taiwan in April 2014), the Middle East (Israel, September 2014, Jordan, July 2015) and Africa (Ivory Coast, September 2014), start-ups have access to a real international network rooted in highly active innovative ecosystems in 10 countries on four continents.

In November 2015, 145 start-ups have already been accelerated and monitored by Orange. The start-ups selected by Orange Fab also have the advantage of a partnership between innovation-based structures with start-ups from Singtel (Singtel Innov8), Orange (Orange Fab), Deutsche Telecom (hub:raum) and Telefónica (Telefónica Open Future).

Orange invests in start-ups and the digital ecosystem directly or through investment funds:

- Orange Digital Ventures bought a stake in Actility, or through other investment tools where Orange has a presence (Netatmo financed by IRIS or Fotokite by Robolution Capital).
- Widespread promotions for French Tech IoT start-ups at major industry tradeshows like the Connected Conference where the Orange booth hosts several IoT start-ups (Prizm, Lucie Labs, Label Abeille, My Biody Balance and Green Communications), or through a partnership with Business France that gives French IoT start-ups like Giroptics and Prizm an opportunity to attend key international events such as CES Las Vegas, MWC, and Web Summit so they can expand their base of prospects and partners.
Connectivity solutions for device designers
True to its open innovation approach, Orange also develops tools to help device designers innovate faster.

- The LoRa Kit: A connectivity kit to prototype any type of connected object in preview mode on Orange's experimental LoRa network
Launched in November 2015, the LoRa Kit is a turnkey connectivity kit that start-ups and industrial partners can use to prototype their connected objects and develop services by relying on the experimental LoRa networks deployed by Orange and on the Datavenue solution. This experiment gives our partners an opportunity to start creating LoRa connected objects right now on the Orange test network.

The kit includes all the hardware needed to produce a connected object prototype: an open source microcontroller, a LoRa module, an aerial and a battery. Start-ups can use the LoRa Kit to develop prototypes of connected objects that need to be used with a low-speed connection and have long autonomy, for example to read the air quality once a day.

All of the data that the LoRa Kit transmits is automatically available on Datavenue, which makes life easier for partners and allows them to very quickly create value-added services.

The kit gives start-ups a competitive advantage because they save time by embedding LoRa technology into their prototypes. They can quickly canvass investors and customers using a working prototype and more easily convince them to industrialise their products and services.

Orange is seeking motivated partners with concrete projects to help test LoRa. Interested startups are invited to submit an application on Orange Partner (www.orangepartner.com/lorakit).

- The 4G Kit for IoT: a connectivity kit to prototype any type of connected object on Orange's 4G network
Designed in partnership with Alcatel-Lucent and Sequans, the 4G kit for IoT enables start-ups to quickly and cheaply design their connected objects for testing in live conditions on the Orange 4G network.

The 4G Kit for IoT is a turnkey 4G connectivity solution including the equipment necessary to produce a connected object: an Olimex micro-computer, a 4G module, an aerial, a battery and an Orange SIM card with data included. The kit also contains software that enables native management of the Orange 4G connection and a whole range of functions in the Cloud (storage, processing, etc.) to enrich the object’s potential.

- Pops: a hardware and software platform for quickly developing an industrial solution in wearables.
Pops includes a physical module that is the size of a watch with a 2G connection and BLE (Bluetooth Low Energy) connection. The module contains various sensors that provide geolocation and actimetric functions, a screen for starting actions or sending messages. The solution comes with a software platform for designing a very wide range of business applications like connected pet collars, health or treatment regimens and athletic coaching.
Orange Partner

In the discussion on innovation, we cannot overlook the importance of developers, whether they be start-ups, people at device manufacturers, ESNs (digital services enterprises), software publishers or large groups, and at an increasing rate everything is being governed by the “code.” They are actually tomorrow’s decision-makers. Through its Orange Partner hub, the Group allows developers all over the world to access its networks and symbolic services. Orange has provided self-service access to 15 programming interfaces (APIs) on its core French services: Identity, User Details, Direct Billing, Cloud, M2M, Search Toptrends, Orange Store Locator, Orange Wifi Locator, Orange Beacon and Datavenue. The text API is offered to smartphone app publishers or web clients targeting users in Cameroon, Senegal, the Democratic Republic of Congo, Ivory Coast, Guinea and Niger.

Consulting and mentoring

Orange provides consulting and mentoring in a number of business sectors like sales, location services and manufacturing, mainly through the Orange Supply Consulting’s hardware support programme that it has already offered to two French start-ups (Smiirl in 2014 and Prizm in 2015) to help them find a manufacturer in Asia that meets their specifications and then assisted them in tracking the industrialisation phase.

Orange partners with the Connected Objects City in Angers

This is a one-of-a-kind place in France where connected objects are designed, prototyped, industrialized and produced. French President François Hollande opened the Connected Objects City in Angers on 12 June 2015. The Connected Objects City is a private company in which Orange is a shareholder (along with Eolane and many other investors) that provides project originators all the resources they need to successfully manufacture their product in France. Everything is done on-site, from design (CAD) to prototyping (professional 3D printers, electronic development stations) all the way through industrialisation (electronic component installation line, laser cutting, micro-foundry).

In addition to its financial investment, Orange’s backing essentially represents mutual assistance for start-ups through products and services like the 4G Starter Kit, MyPlug, U-by, and in a broader sense Datavenue that are provided free of charge during the project incubation phase. This guidance also comes in the form of skills and technological support.
Research and development: Preparing for the future

Orange is continuing its work on standardising future (2G/4G) cell networks for the Internet of Things, which will be operational in 2017. 5G networks will be ready by 2022. From this perspective, Orange and Ericsson are joining forces to experiment with functions that will make it possible for 2G/4G networks to meet the challenges of the Internet of Things. The main functions being tested are:

- Enhanced Coverage GSM (EC-GSM). This function will expand the coverage of the 2G networks in areas that are hard to reach, like basements.
- Power Efficient Operation. This function extends the autonomy of connected objects, like some sensors, for up to 10 years using a regular battery. Sequans will be providing the test module.

The experiment includes an initial laboratory phase from 23 November to 4 December 2015. The next phase will be rolled out on the Orange France consumer network in the Paris region from 7-18 December. The purpose of the experiment is to prove the relevance of these technologies in meeting the requirements of the Internet of Things.

A key component of the IoT market room will be the interoperability between the objects themselves and between objects and services. In fact, there will be billions of connected objects between now and 2020 and customers will not be equipped by a single supplier, so they will need companies like Orange to help them manage the variety and the interfacing between multiple objects. Orange is playing an active role in these efforts through research and standardization at the European and global levels.
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