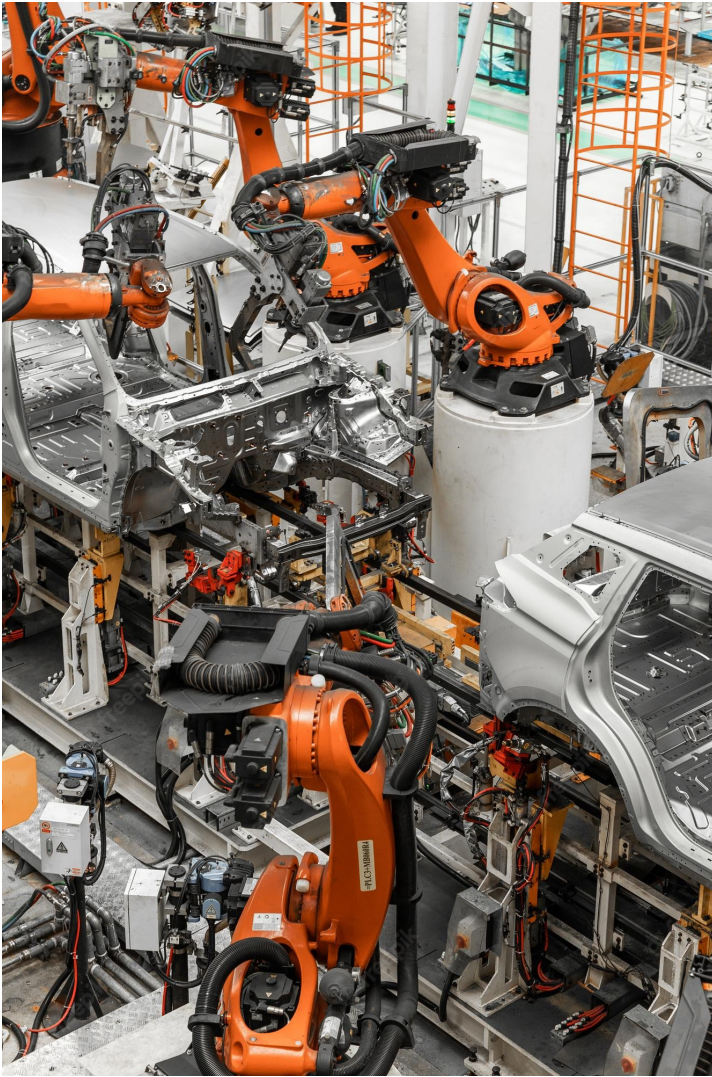


The Effects of Automation on HR Strategies of Manufacturing Businesses.



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The Effects of Automation on HR Strategies of Production Businesses.
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Summary

The aim of this research is to find out how automation processes affect HR strategies within manufacturing businesses. With the main research question formulated being: What are the effects of automation on the HR strategies of manufacturing businesses? Because of the implementation of robots in the interviewed businesses, their HR strategies have shifted from administrative tasks to strategic alignment, skill management, and employee engagement. HR departments seem to have become more important and must contribute to the goals and success of manufacturing businesses. Research shows that the future of production lies in automation, allowing businesses to compete and mass-produce products efficiently. For this study, the concept of automation focusses on the implementation of robots into the production process of a manufacturing businesses and the human-robot interaction resulting from this. The businesses that were interviewed for this study are active in the manufacturing of agricultural machinery, piping systems, and mass food processing. All these businesses work with assembly lines where robots are implemented on the work floor. While employers see robots as beneficial, employees can feel anxious about their job security due to the negative perceptions they may have of robots. However, the human role in production is not necessarily diminished by automation according to literature. Human-robot interaction is crucial, and employees can be trained and educated to work with and alongside robots effectively. Transparency becomes an important topic for HR departments to create trust and collaboration between employer and employee. Research shows that collaboration between employers and employees fosters innovation, and trust can facilitate successful implementation of robots. Retaining skilled employees is essential in today's tight labour market. The "human touch" and human decision-making capacity remain essential within a production process since this is something robots cannot take over from employees. Employability matrices can help HR employees identify employees' skills and training needs. Flexibility is crucial, with employees being trained to work in multiple areas of production. This enhances safety, diversity, and job satisfaction. Employers must provide career prospects and perspectives to their employees and encourage self-driven career development. Fringe benefits are offered to keep employees satisfied and can help retain skilled workers.

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Introduction

Today's world is constantly changing, which is also the case for the labour market. The labour market is highly dynamic which is mainly due to the multiple industrial revolutions that have occurred in the past and is ongoing right now. During the 1st and 2nd industrial revolutions, that occurred roughly 200/300 years ago, there was a start to automation within production processes (iED, 2019). During these revolutions, the biggest changes came in the form of mechanization such as the steam engine and later the usage of electricity, oil, and gas (iED, 2019). For this research, the 3rd and 4th industrial revolutions will be the most important revolutions to look at. The 3rd industrial revolution marks the beginning of automation processes within the production processes of businesses (Mohajan, 2021). In the 4th industrial revolution, which is ongoing right now, the surge of AI is prevalent which has the potential to disrupt today's labour market (Schwab, 2018). Workers facing the world of the 4th industrial revolution must constantly be aware of, and acquire new skills in automation, digitization, and information technologies without forgetting soft skills (Petrillo et. al, 2018). This arises a question, how do businesses deal with the effects that the recent industrial revolutions have had on their production process regarding their employees? More specifically, HR departments within manufacturing businesses and the HR strategies that they apply to prepare their manufacturing labour force for the effects that automation brings to the work floor. Automation can cause effects and changes on production processes that might be difficult for current employees to adapt to which in turn may jeopardize the production process and can cause loss of profits, Säfsten et. al. (2007), studied multiple cases where automation caused problems by being "too complicated" for employees and caused a loss in productivity which, in turn, leads to loss of profits. To maximize profits, businesses need to produce as time/cost efficient as possible (Banton, 2022). Automation is a solution for efficiently producing products (Acemoglu and Restrepo, 2018), and for this to work, employees must have the knowledge and skills to work with, or alongside, robots as they can "achieve greater efficiency together" (Galim and Meshcheryakov, 2020). Providing non-formal education for employees to upscale their skills is a way businesses can deal with the effects that automation can cause on employees (Koster and Brunori, 2021). However, this can also be looked at from a different angle, an employer can try to become more attractive for high(er) educated workers that are competent to man the robots by facilitating their employees as much as possible, an example of this is providing good fringe benefits (Sidorcuka and Chesnovicka, 2017).

Following the question asked above, the central research question of this study is as follows: *What are the effects of automation on the HR strategies of manufacturing businesses?* To gain further insight into the topic, the following two sub questions were formulated to help answer the main research question:

- 1 - *How does automation affect businesses and their employees?*
- 2 - *What factors are at play regarding the decision-making process on HR strategy?*

In interviews conducted as a primary data source, questions regarding the effects of automation on HR strategies were presented to manufacturing business directors and HR employees to get a grasp of the decision-making process on automation within businesses.

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This research will focus on HR strategies that arise from automation processes in businesses.

Whereas it is widely studied that automation has effects on the labour market, employment, and productivity in manufacturing businesses, there is rather little to no research done on the effects automation has on HR strategies in manufacturing businesses even though human resources are becoming pivotal for businesses to maximize output and profit. This study explores the effects of automation on HR strategies and tries to provide new insights for further academic research into the topic.

Automation is fast becoming a key instrument in the manufacturing space and this makes the topic also highly relevant in today's world since businesses always try to evolve their production process to maximize profits (Wahab et.al, 2021). Therefore, workers will have to constantly update their skillset to stay relevant in the labour market. Furthermore, companies might have to alter their HR strategies to be able to find or retain employees who can efficiently function in the automated production process they might have created. Moreover, finding experts and specialists for specific tasks within a production process is becoming more and more difficult and HR employees will have to get creative to find and retain these employees. The (local) tight labour market in the Netherlands is a factor that can make this problem more difficult.

The aim of the research is to gain insight into how automation processes affect HR strategies within manufacturing businesses. Moreover, how do companies ensure that there is a good human-robot interaction on their work floor to increase their output? The production process needs to stay active, therefore businesses have to find a balance between educating or training their employees and having specialists work tasks that require specific skills that cannot be taught or acquired in a short time span. It is also interesting to research the considerations businesses keep in mind when deciding on their HR strategies while they are evolving their production process.

It is important to clarify what is meant with the concepts of automation processes and HR strategies, therefore:

In this research I have defined automation processes as follows, the process in which businesses step away from using (mostly) human labour and replacing it with machines or robots to manufacture their products.

I have defined HR strategies as follows, the focus is on manufacturing businesses (for example assembly lines) and HR strategies are classified as either, up- and reskilling of employees, employee lay-offs or the outsourcing of manufacturing. By using these classifications, differences in HR strategies can be found and coded to draw conclusions out of.

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Theoretical framework

To investigate how automation affects HR strategies in businesses, several concepts and theories can be used to gain further insights into the topic. Automation, Human-robot interaction, Upskilling, Employability, Flexibility, and Strategic human resource management are the key concepts identified for this research. Through studying these concepts, a good base can be laid for this research and comparisons can be made to draw conclusions from at a later stage. The key concepts listed above are all connected to each other as one can clearly influence the other.

The concept of automation in the context of this research is explained as follows, "Automation, in the context of manufacturing, is the use of equipment to automate systems or production processes. The end goal is to drive greater efficiency by either increasing production capacity or reducing costs, often both" (Westrom, 2020).

For automation to be successfully implemented, a good human-robot interaction needs to be achieved (Charalambous, et. al., 2015). The implementation of robots in the production process of a business has created a new dynamic between the employee and the newly arrived robot. The employee must be able to work alongside, or control the robot. If the employee is unable to do so a business will not achieve the end goal of maximizing profits (Charalambous, et. al., 2015).

According to literature, a good human-robot interaction is achieved when "fear of job loss and ensuring an appropriate level of trust in the robot are considered important" and "Occupational safety" is addressed accordingly (Kopp, et. al., 2021). Hirche & Music, (2017), add to this where they state that the human role is not necessarily reduced by the implementation of robots, it does however create new high-level responsibilities for employees working with robots. For these new high-level responsibilities, employees must expand their technical knowledge and gain conceptual clarity, so they are aware of what they are dealing with, furthermore the "human touch" and decision-making capacity were found to be unique to humans and thus irreplaceable. Human involvement will remain vital to the forthcoming fifth industrial revolution (Bhargava et. al., 2021). An indication on how to answer the effects sub question 1 addresses through the theory is; when the initial scare and negative perceptions of automation are addressed accordingly by employers, the effects on employees may be less severe.

Naturally, it is important that an employee is able to control or work alongside a robot to achieve a well working human-robot interaction. This can be achieved through the concept of upskilling, the concept of upskilling in the context of this research is when a business or individual invests time and money in someone to increase their competitiveness and cost effectiveness in long-term without disregarding the need for human skills that specialists have mastered (Wahab, et. al., 2021).

Employee upskilling can lead to an increase in employability. Increasing one's employability can be seen as a pro-active response to the rapid changes in the labour market and within organizations it has the goal of increasing one's internal and external employability by developing relevant competences and expertise (upskilling) (Van Dam, et. al., 2006). Van Dam, et. al. (2006), also claims that in a world that changes rapidly, employees need to

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develop themselves to stay employable for businesses. For businesses, the concept of employability ties into the concept of flexibility where businesses see one's increasing employability as a way to increase their flexibility by having their employees able to work multiple tasks outside of their current function (Van Dam, et. al., 2006). Involving employees in the decision-making process of a business can improve one's flexibility and employability which is highly desirable for businesses since a good collaboration between employer and employee creates a certain trust between parties which can benefit the implementation of robots in the production process (Kopp, et. al., 2021). In the conceptual model, the concepts of employability and flexibility are combined into one concept named multi employability where employees are able to work multiple stations in a production process.

The aforementioned concepts all share connections to each other. However, without the concept of strategic human resource management, businesses might not be able to achieve their goals of smoothly implementing robots into the production process, increasing the human-robot interaction, correctly and efficiently upskilling their employees, and increasing employability and flexibility of their employees. Research states that for HR departments automation technologies constitute a new strategic approach to managing employees and enhancing firm performance, thereby offering new opportunities for HR departments but also new challenges at a technical and ethical level concentrated on job replacement, human-robot interaction, learning opportunities, recruiting, training, and job performance (Vrontis, et. al., 2021).

Part of this new strategic approach could be to layoff part of the employees that are directly affected by the implementation of robots in the production process. As research suggests, it is an important consideration for directors and HR departments to either raise the level of workers' education so that they can undertake higher level jobs required by automation or to lay off employees that become redundant by the introduction of robots (Pham, et. al, 2018). Laying off employees might economically benefit a business if robots can take over all the employees' tasks and produce more efficiently. However, research shows that the human role is not necessarily reduced but requires different high-level responsibilities when working with robots (Hirche & Musić, 2017 in Kim, 2022). In a time of economic success, a business might be growing and outputting higher amounts of products which can lead to businesses needing more employees because demand also grows (IFR, 2017). This creates quite an interesting relationship in the decision-making process of businesses to lay off employees or not.

Research sees that HR has transitioned itself over the years from more of an administrative focus such as handling payroll and record-keeping to more of a strategic focus where it focusses more on aligning goals with the overall organization to contribute more to the overall organizational success of the business (Pattanayak, 2020). An example of this is that HR departments manage and focus on skill management and employee engagement. Outside of handling the recruitment of new employees, HR departments now also focus heavily on attracting, maintaining, and developing (new) skills for their employees (Buta, 2015). Furthermore, having a healthy work-life balance has shown to have a positive impact on productivity and engagement, therefore it is important for HR departments to offload the employee as much as possible outside of the working line (Sheppard, 2016).

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The concepts mentioned above are essential in research into the topic of automation's effects on the labour market. The aforementioned research are focused on the perspective of employees and businesses, comparisons can be made to the interviews that were conducted for this research to draw conclusions out of.

There is countless research on how automation affects jobs and how non-formal education can be of use for employees to acquire the new skills needed to stay relevant in the current labor market. The employee side of the topic has been widely researched while the business side on the topic seems to be only scarcely studied. Finding how businesses alter their HR strategies based on automation in their production process could possibly create a new view on how businesses assure a good human-robot interaction that could lead to higher output which is desired.

Using the concepts mentioned above, this research can build further of the existing literature into the topic and contribute to it as well. The following conceptual model was created from studying existing literature and shows what is expected from this research.

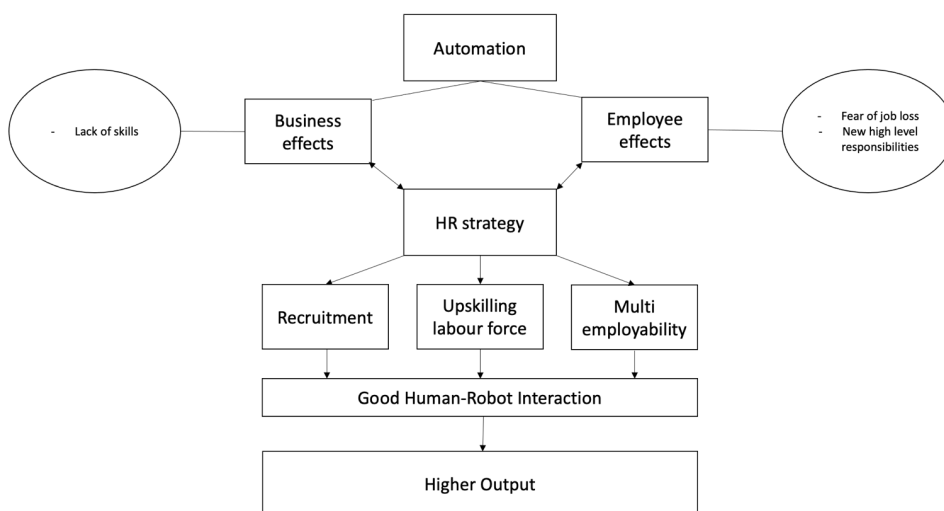


Figure 1.

The conceptual model can be explained as follows, the implementation of automation in a production process will have effects on the business itself and on the employees of the business. Because of automation, a lack of skills can be experienced within businesses where their workforce is unable to work with automation. On the other hand, employees can be affected by experiencing fear a job loss and having new high-level responsibilities. Through a new HR strategy, businesses can try to alleviate these effects to achieve a good human-robot interaction. Recruitment, upskilling, and multi-employability through HR strategy are ways to achieve a better human-robot interaction which leads to a higher output which is the end goal for businesses when they implement automation.

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Expectations

The expectations on the result of this research are that HR strategies by businesses are highly affected by automation. The choice for automation will force businesses to make difficult and important decisions, this can be employee lay-offs but also employee up/reskilling. Either decision will have effects like monetary costs or time costs which can have an impact on the business. Automation is of utmost importance for businesses to compete with other businesses and to stay in a good market position. In the end, profits and efficiency are most important for businesses and this may mean that employees need to be replaced by higher educated workers or that businesses need to provide non-formal education for their workforce which costs time and money to realize. Therefore, HR strategies will have to be altered by businesses due to automation processes to keep a good market position and to try and make maximum profits.

Methodology

To find answers to the research question and sub-questions, a qualitative research method will be used to gather original data. Interviews with people in the decision-making process of businesses and HR employees are the target. HR employees can show their perspective on what it takes for a business to stay attractive for employees to work at and how businesses facilitate their employees to offload their workload outside of the production process. Getting response from the target group has been done through personal and commercial networks as well as by approaching potential interviewees through e-mail. Using the business angle in the interviews, comparisons can be made with existing literature and see if they correspond with each other. Furthermore, the data will be used to test the expectations written above.

5 interviews were held with 6 different people working in manufacturing businesses as either director or HR employee (See figure 2). Commonalities between interviewed businesses are that their production processes all share the same trait which is the assembly line. The interviews were face to face (excluding 1 interview), a questionnaire was created with fixed questions that were relevant for either director or HR employee. Questions ranged from asking about the tasks robots perform, how they were implemented, employee response, and changing HR tasks to facilitate for the business' goals and employees. By conducting these interviews, interviewee experiences can be used to compare to each other between businesses and to existing literature. Information provided by interviewees can help answer the research question and sub questions to see what the effects of automation are on HR strategies of production businesses.

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	Director	HR employee	Industry type
Interview 1 (Interviewee 1&2)	X	X	Agricultural machinery components
Interview 2 (Interviewee 3)		X	Agricultural machinery assembly
Interview 3 (Interviewee 4)	X		Mass food production and packaging
Interview 4 (Interviewee 5)		X	Piping system production
Interview 5 (Interviewee 6)		X	Mass food production and packaging

Figure 2.

Ethical considerations to keep in mind during interviews are that there are power relations when interviewing someone in the decision-making process of a company. These will likely be people that are formal and well-informed and therefore as an interviewer I should also be very formal and have a lot of knowledge in advance to be able to get the most out of the interviewee. Regarding positionality, I am an outsider and therefore an interviewee might not be willing to share certain (sensitive) details with me especially when the topic is on their business. Being formal and well-informed myself could be of help to gain a bit of respect and trust from the interviewee. Privacy considerations that I should make are that I need consent from the interviewee to use the data they provide by providing them a form with what I will and will not use in the research. For example, I do not need to use names of the interviewees, maybe I only use the company name. If the interviewee do not want their company name used, I can also describe the sector they work in or what they produce for example.

The research might have an impact on the social stereotyping of low-educated people, even though this research is not merely focused on low-education workers I should be careful not to make broad claims that might negatively view the lower educated on the labor market. To avoid negative social stereotyping, I was cautionary on focusing and mentioning low educated employees during questions. Avoiding using *low educated* in questions asked helped and interviewees mostly mentioned lower educated employees themselves in a respectful manner to answer the questions.

The interview data quality is valid, interviewees are experienced professionals in either the field of leading a manufacturing business, or human resources. They were all interviewed following the same interview guide with questions for both disciplines and questions specific for HR employees' experiences. The interviews took place under confidential, natural circumstances with regard to the power relations that were in place during the interviews. All the interviewees were given the opportunity to answer the questions freely, without pressure.

After the interviews were conducted, they were transcribed and coded. The coding was done in a separate document where key concepts for this study were listed and quotes from the interview transcriptions were placed under the fitting concepts. Each interview was assigned

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a different color to make it clear which interviewee said which statements to avoid mistakes and ease the analysis of the collected data.

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Results

AUTOMATION EFFECTS ON BUSINESSES

Theory states that automation in a production process is important for businesses to be able to compete with other businesses and to be able to mass produce specific products at the hand of robots and machines. Interviewees agree that automation in their production process is necessary to be able to compete with other businesses. They recognized several positive effects, such as, quality improvement, increased efficiency, and cost savings which the implementation of automation in their production process brought forth.

“Before the use of the optical sorter, everything was done manually and with the human eye and only on spots and length of the products (carrots). In view of quality improvement and cost saving, we have invested in this machine.” (Interviewee 6).

“Because our business is growing and this in combination with having less people, the cost pressure makes it that we want to use automation.” (Interviewee 5).

“If someone starts stacking boxes in the morning, they will be pretty fast. However, as the day progresses, this will lessen. This is the biggest advantage (of having a robot do the stacking).” (Interviewee 4).

Naturally, automation can also cause difficulties for businesses. The problem that is mostly seen by interviewees is that there is a lack of the required skills to man a robot by their employees. *“Our robots could not be controlled by our employees immediately ... other capacities are expected of employees that man a robot”* (Interviewee 6).

AUTOMATION EFFECTS ON EMPLOYEES

Whereas interviewed employers can see the positive effects of robots in action, their employees, at first, mostly feel negative effects from implementing automation. They mainly feel are that their jobs might be jeopardized by the implementation of robots on the work floor and they feel this might get them replaced. Interviewees are aware of the effects that their decisions have on their employees, and they try to alleviate the negative perceptions by creating support and trust for their automation plans. Interviewee 2 says they aim to have a “trust pact” with their manufacturing employees to create support for the acceptance of the plans and smoother implementation once the plans are realized.

While the negative perceptions felt by employees are not unjustified since robots do in fact take over certain tasks from humans in a production process, it does not always mean when a business implements robots into their production process that employees will be replaced as a result of this. Interviewee 1 describes that their *“growth was so fierce that when we bought more (robots) and they were placed here, we hired more people”*. This statement shows that the implementation of automation (and the positive effects it has on businesses) does not mean jobs are always lost as a result when economic growth is achieved. Interviewee 5 also adds that in their case *“there are no jobs in danger, this is the ideal variant of automation (robots in the assembly line) for me personally”*.

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As described in the theoretical framework, the human role in the production process is not necessarily reduced by the implementation of robots, it does however create new high-level responsibilities for employees. Being able to work with, alongside, or control the robot are examples interviewees give of these new responsibilities. Furthermore, interviewees say that human decision-making, and as interviewee 2 describes it, *“the feeling”*, remain important for producing products.

“Humans are super flexible, they see something, they reason to themselves “oh I need to help, oh I need to quickly go there” and even though the robots (self-driving forklifts) are intelligent regarding their software, they are quite dumb things. You will have to tell them what to do or they will not do anything.” (Interviewee 5).

ALLEVIATING NEGATIVE PERCEPTIONS

Interviewees see that their HR tasks have changed over time due to automation. As the theory describes, having a good human-robot interaction is needed for successful implementation of automation. Therefore, the effects that employees feel because of automation must be addressed and alleviated by HR departments to ensure a good human-robot interaction. As described above, creating a support base and a trusting relationship between employer and employee is an important first step. To create this trust and support, interviewees see that transparency is becoming very important. *“Transparency is one of the most important things”*, interviewee 3 says. By being transparent of the plans of implementing robots by showing videos to their employees of how the robot operates, interviewee 5 took away the initial scares their employees had of the robots and as a result, interviewee 5 saw that the acceptance of the robot was faster which can lead to a smoother implementation.

HR TASKS AND STRATEGY CHANGES

Whereas existing literature already shows that HR departments are becoming more important for businesses to maximize performance, interviewees also see this trend happening. Examples of the focus HR departments had in the past were payroll and recruitment, now HR departments are tasked with mapping out the skills of every employee to be able to provide education or training where this is needed. Another change interviewees see is that HR is transitioning into more and more of facilitating employees to provide for, and retain (skilled) employees with the main goal of improving the human-robot interaction on the work floor. Interviewees see 4 main ways of improving the human-robot interaction and negating the negative effects of automation through an updated HR strategy:

- Recruiting high(er) skilled employees
- Facilitating current labour force
- Upskilling current labour force
- Multi-employability of employees

It is interesting to note that none of the interviewees mention layoffs of employees as a way of improving the human-robot interaction. Interviewees even say that they are willing to cooperate and keep a hold of employees that lack the skills to man a robot and are not

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willing to upskill themselves to be able to do so in the future. This is mainly due to the growth they experienced in recent years (boosted by automation) which means it is important that they hold on to their employees.

RECRUITING HIGH(ER) SKILLED EMPLOYEES

As mentioned in the introduction, the tight labour market plays a factor in the decision making regarding the topic of recruitment. Interviewees say that finding high educated/skilled employees is difficult currently, with interviewee 2 saying; *“acquiring the real specialists is just very difficult at this moment, we have job offers reserved specifically for experienced specialists because yeah, we just need those”*. The ‘real specialists’ interviewee 2 is referring to are of utmost important for manufacturing businesses. Robots are not able to do certain tasks within production processes even though they are very precise and consistent. These specialists have years of experience in their field of work as they possess knowledge and skills that are not easily taught to another employee or easily put into a specific working system.

“If you are on a line for 25 years, those people will take out a notebook and say “in 1968 I have experienced this as well” ... That knowledge, spread out over 10 to 15 people, we will never be able to get into 1 system because it is too broad.” (Interviewee 5).

FACILITATION

Acquiring and retaining high educated/skilled employees is not an easy task. By facilitating for these employees well, interviewees try to become more attractive as a business to work for. It is mentioned by interviewees that they offer high salaries to specialists, as well as attractive fringe benefits, such as providing a car for example.

“We take good care of our employees and we see the results of that, our efflux is low and even if people leave, we see a lot of them return.” (Interviewee 3).

Facilitation as a whole has become an important topic for HR departments. Not only the specialists and high educated employees are cared for well, the rest of the labour force is also taken care of increasingly. Interviewees mention that they highly value their employee’s satisfaction since a satisfied and motivated labour force will perform better. Further examples of facilitating employees given by interviewees are providing high quality work clothing, providing full meals at low prices, and giving employees clear job prospects and education possibilities in an effort to keep the efflux low.

UPSKILLING

Another effort to improving the human-robot interaction through HR strategy is the upskilling of the current labour force. To counteract the lack of skills a business might have after implementing robots into the production process, businesses can provide education or training to their employees. However, it is not an easy process to establish the training and education needs the employees have. This is a challenge that arises for interviewed HR departments, interviewee 2 states;

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“Specialists value “the feeling”, the hearing, and the experiencing highly whereas a younger person will rather say that they trust the machine ... an older person can trust a bit more on the machine ... for the younger people it is important that they can hear it (when something goes wrong with the machine). This makes it difficult to establish the training needs, especially for a whole team because one individual has to go more in the digitization direction, the other individual should move more towards the “feeling”, so you cannot just say “we are going give one training” ... the needs differ.”

To try and establish the training needs as best as possible, interviewees 1 and 2 showcase an employability matrix with all their manufacturing employees where they can classify all their employees’ skills on the X axis and workplaces and processes on the Y axis. Using the matrix, they can more easily recognize which employee is suited for which workplace and what they may have to improve on by attending training or education.

Interviewee 2 furthermore adds that they see that the younger working generation highly values job prospects and being able to improve themselves through their work. Providing this generation with training and job possibilities helps them retain these employees as well.

MULTI-EMPLOYABILITY

Interviewees see that through training and education, employees can become multi-employable which might boost the human-robot interaction. Being multi-employable means that their manufacturing employees are able to work several stations within the production process, not only does this secure production safety for interviewees since they can more easily handle sick leave or training leave for example, is also brings diversity for their employees which can improve their work satisfaction and prevent efflux.

“For the employee it is more attractive at a certain moment of course. If you are always doing the same thing it gets monotonous but if you know how everything works ... it brings diversity ... Yes, to ease the work and in the end of course to keep the employee onboard ... that the employee is also happy with his work and that the employee see challenges in his job and not just a 9 to 5 every day.” (Interviewee 4).

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Conclusion

With the implementation of automation tools such as robots, there are positive and negative effects arising for businesses and employees alike. Both researchers and interviewees see positive impacts for businesses from the implementation of robots such as, increased productivity and efficiency, cost reduction, and quality improvement. There is, however, also a downside for businesses where they experience a lack of skills from their current labour force. Negative effects are also felt by employees, they may feel apprehensive about automation as it could potentially jeopardize their jobs. However, research and interviews have shown that the human role in the production process is not necessarily diminished with the implementation of robots (Hirche & Music, 2017) and in some cases, collected data shows that there are no layoffs because of automation. Instead, it requires employees to take on different high-level responsibilities and work in collaboration with robots. Interviewees furthermore say that transparent communication from HR departments plays a vital role in mitigating these negative perceptions fostering trust and collaboration.

The human-robot interaction is crucial for successful automation, and through HR strategy it can be improved by focussing on upskilling, recruitment, and multi-employability. Interviews and literature have shown that by training and educating employees about the roles and responsibilities of robots and how to work with them, they can upskill their employees' skillset to negate the lack of skills within their labour force.

Recruitment is the second way to improve the human-robot interaction through HR strategy. Finding high educated employees that can work with automation is a difficult task for HR employees interviews show. High educated employees and experienced specialists remain vital for businesses to produce where the "human touch" and soft skills remain very important in the production process (Bhargava et. al, 2021) and interviewee 2 agrees that "the feeling" these specialists have, are qualities that makes them irreplaceable. Interviewees offer attractive fringe benefits and facilitate employee well-being outside of the production process to retain these valuable employees. Data shows identifying the training needs of employees and finding a balance between technical skills and soft skills is a new challenge that has come up for HR departments.

Multi-employability of employees is highly valued by interviewees, who aim to have employees capable of working in multiple parts of the production process. This not only ensures production safety but also brings diversity and job satisfaction for employees as stated by interviewee 4, which can help retain valuable employees.

The effects that automation has on HR strategies of production businesses is certainly noticeable for the interviewed parties. The successful implementation of automation in the production process requires a collaborative approach between employers, employees, and HR departments, interviewees say. Whereas their HR departments in the past primarily focussed on administrative tasks such as payroll, their role within the business has grown severely as of today. HR departments have become an important factor in participating to the success of the business. Therefore, the role of HR has evolved from administrative tasks to a strategic focus, aligning goals with the organization and contributing to its overall success. Interviewees now focus on skill management, employee engagement, and providing

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a positive work environment.

Across the collection of the data, it is interesting to note that all of the interviewees have provided roughly the same information as each other. Even though they are in different industries with the only similarity being that they manufacture products following an assembly line. Business directors and HR employees providing the same data can show that HR departments' goals and tasks have indeed been aligned with the board of businesses to contribute to the business' success and show that HR departments play an important role in businesses to assure successful implementation of automation.

Reflection

This thesis was a complicated process. Identifying a focused and streamlined research question was a difficult undertaking and keeping a small scope within the boundaries after eventually formulating a good research question has been a personal pain point. Furthermore, identifying relevant literature for studying this topic was quite time-consuming since existing literature is skewed towards employee and business effects instead of HR effects.

The interview guide was hard to create since there were interviews with directors and HR employees, asking the same questions would not always lead to good results. Therefore, alternative questions from a different angle had to be created later on so that every interviewee would be able to answer the questions. This has damaged the data collection since not every interview resulted in collecting the same data. Furthermore, arranging the interviews took quite some time, this was due to a lot of potential interviewees not agreeing to be interviewed, perhaps I should have been more assertive in the interview arranging process, furthermore, private situations have resulted into postponing and cancelling interviews due to time constraints. As a result of the private situations, interviews were not optimally prepared and conducted which has also hurt the data collection. Furthermore, the sample size of this research is too small to draw definitive academic conclusions out of. Having more interviews would increase the robustness of the results found, 6 interviewees can give an indication of what the effects could be like but not a definitive answer. Future research into the topic with a larger sample size may have better definitive findings to be able to draw a more well-rounded, argued conclusion out of.

The research conducted on automation's effects on the labour market emphasizes the importance of considering both the employee and business perspectives, as well as the HR perspectives. While much research has focused on the employee/business side, there is a need to further study how businesses adapt their HR strategies in response to automation. Understanding how businesses manage human-robot interaction, upskilling employees, and increasing the multi-employability of their employees can provide valuable insights for achieving successful automation implementation.

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Appendix

Listed below are the interview questions.

For privacy reasons, the interview transcripts will not be listed below.

-What are the effects of automation on the HR strategies of businesses that are in the process of innovating their production process?

- How does automation affect businesses and their employees?

- What are other factors at play regarding the decision-making process on HR strategy?

Data collection instrument:

Start off with asking about the production process of the company.

-What do you, as a company, produce?

-What is your personal role within the company?

-When did the automation process of the production process start for your company and what was changed in the production process?

-Has automation affected your business and/or employees in certain ways?

-What were the considerations or decisions made regarding the change of the production process?

-What role does your labour force play in this decision-making process? Was your labour force ready to work with automation? How did the employees respond?

If not:

-What was the next step regarding labour force? Re/Upskilling? Lay-offs? Outsourcing? Recruitment?

-What considerations were made to fix this problem? Could providing training/education be too costly/timewise/monetary wise? Could recruitment be a quicker solution?

-Are there specific risks or benefits to providing education or choosing something else like lay-offs?

If yes:

-How come? Have you prepared for the automation change? Have you provided training/education before?

Regarding HR

-What is the strategy this company has regarding HR?

-What are factors that normally influence HR decision-making?

-Has automation changed the way your company handles HR? In what ways or Why not?

-What are the central terms in your HR strategy? What is the focus?

-How has your HR changed over time due to automation?

-How important is HR for making sure that the automation process is implemented smoothly? Interplay between automation and HR?

For HR employees

-How has your work changed?

-Were changes top-down?

-Did change "just happen"

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