Solutions within the Issue of Gender Discrimination and Artificial Intelligence: Analytical Essay

We are living in an age where women are being under-represented within the male-dominated workforce, technology now has the possibility to make this issue even worse. Women hold only 19% of the board of directorships within the USA and Europe, in comparison to men who hold 81%, those statistics demonstrate just how dominated high-paid job positions are by men (Büchel, 2018). A system thinking approach will be used, along with the use of the iceberg model, this will give us the opportunity to look for solutions within the issue of Gender discrimination and Artificial intelligence. This can then lead on to finding a possible system-based solution to this wicked problem, possibly making bias even worse for women. We need to ensure that this problem actually is a wicked problem. Within the essay, we are aiming to apply a system thinking approach to the issue to help develop the solutions to this complex problem. The systems thinking approach should be able to find and establish possible patterns of behaviour that add to the complexity of the issue and identifying different parts within a specific boundary. In order to completely understand system thinking and how it can benefit a wicked problem, the essay will need to go through the process of determining if this issue really is a wicked problem, along with if it can relate to the five characteristics making it a wicked problem, providing an outlook to see if using artificial intelligence will instil bias into the workplace, causing more issues for women finding jobs. This will help to outline how effective a system thinking approach can be when dealing with other wicked problems. The essay will then provide insight into what a system thinking approach is and how it can be useful along with an example of the iceberg model, A combination of components will be provided for the model along with a final conclusion on the issue. It will be made clear through the conclusion that a system thinking approach is a great approach for uncovering problems within an issue, not always obvious by an initial viewing and finally discussing if this really is a wicked problem.

A wicked problem is split up between ten key characteristics, the characteristics help outline what a wicked problem is and how it differentiates itself from ordinary problems; four characteristics have been covered in the essay to outline the main difference between a regular problem to a wicked problem. Characteristic one “There is no definitive formulation of a wicked problem” (Whelton, 2002) outlines how a wicked problem is different from an ordinary problem, detailing how an ordinary problem can establish a solution much easier compared to a wicked problem that is a lot more complex in comparison. Artificial intelligence is being introduced in the hopes to improve the main issue of gender bias within workplaces, fitting into this characteristic as it can often be challenging to find a full proof solution to an issue such as gender inequality. The wicked problem also links to the second characteristic “solutions to wicked problems are not true-false, but good or bad” (Samuel F. Kovacic, 2013). Since Gender Inequality is such a widespread issue amongst the workforce, a solution such as Artificial Intelligence to eliminate potential bias could result in an improvement to the wicked problem however, it may not suffice all possible stakeholders of the issue. This differentiates a wicked problem from an ordinary problem since there’s not necessarily a right answer to the issue and it’s hard to determine if this is a good or bad solution. Within the wicked problem, the intention to fix the gender inequality problem within in the workforce may be admirable but in reality it could lead onto a snowball effect, leading to much larger issues down the line, concerning artificial intelligence taking positions from not only Men but Women too, unintentionally creating another

characteristic to the issue. This now makes the wicked problem a lot more complex, leading into the third characteristic, “Every solution to a wicked problem is a 'one-shot operation'; because there is no opportunity to learn by trial and error, every attempt counts significantly” (Whelton, 2002). This characteristic, in summary, means that when a potential solution is implemented, and it ends up leading to negative effects, the effects cannot be repaired since the impact has already been made. This characteristic applies to our wicked problem, if Artificial intelligence is implemented into different workplaces to eliminate the possibility of human bias, the decision could negatively affect employees of each workplace whose current positions would ultimately be replaced. Wicked Problems are difficult to navigate, leading into the fourth characteristic “Every wicked problem is essentially unique” (Whelton, 2002). What this characteristic refers to is that some wicked problems may possess similar characteristics to others or may even be very similar to other ordinary problems, there will always be distinguishing factors that differentiates itself from the similar issues. If other similar wicked problems are found to have a solution it does not mean that the solution could fix this wicked problem. This characteristic applies to our problem, there have been other studies conducted such as (Ordóñez, 2016) that look at a similar problem with artificial intelligence however, this is a separate issue with different characteristics, other similar issues that find a solution may not necessarily help find a solution to our wicked problem.

Systems thinking is the process of analysing different parts of an issue and how different influences may affect the entirety rather than just single parts of a larger system (Ross D. Arnold*, 2015). Looking at systems thinking with the iceberg model (Maani, 2013) creates four levels of thinking. The events section of the iceberg model outlines what the obvious problem is, what can easily be seen (Anon., 2019). The obvious issue we have is that there is gender discrimination in the workplace, looking to see if artificial intelligence can be the solution to this issue. The second section of the iceberg model is patterns and trends, these are intertwined with the system’s structures, showing the connections between the patterns and trends, investigating if there have been similar events or patterns that have taken place over time (Anon., 2019). Patterns will help our issue by determining if the discrimination has been taking place forever or possibly only within the last few years, possibly providing insight into future events (Maani, 2013). The third section is the structure level, this section determines what may be causing the patterns and trends (Anon., 2019). This level helps determine if Gender discrimination is linked to certain patterns taking place in each workforce. The final level is the mental model, this section looks at the behaviour of individuals. This will help our wicked problem by determining what has been influencing people through their attitudes, beliefs, morals, expectations and values (Anon., 2019).

Using the Iceberg model will show how the gender inequality problem can be observed and studied within different areas to ultimately determine what the best solution will be to solve this wicked problem. The wicked problem we are faced with done not only concern gender inequality but also replacing humans within the workforce with artificial intelligence, creating a difficult situation to solve however, it is worth viewing through another lens of system thinking (L, 2003). The Iceberg model is one of a few ways of looking into a wicked problem through systems thinking. The main purpose of the model is to acknowledge the entirety of a problem, looking at every aspect of a problem to provide insight into the causes of issues (Anon., 2019). The Iceberg model helps to break down an issue and find the underlying issues of a wicked problem such as this one. In order to create change and to solve underlying issues, each layer of the iceberg model must be followed in chronological order to decipher if there are any solutions to this wicked problem (Anon., n.d.).

System drivers, as well as social normalities, are other aspects of the Iceberg model, further looking into underlying issues within the model (Anon., 2019). Whilst testing the artificial intelligence in a workplace, bias was tested, finding that it was unproblematic in most testing, not suffering from natural human error (Büchel, 2018). However, the replacement of humans with artificial intelligence takes effort and a lot of money, the artificial intelligence is not 100% guaranteed to be effective in removing bias, ultimately not being an effective tool in removing gender discrimination (Büchel, 2018). After this research was found the issue now becomes a lot more complex, the ultimate goal here is to resolve gender bias and discrimination, it has been found that artificial intelligence may not be the solution to fix the problem but, in order to continue to find a solution to this wicked problem attitudes must be shifted before being dealt with sufficiently.

For the ability to achieve gender equality in the workplace through systems thinking, we must look at other examples of discrimination, looking to see if the artificial intelligence used was successful in eliminating the bias and discrimination. (Ordóñez, 2016) found that artificial intelligence “not only mirror biases, it amplified them” proving that artificial intelligence cannot simply eliminate bias towards women in a workplace. This now simplifies the wicked problem slightly, proving that artificial intelligence cannot simply solve this issue. Without the systems thinking it would be near impossible to find distinguishing patterns that contribute to the surface level of the problem. The framework of systems thinking is useful as it gives researchers the ability to find solutions to larger issues however, this in turn may lead to finding more issues, turning it into a wicked problem. The essay has been able to identify three main challenges: Gender bias, discrimination in the workplace and issues associated with replaying employees with artificial intelligence (Büchel, 2018). Each one of these challenges has an underlying factor that relates itself to a much larger issue, once again demonstrating the need for systems thinking in order to gain a greater understanding of a wicked problem, developing solutions to combat these issues now, and further into the future. However, the systems thinking model is not always straight forward, it can often be hard to implement and can also bring with it disadvantages. The main disadvantage being the difficulty to implement it. The model can provide solutions to a problem but to be able to execute the potential solutions can be difficult in real life, an example of this is the inability to change someone’s perspective on gender inequality therefore the inability to remove bias from an individual.

Applying a system thinking approach is the best way to find a possible solution to the gender inequality issue within the workforce, it does not always provide an obvious solution by an initial viewing, but it can uncover a possible solution when all the steps are covered. The current discrimination of women in the workforce along with the issue of artificial intelligence replacing human workers combined become a wicked problem since there is no simple solution to the issue. The best way to find a solution and to tackle the issue head on is through the iceberg model. The issue that we are faced with fit into the four levels of the iceberg model, with the events level being the obvious issue of gender inequality, the pattern level focusing on determining if there are patterns in attitudes towards gender inequality that have taken place over time , the structure level focusing on why gender inequality may continue to take place in the workforce especially in this day and age, finally the mental model level will focus on what is influencing peoples attitudes towards gender along with their beliefs, morals, expectations and values in the hopes of finding a solution to the wicked problem. In order for the issue to be assessed properly all levels of the iceberg model will need to be addressed and resolved in chronological order, if this does not happen in order the issues will not be addressed properly giving the opportunity for the issue to remerge in the future.