

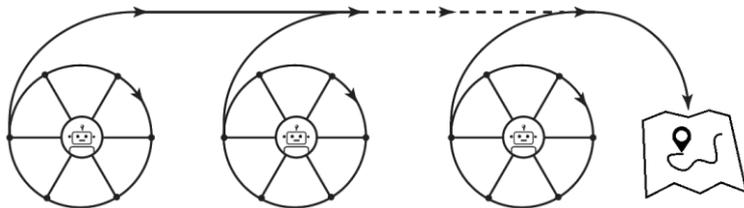


# REELER Data for Mini-Public II

Robots have the potential to radically alter human societies as they are expected to increasingly coexist with or replace humans. While there is a growing amount of literature predicting the economic and social impacts of robots, few empirical studies have considered how roboticists' visions of a robotic future may differ from users/affected stakeholders' own needs and concerns, and how these ideas come through in roboticists' design practices and ultimately affect our future with robots. The REELER project has taken on the task of studying these processes.

## About REELER

REELER is a Horizon 2020 project, funded by the European Union, consisting of four European partners: anthropologists and social scientists from Aarhus University, Danish School of Education (DPU) (Denmark), roboticists and engineers from Ab.Acus (Italy); anthropologists and ethicists from De Montfort University (UK), and economists from University of Hohenheim (Germany). We share the common goal of aligning future robot designs with empirically identified societal needs and concerns.



In 2020, REELER will produce the REELER Roadmap, which includes recommendations and tools for aligning designs with human needs and values, to ensure a more ethical future with robots.

This Roadmap will be built upon the findings from our research, which consists of 10+ ethnographic case studies, each built around a particular robot. The researchers have worked in 6-month fieldwork periods, where they have conducted case studies around robots selected for variation across nationality, sector, robot type, and other criteria. In each case, the fieldworker has engaged in participant observation and semi-structured interviews.

We are now in the third and final fieldwork period, having already interviewed more than 130 roboticists and affected stakeholders in 13 European countries. In our initial cross-case analysis, we have already begun to identify ethical issues and human needs in relation to robots entering human spaces and workplaces. Through outreach activities, such as mini-publics, we present some of these findings in to stakeholders, policymakers, and roboticists in order to join together their disparate values and fields of knowledge. For the upcoming Mini-Public II, we will discuss:

*Who is responsible for ensuring a meaningful worklife with robots?*

We therefore present some of the anonymized ethnographic data we've collected on the topics of work, replacement, reskilling, and relief.

## WORK

Ethnography is a method that has allowed REELER researchers to observe how affected stakeholders and roboticists undertake their daily work and to understand how they experience work. Through semi-structured interviews, we've taken this further to explore how their experiences have changed or might change with the implementation of robots in the workplace.

## Resistance.

A common reaction to implementation is resistance, which can take the form of non-use, misuse, or even destructive forms of sabotage.

*“Some get very offended and they try to sabotage the robot itself. The robots are not bulletproof in any way. You cannot have a robot that could cope with any [every] type of situation. And also the sensors have flaws. So once you know the robots just a little bit, you can easily sabotage them. [Have they done that? Users?] Yeah, definitely. (Roboticist)*

He describes users’ frustrations with the robot, not knowing why it is standing still, but he does not really understand their motivations for sabotaging the robot.

*A simple example is the emergency stops: once you push the physical button, the robot cannot release it itself, it needs to be released by a human. And by that, there could be hours of a robot just standing still... Let’s take the [robot], it’s standing in some random hallway where you have users who don’t understand why it’s standing there. Or, even worse, they drive into them with their transportation vehicles that they have in the buildings. [Why would they do that?] Frustrations of some kind...that’s what we guess, because we don’t understand why somebody would drive into a robot and destroy the front of it.” (Roboticist)*

One reason why robots may take the brunt of users’ frustrations is simply because the robots are material objects that we can project social relationships onto. The workers can be frustrated with the robot because it has a physical presence, whereas the innovation discourse that drove the robot’s development and the local decision-makers who implemented the robot are not physically present. One affected stakeholder described robots as a part of the “staging” of Industry 4.0.

*“It was about examples that are tangible. Because digitalization is not tangible.” (Affected stakeholder)*

Robots, old and new, are made a part of Industry 4.0 when companies market them and apply them in new ways. Industrial workers have known the machines for decades, but new applications – digitalizing work processes, for example – have brought robots to the forefront of workers’ minds.

*“The classic robot that is using a gripper, that was like 1989, 1990...Yes, I mean we had the first robot before the first mobile phones or the first Personal Computer at all desks...That wasn’t a revolution back then. The first bigger movement started in the offices with the [ERP systems] for example. That’s when it started.” (Affected stakeholder)*

He refers to management systems brought in to collect, store, manage and interpret data from all parts of the company, often in real-time, to optimise the production – essentially tracking all of the labour tasks, machine *and* manual. In this case, it was not the machine itself that caused discord among the workers, but the software and the symbolic power it entailed. It was a social relationship between the employer and the employee that was realized through the material artefacts between them. However, it is because the machine is a part of the production process that its labour is recorded and planned electronically – and that these processes are extended to the human worker. The discourse of digitalization translates into real innovations and real company decisions, resulting in actual ethical challenges.

*What are workers protesting when they resist new technologies?*

## REPLACEMENT

Replacement is one of the most prevalent fears surrounding robots. One industrial designer argues that robots will replace most people in the workforce and he has concerns about his own role in creating robots that replace workers:

*“It’s very difficult to work with robots, because the robots will take most people’s jobs...It has very serious implications that these robots are somehow taking the place of humans in the workplace. I’m an industrial designer so I don’t necessarily have to work with robots. My colleagues are roboticists, so that’s the only thing they are working with...I could be designing chairs, or tables, or whatever. Is it fine to design things that will take people’s jobs away? It’s very disconcerting how fast the robots will take people’s jobs and how little they cannot do. It’s a matter of a few years and a lot of money and then very few people will have work – especially construction, or industry, or cleaning. So yeah, it’s something that I really think about a lot.” (Roboticist)*

A common argument in Denmark’s robotic hub is that robots create more jobs than they destroy, but the problem is that the same *type* of jobs are not necessarily created. And those persons whose jobs

are taken do not necessarily possess the skills or aptitude for taking the new type of jobs. These workers will personally experience a loss.

Even in a case on collaborative robots, which are meant to be used by a human worker, a common phrase used was “Robots as the destruction/annihilation of jobs”. In many sectors, replacement essentially comes down to costs - which is the cheaper source of labour, man or machine?

*"I think [the robots] could collaborate, but they don't. So, they just sit there instead of a human. And that's basically the idea or the application that's mainly found here." (Affected stakeholder)*

*"Definitely, you have to break down the price. If I put an employee who earns ten euros to do the job, or do I take a robot, which, I do not know, in principle costs 1,000 euros, and which needs to be programmed by an extremely expensive human?" (Robotician)*

This phrase does not only refer to the destruction of paid income, but also the type of work humans do, where automation results in a redundant or simplified workforce.

*"I'm worried that, by getting robotics into final assembly, it won't make jobs more interesting. So, it used to be automobile welds. It's cool that humans do not need to weld the car together anymore, that's ok. But if robots come into the cognitive as well, that's where the humans are really good. Then humans are just doing weird things." (Robotician)*

This leads to fears for the future of the manual labour workforce as their tasks are automated.

*"I am aware of it, especially at [the car factory], that jobs are really disappearing one after another... It makes you realize that this is an absolute two-class society. There are huge cars around, and when you get into a bus, there are quite a few [homeless people], or there are a lot of homeless people in the streets. And then you can see that some are doing really well, and some just do not have anything. And in these situations, I see the danger a bit." (Robotician)*

Both roboticists and affected stakeholders in REELERs cases express a tremendous need for reskilling and adaptive skills, in order to stay relevant.

*"I do not think that safe workplaces exist anymore. You just have to constantly stay updated...Our knowledge and our durability of knowledge changes much faster. Things really change a lot. Especially in the field of programming and technology. If you do not educate yourself and keep up with the times, you will be left behind. So, this working model 'Okay, I'm at [a very established company], my life is now secured', it will not exist anymore, for now." (Affected stakeholder)*

Some recognize that to remain relevant requires a particular way of defining human labour as something different from machine labour – a craft, or a creative, cognitive job, such as design – while others stress that soft skills that will matter.

*"I believe that communication is also very important. How do I talk to people? How do I deal with people? Social contact, as it is always postulated, will be more important and not less important as it is postulated, I believe. With these soft skills one can see how someone is dealing with people?! Also, to make a certain reflection and self-assessment." (Affected stakeholder)*

*"The educational standards need to change, because the tasks, which humans now do, they do not exist anymore. Which means that humans now do higher quality tasks." (Robotician)*

Some, however, are more skeptical of the type of reskilling needed to remain relevant.

*"Yes, people say this initiative lifelong learning and that you always have to stay tuned. But how will it help people?" (Affected stakeholder)*

*Is such reskilling, one that is not static and which requires a willingness to learn and adapt constantly, possible?*

## RESKILLING

Most roboticists are eager to defend against replacement issues, usually by citing reskilling as a solution.

*"We have had robots that were taking over people's tasks. So the way that we try to deal with those users is to try to get them on the train where they become users of the robot...We try to teach them and give them the opportunity to be robot users...Let's take a floor cleaning robot, for example. You cannot have as many robot users as you presently have manual cleaners. Some people get the*

*chance to become robot users and figuring out how to use these robots in the most efficient way. Because in the end, the people who are cleaning now are the ones who have the knowledge of how to clean. And that is very important for the robot to perform in the best possible way. So that is how we deal with the users: we try to teach them as much as possible, we give them that opportunity, and they can grab it or not.” (Robotistic)*

This roboticists means that not everyone would be retained with automation, and those most *willing and able* to align with the technology would succeed. This argument shifts the burden of reskilling onto the worker to accept the robot –the same robot that depends on their expertise to function and that will replace them or their colleagues.

### **Willingness to learn.**

Indeed, there are some workers who are motivated and willing to use new technologies and others who shy away from them (cf. Technucation project). But many affected stakeholders expect some help from management or the government, in the form of education or training.

*[Would you like to learn more in this area? The technological part?] “Yes, I love everything that has anything to do with science, I like it a lot. For an example this device [audio recorder] is here, it’s recording, but how was it made to record? A person is always curious. In this moment, the only thing that I studied was cars and how they work.” (Affected stakeholder)*

*“I am entirely sure that there are some who won’t use it, because they don’t dare. And old people won’t have it. But, in fact, it does not matter how old one is. There are some persons who dare not use this. So it might be information is very important, and some courses maybe. How can one protect oneself? It is actually very, very important.” [Do you dare to use it?] “Well, of course I do! Yes, but, I would rather have the information: How should I use it? What should I do? Instruction is very, very good.” (Affected stakeholder)*

Some managers recognize that certain workers, even when willing, may have difficulty learning to use new technologies.

*“I actually think that, when I look at my staff...they’re fairly open to the fact that they have to learn new things...I am actually sure that they are pretty open-minded and also interested. But, I can see, definitely, when I look at the staff as a whole, it comes so much easier to some than to others. And, strangely enough, they are all very good at using their smartphone, but if I put them in front of a computer, they kind of freeze. So, I think there will be some that have this kind of: ‘No, I can’t. I will never be able to.’ They just can’t, you know, see themselves doing it, and they will never get around to it.” (Affected stakeholder)*

Some might require some effort from leadership to bring them on board and support them, but also help from the roboticists or system integrators to support the leadership:

*“If I can present a very good reason, if they can see that reason, they can adapt almost to everything...So actually working with the staff in terms of, mentally, you know, talking about what are the good things about this, where does it make sense, and if our staff can see: ‘Oh, this is a good idea’, then it’s never going to be a problem...For us, as a team to go out and convince the staff or teach the staff to use this kind of technology, we have to be very convincing. And you can’t do that, if you don’t know the product well enough. And the only one, who knows that well enough, to be able to also answer all the questions that would arise, would actually be the ones that are manufacturing the thing. So it would definitely be with the help from whoever is manufacturing the product.” (Affected stakeholder)*

*If a worker is willing to be reskilled, what kinds of aptitudes and abilities make it possible/impossible?*

### **Aptitudes and abilities**

Besides willingness, language, cognitive and physical abilities, technical aptitudes, and culture affect a worker’s chances of being reskilled. Some manual labourers are not entirely literate, and thus may not have the same aptitudes for acquiring new technical competencies that are based in literacy.

*“I would say that 70% of them all can read and write and understand Danish perfectly. The rest, some of them, are having problems with Danish for various reasons, actually. Some of them, very few, I think maybe under 1%, have actually never been to school, and are actually not, maybe, able*

*to read or write, not even in their own language. But that is very, very, very, very few; it's probably not even 1%, but there we have them. Then we also have ethnically Danish people, employees that have very big difficulties reading or writing (we have lot of e-learning programs, and that can be a little difficult for those 30%...I should say maybe more). But that is due to dyslexia? Most of them, all of them I guess, have been to school. I don't think everybody has a level of high school but they, definitely all of them, more or less, have levels of junior high." (Affected stakeholder)*

It may be that certain jobs attract people who are less competent or confident in the local language, or who have less education. Many of those working as cleaners in Denmark, for example, were immigrants or descendants and/or Danes who struggled with literacy. In Portugal, most of the cleaners did not study beyond 8th grade or fell into cleaning because of some difficult life situations.

*"Yes. That's why I say that I feel embarrassed, because if I had studied, I would have had a better job...I would like to work in a school...I consider all positions. For anything, because I am not in a position of choosing. I want a proper wage. Yes, and do you know why? Because of the divorce, and my husband leaving for his land, he is going to Porto and I remain here with all the bills to pay, understand? I'm very afflicted." (Affected stakeholder)*

This points to a significant problem with offering reskilling as the solution to technological displacement – too often, manual labour is a last resort type of job appealing to a particularly vulnerable niche of disadvantaged workers.

## RELIEF

The need for relief is cultural and situated. In the Danish hospitals, the working conditions and pay are good. The hospital cleaners did talk about needing relief. Neither did department leader, who began as a hospital cleaner herself, before moving to management:

*"Well, I really like my work out here. I always liked the physical part of the work out here. So, being very familiar with the, the actual job out here, I thought that might be very good for the staff out here to have someone in the managing staff that has a good knowledge of the actual work. And I just kind of found out that I loved it!" (Affected stakeholder, SPECTRUS)*

In fact, one of the Danish hospital cleaners came to a point in her life where she could no longer fulfil some of the more physically challenging tasks, such as cleaning windows. Rather than retire her from the workforce, the municipality paid for her to have an assistant to perform those tasks that she was no longer able to perform. This social welfare support provided the relief that automation might have provided, and did so without depriving the worker of dignity, purpose, socialization, or a role in her community.

On the contrary, in Portugal where the work was more taxing, the workers did seek relief from the heavy work, but did not receive the same social supports and worked under tougher working conditions. Although they sought relief, they made it clear that it was aspects of the job, but not the job/livelihood itself, that they would like relieved.

*"Look I will be honest, I like the work that I am doing! I am an ironer and I actually like it. I love my work, therefore, I don't think I would want anything else...If the company buys a robot to assist my work, and if they see that they spend less money with the working robot, they will put me on the street and put the robot to do the ironing. I will be without a job, that's what I think. That's why I say that I do not want it to do the ironing, I want it to fold the towels. I like ironing. I need to work."*

*"It would help! It could help me carry the bags on the bag. Instead of me carrying the bags on the bag, the robot would help me carry the bags. What the robot won't be able to do is the detailed cleaning. For an example in the bathrooms--"*

*"If they had robot that could make the beds, because one gets really hurting backs due to bending it, due to the low level of the beds."*

*"I find it a nice idea, if the robot could take over some functions for the personnel. I think it's a good idea as long as people are not left without jobs."*

*(Affected stakeholders, SPECTRUS)*

As difficult as the work was in Portugal, the workers generally did not want to give up work itself, even for a basic income.

### **Universal basic income.**

Many affected stakeholders and roboticists in both cases could not envision themselves giving up their work for a basic income.

In COBOT, the labour unions were generally not in favour of this idea. Their work is to create meaningful work and workplaces for citizens that ensure them an income and a good life, and they feared greater social inequality would follow from universal basic incomes. One affected stakeholder pointed to the identity people attach to their jobs, but also that there is some sort of pride, status, or value that comes from *earning* a particular position or salary.

*"But I do not think that [universal basic income] will prevail here in Germany. In Germany, I would rather say that people can also distinguish themselves by their work, because they also identify strongly with the work they are doing. And accordingly, you want to be able to differ within certain salaries, like performance for money or money for performance." (Affected Stakeholder, COBOT)*

The roboticists and stakeholders in the SPECTRUS case were also generally opposed to the idea of giving up their work, but could consider taking the income if it freed them to do other things.

[Would you be okay with taking, for example, universal income, you know, base income, instead of working? If a robot could do all of your work?"]

*"I wouldn't, from an ethical point of view or for concern what will\_no. But, if it was done so that I could have so much more personal contact with the staff, for instance. If it meant: 'Well, okay, you don't have to sit with a computer, because I can do all of that, you know, you just...' I would say: 'Okay, that would be really nice'." (Affected stakeholder, SPECTRUS)*

In a group interview with hotel cleaners, they contemplated what they might do if they were given a basic income:

*"A person can buy a machine but not a person."*

*"It is that despite all the work we do here it is not the money that keeps us here. Of course we get money to be here, but I don't think it's the money that keeps us here."*

*"That's fine, but it's exactly because of this. The problem in question is not the money."*

*"I can't stay put."*

*"I don't like staying at home. I like working."*

*"You would get tired of sitting there."*

*(Affected stakeholders, SPECTRUS)*

Generally, their main concern with regard to being put out of work was losing their livelihood, but even if this was secured by a universal basic income, they would want to continue with an occupation:

*"No. I'm not even thinking about the robots but if a reform were to happen one day, I would support the people. How do I say this? Volunteer work, to help the others. I would like to work with elderly and kids when they reform my area. This would be something I would like to do; to help, because there are so many people who needs help. If the reform comes, this is what I want to do, working especially inside the homes (of others)."*

*"If I one day came back home I wouldn't know what to do with myself, but I like to work with children. I would like a job in a kindergarten, something like that. Or take care of the elderly, I also like the elderly!"*

*"I like to leave my house to work. But even if I did receive the unemployment salary, I would go to people's houses. I mean I also have to find people, too..."*

*(Affected stakeholder, SPECTRUS)*

The roboticists shared the opinion that they would want to continue working, even if their pay was assured.

*“It could be a way to compensate (the loss of jobs) (...) and of course, we can regulate and try to avoid the interactions between humans and robots, but for how long? It all depends, what are the politics behind? How long that will work.”*

[Would you take a basic income and leave your job?]

*“No!”*

[If a robot would come and take your job?]

*“I would try to do my job in a different way, I think. Not as a robot, but as an industrial designer, because I think- there is the other side to this. There are more and more things that are made by robots. I think, that might be the case, that handmade things by humans will have a different value. Like handcrafts, right? (...) So, I think I will do that, I like my work, I also like doing other things, but I like my work.” (Robotician, SPECTRUS)*

Other roboticists’ expressed skepticism over whether robots even could take their jobs.

#### Future considerations

- Could the same level of relief promised by automation be achieved by investing in better working conditions?
- Could immigration solve some of the same problems that automation seeks to solve?
- What is work beyond earning a living? Is work a part of the human condition?
- What kind of work/tasks are irreplaceable?
- How can we preserve meaningful work?

#### Meaningful work.

A significant finding is that workers perceive robots as a threat to the social aspects of work. REELER has found that loss of collegiality is one fear that has been realized with implementation. Work in pairs and chat throughout their cleaning process. The very notion of ‘service’ is a social one: a person providing something for another person. For the hospital cleaners, communication with each other is an important aspect of the job – and one that they feel automation (even partial or assistive automation) may threaten.

*“For instance, right now we have communicated with each other, we are contacting much with each other, but when robots come, then the contact becomes a bit cold and far away, so we won’t see each other a whole lot, because then there are robots, and then I don’t have to ask my colleagues ‘Well, can you come help clean my hall? Or if you have time can you do this?’ Then it is a robot that must do this for me, so that is actually even more stressing. Life is too stressing, because one has to talk, think too many things in one day. But there comes a robot, then one has nothing to talk to, and maybe one must talk to a robot. I don’t think it is a good idea.*

*Because it is not that when we borrow the machine from each other, we don’t ask the machine: ‘Have you had a nice weekend?’ ‘Well, have you had a nice holiday?’ ‘Where were you?’ ‘Have you had your break?’. It actually means a lot at work to talk to one another, because sometimes one can share something with one another, then you get peace of mind. It might be that they have some ideas, that they comfort you, or they have some experience. But with robots, no. There are no persons to talk to, and one shuts oneself entirely off. One can no longer find solutions to problems, so, it becomes very, very difficult.” (Affected stakeholder, SPECTRUS)*

It is also the communication with patients that concerns the hospital cleaners. They all place a high value on the service they provide, and the benefit for themselves, when they communicate with patients.

*“I smile and greet the patients, when I start, and also smile. It is particularly the spine/back department that needs most to talk because the people there are in a lot of pain and many of them are young, not very old, and they are in need of a smiling face. And I will help them if they ask me for a cup of coffee or a glass of water, so that I do as well, without doubt. And I don’t disturb them*

*if they are sleeping or relaxing I always ask them if I should close the door, or if it is okay that I come in an clean.” (Affected stakeholder, SPECTRUS)*

The hospital cleaning leader placed the same emphasis on human connection.

*“But they do have a lot of interaction with our patients, and that is so very hard to imagine that, that kind of interaction being solved with a robot. I’ve seen programs about this; I’ve seen how they use robots in houses with elder people for company, and they actually [laughter] but, but, that’s you know, where some of those tasks, or where you have this intimate, intermediate contact, that’s very hard to, to imagine actually.”*

[So one of our questions, I guess, are there any human functions that you wouldn’t want replaced by a robot?]

*“Definitely there would be, and, and there’s also-- maybe because it is difficult to see how robots develop with the, with the coming years-- but there are a lot of these emotional situations, where our staff, even though they are not nurses or anything, they get involved. Both from patients side, but also from the patients family, where I think it would be a shame, if that factor wasn’t there – you know? I also think that actually a part of the fact our staff are very happy about being here, and happy about their work, and satisfied with it, I also think another part of them are very satisfied because they get a lot of compliments. They feel, when they talk to the patients, they can feel that they also make a difference for them, actually. And I would hate that that part of the work wouldn’t be available, you know? That would be ‘øv’ [laughter]. So I guess that was situations where it is very difficult to see robots--“*

[The human connection?]

*“Yes, the human connections. But who knows?”*

Thus, we challenge the notion of ‘system integration’. Integration implies two-way adaptation. It seems that there is a tipping point where implementation pushes the boundaries of integration to enveloping. And, it seems that some of the frustrations with technologies are referred from frustrated social or hierarchical relations. Sometimes the machine is simply ‘staging’ for other issues, but other times it is at the heart of the problem.

#### Future considerations

- How much should the human adapt to the new technology (e.g., allow a robot priority in an elevator?) and how much should be anticipated by the roboticists?
- How do changes to the workplace translate to changes to the nature of work itself? To humanity?
- Who is responsible for workers’ frustrations surrounding implementation?
- Can design values like transparency (e.g., better communication re: emergency stop) solve implementation issues of misuse/abuse?
- When might enveloping (adapting the built environment to fit the robot) be beneficial or a solution to implementation challenges?

## 4.8 Meaningful work

Many of the affected stakeholders interviewed, not only in these cases but in the REELER project’s other cases, find their work to be meaningful, enjoyable, and valuable. This goes against the rhetoric around automation as a relief to the worker (i.e. relieving people of tiresome, monotonous, tedious, repetitive manual labor).

*“I’ve worked with a cleaning firm many years ago. I was there for a year and a half, and then I stopped. I have also worked at a hotel, also with a firm, but the hospital is something else entirely. We are a lot of people here, and I have been here for 13 years – as my other home... I have gotten very used to it, and I am very fond of my work. Because we are many people here, and we have the perfect manager who understands us, and I am very fond of the ward, and the nurses and everything. And the working hours I am very content with. And in terms of ergonomics, it is also*

*very nice. We aren't straining our bodies, if we use the right cleaning appliances and cleaning methods; if we know it, then we are not ruining our bodies in that way. So I am very fond of it all. We can ask for days off, and almost every time, we are given the off days that we have asked for. Yes. I am fond of it all."* (Affected stakeholder, SPECTRUS)

But this meaningfulness is related to particular aspects of her work that she values. For example, she has the freedom within her job to manage her own workflow, her ideas are heard and implemented by the leader, and she feels respected. Ella, the leader of the cleaning department, also values her work and chose to continue in cleaning even after completing her ministry studies.

*"So I actually came out here and started to clean out here at the hospital while I was still studying [laughter] and the year before I finished studying they asked me, if I would be interested in being part of the team, because we are a team that is running the [cleaning] department (...) and I said: 'Well, I don't know because from a year I will probably be done for my [laughter] studies,' but I said, 'Okay, I can try it.'...and I just kind of found out that I loved it!"* (Affected stakeholder, SPECTRUS)

The hospital and hotel workers found their work meaningful for different reasons, but the point is that they, and others in the REELER case, attribute meaning to work/labour in general.

## Definition

Meaningful work is...

...Accomplishment: *"...work that you finish every day..."*

...Human connection: *"They are very satisfied because they get a lot of compliments, they feel, when they talk to the patients, they can feel that they also make a difference for them, actually."*

...A good team: *"...[a] pretty open-minded and also interesting, interested [team]"*

...Respect: *"What I think, however, and that's really important that I say it. It's very hard to get respect for this type of work, because it's something that everybody thinks they know about, because they clean at home."*

*(Affected stakeholder, SPECTRUS)*

This is especially important because both hospital and hotel cleaners expressed that implementing a robot will bring respect to their field as a modern discipline:

*"The more of this new technology that we can put into our field, the more respect, strangely enough, the more respect we will get for this field of work."* (Affected stakeholder, SPECTRUS)

The hospital cleaners, for example, explained that the cloths and cleansers they use are already advanced technologies, but these aren't recognized in the same way that robots are.

In Denmark, for example One hospital cleaner has some physical health issues that prevent her from fulfilling all of her work duties. Rather than retiring her from the workforce, the municipality has provided her with an assistant so that she can continue working. Her assistant performs those tasks that are too challenging for her (wiping windows for example). Her boss suggests that instead of having a human assistant, a robot could perhaps support her so that she could continue working:

*"She has different task, where I could easily see her, instead of having an extra staff, you had a robot that would help her with some of the tasks she is doing."* (Affected stakeholder, SPECTRUS)

Whereas, in Denmark, in the hospital, the working conditions are very good and the cleaners chose to remain working there. These situated experiences are rooted in deeper societal structures. In Denmark, wages are high, unions are strong, and workers' rights are respected. There are also many social supports in place to accommodate differences in ability. In Portugal, this didn't seem to be the case. Germany's working conditions reflected those of Denmark.

## Future considerations

- What types of jobs are automated and who is particularly affected?

- How does automation impact existing hierarchies, and how do these hierarchies affect automation decisions?
- How can we 'reskill' 'unskilled' labourers whose jobs are already last-resort type of jobs?
- How do the political and societal circumstances around work affect the way work is experienced, and thus the way automation is experienced?

#### **Future considerations**

- How do the political and societal circumstances around work affect the way work is experienced, and thus the way automation is experienced?
- Does strengthening unions, raising wages, etc. impact the demand for automation?
- How can the EU ensure that regulations, protections, and guidelines fairly impact citizens of all member states?