Hello Future Articles Archive

Year: 2018
Welcome to the Hello Future articles archive for the year 2018. This document compiles all articles published during this period, reflecting the ideas, innovations, and insights that defined the year.

The purpose of this archive is to preserve and share significant contributions from the Hello Future community, while providing an overview of developments and trends.

https://hellofuture.orange.com/en/marion-duprez-driving-open-integrative-5g-research/

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Research | Article

Marion Duprez is driving open and integrative 5G research

Monday 5th of February 2018 - Updated on Monday 12th of February 2018

- 5G
- Connectivity
- Networks
- Open innovation
- Research exhibition

Manager of the Plug'in research platform around 5G, Marion Duprez offers researchers a fantastic shared playground: to build, together, the next generation mobile network within the scope of research that is undergoing a major transformation.

"5G will only be a success if it stems from an innovative and open ecosystem"

From the rise of the Internet through to 5G, Marion Duprez's career path has followed the evolution of networks. A researcher, she joined Orange as a telecoms and networks engineer in 1999, at the time of narrowband then broadband internet

deployment. "*It was a thrilling adventure, because the entire France Télécom IP (Internet Protocol) network had to be set up, with all technical fields being represented, thus enabling me to understand network construction from A to Z,*" she tells us.

In 2006, at the time of 3G, noticing the rapid increase in data traffic on smartphones she decided to move from fixed networks to mobile networks, and to go into research so as to contribute to the development of the 4G architecture. "*I felt the growing importance of data and thought to myself that 4G would be the generation to most need high-speed transport based on the IP. So I thought this was where my knowledge of the IP network could be the most useful.*"

Marion worked next on fixed-mobile convergence, then on the convergence between telecommunications networks and IT, within projects aiming to encourage discussion between architects from these two different worlds. This global vision of networks, acquired throughout a career spent at the heart of their evolution, and her will to make teams collaborate, understandably brought her to lead the Plug'in platform research project, a platform launched by Orange with the aim to experiment 5G in the scope of integrative research.

Open and integrative research

"*5G is a next generation mobile network that draws on technological developments in many areas, with software taking up an increasing share,* explains Marion Duprez. *In order to assimilate these different developments, we need research that is more integrative.*"

That is the core of the Plug'in platform project: to create both a self-service technical platform, which makes all of the necessary tools for building technological bricks available to 5G researchers (radio, network core, software, etc.), but also to build a "*shared playground*", enabling the gathering of competences and the exchange of developments, knowledge, and experience, so as to build an integrated 5G right from the start. A true transformation of research is taking place here!

Marion Duprez's team has also set up a framework with the aim of working on the platform in collaborative mode with third parties (public research institutes, industry, start-ups, users). In this respect, the Plug'in platform perfectly embodies the Open Innovation initiative undertaken by Orange for several years now. "*We believe that 5G will only be a success if it stems from an innovative and open ecosystem,*" the researcher underlines.

A transformative 5G

A smart, secure, and responsible 5G that is also transformative, democratises new uses, and paves the way for numerous applications in a wide range of areas such as

industrial robotics, autonomous vehicles, or even health and tourism. How? By offering very high data rates and a uniform user experience at all times, in all places, and on all devices; by connecting billions of smart objects; and by guaranteeing an extremely reliable network with low latency.

A 5G that is also very diverse and modular, according to Marion Duprez: "*Our clients – industry, to start with – will be able to choose what options they wish to have on the 5G. A bit like when one chooses the features, bodywork, or colour of a car at the car dealer's.*" And it is the preparation of precisely this 5G that the Plug'in platform enables.

https://hellofuture.orange.com/en/e-sim-supports-accelerates-development-iot/

1. Hello Future
2. Internet of things
3. e-SIM supports and accelerates the development of IoT

Internet of things | Article

e-SIM supports and accelerates the development of IoT

Friday 2nd of March 2018 - Updated on Thursday 16th of June 2022
Reading time: 4 min

- Connected objects
- Cybersecurity
- Device
- SIM

It's an invisible yet crucial transformation. In a few years from now, operators will no longer provide physical SIM cards. This chip, which makes it possible to secure and identify a user so that he or she can access the network and cell phone services, is now welded directly to the terminal during its assembly. The user chooses an operator which personalizes the chip remotely. This saves time and space, and above all provides an even more digital subscription process. Philippe Lucas outlines his vision to us.

“There is more just than competition developing between operators and manufacturers - in fact, e-Sim is helping to bring about a virtuous circle!”

What is the e-SIM? What does it offer that the traditional SIM card doesn't? Does it change the customer-operator relationship? What does it tell us about the mobile uses of the future? Philippe Lucas, Strategy, Architecture and Standardization Director and Director of the e-SIM program within Orange's Innovation, Marketing and Technology Division, answered our questions at the Mobile World Congress, where he also made a speech on this topic.

What is an e-SIM? How does it differ from the traditional SIM card?

Philippe Lucas: Simply put, the embedded SIM or e-SIM is an evolution of the SIM card. It's actually a SIM card, welded directly to the terminal during its assembly, and so is now inseparable from the terminal that houses it, whether it is a phone, watch, tablet, computer or connected object. The data from this e-SIM can now be configured via a remote server.

What does this change for the user? And for the manufacturer?

Philippe Lucas: Previously, the SIM card was a visible component, which the customer obtained from the operator by going to the point of sale or receiving it by mail. This took some time, even when the customer had subscribed to an online offer in a matter of minutes. From now on, this "wait period" is no longer necessary because the manufacturer integrates it directly into the terminal. When initializing the new device, the user simply has to download the digital profile of their SIM card from their operator via Internet access, such as Wi-Fi.

For the manufacturer, the e-SIM allows several types of improvements. Since the card is welded to the terminal, the device is sealed more tightly against liquids and dust. Moreover, the e-SIM is much smaller than a traditional SIM, without this altering any of its features. So that means there's more space available, whether for an extra battery or for new features. This is to the benefit of the user.

Several manufacturers already offer the e-SIM in their products, including Samsung, Huawei or Apple for some of their connected watch models.

What about the operators? Doesn't the manufacturer intervene in a certain way, as an intermediary between the operator and the customer?

Philippe Lucas: This is indeed an argument we've heard. This persistent fear seems to be fading as the e-SIM gradually catches on in the industry. Operators, including Orange, will maintain this direct relationship with their clients, a relationship that will gradually become end to end digitalized with the arrival of the e-SIM.

If we take a step back, the manufacturers are there to improve their products or OS's as much as possible in order to meet the needs of customers and to keep them loyal. They are looking for ways to make it easier to connect to their terminals,

which will allow them to offer value-added services to their products. As far as connection to mobile networks is concerned, operators remain the key players for the moment. I don't believe there will be any sudden changes in this approach. We must nonetheless remain vigilant. Orange is one of the most active operators in this regard.

Operators set themselves apart in terms of their specific expertise, the quality of their network, their knowledge of their customers, the profusion of their offers and the particular experience they wish to bring them… I sincerely believe that we can and must turn these fears into opportunities.

Meaning…?

Philippe Lucas: In addition to speeding up the activation of terminals without going to the point of sale, the e-SIM also has many uses in the rapidly growing connected objects sector. Looking ahead to the coming years, it is clear that smartphones will no longer be the only devices with a communications package. Connected watches come to mind, of course, but there are also personal surveillance cameras or other connected mobile or wireless devices, for example in the smart home or health care fields. We are talking here about general public uses, but we can also envisage uses at the corporate or community level, such as smart cities.

At the moment, introducing a SIM card into connected objects limits its development. It's a complex journey for the customer, who is naturally hesitant to connect more and more objects with extractable physical SIM cards. With the e-SIM, your main subscription becomes a kind of "hub" to which you can add or remove connectivity according to your use of connected objects, all in a fully digitalized way. The offers from the operators evolve, in order to favor this multiplication of things attached to the same package. The operator will play an increasingly important role as a trusted partner in this evolution.

Rather than causing competition between operators and manufacturers, in fact, e-Sim will help to bring about a virtuous circle! Simplifying the itineraries of users means increasing the number of objects used. In other words, the e-SIM will accompany and accelerate the development of the Internet of Things.

Was this virtuous circle made possible by discussions between operators and manufacturers? Are the e-SIMs we find on the market today the result of a common standard?

Philippe Lucas: The e-SIMs you can have in watches today are the result of several years of discussions between operators and manufacturers. We all knew that a standardized, mass-market solution was needed for this innovation to benefit everyone.

This is the spirit of the GSM Association, which has enabled us to work together to achieve this standard. This work within the GSMA made it possible to align operators and manufacturers in order to develop a standardized solution and establish a relationship of trust. I wouldn’t go so far as to say that it was easy, but there was a genuine willingness on the part of all stakeholders to work together to develop this standard. It can be said, however, that the result is in line with everyone’s expectations and with the work done!

https://hellofuture.orange.com/en/emotional-intelligence-meeting-empath-japanese-start/

1. Hello Future
2. Artificial intelligence
3. Emotional intelligence: meeting with Empath, a Japanese start-up

Artificial intelligence | Article

Emotional intelligence: meeting with Empath, a Japanese start-up

Monday 11th of June 2018 - Updated on Thursday 16th of June 2022

- Connected objects
- Human sciences
- Machine learning
- Start-up

The start-up Empath attended the Viva Technology trade fair in Paris, where it presented an artificial intelligence solution that can detect emotions through voice analysis. The spotlight was on this Japanese start-up, which had recently been selected by the Orange Fab Asia acceleration programme.

Speed, volume, pitch, tone…:Empath analyses the physical properties of the voice to identify emotions such as joy, anger or sadness.

With the rise of *chatbots* and personal assistants like Siri (Apple) or Djingo (Orange), with or without a connected speaker, the voice recognition market has grown rapidly in recent years. Most of these apps focus on linguistic analysis. They try to pinpoint the lexicon and grammar in sentences spoken by the user. However, when it comes to communication, words are not everything. Meaning is also carried across by our way of pronouncing words, especially emotional meaning. You do not have to be a seasoned comedian to understand that the same sentence will not convey exactly the same message when whispered hesitantly or shouted loudly.

In the wake of the tsunami

It is this aspect of conversation that the Japanese start-up Empath has chosen to explore. It all began with the earthquake and tsunami that ravaged north-eastern Japan in March 2011. Empath's Strategy Director, Hazumu Yamazaki says: "*While working for a group specialising in medical technologies, our founder Takaaki*

Shimoji discovered that there were many alternatives for analysing the data concerning the physical condition of the victims of the disaster, but nothing to assess their mental state". This is how the idea of the Empath project was born, and its first product arrived on the market in 2014.

"*Empath is an Emotion AI",* as Hazumu Yamazaki puts it. *"By analysing the physical properties of the voice such as speed, volume, pitch, tone, etc., instead of the language itself, our solution manages to identify in real-time emotions such as joy, anger, calm or sadness*". The perspectives for this technology are many. Its ability to enrich and refine our interactions with robots is of interest to specialists in artificial intelligence (AI), health and rescue services, or even commercial call centres.
The development kit (SDK) and Empath API have already been adopted by more than 700 customers in 50 countries. And that's just the start!

Providing for more nuanced behaviour in robots

Today, the start-up is looking to move up a gear, both technologically and commercially. Empath recently joined Orange Fab Asia. This acceleration programme will facilitate its entry into the European market, and France in particular. Hazumu Yamazaki can see his collaboration with Orange expanding in the future:
"*Voice assistants like Amazon's Alexa, Microsoft's Cortana, and Google Assistant are dominant players in the market, while a new form of e-commerce, 'vocal commerce', is about to explode in the United States. I think that Orange's voice assistant, Djingo, could differentiate itself substantially by incorporating Empath. This would enable it to understand the user's emotions, allowing Djingo to behave in a more human friendly way. Furthermore, our emotional AI could also contribute to the development of voice commerce: in telemarketing, Empath has already demonstrated its ability to increase sales by up to 20%*".

Empath continues to develop its software by focussing on *machine learning*.
"*Our strength",* concludes Hazumu Yamazaki, *"is that we have the largest user portfolio in the field of emotion recognition from speech. And if we seek to grow internationally, we must also create a global R & D team to advance our Emotional AI. For this, our small team of six needs to expand with experts in AI and affective computing*".

https://hellofuture.orange.com/en/stephane-pateux-co-creator-sensitive-home-tomorrow/

1. Hello Future
2. Research
3. Stéphane Pateux, co-creator of the sensitive home of tomorrow

Research | Article

Stéphane Pateux, co-creator of the sensitive home of tomorrow

Monday 12th of March 2018 - Updated on Thursday 16th of June 2022
Reading time: 3 min

- AI
- Cloud
- Connected objects
- Deep learning
- IoT

The home of tomorrow will be smart and sensitive, offering a whole range of personalised services to each one of its occupants. Research engineer at Orange Stéphane Pateux is helping to materialise this vision thanks to his work in the area of facial recognition and analysis.

"These facial recognition and analysis tools constitute the entry point into a myriad of smart services within the connected home"

From research to management… and back. After having managed one of Orange's research areas around customer experience, Stéphane Pateux made the bold

decision at the end of 2015 to return to research as a contributor, in the area of artificial intelligence.

"*My managerial experience was rich and interesting, but I really enjoy the technical side. I wanted to carry on taking part in the technological development of the Group, and to bring on board my research experience*", he tells us.

An engineer from the Corps des Télécommunications, Stéphane Pateux joined Orange in 2004 after spending nine years at the INRIA (the French Institute for Research in Computer Science and Automation) as a research fellow for video and network video transport analysis techniques. He took part in the development of video compression standards, including the recent HEVC coding standard, which has enabled a considerable reduction in video streaming transmission rates and the introduction of ultra-high definition into networks.

Deep learning

Now Stéphane Pateux is working on artificial neural network technologies, which have evolved considerably over the past few years thanks to the addition of more and more layers of neurons, thus contributing to the rise of *deep learning*.

Reproducing the operation of biological neural networks in a simplified manner, these technologies aim to teach computers to see and to hear – and to understand what they do see and hear! – through experience.

With his team, Stéphane Pateux is developing, for example, facial recognition and analysis tools that enable faces to be found in an image or a video, to know a person's gender, to estimate their age, to identify, them, and even assess their emotions.

Presented at the Salon de la recherche 2017, his work fits into Orange's vision of a future "sensitive home" and provides content for the Group's offer, in particular around a home assistant.

"*It's the tools that enable you to be immediately recognised by your home; the entry point, in a way, to a myriad of smart services within the connected home*" Stéphane Pateux explains.

In practice, facial recognition and analysis techniques enable the personalisation and adaptation of these services to each occupant. If we take the example of video on demand (VOD), a child will not be offered the same catalogue of films as an adult.

Publications and awards

These works and these solutions have been the subject of several publications and awards. "*We are integrated in the research ecosystem, and are recognised through the quality of our work,* Stéphane Pateux underlines. *For example, our technology on gender and age estimation was rewarded during an international competition last year. It was judged higher performing than a human being.*"

If contact with the academic world is frequent and fruitful, so is that within Orange, where Stéphane Pateux's team interacts in particular with the "Anticipation" teams of the various Orange Labs.

Having known both the academic research world and that of industrial research, the researcher underlines the contributions of the latter, in particular at Orange: "*Within the scope of industrial research, we have to make technological choices based on a techno-economic approach*" he explains.

"*Thanks to the quality of the different researchers and engineers working here, we are able to analyse the solutions and to qualify their performance in order to make these choices, which must be viable for the Group whilst meeting its customers' expectations. We do not push technologies for the pure beauty of technology; we truly try to find out how they can serve users and if it is the right time to introduce them.*"

1. Hello Future
2. Internet of things
3. Orange and myfood: connected greenhouse for better growing

https://hellofuture.orange.com/en/orange-myfood-connected-greenhouse-better-growing/

Internet of things | Article

Orange and myfood: connected greenhouse for better growing

Monday 25th of June 2018 - Updated on Thursday 16th of June 2022

- AI
- Connectivity
- CSR
- Open innovation
- Start-up

Connected, responsible, autonomous: the greenhouse concept developed by myfood, a start-up based in Alsace, France, incorporates various key principles for sustainable production and consumption. It combines them within a pioneering hybrid approach that brings together the worlds of digital technology and agroecology.

A connected greenhouse that combines permaculture and aquaponics techniques to achieve the best yields

22 square metres of greenery and tranquillity, offering an escape from the city's noises and pollution, where fish and vegetables share the space harmoniously in a

rich mini-ecosystem, producing salad plants, fruit, vegetables or herbs all year round. All widely accessible, from individuals to local municipalities or businesses looking to take back control of their food by producing part of it themselves with minimum time and maximum ease-of-use. Because the greenhouse is connected, it can guide users step-by-step to ensure the best possible yields…

Growing and consuming with complete confidence, even in the city

But how did this idea take shape and how has a traditional concept – greenhouse – been overhauled with agroecology techniques and digital technology? To understand this, we need to go back a few years to when myfood's founders, including Johan Nazaraly, were fresh out of school and found themselves faced with a situation. As Johan explains: *"In the past few years, we have seen a gradual erosion of supply chains and traceability in terms of what we are consuming. We are talking about food and nutrition because people have less and less confidence in what they are eating. So, we came up with an idea and goal to produce and consume without fear and with a sense of security. And this should be everywhere, even at the heart of cities, when we are short of time, space and knowledge."* A challenge that myfood is ensuring an effective response to by combining the best features of agricultural techniques with the operational benefits offered by the internet of things.

Permaculture, aquaponics… and sensors

While this start-up uses a greenhouse structure that has existed for decades, it optimises plant yields by opting for permaculture and aquaponics techniques and vertical growing to save space. Aquaponics can be found at the heart of the greenhouse, where vertical plants towers rise up above a tank filled with fish. This highlights the outstanding symbiosis between these living organisms, where the waste products and excrement produced by the fish provide nutrients for the plants, irrigated with water from the tanks. So, there is no need for fertiliser and the ecosystem covers its own requirements within a closed circuit. Next to the fish tank, permaculture beds add to the greenhouse's production capacity. And myfood has carried out extensive research to find the best possible substrate – the support structure for connecting and nourishing the plants. *"Two years of research were needed,"* adds Johan. *"The substrate we chose in the end is made up of organic compost, biochar, vermicompost and ramial chipped wood (RCW) mulch"*, which gives a soil just like the one found in forests. By combining the best features of agroecology and vertical growing, the greenhouse delivers exceptional results: producing several hundred kilograms of vegetables each year, covering the needs of a family of four for a good part of the year. All for minimum maintenance and upkeep, with just 1.5 hours per week.

Autonomy is also a key feature, because myfood offers the option to fit semi-transparent photovoltaic panels to supply the energy needed for the irrigation system and sensors in particular.

Orange and myfood get connected

Another specific feature of the connected greenhouse is the way it uses the internet of things, which makes all the difference for users. Laurent Chivot, anticipation project Manager at Orange explains: "*Several sensors are set up inside the greenhouse: connected to the best possible network infrastructure available – 2G or LoRa – they measure and track data relating to the water or air temperature or even the pH levels in the tanks. These data are then sent to a server, where they are compiled and analysed with artificial intelligence. They can then be shared with users through a smartphone, PC or tablet app, providing advice and analysis to guide them to achieve the best possible yields, or even warnings if the sensors show that temperatures inside the greenhouse are too high, for instance.*

Orange first connected with myfood at the Paris International Agricultural Show in 2017. This interest grew on both sides and eventually a connected greenhouse was set up at the Orange Gardens site. Since then, Orange has been supporting this young start-up to help it choose the best network and data storage platform solutions".

Connected and collaborative

This is another distinctive feature of the myfood experience, because it capitalises on the ideas and feedback shared by all its users. A collaborative platform brings together users and expert agronomists. *"Each greenhouse owner has access to the community, and everyone can share their contributions. They are what we call pioneers, who can all help develop and perfect our solution."* Collaboration and openness are also an integral part of the myfood state of mind, because all the greenhouse plans are open source.

Connected, smart, efficient, autonomous, eco-friendly, collaborative: the myfood greenhouse is all of this and more…

1. Hello Future
2. Data
3. Live Data Hub: Giving cities control of their data

Data | Article
https://hellofuture.orange.com/en/live-data-hub-giving-cities-control-data-2/

Live Data Hub: Giving cities control of their data

Monday 3rd of December 2018 - Updated on Wednesday 16th of September 2020

- AI
- Big data
- Digital
- IoT
- Smart city

Orange supports cities with the implementation of their data strategy with its dedicated Live Data Hub platform.

With the Live Data Hub, Orange is positioning itself as a partner of cities and a facilitator for the implementation of their data strategies.

Data is at the heart of the contemporary digital transformation, but it still must be harvested, to collect, aggregate and visualise them to define those to be shared in order to unlock the value of this raw material. While it is particularly urgent for the commercial and private sectors, it is also a challenge for the administration of cities. This is because, in terms of their different departments, cities also generate significant volumes of data that may be left unused, either intentionally or due to a lack of suitable means or even a clearly defined data strategy.

More than sharing data

The French Digital Republic Act passed in 2016, also known as Lemaire's law (named after the former French Minister of State for Digital Affairs, Axelle Lemaire), heralds the dawn of a new era. Indeed, it enshrines the principle of open data by default to communities with more than 3,500 inhabitants. Henceforth, they must organise themselves to ensure public data is distributed, in particular data that presents "an economic, social, health or environmental interest". The aim? To turn the data into a fountain of "wealth" that will be made available to citizens,

businesses, start-ups, etc. in order to develop new, value-added solutions. This wealth is also, and above all, a great opportunity for the various services of the community to better know their territory and identify levers of action. Large cities and towns did not wait for this law before launching their plans: “Rennes in particular has been working on this subject for more than five years in partnership with public services and/or partner businesses”, explains Xavier Augustin, Head of Live Data Hub at Orange. “This ecosystem of stakeholders pour their respective data into a ‘data lake’, which then produces new services, such as a tool for determining both the positive and negative impacts related to the construction of new buildings. For example, this allows for the impact of the construction of buildings on traffic, energy consumption, etc. to be evaluated.”

Orange naturally forms part of this approach to Big Data/Open Data as a driver for value creation. Orange Labs Services in Sophia Antipolis has capitalised on various responses to tenders to develop a data management platform: the Live Data Hub.

Live Data Hub, the station for controlling/sharing data

The Live Data Hub is so much more than a solution to comply with regulations, and is equally intended for businesses. As well as its already-operational Open Data division, which gathers, organises and publishes public data, and especially as an integrator and aggregator, the platform will also use data from different internal and external sources. Orange therefore positions itself as a facilitator that can provide cities with a self-service solution (Software as a Service, SaaS), without having to deploy any infrastructure to achieve integration or having to worry about the complexities associated with the types of licence required for the data. “The SaaS method guarantees easy deployment”, confirms Thomas Lafargue, Head of Data Products at Orange. “The solution, based on an Open Source foundation for most of its building blocks, from storing and safeguarding data through processing or even indexing, is destined to develop and evolve.” If this is designed for controlling, it is also used through its sharing component for cities (or groupings of cities) looking to build an ecosystem of partner businesses and start-ups that will consume the data and restore or transform it into new services.

Will AI soon be in the Live Data Hub?

Orange is therefore looking to achieve functional enrichment, “with environments for processing heavier Big Data”, adds Lafargue, “even going as far as integrating artificial intelligence solutions to benefit even more from the stored data”. The other development concerns the market: if Live Data Hub initially addresses cities, the platform will have to be adapted or developed to respond to the needs of several verticals, in particular in the energy or health sectors. It is equally intended to connect or establish synergies with Orange’s other services universes, such as Live Objects for the IoT or “Ma ville dans ma poche” app for citizen feedback.

An attractive product for cities

Without waiting for these future developments, the solution already represents a beneficial product for mid-sized communities, the core target of Live Data Hub, which do not have the same means as large cities, but nonetheless want to develop a data strategy. “We offer these communities a standardised, safe and reliable product to meet the requirement for transparency and their need to share data,” emphasises Xavier Augustin. “They will be able to better understand their data heritage, better use and take advantage internally between services and externally with partners.”

All this can be achieved very easily, without having to make developments and on a customisable platform.

https://hellofuture.orange.com/en/home-car-seamless-uses-digital-technology/

1. Hello Future
2. Internet of things
3. From home to car: seamless uses of digital technology

Internet of things | Article

From home to car: seamless uses of digital technology

Tuesday 27th of March 2018 - Updated on Wednesday 22nd of June 2022

- Connected objects
- Smart city

Connected home and connected car, these two technologies are developing rapidly and are now beginning to edge closer together, all the better to enable those who so wish to ensure continuity and consistency in their digital experience, whether at home or in the car.

“Home To Car” convergence promises continuity of experience and use between two environments in which we spend a large part of our time.

You return from work by car and get home, where the heating came on a few minutes ago, at whatever temperature you like… This scenario is not so difficult to imagine – or to achieve: a simple programmer is all you need. However there is a subtle difference: it was, in fact, your car that, as it approached your house, “ordered” the heating to come on. Welcome to the future of convergence, in which your home and your car connect to each other.

For the great majority of people in industrialized countries, time is mainly divided between home, work…. and travel between the two. By private car in particular: according to a survey commissioned by Citroën in 2016 and conducted by the CSA Research institute in 7 European countries including France, we spend 4 years and one month of our lives in our cars, or 7.7% of our waking hours.

As a real extension of our home, our car is an “*extra room*”, explains Carlos Jordan de Urries, Head of Smart Home Products in the Partnership and Connected Objects department at Orange.

"*Neither can avoid connectivity any longer, and both are digital environments in their own right, where we interact and communicate with or via objects",* he adds. *With homes and cars becoming increasingly connected, convergence between the two, that is the ability to continue certain uses as you pass from one to the other, is an important issue, and a major expectation of users.*"

A parallel development

In fact, the connected house and the connected car have developed considerably, in parallel, in recent years. In the former, increasing numbers of objects and systems are connected using high or very high speed broadband, and there were approximately 800,000 connected cars in France in 2017, a number which is expected to rise to 8.9 million in 2021, according to Statista Digital Market.

At the same time, the connected home has developed considerably, particularly as regards issues such as security, assistance and energy management.

In the future, there will be consistency between these two living environments, which will make best use of their respective connectivity capacities. First and foremost to provide the ability to control the services of one from the environment of the other and vice versa (for instance, to find out from your home the whereabouts of your car when it was parked by someone else the previous day).

But also to make your vehicle a secondary "device" under your contract, just as some people now use connected watches to make the most of their data allowance and access the content included in their bundle whilst on the move.

Initial solutions already available, others yet to come

Operators have a crucial role to play in delivering this connectivity "building block" to car manufacturers, in an open ecosystem which will also be the incubator in which future connected car services will be developed.

From the perspective of *Home To Car* convergence, the simultaneous explosion and merging of these two markets is already producing its first applications. The system of intelligent thermostats linked to cars, for example, is already available using Nest sensors from Google. Amazon, for its part, is working with Ford to integrate Alexa, its voice-activated smart assistant, into the North American manufacturer's vehicles.

Similarly, with Orange's virtual personal assistant Djingo, the voice is used as the perfect interface for interacting with home connectivity and users undoubtedly expect to be able to use this means of interacting with their cars in the future.

However, optimal convergence is still a long way away and there are several challenges along the road, particularly technical ones, in terms of access interfaces, connectivity and the management of user profiles.

The connected vehicle and the connected home are also not at the same stage of maturity: the virtual assistant that is beginning to find its way into some homes is soon expected to enter the car, where voice interaction is currently restricted to GPS navigation only.

As many uses as there are drivers

However the range of possibilities is wide open, and the expectations are there, "*particularly in terms of content consumption*", continues Carlos Jordan de Urries. "*Such as, for example, the ability to continue listening to a song or a podcast in the house, from the exact point at which it had been cut off in the car*", he explains. *"Or to be able to share content between the two environments; for example, a father who is watching an interesting television programme and wants to show it to his wife in real time in the car. Or to monitor connected objects from either the car or the house.*"

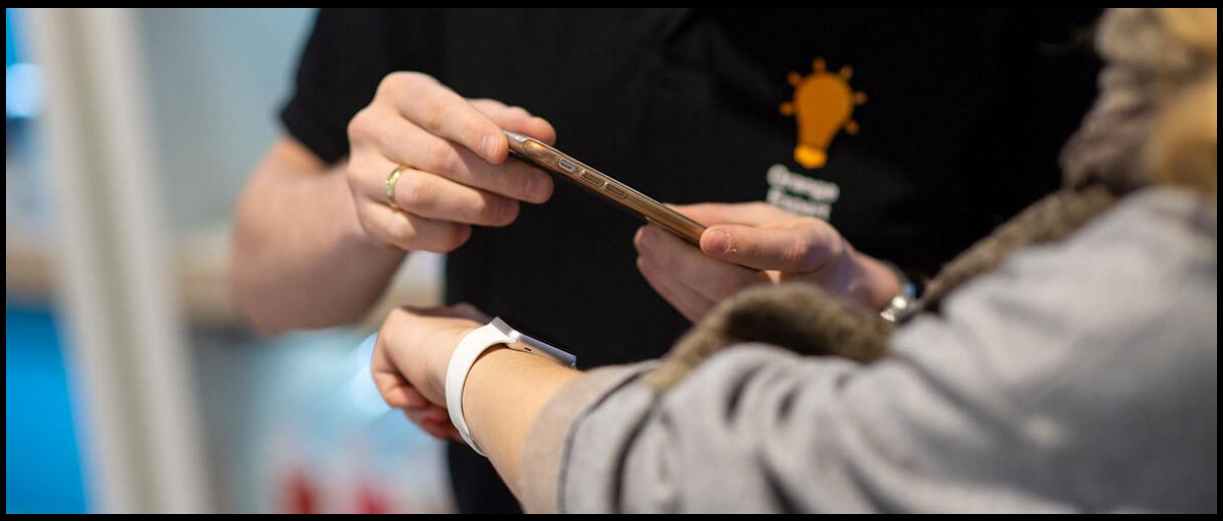
Before such a scenario becomes a reality, we must look at the question of relevance. "*There as many in-car uses as there are users of cars!*", stresses Carlos Jordan de Urries. "*These are all different, regular, casual, users for professional or personal purposes, etc… and it is fundamental to look at these different profiles before designing services left, right, and centre, that do not necessarily match the needs of the individual."* Convergence is also customization.

https://hellofuture.orange.com/en/orange-heart-innovation-new-generation-sim-card-esim/

Hello Future < Networks and IT < Orange at the heart of innovation with the new generation SIM card: the eSIM

Networks and IT | Article

Orange at the heart of innovation with the new generation SIM card: the eSIM



Tuesday 2nd of October 2018 - Updated on Thursday 16th of June 2022

- Connectivity
- Device
- High tech
- SIM

In about a decade, the SIM card as we know it today should totally disappear, giving way to the eSIM (embedded SIM). This is a SIM that is soldered directly into the device and onto which it will be possible to remotely upload the operator's profile. The first smartphones with eSIMs are already entering the market.

In two to four years, the first smartphones equipped only with an eSIM should appear on the market. By 2030, all smartphones will be equipped with eSIMs.

A small revolution is on its way right at the heart of our terminals, smartphones, smart watches, tablets, and the like. This next-generation SIM card can no longer be removed but is soldered straight into the device when it is assembled. Now the operator profile, which can be configured and downloaded from secure eSIM

platforms, enables more flexible access to mobile network services (calls, SMS, internet, etc.).

With this new technology in which Orange is highly involved, customers will be able to significantly speed up the setting up of their equipment on the mobile network. They will, of course, still be able to go into an Orange boutique to activate their profile with the help of an assistant if they so wish, but they can also do it themselves online. To activate their eSIM profile, customers will for example scan a QR code from a secure menu on the device or download the operator's application. Other eSIM activation techniques are being explored by device manufacturers. The days of waiting between subscribing and receiving a SIM card will be a thing of the past.

By 2030, 100% of devices will have eSIM

The eSIM market will only really speed up through the smartphone, an unbeatable vehicle for democratising new usages, with more than 1.4 billion units sold each year worldwide. "*The very first hybrid devices equipped with both a SIM card and an eSIM are already appearing on the market. Manufacturers are responding to a market trend around the dual SIM (two SIMs in one device), whilst laying the foundations, familiarising the user bit by bit with this new technology*", specifies Philippe Lucas, Strategy Director, Orange Architecture and Standardisation. "*In two to four years, the first smartphones equipped only with an eSIM should appear on the market. By 2030, all smartphones will be equipped with eSIMs*", he believes.

The question of security remains a major issue. Downloading operators' profiles via an internet access, for example with WiFi, can worry some people. "*Orange's security experts are deeply involved in writing the specification about security, just as they are in the certification process defined at the GSMA level. Orange has been de facto a major player and leader in this area since the beginning*", ensures Christine Lemoine, Orange's eSIM Program Manager who took part in the first eSIM Proof Of Concept (POC) in 2014-2015, enabling the launch of standardisation work at the heart of GSMA.

"*In view of the sensitivity of the data, the operators' security departments, in particular at Orange, have carried out the work with the utmost vigilance to ensure that there is no risk of hacking*", adds Philippe Lucas. He specifies that all devices follow the standard and its "security" rules by being certified by the GSMA (phase II). Currently, a third version is under development to provide new functionalities (management of subscriptions by businesses, secure configuration of eSIM from an application installed on one's device, etc.).

Facilitating digital connectivity of new devices

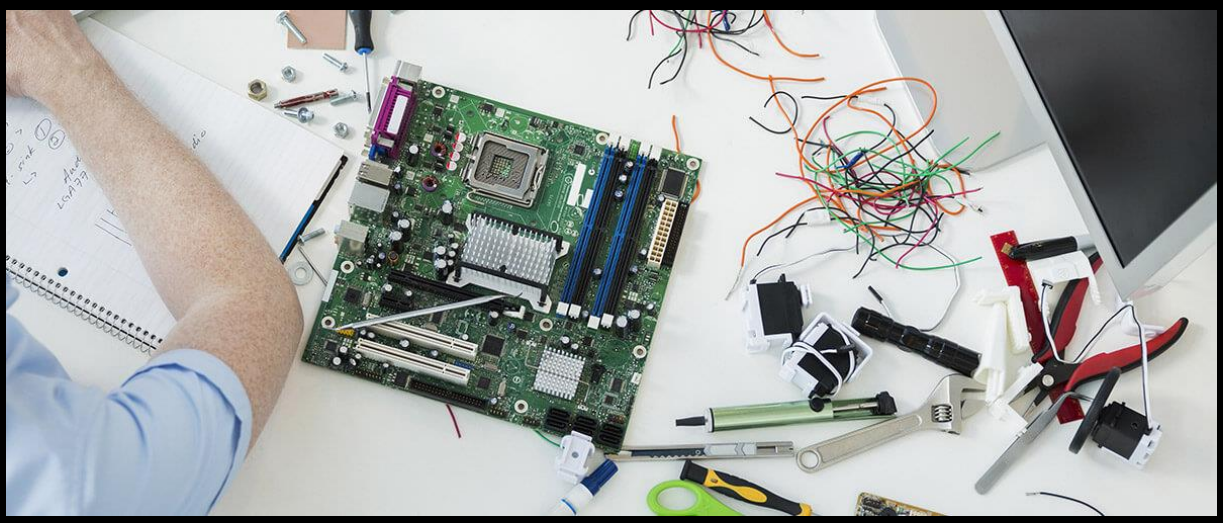
New devices, called secondary or companion devices, such as watches, tablets, and even computers, are being fitted with eSIM cards. It will be possible for these to be connected to the same mobile service as that of the customer's smartphone. The customer can thus use their mobile number and plan on different devices. The aim is to facilitate connectivity of these new devices in a completely digitalised manner. "*Orange's customer experience experts imagine and optimise the digital pathways of tomorrow, which are built in close cooperation with the group's standardisation managers and IS (information systems) experts, but also with the device manufacturers themselves*", explains Christine Lemoine. Orange has already launched several connected watches from different manufacturers, to enable its customers to remain reachable and connected in all circumstances, even without a smartphone. "*The United States and Korea have recorded good launch successes*", notes Philippe Lucas. Japan achieved the performance of selling one million tablets equipped with eSIMs in one year. And for tomorrow, operators are already working on this new technology in the autonomous, connected vehicle.

https://hellofuture.orange.com/en/open-iot-lab-lets-work-networks-future/

1. Hello Future
2. Internet of things
3. The Open IoT Lab lets you work on the networks of the future

Internet of things | Article

The Open IoT Lab lets you work on the networks of the future



Wednesday 4th of April 2018 - Updated on Thursday 16th of June 2022

- Connected objects
- Networks
- Partners
- Smart city
- Start-up

In 2017, Orange inaugurated the Open IoT Lab, which is the first European lab dedicated to the Internet of Things and the LTE-M network. One year after its launch, at the Mobile World Congress where he spoke, Thibault de la Fresnaye, Head of Smart Access and Smart Home Anticipation within Orange's Innovation, Marketing and Technologies Division gives us an initial report about this project.

"LTE-M offers very wide coverage and consumes very little energy, which is ideal for connected objects."

What is the "Open IoT Lab"? Why was a decision to launch this initiative made one year ago?

Thibault de la Fresnaye: The idea behind the Open IoT Lab stems partly from the realisation that when you visit sites dedicated to innovation, such as incubators or accelerators, you'll notice that nothing is actually offered in terms of connectivity.

Structures can give support and provide services, tools or specific technologies, but there's no place where you can do any advanced work on telecom networks of the future. When it comes to connected objects, this is especially problematic because not everyone needs – or has the ability – to go through "traditional" networks.

That's why we launched the Open IoT Lab in May 2017 in Châtillon, at Orange Gardens, which is the Group's dedicated innovation campus. People who come to the Lab, whether they are with start-ups or partner companies, can test connected objects or software they're developing on the future LTE-M network, which is one of the networks that Orange is working on.

We put our expertise at their disposal and provide them with technical tools and test equipment so that they can analyse this network's energy consumption, check the connectivity level, or compare the LTE-M network to other networks.

So, is the LTE-M network specifically recommended for connected objects?

Thibault de la Fresnaye: The LTE-M is an interesting cellular technology because it offers very wide coverage and consumes very little energy, which is ideal for connected objects. This low consumption rate has a significant impact on the battery's service life if the connected object is not going to be connected to an electrical power source.

(However), The LTE-M network doesn't enable one to transmit as much data as one can on 4G or 5G. The data speed is much lower, in the order of 250 kb/s. That's what makes it a financially more inexpensive technology than those that require greater bandwidth. All of this needs to be taken into account when one launches a new object or service on the market!

Lastly, the LTE-M network represents an evolution from traditional networks. It uses the same protocols. This means that data security is equivalent to that of current 4G networks, and its deployment, which will take place over the course of 2018 in France and Spain, will not require implementing dedicated antennas.

One year after launching the Open IoT Lab, what are some initial lessons learned from this project?

Thibault de la Fresnaye: First and foremost, there is a real demand in this arena! Certain usage situations are also emerging from an industrial perspective as well as a more personal one. We are exchanging many ideas with makers of tracking devices, who are working on objects that would enable one to monitor a fleet of vehicles, for example, as well as individual objects that provide security for individuals, or to work with players in the energy realm, for whom the LTE-M network seems ideally suited for taking automatic readings of meters. The security sector is also interested in the benefits presented by the network. And then, one can also consider [applications intended for] smart cities. There are also more forward-looking projects, such as those pertaining to smart homes, connected health or wearables.

I also want to add that people who come to the Lab love to share ideas about their respective projects, requirements, and discoveries. Start-ups working with industrial partners create a true ecosystem that encourages testing new functionalities, and sharing impressions and ideas, which is not necessarily something they can do elsewhere!

The LTE-M will certainly be deployed this year. Will the Open IoT Lab lose its relevancy?

Thibault de la Fresnaye: The Lab will evolve alongside the LTE-M, which in the long term will support a transmission rate of 1 mb/s compared to 250kb/s today and will work in energy-saving modes (partial listening, depth monitoring, etc.). Here, too, we're going to offer this in the early stages. Then, we're going to offer 5G of course. We're expecting to deploy a test network in the near future.

We're lucky to be in an environment that is changing very rapidly, and we are continuously coming up with innovations on telecommunication networks. The Open IoT Lab still has a bright future, commensurate with the number of connected objects that will continue to increase in the years to come.

https://hellofuture.orange.com/en/orange-designing-standardised-apis-facilitate-interoperability-ethernet-services-operators-businesses/

1. Hello Future
2. Networks and IT
3. Orange is designing standardised APIs to facilitate the interoperability of ethernet services from operators to businesses

Networks and IT | Article

Orange is designing standardised APIs to facilitate the interoperability of ethernet services from operators to businesses

Monday 29th of October 2018

- Cloud
- Open source
- Technology

In the glory days of connectivity and globalisation, there are still grey areas that many commercial players would like to see disappear. Among others, the difficulty to enable interoperability of the networks of different telecom operators across the world.

An ethernet connectivity service is established in just a few seconds between the Orange site in Lannion and the AT&T site in Plano, Texas: a great performance in network agility.

Launch of an open source project between three operators

After winning the MEF 2017 prize for best proof of concept, the 3 operators Orange, AT&T, and Colt are working together on the validation of standardised APIs – programming interfaces. The ultimate goal: to create a global network of operators capable of delivering homogeneous end-to-end services to their customers.

Under the auspices of the Metro Ethernet Forum (MEF), an international forum bringing together a great number of ethernet players, Orange has been working since early 2017 with AT&T and Colt on the interoperability of telecom operators' ethernet services. At this point in time, each operator has a network architecture and programming interfaces (API) that enables it to manage its own infrastructure. This means that when a business customer wishes to obtain international connectivity between two sites covered by different operators, the technical implementation is slow and laborious. The aim of the Orange, AT&T, Colt triptych is to remedy the situation by enabling networks to interact with each other, in a few seconds, regardless of the operator. To this end, standardised APIs are being developed, with networks based on an SDN (*Software Defined Network*) architecture. Within the frame of these works, Orange and AT&T are using the ONAP platform, an open source project hosted by the Linux Foundation, to orchestrate network functions. The APIs taken as a working basis are also provided in open source and come from the TM Forum. *"The open source approach is strategic for Orange because when we remove ourselves from the logic of property, we can be much faster and innovative. What's more, entering an open source dynamic fosters collaborative working and spirit amongst the different stakeholders"*, explains Ludovic Robert, IT and API architect at Orange.

Connection established between Lannion and Plano in a few seconds

Every autumn in Orlando, the MEF organises an event over several days for the ethernet networks and services sector. The opportunity for Orange to demonstrate its *proof of concept* (PoC) to the whole community. This is how in November 2017, an ethernet connectivity service was established in just a few seconds between the Orange site in Lannion, France, and the AT&T site in Plano, Texas. A network agility performance that won the prize of best PoC. *"But to get there, we had to face many challenges,* Ludovic Robert tells us. *First of all, in terms of temporality, we committed to take part in this challenge with the MEF in June, which only left us four months to be ready. Then, it wasn't just about showing that a concept worked, but about winning a competition among PoCs. Our demonstration had not only to be perfectly functional, but it also had to impress the audience in order to take first prize. This work had to be done coordinating six companies: Colt, Orange, AT&T, Fujitsu, Ciena (equipment providers for Orange and AT&T respectively), as well as Amdocs (customer experience software and solutions provider). It was highly ambitious and stressful, but we did it!"*

In Lannion, the teams at Orange managed the implementation of the automation platform (ONAP), of an Ethernet/IP data plane, a video server and the external network to network interface (ENNI), as well as the SDN controllers, the end-to-end connectivity with the equipment hosted at AT&T, and the links between the various platforms.

Creation of an ecosystem of connected operators

In the end, four APIs were developed by the team: place search, technical eligibility verification, command execution, and command execution verification. The PoC having perfectly fulfilled its objective, there remains now one formal stage: to get the APIs approved by the MEF at the next event in October 2018. *"It's only after formal approval by the MEF that we will really be able to implement and, moreover, use these APIs with other operators"*, Ludovic Robert reminds us. Beyond guaranteeing interoperability of networks, the standardised APIs will also enable reduction of costs and of the complexity caused by the deployment of proprietary equipment on customers' networks and sites.

The other underlying objective of the project is to accelerate market uptake of SDN solutions. In effect, this model of network architecture provides flexibility and reactivity by enabling fast reconfiguration of network equipment, data stream segmentation, and virtualisation of certain functions. *"In particular it enables us to provide our customers with flexible offerings that automatically adapt to computing resource consumption according to demand"* explains Jehanne Savi, manager of the On-Demand Network programme.

By creating an open source ecosystem that is also common to all the operators, Orange and its partners are therefore not only responding to the request to optimise end-to-end service management, but they are also improving the cost of network interoperability across the world.

https://hellofuture.orange.com/en/track-driverless-cars/

1. Hello Future
2. Internet of things
3. On track for driverless cars

Internet of things | Article

On track for driverless cars

Thursday 4th of January 2018 - Updated on Wednesday 22nd of June 2022

- CSR
- Smart city

Prototypes of driverless cars can already be seen on our roads. These are trials, but we know that the reality will catch up with science fiction. And this will enable our society to progress because driverless cars will be greener and help relieve congestion in our cities...

What do drivers do when they are piloting their vehicles? They are constantly making decisions based on what they see, as well as what they perceive and even what they deduce. They also draw on their driving experience, which increases their expertise. This is what driverless cars will need to be able to do as well, while being safer and – if possible – even more rational, ecological and economical…

So, we can easily imagine that driverless cars, which are on the horizon, will need to be packed with technology, such as sensors, radars and webcams, as well as integrated artificial intelligence software to make the best driving decisions.

It may also be asking a lot for a “machine” to think exactly like a human being. But the question is not necessarily being asked in these terms. Driverless cars will communicate, through their equipment, with the other vehicles on the road, as well as with road signs, traffic lights, speed cameras, and so on. Even the roads themselves will be equipped for communicating with vehicles with zero latency.

In reality, driverless cars are one part of a broader project for smart cities – ecological, fluid cities, thanks to innovation – as well as smart territories looking beyond the cities’ boundaries…

No longer really a dream, not yet a reality

So, does this mean that we will be seeing driverless cars sometime soon? “This is no longer really a dream, but neither is it yet a reality for the immediate future”, explains Lyse Brillouet, head of digital society research at Orange Labs Research.

“Neither the technologies, nor the infrastructures, nor the legislative framework are ready for any rapid, widespread deployment. We expect to see quite a long transition phase between current vehicles, connected or semi-connected cars and then driverless cars”.

When they become a reality, “driverless cars will undoubtedly transform the auto sector”, adds Lyse Brillouet. The stakes involved are significant, when we consider that in Europe, this business sector on its own makes up 4% of economic production today”. So, with driverless cars, models will need to be put in place for economic cooperation between industrial firms and high tech specialists.

The issue of insurance will also need to be rethought with driverless cars. Who will be insured? The “driver” or the vehicle’s manufacturer? How will we define responsibilities? Basically, who will pay what in the event of an incident?
The approach will no longer be based on pooling risks, but a sort of self-discipline for individuals, monitored with a digital ecosystem. A model that still has some way to go to win over all the parties involved.

Trust and data

Global research by the Cetelem Observatory found that levels of trust in artificial intelligence in cars varies considerably depending on the country. For instance, 91% of the Chinese people surveyed said that they would be very interested or somewhat interested in using driverless cars, while this percentage dropped to 41% in France and 32% in the US.

And yet, like at home, passengers in driverless cars will be able to enjoy a range of new services that will be integrated into their vehicles: imagine a car office, video on demand, video games, etc.

The issue of trust is closely linked to that of the data produced within the new digital economy. As Lyse Brillouet explains: “driverless cars will produce a phenomenal quantity of data and everything will need to be orchestrated to ensure the effective management of this data and respect the privacy of drivers”. We will also need to put in place safeguards to protect against cars being hacked, whether attacks focus on individual vehicles or whole fleets simultaneously.

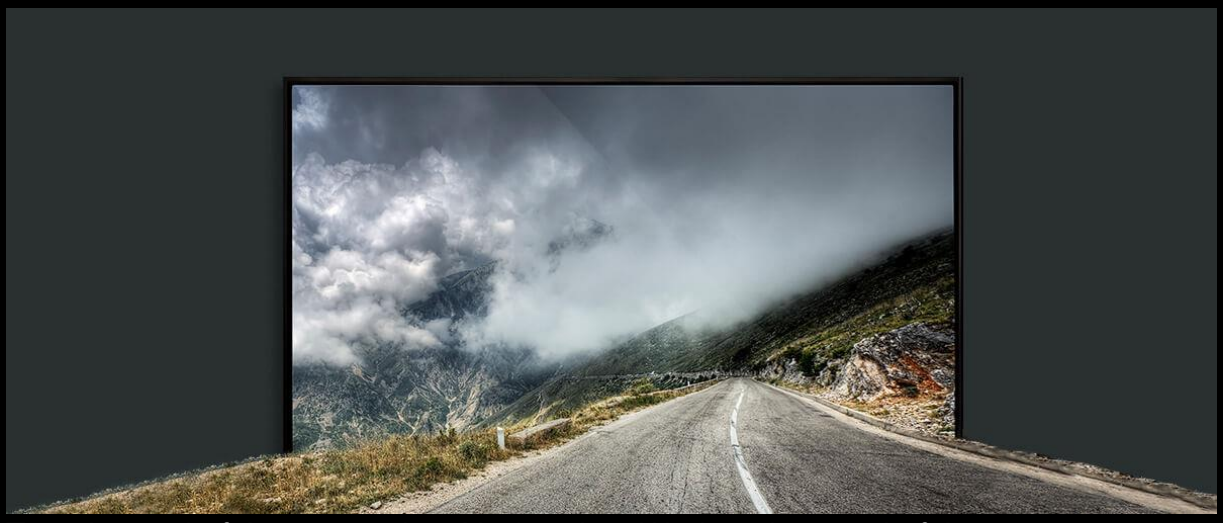
Researchers still have some magnificent challenges ahead of them…

https://hellofuture.orange.com/en/take-360-tour-tomorrows-tv/

1. Hello Future
2. Internet of things
3. Take the 360° tour of tomorrow's TV

Internet of things | Article

Take the 360° tour of tomorrow's TV



Tuesday 2nd of January 2018 - Updated on Wednesday 22nd of June 2022

- AI
- Device
- Society
- VR

With the emergence of successive digital formats, the quality of TV – and video in the widest sense – has improved considerably in recent years, and for that very reason has improved in its immersive capacity. But advances like 3D, 4K and UHD are only the first signs of a far greater revolution that will make viewers the players and/or directors of the what they are seeing.

Immersive TV, defined as TV that offers an enhanced sense of immersion in the video scene being watched, is a word used today to talk about 3D or the Ultra High Definition (UHD) format. And in fact, the more the video format improves, the more optimal is the image resolution and the more palpable the illusion of depth, enabling viewers to experience image and sound as closely as possible to what they are in the "real" world.

Being at the centre of things and everywhere!

Right now, two immersive video technologies are being developed simultaneously, one being at a more advanced stage than the other. 360° video has effectively reached a fairly mature stage and the amount of content based on the technology is now growing fast. “Technically, the idea is to capture a scene using a camera filming from different angles – a spherical device holding several cameras that film a scene from different viewpoints,” explains Henri Sanson, head of Data & Knowledge research at Orange Labs. “As a result, viewers find themselves in the centre of the scene, although they are limited in their movements: this is what is called the three degrees of freedom, where users can look up, down, or to the side, but can’t move their heads in those directions. 360° video is particularly well-suited to use with a headset – a virtual reality headset – but even then, this does not overcome the limitations of the three degrees of freedom.”

The second emerging application is super multi-view video. Unlike 360° video, characterised by a single framing system, super multi-view uses a network of cameras surrounding a scene or part of a scene. “In this case, we talk about convergent filming, which is a bit different from immersion: in convergent, you are no longer in the centre but everywhere. Users can navigate freely and choose their point of view completely independently. Super multi-view, which gives rise to a raft of technical challenges in terms of camera calibration and timing, data transmission, recreation of intermediate views, etc., is still at the research stage.” But at Orange, our Research people are deeply involved in this area, especially in the standardisation aspects and are working alongside research institute b-com.

No image without sound and vice versa

Images are nothing without sound, especially as, while our binocular field of vision covers 120°, our ears hear in full-on, all-round, 360° sound! Sound recording systems equivalent to the ones we mentioned above for filming now exist. As a result, 360° sound recording helps to capture representations of the three-dimension sound field. “The issue is then to code, synchronise and align the sound recording with the filmed images so that users can perceive the sound emanating from an object in a scene in line with the image, and independently of their viewing angle.”

Immersive Video/TV hand-in-hand with virtual reality

At the same time as this new video content is becoming slicker and gaining traction, the emergence and development of virtual reality are providing a significant opportunity for adopting and expanding immersive video/TV. “At the outset, virtual reality was largely limited to computer-generated imagery, but CGI is very expensive. The advent of 360° video means we can now create virtual reality content for much less. However, 360° video does not necessarily need VR to exist and be watched – a TV screen is all you need.”

And what does the future hold? Henri Sanson notes that virtual reality, augmented reality, and immersive TV are all converging towards a single point and will flesh out a mixed reality, where computer-generated components can be recomposed in a real scene, while it will be possible to place objects from a real scene in a computer-generated environment. “A look at Microsoft’s demonstration of holoportation will convince you: the computer-generated and the real have never been so close…”

https://hellofuture.orange.com/en/entertainment-media-welcome-experience-era/

1. Hello Future
2. Internet of things
3. Entertainment and the media: welcome to the experience era

Internet of things | Article

Entertainment and the media: welcome to the experience era

Friday 5th of January 2018 - Updated on Wednesday 22nd of June 2022

- AI
- Digital
- Society
- User experience
- VR

The media and entertainment universe has not escaped the wave of digitalisation that has engulfed us in recent years. Now that universe is on the brink of a new transformation that could be qualified as “post-digital” and is focused on the user experience.

Over the past twenty years, the entertainment landscape has been largely shaped by media digitalisation. The emergence and widespread adoption of the World Wide Web in particular have meant that new players like YouTube and Netflix have been able to emerge and impose novel ways of designing, distributing and consuming content on the market. Self-production is thus finding a growing role and an audience that complements professionally-generated content.

“Beyond Digital”, the new age of entertainment

So, after digital, what? The Flood? Far from it, as Ludovic Noblet, VP Hypermedia at b<>com, the technology research institute, explains: “We are now entering a new era, that of “beyond digital”, where the basic reference for creatives and content producers resides in the experience offered to users.” And effectively, the technology continues to advance at a frantic pace, although it is tending to disappear behind the content and the experience criterion. Or rather, it is tending to be the “vehicle for exaltation”, according to Vincent Marcatté, Chairman of b<>com and VP Open Innovation at Orange Labs: “Technology represents undeniable added value when it comes to enhancing an image or a video – a creative proposal, in short. But the content designer is still the cornerstone in this new era. As an operator contributing to the development of new uses and technologies, we are there to offer the creatives innovative tools that they can use to enrich the way they are going to deliver their creations to consumers, even if that means re-thinking narrative and storytelling mechanisms, especially via virtual and augmented reality.”

Why do we need to entertain ourselves in the 21st century?

In this connection, it is essential to involve content creators before developing an experience and to attune them to the technology. And because it could generate real breakthroughs in the way we entertain ourselves, it is also important to call on the views of acceptability experts. In the case of virtual reality or augmented reality, it involves the shift from entertainment to escapism, a new way of cutting loose from reality by immersing oneself in an alternative environment. This can raise issues in a number of areas, in respect of which content creators need to adopt a responsible stance so as not to cut users off from reality. One very mundane, material example was the Google Glass, whose users were often viewed with caution in public…

“The idea is to generate satisfaction among consumers, without which these new entertainment experiences are fated to be short-lived or isolated,” adds Ludovic Noblet. “And because it is a precondition for engagement and loyalty building. But where do this satisfaction and desire to consume come from? According to Uses and Gratifications theory, an audience switches to a specific media to satisfy a specific need, whether this involves information, personal identity (to underpin their values, their status, or to identify themselves to another), the quest for social interaction or entertainment – in other words, the ability to escape. A topic such as virtual reality, which is likely to situate itself at the intersection of these four uses, has a considerable potential for satisfaction and engagement in this respect.”

New experiences, new media: encouraging creation

Indulging himself in a little futurology, Ludovic Noblet reckons that the development of virtual/augmented/mixed reality technologies will go hand-in-hand with the emergence of new media players. “That’s because the technologies renew the

possibilities of offering innovative content: virtual reality via on-demand platforms or the Cloud; new multi-user/multi-player experiences, etc."

It is the likes of Google, Apple, Facebook, Amazon and Microsoft (aka GAFAM to the French) who were the first to see the way the wind was blowing, and who are massively investing in these areas. In 2014, Facebook acquired Oculus VR, the manufacturer of the Oculus Rift immersive headset, and the social network will shortly be launching Facebook Spaces, an app dedicated to the headset that will allow people to get together with their friends in a virtual, interactive environment.

The web giants are thus the powerhouses driving this revolution, and the traditional media are lining up behind them. In Europe, and in France especially, the content sector is still characterised by its vigour and diversity (that cultural exception again). "It's essential to invest in content," notes Vincent Marcatté. "Orange's Content division, for example, is offering a bursary called Beaumarchais to young virtual reality creators and directors. At the same time, the Group is devoting a part of its research effort to designing different and differentiating entertainment experiences – today in the field of 360° Video, for example, and tomorrow in the field of "6DOF" ("Six Degrees Of Freedom") video."

The b<>com institute is also deeply involved in this subject area, aiming to "project virtual reality in a proactive approach," adds Ludovic Noblet. "Today, it's possible to immerse yourself in content. Tomorrow, you'll be able to interact naturally with it!"

https://hellofuture.orange.com/en/ces-2018-towards-more-human-useful-technologies/

1. Hello Future
2. Artificial intelligence
3. CES 2018 : towards more human and useful technologies

Artificial intelligence | Article

CES 2018 : towards more human and useful technologies

By Luc Bretones, 2018-01-05 - Updated on Wednesday 22nd of June 2022

- Connected objects
- IoT
- VR

The 2018 edition of the Consumer Electronic Show will take place from january 9th to january 12th in Las Vegas. In preview, Luc Bretones, Vice President of Technocentre and Orange Fab at Orange, presents the main trends through this article. First of a three-part series, it shows the willing of a better adaptation of robotic technologies and virtual reality to human.

This tech event has gone from being a consumer electronics fair to being a global innovation one.

As has been the case for several years, the ever-growing procession of CES, with almost 190,000 visitors and about 4,000 exhibitors, is described as being not very innovative but repetitive and without any genuine innovative character. As with the announcements between October and December, typical questions will arise, such

as: “has the CES ever presented a groundbreaking innovation? And, as every year, there will be participants again, some even wearing the golden badge of the CES Alumni with over 5, 10, 15 and 20 years of participation.

But over the years, this annual tech event has evolved from the once consumer electronic goods show to global innovation.

With an impressive increase in the quality of the 5G show and over 110,000 visitors, it inevitably affects the CES and its themes, such as 5G, network, quality of service and security with. Nevertheless, or just for that reason, I would like to reserve my opinion on these topics for the MWC.

However, if we look to the DNA of the CES, the defining theme of 2018 will be humanization. The humanization or rather, a better adaptation of robotics and virtual reality technologies to humans. It seems as though the Orange’s signature, #humanInside was visionary…

Empathic and sensitive domestic robots

Many of the domestic robots developed last year will continue to be present in 2018, with little visible change in outward appearance but with smarter capabilities and a much lower price level. Beyond the technological performance of recent years, the real challenge is clear: the use and its intensification with the most important factor: trust. Like Djingo, Alexa and others, these artificial intelligence resemble personal assistants. But is there added value in making them mobile and able to mimic and express human behaviours and emotions?

This is an important topic for the next CES. What the role will robots play in the face of virtual assistants, mobile application or smart speakers? And how could one strive to give robot its own personality, which will aptly be suited to the purpose for which it was designed for and be able to fit well in the family context?

Heykuri a domestic robot, designed by a former Pixar designer, combines empathy and interaction with the perception of its surroundings through touch, voice, sounds, and a video. The expression of its mood – contentment or reflection – is mediated by a play of colours. A complete package for $800!

Due to the aspects mentioned, Honda is focussing on the acceptance of its robots by improving the artificial intelligence of its humanized robots, reducing their physical dimensions as well as giving them touches of a human smile. Since drones first appeared on the CES as toys and were later adapted for professional use, Honda wants to take a very similar approach with its robots. Honda’s robots are encroaching the B2B world with two major commitments: to be useful and empathic.

Home, a strategic challenge of conquest

The budget, however, remains a particular challenge for robotic conquest. Is not the family often comparable to a constantly changing small business? Still, there are plenty of ideas from Mainbot's Winky edutainment robot, a true multimedia companion of the family, which is able to transmit emotions and track the development of the child when during its course of learning and also being able interpret the emotional states, desires and even display a level of empathy to a domestic robot designed by Camtoy that is able to monitor and play with your dog in your absence, to SimpleHuman's voice-activated trash which can be controlled by voice hand movement. Who frankly ever imagined of talking to his/her trash can? Based on these and other examples, it can be seen that humanization will find its way into the home and ultimately lead to simplification of life in the house.
And the French are once again well placed in this global competition with Buddy of Bluefrogrobotics and its best of innovation CES 2018!
But this trend of humanization does not stop at robots alone, on the contrary…

In search of meaning of both virtual and augmented realities

VR and AR are no exception to this need of humanity and meaning, in all dimensions of the term. The reproduction of touches and resistances or haptic feedback on more than just surfaces or their proximity, which has been succinctly described in previous years, is becoming increasingly popular.

For example, Tactuallabs offers a variety of exceptional use cases and situation scenarios. Although the demos are very technical and lab-based, there is no doubt about marketability of the examples offered in low-latency fibre or 4G + / 5G network.

But especially virtual reality games have enormous potential , like the holotennis had demonstrated during the Roland Garros 2017. They picked up on the popular sport and give it another social dimension. Furthermore, there is also the opportunity today to replace normal Zumba training with the more intense TRX – Total Resistance eXercise Fitness, which is supported by Blackbox VR and encourages and enhances their fitness experience with motorized ropes.

And if you then, like me, want to soothe your aches and relieve your muscular discomfort, then simply test the massage seat of Aurasens, with which you can physically "feel" the music. Hard rock is not recommended here…

Virtual or augmented immersive 360° vision, force feedback, its Dolby atmos or just Envelopes: For example, another trend is to create smells, and our young French fragrance specialist, Sensorwake, announced a partnership with Disney to bring that dimension into VR or "simple" video games.

https://hellofuture.orange.com/en/cedric-seureau-exploring-mobility-tomorrow/

1. Hello Future
2. Research
3. Cédric Seureau is exploring the mobility of tomorrow

Research | Article

Cédric Seureau is exploring the mobility of tomorrow

Monday 22nd of January 2018 - Updated on Wednesday 22nd of June 2022

- IoT
- Open innovation
- Research exhibition
- Smart city
- Start-up

Manager of the "Interconnecting Attractive Territories" research project at Orange Labs in Lannion, Cédric Seureau is exploring the mobility services of tomorrow for more pleasant and sustainable cities.

"The autonomous car will be at the heart of the mobility of tomorrow. It is an exciting field of research, which enables us to take up many technical challenges and explore new uses."

New technologies are broadening the field of possibilities in terms of mobility, mobility that is at the heart of the smart and sustainable city of tomorrow. As tomorrow is prepared today, that is precisely the work of Cédric Seureau, Manager

of the “Interconnecting Attractive Territories” research project at the Lannion (Côtes d’Armor, France) Orange Labs.

“*It’s a project with a strong focus on urban mobility, both on the network side – for example we are looking at the connected car, soon to be autonomous, and so at connectivity within and between vehicles – and on the service side: how to ease everyday mobility of users”, he explains.*

To carry out this vast project, launched by Orange in April 2017, Cédric Seureau’s team is working with a vast ecosystem and in particular with communities.
It contributes notably to the inOut initiative, a yearly event initiated by Rennes Métropole, which aims to invent and experiment new mobility services in metropolitan Rennes.

The role of Cédric Seureau and his teams is, for example, to model travel flows thanks to artificial intelligence and Big Data, so as to better organise public transport routes or car sharing services, and to predict journeys.

Making urban space more pleasant

“If we can predict drivers’ journeys, we will be able to predict the places where there will be traffic jams, car parks that will be full, enabling them to deviate their route to avoid jams or to find an available car parking space, he explains. *The idea is to make urban space more pleasant for the user, but also for the community as a whole.*”

Reduction of traffic jams and, ultimately, of pollution, is one of the issues of the research project managed by Cédric Seureau. “*Cities must respect the engagement made within the COP21 framework to reduce greenhouse gases. Some, such as Copenhagen, even display the ambition to become carbon neutral by 2025. This will necessarily take place via a change in usage of urban and intercity transport.
In particular by taking care to accompany each user in an integrated and personal itinerary: mobility becomes a service that that we must consider from end-to-end.*”

“*For me,* he adds, *one of the objectives really is to manage to look at the mobility of tomorrow from the angle of greenhouse gas reduction, and to contribute, through our research and solutions, to the environmental engagement of cities.*”

The “Interconnecting Attractive Territories” project was tailor-made for Cédric Seureau, who joined Orange in 2010 as an architectural engineer. “*What attracted me to Orange was the diversity of profiles and professions, as well as the ability to work within multidisciplinary teams. To sit round a table with engineers, network architects or sociologists, and imagine the services of tomorrow… This creates an effervescence of new ideas and makes the job fascinating.*”

What appreciates in this job? The possibility to take hold of decisive technical topics whilst remaining close to the user. The project forms a part of the “Digital society” domain (one of the nine research fields invested by Orange), which gives pride of place to uses coming from digitalisation in a number of areas of society (education, health, transport, citizenship, etc.).

Co-innovation

In the framework of his research, Cédric Sureau is of course looking at autonomous vehicles. “*They will be at the heart of the mobility of tomorrow even though, despite the announcements of certain stakeholders, we have not yet reached full autonomy! It is still an exciting field of technological research, which enables us to both take up many technical challenges and explore new uses.*”

The autonomous car topic is also significant in the co-innovation that it has initiated between Orange and its partners: cities, car manufacturers and parts suppliers, innovative telecommunications companies.

The Towards 5G project, presented during the 2017 edition of the Orange Salon de la Recherche, from 5 to 7 December 2017, illustrates this well. This experimentation platform, in partnership with Ericsson and PSA, aims to test automobile-specific pre-5G and 5G technologies so as to assess their capacity to meet the needs of this sector where security is crucial.

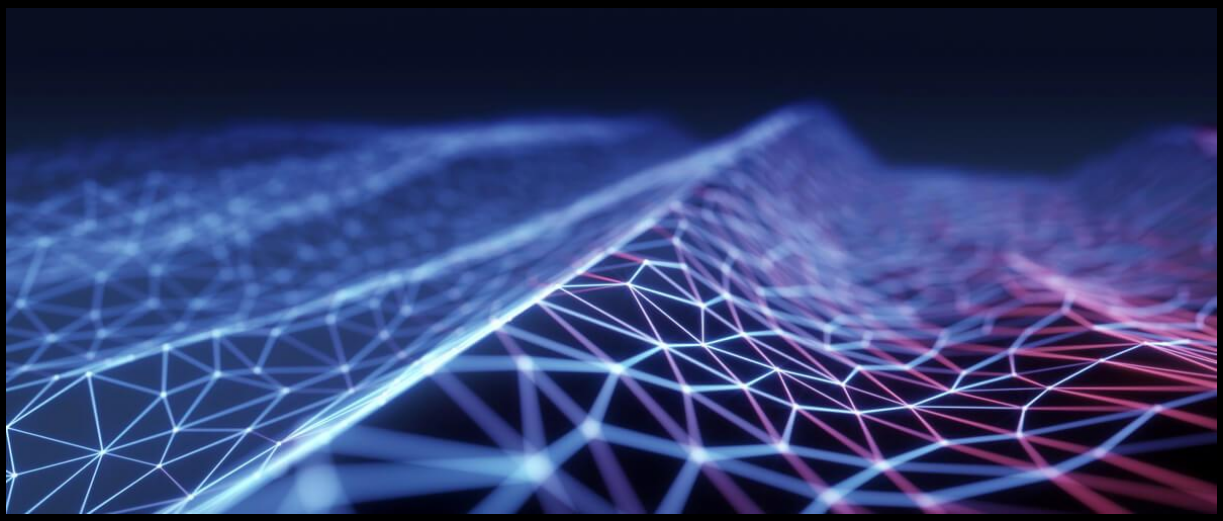
An example that testifies to more and more open research, on which Cédric Seureau looks very kindly. “*I am proud of the evolution of research at Orange, of how it manages to show itself in its best light. The Group manages to enable researchers to go outside of their laboratory, to show what they are doing and the added value of their work, and to develop links with partners so as to enable them to work in an open and innovative ecosystem. This is essential to the research of tomorrow.*“

https://hellofuture.orange.com/en/paul-chaignon-heart-transformation-networks/

1. Hello Future
2. Research
3. Paul Chaignon, at the heart of the transformation of networks

Research | Article

Paul Chaignon, at the heart of the transformation of networks



Monday 29th of January 2018 - Updated on Monday 12th of February 2018

- Networks
- Research exhibition
- Software infrastructure

SDN and NFV technologies are profoundly changing the way in which telecommunications networks are designed and managed. A true professional pleasure for Paul Chaignon, a doctoral student at Orange.

Networks are evolving greatly thanks to the contribution of two recent technologies: Software-Defined Network and Network Functions Virtualization.

When we question him on the telecoms networks of tomorrow, Paul Chaignon, a doctoral student at Orange, prefers to remain cautious… "*I wouldn't go as far as to say that we are going through a revolution of the network, because the changes will take place over long periods of time. However, the new services that are emerging will be very different, more agile, easier to control in real time, and they will adapt more to users.*"

In this day of cloud computing, of the Internet of Things and of Big data, networks are evolving greatly thanks to the contribution of two recent technologies: SDN (Software-Defined Network) and NFV (Network Functions Virtualization).

On the one side we have SDN, which decouples network control and data forwarding functions, enabling IT teams to manage network performance and security better thanks to its programmable functions and the simplification of network infrastructures. And on the other side is NFV, consisting of migrating certain network functions from a physical infrastructure to a software infrastructure, which makes it possible to do without the former so as to deploy and update new functionalities whilst avoiding the complexity and costs associated with the installation of new machines.

More agile networks

These two complementary technologies aim to make networks more agile, flexible, and scalable, in order for them to better meet the changing requirements of businesses. "*These solutions are for people who manage networks, both within the companies where network equipment is installed, and for network operators, such as Orange*, explains Paul Chaignon. *We hope that this will enable them to be more autonomous, to benefit from greater flexibility, and thus be able to deploy new services and innovations faster.*"

For a doctoral student such as Paul Chaignon, to work on the evolution of networks at Orange is to be at the heart of a major transformation. In fact he says he is very satisfied with his experience, of which he shares the daily life with us, which he says is very varied.

"*No two days are ever the same!* he says. *One day we'll be reading academic publications to find out about the work being done by competing researchers, what the emerging tendencies are, and how Orange is positioned compared to these stakeholders. Another day we'll be working on prototype roll-out and assessment: the emergence of an idea, its implementation, the analysis of its added value, its effective operation. Or again we may be writing our own academic papers, attending expert conferences, sharing our work to attempt to popularise our research topics…*"

The Salon de la Recherche, a special occasion

Doctoral students like Paul Chaignon work at Orange with teams of researchers, engineers, experts…, on a wide range of topics. "*What is highly motivating for us is to get opinions and feedback on our work. The Salon de la Recherche, for example, is a special occasion to meet people who are faced with the problems that we are attempting to address, who can potentially provide us with solutions or whom our approach can help.*"

He attended the 2017 Salon de la Recherche with Oko, a programmable switch software developed within the <I/O> Lab, a shared Orange and Inria (the French Institute for Research in Computer Science and Automation) research laboratory. "*We looked at switch software, network equipment that enables the transfer of data packets to virtual machines, and attempted to extend its functionality during implementation, without interrupting it*, he explains. *The aim was to check that our approach increases network performances compared to competing approaches.*"

Oko represents a good example of the work, carried out over the past two years at Orange by Paul Chaignon, to serve the networks of tomorrow.

https://hellofuture.orange.com/en/way-5g-orange-preparing-mobile-technology-next-decade/

1. Hello Future
2. Networks and IT
3. On the way to 5G: Orange is preparing mobile technology for the next decade!

Networks and IT | Article

On the way to 5G: Orange is preparing mobile technology for the next decade!

Wednesday 7th of February 2018 - Updated on Wednesday 22nd of June 2022
Reading time: 3 min

- 5G
- Industry
- Smart city
- VR

To prepare the arrival of 5G, Orange is engaged in a joint building exercise with all ecosystems: research, universities, various sectors of the economy (especially transport, industry, health, entertainment). Orange is preparing for the arrival of 5G. Arnaud Vamparys, Director of Orange's 5G program, explains what this technology will bring and details the three new experiments Orange is conducting with its technological partners.

Self-driving cars are one of the most symbolic applications of 5G. Within the next decade we can even imagine red lights disappearing altogether!

In concrete terms, what will the development of 5G technology offer in 2020?

Arnaud Vamparys: First, better mobile broadband, up to ten times faster than 4G. Next, high-performance fixed-line internet that will supplement locations where the fibre network is unavailable. And lastly, new industrial applications for different business sectors.

What changes will improved mobile broadband bring to businesses?

Arnaud Vamparys: 5G will offer higher performance in terms of speed and response time. For businesses, augmented reality solutions will become more widespread, which will make maintenance operations easier. What this means is that a technician will be able to see what repairs are needed using connected 3D glasses. 5G will also provide better coverage of corporate sites and digital campuses by offering a quality of service that is tailored to each application and business process, and that means no more cables!

And to consumers?

Arnaud Vamparys: You will have the unparalleled experience of multi-player online games or you can watch very-high definition TV on your phone, not to mention the ability to share videos in real time including at sporting events and concerts. We are also experimenting with using virtual reality, augmented reality and 360° video. The tourists visiting a city, for example, can show their family what they're seeing in real time through connected glasses, and those same glasses can give them cultural insights or teach them about customs as they travel around. In short, 5G is really going to change our daily lives!

Why are you testing very-high speed fixed-line web access with 5G?

Arnaud Vamparys: Because for consumers, fixed-line 5G will be an added very-high performance solution in peri-urban areas where fibre networks can't be connected directly to homes. For companies, fixed-line 5G will be an efficient solution like a fixed-access lifeline with performance that rivals fibre and will ensure solid availability at all times. In the second half of 2018 we will also be conducting a full-scale test in partnership with Samsung and Cisco with Orange customers in Romania to evaluate how mature fibre-equivalent 5G fixed-line technology is in Europe.

What will 5G mean for industries?

Arnaud Vamparys: 5G is going to spur the development of the internet of things, which will spark the rise of industrial automation and the automated surveillance of industrial sites. It will also usher in specialized real-time applications for the chemical and automotive industries. With Nokia, we created an innovation platform at Paris

Saclay to test several cases in various industrial sectors. For example, in 2017 we completed a successful test of a fire detection and management drill at an industrial site. And we are continuing our research in 2018 on robot and remote-maintenance cases.

There's a lot of talk about self-driving cars. Is that one of the most symbolic applications of 5G?

Arnaud Vamparys: Yes, on-board software downloads will be secured using 5G. The network will give the vehicle a bird's-eye view of a highway or neighbourhood. Cars will have access to information about accidents and can opt for a faster route to avoid bottlenecks. They will also detect remaining battery power and can be guided to the closest recharging station. The first applications are expected to arrive starting 2022, and within the next decade, thanks to 5G, we can even imagine red lights disappearing altogether!

https://hellofuture.orange.com/en/5g-orange-preparing-tomorrows-network-today/

1. Hello Future
2. Networks and IT
3. 5G: at Orange, we are preparing tomorrow's network today!

Networks and IT | Article

5G: at Orange, we are preparing tomorrow's network today!

Wednesday 7th of February 2018 - Updated on Thursday 8th of February 2018

- 5G
- Connectivity
- Prospective

From 2020 5G will gradually offer improved mobile broadband with speeds up to 10 times quicker than 4G, ultra-high-performance fixed internet access to complement the fibre network where it is not available, and new applications to support businesses with their digital transformation. And we are preparing all of this today with our teams because at Orange, our customer experience is key!
Mari-Noëlle Jégo-Laveissière, Executive Vice President Innovation, Marketing & Technologies at Orange describes it in détail.

Orange is the leader for 4G and wants to maintain this position with 5G. Orange is thus striving everything to prepare this generation of network, carrier of promise for the future: 5G generation!

Today, 200 of Orange's men and women are working on 5G, and the 20,000 staff working on mobile networks across the Group will be gradually brought on board.

We are currently looking into three complementary areas:

– Improved mobile broadband, with speeds up to 10 times quicker than 4G.
– As well as ultra-high-performance fixed internet access to supplement the fibre network wherever it is not available.
– Not to mention a range of new applications, to support the digital transformation for various business sectors.

Connectivity is the foundation for our innovations. That is why we will be actively preparing for the arrival of 5G.

5G with Orange will be a genuine “multi-service” network.

5G is designed to be a multi-service network, able to adapt to a very wide range of devices: smartphones of course, as well as augmented smartphones with augmented reality and 360° content, sensors, connected devices, fridges, driverless cars, and much more. Basically, it is 5G that will make it possible for connected cars or smart cities of the future to develop.

The cost-effective development of 5G on a large scale requires a global standard that will make it possible to ensure solutions are interoperable and sustainable. We are actively contributing to its standardisation and a first major milestone was successfully passed in December 2017 when a first version of the standard was published. Another essential element for its development: frequencies. Low frequencies, which will meet the requirements for coverage, particularly inside buildings, high frequencies, to deliver quicker speeds and accompany growth in uses, and very high frequencies, for very high-speed fixed broadband.

We are committed to a co-development approach with all the ecosystems: research, universities, various economic sectors (transport, industry, health, entertainment, etc.).

Together, I firmly believe that we will be able to better understand the challenges that lie ahead, the new business models involved and the requirements at stake, in addition to testing various use cases.

Of course, we are carrying out this work and assessing the performance of the various technologies under real conditions to gain the operational experience needed to create 5G networks.

We have already carried out several concrete tests on 5G and we are launching others.

We will be carrying out France's first end-to-end 5G test in Lille and Douai between mid-2018 and mid-2019 as soon as ARCEP has given necessary authorizations. For these tests, we will be using Ericsson's 5G equipment.

With Samsung and Cisco, we will also be carrying out a full-scale test in the second half of 2018 for very high-speed home internet access with 5G for Orange's retail customers in Romania.

Transport of the future is a fascinating field and we are working in particular on vehicle connectivity. I am particularly proud that Orange is now the 4G/5G connectivity partner for UTAC CERAM, a global leader for the testing and approval of driverless vehicles.

5G will be rolled out gradually from 2020.

The first 5G smartphones are scheduled to arrive in 2019, which will enable us to launch some pilot cities. Then, deployments will move forward gradually from 2020 depending on the availability of frequencies and growth in use.

Orange is the leader for 4G and wants to maintain this position with 5G.

This next-generation connectivity will transform our practices and society in general, driving the emergence of a 5G Generation.

https://hellofuture.orange.com/en/fixed-line-web-access-5g-romania-testing-solution-complement-fibre-network-home/

1. Hello Future
2. Networks and IT
3. Fixed-line web access with 5G: Romania is testing a solution to complement fibre network up to the home

Networks and IT | Article

Fixed-line web access with 5G: Romania is testing a solution to complement fibre network up to the home

Wednesday 7th of February 2018 - Updated on Thursday 8th of February 2018

- 5G
- Connectivity
- Fibre

From this summer, Orange will be carrying out a full-scale test of fixed-line web access with 5G in Romania. A pioneering move in Europe on the consumer market for this solution to complement fibre network. An opportunity to take a first step towards very high-speed broadband convergence and the structuring of the 5G market. Here, we meet Pierre Dubois, Research and Development unit manager, and Iulian Gimiga, Transmission Architect with Orange Romania.

Pierre Dubois: “One of our main objectives: helping accelerate the drive towards convergence, with access to high-speed internet, whatever the situation, for as many people as possible”

To bring very high-speed broadband to European homes, Orange has chosen to focus on fibre. With 25 million connectable households, the European market leader is once again accelerating the deployment of very high-speed internet. However, in certain suburban areas, it can be difficult to deploy fibre all the way through to end customers, with technicians facing a range of technical challenges that can prove to be particularly time-consuming. To develop complementary offers and bring very-high speed broadband to its customers, Orange is looking into new solutions, such as fixed-line web access with 5G.

This is certainly not a new idea: mobile phone networks (3G, 4G) have already been used in the past to offer fixed internet access. What is new is the use of very high frequencies (26 GHz), making it possible to deploy a network with properties that combine very low latency and ground-breaking bandwidth: it can be up to 10 times higher than what is available with 4G today.

In concrete terms, this involves providing end customers with a rapidly deployed wireless solution offering the same technical features as very high-speed fibre broadband. The technical progress made by Orange’s partners Samsung and Cisco, (who are the first firms on the market to offer end-to-end 5G solutions capable of using very high frequencies), enables to organise a full-scale test for this solution.

This is a strategic project because it will make it possible to demonstrate the technical viability of fixed-line web access with 5G, while laying the foundations for a new ecosystem within which everything still needs to be built. From the network’s deployment to hardware that can connect with this new frequency and a regulatory framework that will enable its use throughout Europe, Orange is paving the way forward to structure Europe’s future telecommunications market. The experience gained through this first test will make it possible to manage the strategic and technical stakes involved with the internet of the future more effectively, serving as many people as possible.

Pierre Dubois, head of Orange’s Research and Development unit, and Iulian Gimiga, Transmission Architect with Orange Romania, answer our questions about this project.

What will the test in Romania specifically involve?

Iulian Gimiga: It involves inviting selected customers to test out fixed-line web access with 5G as a means of accessing very high-speed internet at two different locations. This operation will take place over three months this summer: two months to put everything in place and then remove it and one month for the test itself.

Why is it important to focus on this technology today?

Pierre Dubois: One of our main objectives is to help accelerate the drive towards convergence, with access to high-speed internet, whatever the situation, for as many people as possible. However, when you move away from highly dense buildings or urban centres to suburban locations or the countryside, the deployment of the FTTH network, i.e. fibre up to the home, can face various technical issues. Its installation is more expensive and can take a certain amount of time because it is linked in particular to requests for building permits from municipalities.

Iulian Gimiga: With fixed-line web access with 5G we want to address this issue by deploying a wireless network with the same properties as fibre. This solution is positioned to complement our existing fibre services. It will make it possible to expand the range of solutions we can offer end customers. One of its benefits is its capability for rapid deployment: so it will also make it possible to address the issue of the “final metre” involved with fibre in certain situations and therefore reduce the costs involved.

Pierre Dubois: This test is particularly strategic. This represents a first step towards structuring an ecosystem around 5G for fixed-line access. Alongside this we will be able to capitalise on the knowledge gained through this experience for our next 5G mobile deployments.

What are the technical requirements for developing fixed-line web access with 5G?

Iulian Gimiga: We aim to get as close as possible to the performance levels and experience offered by fibre. To achieve this, we are using very high frequencies (26 GHz), which stand out by offering low latency and a bandwidth of several hundred MHz. However, with these frequencies, propagation is less optimal and the broadcasting radius is significantly lower.

Pierre Dubois: These technical characteristics represent a challenge that we can meet thanks to our partners, Samsung and CISCO. They are the first firms on the market to offer a pre-standard solution for the technology, making it possible to work with these frequencies. We are using massive MIMO (a new smart system within which several hundred antenna elements can be integrated) to focus energy. This focusing of the antenna beam notably makes it possible to offset the propagation loss.

Iulian, could you tell us more about this test that will be carried out in Romania?

Iulian Gimiga: We found that the stakes involved with convergence in Romania mean that fixed-line web access with 5G is particularly attractive. This market is very open

to adopting new technologies. Another crucial factor with this decision was the fact that the 26 GHz frequency is not widely used in Romania, which is not the case everywhere.

Why is it important to test out this technology?

Pierre Dubois: The use of frequencies just mentioned by Iulian is a critical point for the deployment of fixed-line web access with 5G and 5G in general. Testing this technology under real conditions offers a way to join the discussions that are underway at the European level concerning the use of these new frequencies.
Our work in Romania aims to launch an entire ecosystem in Europe!

Iulian Gimiga: The ecosystem idea is particularly important. We are working with new frequency bands, which has a number of implications in addition to the regulatory framework. We need to apply new rules in order to correctly size this new network. These tests will enable us to effectively understand, thanks to our partners and teams, the specific features involved with using these new frequencies. We will also be dealing with the specific aspects of a network architecture that is very different, because it is virtualised…Another ambitious challenge!

Pierre Dubois: This will also enable mobile and connected objects manufacturers to create “products” with the capability to connect to this network, while opening up extensive possibilities on this new market. This represents a first step forward in an area where everything still needs to be built…which is fascinating!

https://hellofuture.orange.com/en/julien-cumin-preview-home-tomorrow/

1. Hello Future
2. Research
3. With Julien Cumin, a preview of the home of tomorrow

Research | Article

With Julien Cumin, a preview of the home of tomorrow

Monday 19th of February 2018 - Updated on Thursday 16th of June 2022

- AI
- Connected objects
- IoT
- Research exhibition

Understanding the context of the home better in order to optimise and enrich the services offered to its occupants, that is the heart of Julien Cumin's thesis work and of his vision of the home of tomorrow: smart and sensitive.

"For a home to be smart, it must be sensitive"

A smart home, what exactly is it? Julien Cumin belongs to those who are working to address this question. The Orange Labs doctoral student explains, "*the smart home is able to offer personalised and adapted services to its occupants*". And to this aim it has to build a more refined knowledge of its occupants, whose everyday activities are a key element, and of their environment, thanks to what is known as "contextual" information.

Information that "*strongly characterises the services the occupants of the home will need*", underlines Julien Cumin, whose thesis deals with activity recognition within the home. The objective: to understand the actions taking place there thanks to environmental sensors (electricity consumption, humidity, motion, etc. sensors) that provide very varied raw data.

However, "*in order for a home to be smart, it must be sensitive*", Julien Cumin states. Take automatic lighting for example: in the smart home as we imagined it in the past, lighting switches on and off automatically when a person enters and leaves a room. In the sensitive home of tomorrow, if a person leaves a room momentarily to go and get something, the system is capable of understanding this information. Capable of understanding that this occupant intends to come back because they have not finished their activity, thus the system will not switch off the light.

From smart home to sensitive home

So where the smart home of yesterday aimed to offer services based on the detection of events within the home, the smart and sensitive home that Julien Cumin calls for, goes even further. It contextualises these events, translates them into activities, thus using information that bears more meaning for each occupant. Everyday activities are recognised by machine learning. The team within which Julien Cumin works is teaching a computer to establish a link between the sensors' events and the associated activities by feeding it with examples: if I am cooking, taking a shower, or watching TV, here is the sensor information that is fed back. "*Eventually,* the doctoral student explains, *we hope that the algorithm will be "smart" enough to recognise the activity taking place when it is confronted with a new event.*"

As happy as a doctoral student at Orange

Julien Cumin joined Orange Labs in Meylan (Isère) after an end-of-studies internship in the company. He commends the importance given here to the works of doctoral students. "*The worry I had when starting my thesis, was that I would be isolated,* he says. *I was to interact with my thesis director and my supervisors, and publish papers, but my work would remain quite confidential. In the end, I observe that this is not the case: I take part in many events during which I have the opportunity to present my work and to exchange with lots of people.*"

"*At Orange,* he adds, *doctoral students really have the possibility to disseminate their work within the Group, to the scientific community, but also to professionals and companies, which constitutes an extremely interesting opportunity.*" In fact this shows the importance given to research as a whole, on which the young man looks positively: "*Firstly it is vary varied and widespread, with a great wealth of research topics and researcher profiles. Secondly, it is strategic for the Group, both because of the large budget invested in it, and because it strongly values it.*"

https://hellofuture.orange.com/en/three-questions-nanda-menon-athonets-director-corporate-development/

1. Hello Future
2. Networks and IT
3. Three questions to Nanda Menon, Athonet's Director of Corporate Development

Networks and IT | Article

Three questions to Nanda Menon, Athonet's Director of Corporate Development

Monday 26th of February 2018

- 5G
- IoT
- Smart city
- Start-up

Athonet is an Italian start-up who won the prestigious Global Mobile Award from the GSM Association in 2016. It builds customer-centric Industrial IoT and enterprise mobile networks. Athonet joined the first season of Orange Fab France "Telecom Track" in 2017.

"Our focus is on enabling mobile operators and their partners to use our advanced architecture and solutions to enable in today's LTE networks itself the ability to deliver "5G-like" services"

Athonet is a computer software and disruptive cloud company for the 4G / LTE and 5G market. This software makes LTE (Long Term Evolution) universal, affordable and easily deployed while opening up opportunities for the Industrial Internet / Industry 4.0, Internet of Things (IoT), public security, emerging and rural markets, and other transversal markets.

Can you explain on what technology you develop your range of services and why it is disruptive?

Nanda Menon: Athonet's disruptive mobile "edge-computing" core network software makes it dramatically simple, with order of magnitude reductions in cost, for network operators, enterprises and other non-telco users to deploy and manage 5G-Ready wireless networks. Such networks are critical enablers for vast new markets such as the Industrial Internet, Public Safety, Connected and Autonomous Cars, Smart Grids and Cities as well as bridging the Digital Divide.

Athonet's already advanced architecture maps to 5G with a simple software upgrade.

Since winning the GSM Association Global Mobile Awards in 2016, Athonet's software is already being used commercially by network operators, governments and enterprises across the world. These include some of the first CBRS (Computer-Based Reporting System) trial networks in North America, first LTE Smartgrid and Industrial IoT Networks in Europe and Australasia; and first LTE Networks in Africa.

What are your technological projects (evolution, integration of more technologies) for the near future?

Nanda Menon: Our focus is on enabling mobile operators and their partners to use our advanced architecture and solutions to enable in today's LTE networks itself the ability to deliver "5G-like" services such as low latency for industrial LTE, mobile edge computing, and immersive video etc.

One particular example is our innovative Mobile Edge Offload solution that solves a major problem for mobile operators on how to deliver the hyper dense crush load of video that is swamping their networks. It allows selective traffic offload at the extreme network edge, delivering low latency services and locally cached content in a way that was not possible previously while still complying with all the key aspects of 3GPP standards.

You were integrated in the Orange Fab France Telecom Track season 1 team: what did you get from this collaboration with Orange, on a technological point of view?

Nanda Menon: The interaction with Orange Fab France has helped us understand how to further differentiate our solution to address the needs of a leading operator like Orange.

>> The hub “Orange et les start-up”

https://hellofuture.orange.com/en/mobile-world-congress-brand-new-experience-immersive-vr-thanks-5g/

1. Hello Future
2. Networks and IT
3. Mobile World Congress: a brand new experience in immersive VR, thanks to 5G

Networks and IT | Article

Mobile World Congress: a brand new experience in immersive VR, thanks to 5G

Monday 26th of February 2018

- 5G
- AI
- VR

Orange has set up an experimental 5G network in Barcelona for Mobile World Congress 2018. It aims to offer visitors a brand new experience in immersive virtual reality, by transporting them into the cabin of the city's cable car, giving them 360° view. This demonstration hints at the initial use we can make of 5G. Jean Pierre Casara explains.

"This is an example of what 5G will be able to do in the future, in deployment and operational circumstances that reflect real life."

The cable car in Barcelona's port – experienced as if you were actually there. During the Mobile World Congress, to be held in the Catalan city from 26 February to 1 March 2018, Orange will offer those visiting its stand a truly unique experience: to (re)discover the city from the dizzy heights of a cabin on the port's cable car, an iconic attraction that opened in 1931 and is located several kilometres from the exhibition.

In practice, visitors are simply kitted out with a virtual reality headset, which transports them between 50 and 120 metres above the ground: "*The user is immersed in very high definition 360° images, captured live by a 4K camera installed in one of the cabins of the cable car*", explains Jean-Pierre Casara, Future Network Innovations Director within Orange's Innovation, Marketing and Technology Division.

"5G will support changes in usage patterns"

This experience will be made possible by installing an experimental 5G network, capable of handling much larger volumes of data than the current 4G network. *"4G brought a huge increase in the viewing, streaming and sharing of videos on mobile devices. 5G will enable us to go even further and open up a new range of possibilities, as we're no longer talking about connection speeds of a few megabits (Mb) per second, but dozens of Mbs per second. In simpler terms, we can say that both download speeds (viewing, downloading files) and upload speeds (streaming or sending files) will be ten times as fast"*, explains Jean-Pierre Casara. This is a development that does and will make it possible to use 4K and 8K cameras seamlessly, and to view live 360° images on the move. *"5G will support changes in usage patterns"*, he adds.

"A demonstration of everything 5G will make possible in the future"

For Jean-Pierre Casara, this 360° Live Streaming experience is an authentic case study: *"Our Orange subsidiary in Spain has installed a 5G network in the city,"* he explains, *"with the assistance of our partners and the agreement of the Spanish Ministry of Telecommunications. In addition, we are using C-band frequencies, i.e. between 3.4 and 3.8GHz, which have been identified in Europe and in many other countries as the key bands for 5G.*"

All the components of 5G are therefore in one place, from use of the frequency bands to using the devices (cameras and virtual reality headsets, routers) via the installation of a radio antenna and a core network to guarantee high-quality signals in the relevant coverage area, in this instance the area of the city where the cable car operates.

"Pilot installations of 5G networks have already been carried out in many countries, most recently in Korea for example. But this type of mobile system, with live streaming of 4K, 360° images from a cable car, this is a first", says Jean-Pierre

Casara. *“This is a simple and concrete example of what 5G will be able to do in the future, in deployment and operational circumstances that reflect real life”*.

And that future is gradually taking shape, and it is easy to imagine potential uses in other tourist locations, but also in order to train or inform the general public or businesses. *“And why not experience a sports competition live, as if we were the athlete! Or be transported to the location of a news report or an event, live, through a 360° camera worn by a journalist*”, Jean-Pierre Casara suggests with a chuckle. Good question: why not?

https://hellofuture.orange.com/en/heart-sense-sociologist-anca-boboc/

1. Hello Future
2. Research
3. Anca Boboc, sociologist at Orange

Research | Article

Anca Boboc, sociologist at Orange

Monday 5th of March 2018 - Updated on Wednesday 28th of March 2018

- Digital
- Education
- Human sciences
- Work

Specialising in the uses of digital technology within companies, Anca Boboc is a sociologist at Orange Labs within the Innovation, Marketing and Technologies Division of Orange. She tells of her work within this body, which analyses the impact of emerging technologies on our lives, both within and outside the workplace.

"We provide a wider vision to operational players"

From Romania to France, from the automotive industry to telecoms, and from engineering to the sociology of work, Anca Boboc's career embraces the will of this Orange Labs sociologist to understand the complexity of everyday work situations and to decipher the impact of technical progress on the evolutions of work.

A trained engineer, she soon felt the desire to open up to the humanities and social sciences. She thus left her homeland, Romania, to complement her engineering

degree with a master's degree and a doctoral thesis at the École Nationale des Ponts et Chaussées.

Supported by her thesis on the forms of socialisation in automotive design, which was based on several years of field research at Renault and enabled her to build up her expertise in sociology of work, Anca Boboc joined the Orange Labs social science laboratory, in the early 2000s. At a time of massive increase of digital tools in the workplace.

A cross-functional path and role

"We have a very cross-functional role within Orange, we work with all professions, explains Anca Boboc. We help them to take a step back, we provide a wider vision to operational players, and we disseminate knowledge, so as to feed their thinking."

The sociologist's career path bears witness to this cross-functionality. She has, for example, worked with Orange Labs on the trials of technical solutions developed by the research teams, with Orange Business Services on a study of ICT uses on the boundary between private and professional life carried out between 2009 and 2011, or with the CSR within the Digital Society Forum framework where she carried the "Work and digital" forum.

From 2011 to 2013, Orange set up a large-scale study on the usage of corporate social networks, to which Anca Boboc contributed. *"Orange was a forerunner in this area as it had just rolled out an internal social network,* Plazza, with an already huge array of functionalities and an important quantity of users. In terms of research, it was extraordinary to see how employees sought to appropriate such a tool."
The sociologist undertook qualitative surveys on its users' usages, but also on the activity of the community manager, a role that was relatively unheard of at the time…

How does a sociologist work at Orange Labs? *"Our work is fed by all questions that are asked, be they from within the Group or from the outside, replies Anca Boboc. We take the question on board and read other scientific works performed on the subject before launching the study. Then we translate the results, providing operational responses as well as publishing in scientific journals."*

This foothold in the academic world and the interactions with other external stakeholders are important. For example, Anca Boboc belongs to the scientific council of the French national agency for the improvement of working conditions (Anact: l'Agence nationale pour l'amélioration des conditions de travail), which enables her to have a wide view of what is happening and of the questions French companies are asking themselves.

The researchers promote the results of their studies as much internally, in the various entities of the Group, as externally, in the academic world or within the scope of Orange's intercompany relationship fabric. "We get input from both sides, and we also disseminate to both sides, which, I believe, contributes to the image of a humane and responsible provider. Orange is progressing is the digital arena, and it is doing so knowingly."

Added value

Anca Boboc's first study was on the future of the landline in business in 2002, at a time when phone boxes were gradually disappearing from public space.

What about today? What are the most interesting tools in the workplace? *"I wouldn't say there are tools that are more important than others. What counts* is the added value that these tools bring to a given activity at a given time, the sociologist states. I may be on the internal network Plazza for three months because I have an event to organise, then not use it for a while… There's email – that's the basic tool – , and then there is an array of tools from which employees choose depending on individual or collective needs, on their activity, personal or professional inclinations linked to their career path, to what has been made available by the company, etc."

As for the technologies of tomorrow, Anca Boboc prefers not to get lost in speculation: *"I'm waiting impatiently to put the technologies arriving in the workplace into test, to see which tools will be adopted, under what conditions, and how they will contribute to the evolution of the organisation and the working environment."*

The sociologist concludes with a sentence that could be a manifesto *"As a work sociologist, what I'm interested in mainly, are the appropriation factors – individual, group, organisational – of these technologies rather than the actual technologies themselves."*

https://hellofuture.orange.com/en/semantic-similarity-help-internet-users/

1. Hello Future
2. Research
3. Semantic similarity to help internet users

Research | Article

Semantic similarity to help internet users

Monday 5th of March 2018 - Updated on Thursday 16th of June 2022

- AI
- Research exhibition
- User experience

Frédéric Herledan, a project manager at Orange, presents the new pathways opened up by semantic similarity techniques, for example in terms of searches on technical help forums or processing audio fonds. What internet user has never dreamt of easily finding the answers to existing questions that are close to those they are asking using their own words? On the web there are many areas (FAQ, forums, etc.) where one can find the answers to questions that have already been asked by other people. However, in order to process these answers, the question closest to the one we are asking still needs to be found. Today though we must still ask questions using words that are already indexed by search engines. But maybe not for long…In effect, semantic similarity techniques enable us to overcome this hurdle by replacing words with their context of occurrence. Frédéric Herledan, a project manager at Orange, is working on the question, notably through two practical applications: the improvement of searches on technical assistance forums, and the offer of a new way to be informed and to learn via radio programmes by processing audio fonds. Applications that should enable the enhancement of

Orange’s assistance forum and the optimisation of usage via the Djingo personal assistant, for example. A project that was presented at the latest Orange Salon de la recherche from 5 to 7 December 2017.

Listen to the podcast

https://soundcloud.com/human-inside/pitch-20-la-similarite-semantique-au-secours-de-linternaute

https://hellofuture.orange.com/en/trust-security-heart-vote-system/

1. Hello Future
2. Research
3. Trust and security at the heart of the Vote+ system

Research | Article

Trust and security at the heart of the Vote+ system

Monday 12th of March 2018

- AI
- Cybersecurity
- Research exhibition
- Smart city

A PhD student at Orange working specifically on the Vote+ project, Quentin Santos presents this new secure and transparent online voting solution. Where Le Vote focuses on decentralizing elections using blockchain, Vote+ secures them using cryptography. Vote+ is an online voting system that supports several voting methods and, using advanced encryption mechanisms (cryptography) and blockchain technology, ensures the secrecy of the ballot as well as its sincerity, transparency and security (results verification and controlled voting procedures). As Quentin Santos, a PhD student at Orange in charge of developing this project, points out, the Vote+ solution – for use in political and professional elections as well as polls in general – offers high-level security guarantees and in addition more representative voting methods. These features could restore the confidence of citizens, employees and voters in the democratic process, and increase voter

turnout. This system was presented at the 2017 Salon de la Recherche on December 5-7.

Listen to the podcast

https://soundcloud.com/human-inside/pitch-22-la-confiance-et-la-securite-au-cur-du-systeme-vote

https://hellofuture.orange.com/en/lte-m-fresh-impetus-internet-things/

1. Hello Future
2. Internet of things
3. LTE-M, fresh impetus for the Internet of Things

Internet of things | Article

LTE-M, fresh impetus for the Internet of Things

Tuesday 3rd of April 2018 - Updated on Wednesday 22nd of June 2022

- Connectivity
- CSR
- Industry
- Networks
- Smart city

As an extension of 4G standards, the power of the “Long Term Evolution, category M1” standard is gradually gaining ground, with the introduction of the first operational solutions. But what is it exactly? A “mobile IoT” technology that is economically and environmentally sound because it is less energy intensive.

LTE-M supports a wide range of use cases related to the IoT, by providing extended coverage and connectivity compared to historical cellular technology.

A simple, concise description of LTE-M might be “Long Term Evolution for Machines”, as LTE is the next generation of 4G technology. It is a familiar principle: with the spread of the Internet of Things and M2M, machines are able to send information and data and communicate amongst themselves. LTE-M is particularly well suited to increasing the variety and volume of these objects: it is a versatile technology that is capable of connecting a wide range of devices designed for many different purposes – from smart electricity meters or automatic vending machines to fleets of vehicles, GPS beacons and e-health devices.

An ecosystem under construction

LTE-M is still only just getting started, although across the world, some operators are already making good progress: in the United States, for example, AT&T and Verizon launched their nationwide network as early as 2017. In Europe, Orange has prioritised the roll-out of LTE-M within its markets, and its series of field tests has

been ongoing for several months now. At the end of 2017, Orange Belgium even announced that Mobile IoT technology, including LTE-M, was available throughout Belgium.

Collaborative innovation is currently taking place, in order to come up with applications and solutions that are tailored to business needs, and ecosystems are being built around the key links in the "LTE-M chain", between operators and the manufacturers of both the connected objects themselves and the electronic components embedded within them. "*It is now a question of bringing these actors together to work on joint initiatives and partnerships to invent the future of LTE-M*," explains Luc Savage, Vice-President Enterprise IoT, within Orange's Innovation, Marketing and Technology Division. In this regard, the Group is offering the manufacturers of connected objects and modules an LTE-M environment, as part of its Open IoT Lab. *"And this co-innovation approach needs to go so far as to involve future users and, those primarily affected, businesses, so that they can test solutions and share feedback in order for solutions to be adjusted to match their operational reality and production chains as closely as possible."* Things are definitely on the move and the outlook is promising.

An improved, "green" IoT

But exactly what operational benefits does LTE-M technology offer?

One benefit is the economy of scale involved in rolling out LTE-M, as all it needs is a simple update of the existing 4G infrastructure. Secondly and most importantly, it means further progress can be made in IoT applications for the business world, based on Low-Power, Wide-Area Network (LPWAN) technology, and all of this is geared towards mobility. Thanks to LTE-M's performance in terms of coverage and energy consumption, businesses will be able to connect objects they would have not have been able to connect with existing technologies.

"*Better and more widespread coverage means, in particular, that we can guarantee increased penetration and availability inside buildings,"* says Simon Glassman, Head of Strategic Partnerships at u-blox. This international company based in Switzerland designs wireless modules and chips and, together with Orange and connected objects manufacturer Ercogener, has helped to develop the first LTE-M object dedicated to business – a tracking device suitable for industry 4.0 uses. *"And solutions are less power-hungry and have a life expectancy of between 5 and 10 years, paving the way for use even in remote areas, with limited or practically non-existent maintenance requirements. And with the significant benefit of being able to support Voice applications if required."* The object that resulted from the partnership between u-blox, Ercogener and Orange is an LTE-M modem that is waterproof and robust, making it possible to guarantee the smart tracking of different kinds of goods – pallets, containers, etc. – in all circumstances, in remote environments, both when they are being transported and in any location and at any time. Finally, it

can be linked with external sensors if the user wishes to record any other data, for example the vibrations to which an engine is exposed.

As Simon Glassman sums up, the IoT in LTE-M mode is *“a gateway to a whole new world of opportunities, and the ability to connect a large number of devices, so that they perform effectively and at a lower cost.”* A gateway to a world that is even smarter, in other words…

https://hellofuture.orange.com/en/lte-m-fresh-impetus-internet-things/

1. Hello Future
2. Artificial intelligence
3. AI, the key to useful data exploitation

Artificial intelligence | Article

AI, the key to useful data exploitation

Thursday 19th of April 2018 - Updated on Wednesday 16th of September 2020

- Big data
- Deep learning
- IoT

The Internet of Things (IoT) and connected objects themselves are playing an increasingly important role in the everyday lives of users. For Patrice Slupowski, Orange's Director of Digital Innovation, the data generated by this multitude of objects cannot be processed without artificial intelligence (AI).

"What are the 4Vs of Big Data? Volume, velocity, veracity and variety"

The IoT sector has seen significant growth, partly due to the extent of business investments (expected to reach 62 billion dollars in 2018, according to a study carried out by IDC at the end of 2017). This is accompanied by the inclusion of a growing number of connected objects in our daily lives, which generate a huge amount of data. This data represents a veritable gold mine for developing new services – as long as it's processed and exploited in line with ethical, privacy and security regulations. For Patrice Slupowski, Orange's Director of Digital Innovation, this formidable growth lever can only be pulled by using another form of technology: artificial intelligence.

How does the Internet of Things relate to artificial intelligence?

Patrice Slupowski: The Internet of Things is based on the connection of a plethora of objects that operate as a network. It will lead to the production of enormous quantities of raw data. This data must be qualified and processed into usable information. To achieve this, the use of AI seems crucial. Tools such as algorithms, or even learning mechanisms, like deep learning, will allow us to process, analyse and *ultimately* make the best use of this bulk of data.

Can you give us a practical example?

Patrice Slupowski: We have worked for the Sanoia and AP-HP (Paris public hospitals) e-health platform. We have contributed to the analysis of activity data for patients with rheumatoid arthritis. This is a very debilitating disease that affects 1% of the population and causes flare-ups. We've given actigraphy bracelets to 150 patients. They work like connected wristbands sold commercially for well-being or exercise purposes. Through the development of specific AI and the exploitation of data, we were able to identify and predict the onset of these flare-ups. Eventually, the aim is to change how the disease is treated, making it much more accurate.

A combination of data and AI will help create smarter IoT solutions. In your view, will data become the gold mine that we're all expecting?

Patrice Slupowski: The promises around data are related to the ability to re-engineer all human activities by building data-driven models. The speed at which data is produced, and the increased power of micro-processors, suggest that we will see great strides in many areas: health, energy, business, etc. We will be able to understand the links between different variables and design apps with previously unimagined capabilities.

What type of data are we talking about? Can it all be collected and exploited, from both a technical and regulatory perspective?

Patrice Slupowski: It is important to distinguish between anonymous data and personal data. With regard to the former, we often talk about the 4Vs rule in the context of Big Data: volume, velocity, veracity and variety. These are fundamental to the work of *data scientists.* Of these four priorities, veracity is probably the most important point. This means ensuring the quality of the data to be exploited.

And with regard to personal data?

Patrice Slupowski: The most important concern around this data is privacy.
From 25 May 2018, the GDPR (General Data Protection Regulation), which resulted from the work of the CNIL (French Data Protection Authority) and its European counterparts, will establish a harmonised framework at a European Union level, and

grant new rights to citizens with regard to the collection and use of personal data. This document highlights a founding principle: personal data fundamentally belongs to the individual. This means that, from 2018, it's the individual who must be in control of his or her data.

Returning to the issue of AI and IoT, what are the advantages of such an alliance?

Patrice Slupowski: AI's ability to beat humans at chess or a game of Go is an impressive example of its aptitude, but that's not the point. It's very likely that data will become an asset in a huge number of areas with far greater relevance from a user's point of view. AI and the IoT will help users to become better acquainted, to simplify their digital life, to discover new experiences, to protect their privacy, etc. Businesses won't be left behind: this intersection will lead to gains in productivity, a better understanding of their customers, a transformation of their operations, new business ventures, process improvements, etc.

Sometimes, this new digital potential causes people to worry about the role of humans alongside the devices of tomorrow. What's your view on this?

Patrice Slupowski: The anticipated progress around AI is generating many expectations and promises, but also a few delusions. We're talking about radical transformation scenarios, which have captured the imagination of those who enjoy reading science fiction for many years.

In actual fact, we're currently dealing with so-called 'weak' AI. It's able to problem-solve in four main areas: understanding language, advanced data analysis to identify links, real-time data classification (for example for computer vision) and winning games with defined rules, like chess.

Humans are still relevant in many ways, and will be for a long time! This is particularly true in terms of our ability to express and recognise emotions. Advocating the role of humans in digital development is central to our efforts at Orange, whether in the day-to-day running of our company, in policies for developing our employees' skills, or even in listening to our customers.

https://hellofuture.orange.com/en/esim-coming-soon-mobile-networks-services-near/

1. Hello Future
2. Internet of things
3. eSIM: Coming soon to mobile networks and services near you!

Internet of things | Article

eSIM: Coming soon to mobile networks and services near you!

Wednesday 25th of April 2018 - Updated on Thursday 16th of June 2022

- Device
- Networks
- SIM
- User experience

United under the GSM Association, operators, card embedders and manufacturers have decided to agree on an eSIM standard. “It’s an invisible yet critical transformation”, said Philippe Lucas, Orange’s eSIM Programme Director, at the Mobile World Congress in Barcelona on February 2018.
Interview with Christine Lemoine, Orange’s Director of Cross-Divisional Projects.

“Due to its size and its simple digital activation, the eSIM will increase the connectivity of objects that were previously unconnected to the cellular network”

What is eSIM and what does it change compared to the SIM card ?

Christine Lemoine*:* An eSIM (embedded SIM) is still a SIM card. Customers still have to sign up with an operator. They still have access to advanced services, and can transfer their phone numbers. They have a unique contact number, and the same legal requirements still apply with regard to customer identity.
The changes are taking place at a SIM card retail level, since eSIMs are being built into every connected object, which will eventually include smartphones. Although the operator still manages the network and, thus, the connectivity, it no longer sells the SIM card itself. The mobile manufacturer buys the eSIM component from a card embedder (Gemalto, G&D or Idemia, previously Oberthur).

Meanwhile, the operator must use a platform for downloading profiles, provided by these same card embedders, mostly as a ‘cloud-based’ solution. These card embedders have built secure digital facilities for creating and downloading profiles

for operators.
Due to its size and its simple digital activation, the eSIM will increase the connectivity of objects that were previously unconnected to the cellular network, such as tablets, watches, etc.

How does this work in technical terms?

Christine Lemoine*:* The operator profile is no longer incorporated into a physical SIM card at the factory ahead of being sold, since it's downloaded by the customer remotely. The card is configured in seconds, after the customer signs up.
A profile is sent to them via a platform, and the operator is able to make the link between the profile and the customer's mobile account. The operator's information system collects data from the platform, such as confirmation that a profile has been correctly installed, and on which card. Multiple 'operator profiles' can be installed on a single eSIM card. However, only one profile can be active at a time – the others are disabled.
A profile cannot be copied, nor transferred. Whenever a customer changes his or her device, he or she will need to launch a new profile request process.
As a result, the eSIM increases the digitalisation of the customer journey, and means they no longer need to go into a shop, and no longer need to deal with physical SIM cards. Customers will be able to activate their eSIM devices in physical Orange shops, as will be the case very shortly with the Huawei Leo watch in Spain; or they can decide to do so later on, using online tools or apps.

Several manufacturers are already offering the eSIM within their products. It is therefore no longer provided by operators. How is Orange preparing for its arrival?

Christine Lemoine*:* The GSM Association (GSMA), which unites both mobile operators and manufacturers (around 40 of the leading mobile operators, device manufacturers and card embedders) has successfully set up a joint project and fostered a relationship of trust between these stakeholders, in order to establish common standards.
Orange is heavily involved in this working group, to ensure that a standard that meets the needs of operators is developed, and that a direct link with its customers is maintained. A standard solution has thus emerged.

What were the steps taken within the GSMA to reach this standard?

Christine Lemoine*:* The process was an immediate success, resulting in the release of Phase 1 of standardisation after six months (in December 2015), and the drafting of a document specifying interfaces and security measures that would allow operator profiles to be loaded onto eSIMs remotely. It's true that the GSMA was able to reuse some of the details already specified for the Machine-to-Machine market, the standard launched two years previously. This release has allowed quite a few countries to launch the Samsung Gear S2 watch, which contains an

embedded SIM.
During Phase 2, operators managed to offer end-to-end, digital journeys, and incorporate the eSIM into mainstream devices, such as connected watches for example. This is also when Apple joined the GSMA, having launched a non-standard version of the eSIM – the Apple SIM – a few months earlier.
With an increasing number of players, resulting in lengthy discussions on certain features that sometimes required legal input, and with different views from a range of countries, we needed a good 18 months of work before moving to Phase 3.
This Phase, launched in mid-2017, was marked by Google's arrival into the GSMA working group. The goal is to work together on 'Business' features, operator profile management (product support) and, above all, to optimise the digital journey. In fact, activating an eSIM with an operator profile is very easily done from a smartphone or tablet, using a pre-downloaded app like 'My Orange'.

What impact does the eSIM have on operators?

Christine Lemoine*:* Besides ceasing logistical operations such as the production, delivery and storage of SIM cards, operators must develop their information system (IS) in a structured way, by incorporating the process for the real-time loading of their profile onto customers' eSIMs. The operator's IS must also interface with that of the card embedders, to ensure the security and authenticity of the profiles downloaded.
Three options have been developed for downloading profiles:
First scenario: the operator provides an activation voucher using a QR code displayed in an app, on the website, or on a receipt that the customer scans with the device to be activated. It contains the location of the operator platform, together with a code, thereby allowing the profile to be received.
Second scenario: the customer can retrieve a profile by submitting the eID, the eSIM card's credentials, as well as the IMEI (International Mobile Equipment Identity), which identifies the mobile device. A connection is subsequently established between the device and the platform using Server Discovery (SD). The profile is sent automatically after the customer gives his or her consent. This approach is particularly useful where the customer has signed up before setting up the device, and in some cases where there are two different people involved (the person who pays the mobile contract/the user of the device)
Third scenario: the customer uses the 'My Orange' app to confirm the request for connectivity from his or her device, and instantly receives the profile.
In order to facilitate these different processes, Orange needed to invest in a management platform – 'digital SIMs' – provided by the company G&D. All countries with an Orange presence can connect to this platform, since it has been calibrated to best suit their operational requirements and business needs. Spain, for example, has just launched the Huawei Leo watch using this new platform.

What are the next steps in the eSIM roll-out?

Christine Lemoine*:* In three years, operators and manufacturers have successfully reached agreements by working together on the functionality of the eSIM on the personal device market (smartphones, tablets, watches, PCs, etc.), releasing two standard iterations, and bringing secondary devices to market for the first time. Alongside the third standard iteration, planned for this year, the next step will be to ensure that the common standards are well-respected, regardless of any specific manufacturing conditions. Giving a profile to customers should follow an identical process for all devices.

In order to remain compliant with these standards, it will undoubtedly be critical to work towards the certification of the SIM card, as well as the functionality of the device. Discussions on this matter are still underway. Without such certification processes, the operator may not be able to market products that do not comply with these standards.

By 2030, we predict that 100% of devices will be fitted with an eSIM. This move into the mainstream market will be slow, since meeting the standards will involve major modifications to internal processes for the majority of operators, and the upgrade of devices for manufacturers, starting with the highly-anticipated overhaul of smartphones.

https://hellofuture.orange.com/en/vivatech-innovation-proves-demonstrates-value/

1. Hello Future
2. Digital culture
3. At VivaTech, innovation both proves and demonstrates its value

Digital culture | Article

At VivaTech, innovation both proves and demonstrates its value

Thursday 24th of May 2018 - Updated on Thursday 17th of September 2020

- 5G
- AI
- CSR
- Data
- Industry

At the 2018 VivaTech show in Paris, Luc Bretones, Executive Vice-President of the Orange Technocentre and Orange Fab, encapsulates this unmissable event for global innovation and some of the start-ups present with the phrase: innovation that matters!

Emphasising innovation which matters and which provides something, the kind of innovation which makes a difference and turns technology into progress to benefit as many people as possible.

For the third consecutive year, Orange is a Platinum partner of the Viva Technology show held on 24, 25 and 26 May 2018. The largest international IT event in Paris brings together 80,000 participants and 8,000 start-ups from all over the world, to

share and learn about the latest innovations in 5G, the Internet of Things, data, security, artificial intelligence (AI) and even new voice sensitive interfaces. Innovation in Africa will also be a highlight at this year's event which will be attended by the CEOs of the IT and web giants Microsoft, IBM, Alphabet, Uber, Facebook, etc.

Technology to serve the largest number of people

VivaTech remains, first and foremost, the global meeting place for start-ups and so, of course, the spotlight will be on them. In particular, we are supporting 120 start-ups: some of them have come from the Orange Challenges, and others represent the developments accelerated by our 14 Orange Fab projects in 15 countries around the world.

All of them have one key thing in common – they are consistent with the values of our Group as promoted within our Human Inside philosophy: *innovation that matters*. In other words, innovation which matters and which provides something, the kind of innovation which makes a difference and turns technology into progress to benefit as many people as possible.

Technological progress only makes sense if it benefits everyone. These formidable start-ups, identified, supported and promoted by Orange, share this belief and allow it to permeate all areas. For example, in the area of accessibility where *Voiceitt* has developed a new technology to translate the sounds produced by people with speech difficulties into language which is clear and audible for everyone in real time. The voiceprint, which is unique to us, conveys much more than just language. It is also at the heart of the solution developed by *Cochlear.ai*, which has developed AI algorithms which are accessible via the Cloud and intended to interpret the emotional dimension of voices so as to provide, for example, prior warnings about emergency situations. *Soundhound* specialises in "speech to meaning", in other words understanding the meaning of oral speech directly from the sound without having to do a textual translation first. This all takes us closer to traditional human conversations in our interactions with digital terminals…

And when the voice is not enough or more information needs to be transmitted, *Dotincorp* uses touch by imagining a Braille watch which conveys the messages sent by the finger touch of its users.

Heightening the senses

The combination of AI algorithms, new terminals and translations between sounds, intentions and emotions, by text or touch, today enables communication between the available or desired senses. And this is widened further when it is linked to VR or AR technologies so as to give the kind of rich experience proposed by *Rendr.fr* which brought the ancient site of Palmyra back to life.

Nunki.co transfers this challenge to the area of security, via a solution that "increases" our vision and our understanding of out-of-the-ordinary situations by collecting and analysing the information given by people who are closest to these events.

Listeners connected to the *Bragi* cloud are connected in turn to earpiece-aids, through which you can make voice commands and receive useful information in real time: more than a smartphone, more than a keyboard, everything is guided by voice.

Innovation for a "sustainable" continent, in Africa

The activities of the start-up companies we support are directed also to the specific challenges of African countries, consistent with our presence and commitment to the continent. In Cameroon, Côte d'Ivoire and Senegal specifically, *Isahit* contributes to educating young women by helping them to pay for their studies by carrying out microjobs for one to two hours per day. *Coliba* addresses the problems of pollution and recycling using a mobile, SMS, and web app, which finds the geolocation of its users before organising the collection of its plastic waste.

Data is a valuable resource when talking about agriculture, and it is used successfully in the API Ecosystem from Listenfield which integrates agro-environmental data in order to facilitate the predictive analyses of its users. It is also a valuable resource when discussing how to contribute to creating sustainable and cost-effective agriculture through local decision-making based on the data.

https://hellofuture.orange.com/en/look-around-adds-intelligence-virtual-tour-experience/

1. Hello Future
2. Internet of things
3. Look around adds intelligence to the virtual tour experience

Internet of things | Article

Look around adds intelligence to the virtual tour experience

Friday 1st of June 2018 - Updated on Wednesday 16th of September 2020

- AI
- Big data
- Prospective
- VR

Look around is a virtual tour service which makes it possible to immerse yourself in a place, in a dimension that can be both geographical and historical. It is also a smart assistant that accompanies the visitor in order to offer them an enriched and personalised experience.

At the Roland-Garros French Open, the public will use Look around from 2 interactive terminals on 65"/55" 4K touch screens to immerse themselves in the history of the stadium of yesterday and tomorrow alike.

Look around is at the crossroads of several technologies and digital worlds – artificial intelligence (AI), 360° immersion, Big Data… And that's what makes it so

original. The visitor is guided by AI throughout the virtual immersion tour. What's the aim? To answer all questions before, during and after visiting the location.

A dive into the history of the Roland-Garros French Open

At the Roland-Garros French Open 2018, the general public will be able to access Look around from 2 interactive terminals on 65″/55″ 4K touch screens to immerse themselves in the history of the stadium of yesterday and tomorrow alike. The solution includes a virtual tour service enriched by a smart assistant, textual content, and 360° videos and photos to explore the four major phases of the stadium's transformation since 1928. *"The 360° content is there to enhance the attractiveness and the 'wow' effect, while the smart assistant takes over to bring depth to the content and guide the user*," explains Anne-Laure Alliot, an Intrapreneur at the Intrapreneurs' Studio within Orange. "*The level of artificial intelligence on which the assistant is based is tailored to the expectations of the division's customers. It will then be possible to offer more personalised support, adapted to the user's browsing history, or even to anticipate certain predictive issues, just as it will be possible for the visitor to access the service before, during and after their visit from any terminal."*

A remarkable AI flexibility

Look around, unique because of the role AI plays, can be put to use in many places – from tourist or sports sites, to shopping centres, business premises, etc. – to provide guidance, for promotional purposes or to boost economic development. François Bourquin, Chief Digital Officer within Orange explains, *"It has a number of benefits. For one thing, it groups and organises heterogeneous sources of information in order to simplify the user's life and optimise their visit. It also allows industrial processing while applying individual and personalised answers. It is possible to control and calibrate this AI to increase the quality of the support given to the visitor in real time. It can also be combined with an e-commerce module to enable the user to make a purchase that they would have forgotten to make on the spot."*

There is a wealth of different functionalities and the level of artificial intelligence can be adapted according to the customer's individual needs.

Look around is a valuable tool for users and professionals alike: users benefit from being given a guided tour by a digital companion, while professionals can optimise visits to their site by refining their knowledge of their visitors in order to offer them an even richer and more personalised experience.

https://youtu.be/JbKf9igtcl0

> Roland-Garros 2018

https://hellofuture.orange.com/en/edge-video-analytics-reveals-intelligence-networks-future/

1. Hello Future
2. Networks and IT
3. Edge Video Analytics reveals the intelligence of networks of the future

Networks and IT | Article

Edge Video Analytics reveals the intelligence of networks of the future

Friday 1st of June 2018 - Updated on Wednesday 22nd of June 2022

- AI
- Cloud
- Edge computing
- Prospective
- Sport

As part of the Edge Video Analytics experiment, carried out during the 2018 Roland-Garros French Open, Orange is making its networks take on a new role, favouring dynamic processing of information rather than transporting it in order to provide a subsequent analysis. Explanations.

“Edge Video Analytics anticipates the power of the networks of tomorrow, as it heralds their ‘softwarisation’ and distribution”

“*Today, we transport information. With this Edge Video Analytics experiment, we are converting this information as close to the source as possible, so that only* ***useful***

information is transported," summarises Jean-Pierre Casara, Director of Network Innovations of the Future within Orange.

Making the images talk in real time

Specifically, the experiment consists of installing cameras connected to the Suzanne Lenglen court, every one of which points to a section of the stadium ("tribune"). The images captured by these cameras are fed back to the mobile network and are interpreted in a decentralised mini-Cloud located in the same stadium. Here, an artificial intelligence solution converts these images into the indicator required, namely, the precise number of spectators present in every area of each "tribune". These indicators, around 30 in total, are updated every minute and fed back via a website to the staff of the Fédération Française de Tennis (French Tennis Federation – FFT). Combined with other information, such as the progress of the current match, it therefore allows the flows of spectators so that it is possible for them to dynamically adapt reception, orientation and seating management, etc. This will result in an optimised experience both from the spectator's and organiser's point of view.

5G and Edge Computing – the new paradigm

Today, the experiment is taking place with the help of a private 4G network while awaiting the arrival of 5G. *"Edge Video Analytics anticipates the power of the networks of tomorrow, as it heralds their 'softwarisation' and distribution,"* explains Jean-Pierre Casara. Indeed, the principle of edge computing, which is at the heart of the solution, involves distributing intelligence and computing power to bring it as close to the source data as possible. Thanks to its ability to process locally and in real time, edge computing therefore has the advantage of limiting the data transported to the Cloud. As such, it never leaves the mobile network, which allows for increased commitment with regard to respecting privacy and data.

Jean-Pierre Casara specifies that market prospects are important, and operators have a role to play. "*There is a real enthusiasm for processing images, their interpretations and predictive models. New markets can open up for developers of specialised applications in these fields and Orange could be there to provide the means by which these applications are operated within networks of the future."*

https://hellofuture.orange.com/en/nicolas-pellen-semantics-sounds-internet-things/

Internet of things | Article

Nicolas Pellen: semantics of sounds and the Internet of Things

Monday 11th of June 2018 - Updated on Thursday 16th of June 2022

- Connected objects
- Human sciences
- Research
- User experience

the internet of things. With his teams, he is currently developing technology capable of identifying the signature of the noises of a house, and of putting this information at the service of better user experience within voice assistants. In practice this means putting “semantics” onto everyday noises (a banging door, a miaowing cat…) to enable connected objects to better recognise the meaning behind background noises.

“I’m lucky to work with multidisciplinary teams, with developers, researchers, network architects. We also work a lot with sociologists and ergonomists. This is what provides the richness of the job because we all really work together.”

https://hellofuture.orange.com/en/bercenay-orange-teleport-celebrating-40th-birthday/

1. Hello Future
2. Networks and IT
3. In Bercenay: the Orange teleport is celebrating its 40th birthday!

Networks and IT | Article

In Bercenay: the Orange teleport is celebrating its 40th birthday!

Tuesday 19th of June 2018 - Updated on Wednesday 16th of September 2020

- Big data
- Connectivity
- Open innovation
- Prospective

In Bercenay-en-Othe, the Orange teleport is celebrating forty years of satellite communication. Originally devoted to voice communication, this strategic site is now a key component of the network, providing all forms of telecommunications coverage worldwide.

“While undersea cables continue to extend throughout the oceans and on land, the satellite remains an essential supplementary technology.”

Satellite is used to broadcast television programmes, connect telephone calls, view videos, and much more. Teleports serve as a gateway to wired networks. They send and receive information of all forms to and from satellites orbiting the planet.
Every day, thousands of telecommunications and gigabits pass through Bercenay,

one of the largest teleports in Europe. The site has over thirty antennas, three of which measure over thirty metres in height. The teleport is connected to the terrestrial “backbone” that is made up of IP networks (IP VPN, OTI, etc.) and uses satellite to connect to sites that are distant and/or isolated from the network. Bercenay does not cover the entire globe: its range extends from the coast of Brazil on one side to India on the other. Therefore, in order to offer a global coverage to its customers, the Orange teleport is connected to partner teleports in the United States, Germany, Australia and South Korea.

Photo credits: Swifties. The Orange teleport at Bercenay-en-Othe in its early stages.

When Orange operated satellites

Véronique Disdet is the head of Orange’s Satellite Factory, whose mission is to provide satellite communication solutions to internal and external customers. Naturally, the teleport is a key element. How did Orange succeed in developing a site of this magnitude and become a major player in Europe? Véronique explains: *“Forty years ago, France Télécom was working with the French army on a major project to establish telecommunications connections with the French Overseas Departments and Territories, at a time when there were no undersea cables. This is how the Bercenay-en-Othe Teleport came into existence. Initially, it consisted of a handful of antennas used to transmit voice calls, which were analogue at the time.”* This was also when Orange became a satellite operator: operating three satellites as part of the “Télécom 1” project, and four others for “Télécom 2” a few years later. The last of these satellites was decommissioned in 2012.

From analog telephone to all IP, a technological evolution

Today, Orange buys capacity, in other words frequency bands, from specialist suppliers such as Intelsat in the United States and Eutelsat in France – two major players in the satellite market. Orange then uses these frequency bands to transmit telecommunications, turning megahertz to megabits in the process! The days of the analogue telephone are long gone. Today, everything from sounds to images can be transmitted via the same IP networks used by the global internet. In order to fulfil these new uses and communicate with these new networks, the Bercenay Teleport has upgraded its equipment. It has also extended its offering: the teleport, which was historically only used for domestic needs, has undergone significant expansion.

Photo credits: Swifties. The Orange teleport at Bercenay-en-Othe on May 2018.

What is Bercenay teleport for today?

Except for Saint-Pierre-et-Miquelon, the French Overseas Departments and Territories are now sufficiently connected via cables and no longer have the same need for satellite communications. However, many other areas still require coverage: *"Orange is making significant investments in Africa, particularly in landlocked countries that lack access to undersea cables or proper domestic connectivity. In the Democratic Republic of the Congo, the Central African Republic, Niger and elsewhere, Orange offers affiliated operators solutions for connecting territories."*

Banking networks also consider satellites to be a more reliable means of carrying out transactions. Orange Business Services, the arm of Orange devoted to businesses, uses the Bercenay Teleport to offer satellite services to multiple customers. NGOs and businesses use them in refugee camps, on isolated drilling sites and even on ships at sea. Government ministries, who see them as a solution to their need for varied and secure connections, also use them as a backup system.

The future is studded with satellites

"While undersea cables continue to extend throughout the oceans and on land, the satellite remains an essential supplementary technology, as there will always be poorly-served areas and situations and contexts in which they are more effective." In Africa, Orange is pursuing an ambitious strategy to reduce the digital divide in rural areas, working with local suppliers to create "WiFi hotspots" in villages using satellite connections. *"Today, more than ever before, satellite communications are a driving force for the future. Proof of this comes in the shape of two constellation projects, launched in parallel by OneWeb and SpaceX."* Their aim? To launch a myriad of small satellites into orbit in order to provide global coverage at a more competitive rate. As long as there are satellites in the air, ground infrastructure will be both necessary and essential for receiving and sending signals throughout the global network. For the Bercenay Teleport, there are exciting days ahead.

https://hellofuture.orange.com/en/networks-future-will-less-energy-intensive/

1. Hello Future
2. Networks and IT
3. The networks of the future will be less energy-intensive

Networks and IT | Article

The networks of the future will be less energy-intensive

Tuesday 3rd of July 2018 - Updated on Thursday 16th of June 2022

- AI
- Big data
- Connectivity
- CSR
- IoT

Mobile and fixed networks alone represent more than two-thirds of Orange's energy consumption. How is Orange working to improve the efficiency of its existing infrastructures and get a head start on the networks of the future?

Orange, a player involved in its research work for better efficiency of the networks.

At COP21 in 2015, Orange made a commitment: to reduce its carbon emissions by 50% for each customer-usage between 2006-2020. In 2017, this objective has already been exceeded with a 50.03% drop. Orange’s networks are actively involved: since 2006, their emissions for customer-usage fell by 35%. This is thanks in particular to the Orange programmes launched at various levels, such as ‘Green

ITN 2020' and projects launched in collaboration with all those involved in the industry.

Vital cooperation

By joining forces to develop common requirements, telecoms operators have been able to move the goalposts among equipment manufacturers. In charge of ITN Energy Consumption forecasts for Orange, Carole Paganus explains: *"suppliers and operators carry out major research partnerships together to improve the energy performance of existing networks and build future networks that are less energy-intensive."*

Across the mobile network

The antennas represent most of Orange's mobile network consumption. The main focus is the base station used to transmit signals. It consumes little in isolation, but the collective number drives up the energy bill: there are several thousand for each Orange country. *"The main challenge is that a base station, even when there is no traffic, consumes power rather like an empty fridge that has been left on. However, it must remain available 24/7 if a user needs the network. By working with manufacturers, we have been able to develop many functionalities that are often technologically complex such as different types of 'sleep mode', allowing the equipment to consume less when there is little or no traffic,"* explains Carole Paganus.

Across the fixed network

Thanks to the work implemented upstream for the regulations, fibre networks are proving very energy-efficient with consumption of 0.5 watt/customer – this can rise up to 4 watts for the oldest ADSL technologies. Carole Paganus explains:

"The ATM (Asynchronous Transfer Mode) is traditionally used to collect and transport flows: the Group's 6 countries that have this technology will gradually replace it with a more energy-efficient alternative (Ethernet). In data centres and flow points (PoP – Point of Presence), innovation in terms of cooling will also reduce energy consumption beyond what is possible with today's technologies."

Renewable energies play their part

In the Middle East and Africa, the frequent power cuts affect the quality of service, not to mention the isolated stations powered by high-energy consuming generator sets and diesel generators. As we can count on a steady stream of sunlight throughout the region, deploying radio base stations powered by solar energy allows an autonomous and sustainable network to develop, providing greater availability for customers.

Standards, IA, Big Data: an all-encompassing future

To improve the energy efficiency of networks, Orange is exploring many avenues, such as Big Data or artificial intelligence. Orange is also very active in discussions and research work dealing with the standardisation of future technologies (5G, networks, IoT), because it alone makes it possible to impose strict requirements on the various players involved and guarantee the energy efficiency of all telecoms networks around the globe in the future.

Through its actions, Orange has brought together the entire ecosystem and stimulates research and sharing of Green innovation with other operators and major players on the internet.

https://hellofuture.orange.com/en/big-data-data-improve-energy-efficiency-networks/

1. Hello Future
2. Data
3. Big Data: when data improve the energy efficiency of networks

Data | Article

Big Data: when data improve the energy efficiency of networks

Wednesday 4th of July 2018 - Updated on Thursday 16th of June 2022

- Big data
- CSR
- Data

Optimisation of technical sites, real-time alerts, sharing best practices: with increasingly accurate measurements of its energy consumption, Orange is building more efficient and less energy-intensive networks.

By correlating all the data obtained, we can achieve an optimum energy configuration for each situation and each type of site.

Between 2012 and 2017, when upgrading its mobile networks, Orange launched a plan for deploying probes that measure energy across a sample of its technical sites. The main aim of this upgrading was to improve the quality of service for customers in every country in which Orange has a presence. However, the new equipment is also more energy-efficient and has enabled Orange to control the energy consumption of its mobile networks. “*The suppliers had announced energy-*

saving figures that we were able to check and refine from field data, country by country, thanks to our metering project," indicated Carole Paganus, in charge of ITN Energy Consumption forecasts for Orange. Today, several thousand sites are equipped with these sensors, a means of better understanding how technical sites actually operate.

Identifying the source of consumption

To optimise energy consumption, you first need to measure it! ("If you cannot measure it, you cannot improve it," according to Lord Kelvin). Measuring it makes it possible to find out, for example, when the peaks of consumption take place, to understand the impact of traffic (in field configuration), temperatures, public holidays, etc.
"*Measuring energy consumption* ***in the information systems and networks*** *allows us to follow the energy consumption of our networks in real time and anticipate its changes by data analysis and modelling,"* explains Carole Paganus.

Linking information

By increasing awareness of the consumption profiles of its sites and by correlating the consumption data with other information, Orange is able to identify cases of abnormal energy consumption.

The data gathered in recent years will allow other improvements to be made: *"We will be able to achieve an optimum configuration for each situation and each type of site. We have also launched strong lobbying efforts among our suppliers to benefit directly from meters embedded in the equipment, so that each of them transmits their consumption natively."* A better understanding of sites also means optimising the energy bill, to adjust contracts – subscriptions, power, etc. – to be as close as possible to actual consumption.

Detecting malfunctions

Big Data has another clear advantage: it provides real-time data. This regular monitoring means we can detect malfunctions across the network. In some countries, many technical sites are air-conditioned to cope with the heat and an air conditioner may continue to operate (and, therefore, consume energy) but without fulfilling its cooling role or, on the contrary, cooling more than the set point, while using more energy. Without measuring consumption and temperatures, these malfunctions cannot be detected and the optimum temperature ranges are not respected. With the measurements taken from the probes, alerts are faster and more precise: this has led to a marked improvement in energy efficiency.

Communicating good practice

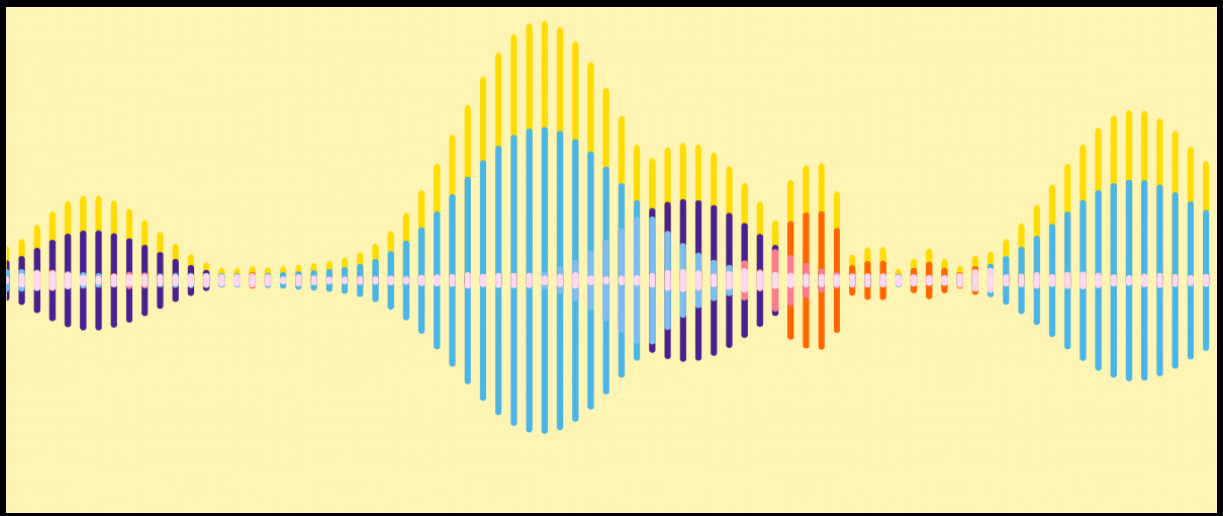
The data alone are not the only factor for optimising energy consumption. Orange has also launched a “Big Data Energy” community to encourage those in the countries in which Orange has a presence to share their experiences. *“More than 20 use cases have been identified, some of which have already been deployed – and that’s just the start. The many research tasks carried out by Orange in the field of Big Data and Artificial Intelligence will also enhance this ecosystem, making Big Data Energy decision support tool, but also a meaningful community for discussions driven by a common ambition for energy efficiency.”*

https://hellofuture.orange.com/en/20-years-attention-management-mechanisms-digital-interfaces/

1. Hello Future
2. Internet of things
3. 20 years of attention management mechanisms in digital interfaces

Internet of things | Article

20 years of attention management mechanisms in digital interfaces



Monday 9th of July 2018 - Updated on Wednesday 22nd of June 2022

- Deep learning
- Human sciences
- Networks

- Society

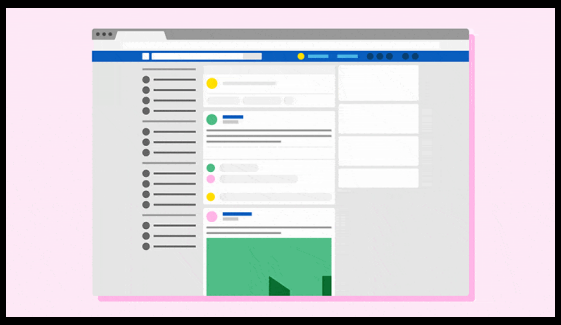
Chat rooms, mobile notifications, streaming... For each technical improvement of the Internet there are new techniques for keeping the user online. 5 examples under the microscope.

October 1997. Caramail and chat rooms

Late 1990s: Internet use is limited by bandwidth. Social networks don't yet exist outside of professional mailing lists. The entry point to the Internet is often through the inbox. Connection, which is still through a modem, makes it necessary to wait in between messages sent between users. This is how France discovers chat rooms.

To boost its audience and to compete with American email provider Hotmail, the founders of Lokace open Caramail, an email service integrating chat functionality. At the heart of the success of chat rooms, we get to meet up and chat with strangers from all over the world, time is forgotten, we're looking for socialisation, to discover an open world and for live chats. Users spend hours there, even creating huge queues to have access to computers in university IT rooms or in cyber cafés (as recalled by Olivier Le Deuff). An addictive social mechanism that in time to come will propel the social networks of the 2000s.

2004-2007. Facebook, Twitter… the social and infinite vertical scroll revolution

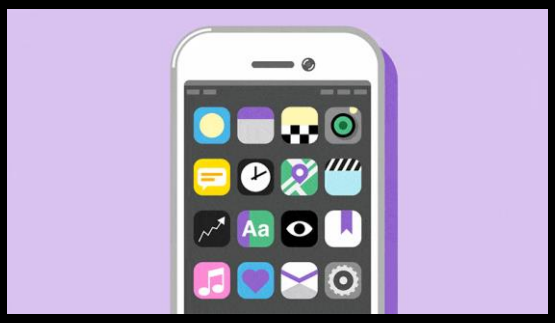


The virtually simultaneous launches of the first social networks, such as Facebook (2004) or Twitter (2006), and of the first iPhone (2007) constituted a significant milestone in capturing the attention of Internet users. The technique of infinite vertical scrolling of the screen, in particular on social network news feeds and mobile internet, has largely contributed to the success of these new internet players, cresting the wave of the craving for another dose of dopamine … through exchanged "likes".

Each new publication is displayed live, bringing about feverishness in the user when they are not connected, for fear of "missing something". The entire system is part of this logic of continuous presence; as shown, for example, on the Twitter application screen that opens up to a summary of missed tweets "while you were away".

A recent study by NN/g (Nielsen Norman Group), "Scrolling and Attention", reveals the tendency to scroll smartphone screens more and more. Today, 74% of mobile Internet users look at the first two pages whereas in 2010, 80% of them looked only at the first page.

2015-2016. Push notifications, Instant Articles, and AMP.



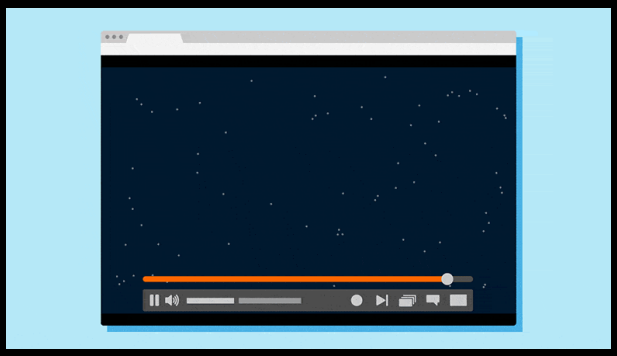
Dreamt up in the early 2000s by the Research In Motion (RIM) engineers who invented the Blackberry, push notifications, those messages sent to a smartphone user via a mobile application, already took attention management to the next level.

With the "Instant Article", a format launched for iPhones in 2015 by Facebook, the trend gained momentum. This functionality enables a much faster loading of content without having to leave the Facebook app, and provides a usability that is supposed to increase readability, thus mechanically increasing content consultation and average reading time of increasingly mobile internet users.

However, to date, Google's Accelerated Mobile Pages (AMP) have undoubtedly taken this logic the furthest. In response to users' ever increasing expectations of faster display, the AMP standard is a new web page source code writing format based on HTML, but whose minimalistic version enables very fast downloading: on average the pages are ten times lighter and they download four times faster. A means of minimising friction caused by changes of environment and by load times.

This will to deliver content at ever-increasing speed enables users to browse content more comfortably, browsing therefore for longer.

2013. Streaming and algorithms: the Netflix revolution



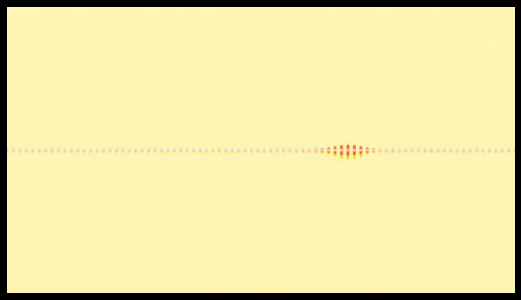
On 1st February 2013, Netflix pulled off a major coup with the launch if its "House of Cards" series. Since then, the American SVOD (Subscription Video On Demand) giant has coupled an ambitious content strategy with the power of algorithms. With app personalisation and customised recommendations, Netflix streamlines the (already existing but informal) practice of "binge watching" of content one after the other without interruption. Thus at the end of a "House of Cards" episode for

example, the next episode is automatically suggested, unless the user requests for it to stop.

Its success is due to progress made in the area of artificial intelligence and to its recommendation algorithm, which are explained in detail on their technical blog, enabling the identification of spectators' expectations and offering them content they wish to see even before they have explicitly requested it. As this data (clicks, viewings, re-viewings, interruptions, pages viewed, etc.) is collected, the platform is capable of generating a personalised homepage for each user.

This personalisation technique goes as far as the production of visuals displayed on the homepage according to subscribers' preferences. Thus for the film "Good Will Hunting", two illustrations are suggested: one to convince romance fans and the other for comedy enthusiasts.

Today and… Tomorrow. Ambient Internet and voice interfaces



Siri in 2011, Amazon Echo in 2015, proliferation of chatbots in 2016… voice interfaces are going in hand in hand with a revolution in the area of the Internet of things and with the huge technical progress of new generation networks (4G, 5G). The emergence of ambient Internet is enabling the development of an uninterrupted and intuitive relationship using voice and natural language. Will these interfaces even be able to supersede mechanical interfaces (keyboards, mice, tactile screens…)? Already 20% of queries performed on Google are done so through a voice interface.

Ever more connected with our smartphones and with access to infinite content, in particular via the many social networks that we view (Twitter, Facebook, Instagram, Snapchat…), our attention is more and more fragmented. This has led to the wish to create short content and single-task apps, as well as command systems, using voice, enabling us to read content even when we don't have direct access to our smartphones, when we're tinkering, or in the shower for example.

In this tendency to assist us in our daily lives, these new interfaces don't only act as search engines in the way that Google does by providing a list of results that we can consult and select, they become solution engines by only showing a reduced corpus of answers to our oral request.

It remains to be seen how users can continue evolving in an ever more rich and connected environment, all the while remaining in control of their attention.

TO FIND OUT MORE about the management of our behaviour and in particular of our cognitive biases in the interfaces of yesterday and today, listen to our podcast with guest speakers James Auger and Albert Moukheiber.

https://hellofuture.orange.com/en/search-simpler-accessibility/

1. Hello Future
2. Research
3. In search of simpler accessibility

Research | Article

In search of simpler accessibility

Monday 16th of July 2018

- Connectivity
- Digital equality
- Human sciences
- Prospective
- Society

For the last ten or so years, Orange's research teams have been working on the design of touch-based gestural browsing for all. With the Tactile Facile [easy touch] app, they have developed an innovative solution to simplify access to a smartphone's basic functions.

The Tactile Facile app brings together many years of research into human-machine interaction for enhanced accessibility on the phone interface.

The issue of disability and accessibility in digital services is seldom addressed in full. Whether visual, auditory, motor-based, or linked to understanding, the needs of users are very diverse. Usually, technical aids added to standard interfaces can meet these needs, though making users adopt shortcuts and complex additional manipulations: this is, for instance, the case with eye control and sign language avatars.

Additionally, today's standard touch-based interactions are quite simple: a tap, a swipe, or a long press. However, they often cause manipulation errors: barely touching the screen can result in it "coming to life". They do not offer solutions to people who have difficulty using their fingers to point. Nor do they provide a simple way to hear the functions and content being displayed, though this would be very useful for people with reading difficulties.

Finding the best compromise between constraints and needs

Orange and its research, design, development, marketing and human resources teams have been working for around ten years now to satisfy these diverse needs in terms of the telephone interface and to provide a simple accessibility solution. The joint work carried out by Eric Petit, a research engineer in human-machine gestural interaction, and Denis Chêne, an ergonomics researcher in human-machine interaction, both working with Orange, has been key. After researching their respective specialities, they pooled their work so as to design a technology that takes into account both the technical constraints expressed on the one hand, and the constraints inherent in the user's needs expressed on the other.

Eric Petit has been working on gestural interaction since the 2000s. He gradually moved towards accessibility issues as applied to touch-based interfaces.

For his part, Denis Chêne, an ergonomics specialist, is interested in ways to adapt technology to humans. In order to tackle the accessibility of user interfaces, he focused on the subject of multimodality. Through discovering the extent and variety of needs in this area, he found that these were hardly ever taken into account in the technical solutions put forward up to that point.

By drawing together their long-term research goals, Eric Petit and Denis Chêne have made the *Tactile Facile* application possible. Eric Petit and his team first developed DGIL (Dynamic Gesture Interaction Layer technology), a powerful touch-based gesture recognition engine able to recognise symbolic gestures consisting of one or more strokes. For instance, with DGIL it is possible to draw a heart on a screen in order to access a function more quickly, rather than having to click on a graphic. A DGIL extension was then created which resulted in a system able to manage a multitude of gestures and analyse them in real time.

Lastly, in order to control event programming and the coupling between events and commands, another technical element was developed: AEvent. "*This component adds a lot of flexibility to the software architecture*," Eric Petit emphasises. *Such flexibility is needed to create multi-profile interfaces."*

At the same time, Denis Chêne analysed tests undertaken by Orange employees with disabilities for several years. With his team, he was able to distinguish three major types of diversity from the standpoint of the telephone interface:

● diversity of perception (visual, auditory, touch-based, a mix of all three, etc.),
● diversity of understanding (novices/experts among people without disabilities or among people with specific mental constraints),
● and lastly, diversity of manipulation (ability to use fingers to point or not, use of elbows to touch an interface for some kinds of motor disability, etc.).

"*Identifying this raises the issue of multimodality and the myriad of possible combinations that it generates"*, explains Denis Chêne.

The challenge then turned to finding a way to consider all these points of view simultaneously. At this point, Eric Petit and Denis Chêne pooled their work to come up with a universal design approach, known as Menu Design for All (Menu DfA), aligning this diversity of perception, understanding and manipulation. This innovation brings together information presentation components that can be manipulated in different logic frameworks. The entire design principle of Menu DfA is to be at least able to handle the most limiting situations. Eric Petit and Denis Chêne have determined that, in terms of human-machine interaction, the list is the easiest way to reconstruct any complex object. The toolbar of a simplified word processor in the form of a list of possible choices, for instance, makes it very easy to use. The most complex problems relating to the interaction profile can thus be solved thanks to the list, and more generally to the Menu DfA.

An app better suited to each user's profile

Eric Petit and Denis Chêne's project to devise a touch-based telephone interface that is accessible to all delighted and won over the Accessibility Division at Orange, which was responsible for building the offer and managing the multi-channel distribution. This product is part of an ethnographic and design for all approach.

All these years of work have thus resulted in the *Tactile Facile* solution: a free application available on Orange mobile devices version 6 Android in France, Spain and soon Romania. Three European countries will follow in early 2019.

It allows customers to easily access the basic functions of a phone: making calls, sending texts, and accessing apps. The actions are simple and adapted to different user profiles.

Thanks to the Menu DfA technology, five interaction profiles were created (this list is not definitive) with a defined preset for given types of needs: Easy+ for beginners, Vision+ and Vision++ for the visually impaired, Motor+ for people with manipulation difficulties, and Micro-gesture for people with motor difficulties but who can point accurately.

The innovative nature of this new app lies in its multi-profile approach, which provides several ways of interacting with the interface, as well as a number of

interaction principles such as “micro-gesture” for people with motor disabilities who can only make small browsing gestures. Thanks to micro-gesture, the focus can be effortlessly moved with the help of micro-movements of your finger, with no need to point or lift: this is known as “de-colocalised pointing.”In this case, the sensitivity of interaction can also be adjusted by the user.

Security is also one of the app’s innovations: hence a user can confirm with a long click rather than a single tap which is sometimes performed unintentionally.

Within the *Tactile Facile* application itself, the “verbosity” parameter appears: vocalisation is triggered either manually by tapping, or automatically by moving the focus to a new item. Vocalised content is transcribed as required: for instance, if the user wants to make a call, the voice transcription will be at least “Call” or, for a higher level of verbosity, “Call your friends or reach your contacts”.

Each action performed on the interface is accompanied by feedback for the user: vibration under the fingers, vocalisation by the interface following the action, or even while it is being performed for confirmation.

The “motor” profiles are still under development, while the “literacy” profiles are at the test phase and the profiles for hearing and cognitive impairments are at the research phase.

Gema Solana Díaz , Disability Product Marketing Director at Orange emphasises that:“*Today, Tactile Facile offers numerous solutions, and research work is not yet at an end. The app is scalable and we hope to launch various profiles adapted to each user in the future.”*

https://hellofuture.orange.com/en/internet-things-orange-opportunity-start-ups/

1. Hello Future
2. Internet of things
3. The Internet of Things and Orange: an opportunity for start-ups

Internet of things | Article

The Internet of Things and Orange: an opportunity for start-ups

Tuesday 4th of September 2018

- Cloud
- Connectivity
- Industry
- Networks
- Start-up

In order to meet the specific needs of customers and build business solutions that target these needs, start-ups can rely on the technical and human resources that Orange has to offer: connected objects, networks, management platforms, data analysis, etc. Being an Orange start-up partner means benefiting from strong support as you develop.

“Any business solution find in Live Objects a modular,standard and open foundation which perfectly supplements its IoT ecosystem.”

Above all, IoT projects meet business needs. The best solution for a customer is first and foremost a matter for specialists in the field, who can rely on Orange’s technological expertise.

In order to offer a comprehensive solution, Orange is therefore working with the ecosystem as a whole, becoming involved with a large number of start-ups specialising in various business needs.

The Datavenue offer allows each partner to select the services that it needs and provides them with the opportunity to focus on its know-how and expertise. Orange achieves this by providing proven, adaptable technological building blocks, as well as comprehensive support. Start-ups – publishers and integrators – can therefore develop their solutions through collaboration with technical experts, in particular on networks.

Focussing on the complementary nature of networks

In the field of IoT, there are various networks adapted to each need: the long-distance and low-consumption network LoRa, 4G that is able to transport large quantities of data and the new LTE-M network that has already been tested in the Open IoT Lab at Orange Gardens, near Paris. Orange therefore offers its partners a real opportunity to get ahead in the market. For example, in the case of the start-up Hostabee, which Orange has been supporting for almost three years, LoRa technology was the preferred choice. *"This network is practical for many use cases in agriculture,"* explains Marie-Sophie Johner, Head of the Datavenue Programme at Orange. *"Hostabee offers a solution that addresses the challenges faced by beekeepers. Its sensors allow beekeepers to remotely observe the bees' activity and to ensure that everything is going well. Bees are highly sensitive to temperature and humidity, which these sensors can monitor in order to regulate them or even to prevent hives from being stolen. For beekeepers, the economic benefit is significant."* During a hackathon on the topic of smart agriculture organised by Orange at the start of 2017, Hostabee and Groupama strengthened their link. Groupama, the leading agricultural insurer in France, has really and fully taken the way of digital, in the construction of its offers and services; Groupama has also taken steps with several start-up, including Hostabee, with whom it is working today. Installed in over a thousand hives by Hostabee, these sensors are among the 15 million objects currently connected via Orange networks.

An open, sustainable, and secure platform

The IoT involves 330 million pieces of data being managed per minute by Orange platforms. With Live Objects, data are collected, stored in France, freely used and exposed in dashboards. All processing is fully compliant with the regulatory framework (GDPR). Live Objects can be used in self-service, irrespective of the networks and technologies used, and is based on three fundamental functions: *Device Management, Data Management and Event Processing*. Thierry Gaillet, Developer Advocate at Orange, explains: *"Live Objects is the ideal foundation for any business solution: a modular and open platform via standard interfaces (API, SDK) for connected objects, mobile or web applications, but also connectors to the*

clouds of other data providers. Exchanges take place securely via customised protocols, such as https and MQTT."

Live Objects is used by the start-up Hostabee, but also by e-novACT in a completely different universe – industry 4.0. Spotted by Air Liquide during a developer challenge organised by Orange at the end of 2016, back when it was not even a company, e-novACT has since progressed: from proposing a connected headset that detects harmful gases, e-novACT has diversified and now offers smart monitoring solutions, for example, for works vehicles. By relying on Live Objects and Orange networks, e-novACT can focus on its own expertise: physical measurements, miniaturisation of sensors, signal processing and machine learning.

The right tool for the right job

In order to supplement its IoT offer, Orange has created its own marketplace: Datavenue Market. In cooperation with many manufacturers, Orange offers over 90 selected objects. Stakeholders in the ecosystem visit the Datavenue Market to select objects that are relevant for their needs and in turn, supported by Orange, they can become partner manufacturers. This is the case for K Technology & Services. This company specialises in claims management, such as water damage, and developed a solution that measures the level of moisture in walls during drying and regularly transmits information to avoid experts travelling unnecessarily. A functional prototype demonstrated the relevance of this approach and the company reached a critical phase: how do you scale up a good idea? Orange is currently helping K Technology & Services to industrialise the production of its connected object and to meet the right stakeholders. Later, it will most likely enter the Datavenue Market.

Co-innovation that benefits the whole IoT ecosystem

Technical, digital and human support from Orange is also a long-term commitment: *"Regardless of the network developments, protocols or technologies used,"* adds Thierry Gaillet*, "it is the guarantee that its data is always managed in a consistent manner by capitalising on what has already been developed, thanks to API standards in particular. On a non-mature market that is destined to evolve greatly, it is reassuring."* By supporting object designers as well as integrators and publishers of solutions, Orange is a key player and contributor to the IoT ecosystem. Every day, Orange learns from its partners, in contact with developments on the ground, in order to follow and integrate the directions taken by the market and its developments. Orange thus refines and enriches its offers to remain closely focussed on its customers' needs and uses. More than just virtuous support, it is a real approach to co-innovation, which benefits the whole IoT ecosystem.

Datavenue

** Application Programming Interface*
*** Software Development Kit*
**** MQTT: publish/subscribe messaging protocol, particularly adapted to IoT*

https://hellofuture.orange.com/en/oranges-energy-boost-africa/

1. Hello Future
2. Digital culture
3. Orange’s energy boost for Africa

Digital culture | Article

Orange’s energy boost for Africa

Wednesday 19th of September 2018 - Updated on Thursday 16th of June 2022

- Bank
- CSR
- Digital

Orange has confirmed its commitment to becoming a key player in Africa’s energy transition. The Orange Energy service is linked to Orange Money* and provides residents with access to clean, affordable, and reliable energy.

Orange offers a clean, affordable, and secure energy service to people in Sub-Saharan Africa.

Africa has a population of 1.2 billion people, yet 50% of these have no access to electricity. In rural areas far from the national electricity networks, this figure can be as high as 82% of the population, or more than 600 million people. It is therefore vital that electricity is installed in these regions.

Even so, local residents suffering from this issue spend $17 billion a year on candles, lamps, and on recharging their mobile phones. The energy needs of the population are therefore very real.

Facing this situation head on, Orange launched its Orange Energy service in December 2017 in the Democratic Republic of Congo and extended it to Madagascar in February 2018, then to Burkina Faso, as well as to Senegal, Mali, and Côte d’Ivoire in June, and will soon be bringing it to Conakry in Guinea. The objective is to provide access to solar energy in rural areas or in cities where the quality of service provided by electricity suppliers is insufficient.

“*We offer our customers a kit which includes a solar panel, a central unit containing a battery and a SIM card, lamps with LED bulbs, a multi-socket cable charger, a radio, a portable torch, and an optional 15 or 24-inch television set*,” explains Alain Talès, head of the MEA Energy division at Orange. These kits can be used to light the whole house, charge mobile phones at home, or operate a radio or even a

television. The kit is easy and quick to set up – all you need to do is install a solar panel on the roof and a unit in the house.

Orange has carried out market research that allows it to target and prioritise populations and to determine marketing and distribution areas. "*These various stages have been carried out directly by the countries where Orange Energy is marketed*," says Alain Talès.
When it comes to the different products, Orange has selected various partners based on their quality and ability to offer integrated solutions and meet the scale of the demand. "*The selected platforms make it possible to digitize all processes from finding prospective customers, conducting logistical follow-ups and installing kits, to handling payments via Orange Money, as well as customer complaints*," explains Alain Talès.

People who have previously had no access to electricity can now benefit from the guarantee of this service proposed by Orange, which offers comprehensive installation, maintenance and repairs facilities in collaboration with its partners.
This "plug and play" service is simple to use. The kit is delivered directly to the customer's home and the subscription is set up using a simple mobile phone.
The customer subscribes to the Orange Energy service and chooses their desired subscription type, which can be weekly, monthly, or quarterly. Payment via Orange Money makes it possible to automatically grant or restore the service remotely for the desired time period (one week, one month, etc.). Charging indicators are located on the unit so users always know if the battery is charged.
After three years, ownership of the kit accessories is handed over to customers.
As Alain Talès explains, this is "*A way to pay less for energy consumption subsequently.*"

With Orange Energy, Orange is pursuing its goal of becoming a key multi-service operator for people in Africa.

*Orange Money facilitates international money transfers and provides mobile financial services

https://hellofuture.orange.com/en/supercloud-new-approach-security-multi-cloud-environment/

1. Hello Future
2. Networks and IT
3. SUPERCLOUD: a new approach to security in a multi-cloud environment

Networks and IT | Article

SUPERCLOUD: a new approach to security in a multi-cloud environment

Tuesday 2nd of October 2018 - Updated on Thursday 16th of June 2022

- Cloud
- Cybersecurity
- Data
- Open innovation
- Open source

Security and dependability of data and services in a multi-cloud environment: this is now possible thanks to the SUPERCLOUD project. An unprecedented innovation developed by a prominent European technological consortium, led on the technical side by Orange.

SUPERCLOUD is an innovation enabling to benefit from “on-demand” security services for multi-cloud environments.

Why SUPERCLOUD?

After adopting the Cloud to increase productivity, agility, and reduce operational costs, companies are now relying on multiple cloud service providers, 5 on average according to Gartner (2018), we call this multi-cloud strategy. This evolution is due to the desires both to no longer be dependent upon one single provider, but also to benefit from the most agile and most innovative solutions on the market, with higher levels of availability. Multi-cloud however means new security issues. For, in a context where, according to the Going Hybrid study (carried out for NTT Communications in March 2018), 84% of European businesses have adopted a multi-cloud approach, guaranteeing interoperability and flexibility in exploiting data, services and communication, therefore their security and dependability, has become a major issue. This is the challenge that the SUPERCLOUD project has managed to take up thanks to the European Union’s largest research and innovation programme, “Horizon 2020”, aimed at stimulating Europe’s economic competitivity.

“Horizon 2020”: a synergy of skills at the service of innovation

The aim of the actions of “Horizon 2020” is to foster collaboration between public and private sectors so as to develop research and innovation. With its partners from the consortium selected and financed by this programme, Orange is at the origin of a three-year project aiming to create a new and unprecedented secure Cloud infrastructure: the open source SUPERCLOUD framework, presented to the European Commission during its final review on 15th March this year in Brussels.

It is dedicated to the development of “on-demand” security services for multi-cloud environments. The SUPERCLOUD consortium unites nine organisations: industrial partners, research institutes, SMEs, and universities *, coming from six European countries and widely recognised in their respective scientific and technological fields. Each partner contributes its leading expertise, for example data protection for IBM, system security for Darmstadt University, security policies and network security for the Institut Mines Télécom, network virtualisation for the University of Lisbon, or the medical field for pilot projects carried out for Philips Healthcare and Electronics and for Maxdata Software. Furthermore, Technikon managed the administrative coordination of the project. Marc Lacoste, researcher in security at Orange specifies: “*Orange’s teams, in synergy with the partners, defined a scientific vision of the project, and piloted it from a technical viewpoint*”. Plus, Orange provided its expertise to design and develop the SUPERCLOUD technology through production of several components of the framework, for example those linked to virtualisation for multi-cloud, advanced cryptography for flexible data protection, or supervision of virtualised network security.

A user-centric Cloud or “U-Cloud”

In a multi-cloud environment, the general lack of interoperability and flexibility poses security and dependability problems. Furthermore, as each provider imposes its own security services – the “lock-in” phenomenon – it is difficult to configure them to closely adapt to user needs.The SUPERCLOUD framework thus proposes a new approach to the management of security and of the availability of multi-cloud environments. This user-centric architecture enables the user to choose, autonomously and on-demand, their protection requirements and the security services necessary to guarantee these. In this way, the user defines “U-Clouds”, or isolated sets of services and data operating in multi-clouds. Their security is ensured thanks to the SUPERCLOUD framework, or security layer, deployed over existing public or private Clouds, separating user Clouds from those of providers.

“*The SUPERCLOUD vision is built around four requirements: security must be in self-service mode, i.e. completely at the hand of the user; it must also be guaranteed end-to-end, i.e. transversely to all of the systems; equally, it must be automated, so self-managed; and finally, it must guarantee resilience, meaning resisting failures*”.

The Commission's assessors congratulated the consortium for the progress made, and in particular for the very high scientific and technical level of its solution. Thanks to this experiment, Orange brought to the fore the excellence of its research in the field of security. Notably via the dissemination of over 40 project articles in distinguished international publications, the coordination of a "Vision Paper" published at the IEEE, and even the co-organisation of several workshops such as during the ACM EuroSys 2017 conference.

SUPERCLOUD for all, an example in the medical imaging field

Who can benefit from this new approach? All Cloud providers and companies that handle sensitive customer data and who wish nevertheless to benefit from the advantages of the Cloud. "*The SUPERCLOUD enables freedom from the barriers set by current public or privates Clouds, and the combining of the deployment security that one finds in private Clouds with the upscaling flexibility of public Clouds*".

To prove this, the consortium completed, inter alia, a pilot project of a distributed medical imaging platform. Medical imaging is used more and more to perform telemedicine or diagnostic assistance for example. Hospitals store these images in several Clouds, and often need to send this data to each other, in a completely secure manner. To do this, the consortium deployed a distributed platform implementing the SUPERCLOUD framework. Hospitals can thus manage their imaging data exchanges thanks to an infrastructure that is powerful enough to guarantee both data dependability – for it to be accessible from any place at any time, and its security – to prevent it from being taken or used by unauthorised persons.
The medical field is far from being the only area that could benefit from this new security model in multi-cloud environments: "*SUPERCLOUD uses are virtually limitless. As the framework is open, it can easily be used by all professions with specific security needs, like those of the financial sector for example, or the automobile industry, and of course all Cloud operators themselves*". Orange is a major player in network security performance research, serving the development of emerging technologies that will be included in the innovative uses of tomorrow. To achieve this, the company initiates and carries out pioneering scientific research, teaming up with the best researchers in their fields. Its major participation in the SUPERCLOUD project is a superb demonstration of this.

* Technikon Forschungs- und Planungsgesellschaft mbH, Austria,

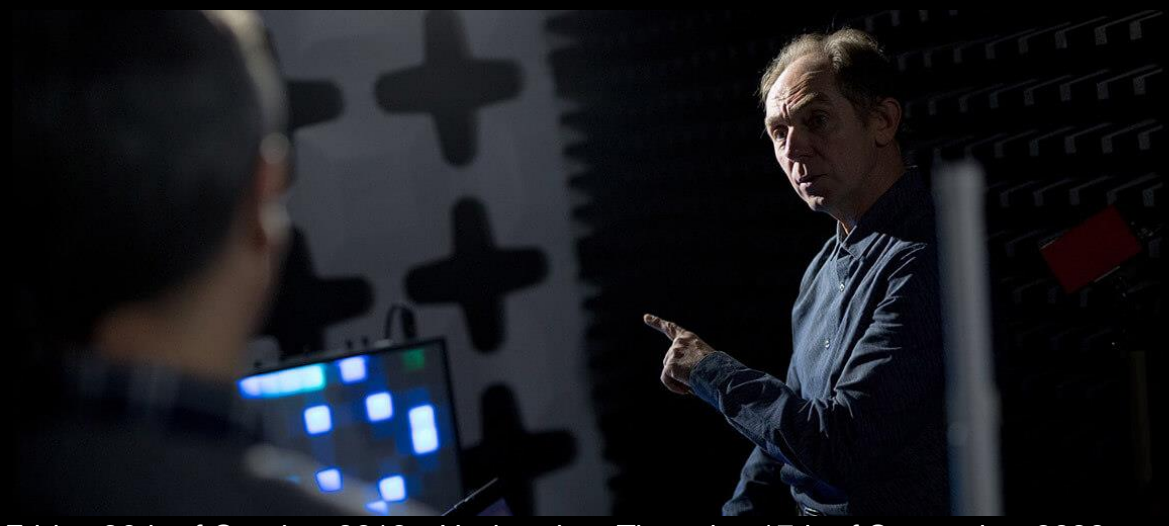
Orange SA, France,
IBM Research GmbH, Switzerland,
FCiências.ID – Associação para a Investigação e Desenvolvimento de Ciências, Portugal,

Institut Mines-Telecom, France,
Technische Universität Darmstadt, Germany,
Philips Medical Systems Nederland, Holland,
Philips Electronics Nederland, Holland,
Maxdata Software SA, Portugal

1. Hello Future
2. Networks and IT
3. First 5G NR call in France: the connection’s live!

Networks and IT | Article

First 5G NR call in France: the connection’s live!



Friday 26th of October 2018 - Updated on Thursday 17th of September 2020

- 5G
- Connectivity
- Data
- Open innovation

After successfully completing the first major step last June which was standardisation, 5G has recently made major advances in R&D. The first interoperable data call in France conforming to 5G NR specifications is a seminal milestone.

"A seminal event for 5G: the first time that a 3GPP-compliant interoperable 5G NR data call has been made in France."

In June 2018, the 3GPP (3rd Generation Partnership Project) approved and published the 5G New Radio (NR) specifications as part of Release 15, the culmination of two years of work. The announcement, which marks a milestone in standardisation, was closely monitored and lauded by the ecosystem of players involved in forging new-generation standards for mobile telephony. Over the

following months, many of them worked hard on demonstrations and experiments that are only partially compatible with 5G NR specifications.

Committed to 5G on all fronts for many years, whether through R&D, innovation or strategic partnerships with key players in the ecosystem, Orange has proven that it is a cornerstone in the ramp-up of 5G infrastructure and capability as part of its 5G partnership with Ericsson. In making the first ever interoperable data call in France using the 5G NR protocol, with its partners Ericsson and Intel, Orange stands out more than ever as the leader in tomorrow's mobile networks. Oliver Simon, Wireless Technologies Evolution Director at Orange, reflects on the importance of this event.

What does this 5G NR data-call demonstration mean for Orange?

It's the result of many years' effort and R&D, and is the launch pad for the success of 5G. In fact, it's the latest phase in an adventure that picked up steam on 7 February at the Orange 5G event when an experimental 5G network for Lille and Douai was announced. Our lab-based call uses the core of this experimental network. But what makes it exceptional and explains its value is the fact that it demonstrates that it works between two independent equipment – A test mobile supplied by Intel (called Mobile Test Platform) and a 5G network provided by Ericsson – in accordance with 3GPP specifications. Interoperability between a mobile and any manufacturer's network is the key to the success of 2G/3G/4G systems. Technically, this is a major technical challenge as both manufacturers have to implement 3GPP specifications very precisely for them to be able to communicate. This is therefore a much more difficult challenge to overcome than calls from isolated manufacturers touted as "proprietary".

How does this demonstration work in practical terms?

In brief, as stated earlier, it involves setting up, in the lab, an interoperable data call on the 3400-3800 MHz band between a mobile terminal and a base station.
It consists of an Ericsson 5G active antenna and a virtualised core network.
Data communication, which consists of sending packets to a server (connected to the Lille-Douai experimental network), is then set up to using standardised protocols.

Where does this demonstration figure in Orange's 5G technical roadmap?

Now that we have established this connection and demonstrated interoperability in a laboratory environment, we have together with Ericsson to tackle the same challenge in the field, in the Lille and Douai experimental environment. And at the same time we have to roll out the technical sites and logistics functions we need to grow coverage and to achieve expected 5G performance levels. Orange is now, more than ever before, in pole position in the 5G revolution and is the leading developer of tomorrow's networks in France.

https://hellofuture.orange.com/en/machine-learning-provides-virtual-agents-human-face/

1. Hello Future
2. Networks and IT
3. When self-driving cars hit the road… or the test track

Networks and IT | Article

When self-driving cars hit the road… or the test track

Tuesday 30th of October 2018 - Updated on Wednesday 22nd of June 2022

- 5G
- Connectivity
- Digital
- IoT
- Smart city

According to the standards defined by the Organisation internationale des constructeurs automobiles (Society of Automotive Engineers), six degrees of autonomy separate the traditional cars that our parents knew from fully self-driving vehicles that need no input from a human being. There is still a long way to go before they can take off, but the ecosystem is getting ready for their development. This is demonstrated by the work being done by UTAC CERAM, the global reference for vehicle testing and certification (in particular, self-driving vehicles).

"Cars that used to be an assembly of mechanical parts have now become a software programme. Our business has to develop as this digitisation advance, to harness new skills such as simulation, cybersecurity, etc."

Featured in science-fiction stories and films (usually flying!), self-driving cars are now becoming a reality. Autonomous “bricks” are now an on-board feature in new-generation cars, in the form of driver aids such as speed regulators, lane departure warning, and autonomous parking.

First and foremost is safety.

Despite these initial features, which are now mainstream, drivers have to remain watchful and be able to take control of the vehicle at any time. These features are classified as level 2 in the European standard for vehicle autonomy. This scale has 6 levels – from the most basic where the user keeps complete control of all vehicle functions, to the most advanced where the vehicle doesn’t need a driver at all. All self-driving specifications ultimately converge on one key factor: safety. This is the central focus of the UTAC CERAM Group’s activity and responsibility. Its business was historically the certification of road vehicles.

Self-driving cars are a major factor in UTAC CERAM’s medium-term roadmap. It will be opening a new test centre at Linas-Montlhéry (named TEQMO) by the end of the year, dedicated to the development and certification of self-driving, smart vehicles. As Laurent Benoit, Chairman of UTAC CERAM explains: “*We’re starting to test driver aids that have increasingly powerful functionalities. Ensuring vehicle safety is a key challenge, and the TEQMO centre aims to deliver safety by testing severe driving conditions in all environments and circumstances where a vehicle may be in trouble.*”

Vehicles are becoming software programmes…

The process is complicated and requires the development of new skills.
The computerisation of self-driving functionality is having a “disruptive” impact on the car industry, says Laurent Benoit: “*Cars used to be an assembly of mechanical components. Today they have become one big software programme. Our industry, skills and expertise are becoming computerised as this digitisation proceeds, requiring new skills for things like simulation, cybersecurity, etc. How we do what we do is also being challenged. The rapid rise of the over-the-air concept, for example, whereby on-board apps can be updated remotely, may require us to rethink the traditional certification process. How we roll out such stress tests is also in question, as it would take more than 100 years of real-world testing to cover all imaginable scenarios for self-driving vehicles. That is why we’re increasingly using simulations techniques in the near future.*”

Connectivity for experimentation

Features of self-driving or smart vehicles – whether for users (driver assistance, web navigation, etc.) or manufacturers (over-the-air updates) are based on connectivity. This is a new challenge for players in the automotive industry, which requires

outside expertise. It is with this in mind that UTAC CERAM and Orange have forged a partnership for this purpose. They have teamed up at the Linas-Montlhéry test centre to trial 4G/5G and Wi-Fi roaming solutions – which are absolutely essential to the success of self-driving vehicles. Orange will, in particular, be providing 4G+ broadband at the site, before rolling out its experimental 5G mobile infrastructure. On one hand, UTAC CERAM Group will develop tests for self-driving cars, while Orange will have a full-scale test track to trial and test the bricks of future 5G networks.

An expanded ecosystem

This cutting-edge test centre designed by UTAC CERAM with six scenario-tracks for self-driving cars (ranging from a 2.2 km motorway with toll booth and tunnel, to city traffic), has already attracted many investors. In fact, the self-driving vehicle ecosystem extends far beyond car makers and parts manufacturers, and embraces digital and hi-tech operators. UTEC-CERAM's goal is to bring together this entire ecosystem, reaching out even to start-ups who will develop services for self-driving vehicles. *"TEQMO's aim is to be a French centre of excellence and a hub where manufacturers, parts makers, software providers, operators and start-ups, will have complete freedom to contribute to developing self-driving vehicles. It is for this reason, and with the aim of operating the most advanced and continuously updated centre, that we are establishing wide-ranging partnerships with key players respected in their fields, such as Colas for road surfacing, Here for digital mapping, and Orange for connectivity,*" says Laurent Benoit.

Self-driving vehicles are here to stay…

https://hellofuture.orange.com/en/embedded-iot-solutions-route-du-rhum/

1. Hello Future
2. Internet of things
3. Embedded IoT solutions during the Route du Rhum!

Internet of things | Article

Embedded IoT solutions during the Route du Rhum!

Wednesday 31st of October 2018 - Updated on Thursday 17th of September 2020

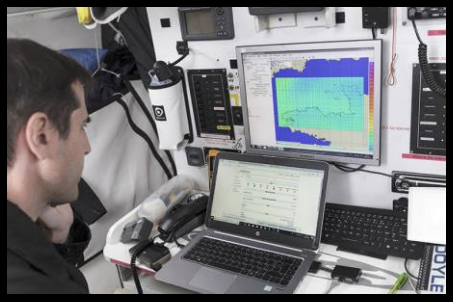
- AI
- Data
- Sport
- Start-up

Innovation and human exploits will meet during the next Route du Rhum. The famous transatlantic yacht race will be the setting of a technological experiment to test an IoT (Internet of Things) solution that allows for remote tracking of a skipper during his crossing. What's the aim? To collect navigation information and physical data from the skipper in order to share it with the fans, via a web platform and a chatbot.

We will be able to find out how many steps the skipper takes each day, how many calories he burns and answer the question that has so many people wondering: do you sleep during a solo race?

Do you dream of embarking on a solo transatlantic race? Orange partnered with students at ESIR (a Graduate School of Engineering in Rennes, France) to carry out

an experimental project putting you on board the "Spirit of Saint-Malo", which sets sail on 4 November in the 11th edition of the *Route du Rhum*, skippered by Sébastien Desquesses. How is it done? Using a system for communicating both information about navigational conditions, thanks to numerous sensors mounted on the vessel, and details on the skipper's physical condition, provided by a Bluetooth connected watch. All data, collected by a server, is transmitted via satellite link and made available via a web platform and a chatbot to all those wishing to actively follow the race.



At the heart of racing thanks to the Internet of Things

When Sébastien Desquesses, the skipper of "Spirit of Saint-Malo", told his childhood friend, Jean-François Pellet, a project manager at Orange, that he would be taking part in the *Route du Rhum*, the idea of creating an innovative way to remotely follow the sporting event was born. The latter reveals: *"Currently, when you follow a sailing race, the information to which you have access is limited to the route of the boat, provided by its beacons. I found this very disappointing and I thought that with Orange we go could further by sharing data like the vessel's course, its speed relative to land and water, the wind speed, atmospheric pressure, wave swell, the temperature of the water and air, depth… With a connected watch, we could also find out how many steps the skipper takes each day, how many calories he burns… but also answer the question that so many people ask: do you sleep during a solo race?"*

In partnership with the Graduate School of Engineering in Rennes (ESIR), Orange approached students to offer them the opportunity to work on the project. Achille Pénet and Anthony Picquet, two of these students specialising in the Internet of Things, joined the teams to create the device that was essential to the project.

To find technical solutions to all constraints

Before diving straight into developing the prototype, a feasibility study and several visits to *Spirit of Saint-Malo* took place over the course of six months. These revealed the technical constraints regarding the boat, as well as those involving the skipper. *"It needed a server that was small and light, with low energy consumption, capable of collecting the various bits of information picked up by the boat's sensors and its navigation system, but also the connected watch"*, explains Achille Pénet. The students used a Raspberry Linux server, connected via a serial port to the navigation system. They then created a program capable of handling the continuous stream of information received and carrying out local calculations in order to address a second problem: the very costly satellite connection ($9 per megabit). *"To optimise the transmitted data,"* Jean-François Pellet continues, "*we connected our server to the boat's satellite housing and, to free ourselves from the constraints of*

power outages or slow connection speeds (128 kbit/s), we used Orange Business Services' cloud solution, Flexible Engine." It is a service which stores and synchronises the data in Orange's Cloud. In the event of a power cut, it allows us to resume message transmissions from the point at which they were interrupted, thanks to a cache system. Another objective is the communication of data about the skipper through a Bluetooth connected watch. It should be both waterproof and have a substantial battery life, which is why the team chose the Garmin Vívosport watch. This also has the advantage of calculating the amount of time spent asleep based on heart rate. *"The boat is continually pitching, so without this watch, it would have been impossible to check the actual amount of time that the skipper spends asleep by using movement-based calculations*", explains Jean-François Pellet.

To communicate the data collected via a chatbot

Once the data has been transmitted to the Cloud and then to the satellite, it should be accessible to the public via a chatbot. To build this platform, the team worked with the start-up Vocal Apps, which has developed the Smartly.ai solution, allowing for the translation and channelling of data stored in the Flexible Engine cloud to the chatbot. The start-up Airmont, the skipper's partner, not only helped to secure the satellite link and the implementation of protocol filtering, but also to optimise flows for each application by using data classification.

"At Orange, Open Innovation is based on close collaboration with start-ups. This collaboration allows us to expand our network, learn to work more flexibly, and identify ideas for future innovation work. At the same time, these start-ups can benefit not only from our technical expertise, our human and material resources, but also from our funding to help them stabilise", explains Jean-François Pellet.

To test again and again until the race starts

A few weeks before the start of the *Route du Rhum*, Orange has completed its tests successfully. The team is delighted with the work that has been done. According to Jean-François Pellet: *"Providing so much information about a sporting event remotely and in extreme conditions is a first. Beyond helping the public feel immersed, our system also allows Sébastien to monitor and analyse his performance: he will be able to know which activity burns the most calories, his optimal sleep time, and so on. Whatever his position at the end of this race, he may have a head start on his competitors when preparing for future competitions!*"

Follow the Route du Rhum aboard the Spirit of Saint-Malo

https://hellofuture.orange.com/en/extended-reality-coming-soon/

1. Hello Future
2. Artificial intelligence
3. Extended reality: it’s coming soon!

Artificial intelligence | Article

Extended reality: it’s coming soon!

Monday 19th of November 2018 - Updated on Wednesday 22nd of June 2022

- AR
- High tech
- Society
- VR

Promised for several years already, virtual reality (VR) and augmented reality (AR) are taking their time to become available and enchant our everyday lives. But for every obstacle encountered on their path, the innovators find solutions to make these technologies more useful and more attractive. A brief stage report.

“I believe we’re in the virtual world now more than the real world already. It’s just that our interface sucks.”

It was in August 2015. *Time* magazine headlined its monthly issue “*Why virtual reality is about to change the world*”, with a photo of Palmer Luckey, aged 22, young inventor of the Oculus Rift headsets, to whom Facebook built a golden bridge. Three years down the line, and the manufacturers are keeping a low profile. When questioned about these extravagant announcements, Mark Zuckerberg recently admitted: “*I don’t think we can pull VR’s trajectory in from ten years to five. I just think it’s going to be a ten-year thing.*”

This comes as no real surprise: before being massively adopted, all technologies seem to follow the same "Hype Cycle" theorized by Gartner – a peak of enormous attention for the first big announcements, which drops rapidly, creating a disillusion effect. This is where VR and AR are at now, the trough of the wave. As the technology improves and matures, the increase in popularity with consumers should take longer and be more chaotic, but also more solid.

Obstacle n°1: cumbersome devices

In this short anticipation film imagined as early as 2012, there is no need for glasses or a futuristic headset to evolve in augmented reality: the technology has been miniaturised to fit in a contact lens. In 2018, the challenge for AR and VR industries would rather be to make it bearable to wear connected objects that must have high computing power (90 images per second are necessary in a VR headset versus 60 for a traditional video game) all the while providing the best autonomy possible. And all that for a reasonable price… which remains a tall order in the current state of microprocessors and batteries. As summarized in June 2017 by Frédéric Conolo, product manager of startup MindMaze: "*The algorithms and processes are there, we need consumer electronics to be able to provide this power.*".

Another priority for manufacturers: reducing the number of cables necessary to access VR – preferably via open standards so as not to add to market fragmentation. In the same way as VirtualLink, a project supported by NVIDIA, Valve, Oculus, AMD, and Microsoft, which aims to reduce the electrical connector of VR cables to one single USB-C port.

Obstacle n°2: the number of sensors

Virtual reality is first and foremost about sensors: the more of these a user wears, the better will be the retransmission of their movements in the virtual world. Here also, innovations are doing well. Whereas most headsets available on the market offered only three degrees of freedom (3DoF) – the ability to turn, nod, and tilt the head – the new generation 6DoF now adds body movements. All that remains therefore is to increase the number of sensors, which is what is being experimented by projects such as HoloSuit, a wireless and affordable full body motion capture suit, whose 36 sensors and 9 haptic feedback devices can be placed on the legs, arms, hands, or even on all ten fingers. The project has been over 120 % funded on Kickstarter and the first deliveries are planned for November 2018.

Obstacle n°3: the interfaces

"*I believe we're in the virtual world now more than the real world already. It's just that our interface sucks*", Mark Bolas, a professor at the University of Southern California, confided to *Time* pointing to his telephone. It's hard to contradict him: squinting at a smartphone screen or sweating inside a headset, we only get limited

immersion. The device takes up a lot of space in our mind, which forces us to divide our attention into two worlds at once: the “real” one and the one opened by the application. The theorists of extended reality (XR), which groups together AR and VR, do however predict that “immersive computing” will take off as these interfaces get closer to the body – or even as our bodies themselves become the interface, as with this infrared light projected on a patient’s skin so as to see their veins.

Obstacle n°4: the cost and availability of consumer devices

Whilst we are still waiting for more flexible interfaces, the development of XR relies also on its capacity to embrace consumers’ current terminals and usages.
When “premium” headsets cost nearly € 400 and lock *early adopters* into a sealed off technological environment, the decision to buy is difficult.

On the other hand, certain manufacturers have chosen accessibility – even if this means putting to one side part of XR’s potential. With a touch of humour, faced with Oculus Rift, Google presented… a simple cardboard headset, which held a smartphone in front of our eyes so we could benefit from all the technology already onboard our mobiles. The entrance ticket to VR thus drops to € 15. A philosophy also adopted by Orange in Europe with the VR2 headset associated with the Orange VR360 application for content, making VR accessible to all. Likewise, the most successful VR and AR applications aren’t necessarily the most technologically advanced, but those that have managed to make the most of already widespread devices and usages – like the *Pokemon Go* game for smartphones or Sony’s PSVR, whose resolution is lower than that of a smartphone but that managed to rely on the PlayStation network.

In the near future, exploiting the possibilities of new generation smartphones is therefore a promising route that is already being explored by a few pioneers, such as Lucid, a company that develops software enabling smartphones equipped with two cameras to capture panoramic 3D images including depth-of-field information.

Obstacle n°5: content and usages

Beyond the equipment, it is of course the experiences offered by XR that will spark consumer interest. With the current fragmentation of the market, content production is not encouraged because developers must transcribe their applications into the languages of the various manufacturers, and the market therefore appeals to a consumer niche, which is often already into a specific brand or technical environment.

Yet, an increase in the diversity and quality of content is well underway. Drawn by ever-faster broadband networks, AR and VR usages are opening up to collaborative experiences that bring users together remotely. Thus enabling us to imagine immersive games such as *Holotennis*, the Orange experiment that enabled tennis

fans to teleport to Roland-Garros and play live against an opponent. Beyond play, "collaborative" XR carries its share of promises in the area of distance learning or that of telecommunications, to unite far-away collaborators in a virtual reality meeting, or bring a lone family member to the table for a get-together, shared in augmented reality.

Obstacle n°6: the human brain

In general, XR tries to "deceive our senses", for example by providing our bodies with real *stimuli* within the scope of virtual situations. The ultimate stakes for the development of these technologies lie therefore with neuroscience and research on the human body – and in these areas, there is still a lot of work to be done.
For example, we know today that the road to a perfect immersive experience is not without obstacles: like in robotics, total commitment of a subject to simulation can only be won above a certain level of quality that is difficult to reach, where the plausibility zone (a source of discomfort, as it gives an impression of strangeness) disappears and is replaced by a full and total feeling of authenticity. Just as the android capable of fooling us has not yet been invented, perfect VR immersion will no doubt have to wait for some research feats to be performed for these technologies to leave the "uncanny valley" and be as one with our brain!

In all areas, innovations continue therefore to improve AR and VR technologies. But we'll have to remain patient. As pointed out by Mark Zuckerberg (Facebook): "*The first smartphones came out in 2003 and we had to wait ten years to reach a billion units.*". And as Adam Rowe points out in Tech.co, they became "cool" just when the technology seemed both new enough, but also mature enough, to find a place in collective usages. In the same way, the golden age of XR is probably only waiting for a *momentum* where the technology will be new enough as well as "tried and tested", for a swing to take place towards mass uptake of all the new usages envisaged these past few years.

https://hellofuture.orange.com/en/developing-countries-lora-network-bearer-progress/

1. Hello Future
2. Internet of things
3. In developing countries, the LoRa network is the bearer of progress

Internet of things | Article

In developing countries, the LoRa network is the bearer of progress

Monday 19th of November 2018

- Agriculture
- Connectivity
- Networks
- Smart city
- Society

The LoRa network is making progress! In European countries, of course, but also in India and in African and South American countries where several large-scale deployments have been launched.

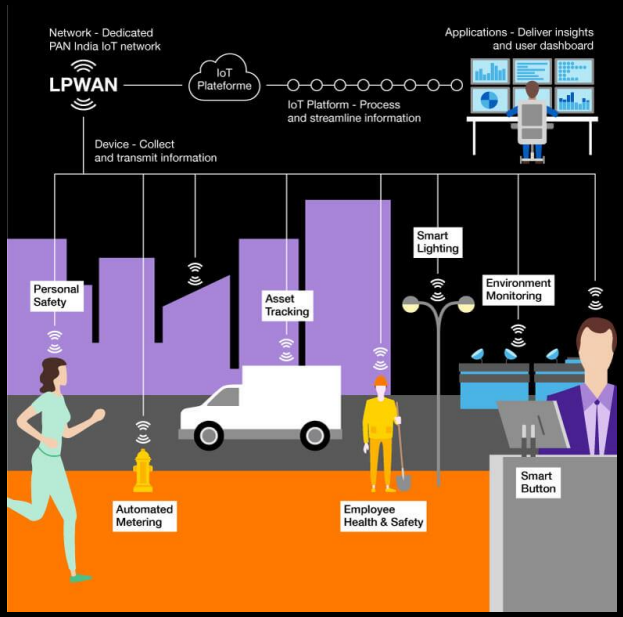
In the Akagera National Park in Rwanda, LoRaWAN technologies are used to combat poaching more effectively.

A long range, low energy consumption, and economical technology, LoRa is making progress all over the world. According to the LoRa Alliance, a non-profit organisation that promotes the LoRaWAN protocol for the Internet of Things (IoT), today this tech is the subject of deployments in around one hundred countries, including several developing countries in Asia, Africa, and Latin America. Regions of the world where IoT offers future prospects and can help to resolve many problems.

The biggest LoRa network in the world

It is on the Indian subcontinent that one finds the most ambitious LoRa projects, if not the most ambitious of all. In effect, Tata Communications has announced the deployment of the biggest LoRa Network in the world. It will reach 400 million people in nearly 2,000 cities and communities! The Indian telecommunications company, which has already deployed LoRa technology in 38 cities and plans to cover the majority of the country by the end of 2019, is thus building the foundations of the Internet of things by developing a network capable of meeting the connectivity needs generated by the millions of connected objects that should sweep into the country in the coming years.

Such a network will enable the development of an ecosystem of connected objects, applications, and services in many sectors within the framework of projects carried out by both private enterprises and public authorities (like the Smart Cities Mission launched by the Indian government in 2015). Tata Communications is already offering several end-to-end IoT solutions including smart meters to track gas, electricity and water consumption; a connected alert button that can be activated to report an aggression and is aimed in particular at women; connected accessories for improving health and security in the workplace; environmental sensors, smart lighting, etc.



The LoRa network to the rescue of protected animals

8,000 km away as the crow flies, in South Africa, a company called Comsol has built the biggest IoT-dedicated network in Africa. Named Comsol IoT, it covers the major South African cities. It is worth noting that LoRa technology had already made an inroad into the country thanks to FastNet, a subsidiary of telecommunications company Telkom specialising in IoT and machine-to-machine, who have used this technology since 2015 as a basis for their “smart metering” offering aimed at public water, electricity, and gas providers.

As underlined by Comsol CEO Iain Stevenson in a press release: "*IoT offers solutions for smart cities, smart businesses, and even many of the challenges we face as a society, for example managing scarce resources like water.*" For this matter, the example of CityTaps is interesting: the French startup has designed a solution – that it is experimenting in remote cities in Africa – enabling people to pay for their drinking water with a mobile phone thanks to smart water meters linked to a private LoRaWAN network.

In Rwanda, where the LoRa network was deployed in 2017 and 2018 by operator Inmarsat within the framework of the Smart City Kigali programme, let's mention the fine example of the Akagera National Park that has launched a "smart park" system based on LoRaWan. The idea? To use this technology to effectively combat poaching. One hundred solar sensors have been installed within the park, these regularly send signals that are relayed to a control room thanks to LoRaWAN gateways placed at high altitude around the site. Agents use the data collected to track the localisation of animals, park staff, or tourists' vehicles, and to check the state of the electric fencing and other security equipment. The facility has several advantages: it is more secure than traditional radio systems (researchers realised that the poachers were intercepting the radio signals used by the park's agents and scientists to track endangered species), it is less costly than satellite positioning systems, and connection to the LoRa network inside the park is highly reliable.

<iframe title="vimeo-player" src="https://player.vimeo.com/video/177198371?h=f8397c588a" width="640" height="360" frameborder="0" allowfullscreen></iframe>

https://vimeo.com/177198371

What about South America?

Now let's head to the South American continent where a national LoRaWAN network has just reached its first stage of deployment in Montevideo, the capital city of Uruguay. Led by YEAP!, and launched by iCondor, the project aims to increase LoRa's coverage in Uruguay and Paraguay. YEAP! was at the origin of the deployment of the first Argentinian LoRaWAN network in 2017 (in the cities of Buenos Aires and Rosario) and 2018 (across the whole of the country). Let's also mention Brazil, where the LoRa network is deployed on a national scale by Semtech and Anatael, the national telecommunications agency, following the publication by the latter in early 2018 of new technical provisions on communication devices by radiofrequency, enabling exploitation of the technology. An IoT Open Lab was opened in the country in April 2018. Just like the one opened by Orange in Châtillon, in the Ile de France region, it enables trading partners, manufacturers of connected objects and electronic components, as well as developers, to experiment and test solutions end-to-end on the LoRa network.

The aim of the LoRa network is to support a multitude of IoT applications within the scope of smart cities, industry 4.0, or smart agriculture. This last area is particularly important in developing countries where the agricultural sector is at the heart of the economy. Sensors and connected objects can help farmers to cope with difficulties linked to bad weather conditions, to make everyday tasks simpler, and of course to increase crop yields. More broadly, they can help these countries to take up the challenges of development (management of resources or pollution, for example). Here LoRa technology, a connectivity solution tailor-made for IoT, is resolutely a bearer of progress.

https://hellofuture.orange.com/en/orange-multiplies-its-innovations-in-africa-and-the-middle-east/

1. Hello Future
2. Digital culture
3. Orange multiplies its innovations in Africa and the Middle East

Digital culture | Article

Orange multiplies its innovations in Africa and the Middle East

Monday 10th of December 2018 - Updated on Thursday 17th of September 2020

- Connectivity
- Data
- Digital
- Networks
- Technology

With the boom in usage of mobile data, the launch of 4G, the development of smartphones, and the diversification of digital content, Orange wishes to accelerate the digital transformation in Africa and the Middle East. The operator thus means to meet the increasing demand for innovative services in these areas.

With a high level of satisfaction among users, the My Orange mobile application has become indispensable in the MEA region.

“Digital is changing our customers’ behaviour and their experience: their ways of consuming, of communicating, of interacting amongst themselves and with their operator have evolved deeply”, says Arnauld Blondet, Director of innovation of the

MEA (Middle East Africa) region at Orange. The innovative services developed by Orange are at people's service to improve their everyday lives.

My Orange

With a high level of satisfaction among users, the My Orange mobile application has become indispensable in the MEA region. A good example of successful customer experience. Deployed as early as 2013 in Mali, this application is now available in 18 countries of the Africa-Middle-East region. With over 6 million downloads and 46% of active users, the application offers a range of services that are highly appreciated by African consumers. Completely free, My Orange enables customers to both track and manage their mobile account easily, but also to optimise their usage, to access orange products and services rapidly without having to remember short codes (USSD codes), or even to easily find contacts and useful numbers for the Orange boutiques. "*It is the ultimate customer service application, a pillar of Orange's digital strategy in this area where the smartphone ownership rate is rising fast*", describes Noëlle Limoux, Digital & Applications Manager at Orange. "*This application reflects the core of our strategy in MEA, which is to stand out and become the multiservice digital operator*", adds Gilles Boyer of Orange. It is a success: a survey revealed that 90% of active consumers declared to be very satisfied with the functionalities offered, the interface design, and the consumption check at a glance.

Orange Telephone

Thanks to a dedicated call button, Orange Telephone brings new functionalities so as to better protect and inform users before and during their calls. An embedded default call application in Orange mobiles for the last three years, this free service for the operator's customers is also available for download from the Play Store of over 20 countries, of which 18 are in the MEA area. "*The Orange Telephone application downloaded to recent Android smartphones replaces the green button, providing easy access to a multitude of functionalities, including the possibility to give back control of their calls to the users*", specifies Jean-Denis Poullain, Orange Technocentre Manager of Amman. The aim of Orange Telephone is to inform and protect users. How? By enabling customers to detect and block unwanted calls, but also to directly identify professional numbers, and lastly, to avoid the nasty surprises of premium-rate numbers. In addition, the user has the possibility to access the MyOrange application directly, to easily retrieve the access codes (USSD) to the most frequently used operator services (balance check, Orange Money, emergency credit, etc.), but also to search for local professionals. Ever closer to each user, Orange Telephone customises experiences by suggesting calls according to users' consumption habits, with a call planning function, and finally with possible

personalisation of the mobile interface with a choice of different themes and colours. Orange Telephone seems to meet users' expectations perfectly.

Messaging Pro

Launched three years ago, Messaging Pro is a bespoke direct marketing tool available in Cameroon, Niger, Madagascar, the Congo, Guinea-Bissau, Botswana, and shortly in Mali. It enables enterprises (both private and public) to send personalised message (text or voice) campaigns to all of their customers from a single web platform. It has only one requirement: to have internet access. It also analyses the results of each campaign and helps to improve customer service (by easing response to customers). With Messaging Pro, businesses (micro, SMEs, LEs), NGOs (for medical, health, agriculture, or weather), ministries and governments (education, agriculture) benefit from a service that is personalised (campaigns on three types of channel: text, voice, or USSD), easy (campaign programming and selection of contacts from list saved previously in the platform), but also fast (sending the campaign out, analysis of its sending and response). For the enterprise it couldn't be easier: to send out a campaign they need only to connect to Messaging Pro, an interactive platform, then create a Quizz campaign of questions and answers in real time, and finally send out the campaign. All they then have to do is instantly analyse the replies to the Quizz and Surveys campaign, for example. The tool is used notably by UNICEF in Niger or by the ministry of National Education in Madagascar to send out their campaigns. "*One of the particularities of this solution is that it provides the possibility to send out voice messages, which enable illiterate populations to understand the message and also to reply using the voice channel*", explains Thomas Bonnet, B2B manager at the Orange Technocentre of Amman.

Good Deal

In the MEA region, and in particular in Africa, the mobile market operates essentially around prepaid offers. The Orange boutiques do not cover the whole territory so Orange customers buy their telephone credits directly from vendors in the streets. Since June 2018, Orange has offered a service that is revolutionising this market. Thanks to this connected service, called "Good Deal" and available in Cameroon and Côte d'Ivoire, all of the street vendors for Orange can now offer a wider range of packages via their mobile by validating options on their screen. In effect, on top of e-recharging, these vendors can also sell data, voice, or SMS packages. There are currently 5,000 street vendors using this service. For their part, the buyers benefit from more offers in a more simplified manner and that are accessible straight onto their mobile. These vendors can earn extra commissions after each sale and easily check these on their mobile so as to track and drive their revenue. "*Good Deal simplifies customer experience and enables vendors to 'sell more to earn more'*", states Bruno Drouet, Project manager at Orange.

Poke Call

Active in six countries (Guinea, Guinea-Bissau, Tunisia, Morocco, Egypt, and Jordan), Poke Call is a service offered by Orange that is particularly useful for boosting call-backs. Indeed, the operator wished to innovate for this continent where the large majority of mobile accounts are prepaid. It's true that when they have no credits left, Orange customers can no longer make calls. However, to help them in this particular case, instead of sending a traditional SMS-type notification message, it is a "missed call" message that is sent to the person who could not be reached. More discrete and less embarrassing for the person who has no credit left, this service increases their chance of being called back. Completely free, it will be deployed in other African and Middle Eastern countries over the coming months. This ingenious strategy was set up by Orange so as to go further still in customer service. "*It is a means of extending customer experience, of not penalising our creditless customers, and of boosting call-back rate*", explains Jean-Denis Poullain.

https://hellofuture.orange.com/en/lte-m-technology-enters-the-real-world/

1. Hello Future
2. Internet of things
3. LTE-M technology enters the “real world”

Internet of things | Article

LTE-M technology enters the “real world”

Monday 10th of December 2018

- Connectivity
- Industry
- Networks
- Partners
- Smart city

On November 8, 2018, Orange announced the opening up of the LTE-M network in France and immediately launched a challenge, in partnership with SNCF, with the objective of educating, stimulating, and uniting the ecosystem around this key technology for the IoT.

“LTE-M technology provides an alternative in decision-making, and an additional asset designed to cover new use cases.”

The laboratory and experimentation phase is now over for LTE-M technology and it is ready to put its theoretical potential into practice. To encourage its appropriation by players within the ecosystem, on November 8, Orange launched a challenge, at the forefront of industrial IoT within France, in partnership with SNCF that is

designed to explore the capacities of the technology through real use cases and combat challenges currently faced by the rail company. Businesses, start-ups, developers, solutions providers, product manufacturers, etc.: everyone is involved!

On this occasion, Marine Mizrahi, Head of IoT Fab at SNCF, and Mathieu Belouar, Innovations & Connectivity Manager at SNCF, spoke about the level of maturity achieved by the rail group in its IoT development projects and what they expect from the LTE-M technology. Thierry Gaillet, Director, Orange Developer marketing, and Ronan Le Bras, Head of Technical Strategy — Wireless Networks for IoT at Orange, also shared their point of view on the challenge.

At a press conference in May 2017, the president of SNCF, Guillaume Pepy, stated that the IoT was becoming "a key driver of performance and efficiency" for the Group. How was this driver developed and implemented internally?

Marine Mizrahi/Mathieu Belouar: The company, which has a history in the M2M field with the connection of its machines, has been investing in and working on the IoT since 2015, and established its IoT Fab in early 2016. Its objectives are as follows: support the business lines in the fulfillment of their IoT projects by providing dedicated resources and expertise, and create the tools required for the purposes of industrialization. As such, a unified Group IoT platform was designed, together with specific framework contracts and business guidelines. We therefore play a role in supporting these initiatives, while bearing in mind the challenges associated with costs (spreading of costs), time (acceleration of projects, consistency of the TTM (Time to Market) with market trends) and the impact on our business lines. In the end, we want to ensure that we are delivering solutions that are of value to them.

In essence, for us the IoT represents an additional source of information that works alongside what we already have in place. With this in mind, across the 30,000 km of lines, thousands of rolling stock and hundreds of thousands of objects that the Group manages and monitors, we decided to "ioT-ize" only where and when we need information. When this is the case, the IoT allows us to support our operations and gain the best possible knowledge of the state and use of our installations and facilities.

To which use cases are IoT solutions applied within SNCF?

MM/MB: They are spread between three fields of application in equal proportions: the rail network, rolling stock, and stations and tertiary buildings. For the LTE-M challenge organized by Orange, the use cases adopted relate to stations, improving quality for staff and passengers, trackside facilities, better securing infrastructures, and technical centers, to optimize maintenance.

The IoT is used in a reasonable and reasoned way, and offers us greater agility by enabling us, for example, to access places where we have not previously had

sufficient coverage in terms of energy and connectivity. It is a real game-changer, and will help to modernize our processes through new sensors and innovation in wireless technologies, whether relating to energy or connectivity.

What role does LTE-M technology play in SNCF's IoT innovation approach?

MM/MB: A sense of continuity in the exploration of technologies, and an alternative in decision-making. In the end, it is always a matter of choice and at SNCF, we are striving to preserve this in all circumstances. The technology that we implement is always conditional on the anticipated use and ROI. It is also an additional asset that will make a significant contribution in addressing new use cases and business.

In concrete terms, this technology stands out thanks to its practical deployment features and its "ubiquitous model"; wherever there is 4G reception, we will have access to the LTE-M network – including in tunnels – and this will provide solutions in many potential use cases. It also represents a leap forward in terms of speeds, and LTE-M technology will overcome certain constraints and thereby allow us to push the boundaries of the IoT. For applications concerning the security of specific installations, in particular, it will be possible to gather and process video streams.

Thierry Gaillet/Ronan Le Bras: The technology is being rolled out on the LTE networks and supports existing deployments, by offering, since its launch, a national coverage rate of 98% of the French population. Its added value also lies in the capacity of the LTE-M network to support two-way communication in real time, with performance in the range of 100 to 200 milliseconds for a round trip. Other operating benefits lie in the LTE-M network's ability to support use cases covering mobile or roaming.

What are you looking for from the challenge?

MM/MB: We want to see LTE-M technology being explored and used to its maximum potential, to see if it can keep its promises with regard to technical, energy, and performance efficiencies. And within SNCF business lines, it is hoped that it can respond to new and existing use cases, to then industrialize and integrate the solutions developed for our IoT programs.

There is also a strong focus on the ecosystem: the challenge represents a fantastic opportunity to add value to already mature businesses using the technology and to meet new potential partners. Through this initiative, we are positioning ourselves as pioneers and will all go through a phase of education and shared learning together.

Lastly, it provides an opportunity to maintain and consolidate a dynamic of internal mobilization, with the teams from the Auvergne/Rhône-Alpes region at the forefront, which defined and managed the use cases studied by the participants.

TG/RLB: The technology has only just been launched and, through this challenge, it is being faced with real situations. It is an approach that we successfully implemented for the LoRaWAN networks, notably with Groupama and Air Liquide, and now we are doing the same for the LTE-M technology with SNCF. It will be a great opportunity to test concrete solutions, designed by and with start-ups, developers, service providers, etc. Almost 50 solutions were submitted initially, with a wide variety of proposals, from experts in fields such as embedded software, hardware, platforms, data management, and AI.

It is a chance for Orange to test and improve our products, our platforms, and ultimately to refine or focus on our technical roadmaps. And that can equally encourage applicants to think about their own product plans.

The priority and key issue is to validate the relevance of using LTE-M technology for certain use cases, its capacity to work alongside LoRa networks and the transition between a laboratory environment to the “real world” on the ground.

Because the objective of a challenge is precisely to challenge ourselves, we will closely monitor the reaction of participants when faced with these real cases and expect to see their ability to respond, their creativity and their degree of maturity.

We are delighted to have launched and organized this event in partnership with SNCF, a renowned European player in the field of the IoT. It is quite a unique challenge and the first of its kind given the type and variety of projects. We hope that it will serve to stimulate the expertise and vision of the applicants, and the ecosystem as a whole.

https://hellofuture.orange.com/en/show-hello-2018-live-module-a-smart-booster-to-connect-devices-using-lte-m/

1. Hello Future
2. Internet of things
3. Show Hello 2018: Live Module, a smart booster to connect devices using LTE-M

Internet of things | Article

Show Hello 2018: Live Module, a smart booster to connect devices using LTE-M

Monday 17th of December 2018 - Updated on Thursday 16th of June 2022

- Connectivity
- Cybersecurity
- Data
- Networks
- SIM

While the revolution in smart devices is already well under way, certain items and machines are hesitant to make the jump to 3.0, and remain deprived of "native" connectivity. Now, thanks to Orange’s Live Module, any device can become a smart device.

"A ready-to-use integrated tracking solution enabling users to connect all types of devices, with applications in various business sectors."

Using an integrated module to give existing devices a smart communications upgrade: this is the promise of Live Module, an innovative solution presented by Orange during the Show Hello event on December 12th, 2018. Initially developed in a 2G version, this connectivity "activator" has evolved, adopting the LTE-M standard alongside the launch of the national network by Orange on November 8th. As a result, the module will reach new heights in terms of data flow, consumption, mobility, etc., offering multiple applications in various fields.

A connectivity "booster"

This module has its origins in the Live Booster, an all-in-one 2G/LTE-M connectivity service designed to connect and remotely control a device or set of equipment, and an unparalleled tool for industrial users and Orange partners wishing to put together their own fleets of connected devices. "Based on this technological component, the teams from Orange – mobilizing the expertise and resources of its various labs – have perfected the Live Module," explained Meriem Mezzi, Live Module Marketing Manager and Philippe Delbary, Innovation Director in Charge of IoT B2B. This ready-to-use integrated tracking solution makes it easy for users to connect all types of devices, and has potential applications in various business sectors, both in B2B and B2B2C. From critical uses – such as facilitating the flow of data and information on a chronic illness, or monitoring and protecting isolated workers – to connected dog collars, the scope of potential applications is very broad.

3.0-powered bicycles

Initially designed to function in 2G, the Live Module has naturally evolved to use LTE-M connectivity, along with the launch of this new technology in France by Orange. At the event, Orange unveiled an example of how the module could be applied to electric bicycles, which is symbolic of the possibilities being opened up by LTE-M for uses in transport and mobility. Indeed, this solution will be put to wide-scale use in future franchises for electric bike rental schemes, and even for bike sales. Orange is bringing its expertise to the fore in order to organise and implement the connectivity aspect and on-board electronics for fleets, including the Live Module and in some cases even the Datavenue platform.

LTE-M, Bluetooth, CAN bus, NFC, etc.: assembled technologies

This solution's added value is about more than just connectivity: "the Live Module" also features a Bluetooth 5.0 chip, which notably enables us to integrate a secure Bluetooth connection, an NFC chipset and a CAN-bus (Controller Area Network) data bus – a format which is tending to migrate progressively towards the world of cycling after having invested in other industries, especially automobiles. Once equipped with this tech, the bikes can then transmit and receive information from all directions, making them smarter and granting added value for the fleet operator and users. Via a dedicated mobile application, users can access a range of services,

from bike geolocation to management of the electrical assistance feature, as well as remote locking/unlocking of the bikes. For fleet operators, the power of data sciences is opening up a plethora of new opportunities in terms of optimising navigation or the deployment and maintenance of their equipment, and even includes the possibility of developing predictive maintenance modules – making this an essential component in connectivity!

Archive Hello Future 2018 EN Hors éco-système orange

Chaque année de publication = un document d'archive (x2, FR EN). Mettre des séparateurs (***) entre les articles. Mettre à jour la table des matières à la fin du travail.

Un copier-coller depuis le front suffit (est plus rapide). Les indispensables :

- Lien (à rajouter manuellement en premier)
- Date de publication
- Date de mise à jour
- Titre / Chapô / Corps du texte / textes sous le corps du texte / textes dans la marge

Supprimer du résultat les mentions « temps de lecture » / « reading time » et les icônes des boutons de médiatisation sociale ( ).

On ne copie pas les éléments backoffice : texte Twitter, textes SEO.

Si c'est un billet du Blog de la Recherche (catégorie Blog), attention, parfois l'auteur est indiqué en backoffice mais n'apparaît pas sur le site, il faut récupérer au minimum les prénom / nom de l'auteur ou des auteurs et le copier dans l'archive (mention « Auteurs : »). Par ailleurs nous ne supprimerons pas en backoffice les index (« we quote them ») et surtout les auteurs (« authors »), qui sont conservés ailleurs que sur le post et sont susceptibles d'être réutilisés aujourd'hui.

Visuels : supprimer du fichier .doc d'archivage les visuels de banque d'image. Nettoyer les visuels sauf lorsqu'il s'agit de créations ou de photos originales. S'il s'agit de contenus qui ne sont plus brandés Orange (avec marge de tolérance), ne pas conserver.

Archiver la version française puis la version anglaise de chaque contenu.

Ne pas supprimer l'article après archivage pour l'instant. Ne pas supprimer les visuels de Une associés et visuels de corps de texte pour l'instant. Mettre à jour la liste des contenus avec une colonne « Archivé ».

https://hellofuture.orange.com/en/randomness-ethical-solution-learning-machines/

1. Hello Future
2. Artificial intelligence
3. Randomness: an ethical solution for learning machines?

Artificial intelligence | Article

Randomness: an ethical solution for learning machines?

Tuesday 11th of September 2018 - Updated on Thursday 17th of September 2020

- Data
- Human sciences
- Machine learning

Cross discussion between physicist and philosopher Alexei Grinbaum, and Frédéric Serval, manager of a data analysis department at LEGO, around the ethical problems linked to learning machines.

“Resorting to randomness is not a means of erasing harm, but of removing the machine from the field of ethical judgement”

A researcher at the Research laboratory on the science of matter (LARSIM) of the Saclay Nuclear Research Centre (CEA), Alexei Grinbaum is a physicist and a philosopher. He is particularly interested in the ethical questions brought about by new technology (nanotechnology, synthetic biology, robotics, artificial intelligence). In his book *Satanas Ex Machina*, to be published early 2019 by Desclée de Brouwer,

he suggests to resort to randomness in the case of ethical conflicts involving users of smart machines, in particular autonomous vehicles, having to “choose” which lives to protect or to sacrifice in the event of an accident. Following the publication of an article in the *Revue française d’éthique appliquée* (the French journal of applied ethics), which presents a summary of the point of view developed in his book, we invited him to have a discussion with Frédéric Serval, manager of a data analysis department at LEGO.

Frédéric Serval: In your opinion, do the ethical questions that we are facing today with the emergence of learning machines echo the questions of the past?

Alexei Grinbaum: Echo… good choice of word. Obviously, the technological context is new but that doesn’t necessarily mean that to get to grips with it we must come up with completely new ethics. Hans Jonas, a great German philosopher of the 70s, searched for these new ethics for years without finding them. The lesson to be learnt from that is that new technology ethics must be in keeping with time-tested traditional ethical thinking. To go beyond the current technological context, I propose to extract “fundamental motives”, by which I mean the major themes that are repeated from generation to generation and that have already been analysed and developed throughout the history of ethics.

Frédéric Serval: I would like to chat with you about the trolley problem, which describes a choice between two morally unacceptable outcomes. Is there really an ethical solution to this problem? Some people for example, have put forward the idea of an opinion poll. However, if we take the example of the MIT “Moral Machines” website, which gathers people’s moral choices in the case of an unavoidable accident with several types of variables, we notice that the answers have substantial variation. I believe this shows the limits of the possibility of a mathematical approach when solving a moral dilemma.

Alexei Grinbaum: With psychologist Jean-François Bonnefon we took part precisely in a debate on this subject at the l’École normale supérieure. Several strategies were suggested for resolving the trolley problem but before addressing these we must specify that it is a model and not a real situation. In real life, an autonomous vehicle only has limited decision time and limited access to data. The trolley problem puts the technical parameters to one side so as to focus on a purely moral dimension. The question is: should the software developer code moral values into the machine to enable it to make the decision?

Among the possible solutions to resolve the trolley problem, the first consists in letting the people decide, via a referendum for example, which person should die in the event of an accident. The second solution consists in choosing a function to optimise, a quantitative measure of the moral nature of the different outcomes, which seems logical, as the machine only knows how to calculate. However – and this is the “consequentialist” point – morals calculated in a cold manner according

to predetermined rules will never be entirely satisfactory because human judgement also depends on the as yet uncertain consequences that the action of an autonomous car will produce in the future.

Whatever the chosen criteria, the decision will therefore never be ethically flawless. So, what is to be done? The main point that I develop in my book starts from this observation that we cannot undo harm. Technology does good and it does bad, it has always been this way. Thus, the question is not that of working out how to prevent the autonomous car from killing anyone, but rather that of how to ensure that the concepts of good and bad remain purely human concepts, and that machines do not become moral agents. Resorting to randomness is not a means of erasing harm, but of removing the machine from the field of ethical judgement.

Serval: Regarding the optimisation function, it's interesting to highlight that it is always defined by a human being. When an algorithm adjusts the price of plane tickets for example, it isn't optimised to improve the journey of the majority, but to increase the route's profitability… This choice was not made by a machine but by the person who developed the optimisation function. It's not because it is a calculation that it is "cold", to re-use your words…

Grinbaum: Behind all optimisation is a hierarchy of values, which is based on measurements that are not qualitative but quantitative, i.e. there are several criteria with which different coefficients are associated, from 1 to 10 for example. And you are correct, these hierarchies of values are always defined by human developers. The ethical dilemma is a conflict of values that runs much deeper than a measurement of the type "7 > 4". Establishing a quantified hierarchy of values is therefore very difficult, and even impossible, in particular when it is a question of human lives.

Furthermore, when man makes a moral choice, he is confronted with a certain lack of transparency. Personally, I don't know if justice is more important than freedom, or vice-versa. I decide according to context, instinct, but also according to the limited resources that I have. So I'm not entirely transparent in ethics. Yet the calculation of a predetermined function is, by definition, transparent.

Serval: We are getting to the heart of your proposal: to use randomness to add opacity. Randomness is an event or a variable that is not linked to any causality, a true expression of destiny. But, and I see this in my everyday work, true randomness does not exist in computing. I can generate a pseudo-random sequence, but it will never be completely random. There will always be causality because this sequence that I'm going to code will be the same today on my machine as in ten days on that of a colleague…

Grinbaum: I have discussed this question with my fellows… Serge Abiteboul, a computer programmer and member of the French Académie des Sciences, believes

this solution can only work if we are in the presence of fundamental and irreducible randomness, produced for example, by a quantum random number generator. Well, in my book I explain that we need to use only apparent randomness. In order for the ethical point to be acceptable, it suffices that the users think that the choice is made randomly. An example we can quote is that of undefined behaviour programs: some choices are unknown to the programmer because their results were not specified on the compiler's description, and thus appear to be random.

Serval: So, although it is pseudo-random, this opacity for both user and developer provides an apparent randomness that you think is sufficient. Does that not mean that in the end, we're entering a notion of faith, in the sense that users must have faith in the fact that the machine will let chance choose? Which brings us to the myth of Joshua that is covered in the article. Is it really desirable for Men to maintain the same relationship with learning machines that the Jews did with the Talmud God, when they are only pretending to do something that they cannot in fact do?

Grinbaum: I prefer to use the term "trust". In effect the user's trust is fundamental. On this subject I tell a Bible tale. At the end of this story, when Joshua says to Achan "I pray you, make a confession. It is by a draw of lots that the land will be divided amongst the tribes of Israel", he understands that it is not his life that is at stake but the trust the people shall place in the procedure. A chapter of my book is called "Never will a throw of die abolish trust". In it I am looking to find out how to maintain this trust. It is very difficult because using randomness raises not only ethical questions, but also psychological and political questions. Yet in these areas, today, everything goes against trust. We see it for example in the APB or Parcoursup French post-secondary education platforms… When you tell people that we're going to use a random draw, they find it unacceptable and even unfair, even if this perception is tending to evolve with time.

Serval: Once you enable machines to be Moirai (the Greek gods of fate), do Men not then risk rebelling against the IT systems so as to feel like they are taking back control of their destiny? It reminds me of another myth, a much more modern one, that of the Butlerian Jihad in *Dune*, which results in a ban on artificial intelligences that are replaced by a caste of mentats specialised in data analysis…

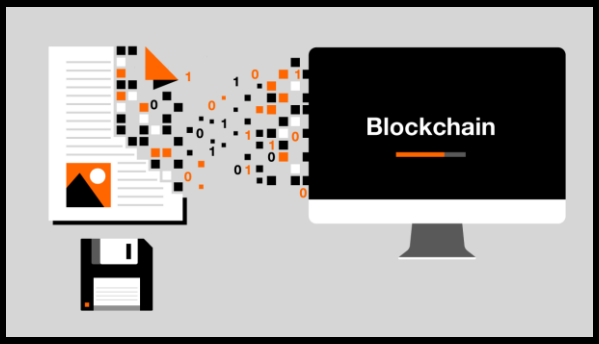
Grinbaum: I think that the fundamental problem of the man-machine relationship isn't one of competition but of mutual imitation. We are attempting to develop machines that are capable of simulating human behaviour. But when interacting with them, we also imitate the machines' behaviour. Man is a fantastic "imitating machine"! For example, the adoption by young people of SMS language, i.e. information compression, is a machine value that has become human. This mimicry is quite formidable and seems to me all the more dangerous because we are not always aware of it. I would place the cursor of danger more on this point.

The myth of Joshua: After the death of Moses, the people of Israel are guided by a new leader, Joshua. It is he who finally crosses the Jordan and enters the promised land. But this land is already inhabited: Joshua must wage war on the occupiers. Quite quickly, the army of Israel takes the town of Jericho. The jubilant population is then under the illusion that the conquest will be easy: given that this land had been promised to them by God, they should fly from victory to victory. However, the first defeat happens right afterwards. The inhabitants of a small city called Ai, not far from Jericho, push back Joshua's men. During the battle of Jericho, God had declared that only he could legitimately take possession of the property of the people who occupied the promised land previously. These objects were forbidden to the people of Israel: he who touched it should be put to death. In all logic, the cause of the defeat at Ai could only be a violation of this divine ban. Joshua then stays alone with God, tears his clothes, lies face down on the earth and remains before the Ark of the Covenant until evening. It is here that God informs him of the punishment he inflicted on Israel at Ai. The people must "destroy the accursed things among" them by finding the culprit, who is to be burned. But who is the culprit? That's what Joshua asks God. But God doesn't answer. He says: "V*ekhi delator ani*" – "But am I a denouncer?" "Throw the dice", God orders Joshua. Behind this command is God's reluctance to become a denouncer. It is not up to him to report the culprit, for fear of being implicated in a matter of human judgement, but it is up to man to follow the procedure and to seek, rather than create, the truth. At stake, more so than the question of finding the culprit, is that of trust in the procedure. The dice point to a man named Achan. At first he rebels against Joshua: "Are you condemning me by a draw of lots? What if the lot had landed on you?" and Joshua replies "I pray you, make a confession. It is by a draw of lots that the land will be divided amongst the tribes of Israel." Immediately Achan confesses. He has understood that what is at stake is not his life but trust in the procedure.

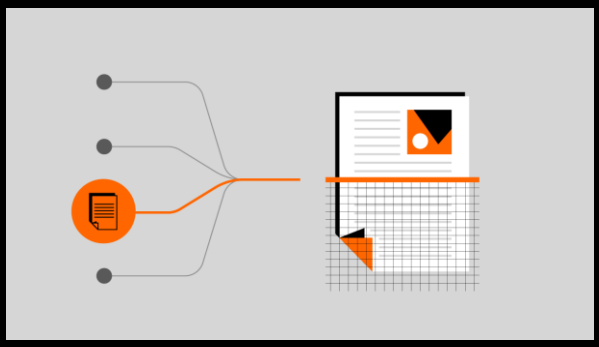
Blockchain: checking and archiving the documents of The National Archives in complete security

Monday 3rd of December 2018 - Updated on Thursday 16th of June 2022

- Blockchain
- Cybersecurity
- Digital
- Technology



Metadata (title, keywords, dates, etc.) are extracted from the original object and stored in a permissioned Ethereum blockchain platform.



The original object is categorized according to its format thanks DROID (Digital Record Object Identification) software, then run through a hash algorithm that is specific to its format. Hashing is a function that calculates a value that is used to rapidly identify an object.

The original object is stored in a secure archive, and its “hash” is stored in the blockchain platform with the metadata taken previously.

When it becomes necessary, the format of the original document is modified. It is then run through a new hash algorithm and the new hash is compared to the original hash stored in the blockchain platform. If they are identical, this means there weren't any modifications to the object during the change of format.

A research project aiming to use blockchain technology to archive The National Archives' documents and check their authenticity.

In June 2018, The National Archives (TNA) in the United Kingdom launched a research project aiming to use blockchain technology to archive its documents and check their authenticity. Named Archangel, this project is being carried out by the University of Surrey in partnership with the Open Data Institute, thanks to funding from the Engineering and Physical Sciences Research Council (EPSRC). If these stakeholders have embarked upon this adventure, it is to solve the challenge posed by digital archiving, and to ensure that people will continue to trust the national archives. In effect, computer files are continually evolving and end up becoming obsolete. Floppy disks, whose use was widespread in the 1990s, no longer exist today. In order to conserve the archives, it is therefore necessary to change the format of the files, and the difficulty lies in ensuring that no accidental modifications take place during this changeover. Archangel therefore has three main objectives: to check the archived documents' provenance and ensure their long-term integrity, to sustain the public's trust in the public archive system, and to create a database that is updated in collaboration with other archive systems across the world. The University of Surrey has given itself 18 months to prototype a blockchain technology capable of achieving this.

1. Hello Future
2. Digital culture
3. Love in the age of smartphones

Digital culture | Article

Love in the age of smartphones

https://hellofuture.orange.com/en/love-age-smartphones/

Wednesday 3rd of January 2018

- Device
- Human sciences
- Networks
- Society

Mobile devices and social networks have transformed the way we create and nurture romantic relationships. New space for intimacy or indubitable love killer?

New technologies bring people together in general and lovers in particular. They multiply contact points and the ways of expressing affection. A simple emoji sent on WhatsApp, a link or GIF shared on Gtalk, an SMS written on the fly, a video posted on a Facebook profile, a FaceTime between two meetings … So many signs of attention shown throughout the day.

A special space for intimacy

Whatever the configuration – a new couple or a long – term relationship, spouses separated due to professional obligations for 24 hours or by an ocean -, the new communication tools help to create a sense of closeness and constitute a special space for intimacy.
As reported by Hua Su on Slate, *"Some young couples even leave the camera on while they cook, eat, study, and play video games".* For the purposes of a study, the researcher interviewed several Chinese students and young professionals.

This illustrates that smartphones and social networks are a tool to satisfy the emotional (but also logistic) needs of couples and they play an important role in the daily interactions of partners.

From "technological colonisation" to "facestalking"

Though the smartphone brings people together, it may also move them apart. It is often criticised for interfering in the lives of couples, or even being a "love killer"! Chiara Piazzez talks of "technological colonisation". "*One of the fundamental aspects of romantic love is to be fully present for the other",* affirms this UQAM researcher in sociology. *Now, with a connected object – like a smartphone placed on the table -, the other is always a bit distracted".*

"In the age of smartphones, some find it difficult to bear radio blackouts"

The smartphone is also criticised for threatening the stability of couples. For example, hyperconnection may make some people think that their partner is (or must be) permanently available, which can lead to significant conflicts. "[…] Many young lovers expect to have "exclusive access" that would conform to their "exclusive relationship", explains Hua Su. In the age of smartphones, some people find it difficult to bear blackouts.

Another source of tension: as much as the new communication tools multiply contact points with ones lover, they equally multiply the opportunities to connect to third parties and, where necessary, encourage flirting with such. However, if certain equivocal behaviours on the Net are considered as betrayals by some, they may not be considered same by others.

In the same way that they challenge our ideas about fidelity, these tools would redefine the concept of intimacy, made more illusive. According to some researchers, the way partners describe intimacy in the digital age has changed. Intrusion into a spouse's private life may be considered more innocuous and increasing while "facestalking" (spying or monitoring of a current or potential partner on Facebook) has become a socially acceptable practice.

Ultimately, the digital age shall witness abuses being perpetrated, in the increase of abuse "In Real Life" or not. A study published by the Centre for Innovative Public Health Research and the Data & Society Research Institute reveals that 12% of US Internet users have experienced abuse from a partner, ranging from monitoring online activities to harassment, humiliation or disclosure of personal information.

Code of conduct

There is no doubt, (almost) everyone agrees with the fact that technology is beneficial to a couple… if it is well used. It seems that peace within the household lies in the transposition on the digital terrain of the right marital distance, or "spatial segregation" to quote Hua Su.

Then comes the idea of a code of conduct which, like the "netiquette" in love that would govern online meetings, would help the partners define a certain number of limits and rules. With the difference that these Tables of the Law would involve a

great deal of individualization. The partners would agree, more or less explicitly, on certain points in order to identify behaviours likely to be ambiguous or abusive, to "*contextualize silence*" and prevent "misinterpretations" from breaking into conflicts.

As such, one of the commandments that should often come up is: "You will not start, or try to settle a conflict via SMS or on the Internet!"

https://hellofuture.orange.com/en/drone-elevates-farmer/

1. Hello Future
2. Internet of things
3. When a drone elevates the farmer

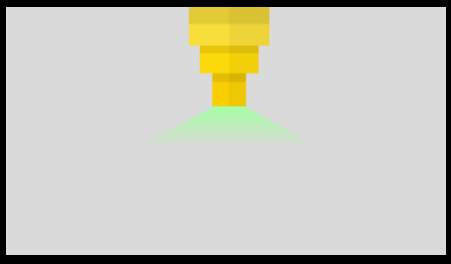
Internet of things | Article

When a drone elevates the farmer

Thursday 4th of January 2018 - Updated on Thursday 16th of June 2022

- Agriculture
- CSR
- Networks
- Radio
- Smart city

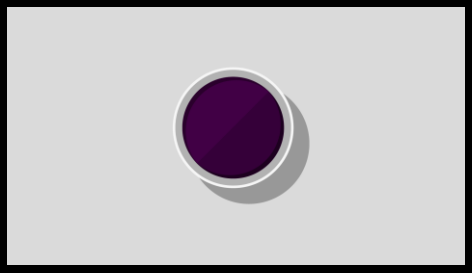
To the general public, it allows the capture of incredible shots with just a few clicks, but the drone has also established itself as a very useful tool in the professional world, especially in precision agriculture. What is contained inside its solid shell? Cameras, batteries, connectivity, geolocation, automation... Technological innovation is evident throughout.



Spray jets

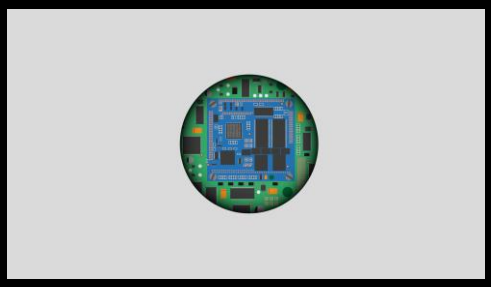
The « drone spray » (a spraying drone) in all aspects resembles the "classic" drone except that it is equipped with spraying jets. Mostly used for agricultural cultivation, it alleviates painstaking work of sweeping the crops to protect them from frost,

snow, and diseases. It can also spray hard-to-reach areas, such as trees or vines (up to 3 liters of product per minute per hectare, covered in 10 minutes).



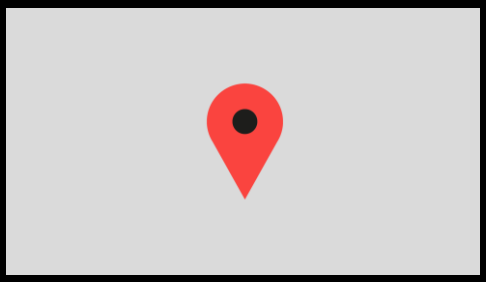
A multidisciplinary camera

The multispectral camera produces high-resolution 16Mpx photos and collects data about agricultural plots. It captures "thermal" data that is invisible to the naked eye, calculates the amount of sunlight, stores the collected data in a dedicated cloud and then generates accurate maps covering up to several hectares. All of these features enable, for instance, the detection of water deficiencies of agricultural land, thus helping to improve the management of farms.



Saved by the automatic pilot

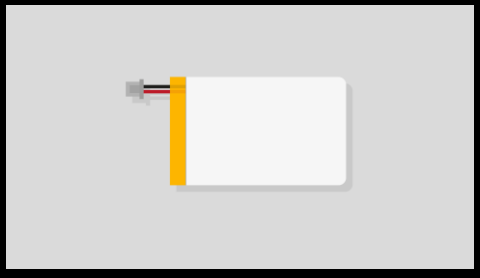
As with any machine, a drone can be damaged: whether it’s a loss of radio connection, Wi-Fi or Bluetooth, or a problem with battery. No need to panic: all recent drone models are equipped with a "Return to home" mode, which will safely return the drone to its launching location, via autopilot.



The OS, the heart of the machine

A drone is nothing without its control center: the operating system (OS). Since it is an object able to locate itself in space, the core of the flying object consists of a geolocation system (GPS or Glonass) connected to a microprocessor, and to an internal memory flash-drive which can contain as much as 32GB of memory. When the drone is in flight, the cellular networks allow for a greater freedom of navigation and direct broadcasting of the gathered information - effective and useful to the farmer.

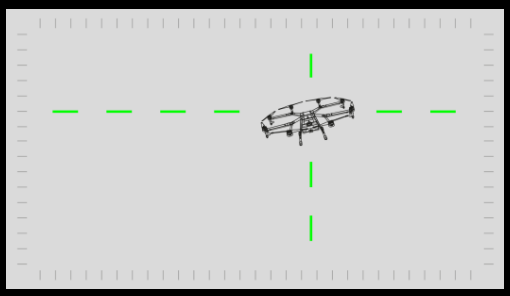
Lithium is synonymous with autonomy



Like any flying object, the drone uses its own type of "fuel." It is not gasoline, but rather rechargeable lithium polymer batteries. Used in smartphones and tablets, among other applications, lithium batteries possess a high energy density - and therefore a long life - while remaining light and

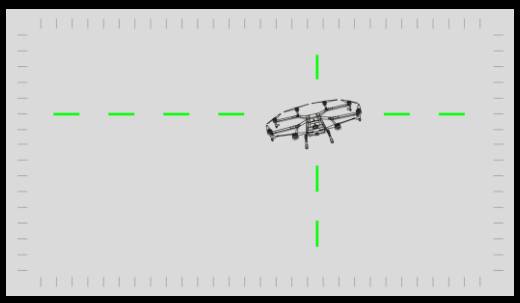
discreet. With such technology, some drones can remain airborne for up to 30 minutes.

Higher, faster ... and less dangerous



A drone has many sensors. Its speed (some go over 200 km / h, but the average peak speed is 40 to 50 km / h) is controlled by an accelerometer, while a gyroscope calculates the object's incline and stabilization. As for the altimeter, it ensures that the drone is not too high in flight. Other sensors, such as the rangefinder or 3D detection, permit assessment of the distance between the drone and the surrounding objects, as well as its movement. Safety is a major issue with the use of drones, particularly in an urban environment.

Higher, faster ... and less dangerous



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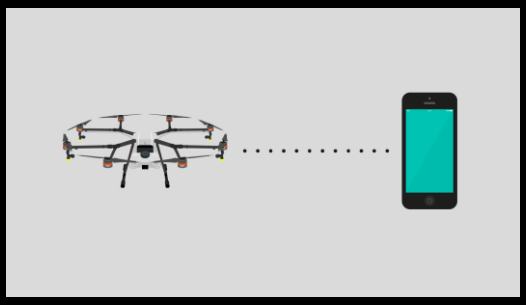
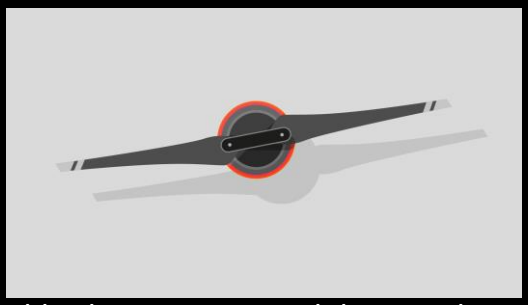
The pilot is on the ground



Although they often appear autonomous, drones are obviously nothing without their pilot on the ground, the controls in hand. The dashboard can come in two forms: a radio control similar to that of the remote-controlled cars of our childhood, or a smartphone or tablet (via an application) with a Wi-Fi or a Bluetooth connection. Even if the Wi-Fi and the Bluetooth ranges are limited to a few hundred meters, it is possible to control the target drone via radio waves, up to several kilometers.



Propulsion forces

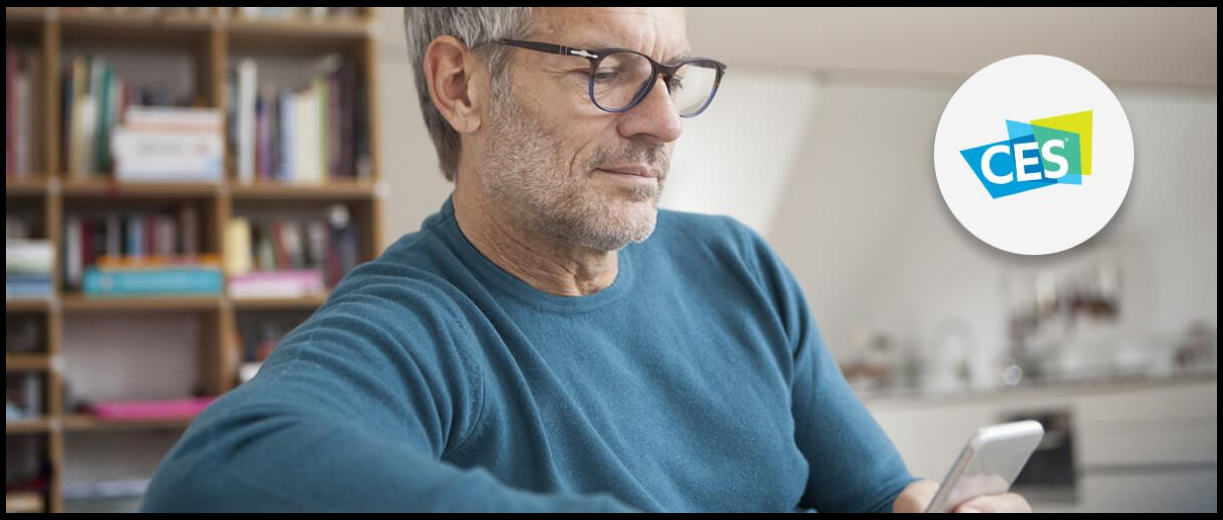
Drones are sometimes also dubbed tricopters or quadricopters, thanks to the number of their propellers. The latter type is fitted with an engine – a propulsion force, which enables the machine to lift off the ground and achieve altitudes up to several thousand meters (although the recommended maximum altitude has been set at 150 meters).

https://hellofuture.orange.com/en/ces-2018-tech-payment-card-planet/

1. Hello Future
2. Digital culture
3. CES 2018 : tech, payment card… and the planet

Digital culture | Article

CES 2018 : tech, payment card… and the planet



By Luc Bretones, 2018-01-07 - Updated on Thursday 16th of June 2022

- Bank
- CSR
- Start-up

Last part of the presentation of CES 2018 main trends, which will take place from january 9th to january 12th in Las Vegas, by Luc Bretones, vice president of the Technocentre and Orange Fab at Orange. After the empathic and sensitive domestic robots, the virtual and increased realities, the personalization of objects and the democratization of technologies and uses, zoom in on a daily and major environmental concern: the state of our batteries, and the future payment cards.

I anticipate a need for the CES of Las Vegas to settle a little more on the domains hitherto prerogatives of the MWC of Barcelona.

Whether at CES or elsewhere, at work, on holidays, on weekends, much of the conversation using our smartphones affects its energy levels. Our teens have become addicted to Wi-Fi, and thus Wi-Fi has become a basic need for physical

survival just like food and of which a layer of it has been added in the famous Maslow's hierarchy of needs.

Unfortunately, the CES2018 cannot solve this problem once and for all, but it gives us temporary solutions, up to the achievement of sustainable energy storage.

While many are waiting for the end of the era of Lithium battery technology to be ushered in by more durable and sustainable organic solutions, such as developed by the Armor Group, I think that the optimization achieved by Enevate is particularly interesting. In fact, this company has earned recognition for its development at the CES2018 show because they have introduced Lithium-ion batteries with 50% more capacity and charges 8 times faster.

In the field of business model innovation, Lancey presents the first intelligent electric radiator with integrated battery for gas-powered electric heaters based on AI.
The customer buys a powerful electric radiator at market price and **Enedis** rents the associated battery for operation.

Final connection between cloud and reality

DynamicSinc decided to expand the capabilities of the famous credit card before its likely final integration into the dominant handheld terminal and the all too likely porting of its superpowers in the cloud. Thus, the integration of function keys makes the credit card almost as smart as a smartphone – only the sound is missing. A concept that comes very close to the solution of OneWave, the card that unites them all: "OneWave allows you to leave all your cards at home to keep only one".

In the spirit of a determined move towards the Cloud, one of my favourites is definitely Shadow Blade! Virtualized in the network, always up-to-date and accessible subscription-based PC. Access is either via a box at home where you can connect the keyboard, the mouse, the screen, joysticks, RJ45 and other components via software in the PC. If you also want to make it portable now, just use the app for your smartphone and tablet. Thanks to the cloud everything is networked together and the handling is enormously simplified …

The dream is near: a raspberry pi, a screen, a good internet connection and let's go! I tested an online game on the shadow box by starting with a TV in the living room TV and then alternating seamlessly into the game on a PC and ending the game on a tablet the same way – with perfect transmission.

A pivotal year for CES?

After all these aspects, and much more, I expect a high level of innovation at the upcoming CES and a considerable acceleration in all the above areas. I also feel it is necessary for the event to increasingly focus on aspects of the MWC. Perhaps it

may be a pivotal year for the CES, especially if it fails to pinpoint the new technological paradigm that is facing us.

To see and experience the previously mentioned stuff, and much more, do not miss to go to Las Vegas from January 9th to 12th!

https://hellofuture.orange.com/en/poc-guide-choices-innovation-process/

1. Hello Future
2. Digital culture
3. POC to guide our choices in the innovation process

Digital culture | Article

POC to guide our choices in the innovation process

Tuesday 22nd of May 2018 - Updated on Thursday 17th of September 2020

- Data
- Open innovation
- Start-up

To represent a usage experience with limited low cost means, design an idea as close as possible to the reality of the final product, test and/or validate a project, open up new fields of thought, stimulate creativity, accelerate the innovation process: there are multiple benefits to POCs. Director of research at the CRG (Management Research Centre) of the Interdisciplinary Institute for Innovation (i3) of the CNRS (French National Centre for Scientific Research) and a professor at l'École Polytechnique, Christophe Midler mentions several basic rules to make good use of these "Proofs of Concept". In what context does the POC answer the problems of innovation? Should we restrict ourselves to POC?

POCs enable the provocation of "creative expansions" and extend our reflexive space by stimulating serendipity.

What is the value of POCs?

Christophe Midler. POCs have various functions. These solutions enable the testing and validation of a project, taking into account the initial specifications but also its capacity to be as representative as possible of the object that is to be produced. POCs provide the advantage of enabling the validation of certain precise aspects of the concept. It's the case, for example, of a model to evaluate the style or the functionality of a product or of devices for testing a man-machine interface, such as the simulation of voice control via a simple microphone and speaker without having to create a software program. The idea is to represent a usage experience with limited low cost means.

In what way can POCs accelerate innovation ?

C.M. They mainly enable the guiding of choices in an innovation process that is, by definition at the beginning, open to a huge field of possibilities. In this way, POCs enable us to go faster in this exploration by rapidly eliminating any dead ends.

How does this type of approach also enable to "de-risk" large innovation programmes?

C.M. Quite simply with its capacity to break down an innovation programme into subsections to each be analysed individually, and to concentrate precisely on those which pose the most problems or the most risk, be it at the level of experience, technique, or of use value…

Concretely, how can POCs impact creativity in an innovation process?

C.M. In what we call POCs, which are based on a sensitive and practical experience as opposed to for example an Excel file presenting the figures of a project, there are demonstrators that validate ideas and there are stimulators. The latter put engineers in the place of users, enabling them to escape their presuppositions and thus open up to new fields of thought. Example: some designers, experts in creativity methodologies in the upstream exploration phase, suggested the following exercise to engineers: the use of objects stimulating new experiences for these professionals such as a surface that miaows when it is stroked, showing that an object such as a mobile phone can also be considered as a stimulator of emotions, or an exoskeleton giving these young engineers the experience of the difficulties encountered by an old person… It is the provocation of "creative expansions" according to the concept developed in the C-K theory (Concept-Knowledge) at the École des Mines. These creative protocols extend our reflexive space by stimulating serendipity.

What rules must be adhered to in order to successfully carry out a POC?

C.M. Its construction must precisely answer the questions initially asked and at the same time its test protocol must be sufficiently open so as to enable this expansion or this capacity to pivot, or to open up new perspectives. It is also essential to ensure rigorous collection of information coming from a POC, as it is here that new ideas can appear.

What are the limits of this approach?

C.M. For around ten years now we have seen an increase in the use of POCs, in particular via business Innovation Labs. But amidst all these often pertinent and effective attempts, the constraints of conception have sometimes been forgotten, as well as those of regulation or simply of cost. Innovation exists only if it is undertaken end-to-end, from creativity stage to development and production. The case of the Kwid project, Renault's new low-cost car, is exemplary of this approach having succeeded at managing the innovation process in parallel from design work through to operational development.

Are there any alternatives to POC?

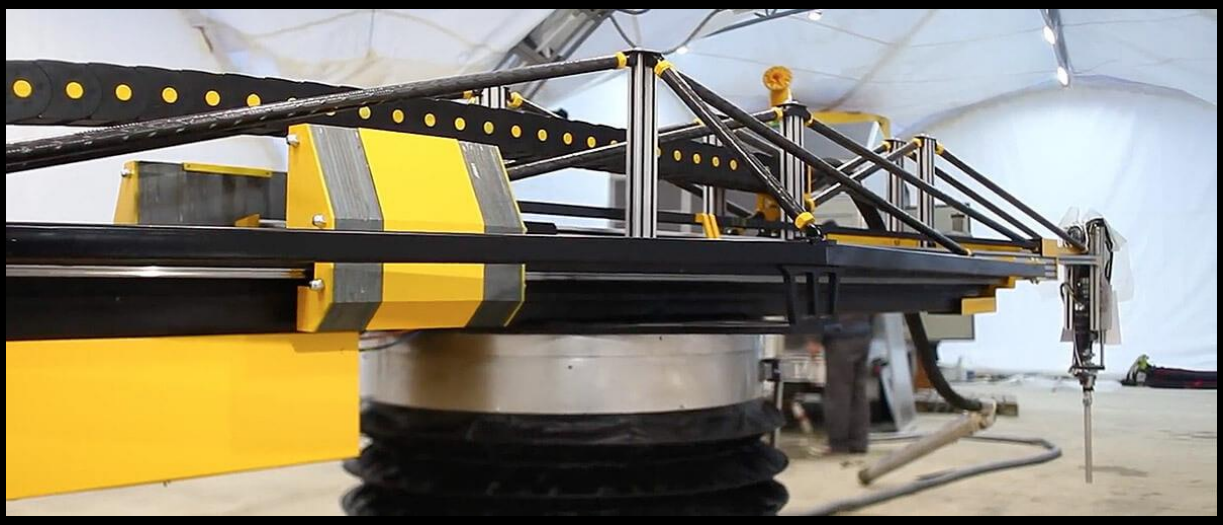
C.M. Probably the application of virtual and augmented reality. They provide another way of testing possibilities, in particular via the simulation of experience. But it is more of a complement than an alternative to POC. However, all these solutions mustn't make us lose sight of one essential reality principle: the importance of calculation and of data in every innovation process.

https://hellofuture.orange.com/en/additive-building-manufacturing-3d-printers-going-revolutionise-construction-industry/

1. Hello Future
2. Digital culture
3. Additive building manufacturing: are 3D printers going to revolutionise the construction industry?

Digital culture | Article

Additive building manufacturing: are 3D printers going to revolutionise the construction industry?



Monday 30th of July 2018 - Updated on Thursday 16th of June 2022

- CSR
- Industry
- Prospective
- Smart city
- Society

Will we soon be drawing our houses with software then printing them? The technique of 3D printing is getting a lot of press, and not just for the modelling of future buildings. Given the progress made over the past few years, this technology is changing scale as well as perspective: in the States, in Russia, but also in Nantes, giant printers are now printing entire houses. Speed, cost reduction, sustainability: this technique seems to have everything needed to face the many challenges of

construction in the 21st century. Let's take a closer look at additive building manufacturing and its amazing possibilities.

Huge first-generation printers never left the factory, and printed parts were assembled on site.

Reduced timeframes and costs

The seven to eleven months previously necessary to put up a building now seem a long way away. In the cold of the Russian winter, start-up Apis Cor managed the feat of printing a 37-square-metre house in 24 hours! Saving time as well as money: the house costs only 10,000 euros, which is roughly 270 euros per square metre – nearly six times less than the cost of traditional building which peaks at around €1,600/m^2.

https://youtu.be/xktwDfasPGQ

The basic principle is always the same: an articulated arm deposits a pasty substance (concrete or fibre composite) in layers, one on top of the other, to produce the floor and walls – and sometimes the roof too. The huge first-generation printers never left the factory, and printed parts were assembled on site. But in more recent projects, printers have been brought to the job, as with Apis Cor whose two-tonne mobile printer is capable of disposing concrete layers over a surface of 132 m^2 and up to a height of three metres.

https://youtu.be/IrNgd7IC6hw

The technique is promising for developing countries: in El Salvador where the average income per capita doesn't exceed €300 per month, NGO New Story plans to print a village of 50 houses by the end of this year. To build these 4,000-dollar houses in 24 hours their mobile printer, Vulcan, can be loaded onto a truck, uses concrete, which can be found anywhere, and operates without access to water or electricity. The technology can thus be deployed in the most remote of areas.

https://youtu.be/SvM7jFZGAec

Of course printed buildings must comply with local building standards and this restriction prevents achieving the performances of New Story or Apis Cor in every country. An example in France is that of a 95 m^2 social housing project that rose from the ground in only three days: only the walls were printed, limiting the cost reduction compared to that of a traditional build to roughly 20%. However, the building, developed by the University of Nantes, has obtained certification for complying with French building standards.

https://youtu.be/kmZvm9vuU8s

More eco-friendly houses?

The construction industry is one of the most energy-intensive sectors -accounting for 60% of raw material consumption in developed countries. Additive construction reverses this trend: the Apis Cor houses for example, require only 40% of the amount of concrete usually needed. Printing also reduces waste material because everything brought to the building site is used and no moulds are needed for pouring concrete on site.

The other issue is that of the ecological footprint of materials used for printing. In the experiments presented here, no 100% eco-friendly alloy is being offered yet – although several projects are under study. In the meantime printed materials enable the optimisation of a house's environmental efficiency. In the Nantes example, the 3D printer creates two expanding polyurethane foam panels into which concrete is poured: the foam remains in the final construction, acting as a thermal insulation. The benefit? Great freedom of shape, which enables construction that adapts to a site's constraints. For example, trees were not felled in order to build the house: rather the house stretches to go round them! And this curving of shapes also improves thermal performance: in particular by avoiding the build-up of water in right angles, also the building exceeds French thermal regulation standard RT 2012 by 40%.

Another example, the tiny kit house from Ukrainians PassivDom who assemble mixed carbon, glass and polyurethane fibre printed elements in a factory: resulting in nearly total thermal insulation. These assets are complemented with the home's smart devices: solar panels on the roof and an air humidity filter system produce energy and even drinking water, with a mobile app to keep an eye on these parameters.

Infinite customisation

Again eco-friendliness: 3D printing combined with kit house building techniques allows us to imagine buildings that can be disassembled and reassembled over and over, providing the possibility to build houses from the waste material of older buildings. This is the concept put forward by design firm Arup and CLS Architects at the latest Milan Salone des Mobile design festival, with a house made up of 35 printed modules to be disassembled and reassembled in a different location and a different form after the exhibition.

To create the house of your dreams with pre-set shapes and volumes… or even create your own 3D: this is what additive building manufacturing software enables us to imagine. PassivDom, for example, offers a range of standard models that can be delivered within 24 hours, but also offers the client the possibility to customise their house – extending delivery time by a few months.

https://hellofuture.orange.com/en/ai-reduce-human-error-rate/

1. Hello Future
2. Artificial intelligence
3. Decision making: AI can reduce rates of human errors

Artificial intelligence | Article | Discover

Decision making: AI can reduce rates of human errors

Shot of a young woman looking stressed while using a laptop to work from home

Monday 15th of October 2018 - Updated on Tuesday 5th of March 2024

- Digital
- Human sciences
- IoT
- Networks
- Technology

● When making decisions, human beings can draw on support from algorithms to reduce the risk of making mistakes in their interaction with machines. However, they should always retain control over final decisions.
● Artificial intelligence, based on neural networks and machine learning, has the potential for the real-time resolution of problems that cannot be detected by the human brain.
● We talk to experts like the co-inventor of Siri, Luc and Jean-Gabriel Ganascia (French National Centre for Scientific Research) about how we should approach the interaction between humans and complex systems.

AI is not the equal of man, who is capable of imagining and successfully carrying out an emergency landing on the Hudson River.

Human error can have disastrous consequences ranging from production slowdowns to physical injuries at critical production sites or serious medical errors. And mistakes in health care are not only harmful to patients, they also affect the lives of medical professionals, who are often wracked by guilt and other negative feelings, creating a vicious circle in which further errors are more likely to occur. Machine learning models trained on critical data, like the one evaluated last year by BMC Health Services Research, can accompany health professionals taking decisions about medication for elderly patients, and improve precision screening for errors in neo-natal intensive care units. However, notwithstanding the positive results demonstrated by these promising systems, the WHO has cautioned against a rush to automate decision making, which could potentially increase the number of medical errors and undermine confidence in artificial intelligence.

"Errare humanum est", Jean-Gabriel Ganascia reminds us with a smile, when we mention using artificial intelligence (AI) to eliminate errors in the interaction between humans and complex systems. Algorithms are written by humans, who are fallible, so they may introduce errors or sources of errors into programming, emphasizes the AI expert and president of the CNRS (French National Centre for Scientific Research) ethics committee. Relying on AI to eliminate errors means taking the risk of seeing the AI make other mistakes, in good faith, you might say. A good example of this was the accident caused by an Uber autonomous car in March 2018, recalls Jean-Gabriel Ganascia. "***The AI was not faulty, the programme worked perfectly,***" points out the expert, who adds that the self-driving vehicle had been programmed to take into account cyclists and pedestrians but not a pedestrian pushing a bicycle. It had also been trained to ignore extraneous phenomena such as plastic bags flying into its path, which would otherwise cause it to stop unexpectedly. So, the model complied perfectly with instructions it had been given. The error did not come from the machine, but from the programmers who didn't comprehensively describe all the possible hazards in this situation.

There is no intelligence in AI, Luc Julia says provocatively, but there is knowledge – of data and of rules – and there is recognition.

Augmented intelligence

The story has the merit of throwing into question the notion of error in relations between humans and complex systems. *"Machines don't invent anything; what they produce comes solely from the data we put into them,"* points out Luc Julia, the co-inventor of Apple's virtual assistant, Siri, and the current Chief Scientific Officer of Renault, who published *L'intelligence artificielle n'existe pas* ("Artificial Intelligence Does Not Exist") in late 2019. *"There is no intelligence in AI,"* he says provocatively, *"but knowledge of data and rules – and recognition."* Instead, we should be talking

about *“augmented human intelligence”,* which will draw on resources that we cannot mobilise with the same power as machines”, says Luc Julia, citing AlphaGo, the first ever programme to defeat a Go world champion. *“Augmenting human intelligence will enable us to limit the margin for error in areas like driving, medical diagnostics and the operation of electronics, three major areas of application in which AI is used to track down errors.”* Luc Julia is not the only thinker to highlight the role of artificial intelligence as a means to circumvent human miscalculations, French computer scientist and philosopher, Jean-Gabriel Ganascia has also pointed out that the systematic nature of AI, combined with its computing power, can compensate for human shortcomings in areas *“where humans may fail, because they are subject to stress and moods, whereas AI is not.”* In an article published by the journal *Nuclear Engineering and Technology* in February 2023*,* American researchers documented how they trained generative adversarial networks – unsupervised machine-learning algorithms – to detect mismatches between automatically recorded sensor data and manually collected surveillance data in a nuclear power plant. The results of their study were unequivocal: the new tool improved both the detection of anomalies and human errors.

Different kinds of errors

However, all the experts are keen to emphasise that although AI can provide valuable help in controlling of complex systems, like modern aircraft, it should not be considered to be the equal of trained humans, who may be required to respond to unforeseen situations. In 2009, an incident in which the pilots of an Airbus 320 were forced to make an emergency landing on the Hudson River is an apt illustration of this point. The quickfire decision to bring down their crippled aircraft next to Manhattan, which they succeeded in doing without any loss of life, not only won them admiration of the world, it also provided a telling reminder of the primacy of humans over machines.

“Without replacing humans, or completely eliminating human error, *AI can act as a limiting force. It all depends on the nature of the errors involved,”* points out Célestin Sedogbo, the director of research laboratory on cognition and a specialist in language processing at ENSC-Bordeaux. When human error stems from a lack of knowledge, cognitive enhancement offered by AI can inform an operator with a step-by-step guide to necessary procedure. The “tunnel vision” effect is another type of error studied by Célestin Sedogbo’s research institute. It can happen that “*an experienced and perfectly competent pilot, who is busy with a particular problem, does not hear the landing gear extension instruction,*” points out Sedogbo who works with Thales, *“because his or her attention is focused in a tunnel.”* In such cases, a second audio alert may also be ignored.

To get around this problem, the solution is to call on a mirror-neuron reflex, which operates on the principle that observation of a behaviour will cause others to imitate it, rather like the sight of someone yawning causing other people to yawn. The

programme deployed by the AI will show the distracted pilot a video of another pilot extending aircraft landing gear, which will break through the tunnel vision effect and cause him or her to initiate the necessary procedure.

Biased and unfair algorithms

Cultural biases and prejudices that distort judgement and influence decisions are another common type of human error. “In such cases,” explains Gaël Varoquaux, a researcher at Inria Saclay, “AI will only be able to identify and correct biases if they have been described and incorporated into algorithms. Citing the recidivism prediction software used in American prisons, which has been shown to be unfavourable to black convicts by a ProPublica study, Varoquaux explains that there is no such thing as a neutral algorithm: if we don’t rectify biases in data submitted to AIs, then these tools will reproduce them. “AI will not correct human errors in such cases, it will just learn to imitate them.”

Read more :

Human Error Drives Most Cyber Incidents. Could AI Help?

1. Hello Future
2. Artificial intelligence
3. Humanisation of AI is not limitless

Artificial intelligence | Article

Humanisation of AI is not limitless

https://hellofuture.orange.com/en/humanisation-ai-not-limitless/
Monday 15th of October 2018 - Updated on Thursday 17th of September 2020

- Algorithm
- Data
- Digital
- Human sciences

Algorithms can endeavour to take emotions and feelings into account so as to better understand users' needs, but the humanised robot remains a mirage.

"*We want machines to be inhuman in order to be more reliable…*" Jean-Gabriel Ganascia, artificial intelligence researcher and President of the CNRS ethics committee, is amused by the paradox. In effect, it is with the aim of improving interactions between humans and machines that various labs are attempting to integrate strictly human characteristics into AI: positive ones such as creativity, or less flattering ones like lying, fear, or transgression. Up until now, machines were programmed to mimic the components of human intelligence in order to reproduce processes. The next stage concerns the "theory of mind", one of the four types of artificial intelligence described by Arend Hintze of the University of Michigan.
The professor of integrative biology & computer science and engineering claims that in the future algorithms will be capable of understanding and ranking the emotions that influence human behaviour.

Monitoring of the pilot

This consideration by AI of the human factor is of interest to various industry and service sectors. Aeronautics for example, where the improvement of interactions between a pilot and an expert system could find truly practical applications.
Informed by a set of sensors collecting data on the psychological and emotional state of the pilot – blood pressure, heart rate, eye jerks, stress – a programme can grasp emotions and suggest adapted solutions. That's the objective of the "Man Machine Teaming" programme launched by Thales and Dassault at the end of 2017,

which aims to improve the man-machine relationship by keeping the human permanently in the decision loop.

Emotion detection and establishment of exchanges between the human and the machine that take these emotions into consideration are one aspect of affective computing, studied notably at the LIMSI-CNRS. Imitation of an emotion by a machine that will talk to a human is another aspect of this branch of artificial intelligence. "Fake empathy", simulated empathy that will be activated in particular in robots, such as Nao and Paro, is an application of this affective computing. Capable of detecting tone of voice or a smile on the face of its interlocutor, Nao is a humanoid that can adapt its responses to emotions. It is used in certain retirement homes and in institutions receiving autistic children. As for Paro, he takes on the appearance of a seal. Originally developed to assist patients with Alzheimer's disease, this robot that is fed with affective computing is capable of communicating emotions such as joy, surprise, or discontent. Joy, fear, anger, the emotions processed by AI remain basic in comparison with the complexity of the human psyche, which very often combines emotions like fear and relief. To refine their perception, researchers multiply the ways of informing algorithms. By combining for example information from sensors, which grasp signs that are not always easy to interpret, with information from behavioural descriptions, or "psychological templates".

A moral AI

The journey will be a long one before it's possible to claim to have put human subtleties into an equation. "*Machines are light-years from grasping our affects*" stated Laurence Devillers, a researcher at the Limsi, in August 2018: "*there is a complexity of mixtures of emotions in real life. We are rarely furiously angry, extremely sad, deliriously happy, but often in a mixture of fear, relief, amusement, and anger. Because context plays a major role.*"

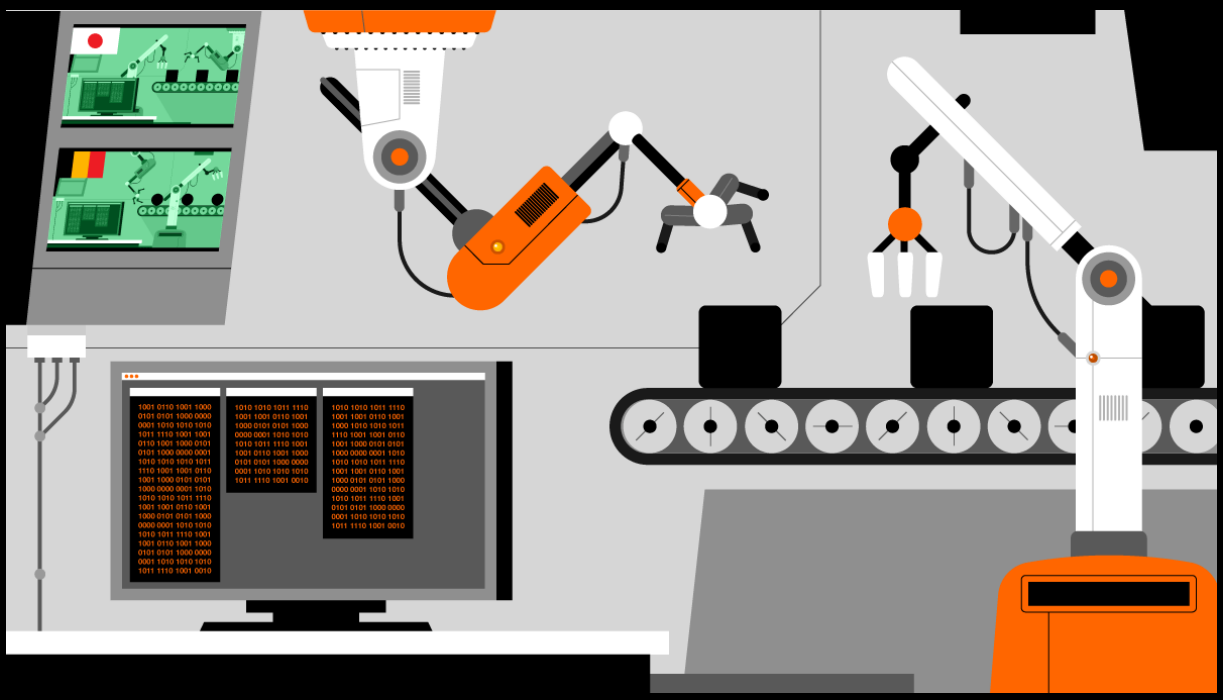
After having mimicked cognitive mechanisms then modestly started to integrate affective elements, will AI one day have to access consciousness and be endowed with moral values? Some American researchers are toying with this idea, Jean-Gabriel Ganascia informs us, but he doesn't share this vision: "*moral values are of a prescriptive nature not a descriptive one*". Without going as far as attempting to give algorithms a conscience, talking about therapeutic robots used with patients Laurence Devillers says she is "*convinced that tomorrow our machines will have to have a "moral" dimension*".

https://hellofuture.orange.com/en/blockchain-facilitating-secure-sharing-data-among-robots/

1. Hello Future
2. Data
3. Blockchain: facilitating secure sharing of data among robots

Data | Article

Blockchain: facilitating secure sharing of data among robots



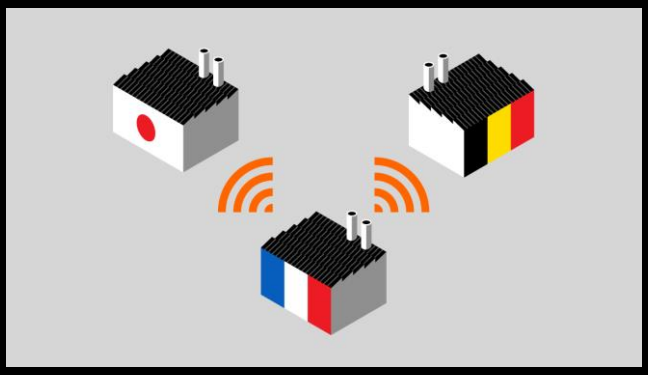
Tuesday 13th of November 2018 - Updated on Thursday 16th of June 2022

- Blockchain
- Cybersecurity
- Data
- Digital
- Robotic

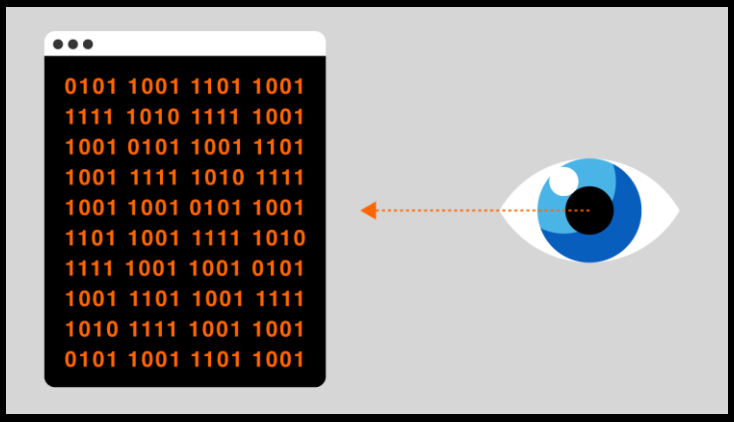
In the era of the fourth industrial revolution, everything is connected and data is decentralised.

During the Salon AI Paris in June 2018, smart robot expert AKEOPLUS and the French Alternative Energies and Atomic Energy Commission (CEA) of Grenoble

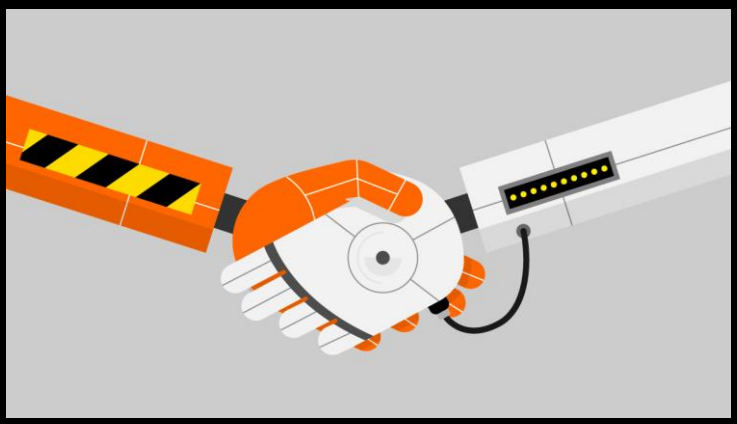
presented a research project that should enable artificial intelligences which control robots to share data via a blockchain.



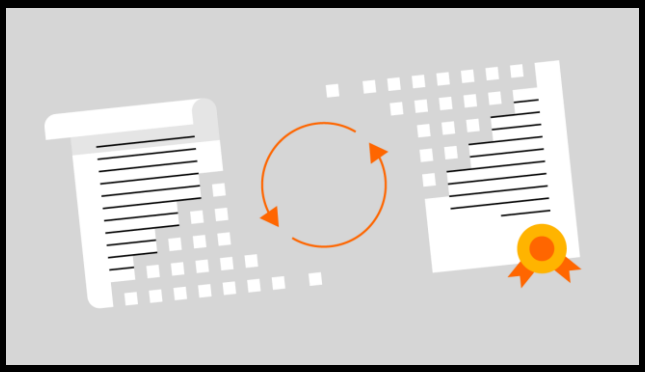
À l'heure de la quatrième révolution industrielle, tout est connecté et les données sont décentralisées.



Smart robots are equipped with sensors whose signals are treated by an artificial intelligence. The AI aggregates the data, which is then stored in a blockchain. Ethereum has been chosen for now because it is the most advanced open source solution in terms of development tools.



Edge computing enables robots on the same assembly line to shared data among themselves.



Thanks to blockchain, smart contracts are created to manage the supply chain. Furthermore, data transmission between different entities happens via a secure chain.

In the era of the fourth industrial revolution, everything is connected and data is decentralised. This means that on a supply chain involving several players all generating data, the question will be raised as to the origin of the data used by the artificial intelligences to make decisions. Especially if they are incorrect or if there is a problem on the supply chain.

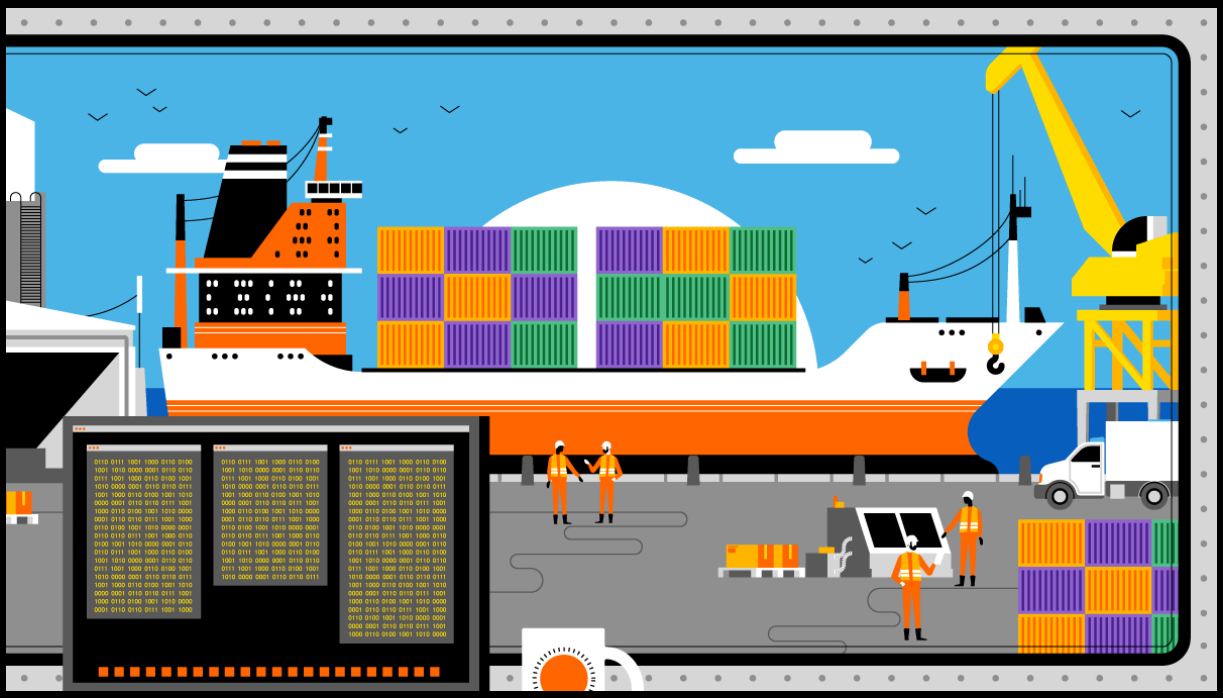
The AKEOPLUS and CEA Grenoble research project is thus first looking to provide visibility and traceability of decisions made by the artificial intelligences, be this for legal or for contractual reasons. It also aims to automate and streamline the transfer of contracts within the supply chain thanks to blockchain, particularly for maintenance, as the robots will be able to order their own spare parts. What's more, it may be possible for the platform to be applied to other use cases, such as the collaboration of multi-agent robots within a factory, or even in other sectors. The research programme will run for three years, and a first proof of concept will be carried out at the end of 2018 in conjunction with leading French industrialists.

https://hellofuture.orange.com/en/blockchain-improving-efficiency-maritime-trade-supply-chain/

1. Hello Future
2. Data
3. Blockchain: improving the efficiency of the maritime trade supply chain

Data | Article

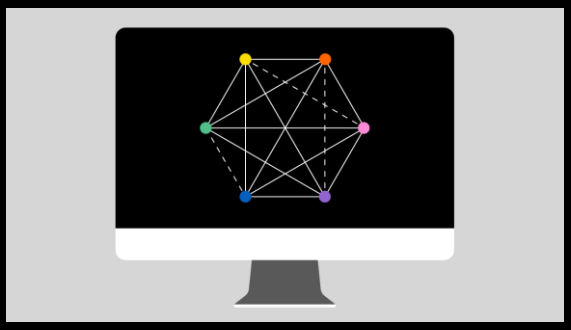
Blockchain: improving the efficiency of the maritime trade supply chain



Monday 19th of November 2018 - Updated on Thursday 17th of September 2020

- Blockchain
- Data
- Digital
- Open source

An open source digitalisation platform based on blockchain for improving the efficiency of the maritime trade supply chain.



The permissioned blockchain platform, built thanks to the Linux Foundation's Hyperledger Fabric 1.0 open source solution, is aimed at the entire maritime trade ecosystem. This includes exporters, freight forwarders, transport managers, ports and terminals, importers, customs and authorities, maritime carriers, and banks.

All of the cargo administration is carried out using the blockchain tool. Within this, the various stakeholders thus deposit and retrieve signatures, authorisations, information, and invoices in a transparent and hyper secure way.

The blockchain solution comprises a virtual dashboard providing access to the information about cargoes and their transport, transparency and management systems for the various stakeholders, and smart contracts that run automatically when pre-established conditions are fulfilled.

Complementary technologies – artificial intelligence, Internet of Things (IoT), analytical facilities – are installed on the loading docks to enable tracking of cargoes in real time. These are open

source technologies hosted in the cloud that transmit data continuously to the blockchain platform.

IBM and Maersk, the largest container shipping company in the world, decided in January 2018 to create an open source digitalisation platform based on blockchain, so as to improve the efficiency of the maritime trade supply chain. Today, 90% of world trade is conducted using maritime transport, which equates to 4 billion dollars of goods per year. As this supply chain is managed via a paper system, the more commercial trade develops, the more the cost and complexity of its administration also increase. Costs linked to an administrative management system should soon reach 20% of the cost of the actual physical transport. A striking example is that of the transport of avocados between Mombasa in Kenya and Rotterdam in the Netherlands, which can take up to 34 days, 14 of which are due to the time needed for the port authorities to obtain governmental authorisations. Replacing the current paper system by a digitalisation platform based on blockchain technology would therefore make it possible to reduce costs, improve efficiency, transparency, simplicity, and security, as well as reduce the barriers of the logistics chain. According to the WEF (World Economic Forum), this last point could lead to an increase in world trade of 15%, thus revitalising world economies and creating employment. Following a first successful test in March, the platform should be rolled out to all of Maersk's activities by the end of 2018.