

What can Industry 5.0 do for you?

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In 1961, U.S. President J.F. Kennedy provocatively launched *"Ask not what your country can do for you - ask what you can do for your country."*¹ In 2021, the European Commission is ramping up the "Industry5.0" initiative in the continuity of Industry 4.0 launched by Germany in 2011. To follow the metaphor, Industry 5.0 asks the technologic question in these terms: *"Ask not what you can do with the technology - ask what the technology can do for you"*. This way of looking at the place of technology in the industry changes everything from the point of view of industry operators, and for innovative solution providers.

For SIMSOFT INDUSTRY, this way of working with industry to implement Smart Voice Assistance solutions operational at workstations is a natural part of the company's approach: we'll see why and how.

How did we get to this point?

It was at the Hannover fair in 2011 that Germany began to speak openly about its national "Industry 4.0" initiative, at the time of the rise of new information technologies. The objective for Germany is clear: as the leader in machine tools in Europe and the world, it was urgent that the machines be designed, collect massive data, react in real time to a default, adapt to short-term production on consumer demands. The example of the automotive sector is the most obvious: production with a tense flow, drastic reduction of inventories, maximum adaptation according to the customer's demand. The limit of this model is felt today with the crisis of electronic chips²: no more stock, supply crisis, decrease in production.

In France, the idea was revived in 2016 with the concept of "industry of the future". This concept takes up all the ideas of Industry 4.0: digitalization of the industry, robotics, interconnection of machines, boom of the internal of objects (IoT). The themes covered by

¹ <https://www.jfklibrary.org/>

² <https://www.bfmtv.com/economie/tout-comprendre-pourquoi-la-penurie-des-puces-electroniques>

the "Industry of the Future" plan are clear³: Data Economy, Intelligent Objects, Digital Confidence, Smart Food, New Resources, Sustainable City, Ecological Mobility, Medicine of the Future, Transportation of tomorrow. The place of the men and women of the industry is the great absent from this ambitious plan.

We can also regret the idea of "future" carried by the French plan, which seems to promote the desire to delay the rapid transformation of the industry necessary to maintain the competitiveness of the companies.

It is only in 2018 with the creation of the Industry of the Future Alliance that the place of the human in this new industry and its organization is timidly introduced in France⁴. The theme "*New human approach to work/innovative organisation and management*" is emerging around the technological concerns already exposed.

Delays in the awareness of the importance of women and men in the industrial performance, the preparation of the industrial future by forgetting the urgency of the necessary transformation bring the genes of the failures and slowness of operational digitalization observed in the industry in recent years in Europe, but especially in France.

Why is it serious?

This is serious, because both Industry 4.0 and the industry of the future promote a purely technological model to complex human organizations. However, the company like society in general, is first and foremost made up of a group of women and men who organize themselves to produce a good or a service. Today, by wanting to place digital technology on human organizations without taking special precautions, a rejection of the proposed technologies is not uncommon. The subject of the rejection of digitalization in business is no longer a taboo⁵, but it must necessarily call into question the current approach proposed by the industry 4.0.

If a certain segment of the industry is at odds with the rest of the organization, the effectiveness of the productive system is penalized in all the way. If the investments made by manufacturers in their digitalization process do not yield the expected benefits, their productivity and competitiveness are reduced.

Finally, European industry (unlike others) is facing challenges that are not only technologised: the low attractiveness of industrial functions in general, and the ageing of the workforce in the industry. According to an IFOP survey conducted in France 2018⁶, less than 50% of the population surveyed is attracted by the trades of the industry. At the same time, the participation rate of 50–64-year-old rose from 11% to 33% between 2000 and 2018⁷, as a sign of an ageing labour force in France. This trend is similar in Germany, although the vision of industry and associated trades may be different in this country. Those who have already attended the fair in Hannover⁸ have seen the number of school groups visiting this industrial fair.

³ <https://www.economie.gouv.fr/files/files/PDF/dp-indus-futur-2016.pdf>

⁴ http://www.industrie-dufutur.org/content/uploads/2018/03/Guide-des-Technologies_2018_V3.pdf

⁵ <https://www.lesechos.fr/idees-debats/leadership-management/transformation-numerique-Organizations>

⁶ https://www.ifop.com/wp-content/uploads/2018/03/2409-1-study_file.pdf

⁷ <http://www.senat.fr/rap/r18-749/r18-7492.html>

⁸ <https://www.hannovermesse.de/en/>

The industry in France and Europe is therefore faced with a dilemma. The digital transformation of the means of production must be intensified rapidly in order to meet the challenges of global competitiveness. But this transformation will only be a success if the membership of the active population (acceptability) has been achieved, as well as the one of the future (attractiveness). The current version of the "Industry 4.0" plans does not fully resolve this dilemma. To succeed, it is therefore necessary to define a more social and human vision of the industrial transformation under way.

In France, the industrial competitiveness cluster EMC2⁹ understood this issue and sounded the alarm in 2020¹⁰ about the need to review this part of the industrial roadmap with the promotion of the place of humans in industry and for an eco-responsible industry.

The response from the Industry 5.0

In January 2021, the European Directorate-General for Research and Innovation updated its industrial strategy for the coming years¹¹. This document gives a definition of the role of the industrial organizations in the European society, as a factor of integration with current societal and environmental issues. This concept "Industry 5.0" does not come as opposed to the version 4.0, but in addition. Industry 5.0 also deals with the "societal" and "environmental" aspects impacted by industrial development in Europe. These topics are not the expertise of SIMSOFT INDUSTRY and are therefore not commented further.

Quote of the document: *"Rather than looking at emerging technology as a starting point and examining its potential to improve efficiency over the process, a human-centered approach to industry places the basic needs and interests of men and women at the heart of the production process. Rather than asking what we can do with the new technology, let's ask ourselves what technology can do for us. Rather than asking the industry worker to adapt their skills to the needs of rapidly evolving technology, we want to use technology to tailor the production process to the needs of workers, e.g. to guide and train them."*¹² »

This evolution of the role of the industry in the society proposed by Industry 5.0 therefore consists in considering that the technology being implemented to promote industrial competitiveness must above all be at the service of the women and men of the industry, rather than the other way around. This means that the technology deployed in the industry must adapt to the needs and diversity of operators, instead of requiring the operators to continually adapt to the technology. This new vision of integrating technological innovations into the human environment of the industry must aim for more self-sustaining work and greater professional development of technicians and field workers. To achieve this, they must therefore be closely associated with the design and deployment of the proposed new industrial technologies.

In the wake of this European vision, the *EIT Manufacturing*¹³ in charge of part of its operational implementation for the field of manufacturing production, defines eight fundamental pillars.

⁹ <https://www.pole-emc2.fr/soutenez-industrie-eco-responsable/>

¹⁰ <https://www.pole-emc2.fr/app/uploads/2020/06/Manifeste-IndusEcoResp-04juin20.pdf>

¹¹ https://ec.europa.eu/info/publications_en

¹² https://ec.europa.eu/info/publications/industry-50_en

¹³ <https://eitmanufacturing.eu/>

The point of view is resolutely user-centric, and considers in the first place the needs and expectations of operators¹⁴:

- super strong: for which operations an operator should have an exoskeleton,
- increased: what operational or training needs augmented reality meets,
- virtual: what is the place of virtual reality in an operator's tasks,
- healthy: on-board health sensors to promote health at work,
- Intelligent: what are the useful and usable functions of an intelligent personal assistant for an operator working in an industrial environment,
- collaborative: how to help an operator with collaborative robots,
- social networks: do professional social networks be useful for operators,
- analytics: how an operator can benefit from Big-Data.

With this proposal, the human is returning to the center of the decision-making process, the technology maximizes the benefits it can derive from a personal point of view and for the development of its professional skills. The benefits for the organization (the company) will follow.

Two points are necessary at this stage. SIMSOFT INDUSTRY's "user-centric" strategy and intelligent voice assistance technology are fully part of this approach. In addition, the intelligent voice assistants developed by the company¹⁵ constitute a pillar of the acceptance of new technologies by men and women in the industry.¹⁶ The intelligent personal assistant of the industrial technician, as in our everyday lives with Alexa, Google Home, Siri or Xiaomi, becomes a privileged and simple interface with a more and more complex digital environment.

Spix: a Smart Voice Assistant for the industry

SIMSOFT INDUSTRY is developing "Spix", a Vocal Intelligent Assistant for the industry. According to a German study, Spix is the only European intelligent voice assistant 100% dedicated to technicians and operators in the industry¹⁷. This Industrial Vocal Assistant is accompanied by a "user-centric" work program "*Spixify Your Industry*"¹⁸.

The "Spix" Intelligent Vocal Assistant brings together a set of integrated technological bricks (speech recognition and speech synthesis, multimodal and natural language dialog functions, business knowledge database) capable of integrating into an industrial process and an existing software application for production or maintenance. For example, Spix naturally integrates into software solutions like IBM Maximo¹⁹, Delmia Apriso²⁰, Infor²¹, IFS²² or other proprietary solutions. The objective of this technology is of course to enable industry technicians to benefit from the power of voice in their digital business tools, but above all to provide them with operational assistance in carrying out their work tasks.

The "Spixify Your Industry" program is to define with operators and end-users of industrial vocal assistance, a solution adapted according to all their constraints and expectations. The

¹⁴ https://www.researchgate.net/Towards_an_Operator_40_Typology_A_Human_Centric_Perspective

¹⁵ <https://www.simsoft-industry.com/assistant-vocal-intelligent-pour-industrie/>

¹⁶ <https://www.simsoft-industry.com/blog-acceptabilite-operateur/>

¹⁷ <https://ipri-institute.com/presse-meldungen> (feb 20)

¹⁸ <https://www.simsoft-industry.com/transformation-digitale-industrielle-assistant-vocal/>

¹⁹ <https://www.ibm.com/fr-fr/products/maximo>

²⁰ <https://www.3ds.com/fr/produits-et-services/delmia-aprison/>

²¹ <https://www.infor.com/fr-fr>

²² <https://www.ifs.com/fr/>

constraints can be physical (*it's complicated to carry a tablet*), sociological (*I cannot type a text to define a defect*), or environmental (*I'm mobile, there is noise next to me*). Expectations can be diverse, and often related to work comfort, both physical (*I don't want to turn to a screen all the time*), intellectual (*I in panic mode in front of complex software*), or business (*I want to focus on my work, on my expertise*).

The idea of this disruptive innovation is to radically change the user experience of industry technicians and reconcile them with their digital environment by integrating voice and intelligent business support to truly succeed in the digital transformation underway in the industry. This innovation and its implementation in an industrial environment meets the expectations and prospects of the industry 5.0.

Why this Smart Voice Assistant meets expectations of industry 5.0

Unlike a consumer voice assistant, an Industrial Vocal Assistant meets the operational needs of a technician in a work situation but will not provide the weather or the distance between Paris and New-York. In the complex digital environment of the industry, the technician needs help because:

- He has to carry out more and more complex tasks without making mistakes,
- The instructions for his work work voucher are long and difficult to understand,
- The instructions change constantly, adapt according to the demand,
- His hands are busy carrying out his tasks,
- It needs to quickly access an increasingly voluminous and varied documentation,
- He is having problems on the ground that he needs to solve,
- He uses software that has not been thought of according to his work situation.

To be consistent with the expectations of an "industry 5.0" more attentive to the needs and constraints of the industrial user, in this case a technician, a quality controller, a field inspector, the expected benefits must be studied from the point of view of the worker first and then from the point of view of the organization. The bet made here is to say that if the use of an Intelligent Vocal Assistant in an industrial work situation responds to an operator's request, removes an inconvenience at work, or eliminates a difficulty, then the company as organization will benefit from it for its operation, and get the associated gains.

Thus, the benefits expected by the use of Smart Voice Assistance solutions by operators and technicians in the industry are categorized into two categories: the benefits for the operator himself, the benefits for the organization. Operational implementation can only be done if the first category is covered; the second category stems from the first.

- **Earnings for operators and field technicians**
RECONCILING WITH YOUR COMPANY'S DIGITAL STRATEGY
 - Working hands-free, safe at work
 - Focus on high-value business tasks
 - Simplify the use of MES-type digital tools and MMS
 - Fluidize its interactions with other technologies: VR, AR, Cobots, ...
 - Avoid wearing digital tablet or smartphone-type devices
- Earnings for industrial organisation
WINNING THE BET OF THE INDUSTRIAL DIGITAL TRANSFORMATION

- Maximising the use of digital technology by field technicians
- Increase the use of tablets and smartphones already made available
- Collect more structured field data for Big-Data analysis
- Improve real-time knowledge of field operating conditions
- Maximizing the return on investments already made in digital tools

Without the full support of women and men in field operation, none of these benefits can be maximized. Membership is "won" by taking into account their concerns, expectations, and constraints. Let's take one last example:

- Need: Filling out an intervention report or quality control form on a smartphone with safety gloves is not easy. Reports of this type are often incomplete or non-existent.
- Answer: Complete an intervention report or make a defect classification by voice without touching the smartphone removes a thorn in the technician's foot: it's simple and he can keep his gloves safe. More comprehensive and structured reports can be generated and allow for a more detailed analysis of the associated production processes, in real time.

Conclusion

Many technologies have reached a level of technological maturity sufficient to consider their operational use in the industry. It is now necessary to consider their level of human maturity on a *Human Readiness Level* (HRL²³) scale to ensure their usefulness and usability by an operator in a working situation.

SIMSOFIT INDUSTRY's "Spixify Your Industry" approach is constantly in the position of asking technicians in the industry what its Spix Vocal Intelligent Assistant could do for them, operationally. The company's latest industrial successes support this approach.

About SIMSOFT INDUSTRY (www.simsoft-industry.com and www.spix.ai)

SIMSOFIT INDUSTRY develops the first 100% Intelligent Vocal Assistant dedicated to Industry 4.0 technicians. The **SPIX** intelligent voice assistant is operational under industrial conditions. SIMSOFT INDUSTRY's "*Spixify Your Industry*" program puts men and women back at the heart of industrial production with assistants specializing in operator voice guidance, measurement, quality control, and hot structuring of their feedback.

SPIX is a registered trademark and model of SIMSOFT INDUSTRY (INPI Ref: 19 4 528 622 and 19 4 528 627)

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²³ <https://www.researchgate.net/publication/277765588>