(Strategic) Foresight: an help for decision making tomorrow… and for OSH today

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Sommaire

Why implement foresight?

Why and what implement (strategic) foresight at INRS?

- Originally, a demand from our Board of Directors
  - By watching of our environment: To detect emerging signals that could have a significant impact on occupational and safety health (OSH) in the coming years, such as new technologies, new work organisations, new diseases, etc.
  - Through foresight: To have a vision of the main transformations occuring in work and employment that can be imagined by 2025 or 2035, and their impacts in terms of OSH

- The aim is to help the Board to define the main priorities for our Institute in the medium term:
  - Respective importance of the different domains in which we are involved (for example, industry vs tertiary activities, occupational diseases vs accidents, etc.)
  - Means of intervention (research, assistance, editorial policy, training, etc.)

Foresight is not forecasting

- In foresight, we do not pretend to describe the future and the way things will happen

- We only give elements which can help decision-makers to define a policy

- If scenarios are drafted, it is only in the aim of making things more concrete and more understandable

- Scenarios are not mandatory: The results of some foresight works are given in the form of stakes

Connections between watching and foresight

- A major share of OSH experts time is dedicated to looking for emerging signals of possible transformations of work and occupational risks in the years to come

- It is a tough, time-consuming task which does not always take enough account of the complexity of situations and the interferences between different (and complementary) scientific disciplines

- Foresight can provide help in watching for emerging signals, providing an overall (multidisciplinary) vision of the main stakes which are likely to become important in OSH in the coming years.

- Some examples are given at the end of the document.

Foresight methods

In foresight, why are time frames so distant?

- Most (not all) experts take a conservative view of the future: it is easier for them to consider that the future will be in the continuity of the present than for them to imagine significant breaks with it

- Placing time frames at a distance can set them more free: the fear of being considered ridiculous may decrease if you are asked to consider the situation in 2030 or 2040 (a date when you are not likely to work anymore)

- When experts do imagine breaks, translating them into consequences in work organisation or into consequences on workers' activity is a very hard task: It requires them to go beyond their area of knowledge

- This makes most (not all) of them uncomfortable: They consider that it may depreciate the value of their usual work

→ Imagining breaks and their consequences is a very hard task

Teams constituted for foresight must be pluridisciplinary

- OSH problems (and solutions) are complex and cooperation between disciplines is required in most cases: Greater focus on real work than on preassigned work

- Being in a group with fellow workers of other disciplines broadens points of view and greatly reduces pressure

- Foresight in OSH is not only the private ground of specialists, it must associate companies and the civil society: Firms (various functions from engineering or manufacturing to OSH specialists), trade unions, employer's associations, elected representatives (lawmakers, mayors), writers (not only science fiction!), etc.

- Using for a foresight exercise a group formerly constituted for a previous task in the domain considered is not a good idea: Occupying the floor will be less free if many people know each other and the angle from which one speaks

Specifications for a foresight exercise at INRS

- Two requirements:
  - The work must not only associate different disciplines but also different jobs inside the institute: scientists (hard and human sciences) and lawyers, physicians, etc., according to needs
  - It is an opportunity to strengthen the relationships with usual (or not so usual) partners intervening in the field of OSH in France: All our exercises have been built with institutes directly or indirectly interested by OSH
  - (We carry out exercises in the framework of several partnerships with foreign institutes: Issa, Suva, and we participate in exercises led by other institutes: EU-OSHA, Anses (F), Inail (I), HSL (UK), DGUV (D))
  - Public presentation of results (from 90 to 350 participants)

Steps for a foresight exercise (1)

1. The question of partnerships is essential: The competences and focuses of partners influence the content of the exercise, since the final product must focus with OSH considerations

   A balance has to be found between a sufficiently precise overall description of possible futures and the specific part of the scenarios that deal with the development of risks and OSH policies, which remains the core of the work

   This focus on OSH should not distort the choices made for building the different scenarios, even though one must never lose sight that the final objective is to brainstorm on OSH

   → Constitution of the project group

2. Analysis of the subject treated: Determining the different variables that have had a significant influence on the evolution of the subject treated during the past years (from the bibliography, interviews, etc.)

   Each variable should be independent from others: no interference

Steps for a foresight exercise (2)

3. The wording of these variables:

  - Which notions does the variable include?
  - How have these notions evolved over the past 10 or 20 years (a duration equivalent to that lasting till the end of the period considered in the foresight exercise)?
  - How might these notions develop by the end of the period considered?
    - Continuity
    - Emerging trends
    - Technological, social or economical disruptions
    - Etc.
  - Main hypotheses: What are the different and likely possibilities of evolution of the different variables by the end of the period considered in the foresight exercise?

For this part of the work, many sources can be used to collect and process the information: Project group itself, interviews, focus groups, questionnaires, etc.

Steps for a foresight exercise (3)

4. Various scenarios can be built by combining of the different hypotheses of the different variables,

   - They are generally designed to describe a wide range of very different possible futures
   - Their aim is to embody the concepts imagined, in order to make them more easily readable by decision-makers or a broader audience

5. Building scenarios is not obligatory: Other ways of communicating the results may be preferred, depending, for example, on the way the results of the exercise will be used

   For the exercise « Production modes and methods in France in 2040: Impacts on occupational safety and health », no scenario was built at the end, but 5 major key stakes have been identified, resulting from about 30 interviews, and 6 different focus groups involving around 70 experts from very different horizons

Production modes and methods in France in 2040: Impacts on occupational safety and health

Five key stakes

1. What will France produce tomorrow?
2. Digitization (Robotization – Automation)
3. A return to local nets as development tools?
4. Towards the diversification (multiplication) of types of work and employment?
5. How will the proceduralisation and pace of work develop?

There are multiple connections between these different stakes. For example:

- The influence of digitization on the pace of work, with possible impacts on OSH: psychosocial risks, muscoskeletal disorders (MSD), accidents
- A return to local nets as an answer to unemployment: How can an efficient OSH policy be built? What are the connections between occupational health and public health?

- Several examples of OSH questions involved by these stakes will be presented in the following slides

What will France produce tomorrow?

- Hypothesis: Deindustrialisation has continued, tertiary activities have taken over. For example:
  - The development of (home) care work for elderly or disabled people
  - The increased importance of logistics (logistic platforms, warehouses)
- Today these activities have a high claims ratio
- What type of solutions can improve this situation? Example of care work
  - Use of personal collaborative robotics to help carers in handling
  - Use of Information and Communication Technologies (ICT) for better organisation and coordination of the care (like Buurtzorg in the Netherlands)
- Some context elements could worsen the situation
  - Needs are growing, resources are decreasing
  - Risk of loss of control of the quality of OSH (and of the service provision): non observed (underground) economy, self employment, possibly via (un)official platforms

Digitilization (Robotization – Automation)

- Who or what will be the reference considered to determine the work pace? The worker or the robot? The consequences in OSH can be completely different:

  - An extraordinary tool for enriching tasks and protecting workers against MSD, psychosocial risks, etc.

  or

  - Some major risks for workers, especially in a context where (see the hypotheses in Frey and Osborne's study for example) the volume of employment might decrease, especially for less qualified workers.

- Ever since the middle of the 19th century, the jobs likely to disappear in the coming years could be identified, but not the jobs that were going to be created: why should things be different in 2017?

  Maybe, because of Artificial Intelligence (AI)…

A return to local nets as development tools?

- The development of local nets has been one of the major phenomena identified by expert during the foresight exercise: They are not supposed to substitute global value chains, but to be complementary to produce specific goods or services
- The phenomenon can take various forms of which impacts in OSH can be very different:
  - High technical level micro or small enterprises (MSE) liable to implement sophisticated equipment (for example, multitask robots): the development of specific new OSH schemes in these firms is likely
  - The use of ICT allows people to work remotely: Risks of isolation that should be considered according to the status of the workers (self employment, contract workers, employees)
  - A surge in the informal economy: In a situation of massive unemployment, some people are likely to perform various kinds of jobs without implementing any OSH measures → In such cases, where is the borderline between OSH and public heath?
  - Etc.

Towards a diversification (multiplication) of types of work and employment?

- Some theorists claim that we will soon be living the last hours of salaried employment: Work contracts will be substituted by commercial contracts, all workers will be self employed.

- A revolution for OSH:
  - Prevention policy is based on the analysis of real work (vs prescribed work) and the working team (the workers cooperating) is considered as a major contributor to that analysis
  - Given the difficulties encountered for implementing efficient OSH policies in small and medium sized enterprises (SME), a specific new reference framework should be built to deal with OSH for self employees: several experiments have already been carried out in France.

- Workers cooperating in a digital world:
  - Is the relationship between workers cooperating in a digital world and their boss analogous to that between classically salaried staff and their boss? A testimony

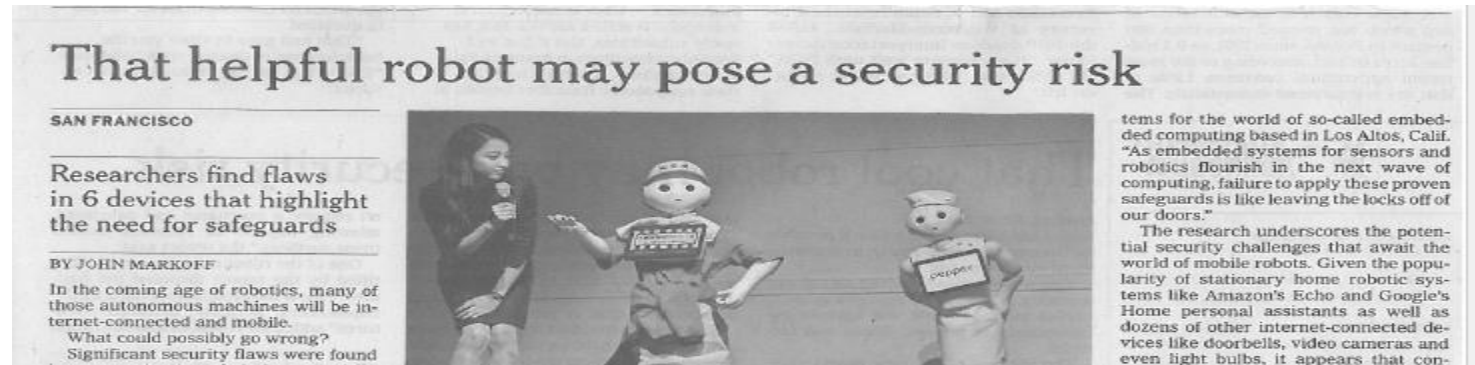# Which developments for proceduralisation and pace of work?

- Progress and innovation are often the results of transgression: will they be possible in a world where procedures, standards, digitization are present everywhere and at all times?

- Productivity is no longer rising, but organisational constraints are growing: until when?

Foresight: an aid for watching Watching: a tool for building foresight

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Hacking

That helpful robot may pose a security risk

SAN FRANCISCO

Researchers find flaws in 6 devices that highlight the need for safeguards

BY JOHN MARKOFF

In the coming age of robotics, many of those autonomous machines will be internet-connected and mobile.
What could possibly go wrong?
Significant security flaws were found

tems for the world of so-called embedded computing based in Los Altos, Calif. "As embedded systems for sensors and robotics flourish in the next wave of computing, failure to apply these proven safeguards is like leaving the locks off of our doors."
The research underscores the potential security challenges that await the world of mobile robots. Given the popularity of stationary home robotic systems like Amazon's Echo and Google's Home personal assistants as well as dozens of other internet-connected devices like doorbells, video cameras and even light bulbs, it appears that con-

- Multiple examples have shown the vulnerability of robots to outside intrusions, leading potentially to dysfunctions
- The consequences of the problem are likely to grow as robots become more able to move freely in working environments (including self-driving cars)
- « An internet of things with arms, legs and wheels » without enough consideration given to security…

Relocation of production

Relocalisations : Drancy montre l'exemple

Le groupe allemand Bosch vient de transférer à Drancy, près de Paris, une production effectuée jusqu'à présent en Turquie.

LE MONDE | 06.12.2016 à 16h32 • Mis à jour le 06.12.2016 à 17h06 |
Par Denis Cosnard

- Six jobs have been created
  - Massive automation of production
  - Very flexible schedules known one week in advance
  - The total number of jobs on this site remains at 200 for a production that grows by 7% annually
  - The relocated activity is competitive with the Turkish factory where it was located before
  - The production of these 6 employees is used on the factory itself. In the future, it could work for other European factories...

Fast mutations in employment

Oil recovers, but not its jobs

MIDLAND, TEX.

By embracing technology, companies now do more work with fewer employees

BY CLIFFORD KRAUSS

In the land where oil jobs were once a guaranteed road to security for blue-collar workers, Eustasio Velazquez's career has been upended by technology.

- When oil prices plummeted to $35 in 2014, many jobs were lost in drilling activities in the USA

- Three years later, with the recovery of oil prices, drilling is back, but not employment

- Manual jobs have been replaced by robotics, real-time computer connections between the rigs and geoscientists at headquarters thus reducing the work force

- Tedious jobs disappear, work conditions improve, occupational risks are different