Future Trends Report
Based on Analysis of the Team's Chosen Community / Organisation in Mid-Term and Final Evaluation

Community / Organisation Studied: Retail Companies using robotics
AIR - Automation In Retail

STEP 1. Identify Challenges

Read the Future Scene carefully and generate ideas for challenges, concerns, and possible related problems. Choose the 5 most important challenges and write them in the space provided. Include applicable research with appropriate in-text citations.

Challenge #1: Lowered Employee Morale

With an increase in the use of robotics in the retail industry, companies are likely to be replacing current employees with robots, which may result in retrenchment. Downsizing can threaten employees' sense of wellbeing in several ways. They may see the company as having behaved unjustly or unfairly. They obviously feel less secure. They may also lose the belief that their contribution to the business will be rewarded in future. These responses may easily threaten business performance. Survivors of downsizing can become unduly risk averse and narrowly focused, and therefore less creative and open to change. Employers who remain behind after the retrenchment process might work themselves to exhaustion out of fear that they themselves might be retrenched next. Conversely, they may feel demotivated and insecure which can result in lower productivity within the organisation. Some individuals suffer symptoms like Post-traumatic stress disorder (PTSD) such as high levels of psychological stress and fear. Organisational performance is also negatively influenced by decrease in job satisfaction, organisation loyalty and post-retrenchment quitting of 'survivors' or remaining employees. Therefore, with decreased morale, companies themselves will also be affected as the workers are less motivated.

Research:
1. In a 2012 review of 20 studies of companies that had gone through layoffs, Deepak Datta at the University of Texas at Arlington found that layoffs had a neutral to negative effect on stock prices in the days following their announcement. Datta also discovered that after layoffs a majority of companies suffered declines in profitability, and a related study showed that the drop in profits persisted for three years. And a team of researchers from Auburn University, Baylor University, and the University of Tennessee found that companies that have layoffs are twice as likely to file for bankruptcy as companies that don't have them. (Harvard Business Review, 2018)

2. A 2002 study by Magnus Sverke and Johnny Hellgren of Stockholm University and Katharina Näswall of University of Canterbury found that after a layoff, survivors experienced a 41% decline in job satisfaction, a 36% decline in organizational commitment, and a 20% decline in job performance. (Harvard Business Review, 2018)

Challenge #2: Preference for Human Interaction

Many service robots do not have human-like characteristics which do not enhance but worsen the customers' experience. New Business School research found that customers prefer robots to have a human voice, show emotions, and physically embody a human not a robot. The research highlights that customers find it easier to interact with robots who appear human-like as they are able to apply the familiar social rules and expectations of human-to- human interactions. Thus, this showed that customers still prefer to interact with real humans. There will be worse human-robot interactions when the robot does not have human-like characteristics. Humans will find that the robot is uncontrollable or unpredictable which gives customers uneasiness and will not use this kind of service again. This would then impact companies as less customers would visit their stores, resulting in less revenue.

Research:
1. Recent surveys highlighted the growing reluctance of US consumers to chat with chatbots. 86% of consumers prefer to interact with a human agent; 71% said they would be less likely to use a brand if it didn't have human customer service representatives available; only 30% believe that chatbots and virtual assistants make it easier to address customer service issues. (TreasureData, 2019)

2. In a survey of 100 US adults, 80.5% prefers human interactions while only 19.5% prefers interacting with robots. In the survey, some factors that caused humans to prefer human interactions over AI are able to understand concerns better, more thorough explanations, more emotional response, more options provided and able to address problems faster. Most of these factors are caused by the fact that robots could not think and act like humans, do not have emotions, and could not place themselves inside the shoes of customers. Seventy-three percent of the respondents said they have had a frustrating experience in which electronic systems failed to connect them to the correct department or customer service representative. (TreasureData, 2019)

Challenge #3: Technical Vulnerabilities

With an increase in the use of robots in the retail industry, there are several concerns related to robots' deployment in critical infrastructures. These concerns are mainly related to security, safety, accuracy and trust. However, various security concerns, issues, vulnerabilities, and threats are constantly arising, including the malicious misuse of these robots via cyber-attacks, which may result in serious injuries and even death. Unintended accidents will always take place, but the ones caused by malicious attacks represent a very challenging issue, as they can cause serious economic and financial losses. Some security issues include:

a. Lack of privacy can result in the exposure of business deals and trades that can affect the reputation of a given organization, and the exposure of the collaboration between different robotic security firms
b. Lack of tamper-resistant hardware renders robots prone to damage and/or partial/total destruction, which can lead to the loss of the robot's functional and operational capabilities
c. Lack of security patches increases the chance of basic and advanced attacks such as stealing of sensitive data, remote access, and rootkit
d. Lack of safety designs is very risky and has proven in many real-case incidents to be lethal and threatening towards humans with a remarkable number of casualties and fatalities, aside the economic/financial losses

Research:
1. Many robotics companies use authentication, basic security level, and authorization while developing robotic software. For instance, a teleoperated surgical robot which is a machine can be used by a doctor to perform a procedure on a patient from the other side of the world. In the future, these robots could provide urgent care to people in disaster zones, on the battlefield, even up in space or radioactive zones where people can't reach. If you're sending a robot to these areas but still want the human in control, there is a link between robot and human that lets them interact with each other. It can be used to control movements and operation of robots from remote locations via a network. This may raise the potential that it can be compromised by hackers and used for disastrous purposes. The long distance between the human operator and the robot means the communications between the two could be vulnerable to attack (Testsbytes, 2021)

2. A robot at Stanford Shopping Centre ran over a toddler in 2016. Knightscope, which makes the robot, said the machine veered to the left to avoid the child, but the toddler ran backwards directly in the front of the machine. Teng said her son was not capable of running backwards."Hearing a report that one of our machines may have injured someone is absolutely horrifying," said Knightscope vice president of marketing and sales Stacy Dean Stephens. "Our core mission is to ensure public safety, and we are taking this report very seriously." (CNN, 2016)

Challenge #4: Cost of Robots

Are robots really cheaper to operate than regular workers? More companies are replacing manual labour with robots with the thinking that it would be cheaper. However, it might not be the case. Companies not only have to pay the purchase price of the robot, which can cost tens of thousands of dollars, but also accessories needed for the robot, as well as workers required to oversee and maintain the robot, which would be higher paid than regular workers. Therefore, if a company is to invest heavily into robots, it would require a large initial capital to cover the costs.

Research:
1. The average annual wage for entry-level factory employees is around $25,000 a year. The robotic worker Baxter, on the other hand, costs $32,000. Baxter costs little more to purchase than the cost of paying the average human factory employee. Baxter doesn't need breaks, won't get injured, and doesn't make errors. On paper, it seems like robotic workers are significantly more cost effective than human workers. However, there is more to cost than just wages. First, the purchase price with accessories and warranty is now $32,000, while just a couple of years ago Baxter sold for $22,000. How many more enormous price increases will we see? How many new accessories will you need? You can set the wage you're willing to pay for a human worker, but Baxter is a product, so the manufacturer sets the price. The operating costs, counting $52/month in electricity, depreciation, and the initial purchase price — work out to about $871 a month. This is quite a bit less than what's paid to a human worker. But Baxter robots can't actually replace human workers. They require operators. The human operators at a plant full of robots will not be entry-level. They'll be more highly paid than the entry level workers. There will be fewer of them, but there will still need to be human workers to build, train, oversee, and maintain the Baxter robots. (TechCrunch, 2016)

2. Offshoring manufacturing jobs had a cost: hundreds of Americans lost well-paying union jobs and America lost much of its foundation of manufacturing skills. Now that manufacturing is returning to the U.S., the manufacturers face higher labor costs and a lower supply of trained workers. Many are responding with increased automation. Manufacturers may have to put a serious investment into education in order to be able to take advantage of the promise of industrial automation.(TechCrunch, 2016)

Challenge #5: Need for Upskilling

With the increased use of robots to replace manual labour companies are looking for higher skilled workers, which have several problems. Firstly, Retailers must also rethink their operating models across stores, distribution centers, and headquarters. Automation creates organizations with far fewer layers—each employee is responsible for a more diverse set of responsibilities. Real-time data and analytics will empower faster decision making. Secondly, employers increasingly view talent—not real-estate costs—as the primary driver of decisions regarding office locations, and many are moving their headquarters to optimize for talent. This would result in higher rent and operation costs. Lastly, there will also be an increase in reskilling current employees as it is cheaper than hiring new employees. Employers will play a leading role in helping workers to reskill, but collaboration with external partners will also be required. Worker training and job-assistance programs are however still quite expensive and don't always produce rewards that are worth the cost. Also, this could discourage modernization, ignore opportunities for positive change or cause employers to avoid necessary risks as recruitment provides state-of-the-art skills, new people and innovation for many companies.

Research:

1. Although reskilling takes a good deal of effort, it often offers a higher return on investment, in the longer term, than hiring; in fact, the business case for reskilling can be 1.5 to three times better. On average, replacing an employee can cost 20 to 30 percent of an annual salary, reskilling less than 10 percent. Reskilling existing employees also allows a retailer to retain institutional knowledge and saves the ramp-up time needed to onboard new hires. Furthermore, reskilling is more likely to earn goodwill from employees, customers, and governments alike. This goodwill can have tangible benefits; approximately 40 percent of transformations fail because of employee resistance, so a reskilling campaign can mitigate that risk. For these reasons, we believe that reskilling will be a large part of the answer for retailers. Across industries, global executives agree: 75 percent of those surveyed say reskilling will provide at least half of the solution for the skill gap. (Business Insider, 2018)

2. Walmart's Dollar a Day college-tuition program, for example, has won support from other key organizations since it started. To ensure the initiative's success, Walmart has partnered with Guild Education, which provides coaches to help the company's employees select the appropriate degree and navigate the college-application process. Walmart also picked its university partners thoughtfully, choosing three—Bellevue University, Brandman University, and the University of Florida—known for their high graduation rates and focus on adult learners. AT&T launched Future Ready, a $1 billion web-based, multiyear reskilling effort, with the support of universities (such as Georgia Tech) and online platforms (for instance, Coursera and Udacity). (CNBC, 2021)

3. Ahold Delhaize's Peapod and McDonald's have both moved their headquarters from the outskirts of Chicago to the heart of downtown. The Canadian grocery chain Loblaws runs its Loblaws Digital organization in a trendy Toronto neighborhood rather than the main headquarters, in the suburbs. Executives from each of these companies have cited the need to attract talent as the key motivation for their site decisions.(CNBC, 2021)

STEP 2. Craft the Underlying Problem

Using the challenges listed in Step 1, identify a problem of major importance to the chosen community / organization in the future. Write your Underlying Problem making sure your question clearly explains the action that will be taken and the desired results/goal of that action.

Incorporating Challenge(s) # ___2,3,5_____

Underlying Problem:

With the COVID-19 pandemic causing a surge in the use of automation in the retail industry, it seems that retail companies will be the most heavily impacted, with the need to adapt to the use of robots and new technology. How can we reduce the negative effects of adopting automation in retail so that companies are able to smoothly transition to the use of automation in the year 2030 and beyond?

STEP 3. Produce Solution Ideas

Generate solution ideas to the Underlying Problem in Step 2. Choose the 5 most effective solutions and write the elaborated ideas in the space provided. Include applicable research with appropriate in-text citations.

Solution 1: ProRobo Campaign

We, Project AIR, will work alongside the Infocomm Media Development Authority (IMDA) to push out a campaign for safe usage of technology and robotics in the retail industry. The campaign will teach companies how to ensure that their robots are safe and have the necessary safety requirements and protection to prevent malware and illegal cyber-attacks. The campaign will also have certain courses for these companies to learn more about the relevant protection requirements such as physical safety, proper encryption tests, authentication and authorization tests

Research:

1. Extensive safety training should be provided for all employees who are expected to have any possible contact with the robot system. Workers must be familiar with all working aspects of the robot, including the full range of motion, known hazards, programming information, locations of emergency stop buttons and power sources, and the importance of safety barriers. Training should also include procedures for freeing a colleague who becomes caught. It is important to emphasize that just because a robot is stopped does not mean it will remain stopped, and just because a robot is repeating a motion does not mean it will continue to repeat only that motion. (SHRM, 2015)

2. Newly trained employees should be closely supervised until they adjust to the robot. Training requirements do not, however, only apply to newly hired, inexperienced employees. Experienced robot programmers and operators should also receive refresher training courses that allow them to stay up-to-date with technological advancements and remind them of the concern for safety. Supervisors should receive the same robotics training as other employees and operate under the assumption that no one is permitted to enter the robotic workstation without first reducing the speed of the robot or halting its movement. (SHRM, 2015)

3. To help employers, Occupational Safety and Health Administration (OSHA) has created an online technical manual for employers to learn about the hazards associated with robotics and automated machinery, including those that stem from malfunctions or errors in programming or interfacing with peripheral equipment. (EHSToday, 2018)

4. In addition, the Robotics Industries Association offers an extensive safety program for employers on its website that covers everything from ANSI standards and RIA technical reports (which OSHA relies on) to public and in-house safety training opportunities that are available from the association. (EHSToday, 2018)

5. The OSHA technical manual groups robotic incidents into four categories: impact or collision accidents, unexpected movements, component malfunctions, and unpredicted program changes related to the robot's arm or peripheral equipment that result in contact accidents. (EHSToday, 2018)

Solution 2: Tech Advancement and Internship Programme (TAIP)

We, Project AIR, will partner with companies as well as the Ministry of Manpower (MOM) to provide courses for people who want to upskill themselves, as well as partner with experts to help. Those who perform well can potentially be offered a job by partner companies. Annual convention will be held for people to showcase their skills and for companies to hire new workers, as well as to help people find out what companies are looking for in an employee and adapt to the requirements. Unemployed people are able to post their resumes and if companies see a person that they may want to hire, they may send them for additional training. For example, if a company is looking for a worker with leadership and communication skills, good teamwork, integrity and a strong sense of responsibility, but also requires the person to know how to code. If the company is able to find someone with all the qualities, but is unable to code, they can inform the person and get him or her to take up a coding course and when he has completed the course, he will be able to work for them. This provides good opportunities to those who are unemployed due to being displaced by robots taking over their jobs, and for people who want to upgrade their skills and become better at something.

Research:

1. Amazon launched its Upskilling 2025 initiative as part of its commitment to prepare workers for a more digitized workplace in the future. "We think it's important to invest in our employees to help them gain new skills and create more professional options for themselves," says Beth Galetti, senior VP of People Experience and Technology at Amazon. (Eightfold, 2021)

2. One of the many opportunities offered through the initiative is the Mechatronics and Robotics Apprenticeship Program. In the two-phase program, employees attend classes and receive on-the-job training in preparation for work as mechatronics and robotics technicians. When done, they will then be poised to earn more money and secure better career opportunities. (Eightfold, 2021)

3. The survey found that 42 percent of companies stepped up their upskilling/reskilling efforts after the coronavirus outbreak, and that 91 percent of companies (and 81 percent of employees) say upskilling/reskilling training has boosted productivity at work. (American Express, 2021)

4. Upskilling or reskilling programs are a way to bridge the skills gap brought on by constant change. While you could hire in the skills that your company requires, investing in your existing workforce can save you time and money. The more you can work with your current staff and help them make themselves more marketable, the more employee loyalty and productivity you'll inspire—the following tips can help. (American Express, 2021)

Solution #3: "AAAA" Social Platform and Website

We, Project AIR will work with relevant government organisations to create the "Adapt And Accept Automation" social platform and website. It will be on multiple social media platforms like instagram and facebook and includes a website, partnering with experienced retail companies, which gives advice and connections to retail companies who have just begun integrating automation as part of their workforce. The main purpose of this is to ensure retail companies will have a better idea of the benefits and drawbacks of automating certain processes.

1. Weekly Tours and Interviews
    Every week, our various platforms will upload posts of interviews or tours of retail companies. For interviews, we will interview retail company heads on their experience with automation. This will include the type of processes they have decided to automate, the positive and negative implications it had on the company and the decision making processes. We also will tour these retail companies to give other companies relevant insight on how their companies would look after the automation of some processes with robots. After the posts, we hope companies will be more informed about their choices on automation and will make more informed decisions.

2. Connections with experienced individuals
    On our various platforms there will be a link which would bring individuals to our home website. Our website will have a scheduling system where experienced individuals in the retail industry will provide their available timings every week and a short biography of themselves. They will be known as the "instructors". New retail companies who have inquiries in the process of integration of automation can select whichever timings they are free. After that, they can choose the specific instructor (who must be available) they prefer to seek advice from. After the scheduling is complete, a zoom meet link will be generated and both parties will enter for the meeting to commence. The meeting duration will be an hour. To make sure the session was productive, a review system will be set up where the new retail companies can rate their session with the instructor from 1 to 5 stars. Through this meeting system, we hope new retail companies can gain relevant insight which helps them to decide how best to integrate robots into their workforce and become more knowledgeable on the topic of automation in retail.

Research:
1. "When used correctly, a powerful website with nonprofit tools and built-in design features can make spreading awareness and building a following for your cause much simpler."(Christine Ward, 2020)

2. "Unlike having a local brick and mortar establishment, a business Website transmits your business profile around the world, permitting for enhanced exposure and sales, due to a wider demographic reach."(Boboy IT solutions, 2020)

3. "Those who are truly open to guidance (and not just looking for validation) develop better solutions to problems than they would have on their own. They add nuance and texture to their thinking—and, research shows, they can overcome cognitive biases, self-serving rationales, and other flaws in their logic"
    (Harvard Business Review, 2015)

Solution #4: Auto-retail Organisation

We, Project AIR, will work with the relevant government organisations and agencies to assist and develop the use of safe automation in these retail companies. The organisation, as well as the Ministry of Finance (MOF) and Ministry of Trade and Industry (MTI), will draw up a subsidy plan to encourage the adoption of more robots and technology in the retail sector. With the rising use of automation in the retail industry, cost will be a significant issue in the progress towards replacing manual labour with robots. This could result in some retail companies, especially new or smaller companies to feel discouraged and may not be attracted to use these technologies. With the increased use of technology and robots, it is also necessary for checks to be put in place to ensure that these robots are able to tackle security concerns, issues, vulnerabilities, and threats. The rising use of technology and robots, it is inevitable that certain groups of workers may be retrenched and lose their jobs, which would lead to high unemployment rates. The programme will work alongside Ministry of Manpower (MOM) and GovTech, as well as other partner companies that will help to reskill employees to be able to find a job in the new future of automation and robots

Research:

1. When safety protocols aren't followed, today's industrial robots can be fatal. They present a danger to workers around them, particularly when employees have to interact with a robot during programming, maintenance, testing, setup or adjustment. There are plenty of ways to improve robot safety, but it's important you do so. Not just for your business, but for your employees. As robots advance in power and capabilities, they can also become more dangerous. (genesis-systems)

2. Business is acutely aware of the importance of upskilling. There is a wide gap between vacant positions requiring new skills and competent candidates to fill them. This is often referred to as the skills gap. A recent CareerBuilder survey found that nearly 60 percent of U.S. employers have job openings that stay vacant for 12 weeks or longer. HR managers say extended job vacancies cost the company more than $800,000 annually. (Forbes, 2019)

3. Many companies use internships as a way to enhance their recruitment efforts. In some cases, a company may decide to hire an intern at the end of the assignment. Even if a job offer doesn't happen right away, an intern who makes a favorable impression could receive an offer down the line when an opening occurs. It's a way for companies to test out an employee before committing to hiring them. (fremont colleague)

4. Automation is increasing so rapidly in demand, the cost of automation is also skyrocketing. Automation has become expensive due to the cost of labour, cost of materials, cost of security, cost of regulations and cost of infrastructure. For example, Cybersecurity as an industry has grown from $70 Billion in 2014 to $155 Billion in 2019. This means that data, which is the oil for the machine learning engine, is coming at a high price. Despite the benefits of automation, the costs are high as well. (data driven investor, 2019)

Solution #5: Machine Learning Algorithms

- With the introduction of artificial intelligence in the 21st century, one benefit is that it can trawl through a humongous load of data and make the most informed decisions. In the context of retail companies, the concern is whether the inclusion of AI to automate some processes will bring greater efficiency to the company. With the costs of purchasing (these automations), maintenance and safety issues, companies are apprehensive on the productivity of their new addition to their workforce.
- Using algorithms similar to that of the MROI (return on marketing investment) algorithm in the field of marketing, these algorithms will take all factors affecting the output rate of the algorithm in the long run and compare this output value with that of the original efficiency. As a result, companies can be sufficiently convinced of the algorithm's productivity in serving or not serving its purpose.
- Issues such as employee morale can also be resolved with the help of machine learning algorithms. These algorithms can measure productivity of employees through physical action or performance metrics like KPIs (Key Performance Indicators). After algorithms have identified those workers of lower productivity, targeted help from bosses can be directed at these workers in an attempt to raise their efficiency level.
- Finally, machine learning can also help to alleviate safety issues. Algorithms , which are used to detect certain patterns in general, can be used to detect the presence of malware. This can give immediate information to retail companies so they can quickly resolve the issue. In addition, the modus operandi of the repetitive recognition of software viruses can give rise to algorithmic recommendations. Algorithmic recommendations of what exactly? The recommendations of antivirus softwares robust enough but cost efficient to ensure immunity to similar malware in the future.

Research:

1. 1. [Walmart's] system can track employee "performance metrics" and ensure that employees are performing their jobs efficiently and correctly by listening for sounds such as rustling of bags or beeps of scanners at the checkout line and can determine the number of items placed in bags and number of bags. Sensors can also capture sounds from guests talking while in line and determine whether employees are greeting guests." (Matt Wujciak, 2019)

2. This is where algorithms ... come in to help organizations make sense of huge amounts of data and apply it to scale their operations and profits. The application of algorithms to leverage data that can be used to optimize processes or create revenue streams is widespread across many industries. From automotive anti-lock braking to Amazon's recommendation engine. (Salim Ismail, 2020)

3. With fast-evolving cyber attacks and rapid multiplication of devices happening today, AI and machine learning can help to keep abreast with cybercriminals, automate threat detection, and respond more effectively than conventional software-driven or manual techniques. By using sophisticated algorithms, AI systems are being trained to detect malware, run pattern recognition, and detect even the minutest behaviors of malware or ransomware attacks before it enters the system. (Gaurav Belani, 2017)

STEP 4a. Select Criteria

Generate criteria to determine which solution idea does the best job of solving your Underlying Problem and/or addressing the Future Scene situation. Select the 5 most important criteria for measuring solution ideas and write them in the spaces provided.

Criterion #1: Fastest

Which solution is the fastest to implement by the relevant organisations so that retail companies are able to integrate into automation and ensure the safe use of technology?

Criterion #2: Attractivity

Which solution would be most attractive to retail companies to integrate them into the use of automation and ensure the safe use of technology?

Criterion #3: Largest Impact

Which solution will have the largest impact on retail companies to integrate them into the use of automation and ensure the safe use of technology?

Criterion #4: Sustainability

Which solution is most sustainable in the future for retail companies to integrate them into the use of automation and ensure the safe use of technology?

Criterion #5: Cost-efficiency

Which solution will be the most cost efficient for retail companies to integrate them into the use of automation and ensure the safe use of technology?

STEP 4b. Apply Criteria

List the solution ideas from Step 3 on the grid. Use each criterion to rank the solutions on a scale from 1 (poorest) to 5 (best). The weighting for one important criterion may be doubled if necessary.

Step 3 Sol'n #	Solution Idea	Criteria					Total
		1	2	3	4	5	
#1	ProRobo Campaign(3)	4	1	1	2	5	13
#2	Tech Advancement and Internship Programme (TAIP)(2)	2	4	3	3	2	14
#3	4A Campaign(3)	5	2	2	1	3	13
#4	Auto-Retail Organisation(1)	3	5	5	4	4	21
#5	Machine Learning Algorithms(2)	1	3	4	5	1	14

STEP 5. Develop an Action Plan and Evaluate its Feasibility

Develop your top-scoring solution idea into an Action Plan. Thoroughly explain how the Underlying Problem is solved, how the plan will be implemented, and how the community / organisation will be affected. Explain how this Action Plan is feasible with secondary research consulted, preferably also with primary research (feedback from chosen community / organization)

Action Plan: Auto Retail Organisation

We, Project AIR, will work with the relevant government organisations and industries to assist and develop the use of automation in the retail industry.

1. Cost Subsidies
- With the rising use of automation in the retail industry, cost will be a significant issue in the progress towards replacing manual labour with robots. This could result in some retail companies, especially new or smaller companies to feel discouraged and may not be attracted to use these technologies.
- The organisation, as well as the Ministry of Finance (MOF) and Ministry of Trade and Industry (MTI), will draw up a subsidy plan to encourage the adoption of more robots and technology in the retail sector.
- These subsidies can include the following:
a. Reduced purchase prices of robots:
b. Reduced maintenance costs of robots
c. Replacement and Upgrades Scheme
    - This scheme would allow companies to trade in their own technologies and robots for newer ones, when it is necessary, for a price cheaper than the retail cost
    - These robots and automations can be ranked A, B and C, to determine their capabilities
    - Companies will only be able to trade in with robots of the same capability grade

2. Safety and Compliance Checks
- With the increase use of technology and robots, it is necessary for checks to be put in place to ensure that these robots are able to tackle security concerns, issues, vulnerabilities, and threats
- These checks will provide a grade issued to these companies by the organisation and GovTech, which would involve 2 tests
- The first test will be done on an annual basis by the organisation as well as GovTech. They would provide penetration tests into the core systems of the companies robots' software, and will thereafter be provided with a checklist of the relevant issues that may compromise the security of their robots
- The second test will be run by the company themselves based on what the company feels may be necessary (eg. every month, two months, etc.)

3. Upskilling Programme
- With the rising use of technology and robots, it is inevitable that certain groups of workers may be retrenched and lose their jobs, which would lead to high unemployment rates

- The programme will work alongside Ministry of Manpower (MOM) and GovTech, as well as other partner companies that will help to reskill employees to be able to find a job in the new future of automation and robots
- These partner companies will also act as an bridge between these employees and an internship programme at their company, before reapplying for a new job or for a new position at their current jobs

How will it solve our underlying problem

So that they will be able to easily adapt to the use of robotics, while ensuring that the application of these new technologies are safe and have minimal impact on our lives

- The main problems brought by the increased use of robotics is the high cost, safety concerns and lack of employees with the necessary skill sets
- With the subsidies, smaller companies, who might have seen the transition to robots too big of a risk, are now able to afford the robots
- With the ability to trade in their old robots, it also ensures that companies are able to adapt to the rapidly changing industry, as well as replace the robots that might be broken
- Th safety and compliance checks will ensure that the robots operated by companies are up to standard and there is a very low chance that accidents will occur, and that the robots are safe
- Companies will need to hire or re-skill certain workers to be able to work with the robots, and this could cause disruption to the companies operations. With the upskilling programme, it would be easier to find new workers to hire,as well as it being more convenient to send their current employees for training to improve their skill sets.

Who

Companies selling robots, the government and retail companies will be involved in the cost subsidies.

Government and the companies will be involved in safety checks.

The retail companies, trainers from both the government and the companies will be involved in the upskilling programme.

Where

Safety and compliance checks and the internship for upskilling programmes will both take place in the retail company.

Potential obstacles

- Smaller and newer companies might make use of the cheaper robot purchase and operating costs and take a big gamble in buying large numbers at once, and if the business fails, they will be in huge debt
- There are many different types of robots in the market, all requiring a different set of checks to be conducted, thus making it difficult to ensure that the robots are accounted for

Solutions(to potential obstacles):
- Limit the number of robots the smaller and newer companies can buy at once
- Have the robot manufacturer create the set of checks and have it approved by the relevant government agency in Singapore before the retail company purchases the robots. If it is not approved, it would be because not many companies in Singapore are using the robot.

Supporters and resistors

Retail companies, especially small ones using robots will be likely to support this campaign. This is because they can enjoy the subsidised costs of robots which means more profit. The companies will also have new and most likely better workers from the upskilling programme. Those whose jobs are already being replaced by robots or those whose jobs are likely to get replaced will also be supporters. The campaign helps them to get a new job and stay relevant in the society. Retail companies may also resist the mandatory safety checks as it may be troublesome. Besides, some robots which are beneficial to the companies may get banned due to the check. Another possible resistors are those who have stable jobs as they have fear that they might be replaced by those from the upskilling programme.

Timeline

2023: Purchase price and maintenance cost of robots have been reduced. Replacement and upgrades scheme has been implemented.

2024: Ministry of Manpower has started upskilling programmes. Companies can start hiring people from the programme.

2025: Variables and criterias tested for the checks are finalised. Safety and Compliance checks by the government will start and continue on an annual basis.

2030: The organisation will improve on the existing policies and might implement new policies.

Research
1. When safety protocols aren't followed, today's industrial robots can be fatal. They present a danger to workers around them, particularly when employees have to interact with a robot during programming, maintenance, testing, setup or adjustment. There are plenty of ways to improve robot safety, but it's important you do so. Not just for your business, but for your employees. As robots advance in power and capabilities, they can also become more dangerous. (genesis-systems)

2. Business is acutely aware of the importance of upskilling. There is a wide gap between vacant positions requiring new skills and competent candidates to fill them. This is often referred to as the skills gap. A recent CareerBuilder survey found that nearly 60 percent of U.S. employers have job openings that stay vacant for 12 weeks or longer. HR managers say extended job vacancies cost the company more than $800,000 annually. (Forbes, 2019)

3. Many companies use internships as a way to enhance their recruitment efforts. In some cases, a company may decide to hire an intern at the end of the assignment. Even if a job offer doesn't

happen right away, an intern who makes a favorable impression could receive an offer down the line when an opening occurs. It's a way for companies to test out an employee before committing to hiring them. (fremont colleague)

4. Automation is increasing so rapidly in demand, the cost of automation is also skyrocketing. Automation has become expensive due to the cost of labour, cost of materials, cost of security, cost of regulations and cost of infrastructure. For example, Cybersecurity as an industry has grown from $70 Billion in 2014 to $155 Billion in 2019**.** This means that data, which is the oil for the machine learning engine, is coming at a high price. Despite the benefits of automation, the costs are high as well. (data driven investor,2019)

Contacted Company

Nathaniel Gregory - Decathlon Singapore

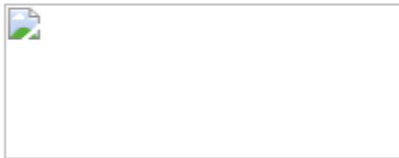**Nathaniel GREGORY -SINGAPORE HEADQUARTER-** <nathaniel.gregory@decathlon.com>
to me ▾

Hi Kenneth
thanks for your mail
we are good to answer any questions !
You can ask via mail and we can assist!

thanks
nat

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Interview questions:

1. How has the pandemic changed the retail industry?
2. According to our research, the StockBot has been trialed and used at certain stores. Has the use of it brought convenience to your operations? If so, how has it helped with your daily operations?
3. Has there been times where robots have brought about inconveniences due to malfunctions,etc.?
4. Does your company intend to invest more in similar robots in the near future?

5. What problems do you foresee occurring in the future due to the rise in the use of robotics in the retail industry? What are some solutions to tackle the stated problems?
6. What changes do you see happening to the retail industry after the pandemic?
     a. What part do you think robots will play a role in them?

Interview responses:

1. Tremendously !

At different phases of the situation we observe very different trends.

During lockdown we had to pivot our business completely online . So there had to be a shift first of mindset that we still had to sell sports products without even seeing or knowing what our customer wanted or needed !

Second it was a shift in our operations from a retail role to an e-commerce fulfilment role. Similar to logistics, teammates had to adopt a process driven work shift as compared to a customer driven work shift . From serving and advising our customers to fulfilling their orders online. On top of that we had to repurpose our staff to do training & serving the customers online which meant engaging them though a digital platform .

However, immediately after the circuit breaker , we saw a huge influx of customers. It was ' revenge shopping '. So we had to adapt our supply chain to have different channels to obtain stock instead of 1 or 2 that we traditionally use and our products had to be sea freight from the usual land transport due to a lockdown from Malaysia where our warehouse was .

As well there was a huge demand for bikes and fitness items , so that's where most resources went to. Post CB we see an increase in the people visiting the store during the weekdays vs the weekends

2.yes tremendously , productivity increases by 60% as we do not have to physically count all the models.

3.yes when it comes to technology , there is always room for failure. So training of the staff to troubleshoot & finding backup inventory Wands are important to maintain productivity levels .

4.large fixed asset cost. SMEs may need to have a larger capital to invest in robots . Grants / co funding / co usage

5.

Robots are essential for all non value added tasks .

Cashing out , inventory , picking , packing , restocking shelves . Everything that's manual in a retail industry should be automated by robots .

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Cite the resources you consulted using the APA format.

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