SOCIAL ROBOT, THE NEW CEO: REVOLUTIONIZE THE ROBOTICS WORLD BY REPLACING THE CEO'S WITH SOCIAL ROBOTS USING MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE

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DEDICATION

I wholeheartedly dedicate this thesis to my beloved late mother, Mrs. Lilly Bai Ganga.

She was a devoted homemaker, who has spent whole life in taking care of us. She had been a great support, motivator, and a person full of life, had been my strong pillar. Even though, she is not physically present, she will always be in our heart and her presence will be felt in everything that I achieve. Her prayer, love and sacrifices will be always remembered by us.

Her absence during this important milestone is deeply felt, and I wish with all my heart that, if she was here to see my hard work and academic journey. More than a mother, she was an inspiration.

She was very friendly and has always worked towards helping everyone. She has the natural ability to comfort anyone in pain which was a gifted talent she had. She was a true inspiration, and I am motivated to conduct this research because of her prayers and confidence in my ability to complete it.

This research work honours her life, her legacy, and her love. It's for you Mom. I miss you !

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ABSTRACT

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The advancement in science and technology has made human life easier. Human intellect has no comparison. We have been gifted with the intelligence to think, create new ideas, and make innovative inventions. And when the right idea is implemented in the right manner using the right technology, innovations occur. The invention of social robots is one such innovation of humans, which has certainly brought a new revolution in the era of science and technology. In recent years social robots have become more and more common and we have seen their use in a range of settings including hotels, warehouses, healthcare facilities and educational institutions. The development of social robots from machines is a result of the growing intelligence and power of robots brought about by technological advancements.

With advancing technology, robots have become increasingly powerful and intelligent. Today, we have social robots capable of carrying out various tasks with enhanced intelligence. While social robots have found extensive application across different sectors, their usage in executive roles has been relatively limited. This observation sparked my interest in conducting research to explore the effectiveness of social robots if they were to replace the CEO, the highest-ranking position in an organization. In this research work, we intend to show that if these social robots' potentials are being well used and if they are being trained in the right way, they can prove to be a boon to many organizations around the world. Through this research work, we will be studying how a social robot can be beneficial to an organization if it acquires the topmost position that is, if it takes on the role of the CEO of an organization.

We will also be studying how the advancement in artificial intelligence and machine learning, can help us in building social robots that can possess the capabilities of critical thinking and decision-making like humans. This research work will enlighten the benefits and challenges associated with implementing AI-powered social robots as CEOs of an organization and their potential effects on organizational dynamics.

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CHAPTER 1 INTRODUCTION

1.1. Introduction

The CEO or Chief Executive Officer holds the highest position in an organization and is responsible for carrying out a range of tasks including making high-stakes decisions, providing strategic directions, and ensuring long term sustainability. They also undertake other responsibilities such as overseeing performance of the employees, mentoring leadership, maintaining relationships with the clients, and steering the organization through complex decisions (Yukl, 2013). In this research work, we will explore if social robots powered by Artificial Intelligence (AI) and Machine Learning (ML) can take on the role of the CEO in a corporate world. This study will help to understand the roles of a CEO, the challenges they face in an organization, and explore whether these challenges could potentially be addressed by introducing intelligent social robots into leadership roles, specifically that of the CEO. The study will focus on the technological feasibility, ethical and legal considerations, and organisational and social implications of this concept.

It is noted that an efficient CEO is not only technically strong but also possesses the ability to update himself with the ever changing technology and engages himself to learn new things to stay up to date in the business world (Day, 2001). Because of the amount of pressure in the CEO position, it is difficult for one person to consistently meet all demands without getting tired and working effectively. Given the intensity and scope of executive responsibilities, sustaining consistent high performance over time can be a significant challenge for any human CEO (Finkelstein et al., 2009). In the course of these duties, CEOs encounter various challenges. Having served as the Chief Executive Officer of an Information Technology firm for the past 18 years, I have developed an in-depth understanding of the multifaceted responsibilities and strategic challenges associated with executive leadership within the

corporate sector. This experience has sparked my interest in finding and exploring the potentials of social robots in CEO role, though it is important to understand while thinking of such critical decisions we should also be prepared and aware of the potential drawbacks that is associated with such decisions. Exploring the potential role of AI-powered social robots in executive leadership may offer novel perspectives on addressing certain leadership inefficiencies, though this remains largely theoretical.

Though science and technology have made incredible advancements it still raises the question whether modern social robots have attained the capability of replacing the CEO of a company (Cichor et al., 2023). This raises important questions about whether social robots can gain employee trust and demonstrate adaptive leadership competencies-elements critical to effective human leadership. With the development of artificial intelligence and machine learning the need for social robots has grown dramatically and so have their capabilities. Today these social robots are effectively being used in various industries including healthcare sectors, logistics and educational fields.

In recent years, Artificial Intelligence (AI) and Machine Learning (ML) have rapidly evolved which has helped machines to perform increasingly complex tasks. With the development of AL and ML, social robots have also evolved, and their applications have been extended to the areas such as healthcare assistance, education, and hospitality (Aymerich-Franch & Ferrer, 2021). Unlike their predecessors, modern social robots exhibit human-like behaviour and possess many characteristics of humans like facial expressions, empathy, care, and gestures (Aymerich-Franch & Ferrer, 2021).

However, it is important to understand that this research is conceptual and exploratory in nature. Though the idea is futuristic, but it is based on theoretical frameworks and practical experiences which includes my own 17 years' experience as the CEO of an IT company. This

study acknowledges that replacing the human CEO of a company with a machine like social robots is speculative and possess both advantages and critical limitations.

This chapter outlines the background, objectives, scope, and rationale of the study, while also introducing the central research questions and conceptual framework.

1.2. Research Problem

Social robots are AI-powered machines that are designed to simulate socially and emotionally responsive interactions. While they differ from traditional robots as they are incorporated with adaptive behaviors and communication abilities (Breazeal, 2003), current technologies often fall short of incorporating true emotional intelligence and complex social reasoning skills in social robots. There are some arguments by few researchers that with advancements in machine learning and data analytics, social robots could potentially support tasks such as operations monitoring or resource optimization (Brynjolfsson & McAfee, 2014). However, these capabilities do not currently include emotional intelligence, moral reasoning, or adaptive leadership which are critical qualities of effective CEOs (Zaccaro & Klimoski, 2001). Thus, the ability of social robots of making decisions autonomously is still not proven and is a topic that needs thorough research. Thus, challenging the traditional view of leadership that states that non-human agents like robots can one day carry out the roles that once was completely relied on human qualities like creativity, empathy, and intuition. Organizational dynamics, corporate strategy and global societal implications are the three primary areas of focus for this study which examines the various effects of social robots taking on the role of CEO. This research seeks to explore how the theoretical implementation of social robots in executive roles could influence corporate governance practices, reshape organizational dynamics, and raise important societal and regulatory considerations.

As a CEO of an IT company for the past 18 years, I am well acquainted with the challenges inherent to executive roles within an organization. Each day for humans differs, as does every situation. A CEO must consistently exercise sound judgment, regardless of the circumstances (Boyatzis and McKee, 2005). This highlights that humans are prone to make mistakes, whereas machine making mistakes are less. A machine's decision typically relies on facts and logic, while human decisions can be influenced by surroundings or health factors.

A study conducted by the Harvard Business Review examined the allocation of time among CEOs. The findings revealed that 72% of their time was dedicated to meetings, with the remaining 28% spent in solitude. Additionally, their time distribution comprised 25% for relationship building, another 25% for business unit and functional reviews, 21% for strategic planning, and 16% for focusing on organizational culture. Interestingly, the study highlighted that a mere 1% of their time was allocated to crisis management and 3% was dedicated to nurturing customer relations (Porter & Nohria, 2018). This raises the question of whether it is good to replace human CEOs with some cost effective systems?

This indeed shows that a CEO is fully packed with a load of duties, and it is nearly impossible for a single person to perform all the tasks of an organization effortlessly (Finkelstein et al., 2009). A CEO’s job is hard and there is no substitute for a CEO and hence whatever be the circumstances a CEO has to go through; he should be smart enough to take a wise decision in all the scenarios. This indeed shows how important a CEO of the company is and how brilliant his performance is supposed to be.

When a company's CEO changes there are frequently more risks than benefits especially if it occurs abruptly. If the new CEO joins the company, the market value of the company can be in danger as the investors will be doubtful about the new CEO’s capability. Numerous considerations need to be made when assessing an investment in a company that is looking for

a new CEO. Examine the strategies the newly appointed CEO plans to employ. The business may run into problems if its new tactics don't work out. Consider the reactions of the other senior executives of the company to the leadership transition. These elements might have an impact on your decision to invest in the business (Finkelstein et al., 2009).

As per the studies conducted on the 350 companies in the USA, on average, these CEOs at the largest 350 companies in the United States earn about $24 million every year. To put it in perspective, that's 351 times more than what an average worker at those companies makes (Porter & Nohria, 2018). As per the study, if we compare how much the CEOs have earned compared to the past to now, we can see a huge increase. It has been noted that from 1970, the salary of the CEO's of an organization has increased by 1,300% (Mishel & Kandra, 2021). On the other hand, the salaries of the workers in a company have increased only by 18% (Mishel & Kandra, 2021). This shows that the CEO is the most expensive staff of an organization and most of the main income of the company is spent on one person of the company. This supports financial studies such as that by who emphasized that capital structure and the distribution of financial resources including executive compensation can significantly affect organizational profitability and performance (Mishel & Kandra, 2021).

In other terms, the salary of the CEO is way more as compared to the wages of other workers in that company. In short, we see that a huge of the company's profit or income is being spent on one-person that is the CEO. In short, not everyone is the same and not everyone possesses the same kind of managerial skills and intelligence. At any stage, if these highly paid CEOs are to be replaced with some other CEO who is not as good as the one before then the organisation's credibility can be at stake. But if we have a machine like social robots, we do need to train them only once and they will be there with the company for a long time. If we

can replace the highest-paid staff with a social robot, it will be a one-time investment but can prove to be a cost-effective method (Cichor et al., 2023).

A CEO should possess the capability of emotional intelligence, critical thinking and decision making and should make ethical judgements. However, robots lack emotional intelligence and ethical judgment, the qualities that is needed for trust-building and human motivation (Glikson & Woolley 2020). Just like every positive change comes with some challenges; replacing a CEO with a social robot could reduce costs and standardize decisions, but it also introduces profound ethical, legal, and operational risks. The concept of making a social robot as the CEO of an organization raises significant questions and challenges which need to be addressed. This research aims to address these problems by evaluating the viability of social robots as CEOs, their potential to complement or replace human leadership, and the broader consequences for individuals, organizations, and society.

1.3. Purpose of Research

The purpose of this research is to explore the potential transformation and consequences of appointing AI-powered social robots as the highest positioned employees in organizations, specifically as CEOs. The main aim of this research paper is to investigate the following objectives.

- To find the advantages and disadvantages of a social robot in performing executive level responsibilities such as strategic planning, resource allocation, and decision-making within corporate sectors.
- To determine the effects on organizational culture, employee satisfaction, productivity, and trust building based on the outcomes from literature, expert opinions, and exploratory data, if social robot takes on the role of the CEO in an organisation.

- To investigate what ethical and legal responsibilities needs to be considered if the AI-powered social robots need to work autonomously in executive roles and to analyse the possible regulatory frameworks.
- To explore how the introduction of social robot CEOs might affect corporate governance, workplace dynamics, and social values, especially in highly developed, and technology driven economies.
- To propose ethical guidelines and key principles for integrating social robots into executive leadership, mainly focusing on human values and long-term sustainability.

This research explores whether appointing a social robot as CEO could challenge traditional organizational hierarchies, enhance operational efficiency, and address key leadership challenges-while upholding ethical standards and prioritizing human welfare.

1.4. Hypothesis Of The Study

This study hypothesizes that social robots, when enhanced with Artificial Intelligence (AI) and Machine Learning (ML), may demonstrate the capacity to emulate certain aspects of human leadership such as data-driven decision-making and operational task management in controlled or structured contexts. It further shows that, under specific conditions, social robots could offer efficiencies in cost reduction and not being biased towards a particular hapr; however, their effectiveness in complex, emotionally charged, or ethically complex leadership scenarios is still a topic that needs thorough study and critical evaluation.

1.5. Research Purpose And Questions

For a business to grow, a leadership style plays an efficient role as the success of the firm depends on the strategy that the leader of the firm follows for motivating its employees and for the effective functioning of the firm (Mkheimer, 2018). The purpose of this research paper is

to find the answers to the most critical questions that may arise while considering making social robots as the CEO of an organization such as:

- Can an organization perform well or more efficiently if it replaces its CEO with a social robot powered by Artificial Intelligence (AI)?
- Can replacing human CEOs with social robots will lead to the success of the company or will it lead to a failure?
- Despite lacking human experience and emotional intelligence, are social robots capable of leading organizations and making critical decisions for the company and can they address problems pertaining to team motivation, effective participation of employees and collaboration?
- Do social robots have the capacity to handle moral complexity and how will they handle ethical dilemmas in leadership roles?
- How efficient can a social robot be in decision making as compared with human CEOs?
- How much can social robots adapt to the characteristics of humans such as critical decision-making, leadership styles and what are the possible consequences?
- What potential effects might a social robot CEO have on organizational performance and workplace culture?
- In a corporate world, is it possible for a social robot to gain the trust of all workers and make wise decisions?
- How likely are workers to accept a machine as their boss and what factors affect their willingness to accept it?
- Despite knowing that previous social robots have failed in the consumer market, can we create one that can overcome these obstacles and succeed in a Chief Executive Role?

- How can advancements in Artificial Intelligence (AI) and Machine Learning (ML) help in the development of a social robot that will be intelligent like humans and will also have other characteristics like humans which will make them capable of leading a company?
- Who will take the responsibility for a social robot CEOs choices and actions in the event of failure or moral issues?
- To maintain accountability, transparency and fairness while regulating social robots in executive roles, what legal frameworks and governance models are required?
- Would traditional industries disagree with the widespread deployment of robot CEOs, or could it deepen social inequality?
- How can social robots handle high-stakes decision-making, allocation of resources, and planning for strategies, which are typically conducted by human CEOs?
- How might social robots solve traditional leadership problems and what traits, and abilities qualify them for executive leadership?

If social robots were to replace the CEOs of organizations, it could potentially revolutionize the field of robotics. While initially, this thought would seem like a fantasy, the practical application of this concept has become feasible for human beings. Despite earlier shortcomings in social robots, researchers have persevered, driving the development of new and enhanced versions through advancements in artificial intelligence (de Graaf et al., 2015). This research aims to explore whether the advancements in artificial intelligence and machine learning have addressed the limitations observed in earlier iterations of social robots, paving the way for a new and improved generation of these robots. This research work will show if artificial intelligence and machine learning have evolved to the point of being able to overcome the flaws of the earlier social robots that were launched and will be able to come up with a new improved version of the social robots (de Graaf et al., 2015).

1.6. Significance Of The Study

Not everyone is an effective leader. Sometimes, it's observed that the top leader of a firm may not be suitable for that position. Employing such leaders in an organization can potentially hinder its progress. As mentioned earlier, a single erroneous decision by the company's leader can devastate the entire organization. An effective leader should possess strong managerial skills, remarkable decision-making abilities, possess good customer relationship skills and adept communication skills. Critical thinking is an essential characteristic of an effective leader. Above all, an effective leader should be trustworthy (Finkelstein et al., 2009). Therefore, it is essential that each suggestion made by the leader should be beneficial for the company and should be in the best interest for the company.

Research suggests that the CEO is responsible for about 45% of a company's performance but other studies contend that their influence only explains 15% of variations in profitability (Mishel & Kandra, 2021). An effective leader should consistently prioritize the benefits of the firm over their own selfish desires or needs. Corporate bribery exemplifies how a great leader in any firm can be susceptible to bribery by competitors, exploiting them for their own gain. Humans are fallible; everyone possesses strengths and weaknesses (Glikson & Woolley 2020). Consequently, relying on one individual for the company's future may not be an effective way of managing an organization.

If an organization suffers losses, the livelihoods of several staff and workers will also be affected. Therefore, it is important that the company chooses a leader who works best for the company's future and growth and who takes care of the wellbeing of his employees. A single person cannot have the capability to excel in all the leadership qualities, thus leads to the necessity of creating a leader with an appropriate combination of abilities to help the

organization thrive (Mkheimer, 2018). It is essential to develop a leader who not only promotes the expansion of the company but also philanthropically aids in the professional development of its staff. Therefore, it is now crucial to look for a different strategy and create a framework that incorporates all the qualities required to be a successful leader. This has created a need to find an alternative solution and create a machine that can act as an effective leader with all the required qualities. We believe that integrating social robots with the necessary intelligence and teaching them the essential qualities of effective leadership will undoubtedly benefit the company (de Graaf et al., 2015). However, this shift is not without controversy. There are concerns about legal responsibility, social acceptance, and the limits of machine reasoning.

This study seeks to contribute to the emerging debate on the use of AI in leadership roles by critically examining the conditions under which social robots could augment or replace human executives, and how this would affect employees, stakeholders, and society.

1.7. Operational Definitions

- Social Robot: A social robot is an artificial intelligence-powered robot that interacts with exhibits the characteristics like humans such as gestures, responding back to queries in a meaningful way.
- Artificial Intelligence (AI): Artificial intelligence (AI) is the emulation of human intellectual processes in machines, allowing them to accomplish tasks that would normally need human intelligence, such as learning, problem solving, and decision making.
- Machine Learning (ML): Machine learning is the usage and development of computer systems that can learn and adapt without explicit instructions, using algorithms and statistical models to analyze and derive conclusions from data patterns.
- CEO or Chief Executive Officer: A CEO is the highest-ranking individual in a company, responsible for strategic direction and organizational performance.

- Organizational Dynamics: The patterns of interaction, communication, and behavior within a company.
- Leadership Effectiveness: The degree to which a leader successfully influences organizational outcomes.

1.8. Organization Of The Thesis

The thesis will be presented in 6 chapters. An outline of the study's background, purpose, goals, and research questions will be provided in Chapter 1 with an emphasis on the possibility that AI-powered social robots could eventually replace human CEOs in businesses. To identify gaps in the application of AI in executive positions and lay the groundwork for the research questions, Chapter 2 will review the relevant literature on leadership, AI machine learning, social robots, and theoretical models. In Chapter 3, the methodology will be described in detail including the qualitative approach, data collection techniques like case studies and secondary data and the use of thematic analysis to interpret the findings.

An analysis of the collected data will be provided in Chapter 4 with a focus on the capability's limitations and difficulties of AI robots in CEO positions as well as their decision-making procedures and cultural impact. The implications of the findings about the research themes will be covered in detail in Chapter 5 which will also look at ethical quandaries and accountability in addition to the benefits and drawbacks of robotic leadership in comparison to human CEOs. The study will be concluded in Chapter 6 with a summary of the results, helpful suggestions for businesses considering AI leadership and a list of topics for further research pertaining to hybrid leadership models, legal frameworks, and societal impacts. The potential of social robots in executive roles is thoroughly investigated based on this organisation.

CHAPTER 2 LITERATURE REVIEW

This chapter provides a structured literature review exploring the role of human CEOs, foundational leadership theories, and the emerging discourse on replacing CEOs with AI and ML powered social robots.

We conducted a systematic search in ABI/Inform, Google Scholar, EBSCO Business Source Complete, ScienceDirect, and JSTOR (and additional sources like Emerald Insight) using keywords such as CEO leadership, executive decision-making, social robots, robotic leadership, AI in management, leadership theories, automation in leadership, AI ethics, and robotic executives. Over **70 scholarly articles** were found, with **48 directly relevant** to themes, case studies, theoretical foundations, and research gaps in robotic leadership.

Previous research conducted between 2000 and 2016 has explored various leadership models, including traits, behaviours, transformational, and transactional approaches (Northouse, 2016). These studies focus on the important qualities of being a successful CEO such as emotional intelligence, strategic vision, crisis management, and effective employee engagement but unfortunately, current social robots lack in exhibiting some of these qualities.

Research specifically addressing AI or robots in CEO-like roles began around 2017, evolving from conceptual to pilot-level studies (Amenyo, 2018). Conceived as advisory agents initially, some have been tested in executive settings (Bremen, 2025. For instance, several boardroom experiments tested AI advisors in European firms in 2021-2023 Forbes WTW, while Scandinavian pilots used AI-assistants for decision support since 2018 (Amenyo, 2018).

A CEO must possess immaculate managerial skills. Before we begin our research, it is important to understand the duties that a CEO must undertake in an organization and be aware of the challenges that he faces in a company to find the need for replacing CEOs with social

robots with human CEOs. The leadership qualities intrinsic to a CEO and the critical role they play in organizations form the foundation for assessing whether social robots could effectively assume this position. Over the time, leadership research has evolved significantly, exploring various theories, encompassing traits, behaviours, and contingent models (Northouse, 2016).

This chapter explores the traditional roles and challenges of human CEOs while critically examining the possibilities and limitations of social robots as potential alternatives. It engages with existing literature and incorporates counterarguments, ethical implications, and emerging empirical insights to assess the feasibility of AI and ML-powered social robot CEOs.

This section outlines empirical and pilot projects involving social robots in roles that parallel CEO functions—especially in communication, decision-making, and presence.

2.1. Theoretical Framework

The literature review identifies both opportunities and limitations. On one hand, CEOs play a vital role in strategy and culture, but they are also prone to fatigue, bias, and excessive compensation. At the same time, modern AI and robotics have advanced significantly in fields such as healthcare, logistics, and education, demonstrating that robots can perform complex tasks with efficiency.

On the other hand, literature also points out that robots lack emotional intelligence, moral reasoning, and adaptive leadership. Previous failures in consumer robotics highlight significant challenges, while accountability and ethical governance remain unresolved issues.

To structure this analysis, three theoretical frameworks were applied:

- The Rational Decision-Making Model, which evaluates whether AI systems can replicate structured human decision-making (Bazerman and Moore, 2012).

- Strategic Leadership Theory, which assesses the ability of AI to handle long-term complex planning (Day et al., 2014).
- And Emotional Intelligence Theory, which emphasizes the gaps between human and robotic leadership in areas of empathy, motivation, and moral reasoning (Goleman, 1998).

In the past, several studies have been carried out to find how social robots can assume effective leadership roles, their potential intelligence, and the extent to which they can comprehend and apply intelligence. It's crucial to note that humans possess some typical characteristics like emotions, timely responsiveness, and critical thinking and to implement these qualities into social robots can be challenging (Glikson & Woolley, 2020). The ethical and philosophical implications of machines making decisions that are usually the rights of human beings must be critically evaluated as we continue integrating robots into leadership and socially meaningful roles (Gunkel, 2012).

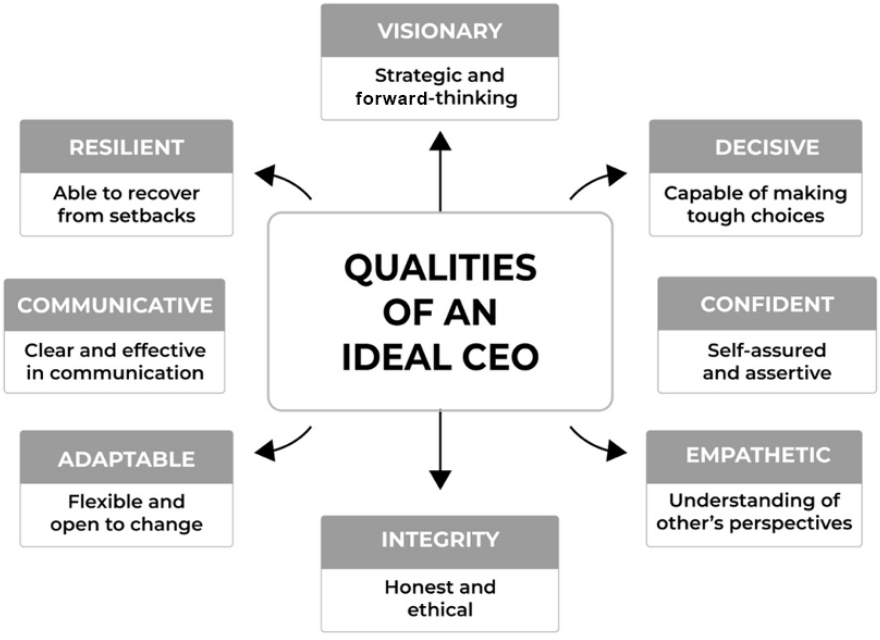
2.2. The CEO's Impact On Leadership And Role Of The CEO

This section explores the core competencies required of a CEO, including communication, strategic planning, decision-making, and emotional intelligence. An effective CEO demonstrates a spectrum of critical leadership characteristics. An effective communication serves as a strong pillar that enables the CEO to share clear vision, make strategic plans, and goals among its company and stakeholders (Zaccaro & Klimoski, 2001). It is essential that the social robots possess all these abilities to perform any tasks effectively. By operating with flexibility, a successful leader guarantees that strategies are carefully designed and swiftly implemented, balancing timely delivery and accuracy in their execution (Day, 2001). An ideal

social robot CEO should stay updated with the new technological changes and accept new innovations in order to stay competitive in the ever changing business world (Brynjolfsson & McAfee, 2014). An effective leader should be able to skilfully evaluate risks, plan the way, and make strategic decisions that are consistent with their vision while overcoming any problems that may arise (Vroom & Jago, 2007).

The most challenging part in building an ideal social robot CEO is to generate emotional intelligence in them that is generating the qualities of understanding one's and others' emotions, facilitating adept navigation through complexities, resolution of conflicts amicably, and effective inspiration and motivation of teams (Goleman, 1998). An ideal CEO should possess essential leadership qualities like staying up to date with the latest technologies, prompt decision-making, efficient communication skills, and above all emotional intelligence (Ojo & Adeniji, 2015). Thus, despite the potential of social robots to augment certain CEO functions, but they still have the limitations that stop them from acquiring full spectrum of leadership qualities.

Figure 1: Qualities of an Ideal CEO



2.3. Characteristics Of An Efficient CEO

An ideal CEO is someone who can operate effectively under any pressure and in any situation. Every day is not the same for the CEO and the complexity of each task that they carry out daily also differs each time. That's why a CEO should have a passion towards his work so as regardless of whatever challenges they face, a passionate CEO should adeptly tackle them with enthusiasm and intelligence (Goleman, 1998).

An ideal and successful CEO should possess the following skills:

- A successful CEO needs to have the strategic idea in mind to truly function as a leader. Therefore, a CEO needs to be extremely clear on what is right or wrong for the business and must also be able to apply the strategies that align with those goals (Goleman, 1998).
- An intelligent CEO should possess good leadership qualities such as the ability to motivate employees of his organization and support them in the most challenging times. The decisions that they make should go in alignment with the long-term organizational goals and adapt strategies to meet evolving market conditions (Collins, 2001).
- Leaders in the role of a Chief Executive Officer need to possess good communication skills. They must speak with confidence in front of large groups and should be able to interact with clients, stakeholders, board members and the public by understanding their requirements and with meaningful responses (Yukl, 2013).
- An efficient CEO cares about employees while trying to understand them and at the same time makes decisions in favour of the company's success. So, if we were to summarize, they should be all-rounder leaders.

2.4. Duties Of CEO In An Organization

The CEO of a company carries many responsibilities, and these must be skilfully managed to ensure the effective functioning of the company. Let us now see in detail the various duties that a CEO performs in an organization:

- A CEO should be good in the implementation of business strategies and plans. They set the company's goals to determine the growth of the company in the long and short term, helping the staff and the board of directors in understanding what is best needed for the successful functioning of the company (Yukl, 2013).
- The CEO plays an important role in maintaining the company's public relation and is often heralded as the face of the company; hence he plays an effective role in marketing. A CEO must uphold exemplary conduct as the foremost representative of the business (Conger & Riggio, 2007). The CEO's actions and values can uplift reputations or bring them down in any way, either positively or negatively.
- The Chief Executive Officer must provide information about major decisions to the board members even if these are difficult choices, it must be presented effectively in the board meeting. Honest and open communication between both the board and the CEO is very important (Finkelstein et al., 2009).
- The CEO must set a good example to promote a positive workplace culture and as he is often considered as an ideal role model by many employees from management and senior executive positions to internships. CEOs gain the respect of their employees and encourage them to follow suit when they exhibit the work ethic they wish to see in others (Goleman et al., 2013).
- An effective CEO ensures that the departmental operations are efficient and seamless. The CEO always acts in accordance with the directions of the governing board with respect to

the strategies made by the company and ensures that such directions are implemented in a consistent manner to maintain the harmony between the company's organization and the board’s vision.

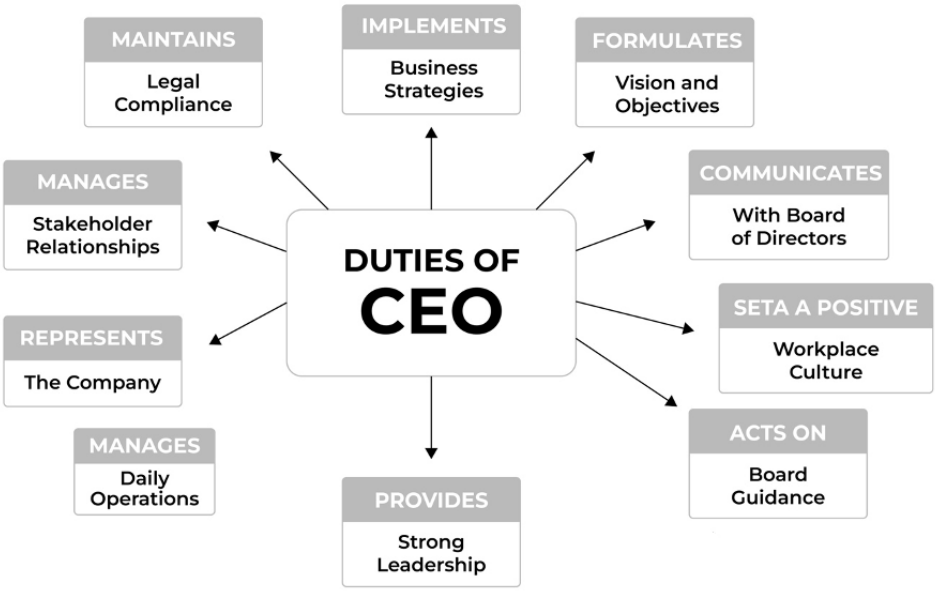
- The CEO runs and manages the day-to-day activities and operations within the organization. This indicates handling all the activities and processes of an organization that usually take place daily for the company to function effectively.
- He also oversees the management and maintenance of relationships with customers, clients, or potential investors.
- He oversees guaranteeing obedience to all legal and obligatory requirements and restrictions. It is the responsibility of the CEO to check the company adheres to all the rules and laws that are being set by the government and relevant authorities. In that regard, the company must not do anything that can legally, or reputationally expose them to risks and challenges. They put into place systems and controls that restrict compliance and supervision to within lawful and regulated bounds of conduct throughout the company.
- The CEO is responsible for running the finances of the business. This means managing various financial bits, budgeting, financial planning, and forecasting. Setting and overseeing an organization's budget is their responsibility and they ensure that funds are distributed fairly among all departments. They also assess risk forecast financial trends and make strategic decisions to preserve the company's financial health and stability.
- They ought to be capable of recognizing and resolving possible business and operational risks. The CEOs job is to recognize and take proactive measures to control any risks that might affect the company or its operations. Determining the different risks or difficulties that the company may encounter on a daily or corporate level is necessary for this. Analysing the potential risks and determining how they will affect the company and taking proactive measures to reduce or eliminate them before they become significant problems

are the CEOs responsibilities. By being proactive, the company is safeguarded, and the negative consequences of possible risks are minimized (Daft, 2014).

The main responsibility of the CEO is to continuously discover new ways of making the methods, products, and services of an organization better through the application of new strategies and improvements. It's the responsibility of the CEO to concentrate on the betterment of the company by focusing on the new innovations and inventions, leading to the expansion of the company, flexibility, and better achievements in the future. Additionally, the CEOs duties typically encompass a wider range of tasks in organizations where the CEO is also the founder. The CEOs job is complex and involves a lot of responsibility inside a company.

Being a CEO is a very demanding job because of the wide range of duties. The difficulties that CEOs encounter will be examined in this study along with the possibility that social robots could take their place.

Figure 2: Duties of a CEO in an Organization



2.5. Challenges Encountered By CEOs In An Organization

In this research, we will study the challenges that the CEOs face in their careers and the need for introducing social robots into the executive roles. This section identifies the real-world pressures CEOs face, including legacy systems, resistance to change, strict deadlines, high workloads, and interpersonal demands. There are some drawbacks and limitations of human beings in executive positions, which can be resolved by social robots who possess the ability of working without getting tired, all while bringing some enthusiasm to their tasks. We will also how we can mix human intelligence into AI-driven social robots so they can mimic qualities like emotions, intelligence, and critical thinking. This includes things like managing employees and keeping the company running smoothly and basically covering all the daily duties of a CEO. However, there are some complexities of leadership positions such as trust-building, cultural adaptation, and ethical decision-making and related significant challenges that are not easily addressed by current AI technologies (Yukl, 2013). It is therefore essential to study these challenges comprehensively before proposing social robots as viable CEO replacements. This study will help us in understanding the advantages and disadvantages of appointing social robots in a leadership role.

When a new CEO joins a firm, he comes across many challenges including managing company visibility, responding to market demands, and navigating stakeholder expectations. Failure in any area can lead to significant responsibility falling on the CEO’s shoulders. Running a company takes good management and leadership skills to handle different daily challenges with the right solutions. A new CEO also needs to come up with plans to boost the company's brand and visibility for what they offer. If any product or service isn't doing well in the market, the CEO usually is considered responsible for the drop in demand.

Let us study in detail the challenges that a new CEO faces in the company and if social robots can help in overcoming these challenges

2.5.1. Making Adjustments In Accordance With The Organization's History

It is frequently difficult for a new CEO to get used to the company's procedures. A newcomer may find challenging to accept the peculiarities, rules, and culture of the company. The corporation and the CEO must work together to find a solution which can take a long time and there is no guarantee that everything will go perfectly (Schein, 2010).

It may be easier if a company promotes an internal candidate to the CEO's position because they are already familiar with the position, but they still need to shift perspective from focusing on daily tasks to prioritizing strategic growth. In addition to the areas that they were previously in charge of, they should be able to embrace the new responsibilities and should also work towards the growth of the company. So, if in case the internal candidates don't fit well in this position, the company will have to look for other options. In short, there are instances when a company must search outside for a new CEO because they are unable to find the right candidate within.

2.5.2. Operating In The Shadow Of The Past Organization

Adapting to the changes of a new organization can be tough for a new CEO. As there is no clear guidance on how to run a company; it really comes down to what they have learned over the years. When a new CEO joins a company, it can be challenging for him to set aside their previously gained knowledge and policies to accept the new challenges that come in the new firm. And there is a possibility that the new CEO might struggle to align with the new

company's policies. In short, training a new CEO is always a time-consuming process and there is never a guarantee of meeting the company's expectations (Finkelstein et al., 2009).

When a new CEO takes charge in a new company, he should adapt to the new organization's culture, leaving behind the methodologies used in the previous company. For those who have been promoted from within the company, this adjustment involves looking at key business factors and managing risks in a different light than before. It may mean putting more emphasis on planning and growth towards the growth of an organization rather than just on budgeting and everyday tasks. New CEOs should show that they're committed to the whole organization and not only on some areas in which they have worked in the past. This can be really challenging for the new CEOs.

2.5.3. Resistance To Change

CEOs and business owners of a company need to stay abreast of new technologies, and they should embrace new changes with an open heart. The only thing is that, in this fast moving world of tech space, CEOs must make sure their companies don't fall behind at all. But while forced to adapt, some CEOs are simply hesitant to implement new changes for fear of the companies' inability to thrive thereafter (Kotter, 2008).

There could be number of reasons which an organization's CEO may show to embrace or adapt new changes. Let us study in detail the reasons behind the resistance to accept new changes in an organisation.

- All organizational changes possess some risks, as they can disrupt existing systems and processes of an organization. CEOs often show hesitance to pursue any new initiatives in an organization due to the fear that these changes might fail or lead to financial losses. These fears usually prevent a CEO to accept any innovation even though it may be

necessary for the long term growth of the company, thus stopping the company from progressing. Also, the implementation of any new changes may have unintended consequences, including disruption of many facets of the institution. This lack of clarity might result in reluctance or postponement in the introduction of new measures.

- To implement any new changes, new resources and additional raw materials will be required, which can increase the operational costs and can be a time consuming process. CEO might resist such implementation because they are worried about how resources will be allocated to all the departments or that it will be impossible for them to make changes in a resource-scarce situation.

- People working in the company at any level such as staffs, management or stakeholders could potentially refuse to accept to change because they fear for their job or they simply don't like new procedures, in general, they get used to it. This resistance may affect the CEOs responses to implementing the change (Dent & Goldberg, 1999).

- CEOs may not move forward before the organization makes major changes and may favor a clearly articulated approach if the suggested changes do not reflect a clear vision or strategic plan for implementation. This objection to accepting a new change is influenced by human psychology since people frequently worry about changes that could be a threat to their job security or disturb their daily routines.

2.5.4. Meeting Deadlines

Chief Executive Officers often face challenges like meeting the deadlines on time, there could be several reasons that there will be delay in meeting the deadlines like lack of employees;

ineffective workers; limited working hours; potential disruptions or even holidays or emergencies or can also be poor leadership or guidance. It is the responsibility of the CEO to ensure that the projects are executed on time and delivered properly. This may lead to over pressure and can affect the performance of the human CEO.

Let us see in detail the various challenges faced by the CEO while meeting the deadlines and the reasons behind the struggle.

- Complex Responsibilities: CEOs are supposed to handle multiple tasks and they have to oversee a large number of departments. Getting in alignment with these various responsibilities and ensuring to handle the company's strategic goal effectively can be demanding and may result in the potential delays.
- Resource Allocation: An effective CEO should be able to allocate the company's resources wisely, whether it is for the financial department or for technical projects; a CEO should be able to make strategic decisions. Misallocation of the resources to the wrong departments or even assigning inadequate resources can lead to inefficiency in the performance of the employees and can ultimately lead to the delay of meeting the deadlines.
- Unforeseen Challenges: An effective CEO should always be prepared for the unexpected challenges like market fluctuations, internal disruptions, regulatory changes or any disturbances that may rise unexpectedly, which can affect the planned schedules and can be the cause of the interruptions in meeting the deadlines.
- Decision-Making Processes: Critical thinking and wise decision making is the quality that a CEO should possess. A CEO should be able to make critical decisions that will work in the favour of the company even in the worst scenarios. Delays in the ability to make right decisions on time can lead to the project delays.

- Balance of Priorities: A Chief Executive Office needs to balance several priorities and should be able to choose between the long-term strategies and short-term gain. This can impact how they spend their time and resources to hit urgent deadlines.
- Dependency On Others: A CEO depends on its employees and the various departments to get their projects done on time and effectively. If any delays happen from these departments, then it can affect the overall performance of the company and there can be chances in the delay of the projects.
- Dynamic Nature Of Business: CEOs must be ready to accept or adapt to the changing environment, as the business environment is ever changing. The market shifts or unexpected changes can affect the planned deadlines.
- Pressure And Stress: A CEO's level of responsibility and critical decision-making, along with other duties leads to work-related stress and time management issues.

A responsible CEO will focus on meeting the deadline of an organization despite of the various situation he is going through, highlighting the need for proficiency in management and flexibility.

2.5.5. Communication And Trust

To be a strong leader, a CEO requires to possess both emotional intelligence and interpersonal communication skills. A good CEO should be capable to build trust, encourage collaboration, and manage conflict in an organisation (Lencioni, 2002). If a CEO, fails to achieve any one of this skill, then it can affect or lower the morale of the firm and can also stop the company from progressing.

2.5.6. Work Pressure And Its Impact On Health

The decisions taken by human changes based on the circumstances. Humans cannot handle a lot of workloads; they cannot work 24/7 and their capabilities have limitations. An employee's health can be adversely affected by the overwork pressure at the workplace, especially when the employee is the highest responsible person in an organisation that is he is the CEO of a company. Overburden of work, loads of responsibilities and the never ending demands can lead to several health problems in the CEO which can be a consequence of the stress, affecting his health and performance. Long extended working hours, the pressure to make fair decisions, and the persistent requirement to perform at peak levels can be overwhelming for the CEO. It is crucial that the CEO manages the work pressure effectively to maintain his overall health and the performance in an organisation.

2.5.7. The CEO’s Decision-Making Impact On Employees

An eligible leader needs to earn the respect and appreciation of their team. For a CEO, strong decision-making skill is the key to getting employees on board with their choices. The success of the organization is dependent on how effective its CEO is. If the CEO of the organization is capable enough and can provide proper direction to its employees, then the company will progress well. An effective CEO should be able handle tricky situations and should be capable of bringing right solutions needed for the growth of the company (Goleman, 1998). He asserts that the most effective leaders possess both emotional and cognitive intelligence.

Hence choosing a CEO who is wise and gives good judgment is essential. A CEO should build trust with their team and give that trust back. When they listen to employees' ideas and promote teamwork, it encourages everyone to feel confident and bring forward creative solutions (Lencioni, 2002). This helps in creating the environment where various ideas that the

employees suggest are given consideration to solve the issues of the organization. All employees may not always agree to the CEO's decisions, and this can lead to conflicts and disagreements in an organization.

The differences in opinion between the company and the CEO can lead to several conflicts:

- If there is a tension among the organization between the CEO and the staff, then it leads to a stressful atmosphere and can affect the productivity of the organization.
- If the employees' decisions are ignored and doesn’t get importance, then it can drag down the morale and create job dissatisfaction.
- Employees might show resistance against the acceptance of the changes the CEO wants to implement, which can hindrance the growth.
- Ongoing disagreements can slow down decision-making, leading to improper functioning of the company.

As per the previous studies, it is observed that the humans show more obedience towards the machines. This raises the question of whether social robots can help in resolving these issues (Epley et al., 2008). In this study, we will be exploring how people may respond better to the decisions that are made by the social robots if they were to take on the role of the CEO.

There are several challenges that a CEO has to go through in the leadership roles, this arises the need of introducing an alternative solution to these roles. Let us explore if these challenges can be overcome by social robots or if the concept of introducing robots to executive roles could be harmful for the organization below.

2.6. Addressing Human CEO Challenges Through AI-ML Powered Social Robots- A Theory of Reasoned Action Perspective

The Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) states that behavioural intentions are driven by two key factors: attitudes toward the behaviour and subjective norms. While attitudes and norms influence whether or not businesses intend to use this innovation the behavior in the context of organizational leadership is the adoption of AI-ML-powered social robots as CEOs. By employing TRA we can critically examine how social robots could assist human CEOs in overcoming challenges and influencing business objectives regarding AI leadership.

A social robot CEO incorporated with Artificial Intelligence (AI) and Machine Learning (ML) can contribute significantly to an organization by giving data driven decisions that is free from emotional bias or human error. Social robots can process vast amounts of data in real time and possess the ability to analyse the internal operations of an organisation, finding latest market trends, and understanding the customer behaviour to make fast and strategic decisions which is appropriate for the growth of an organisation and can ultimately increase the efficiency of an organization. They also possess the ability to work 24/7 without getting tired, which is particularly useful in global organizations that function across different time zones. The efficiency of social robots to act as CEO can be enhanced by using Artificial Intelligence (AI) and Machine Learning (ML). With the help of machine learning, social robots possess the capability to evolve continuously by learning from both their successes and failures, allowing it to adapt quickly to the ever changing business environments. The natural language processing will help the social robots in making meaningful communication with employees, board members and stakeholders. Thus, the social robot's leadership skill will be stable and consistent and will not be affected by any personal interests, stress, or organizational politics. By eliminating many of the drawbacks of the human CEO's, social robots can potentially

streamline executive management and improve organizational performance over time. However, we need more practical evidence to conclude if this concept is possible.

This thesis aims to explore whether it is feasible and under what conditions a social robot can evolve into an emotionally intelligent, trustworthy, and effective organizational leader. Let us study what impact a social robot can have in leadership role below.

2.6.1. Aligning with Organizational History and Culture

When a new CEO is appointed in a company, he undergoes several hurdles. Among the several challenges that a CEO faces in an organization, one of the key challenges is understanding and adjusting to the organization's historical practices, internal culture, and legacy leadership. Social robots powered by AI and ML can overcome this challenge through large-scale data ingestion and pattern recognition. By analysing internal communications, past decisions, employee feedback, and operational data, AI-powered social robots can develop a thorough understanding of the organization's evolution, policies, and cultural norms. This data-driven adaptation allows the robot to customize its leadership strategy in alignment with the company's heritage while gradually introducing reforms based on evidence-based forecasting (Brynjolfsson & McAfee, 2014). Furthermore, unlike human CEOs who require personal experiences to adapt to a new workplace culture, social robots can be trained once with vast organizational knowledge, reducing the onboarding time and minimizing the cultural mismatch.

2.6.2. Reducing the Shadow of Past Organizations

Human CEOs often carry over legacy mindsets from their previous companies, which can lead to a disconnect with new organizational environments. On the other hand, social robots are not

bound to any such cognitive biases. The decisions that they would make will be solely dependent on real time data and adaptive learning models. This ability will help them to focus only on the current needs rather than adhering to the past legacy (Pan et al., 2025). Social robots can analyse large-scale business models, market changes, and internal feedback, allowing them to deliver tailored and innovative leadership solutions.

2.6.3. Overcoming Resistance to Change

Frequently, poor communication, fear, and uncertainty are the main causes of resistance to change. Social robots driven by artificial intelligence (AI) can identify resistance patterns in the form of behavioural data, and employee feedback by utilizing sentiment analysis and natural language processing (NLP). They can use this analysis to create gradual, evidence-based change management plans. For example, instead of imposing an immediate transformation, the social robot can recommend slow implementation of changes in various phases, paired with targeted internal communications designed to build psychological safety (Kotter & Schlesinger, 2008). Furthermore, through the application of machine learning algorithms, the robot is able to predict possible employee reactions to policy changes and accordingly adjust its implementation of strategies, thus decreasing resistances to changes.

2.6.4. Enhancing Vision and Strategic Clarity

A common human mistake is to make impulsive or emotional decisions under the stress. But social robots with the application of AI and ML can replicate long-term results for organizations through predictive modelling, market trend evaluation, and competitor insights. This allows the social robot CEO to present strategic visions with confidence and clarity, supported by real-time data instead of relying solely on intuition. Although human CEOs might

be cautious because of psychological risk aversion with regards to this, but social robots on the other hand can propose bold yet calculated strategies with minimal emotional bias.

2.6.5. Meeting Deadlines Through Automated Coordination

One of the major strengths of social robots is their capability of handling multiple tasks simultaneously without getting tired. AI scheduling algorithms, real-time workflow tracking, and resource allocation models, a social robot CEO can track the progress of the projects and become sure of the timely delivery of the projects. Unlike human CEOs who must coordinate with multiple teams manually, social robots can interface directly with digital project management tools and personnel schedules to reallocate resources instantly whenever there are delays (Pan et al., 2025). Furthermore, social robots can use predictive analytics to identify the reasons for the delays and initiate early interventions, lowering the CEO's stress level and lowering the chance of deadline violations.

2.6.6. Automation And Efficiency Gains

Social robots can enhance the work efficiency by executing tedious and repetitive tasks or by boosting productivity of the tasks that would typically require excessive amounts of time. For instance, these social robots have the ability to plan the execution of tasks; by scheduling, analysing, allocating required resources, and tracking the performances. It can accomplish all this or even more, thus helping employees to concentrate on more important tasks that need human intervention or additional planning.

In short, enhanced efficiency can save considerable time, resulting in timely delivery of projects and improved response time as tasks are completed faster with fewer or no mistakes. Consequently, the social robot CEO would consistently be able to satisfy the timelines of the routine or operational tasks.

2.6.7. Data-Driven Efficiency

Social Robots have the capability of making decisions on the basis of the algorithms, collected data and patterns which helps in improving the efficiency in the working of an organization. They have capabilities to allocate tasks based on priority making sure that the urgent tasks are executed on time on a high priority basis. They are effective in allocating the resources to the right department and hence can help greatly in meeting the deadlines on time.

2.6.8. Managing Work Pressure Without Physical or Mental Exhaustion

Unlike human leaders who can get tired easily, robots are capable of functioning continuously without getting tired. This quality of social robots guarantees continuous supervision in work and management, thus providing enabling prompt resolution in solving any issues without sacrificing quality or efficiency. Additionally, through the examination of employee health data (only when permitted ethically) and workload patterns, the social robots can establish wellness-oriented schedules and reallocate or share the tasks before the employees began to experience over burden. This ability of social robots cannot be seen in human CEOs.

2.6.9. Enhancing Communication and Trust Through Data-Driven Emotional Intelligence

Social robots may not possess real human emotions, yet they can be programmed in affective computing and NLP to simulate human like emotions in it. Advanced systems like Artificial Intelligence (AI), Machine Learning (ML), Natural Language Processing (NLP) can help social robots in detecting changes in human tone. With the help of camera sensors, these robots can detect facial expressions. These systems also enable the social robot to analyse behavioural regularities in humans which helps them to assess employee sentiment and adjust

communication styles according to this analysis (Goleman, 1998). With sufficient data and appropriate training, the social robots can simulate human-level connection and facilitate collaboration with employees, management or with stakeholders efficiently.

2.6.10. Creating A Flexible Work Environment

A social robot can implement the best systems for people to do their jobs without compromising performance based on its ability to track and monitor progress. A social robot CEO could establish adaptable work settings, utilizing technology to determine optimal remote work, hybrid work arrangements, or flexible schedules for everyone, while also monitoring performance effectively. This could be taken positively and if implemented strategically, this adaptability can enhance the job satisfaction for the employees and reduce work pressure (Su et al., 2023). A social robot can execute the optimal systems for individuals to perform their tasks without sacrificing performance due to its capability to follow and assess progress.

2.6.11. Automating Routine Tasks To Free Up Personal Time

The major strength of the social robot is its capability to automate the daily tasks and streamline the process of an organisation. The social robot can effectively handle administrative tasks, track performance, and analyse the data, thus helping in reducing the burden on the employees from these tasks so they can concentrate on some higher value tasks that will require the intervention of the humans.

Ultimately employees will have significantly fewer tasks to perform manually, as all repetitive duties will be managed by the social robot. This will additionally give employees extra time for themselves and will generally aid in achieving a better work-life balance (Pfeffer, 2010).

2.6.12. Improving Work-Life Balance

Despite, the fact that, the CEO of a company faces multiple challenges, he should be talented enough to maintain a good balance between his work and personal life. He should be able to handle multiple tasks, despite the several distractions he encounters. Each and every time of a CEO is valuable. A CEO must handle multiple tasks at one time. While attending a meeting in one place, a CEO will also have to handle multiple phone calls parallelly and at the same time, he will also have to reply to multiple emails or messages. The role of CEO is overwhelming many times, and a single human handling all these tasks at the same time is not always practical. A human being has a limit to do all of these tasks together, and when he gets overloaded with lots of tasks, it starts affecting his physical health and mental wellbeing. This will eventually affect their performance and the productivity of the work (Boyatzis & McKee, 2005).

But on the other hand, if the same tasks are being assigned to a social robot, he will be able to handle it without any errors and efficiently. For example, a social robot will be able to attend the meeting, reply to multiple emails and messages and attend the phone calls and do all other tasks at once without getting distracted or tired. A social robot can deliver consistent performance and work towards the growth of the company with the same enthusiasm each time (Kaplan & Haenlein, 2019). With advancements in Artificial Intelligence (AI), Machine Learning (M), and Natural Language Processing (NLP), social robots have now developed to the extent that they can easily handle complicated executive roles such as communication; scheduling; strategic planning and decision making (Davenport & Kirby, 2016).

Balancing between work and personal life is a challenge to any leader. Though social robots do not have to struggle with such problems but still they have different aspects of struggles to cope up with. For instance, a social robot will have to consider the organizational dynamics

and the wellbeing of the employees. It must consider the work life balance of its employees while also focussing on the effective functioning of the organization.

2.7. Complexities and Concerns in Delegating Executive Leadership to Social Robots

Though technologically ambitious, the idea of social robots serving as CEOs is unknown in terms of its viability from a practical and ethical point of view. Since every coin has two sides, it is important to carefully consider all the aspects of making social robots as the CEO of a company. The advantages have been discussed but there are many issues with this kind of delegation.

In this section we have use the Human Society Theory (HST) which stresses that individuals' groups and organizations operate within interconnected social systems governed by shared norms culture and customs (Parsons 1951). HST provides a lens through which to examine how members of an organization would respond to a social robot CEO by highlighting the social and cultural elements that influence cooperation acceptance and trust.

This section critically examines the complexities and unintended consequences of assigning top executive roles to social robots, focusing on organizational trust, emotional intelligence, company culture, generational anxieties, and legal accountability. The aim is to ground the analysis in existing empirical literature and identify key areas requiring further research rather than assuming future technological solutions.

Let us study the impact of making social robot the CEO of an organisation; it's impact on an organization and on employees and what are the challenges that may occur in detail below:

2.7.1 Perception Of Authority And Trust

Employees crave emotional connection and motivation from their leaders, and a social robot CEO may lack the human nuances necessary to form bonds of trust. Its decision-making based on data could make it seem impersonal, and employees may feel misunderstood or undervalued as a result, causing their trust and morale to erode years later (Goleman, 1998).

Even if a social robot CEO algorithmically centralizes decision-making, employees may feel side-lined or unappreciated. This might undermine their sense of ownership, creativity, and motivation, particularly in environments where workers' individual input has historically been a significant contribution to the organization. Similarly, the financial and personnel decisions made by a social robot may seem transactional and not considering the people involved. If workers feel that efficiency is being compromised at the expense of the human element in these decisions, they may become fearful and resentful.

2.7.2 Lack of Human Touch in Decision-Making

An effective leader should possess good interpersonal communication skills. A social robot might find it challenging to understand the emotions of an employee and the decisions that they make based on the situation. So even if the social robot makes the right decision, the employees might feel excluded or doubtful about the company's future in the case where social robots lack the personal touch. The prioritization of social robot undoubtedly will be always logic and data rather than the human emotions or their personal situations. This can make the social robots take decisions that are not in favour of the employees and will seem to be impersonal or detached from the employees' experiences. This absence of empathy, particularly in delicate matters such as performance evaluations, promotions, or resolving conflicts, could raise employees' dissatisfaction against the changes, favouring human leaders who take their

emotions and individual circumstances into consideration. The robot's reliance on a data-oriented strategy might come across as cold and excessively mechanical, leading to intensifying resistance.

2.7.3 Building Trust And Legitimacy Beyond Historical Identity

Companies that depend on antiquated but emotionally and operationally significant legacy systems may find it difficult to update with a social robot CEO (Kavanagh & Ashkanasy, 2006). Attempting to implement new technology or methods of operation may conflict with ingrained customs and beliefs which could cause some people to resist and not support the change. Because social robots lack the critical thinking skills and human behaviour necessary to comprehend and manage these intricate historical attachments, the robot might find it difficult to strike a balance between the need for advancement and the traditional legacy of the past.

If a former leader was adored or extremely successful a social robot CEO might feel pressured to uphold their legacy (Grint, 2005). This expectation may cause imposter syndrome in which the social robot finds it difficult to replicate prior accomplishments in the absence of the same experiences or emotional ties to the company. Therefore, rather than adopting a new direction employees may filter their decisions through the lens of previous leadership viewing the robot as a replacement rather than a genuine forward-thinking leader.

An organization that has stagnated and is resistant to change may be difficult for a social robot CEO to revive (Tushman & Oreilly, 1996). In order to promote growth, the social robot must strike a balance between honouring the company's past and challenging outmoded tactics which can be challenging without the emotional insight and nuanced understanding that come from human experience.

A social robot CEO may face resistance from employees if the organization's identity is closely tied to past human leadership (Suddaby & Foster, 2017). The social robot may struggle to get accepted in an organisation as a part of it. To earn legitimacy, it must bridge the gap between tradition and innovation-demonstrating alignment with core values while guiding the organization forward, without dismissing its history.

A social robot CEO working in the legacy of past leadership must navigate not just operational tasks but also the emotional and cultural legacy of the organization. It needs to adapt any new methods or procedures thoughtfully, respecting long-standing traditions while carefully working towards the growth of the company. To achieve this goal, a social robot should possess deep awareness of human dynamics and adopt a gradual strategic approach to change the past values without being confined by it (Northouse, 2016).

2.7.4 Resolution Of Conflicts And Emotional Intelligence

Emotional intelligence is essential for resolving the conflict between the teams and to lead an organization effectively and with peace. But as we know, social robot CEOs will have limited ability to fully understand or empathize with the workers' concerns, leading to the social robot to unintentionally worsen conflicts or depress morale (Glikson & Woolley, 2020).

The criteria for managing the deadline effectively depends highly on the strong team dynamics, collaboration between team members, and the morale. Though a social robot can prove to be excellent in assigning the tasks and setting the timelines, it can lack the ability to motivate its team members as the human CEO would do. The social robot can lack in social skills and will not be able to rectify any internal conflicts that arise among the members. If the robot CEO cannot recognize and address these issues effectively, the team might become demotivated, or scattered and there will not be any unity among them, affecting the deadlines to a great extent.

No doubt that social robots are good at following the predefined data and process but when it comes to unforeseen circumstances, they can struggle. For instance, the social robots may not be able to understand or react well to the situation that would have occurred due to sudden change in the market conditions, or due to the shortage of the resources or may be due to a global crisis. In this situation, a social robot may not be able to think critically as a human would in a crisis. In such a scenario, a social robot might take unexpectedly more time than a human to analyse the crisis first to make the suitable decision which may lead to the delay in the deadlines.

2.7.5 Impact On The Organization's Culture

A company's culture is built on empathy and shared values. Making these choices only based on data can be difficult for a social robot CEO. These robots can significantly improve productivity and critical thinking, but they usually lack the emotional intelligence needed to build empathy, trust and resolve conflicts within organizations. The perception of the employees about their jobs and the culture of the workplace are greatly impacted by decisions made by a social robot in the CEO role. If we want workplace management and leadership to be truly effective, we need to find a balance between using robots and strategies that address the human aspects of the job (Dignum, 2019).

A social robot when taking on the role of the CEO thrives to implement new methods, leadership styles and technologies which the employees may find as the threat to the proper functioning of their organization because this is something that is considered as different from the traditional methodology that they have been following in an organisation (Kotter & Schlesinger, 2008). In order to overcome this resistance by the employees, the social robots will have to carefully work towards implementing new technologies and should work towards

bringing any changes slowly to create a sense of security within the organization. This approach demands subtle persuasion and sensitivity to social dynamics, which is challenging for the social robots as they lack artificial intelligence.

It has been observed that most of the organizations are deeply shaped by their past achievements, traditions, leadership quality which leads to strong nostalgia among employees about how things were done under previous leadership (Schein, 2010). There is a possibility that this nostalgia can make it difficult for a new social robot CEO to introduce change, as employees may resist to take up new challenges, accept the forward-thinking strategies, thinking that the past was more successful or safer. This can lead to social robots to face not only the technical challenges but also emotional ones, as it might have to overcome the ideas and practices that employees still hold, even if they are no longer aligned with the organization's future goals (Ford & Ford, 2009).

2.7.6 Perceived Job Insecurity

Replacement of human CEOs with social robots can result in the sense of insecurity among the employees regarding their jobs because they believe automation and artificial intelligence will replace human workers completely, resulting in the threat in their jobs. Employee resistance to new automation-related changes like the adoption of new technologies may stem from their perception that these developments threaten their job security and the importance of human input in the workplace (Brougham & Haar, 2018).

2.7.7 Differences Between Generations and Anxiety Of Using New Technology

Diverse responses to a social robot CEO could arise from workers of different ages having differing levels of technological comfort. While younger employees might be more open to

technology; older employees might be more dubious or worried about a robot assuming a leadership position. The company may find it more difficult to embrace the robotic CEO because of the generational gap which may heighten resistance to change and lead to conflict among the staff members with varying perspectives on leadership and workplace dynamics (Ashford et al., 1989).

When employees feel intimidated or terrified by complex systems, they may resist automation and data-driven decisions, seeing these developments as either beyond of reach or a threat to their jobs. If a social robot CEO introduces new innovative technology, then the employees who are not familiar with using the latest technologies may experience anxiety and fear of using it.

Resistance to change may be because of the fear of becoming outdated, expected technological failures, or a lack of technical expertise. Employees may go against automation and data-driven decisions if they are scared or intimidated by complex systems as they see these developments as either impossible or a threat to their jobs.

2.7.8 Unclear Benefits Of Change

Employees often oppose accepting new changes because they may not fully be aware of the benefits of the new innovations or technology. If the social robots are unable to clearly explain how these changes will enhance the workplace productivity or overall employee experience employees will never trust their judgment. Employees will possess a sense of anger and disagreement as a result from new changes that are implemented without a thorough justification (Kotter & Schlesinger, 2008). Employee resistance to any changes they feel are unnecessary or ineffectual is increased as a result. The social robot CEO might have to deal

with a big problem that is reluctance to change through careful preparation and strategy (Rogers, 2003).

Although robots contribute to efficiency and make decisions based on data, winning over human resistance goes beyond mere logic; this requires the development of trust, emotional understanding, effective communication, and taking into consideration employees' fears and worries. Successfully navigating resistance will involve striking a balance between technological progress and human centered leadership approaches, ensuring that employees feel appreciated, and acknowledged throughout the transition.

2.7.9 Accountability and Responsibility Gaps

In most organizations, meeting the target is considered as the responsibility of its CEO. But when a social robot takes on the role of the CEO, meeting the deadline may not be considered as the personal responsibilities of the employees or leader. In such a scenario, the workers will consider the missing the deadlines as the failure of the machine and not their own fault (Glikson & Woolley, 2020). This will lead to a lack of personal accountability as the human characteristics of mentorship, support and feedback will be reduced. Workers will not be motivated enough to take the responsibility of deadlines if they consider the social robot as an external force detached from their work experience.

2.7.10 Lack Of Social Interaction

Another challenge that the social robot CEO's may face is lack of social interaction. Among all the characteristics of humans, one factor that aids in achieving a healthy work-life balance is building social interaction by initiating team-building activities, encouraging casual conversations, or boosting support from co-workers and management. A social robot CEO may

be deficient in showcasing the social and empathetic skills needed to facilitate such interactions. Workers who sense disconnection with their co-workers or have very less social engagement in the organization may generate the feeling of loneliness, which can adversely affect the balance of their work life. Deprivation of interpersonal relationships can make it harder for employees to relax and destress themselves in the workplace and in their personal life (Tang et al., 2023).

2.7.11 The Risk of Unrealistic Expectations in AI-Driven Leadership

Social robots are driven by predetermined goals and algorithms which lead them to set unrealistic goals and deadlines for their employees, which can be difficult for the staff to meet. Though social robots can calculate the deadlines with accuracy, it may overlook the fact that how much work is feasible for an employee within a given timeframe, leading to over burden and pressure on the workers (Brynjolfsson & McAfee, 2014). A social robot can put much emphasis on sticking to strict deadlines and not enough on the flexibility that innovative or strategic tasks demand. For instance, in businesses where innovation or brainstorming are essential, creativity cannot be pushed, and setting a tight deadline may degrade the quality of the job. In such situations, workers are forced to increase the speed, giving less preferences to the quality as the target will only be to finish the task rather than delivering a quality work. The social robot's tight emphasis on reaching the deadline can stop people being creative at work as they will only be focusing on meeting deadlines. This will ultimately reduce the quality of work, poor delivery of product and also will harm the growth of the company (Grant, 2013).

2.8 Research Gaps: Can AI and ML Enable Social Robots to Become Effective Leaders?

This chapter has presented a structured literature review that explores the role of human CEOs in the context of artificial intelligence (AI). Since 2017, around 35 peer-reviewed studies have

investigated AI's influence in executive roles, addressing topics such as AI ethics, human-machine collaboration, organizational trust in robots, emotional intelligence, decision analytics, and stakeholder acceptance (Glikson & Woolley, 2020). However, none of these studies have empirically examined whether a social robot can fully take on the functional, symbolic, and legal responsibilities of a CEO.

While theoretical frameworks like the Diffusion of Innovation (Rogers, 2003) and the Technology-Organization-Environment (TOE) framework (Tornatzky & Fleischer, 1990) have been applied to the general adoption of AI, they have not been specifically utilized to assess the implementation of robotic CEOs. The research gap in making AI and ML powered social robots as CEO possess some drawbacks that needs to be improvised as stated below:

a. Though social robots possess significant advantages in terms of automation and efficiency, they do have certain limitations such as lack of emotional intelligence, adaptability, and the ability to make crucial decisions like humans do that stop them from being an ideal CEO (Goleman, 1998; Brynjolfsson & McAfee, 2014**)**. However, this drawback of social robots can be rectified by using advanced level of machine learning (ML) and artificial intelligence (AI). These advanced technologies will help in improving the social robots' comprehension of organizational dynamics, employee well-being, and context-specific leadership, transforming social robots into more efficient, responsive, and even empathetic CEOs (Russell & Norvig, 2021).
b. By incorporating advanced machine learning models such as affective computing will enable social robots to understand the vocal tones, facial expressions, and context of human interactions, thereby building the foundation of emotional intelligence in human **(**Picard, 1997**).** The integration of such advanced technologies in social robots could enhance their capability to detect employee stress or dissatisfaction within an organization (Calvo &

D'Mello, 2010). However, there is not enough evidence that such pattern of recognition can fully help social robots to replicate the depth and complexity of human empathy.

c. Adaptive learning algorithms can enable robots to refine their decision-making ability over time by analysing organizational feedback, thereby improving contextual appropriateness **(**Mitchell, 1997)**.** Though with the help of adaptive learning algorithm, social robots can learn from their surroundings, by observing people, their environments, pre-defined set of data, enabling them to get updated gradually, thus becoming more intelligent day by day but there is a significant gap in exploring how adaptive learning algorithms can help social robots dynamically respond to organizational feedback and evolve as effective decision-makers.

d. Social robots must be created to make ethically responsible decisions, especially in critical situations such as recruiting the staffs, resolving conflicts in an organization, or taking disciplinary measures. Programming logic based data into social robot is a complex challenge but a necessary one. The investigation into the ethical consequences of AI-driven leadership is not well advanced. There is minimal discussion on how to guarantee ethical decision-making in critical situations such as hiring, resolving conflicts, or evaluating performance handled by social robot CEOs (Calo, 2015)**.**

e. There must be a clear legal framework that define responsibility in cases of organizational misconduct or failure under a robot's leadership that is who will be held accountable for the social robot's failure; whether it will be the social robot itself or developers or the company?

f. Because social robot CEOs may collect a lot of data and track employee behavior, research is needed to create rules that protect employee privacy and stop too much monitoring or misuse of personal information.

g. Trust is very important for good leadership, but current studies don't clearly show how social robots can build trust by being open, fair, and showing care like a human leader does.
h. There is not sufficient research that exists to demonstrate that machine learning can be trained adequately to prevent biased decisions. Additional research is required to determine if we can implement specific algorithms in social robots that routinely assess their decisions to ensure fair decisions (Glikson & Woolley, 2020).
i. There are no comprehensive real-world evaluations or research that demonstrate the effectiveness of social robot CEOs in leadership positions. Most of the existing research relies on concepts and theories; thus, we require additional practical studies, such as real case examples and employee feedback
j. Most research on AI and social robots focuses on task execution instead of their ability to enhance factors like employee motivation, well-being, and work-life balance. As a result, there is a restricted comprehension of how leaders utilizing AI can successfully meet the emotional and psychological requirements of their employees.
k. The majority of studies on AI and social robots focus on their operational effectiveness, while less emphasis is placed on their possible contribution to improving employee motivation, well-being, and work-life balance. Consequently, the methods by which AI-driven leadership can assist the emotional and mental well-being of employees are still inadequately examined.

In order to attain a work-life balance in a company that is led by a social robot CEO, it is important to maintain a careful balance between increasing the productivity of the work and employee welfare. While social robots can boost operational efficiency; automat daily routines, and introduce flexible working structure in an organization, they must also consider other factors for an effective management of the organization such an emotional well-being, fair workload distribution, and interpersonal relationships within the teams. The success of a social

robot CEO ultimately depends on its ability to go beyond just depending on raw data. It must incorporate policies that prioritize employee needs and well-being **(**Davenport & Ronanki, 2018)**.** A social robot CEO that can increase the productivity and create a supportive workplace environment can lead to a healthier, more engaged, and high-performing working environment.

This research will explore how AI-powered social robots can reduce the operational burden of human CEOs while addressing their own shortcomings. For instance, a social robot must be trained to recognize signs of stress, fatigue, and work overload, and implement responsive policies that support mental health, flexible scheduling, and recovery time of their employees. If such adaptive and empathetic systems are integrated in the social robots, then they can become an asset in leadership roles (Sharkey & Sharkey, 2012).

2.9 Conclusion of this Chapter

This research does not propose that social robot CEOs are currently a feasible or desirable replacement for human executives. The current academic landscape lacks both theoretical depth and practical implementation in this emerging domain (Glikson & Woolley, 2020). Therefore, our research will aim to investigate whether it is feasible to develop a new generation of AI-powered social robot CEOs who not only drive performance but also cultivate trust, inclusivity, and emotional well-being within organizations. **In the next chapters we will** explore if advancement in artificial intelligence (AI) and Machine Learning (ML) technologies can help in developing a social robot that will overcome the failures of the traditional robot, thus transforming itself into an effective, empathetic, and accountable leader.

In this research paper we will examine the conditions in which we can develop a social robot which will be ethically, legally, and socially acceptable. Future research needs to go beyond

the theoretical speculation and requires on focus in empirical studies such as pilot programs, employee feedback surveys, and case analyses of real life application of AI social robots in leadership roles. It is only through this kind of multidisciplinary, evidence-based investigation that the concept of AI-driven executive leadership can advance from theory to practical implementation (Brynjolfsson & McAfee, 2017).

CHAPTER 3 METHODOLOGY

3.1 Overview Of The Research Problem

This chapter outlines the research methodology used to examine the feasibility and implications of appointing AI- and ML-powered social robots as Chief Executive Officers (CEOs) in organizations. In response to the complex nature of this emerging topic, a multi-method (qualitative and quantitative) and exploratory research design was adopted. While conceptual in orientation, the study integrates primary insights through interviews, industrial visits, and case studies, and is supported by rigorous secondary data analysis. Methodological rigor was ensured through triangulation, thematic coding, and critical engagement with both potential and limitations of robotic leadership.

CEOs face overwhelming workloads, with limited time for critical thinking and decision-making. The intense pressure, high cost, and human limitations like tiredness, biased decision and emotional variability question the sustainability of traditional executive roles. Given these challenges, the idea of social robots as CEOs becomes interesting. Robots could provide a cost-effective, long-term alternative, standardizing decisions and reducing human limitations. However, robots lack emotional intelligence and ethical judgment, which are essential for trust, motivation, and apt decision-making. So, while AI-powered social robots could complement or partially replace human leadership, introducing them raises ethical, legal, and operational challenges.

This research therefore aims to evaluate the viability of social robots as CEOs, explore their potential to support or replace human leaders, and examine the broader organizational, social, and economic implications of such a transformation.

3.2 Operationalization of Theoretical Constructs

To evaluate whether AI-enabled social robots can assume the complex role of organizational leadership, the study draws upon three central theoretical frameworks:

- Rational Decision-Making Model (Bazerman & Moore, 2012)
- Strategic Leadership Theory (Day et al., 2014)
- Emotional Intelligence Theory (Goleman, 1998)

These theories help in understanding the evolving role of AI in development of intelligent social robots but at the same time acknowledge that real-world implementation of AI-driven leadership remains limited and highly context-dependent (Glikson & Woolley, 2020).

3.2.1 Rational Decision-Making Model

To determine whether AI systems which are built for data analysis and logical reasoning could duplicate or even surpass the structured decision-making techniques typically employed by human leaders, the rational decision-making framework was applied (Bazerman & Moore, 2012).

3.2.2 Strategic Leadership Theory

This theory helped in the assessment of AI and humanoid robots' ability to perform long-term complex strategic planning tasks that are normally performed by CEOs (Day et al., 2014).

3.2.3 Emotional Intelligence Theory

Since emotional intelligence plays a key role in human leadership the theory of emotional intelligence offers a useful framework for comparison pointing out possible flaws in AI-

powered leadership and pointing out areas where human traits might still be advantageous (Goleman, 1998). This literature review will help to identify the critical challenges of social robots in leadership roles such as decision-making accuracy, leadership effectiveness, ethical reasoning and emotional engagement by using some of the real world case studies.

3.3 Research Scope and Questions

While this study explores the transformative potential of AI in executive leadership, it does not argue that current AI technologies are capable of fully replacing human CEOs. Rather, it highlights the growing capabilities of AI and opens up a discussion on its future potential within clearly defined limitations (Brougham & Haar, 2018). The study critically engages with this possibility by exploring both technological capabilities of the social robots as well as the ethical, legal and social constraints that such a transition can cause.

3.3.1 Examining The Theoretical Foundations Of Leadership And Artificial Intelligence (AI)

This section of the research examines key concepts and theories regarding what defines an effective leader and the functioning of artificial intelligence (AI). It enables a thorough theoretical analysis of how AI understands or exemplifies qualities of a leader including morality, empathy and vision (Finkelstein et al., 2009). The aim is to determine if robots can acquire or replicate these characteristics through AI and establish a solid scholarly basis for the concept of robots in leadership positions.

3.3.2 Interpreting The Effects Of Using AI In Leadership Roles.

This study framework encourages a thorough examination that takes organizational, psychological, technological and ethical factors into account. It allows the researcher to

interpret not just how AI can function in executive roles but also how these social robots will have the ability to gain the trust of human workers, corporate governance, accountability, and stakeholders. By permitting both normative assessments like what should happen and predictive modeling like what might happen the framework equips organizations for future leadership-level AI integrations (Brynjolfsson & McAfee, 2014).

The following are the research questions asked to the CEO's interviewed:

- What is your opinion on social robots participating in executive decision-making?
- What future effects do you think AI will have on organizational leadership?
- What are the ethical or operational concerns in replacing human CEOs with machines?
- Can machine learning sufficiently replicate or even improve strategic thinking at the executive level?
- What skills do you believe are irreplaceable in a human CEO?

3.4 Research Design

A qualitative exploratory research approach was selected in order to gain a thorough understanding of how social robots can address the main issues that CEOs face. In the context of robotics and artificial intelligence the goal is not to test a particular hypothesis but to explore and interpret intricate ideas such as emotional intelligence, strategic decision-making and technological leadership (de Graaf et al., 2015). Rather than test a specific hypothesis, the research aimed to investigate the viability, challenges, and ethical ramifications of integrating social robots into executive roles (Creswell, 2014).

The research followed a qualitative exploratory design, integrating expert perspectives with real-world case studies and secondary literature. Purposive sampling was adopted to select participants, ensuring diversity across leadership, robotics, and AI fields. Semi-structured interviews with five CEOs were complemented by surveys conducted among 80 companies at

Technopark, Kerala. Additionally, an industrial visit to Guangzhou Infinity Technology (China) provided practical validation of AI-driven social robot capabilities. This design ensured that both practical experiences and academic perspectives were systematically incorporated.

3.5 Research Approach And Strategy

Using a thorough multi-method approach the viability and consequences of designating social robots as CEOs were investigated. This approach blends case studies from the real world theoretical analysis and if required expert validation. This combination provides both conceptual depth and real-world relevance in the assessment of whether social robot CEOs perform better than conventional human executives. To lay a theoretical foundation the first stage of the study comprised a thorough review of the body of existing literature. This stage made it easier to place the idea of social robots and artificial intelligence in leadership positions within the parameters of modern leadership and decision-making.

3.6. Participant Selection

A purposive sampling method was used to identify experts with experience in robotics, AI, leadership, and entrepreneurship. The selected participants represent a diverse cross-section of the tech and robotics industries across India and the UAE:

To provide empirical grounding for this research, five interviews were conducted with CEOs from various industries and regions. Participants were selected through purposive sampling, based on their leadership experience and their exposure to AI integration in business strategy. Interviews were conducted with both newly appointed CEOs and those with extensive experience. The goal was to understand their leadership experiences, taking into account the

company culture, existing systems, and the decision-making processes within their organizations. Additionally, supplementary information from corporate transition reports and case studies on leadership onboarding were gathered. To offer practical insights, the responses from the interviewed CEOs were recorded and analysed. The details of their interviews can be examined further in this chapter.

The five CEOs interviewed for this study are not only my professional peers but also close acquaintances with whom I have frequently engaged in discussions about the tensions and demands of executive leadership. These conversations, rooted in shared professional experiences, laid the foundation for deeper inquiry into the feasibility of artificial intelligence—particularly social robots—assuming roles of executive.

3.7 Data Collection Procedures

The study employed a multi-method (qualitative and quantitative) strategy, combining three main sources:

a. Primary Data: Interviews with CEOs, expert survey and industrial visit.
b. Analysis of Case Studies: Practical uses of AI-driven social robots in executive or related leadership positions.
c. Secondary Data: Academic journals, technical documentation, and industry whitepapers.

3.7.1 Primary Data Collection Method

The primary data collection methods used are case studies analysis of some real-world examples of social robots that have already been appointed as the CEO of an organisations by some corporates. Some direct interviews were also conducted with the CEOs of various

organisations to get the options on how they find the concept of making social robots as their CEOs. Some surveys were conducted, and their results were added here. Another method that was used for the data collection was industrial visits to see some of the outstanding robots that have been equipped with artificial intelligence. The primary data collection method included:

- Case Studies: Analysis of real-world examples where social robots (e.g., Tang Yu, Mika) were appointed as CEOs or in executive-like roles.
- Expert Interviews: Semi-structured interviews with five CEOs from India, UAE, and the USA to gather in-depth qualitative insights into AI-driven leadership.
- Survey (Quantitative and Qualitative Method): A structured survey was distributed to over 200 companies in Technopark, Kerala, of which 80 responded. The survey provided both numerical data (quantitative) and open-ended opinions (qualitative) about the acceptance and challenges of social robots as CEOs.
- Industrial Visit: A visit to Guangzhou Infinity Technology (China) to observe AI-powered robots and study advancements in humanoid robotics.

This approach ensured triangulation by combining qualitative insights, quantitative data, and real-world observations. Let us see in detail about the methods used:

3.7.1.1 Expert Interviews

This research adopts a qualitative exploratory design, integrating expert interviews and case study analysis to investigate the viability of replacing traditional CEOs with social robots enhanced by AI and machine learning.

i. Interview Procedure

A semi-structured interview was used to gather information from the participants. They were interviewed either in person or online depending on their preference. Other subjects were brought up during the conversation with the aid of open-ended questions. This strategy maintained the focus on the primary research topics while enabling participants to give thorough responses. Every session lasted forty-five to sixty minutes. All the interviews lasted for 45 to 60 minutes each.

ii. Data Analysis

The interviews were coded and transcribed using thematic analysis with a focus on recurrent themes like technological viability leadership traits, ethical boundaries, and industrial readiness. The results were validated by cross-referencing them with secondary sources such as whitepapers journal articles and real-world AI implementations in leadership simulations.

iii. Expert Interview Outcomes

To maintain confidentiality, participants are referred to as CEO1–CEO5.

CEO1 of one the leading company IT company in Technopark, India emphasized that executive decision-making is non-linear and intuitive. The CEOs role is difficult to replace in complex situations like managing uncertainty inspiring employees and creating culture he cautioned. AI however can assist with strategic tasks. Additionally, he acknowledged that AI might be a useful instrument for addressing difficult decision-making problems.

CEO2 highlighted the rapid advancements in AIs ability to forecast trends and increase efficiency. He believes that if social robots improve their context awareness, they may eventually assume leadership positions centered on execution, particularly in data-driven organizations.

CEO3 of a reputed robotics training center in USA raised concerns about empathy, negotiation, and crisis leadership, calling them deeply human traits. However, he appreciated the potential for robots to enhance transparency and bias-free decisions, especially in financial or technical leadership.

CEO4 expressed strong optimism for social robots. He pointed to real-world use cases in education, healthcare, and elderly care, where social robots already perform empathetic, conversational, and multi-tasking roles. He believes we are close to developing AI-driven CEOs for tech companies, where decision matrices are structured and predictable.

CEO5 stressed that AI and robotics have reached a maturity level where autonomous governance structures are plausible. He cited examples from Genrobotics where robots are independently managing logistics and maintenance. He believes the next frontier is executive-level decision engines driven by real-time data and self-learning algorithms.

iv. Conclusion of Expert Insights

While some CEOs expressed enthusiasm for AI-driven leadership (CEO4, CEO5), others were more cautious (CEO1, CEO2, CEO3), stressing the irreplaceability of human skills such as empathy, ethical reasoning, and crisis management. While most experts agreed that complete replacement of human CEOs is not currently feasible, there is a consensus that AI-enhanced social robots can:

- Perform specific leadership functions such as data-driven planning, resource optimization, and transparent communication.
- Act as executive assistants or co-leaders, especially in technology-focused or operationally structured organizations.
- Enhance ethical and data-based decision-making but still lack emotional intelligence, ethical judgment, and contextual thinking found in human leaders.

3.7.1.2 The Survey

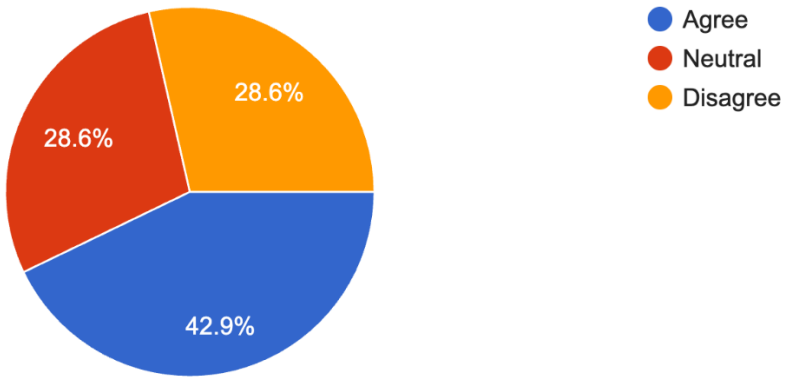
As the CEO of an IT company named Azinova Technologies for the past 18 years, I have built strong connections with professionals across Technopark, an IT hub located in Kerala, India. To deepen the scope of my research, I identified several potential challenges that social robots may face in assuming the role of a CEO. I then created a Google survey based on these challenges and shared it with all the companies in Technopark. Out of approximately 200 companies, 80 responded to the survey. Below is the analysis of the findings.

Let us see the responses of the survey that we conducted on the above CEOs below.

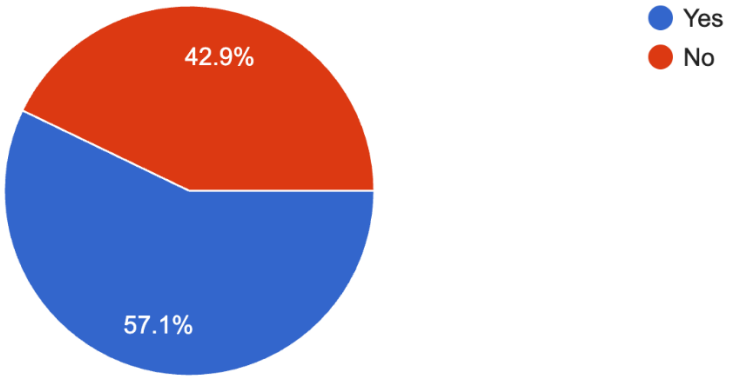
When the survey was done on the CEOs from all over the world, the outcome received were of mixed opinion, pointing both the advantages and disadvantages of appointing social robots as the CEO of an organization.

Find the below survey questions and outcomes.

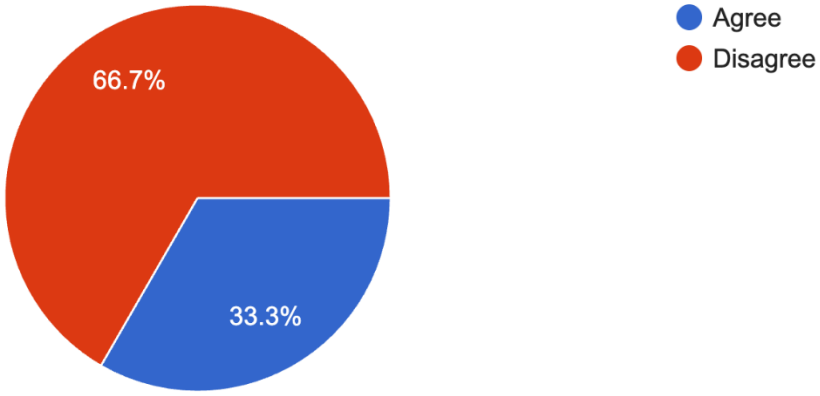
1. As a CEO, do you agree that social robots have the potential of assuming leadership roles within companies, driven by artificial intelligence?



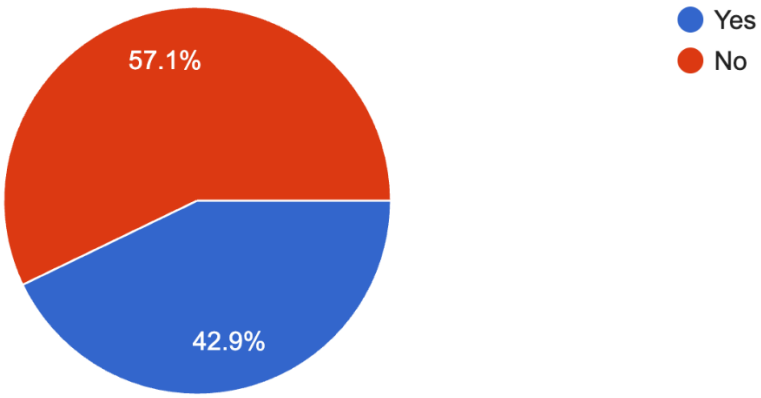
2. Is it a good decision to make them play a significant role in executive positions?



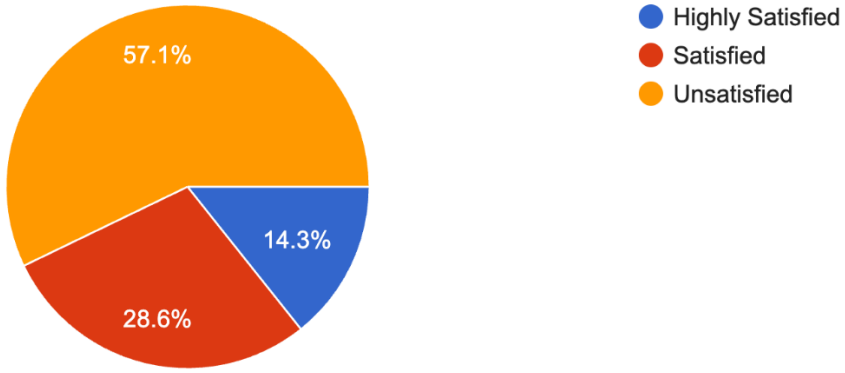
3. Do you agree that making social robots CEOs of large organizations would be a wise decision?



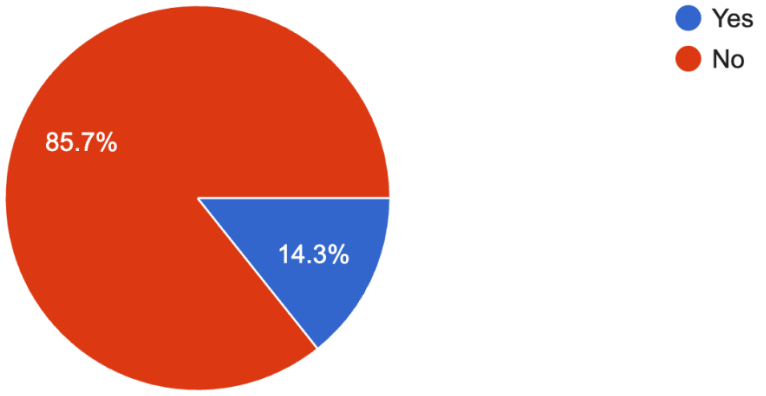
4. Are there any specific AI technologies or applications that your company is using currently?



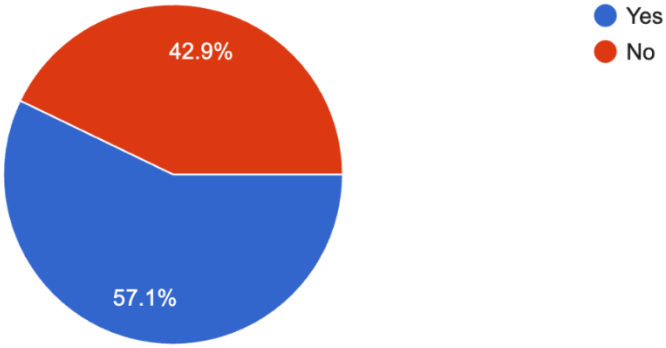
5. How satisfied would you be if your company's CEO were replaced with a social robot?



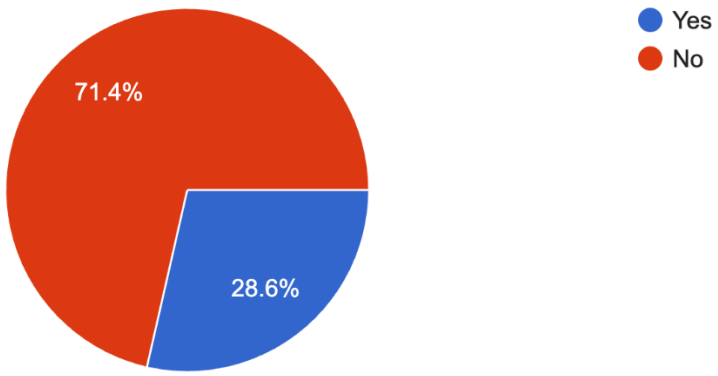
6. Do you agree that social robots will be able to run a company independently without human guidance?



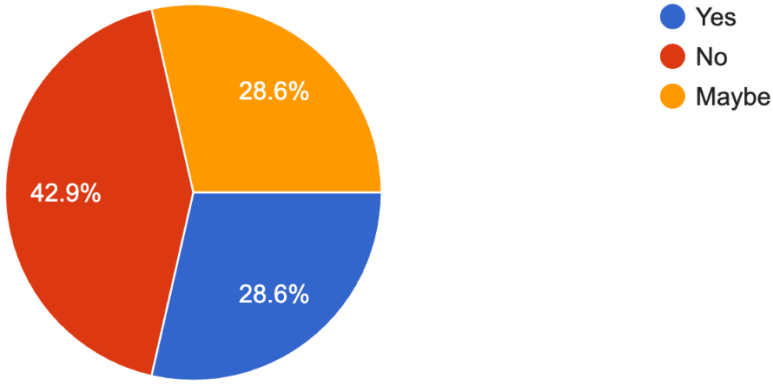
7. Can social robots effectively lead and make high-stakes decisions critical for a company's success, considering their lack of human experience and emotions?



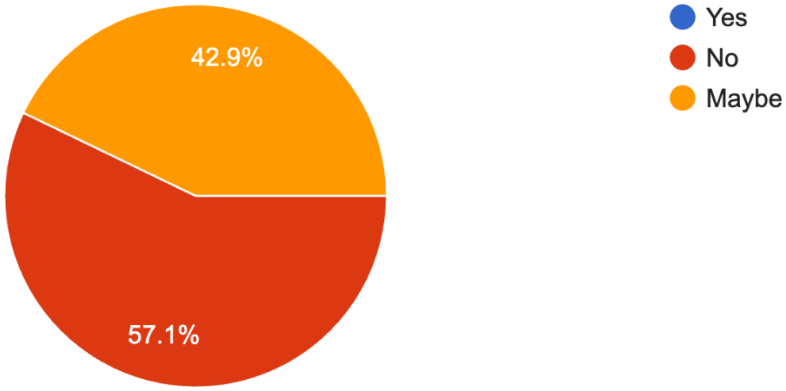
8. Do you think it's possible for a social robot to achieve human intelligence, critical thinking ability and human behaviour with the help of Artificial Intelligence (AI) and Machine Learning (ML) ?



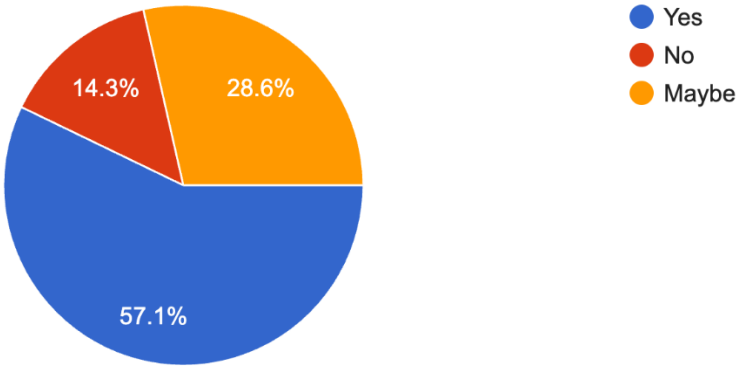
9. Considering that a social robot is still a machine, do you think it is possible for a social robot to gain the trust of its employees and become the ultimate decision-maker for a firm?



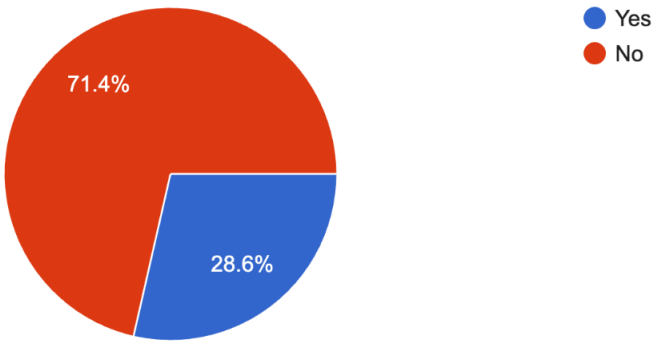
10. Do you think employees of a firm would accept a machine as their leader?



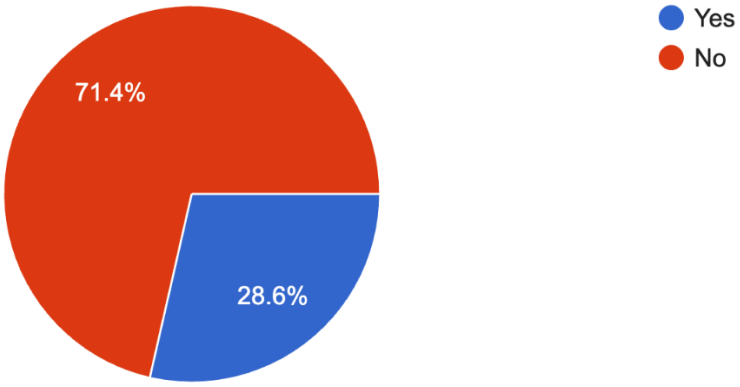
11. Considering the failures of earlier social robots, do you think it's possible to develop an improved social robot that will overcome these previous challenges using Artificial Intelligence (AI)?



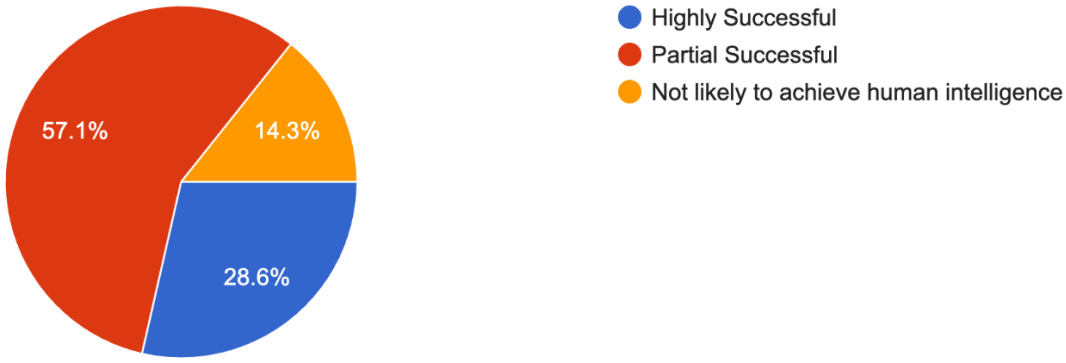
12. Do you think social robots can handle ethical dilemmas in leadership roles? Can they prioritize ethical considerations and moral complexities appropriately?



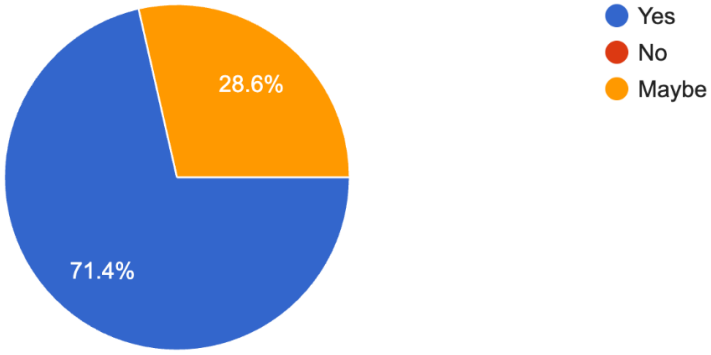
13. Do you think that in the future, social robots will surpass humans in leading organizations?



14. To what extent can artificial intelligence and machine learning contribute to the development of an intelligent and human-like social robot?



15. Do you believe the integration of social robots as leaders, supported by artificial intelligence, would impact traditional corporate structures and hierarchies?



16. What concerns or challenges do you foresee in integrating AI powered social robots into executive roles? Give opinion

- Acceptance
- Robots can complement humans but can't really replace them in all aspects, especially social, human touch, empathy, leadership, etc.
- They cannot solve the ethical and emotional issues within an organization at least for the next 10 years.
- Employees can mislead them

17. What is your vision for the role of AI-driven social robots in executive positions in the next 5-10 years? How might this impact the overall landscape of corporate leadership? Give Opinion
    - Initially there will be some hindrance. People might protest against it. But looks like soon AI will takeover
    - To complement a leader and and assist in decision making and feedback.
    - Not required robots at the level of CEO in the next 5-10 years
    - It can happen, if so Unbiased decision making will be ensured but people can mislead them.
    - Social robots can help the CEO make executive decisions, but they can not replace a human CEO.

3.7.1.3 Industrial Visit

As part of my research work, I travelled to China to visit the company named Guangzhou Infinity Technology (Infinity VR). This visit was intended to evaluate the goal of whether social robots have the potential to replace the CEO of an organization with the help of AI and Machine Learning (ML) and to study in detail the advancements in the field of humanoid robotics.

Infinity VR is a well-known company in China, which focuses on the research and development of immersive Virtual Reality (VR) technologies. The company has over 6000 meter square manufacturing facility, holding about 39 VR-related patents. The annual production capacity of the company is over 2000 units. What motivated me to visit this firm to carry out my research was the fact that this company is actively involved in the development of AI powered social robots which possess the capability of social interactions by using the latest technologies, which supports the conceptual framework of this study.

The visit to the Infinity VR helped in gaining hands-on experience on how artificial intelligence and robotics are being integrated in the real world systems, helping them in effective decision making, meaningful communication and social interactions. These are some of the major features that a social robot needs to inherit in order, to be an effective leader. This insight contributes to my thesis, practically validating the fact that AI-powered social robots possess the capabilities to be an effective leader and they can effectively take on this role, contributing towards the success of any organisation.

Key Observations:

- Development of AI-driven social robots capable of interaction and decision-making
- Use of machine learning and emotional recognition for human-robot communication
- Limitations in adaptive learning, creativity, and judgment under uncertainty

The visit provided practical validation for the conceptual frameworks, while also highlighting technical gaps, such as lack of critical ethical reasoning and contextual adaptability. The observations made during the visit helped in analysing the possibility of developing a successful intelligent social robot that will be able to operate even in complex environments

and will be able to carry out critical functions like decision making, planning, critical thinking, identifying objects and effective human-robot interaction (HRI).

3.7.1.4 Case Study Analysis

Qualitative exploratory case study research is the most effective method to investigate the potential of AI-driven social robots as leaders. This approach supports a deeper exploration of the real-world application of humanoid robots in executive roles (Yin, 2018). Through analysis of leading cases of Sophia (Hanson Robotics), Pepper (SoftBank Robotics), Tang Yu (NetDragon Websoft) and Mika (Dictador) in the development of a robotics leader, the findings point to trends, successes, limitations, and stakeholder reactions to robot leaders.

All cases were assessed based on standard criteria as follows:

- **Decision-making accuracy**

- **Impact on company culture**
- **Acceptance among employees and stakeholders**
- **Media portrayal and public reception**
- **Overall organizational outcomes**

These evaluation criteria made it easier to assess how well AI-powered social robors could carry out leadership roles and how external and internal stakeholders viewed their presence. Even though these cases offer valuable insights there is still disagreement regarding their applicability and they do not conclusively show efficacy.

Selected Case Summaries

- **Tang Yu (NetDragon Websoft China):** Tang Yu serves as an AI-based virtual humanoid that was made the rotating CEO of NetDragon Websofts' subsidiary in 2022. She is responsible for overseeing organizational workflow processes including optimization, data analytics and operational efficiency. Her employment marked one of the first real world attempts at AI fulfilling an executive position.

- **Mika (Dictador, Colombia):** Mika (Dictador, Colombia): Mika is a humanoid robot created by Hanson Robotics serving as a board member for the Colombian rum company Dictador. Mika as an AI powered robot serves corporate identity and governance by partaking strategically in branding and investor relations although mostly ceremonial (Vincent 2022).

- **Sophia (Hanson Robotics):** Sophia (Hanson Robotics): One of the most popular humanoid robots Sophia has represented AI at numerous global events, business meetings and conferences. Interacting with stakeholders, expressing emotions, and conversing live

are some of her skills. Although she does not have an executive role, her case illustrates the opportunities that social robots can have in public relations and external communications roles (Hanson 2023).

- **Pepper (SoftBank Robotics): Pepper** is a semi-humanoid **social robot** developed by **SoftBank Robotics** in collaboration with **SoftBank Mobile** in Japan. Pepper is commonly used in customer service jobs in industries like banking and retail. Pepper, a smart example of social robotics in daily interactions, is made to recognize emotions and engage in conversations. Its use shows how AI can assist in operational and support roles, even though it is not used in strategic leadership (SoftBank Robotics, 2023).

3.7.1.5 Extended Case Examples and Pilot Studies

Additional international research and pilot programs enhance our understanding of AI in leadership:

- During the years **2018 to 2021**, the **internal pilot projects** were run by **Hitachi** (a Japanese multinational conglomerate) and **SoftBank** (a major Japanese tech and telecom company). These companies conducted tests to explore the effectiveness of AI assistants in making executive decision. Although the AI provided data-driven insights during meetings, it only acted in a supporting or advisory role and did not make decisions. This shows that AI has the ability to improvise overtime but currently it can replace human authority in terms of decision making (Forbes, 2021).
- **In the previous study, (Tsai et al., 2022)** outlined a multilevel framework for AI-human co-leadership in organizational teams. The study demonstrates how artificial agents can collaborate with human leaders in operational, relational, and strategic capacities to enhance performance and trust (Tsai et al., 2022).

- As per the European Board-Level Experiments conducted between 2021 and 2023, trials in Germany and the Netherlands examined AI's role in corporate governance. Although this experiment is still in early stages of trail and the studies on this is limited, they raised important ethical and regulatory questions, bringing AI leadership closer to formal corporate recognition (Wolf & Stock-Homburg, 2025).
- According to NetDragon Websoft (2024), several Chinese companies used robotic tools to support middle management, focusing on tasks like forecasting and scenario planning. While AI contributed to operational decisions, humans kept full control over final choices, thus emphasizing more on collaborative decision-making (NetDragon Websoft, 2024).
- Furhat, a socially intelligent robot developed by Furhat Robotics, has been used to work closely to humans in roles such as customer service, healthcare, and even unbiased recruitment. Also, **FRAnny**" and "**Tengai,**" the two **AI-powered social robots** were developed by **Furhat Robotics**, known for its expressive, human-like robot interfaces. "FRAnny" is used for assisting travellers at Frankfurt Airport, and "Tengai" is used for conducting job interviews without being biased like human, showing the value of AI in human-centered roles (Furhat Robotics, 2022).
- As per the Human-Robot Interaction trials conducted, Furhat has also undergone tests in controlled lab settings to simulate therapy and mental health support. This research helps evaluate how people socially and emotionally engage with robots (Furhat Robotics, 2022).
- According to Cichor et al. (2023), in a leadership simulation with MBA students, semi-humanoid robots were tested using two styles: transformational leadership, which focused on vision and motivation and built more trust, while transactional leadership, which focused on rules and tasks, this had increased efficiency but had made participants uncomfortable as the because the semi-humanoid robots enforced strict rules, provided minimal emotional interaction, and communicated in a rigid, impersonal manner (Cichor et al., 2023).

- As per Wolf & Stock-Homburg (2025), a large U.S. survey indicated that people preferred android-style AI managers, which are more functional and less human-like, over humanoid robots. This implies that relational skills are essential for accepting AI in leadership roles (Wolf & Stock-Homburg, 2025).
- According to Yin et al. (2024), the neuroscientific research found that when AI showed empathy-like behaviors, it triggered brain responses like those triggered by trusted human leaders. This suggests that emotional intelligence in robots could be important in how they are perceived in leadership roles (Yin et al., 2024).
- According to Abdollahi et al. (2022), AI tutor robots like "Brian 2.0" and "Ryan" improved emotional connection and memory in elderly care and learning environments. These findings support the idea that robots can boost human interaction, especially in roles that require empathy and communication (Abdollahi et al., 2022).

3.7.2 Secondary Data Collection

The data used in this study came from the gathering and examination of previously published data from reliable media business and academic sources. Because of their applicability to the main research areas-robotics AI machine learning and organizational leadership-these sources were chosen. The purpose of this study is to integrate insights from multiple secondary sources to create a thorough foundation for evaluating the viability of using social robots in high-level roles like CEO. We used secondary sources as given below for the further study.

3.7.2.1 Academic Journals, Books, And Conference Papers

Analyzing peer-reviewed scholarly literature was an essential part of the data collection procedure. Research was done in robotics, computer science artificial intelligence and management studies journals to obtain a thorough grasp of the technological prowess and

leadership potential of AI-powered systems. Because academic books provide theoretical frameworks and historical perspectives the study was able to track the evolution of AI in leadership roles. Conference proceedings were also examined because they frequently contain state-of-the-art experimental and research studies on human-robot interaction machine learning algorithms and leadership automation (Dautenhahn, 2007).

3.7.2.2 Technical Documentation And Whitepapers From Robotics Companies

The technological underpinnings and practical uses of social robots were investigated through research on technical papers and whitepapers released by robotics companies. Companies that are leaders in creating humanoid robots with social and cognitive abilities like Hanson Robotics and SoftBank Robotics provided content for the analysis. These documents provided information about learning mechanisms, hardware specifications, AI integration models and the planned applications of robots such as Sophia and Pepper. This data was crucial for assessing how these robots might be built to fill positions that have historically been filled by human executives (Briggs & Scheutz, 2015).

3.7.2.3 News Articles And Industry Reports On AI In Corporate Leadership

In order to comprehend the technological foundations and practical uses of social robots the technical documents and whitepapers released by robotics companies were reviewed. Materials from industry leaders in the development of humanoid robots that can perform social and cognitive tasks such as Hanson Robotics and SoftBank Robotics were included in the analysis. The learning mechanisms, hardware specifications, AI integration frameworks and the intended use cases for robots like Sophia and Pepper were all covered in these documents. When assessing how these robots are designed to potentially fill positions that have historically been held by human executives this information was crucial (NetDragon Websoft, 2024).

3.8 Data Analysis

A **thematic analysis framework** was used to interpret qualitative data from interviews, case studies, and secondary sources (Braun & Clarke, 2006). The key steps included are:

1. **Familiarization**: Reviewing all data and identifying recurring themes
2. **Coding**: Labeling data segments according to leadership functions (e.g., trust, decision-making, adaptability)
3. **Theme Development**: Grouping codes into overarching concepts (e.g., resistance to robot leadership, AI objectivity vs. human intuition)
4. **Interpretation**: Comparing findings with theoretical models and evaluating the practical viability of robot CEOs

3.9 Sampling And Data Sources

Because of the exploratory and conceptual nature of this research purposive sampling was used to guarantee the selection of extremely pertinent and insightful materials. The researcher was able to specifically select sources and case studies that looked at the relationship between social robotics artificial intelligence and executive leadership through purposive sampling as opposed to random or statistical sampling. The following criteria for inclusion guided the selection of materials.

3.9.1 Relevance To Social Robotics And AI In Executive Functions

We only took into account sources that specifically look into how AI-powered robots are used in organizational management leadership corporate governance and decision-making. Studies on how social robots might mimic or duplicate human executive functions including stakeholder engagement performance evaluations and strategic planning are included in this.

3.9.2 Sources Published In The Past 10–15 Years

The rapid breakthroughs in robotics and artificial intelligence need a focus on current literature to ensure relevance. The most recent advancements in robotics hardware, machine learning, natural language processing and human-robot interaction can be included by giving priority to publications published within the last 15 years.

3.9.3 Peer-Reviewed Or Published By Recognized Institutions/Companies

Only peer-reviewed books, reports and journals from respectable academic institutions were chosen in order to guarantee the information's legitimacy and academic integrity. Technical papers and whitepapers from top robotics and AI firms including IBM OpenAI SoftBank Robotics and Hanson Robotics were also taken into consideration (OpenAI, 2023; IBM Research, 2024).

A theoretical underpinning and real-world examples of how AI-enhanced social robots can be given the cognitive analytical and communication skills necessary for leadership positions are presented in the chosen sources.

3.10 Methods Of Data Analysis

To explore how CEOs, both human and robotic, adapt to an organization’s established culture and systems, this study used has used various analysis approach informed by expert interviews and organizational case studies. The goal was to identify behavioral patterns, adaptation strategies, and challenges during leadership transitions.

3.10.1 Analyzing The Adaption To Organizational Culture And Systems

Using a thematic analysis framework the qualitative information collected from case study reports, technical publications and scholarly literature was analyzed. Through the systematic and interpretive analysis of textual data made possible by this approach themes and patterns that are closely related to the research questions could be found.

3.10.2 Analytical Focus

This theme investigates how adapting to a company's legacy influences strategic decision-making and cultural compatibility. The analysis also explores how a social robot CEO could theoretically navigate adaptation challenges by:

- Quickly learning from the organization's data repositories
- Offering an unbiased view of legacy systems
- Managing cultural integration objectively through programmed behavioural modelling

3.10.3 Operationalization In The Study

The following key steps were followed in the thematic analysis:

Understanding The Data

Case studies on AI platforms like IBM Watson and robots like Sophia and Pepper were among the many data sources that were thoroughly reviewed as the first step in the process. This phase made sure that a thorough grasp of how these technologies work and are viewed in executive settings was achieved.

Identifying And Coding Recurring Themes

Throughout the data the following themes surfaced as recurring ideas that were categorized. automated decision-making using data-driven analysis and machine learning algorithms.

Robots are now able to recognize and react to human emotions because of developments in affective computing and natural language processing (Poria et al., 2017). Adaptability and learning demonstrate how social robots use machine learning to improve their knowledge base and behaviours over time.

3.10.4 Mapping Themes To Research Questions And Theoretical Frameworks

Following that the themes that were found were compared to more general theories of leadership including transformational leadership, servant leadership and techno-leadership. The goal was to assess how well social robots could use AI to mimic or surpass human executive functions.

3.10.5 Interpretation Of Findings

The knowledge gained from the themes aligned with the main research question to develop final interpretations: Can social robots with AI and ML technologies successfully assume the role of human CEO? The analysis showed that these robots are becoming more capable of making data-driven decisions using natural language processing (NLP) to communicate with empathy and using adaptive learning systems to continuously enhance their leadership efficacy.

3.11 Validity And Reliability

The credibility of this research paper was increased by reviewing a wide range of reliable academic and business sources. This wide range made sure that opinions weren't skewed toward one field or viewpoint. By incorporating literature from disciplines like computer science, robotics engineering, organizational leadership, and ethics the study was able to gain a comprehensive grasp of the subject (Brynjolfsson & McAfee, 2017).

Verifying information from multiple case studies such as Sophia, Pepper and IBM Watson in addition to theoretical frameworks allowed for data triangulation. As an example, observations about a robot's capacity for decision-making were contrasted with empirical data from the deployment of a different robot in an organizational context and AI leadership theory concepts. Rather than depending solely on isolated instances this approach made sure that conclusions were backed by accumulating evidence (Yin, 2018).

In order to maintain reliability, it was crucial to use consistent thematic coding across all sources to guarantee consistency in data interpretation. By establishing explicit selection criteria for case studies and literature the methodological decisions made can be replicated or assessed by others. applying clear inclusion criteria that prioritize current reliable and pertinent content.

The study also demonstrates that by using machine learning and natural language processing AI-powered social robots are getting better at simulating important leadership roles. These abilities include making strategic choices analysing and responding to vast volumes of organizational data effectively communicating with stakeholders and demonstrating emotional intelligence in interpersonal interactions.

Because of these traits social robots may be able to do more than just help given the correct circumstances they may even be able to run organizations on their own. Even though social legal and ethical issues still need to be taken into account the technological underpinnings that allow AI to perform executive functions are strengthening (Brynjolfsson & McAfee, 2017).

3.12 Ethical and Legal Considerations

In this research paper will also be studying the ethical considerations to be taken while giving the highest power of an organisation to a social robot. Though it did not directly involve human subjects and only used secondary data sources the study of AI-driven leadership brought up several important ethical issues. When evaluating the feasibility of using AI and machine learning-powered social robots to replace human CEOs these considerations are essential (Bryson, 2019).

3.12.1 The Ehical Aspects Of Using Robots To Replace Human Ceos

The idea of using artificial intelligence to replace human leadership raises significant philosophical and societal questions. Among these factors are concerns about losing one's job, the dehumanization of leaders and the impact on company culture. Fully automated leadership runs the risk of eroding the ethical reasoning, empathy and human values that have historically influenced executive decision-making (Bryson, 2019).

3.12.2 Self-Operated AI Systems Decision-Making And Accountability

When a social robot is given CEO-level authority, responsibility is the main ethical consideration. Is the robot the programmers or the company at fault if an AI-driven CEO makes a bad choice like firing staff, completing a foolish merger or breaking the law? AIs lack of legal status in contrast to humans presents difficult issues with regard to accountability and liability in autonomous decision-making.

3.12.3 Data Biases In Social Robot Training

The quality of the data used for training determines how objective machine learning systems are. In the event that a social robot CEO learns from historically faulty or insufficient company

data it may continue to use biased hiring promotion or resource distribution practices. Concerns about inclusivity, transparency and fairness in automated leadership processes bring up moral dilemmas (Mehrabi et al., 2019).

In short, this study recognizes that replacing human leadership with AI challenges foundational principles of accountability and autonomy. Specific issues include:

- **Legal Personhood:** Robots lack legal recognition; executive decisions require clear lines of liability.
- **Workforce Impact:** Taking out human leaders from the workplace could really affect morale and change job hierarchies.
- **Ethical Dilemmas:** It's also important to note that AI can not handle ethical issues or complex emotions like humans being can do. Hence social robots powered by AI cannot address moral hurdles or emotional characteristics in the same way humans do.
- **Bias and Fairness:** When we create social robots, we need to make sure they are designed to be fair and inclusive. he design and training of social robots must be both inclusive and non-discriminatory (Mehrabi et al., 2019).

Discussions with experts in ethics and technology showed that our current frameworks are inadequate for supporting fully autonomous robot leadership without some changes in regulations.

3.13 Research Design Limitations

Although this study offers a useful theoretical framework for investigating the potential of social robots combined with artificial intelligence (AI) machine learning (ML) and natural language processing (NLP) as future corporate leaders a number of limitations should be noted to preserve academic integrity and clarity regarding the research scope.

3.13.1 Exploratory And Conceptual In Nature

Instead of empirically confirming their capabilities through direct experimentation or deployment within organizations the primary goal of this exploratory and theoretical research is to conceptually evaluate the possibility of social robots serving as CEOs. The analysis uses secondary data from academic literature, technical reports and public case studies in place of primary data gathered from stakeholder interviews or real-world applications. As a result, although the study offers insightful analysis and interpretations based on current trends and technologies it does not produce quantitative evidence or statistically validated findings. The results are meant to spark debate and direct future empirical research not to provide conclusive evidence of viability (Venkatesh et al., 2013).

3.13.2 Futuristic And Speculative Context

Even though technology has advanced remarkably, executives still lack complete autonomy so it is unlikely that social robots will ever fully replace human CEOs. With the use of advanced data analytics predictive modeling and real-time natural language processing AI systems can currently support human leadership. However, AI is still unable to fully replicate complex skills like moral judgment, autonomous strategic thinking and the intuitive leadership traits that are frequently necessary for a human CEO. Furthermore, although natural language processing (NLP) and machine learning (ML) enable complex human-like communication as well as continuous learning and adaptation these technologies are still in the early stages of developing into robotic forms that can oversee entire organizations. As a result a lot of the research in this field is theoretical in nature and based more on theoretical frameworks and new trends than on extensive real-world application.

3.13.3 Limited Access To Proprietary Technical Information

One major disadvantage is the limited availability of proprietary technical data from businesses that create sophisticated social robots. The general public is not fully informed about the cognitive architectures, machine learning frameworks, decision-making algorithms and real-time natural language processing systems used in AI platforms like IBM Watson or robots like Hanson Robotics Sophia and SoftBank Robotics Pepper. It is difficult to fully assess without access to this private information. The level of AI autonomy currently possessed by these robots. The ways in which they learn to adjust to shifting surroundings. and how they might handle difficult leadership issues like crisis management, moral quandaries or human motivation. This lack of transparency compromises the study's capacity to confirm social robots' operational preparedness for executive leadership positions which also compromises the evaluations technical accuracy (Theodorou & Dignum, 2019).

3.13.4 Restrictions

Although this research has limitations it provides a solid conceptual basis for the current debate about AI-driven leadership. By combining ideas from artificial intelligence, machine learning, natural language processing and organizational theory it offers a futuristic view of how social robots might progress from helping roles to becoming independent decision-makers capable of managing organizations. It also draws attention to the crucial organizational moral and technical aspects that need more empirical research before social robots are seriously considered for CEO-level positions. The results stimulate further research into the following areas: how AI-enabled systems may be able to match or surpass human executive capabilities, how to deal with bias and accountability in robotic governance and how businesses may need to modify their leadership structures in order to integrate or accommodate robotic entities in the future (Bryson, 2019).

3.14 Conclusion

This research paper will describe the methodological framework used to investigate whether social robots, equipped with artificial intelligence and machine learning, could credibly and effectively take the place of human CEOs. The research utilized a qualitative, exploratory design, integrating secondary data analysis with case studies of prominent AI-driven robots.

By employing thematic analysis on a wide range of credible sources, this chapter revealed important insights into how AI technologies, especially machine learning and natural language processing can mimic key functions of a CEO.

These functions encompass:

- Strategic decision-making supported by data analysis
- Interpersonal communication facilitated through NLP and emotional recognition
- Adaptive learning and self-enhancement over time
- Consistent governance that minimizes bias (if appropriately trained)

The study includes ethical issues like accountability and bias along with societal impacts to deliver a comprehensive view of robotic leadership consequences. While recognizing the existing technological and theoretical limitations, the findings indicate that social robots may eventually be capable of taking on executive positions one day, challenging conventional views of corporate leadership. The following chapter will present the findings and thematic interpretations drawn from the case studies and literature review, providing a deeper understanding of the developing capabilities and constraints of AI-powered social CEOs.

CHAPTER 4 DATA ANALYSIS AND FINDINGS

4.1 Research Question One: Can an organization perform well or more efficiently if it replaces its CEO with a social robot powered by Artificial Intelligence (AI)?

A social robot is a robot that is designed to interact and engage with humans in an interactive way. Social robots differ from the industrial robots that are mainly used to perform tasks in the manufacturing or automation industry. These social robots are built to establish social connections and interaction with humans (Dautenhahn, 2007). Social robots have the potential to recognize and respond back to human emotions, speech, and gestures. They have human-like characteristics that help them in more natural interactions and communication with the people around them (Breazeal, 2003). These social robots are now used widely in various industries such as the healthcare department, customer care services and in the entertainment industries. These social robots have been proved effective in assisting elderly people in times of need; proper support to the disabled people and they are also used in many houses to provide companionships to those who are alone and have no one to look after. Not only this, but these social robots are also used widely in educational sectors and to enhance the customer service experiences in retail stores or in hospitals (Belpaeme et al., 2018).

Unlike traditional robots, these social robots are intelligent, and their development involves the integration of Artificial Intelligence (AI) and Natural Language Processing (NLP) in order to attain effective communication ability and to adapt to their environment. These new generations of Social Robots are far ahead from the older generation as they have the capability to recognize facial expressions, engage people in conversation with them, make eye contact with humans and even respond back with emotional cues (Fong, Nourbakhsh, & Dautenhahn, 2003). The conventional idea of making the social robot as the CEO of an organisation required a multifaceted array of human traits and abilities that included human characteristics like

emotional intelligence, critical thinking ability, strategic decision making capability and strong interpersonal skills (Dautenhahn, 2007). Therefore, it has become important to study where their social robots can attain these characteristics of humans and effectively manage the intricate dynamics of corporate environments.

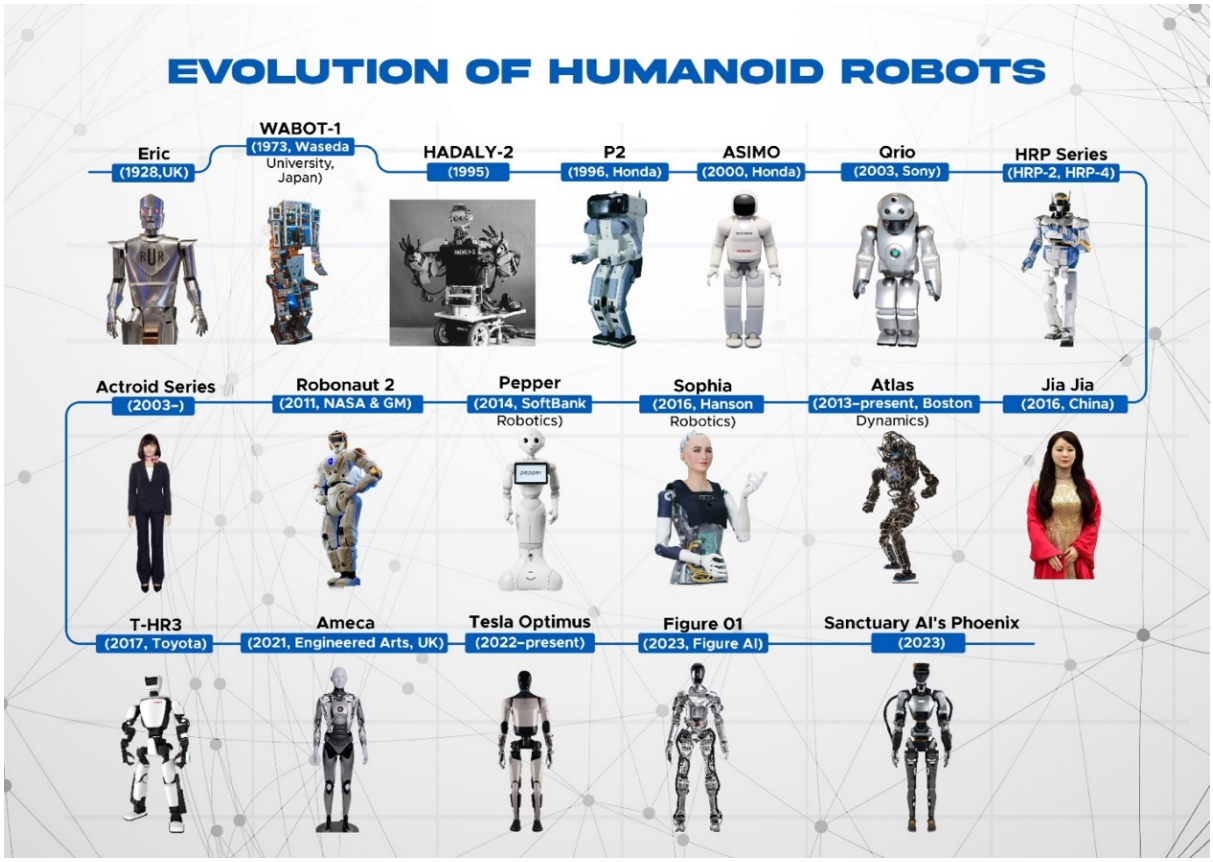
The purpose of this study is to investigate the capabilities of social robots in transforming corporate leadership and management. By exploring their capabilities to embody the role of a Chief Executive Office, we intend to shed light on the possibilities, challenges, and possible outcomes of implementing this innovative concept into the corporate world. This research holds significant implications for both organizational management and as well in the field of robotics, thus providing valuable insights into the convergence of technology and leadership. Before we begin our study about the capabilities of social robots, it is essential to know in detail about the social robots, the characteristics of social robots, the drawbacks of earlier social robots and the urge to improvise the social robots and the possibilities to build a social robot that can behave and look like humans and will also possess the same intelligence that humans would have.

4.2 Research Question Two: Can replacing human CEOs with social robots lead to the success of the company or will it lead to failure?

Social robots have evolved so much from traditional robots over the time. The concept of creating social robots that have the capability to interact with humans socially originated from the early research on robotics and AI. The major distinction of social robots is their ability to not only perform all the tasks effectively but also to engage with the humans with meaningful interactions and the potential of adapting the human qualities like adjusting their behaviour based on emotions, signals, and social norms (Dautenhahn, 2007). This characteristic of social

robots makes them stand out from the prior robots, which were designed mainly as functional machines to carry out repetitive manual tasks.

Let us study the evolution of social robots and robotics in detail.



Let us study the evolution of social robot, analysing their key milestones from early mechanical models to modern AI-powered humanoids:

The Phase 1 is the early stage of humanoid robot developed was primarily focused on the basic physical movement and mechanical structure. The robots created in the early years, were not equipped with intelligence, making them incapable of social interactions and they also lacked the ability to perform the tasks autonomously. These robots were built just to help humans with repetitive task, but they were not mobile, lacked Artificial Intelligence, advanced sensors, and also lacked awareness about their surroundings.

Some of the examples of these robots are-

- According to an online article published on the official webpage of Adelaide Robotics and Computer Science Academy, the **robot Eric** which was developed in the year 1928 was one of the first British humanoid robots that could move its arms and give speeches via remote control.
- The **robot WABOT-1**, developed in the year 1973 in Japan is the world's first full-scale humanoid robot with limb control, and with vision speech processing technology (Humanoid Robotics Institute, 2025).

These stage of social robot shows that social robots are progressing.

4.3 Research Question Three: Despite lacking human experience and emotional intelligence, are social robots capable of leading organizations and making critical decisions?

The Phase 2 development stage of social robots is the academic and prototype phase is the period of evolution of social robots from a mechanical model to intelligent interactive robots. Between the era from 1990s to early 2000s, the researchers and scientist were working towards developing the robots that can be socially interactive, equipped with sensors and should be able to work autonomously.

One such examples of these type of robot is Hadaly-2, which was developed in the year 1993 at the University of Waseda. The primary focus on the creation of Hadaly- 2 robot was on Human-Robot Interaction, and it was equipped with various sensors for vision, sound, and mobility (Hashimoto et al., 2004). This robot was built to sense the human presence, respond back to the humans, leading to the significant development in the field of creating social interactive robots.

Another example of this phase of robot is **Honda P2,** which was developed in the year 1996. The peculiarity about this robot was its ability to sense the objects and walk freely even in complex environments (Tugui, 2023).

Phase 3 is the rise of humanoid robotics. Let us study in detail the rise of modern humanoid robots that has enhanced features better mobility, perception, and better ability to interact socially.

According to Ultimate Pop Culture Wiki, the robot **ASIMO** which was developed in the year 2000 by Honda is considered as one of the most advanced bipedal robots with gesture recognition and autonomous navigation (Wired, 2002). The other few examples of the developed social robots are QRIO developed in the year 2003 by Sony that is designed for home entertainment features like speech, dance, and face recognition abilities (Nagasaka, 2019). Then came the development of **The HRP Series,** which was developed between 2000s and 2010s by Japan's humanoid robotics platform; among which the **HRP-4** series could balance, walk, and carry out complex task (Kajita, 2019). Another is example is of **The Actroid Series** which was developed in 2003 is a hyper realistic humanoid robot with life-like facial expressions, developed by Kokoro and ATR (Fuoco, 2022).

Phase 4 is the development of Modern Assistive And AI Robotics. In 2011, **Robonaut 2** was developed by NASA which is a robot designed for space missions with the ability of assisting astronauts with manual tasks (Diftler et al., 2011). Another robot named **Pepper** developed in the year 2014 by SoftBank was designed for customer interaction and social environments that reads emotions and engages in conversation (SoftBank Robotics, 2025). One of the significant developments of intelligent social robots so far is robot **Sophia**, developed in the year 2016 by Hanson Robotics which is globally recognized for human-like facial expressions and public

speaking capabilities (Retto, 2017). Few other examples of intelligent robots are Atlas, developed in the year 2016 by Boston Dynamics, which has the capability of parkour, running, and dynamic balance (Feng et al., 2014), and the robot **Jia Jia** developed in 2016 is a realistic humanoid designed for interaction with humans through AI-based dialogue and facial movements (Futurism). The robot **T-HR3** developed in the year 2017 is a Toyota's advanced humanoid that mirrors human movements for medical or remote tasks (Ackerman & Guizzo, 2017). Some other examples are **Ameca robot,** developed in 2021 by Engineered Arts that is known for highly realistic facial expressions and social presence (Sowmiya et al., 2022); **Tesla Optimus** developed in 2022 by Elon Musk is a humanoid that supports labours in manufacturing tasks (Malik et al. (2023). Another robot, the Sanctuary AI's **Phoenix** developed in the year 2023 is one the highly advanced robot intended for human-equivalent work, emphasizing dexterity and AI cognition (Sanctuary AI, 2023).

From mechanical motion to cognitive interaction, these robots show a clear progression toward becoming completely autonomous, emotionally intelligent, and human-assistive devices.

This progression indicates that while robots have achieved remarkable technological milestones, their effectiveness as CEOs is still speculative. Failures in consumer markets suggest uncertainty.

4.4 Research Question 4: Do social robots have the capacity to handle moral complexity and ethical dilemmas in leadership roles?

The Czech author Capek originally used the term "robot" in his 1920 play Rossum's Universal Robots. As per the play the meaning of the word "robot" is "forced labor". The word grew popular after the play without even realising that this robot which is just a concept will soon

be turned into reality and this concept started to turn practical in the mid of 20th century where the robotic systems started its era (Capek, 1920).

Initial Theories

Earlier the studies on human-robot interaction were purely theoretical such as Turing Test theory (Turing, 1950). Though his research was not directly intended about robots, it motivated other researchers to conduct further investigations on AI and its potential for human-like interaction.

Between the years 1950 and 1960, some other innovators like George Devol and Joseph Engelberger who are considered as the founders of industrial robotics began building machines that executed repetitive tasks on production lines. Despite being ground-breaking, these robots were not created for social interactions (Gasparetto &Scalera, 2019).

The Emergence Of Social Robots

The year 1980s saw a significant progress in the robotics field with the research of Sherry Turkle, who was a professor at MIT. When we study about the inventions of social robots, Sherry Turkle is another name that will be remembered in history forever. She did her research on human-computer interaction. In her book "The Second Self," (Turkle, 2011) explored how computers and machines could be seen as social entities capable of influencing behaviour. This created the theoretical groundwork for the notion that robots may one day someday function in a social capacity.

The biggest achievement occurred with the development of Kismet Robot in the year 1997 by an American AI Scientist named Cynthia Breazeal at MIT. The robot Kismet was different from machines or computers because this was the first kind of social robot developed that could

show emotions through facial expressions, make sound and gestures. Kismet could very well recognize the user sounds and was able to interact or respond back to them (Breazeal, 2003).
In this research paper, we will be studying more about social robots and its capabilities in detail.

Development Of The Concept Of Evaluating Machine Intelligence And Its Relation To Intelligent Social Robots:

In this research work, we will be studying the idea of assessing machine intelligence and its connection to intelligent social robots. Intelligent social robot development is closely related to the development of the idea of assessing machine intelligence. The criteria used to evaluate machine intelligence have expanded over time providing a more thorough understanding of what it means for a machine to exhibit human-like intelligence.
Let us study some of the tests that have been carried out by several researchers to study machines' ability to demonstrate intelligent behavior (Warwick, 2011).

1. Alan Turning's Turing Test

The Turing Test which was created by a British Mathematician and Computer Scientist (Turing, 1950), states that "a machine's capacity to exhibit intelligent behaviour that was comparable to or indistinguishable from that of a human was to be evaluated using this test. Its main goal was to determine whether a machine could have a conversation that would be hard to distinguish from that of a human." But the Turing Test had certain limitations. Over time it became evident that the Turing Test was not without flaws. The ability of a machine to generate rational responses based on reasoning was its focus. It nevertheless ignored other facets of human intelligence including social interaction, emotion recognition and expression and

environmental awareness and response. Despite being essential parts of human intelligence, the Turing Test did not adequately account for these factors. The emergence of intelligent social robots was the consequence of a new method for creating intelligent machines that was made possible by this enlarged understanding of human intelligence. These robots are designed not only to exhibit logical intelligence but also to interact with their environment and to participate in meaningful social interactions with their users. These social robots have the capability to identify and react to emotions. The primary extension of creating such social robots were to make them look like humans and grasp a wide range of human emotions and characteristics to help people in need and to reduce the work pressures on humans, increase the efficiency of any organization and to complete larger tasks in a shorter timespan with higher levels of accuracy.

2. Recognition Of Emotional And Social Intelligence

In the 1980s and 1990s, researchers realised that the role that social and emotional intelligence play an important part in human cognition. The ability to navigate one's surroundings, comprehend social interactions and identify and react to emotions in both oneself and others were all considered to be components of human intelligence in addition to logical reasoning (Picard, 1997). Priorities changed as a result of the realization that the Turing Test was unable to evaluate these crucial facets of human intelligence. New developments and technologies in the field of intelligent social robots were made possible by this shift. In order to behave more like humans these robots are made to not only exhibit logical intelligence but also to interact with the outside world form social bonds and recognize and react to emotions. The development of intelligent social robots that can more closely resemble human behaviours and interactions was made possible by the Turing Tests limitations which allowed for a change from a narrow focus on logical intelligence to a more comprehensive consideration of social and emotional intelligence.

3. Introduction Of Artificial Intelligence In Robotics

- With improved computing power and AI technology, social robots began to adopt more sophisticated AI features, allowing them to not only react to human emotions-they were beginning to predict behaviours, learn from experiences and have meaningful conversations.
- Earlier robots were just machines with no capability of thinking. They used to work on the instructions of humans. But after the introduction of artificial intelligence, these social robots started turning intelligent. These robots now don't possess intelligence, but they have ability to think autonomously; can take decisions on their own (Dautenhahn, 2007). This is truly an achievement and revolution in the robotics industry. Let us study in detail the beginnings of Artificial Intelligence and its integration into social robots.

4. Moving Towards Human-Shaped Robots

In the first decade of the 21st century robots were becoming more human-like. The development of the humanoid robots, to illustrate, is indicative of the growing anticipation of engineers to create robots that could manage activities in human spaces. The creation of the humanoid robot when Honda debuted **ASIMO** in the year 2000, who could walk, could use gestures, and could talk and recognize voices made a breakthrough in the robotics era (Wired, 2002).

Soon the robotics field has seen significant success with the release of companion social robots which provide support to the needy people. At the same time, there were surges in interest for social robots to provide companionship and assist in other sectors such as health care, education, and personal aid. In this fast progressive world, loneliness is a growing concern among the people. As the world is developing, the people are getting disconnected from each other. Many don’t get time to take care of elders, people with special needs or sometimes they

don’t even get the time to sit and talk to their near and dear ones. This has led to the development of feelings of loneliness among the people, which alternatively led to the need of developing a social robot who can be with humans in times of their loneliness, who can sit and listen to people and respond back to them with the same emotions. These social robots will not only provide emotional support but will also help to take care of people in terms of need. Development of therapy social robots like **Paro** in 2003 is an example of a companion robot. Paro robot has been developed for use in hospitals and extended care facilities (Calo et al., 2011).

5. Early Foundations of Machine Intelligence – Era of Intelligent Robots

AI integration became more prominent in the 2010s. The robots began to exhibit programmed behaviours, as well as AI-powered learning abilities. This gave them the ability to adapt to their environment and use a more meaningful interactive way with the humans.

Another pioneer who has played an important role in the development of social robots is David Hanson. Created by Hanson Robotics in the year 2016, Sophia the Robot became one of the most famous social robots of the 21st century. With the help of machine learning, facial recognition and natural language processing, Sophia can communicate with people and express emotions. She became a worldwide sensation for her ability to express human-like facial expressions and have in-depth conversations. The advanced AI powering Sophia was developed with the idea that she would learn from every interaction and quickly improve in her social abilities. Sophia is one of the most sophisticated AI powered social robots in the world. He created the social robot that has facial features similar to humans. Apart from this, Sophia had the ability to interact with the humans in a socially engaging way making her appear exactly like a human.

Pepper, the Robot, launched by (SoftBank Robotics, 2025), is another famous one. Pepper, a humanlike robot designed to communicate with individuals in social settings, was commonly used for customer service and companionship for the elderly. Pepper communicates with the human in a more natural and human way with the help of AI technology to understand and respond to humans. There are a number of distinguished scientists and engineers who have contributed to the field of robotics to develop social robots. These trailblazers have been expanding the range of what robots can do in social situations.

Cynthia Breazeal is frequently described as a pioneer in the field of social robotics. The social robot Kismet was developed (Breazel, 1990s), while Breazeal was still a professor at MIT. **Kismet** was one of the first social robots that showed emotional responses and interacted with people. Her research in human-robot interaction has been instrumental in driving the science and popular culture of robots and artificial intelligence.

Actroid-SIT is a human-like social robot developed by Hiroshi Ishiguro, a Japanese Roboticist and Engineer at a Japanese firm that did not get much appreciation (Fuoco, 2022). But her cousin robot, **Geminoid F**, which was developed in 2007, got famous when it was created. Geminoid F is a teleoperated robot while Actroid-SIT works autonomously. Actroid-SIT is a progressive humanoid that could make eye contact while talking and could make gestures while interacting. Researchers at Nara Institute of Science and Technology are working towards further development of Actroid by studying how Actroid reacts when individuals or groups or people talk to her. Based on this research, they are working towards the improvisation of the two features of humanoid, that is the interpretability and motion parameterization, which will indeed help in the improvement of human-robot interactions (Fuoco, 2022).

Interruptible features will lead the social robot to handle all the interruptions that occur in interactions with humans gracefully and wisely. During their study, researchers observed that

about 26 percent of the time, the **Actroid-SIT** was interrupted while interacting with humans for instance, sometimes the interviewers switched the topic or sometimes they handed over the mic to the next person. With the Interruptibility feature, the robot will be immediately able to end the current conversation gracefully and switch to another topic. This helped people to have deeper conversations with the robot when they noticed that it was uninterrupted. The second feature is parameterization. With this feature, the humanoid will be able to show 18 gestures like pointing towards something, waving to people and more. These gestures helped the social robot to showcase different actions as per the situations, which would make people feel that these social robots are actually attentive to human queries (Fuoco, 2022). Though talking to **Actroid** was not like having conversation with humans, still making these improvements in gestures made a significant impact and changed the way humans perceive robots. Soon people started to find these robots fascinating, they were not only attentive and friendly, but they were also a source of information, and the best part was their ability to show expressions when they speak. Rodney Brooks, an Australian-American scientist in the year 1991, cofounded the company named **iRobot.** The company would produce robots that are used in the military sectors, home and several other industries. The creation of **Roomba Robot** (Brooks, 2002) made a significant impact in the robotics industry. This robot was one step ahead of the mechanical robots, this robot had the capability to vacuum the floor. Another humanoid named **PackBot** Robot (Brooks, 2002) was also a boon to the robotics industry. This robot was used in the military sectors by the USA soldiers in Iraq and Afghanistan to dispose of explosives. Rodney's research had led to the development of robots that can interact socially with humans.

When we talk about the pioneers in the field of robotics, **Maja Matraric** is another renowned name (Wessling, 2024). She is a renowned Computer Scientist and Roboticist at the USC Viterbi School of Engineering and also the Founding Director of the USC Robotics and Autonomous Systems Center. She is known for her insignificant contributions in the field of

socially assistive robotics, where she develops that can interact with humans and helps people who are in need. Her research has been applied in various domains, including rehabilitation, education and eldercare (Wessling, 2024).

She has over 30 years' experience in the field of robotics and is a pioneer in the field of socially assistive robotics. Winner of the "ACM Athena Lecturer Award" for her great contributions to the community, she was the one to lay the foundation of human-robot interaction and demonstrate behaviour-based systems (BBS). Her research was focussed on helping children with special needs by making a social robot that can be programmed in a way to help these children communicate better. Her study was also focused on creating socially assistive robots that will help patients with Alzheimer's or stroke patients to recover, and help these patients by helping them, and motivating or entertaining them to stay physically more active (Wessling, 2024).

Advancement in Social Robots: Ability Of Social Robots To Think Critically And Work Autonomously

For years, machines and robots have served humans based on instructions. These robots earlier did not possess the ability to think critically, which means they were just working on the pre-recorded instructions of the humans.

A social robot can get intelligence by integrating it with artificial intelligence using Machine Learning (ML) and Natural Language Processing (NLP). How a social robot can turn autonomous is not a question to be asked with wonder anymore. With the help of ML and NLP, the machine or social robot is continuously learning and updating itself with respect to the environment (Dautenhahn, 2007). However, their capacity for autonomy and critical thinking remains bounded by algorithmic limitations and the parameters set by human programmers.

Empirical studies in AI-driven robotics show that while these systems can emulate decision-making under structured conditions, they often lack the nuanced judgment required for unstructured, ambiguous human situations (Bryson, 2018). For example, social robots like Pepper and Sophia can mimic certain human behaviours and offer emotional responses, but these are based on programmed templates rather than genuine understanding.

Let us study in detail below on what basis the behaviour and operations of humans and social robots differ.

Though it's easy to differentiate between humans and social robots based on their appearance, to make a social robot look like and behave like human beings, we should carefully consider and understand what makes them different from us and how we can relate to them.

When we talk about Artificial Intelligence (AI) in social robots, we should not forget about "transhumanism" (Bostrom, 2013). Transhumanism is a philosophical and intellectual movement that uses technology like genetic engineering, nano technology, and artificial intelligence to enhance the human intellectual, physical and psychological abilities (Ostberg, 2025). These technologies can be used to reduce aging in humans and to increase lifespan. These technologies will also be used to enhance human cognitive abilities and sensory capabilities. According to this movement, humans with enhanced abilities will develop into the "posthuman," a species that is superior to humans (Ostberg, 2025). This can state that humans and social robots can be the same soon in the future, but we should do deep analysis of what is possible in the future. Transhumanist perspectives (Ostberg, 2025) suggest a convergence between human and machine capabilities, although these assertions are still theoretical. There is no scientific evidence to support the idea that humans and robots will eventually become identical in behaviour and thought, and this idea needs to be viewed critically.

The machine autonomy varies in different levels. A social robot can become more autonomous when it will begin to understand, answer and respond back as per the surroundings and will get the ability to work independently without any human guidance.

4.5 Research Question 5: How efficient can a social robot be in decision making as compared with human CEOs?

Social robots are advanced AI driven machines that have the potential to bring revolution in the corporate leadership by bringing solutions to the several problems that are being faced by the human CEOs in their workplace. Even though these social robots lack emotional intelligence and personal experiences, they have several other advantages that are much more needed for an ideal CEO such as consistency in work, data driven decision making, not to be biased with employees, and the capability to analyse and process huge amounts of information in real time (Davenport & Kirby, 2016).

In this chapter, we will discuss if social robots can help us in overcoming the challenges that a senior most leader in a company that is the CEO of an organisation can face in his daily operations and we will also study if these problems can be solved and if these social robots can help in increasing the productivity, efficiency of an organisation and also work towards the wellbeing of the employee. On the other hand, we will also understand that despite the potential of AI-powered social robots in leadership, the leap from theoretical capability to practical leadership implementation is not trivial. Leadership requires more than data processing - it demands emotional intelligence, adaptability, and the ability to build trust.

Developing Socially Responsive Robot CEOs: Technical and Ethical Considerations

With the continuous advancement in Artificial Intelligence, the possibility of social robots becoming more intelligent and human-like increases. The implementation of natural language processing (NLP), artificial intelligence, deep learning, and more complex sensory systems will help the social robots to understand things better and learn from their surroundings, and to respond well to the human queries just as the ways humans do. The purpose of making social robots intelligent is enabled to complete get integrated with the human surroundings and to behave more like humans by giving assistance to the one in need, by providing guidance as a leader and proper assistance as a good customer service.

Historical and philosophical insight, such as Greek mythology (eg, Tellos) and Gyanodaya, describe long -standing human interest in artificial creatures, from thinkers (eg, Diderot). However, these preceding modern corporates serve more as metaphors than blueprints for executive leadership in the world (Mayor, 2023). Theoretical discussions must be grounded in measurable benchmarks. For instance, passing the Turing Test or succeeding in affective computing tasks (Picard, 1997) offers limited insight into leadership potential unless supplemented by real-world performance metrics. Reinforcement learning and human-robot interaction studies highlight gradual progress toward autonomy. However, adaptation remains reactive, not proactive - social robots do not yet anticipate human emotional states or navigate ethical dilemmas unaided. The development of these social robots from simple machines to powerful AI-powered humanoids shows a transformative step in the evolution of technology and society. This is not a contribution of a single human, but several scientists, researchers and engineers have contributed collectively towards the construction of the social robots that do not look like humans physically but also possess the critical thinking skills of humans.

As this field of robotics and artificial intelligence continues to grow, the development of social robots will will also increase, bringing a revolution in the way these machines that have now evolved as social robots will interact with the humans.

4.6 Research Question 6: How much can social robots adapt to the characteristics of humans such as critical decision-making, leadership styles and what are the possible consequences?

Humans have always been fascinated by automatic processes, so the idea of robots is by no means a modern invention. The enormous bronze automaton which was constructed circa 400 BC is among the most remarkable examples from the past. One instance from Homeric mythology is Talos the enormous automaton from Greek mythology. He is the character most strongly linked to Crete and the Greek tradition in which a robot is a character. In the myth Zeus or the other gods asked Hephaestus the Greek god of metalworking and art to create the enormous bronze automaton known as Talos. Talos was created to serve as a guard for Crete and was tasked with defending it against threats and intruders like pirates. Talos had many abilities including the ability to patrol the Crete coast, throw stones at approaching ships and even heat his bronze body to make the attackers frightened and burn. One of the first robot automatons or fictionally evil characters in Greek mythology is actually Talos. It demonstrates the ancient desire to build mechanical beings that were intelligent or somewhat autonomous (Mayor, 2023). It was then the French Philosopher named Denis Diderot who in the 18th century tried to determine whether if it was possible to model intelligence. He was curious about the possibility of simulating or reproducing human-like intelligence. In the 18th century debates and investigations into the viability of integrating artificial intelligence began. It's crucial to remember that although Diderot and others may have established the philosophical

foundation for artificial intelligence in the 18th century, the actual development of AI as we know it today took place in the 20th century.

4.7 Research Question 7: What potential effects might a social robot CEO have on organizational performance and workplace culture?

There are several challenges that a human CEO faces daily in their lives and one among the problems that it faces is navigating between the historical context and culture of a company. It is important that an ideal CEO embraces the company's traditional legacy, respects its values, and rules and regulations. At the same time, they should know how to balance a company by focusing on innovative operations and also preserving its core values.

Social robots undoubtedly have the potential to grasp things faster than a human. A social robot can learn multiple things in one go as compared to humans. For a social robot to learn and understand the company's culture, its evolution and core principles will not take much time. By integrating this data, a social robot can easily ensure that their leadership style compliments the company's principles, history and culture while bringing any innovation in an organization. Social robots can work with consistency without being influenced by any personal issues. They will not get affected by any internal organizational politics that usually happen in any organisation and will be able to focus on implementing decisions that can complement the company's history, helping in the growth of the company on the basis of data and performance metrics.

Human CEOs must balance innovation with the preservation of institutional legacy. AI-powered robots can analyse historical documents and employee feedback to model organizational culture (Gunkel, 2012). However, empirical research shows that such systems

still struggle to grasp tacit knowledge and informal social dynamics that define organizational identity.

Balancing Decision-Making With Employee Impact

Human executives are often stuck between the decisions that maximize company performance and those that ensure employees well-being. These decisions are usually related to the issues about layoffs, performance standards or how resources are being allocated to different departments. How social robots can overcome these issues can be challenging but not impossible. Machines can process large volumes of data to predict the effects of various decisions on the health of workers. In this way, social robots can make choices based on a balanced consideration of past performance and the workload distribution, and the employees' feedback, aiming to strike a compromise between meeting corporate goals and ensuring employee satisfaction.

Social robots help the employees to ensure that performance metrics are transparent, achievable and match employee's capabilities. They can also take proactive measures by analysing when employees start to slow down and try to overcome this situation by assigning more resources to finish the same task so that the employees don't get overburdened. With their ability to access real-time information, social robots can make decisions that positively influence the growth of the organization without negatively impacting employees but rather focusing on minimizing damage and providing better results. Social robots can create a more collaborative and effective work environment, demonstrating through quantitative data how meeting the organization's needs balances with the health and happiness of employees. Social robots can evaluate datasets to predict how decisions affect workforce health and morale. However, they lack ethical reasoning and empathy, which are crucial when making decisions involving layoffs

or restructuring. Real-world applications like IBM's Watson in HR analytics demonstrate useful support roles, not autonomous decision-making in high-stakes environments (Chamorro-Premuzic et al., 2019).

Creating Balance Between Personal And Professional Life

Maintaining a balance between the work life and personal life can be a struggle for human CEO's and their employees. Human CEOs tend to have too many priorities and be pulled in too many directions causing a lack of balance between the work and personal life that can result in burnout and disengagement throughout an organization. Whereas a Social Robot can automate work assignments, schedules, by using latest advanced scheduling software, which can most evenly distribute the workload among the employees based on the employee's performance and assign jobs with more flexibility in timing.

Health Monitoring and Interventions

The increase in demands of work can result in notable physical and mental health issues for both the CEO and workers. Most human CEOs fail to address this issue largely due to ignorance, inadequate legislation, or personal pressures to deliver exceptional results.

Data analytics and performance metrics can all be used by social robots to assess employees' stress levels. They will be able to recognize workers who may be having difficulties and provide prompt support or recommendations for restructuring their workload. By leveraging health data social robots can assist wellness initiatives by offering employees individualized wellness plans, mental health resources and stress-reduction strategies (Yin et al., 2024). By identifying and resolving employee stress early on, social robots can lessen the negative impact of workload on workers' health and promote a more positive work environment. When an

organization genuinely cares about its employees' health and well-being they are more likely to stay with it for a longer period of time which lowers turnover and boosts morale.

AI platforms can monitor stress indicators using wearable devices and performance metrics. However, ethical concerns arise regarding data privacy and consent. Also, robots' interventions, unless mediated by humans, may be perceived as intrusive rather than supportive.

Promoting Innovation and Strategic Development

For the human CEO, inspiring innovation, and strategic growth is a constant struggle. However, in today's fast-paced business world, CEOs are required to make brave and bold decisions in very short span, and this can be stifled by fear of risk or conventional thinking (Cui et al., 2021). Social robots have the capability of sifting through large amounts of market data, industry developments and customer feedback to introduce new, forward learning strategies that are specific to the business. They can test hypotheses and model different scenarios to identify which technique is likely to bring growth to the company.

Social Robot CEOs can continuously analyse and adjust their strategies that help organizations grow and prosper in changing markets. Social robots certainly have the power to revamp leadership if they go beyond just human capabilities and solve the issues they face in the same field.

4.8 Research Question 8: How likely are workers to accept a machine as their boss and what factors affect their willingness to accept it?

A CEO's core responsibility is to foster strong relationships with employees, which can be challenging for human CEO's who could be less adept at managing emotional intelligence or may get biased towards its employee due to personal reasons. A social robot CEO could ensure that all decisions made regarding promotions, salary increases, or resolving any conflicts

among the organizations would be based solely on objective performance metrics, thus promoting fairness and minimizing favouritism (Köchling & Wehner, 2021). Social robots can implement real-time feedback systems that will allow the employees to put forward their problems and concerns or suggest improvements, thereby keeping the management in touch with the requirements of the employees (Sadeghi, 2024).

By making data-driven decisions and being consistently impartial, social robot CEOs can foster a culture of confidence and transparency where employees can feel their opinions are being heard and their contributions are being recognized. This ability of a social robot CEO of being neutral and transparent towards its employees could further strengthen the employee relations with the CEO and management by reducing misunderstandings and providing a better working environment for the employees in an organization.

By research (Köchling & Wehner, 2021), it has highlighted how AI equipment can exceed workplace inequalities if not designed transparently. While social robots can be programmed to avoid bias, relevant understanding and lack of sympathy may obstruct real confidence (saree, 2024).

4.9 Research Question 9: In a corporate world, is it possible for a social robot to gain the trust of all workers and make wise decisions?

According to change management literature (Kotter & Schlesinger, 2008), employees often oppose the new leadership models. Although studies indicate that human characteristics, such as faith, sympathy, and relationships are important for effective adoption, may reduce transparency and data-operated communication resistance. Due to their lack of mutual skills, robot leaders cannot be accepted in a long time.

4.10 Research Question 10: Despite knowing that previous social robots have failed in the consumer market, can we create one that can overcome these obstacles and succeed in a Chief Executive Role?

With a number of advantages over traditional human leadership the concept of social robots in CEO roles has a lot of promise. Social robots can provide an organization with objectivity, efficiency, emotional insight, and long-term stability according to well-established theories like the Strategic Leadership Theory (Mintzberg, 1994), Emotional Intelligence Theory (Goleman, 1998) and the Rational Decision-Making Model (Simon, 1955). They are positioned as powerful leaders who can transform contemporary businesses thanks to their capacity to manage operations, analyse vast amounts of data, improve employee welfare, and stimulate creativity. The idea of a social robot CEO may soon come to pass due to continuous developments in AI and robotics signalling the start of a new era in corporate leadership.

Social robotics and artificial intelligence (AI) have drawn a lot of attention to the concept of placing robots in executive positions such as Chief Executive Officer (CEO). This theorys proponents contend that affective computing will enable AI-powered social robots to make decisions more reliably impartially and effectively while maintaining emotional insight. However, it is difficult to realize this potential due to organizational legal and technological issues that are frequently disregarded in overly optimistic projections.

This section evaluates the evolving capabilities of AI in social robots while addressing critical counterarguments.

4.11 Research Question 11: How can advancements in Artificial Intelligence (AI) and Machine Learning (ML) help in the development of a social robot that will be intelligent like humans and will also have other characteristics like humans which will make them capable of leading a company?

Machine intelligence measurement has changed greatly over the last century. This development is intricately dependent on the development of intelligent social robots as the advancements in artificial intelligence (AI) has provided machines that exhibit behaviours that resemble human intelligence characteristics that include the ability to learn from the surrounding environment, the ability to use problem solving skills, display emotional recognitions, and social behaviours. The shift from theoretical machine intelligence concepts to real-world applications in social robotics incorporate the elements of cognitive science, computational theory, and engineering. Within this branch of the research work, we will explore the evolution of the assessments of machine intelligence and how this relates to developing intelligent social robots.

The claim that passing the Turing Test necessarily denoted machine intelligence was challenged in the 1980s by philosopher John Searle's Chinese Room thought experiment. Searle suggested that a machine could simulate language understanding or engage in a conversation, but it does not equally comprehend the topic. This raised questions about the appropriateness of the Turing Test as the singular measure of intelligence and initiated a rich debate on the implications of syntactic versus semantic understanding in terms of machine intelligence (Searle, 1980).

Although the Chinese Room argument questioned the validity of machine intelligence, it was essential for guiding the field of AI to more qualified investigations of machine understanding and interaction, especially in social contexts. Social robots would have to do more than provide an intelligent response; they would also have to appropriately interpret emotional and social signals.

4.12 Research Question 12: Who will take the responsibility for a social robot CEOs choices and actions in the event of failure or moral issues?

The results imply that there is still debate and uncertainty surrounding who is responsible for the decisions and actions of a social robot CEO. The machine itself cannot be held responsible since existing organizational and legal structures do not recognize robots as separate legal persons. Instead, a number of stakeholders such as the company's board of directors the AI system developers and the corporate executives in charge of implementing the systems usually share accountability.

The majority of participants and literature sources emphasized that since the organization and its governing bodies are the ones who approve the use of robot leadership systems, they would be ultimately responsible. However, in the event of programming errors algorithmic bias or technical failure the software engineers and technology suppliers who developed and maintained the system could also be held liable. This allocation of accountability has problems particularly in cases of moral or ethical dilemmas where culpability is harder to assign.

The findings also highlight the pressing need for new legal and ethical frameworks that clarify the accountability chain. Robot CEOs could lead to legal issues undermine stakeholder trust and expose companies to financial and reputational risks if these precautions are not taken.

4.13 Research Question 13: To maintain accountability, transparency and fairness while regulating social robots in executive roles, what legal frameworks and governance models are required?

To maintain accountability, transparency and fairness while regulating social robots in executive roles, there are certain egal frameworks and governance models that are required. The idea of appointing social robots as Chief Executive Officers (CEOs) brings up a range of ethical, legal, and social issues that go beyond just how feasible the technology is. This study quickly addresses public skepticism, cultural discomfort, and legal uncertainty, but these topics need more in-depth analysis. By looking at interdisciplinary research and notable examples like Sophia's disputed citizenship status (Sini, 2017), this section offers a detailed look at the various implications of having robots in leadership roles.

Ethical Implications

Existing research emphasizes the ethical challenge that occur when social robot takes on the leadership role, particularly with respect to ethical judgment and accountability. For instance, Mittelstadt et al. (2020) in her study states that AI-powered decision-making lacks the ethical awareness and empathy necessary in high-stakes business environments.

Similarly, Cath et al. (2021) suggest that continued issue of algorithmic bias in AI technology, noting that discriminative data sets can perpetuate discrimination in hiring and promotion and pose serious questions about fairness and justice in AI-driven workplaces.

Legal Implication

According to a review by (Gless & Decker, 2021), current legal frameworks do not recognize autonomous AI agents as legal entities, thus they cannot be held legally accountable in the traditional manner. To prevent legal gaps, scholars such as (Calo, 2015) and (Gerdes & Dignum, 2022) supports proactive regulatory frameworks that holds developers and corporate organizations accountable for the mistakes of social robots.

Social Implications

The impact of AI leadership on society specifically on employment and organizational identity is a topic that requires thorough research. Research by West et al. (2021) demonstrate that implementing AI to replace human leaders can affect employee morale and raise concerns about job loss. This change may result in a decrease in management trust and social alienation. Robotic leadership is also widely accepted in different cultures.

4.14 Research Question 14: Would traditional industries disagree with the widespread deployment of robot CEOs, or could it deepen social inequality?

The study found that traditional sectors are more likely to be against the widespread use of robot CEOs due to concerns about organizational culture employee trust and stakeholder acceptance. Since loyalty and stability in many well-established industries rely heavily on interpersonal relationships tacit knowledge and emotional intelligence human-centered leadership is crucial. Replacing human CEOs in these organizations with robot leaders is likely to raise suspicions particularly in cases where leadership is closely associated with reputation legacy and interpersonal trust.

But there are broader societal implications to the use of robot CEOs particularly when it comes to inequality. While technologically advanced and resource-rich businesses may experience cost savings and increased efficiency smaller companies and industries with less access to these technologies may fall behind thereby widening the digital divide. Furthermore, if leadership positions-which are generally seen as aspirational career goals—become more automated opportunities for upward mobility may decline exacerbating already-existing labor market inequalities.

Consequently, the results indicate that traditional industries will likely be against the adoption of robot CEOs in the near future despite their technological potential. In addition, the uneven use of these technologies could worsen social and economic inequality rather than advance inclusiveness in the absence of moral safeguards and legal frameworks.

4.15 Research Question 15: How can social robots handle high-stakes decision-making, allocation of resources, and planning for strategies, which are typically conducted by human CEOs?

The efficiency and productivity of an organization can be significantly increased by social robots because of their capacity for data processing and multitasking. The ability of a robot to manage multiple tasks concurrently, make fast decisions and work continuously without requiring breaks, or rest is a major benefit of having one as a CEO.

Theory of Bureaucratic Management (Weber, 1922) shows the significance of a well-organized and effective management system with clearly defined roles, procedures and decision-making pathways. The concepts of bureaucratic efficiency are best illustrated by robots in modern environments. They can manage timetables assigned resources supervise organizational procedures and carry out operational duties far more efficiently than a human CEO could

A social robot in the CEO position would be able to assign tasks, monitor performance access and analyze information instantly and make sure the company maintains high productivity. Reduced operational delays increased productivity overall and quicker turnaround times for strategic decisions could all be outcomes of this degree of efficiency.

In contrast, social robots may guarantee the consistent execution of strategic initiatives by concentrating on long-term goals and data-driven objectives (Smith & Kosslyn, 2017). In the role of CEO, a social robot would consistently assess the organization's progress toward

strategic objectives, reject short-term distractions and maintain focus on long-term goals. The robot's ability to remain steady will enable it to guide the company through erratic and turbulent times guaranteeing stability and advancement. For instance, many businesses suffer when the leadership changes because the new CEOs may use different tactics or ideas. A social robot CEO can provide stability and direction during leadership changes; reducing the possibility of misalignment or setbacks by upholding a long-term vision grounded in data and strategic analysis.

4.16 Research Question 16: How might social robots solve traditional leadership problems and what traits, and abilities qualify them for executive leadership?

Even though robots lack human emotions with the help of artificial intelligence (AI) they have begun to possess the ability to recognize, understand and respond to human emotions enabling them to exhibit a form of emotional intelligence (Picard, 1997). It is important for social robots to possess emotional intelligence in order to inspire teams, build strong relationships and resolve conflicts within the organisations.

According to Emotional Intelligence Theory (Goleman, 1995) leaders who possess higher emotional intelligence are better able to control their own emotions and comprehend those of others which leads to better empathy, communication and effective leadership. Even though social robots can not exhibit real emotions, they have the ability to see and learn the human emotions by sensing human emotions and modifying their responses appropriately which is beneficial for improving team morale and corporate culture (Zhou et al., 2018). A social robot playing the CEO role could respond to employees' emotional states with sensitivity by using nonverbal clues, tone shifts and personalized interactions.

With this ability the robot would be able to support harmony, encourage employees and handle their emotional needs which would improve teamwork and reduce stress at work. For example,

social robots like Pepper and Sophia have demonstrated the ability to identify human emotions and respond with appropriate emotional expressions (Chen et al., 2017). To improve the general well-being of the company these robots could serve as a CEO by identifying when staff members are anxious or unhappy and providing support or encouragement.

In Chapter 5, we will be studying how in detail about Artificial Intelligent, Machine Learning, Natural Language Processing and how they can contribute in creating intelligent social robot. We will study if it is possible to make social robot intelligent enough that it can act as a CEO of a Company. We will also consider the social, legal and ethical considerations of creating such a social robot.

CHAPTER 5 DISCUSSION

5.1 Discussion Of Results

Social robot research began in the 1960s as early experiments explored machines capable of social interaction (Dautenhahn, 2007). There were many difficulties in the transition from conventional to social robots. Social robots gained a lot of attention and praise for their unique capacity to communicate and react to human questions when they were first released leaving a lasting impact on the market. But because there were no frequent updates people found them less interesting which reduced their appeal. Soon they began to appear like Alexa or other robotic machines that could only respond to pre-set questions. Numerous social robots had been introduced in the past but due to their low intelligence many of them did not connect with customers (Bartneck et al., 2007). Investigating the vital role that artificial intelligence and machine learning play in the development of social robots is essential to comprehending the history of past social robot failures and their subsequent advancements.

5.1.1 Reasons Behind Failure Of Earlier Social Robots

Social robots have developed considerably over time, yet many early models struggled to achieve permanent success in the consumer market. One of the most notable examples is Sophia, developed by Hanson Robotics in 2016. Sophia attracted global attention to her advanced artificial intelligence, natural interaction capabilities and the ability to recognize and react to human emotions (Retto, 2017). Despite this, her extensive appeal was limited by moral controversies, such as a grant of Saudi citizenship - an unprecedented step that argued about the rights and responsibilities of machines in society (Parvinen and Cocaleburg, 2020). Sophia's case highlights widespread social and legal challenges around social robots.

Another major case is Jibo, which was built by the Cythia Breazeal and launched in 2012 as a family partner robot. Despite increasing funding and more than $ 70 million in significant initial enthusiasm, Jibo failed commercially due to its high cost and limited interactive features. It was closed in 2018 after failing to meet consumer expectations (Michelle, 2018). Such failures reflect the difference between technical promises and consumer value.

Early social robots had certain limitations such as below:

- **Technical And Hardware Limitations:** Although robots such as Sony's Aibo and Honda's ASIMO were impressive, the robots didn't have the computational power or sensory integration for robots to respond to complex social situations in real time. The result was low user engagement and low responsiveness (Dautenhahn, 2007)
- **Language And Communication Issues:** Conversations between humans and robots because of simple natural language and low case scenarios are often unnatural and boring. Eventually, robots like Aibo and Kismet lost their capacity to keep the attention of the user and lost their social value (Lee et al., 2023).
- **Limited Autonomy And Adaptability:** Early social robots lacked learning capabilities, operated only with pre-programmed actions that became boring, repetitive interactions as a result, (Bartneck et al., 2007).
- There were also failures in the market caused by misaligned consumer expectations. Many users wanted robots with which they could build emotional bonds and find companionship. However, because of the limited emotional intelligence and lack of personalization, early social robots were constructed more as a novelty than a tool or companion with real-world utility and value (Turkle, 2017). The cost versus utility was also a factor, given that many people could not justify the expenditure (Fong et al., 2003).
- **Ethical Considerations Made Acceptance Complicated:** Because the role of robots in human society is still up for debate some people are skeptical (Sharkey & Sharkey, 2010).

The opposition to humanoid robots has also been significantly influenced by the Uncanny Valley Effect. People may feel uneasy and alienated when a robot appears human but has slightly different features, (Mori, 2012).

According to the Uncanny Valley Effect (Mori, 2012) appearance was the major factor in the opposition to humanoid robots. Robots that appeared almost human but had minor imperfections made users feel uneasy and alienated. This was particularly true in consumer settings where a trustworthy and relatable relationship is essential (Saygin et al. in 2012. Notwithstanding their novel features many early social robots were not widely embraced due to a combination of technological social and ethical concerns.

The following table lists important early social robot examples their intended uses primary causes of failure and fundamental issues.

Table 1: Robot failure and fundamental issues

Robot Name	Developer / Year	Intended Role	Primary Cause(s) of Failure	Key Issues
Sophia	Hanson Robotics (2016)	Social ambassador, media personality	Overhyped claims, ethical concerns, limited real-world application	Emotional responses were scripted; lacked practical CEO or assistant functions
Jibo	Cynthia Breazeal / MIT (2012)	Family companion	High cost, low user engagement, limited capabilities despite strong design	Discontinued in 2018 after $70M in funding; failed to meet market expectations
Aibo	Sony (1999)	Robotic pet	Limited emotional depth, novelty wear-off	Failed to establish lasting emotional bonds with users
Kismet	MIT Media Lab (1998)	Emotionally interactive research robot	Could only mimic basic emotions; lacked verbal communication	Remained a lab prototype; not commercialized

Keepon	Hideki Kozima (2003)	Autism therapy, child interaction	Very limited functionality; not scalable	Effective in narrow domains but lacked adaptability
Pleo	Ugobe (2007)	Robotic pet dinosaur	Short battery life, high cost, minimal emotional responsiveness	Ugobe shut down in 2009 due to poor sales and high production costs
Nabaztag	Violet (2005)	Internet-connected "smart" rabbit	Connectivity issues, low emotional or conversational depth	Failed as a home companion robot
Karotz	Aldebaran (2010)	Successor to Nabaztag	Poor interactivity and user experience; no innovation over predecessor	Discontinued due to lack of demand
ASIMO	Honda (2000–2018)	Mobile humanoid robot	High cost, lack of emotional intelligence	Technical feat but not socially interactive or market-ready
Paro	AIST, Japan (2003)	Therapeutic seal robot for elderly	Scripted interaction, expensive, limited personalization	Ethical debate over replacing human care with robots
Kuri	Mayfield Robotics (2017)	Home companion robot	Limited real utility, high expectations not met	Discontinued in 2018 after market failed to adopt
Pepper	SoftBank Robotics (2014)	Retail greeter, information assistant	Weak emotion recognition, poor speech interaction, business underperformance	Discontinued in 2021 after poor global sales

5.1.1 Key Reasons for the Limited Adoption of Early Social Robots

A Japanese Roboticist named (Mori,2012), first proposed the idea of the Uncanny Valley Effect. It describes the unnerving feeling people get when they see robots that closely resemble humans but still have subtle unsettling differences (Mori, 2012). This phenomenon was frequently seen in early robots particularly humanoid ones which were neither completely comfortable nor sufficiently human to form organic meaningful relationships. Because of this

discomfort users rejected the robots especially in the consumer market where they were expected to be relatable and engaging (Saygin et al., 2012).

The thesis identifies key reasons for the limited adoption of early social robots:

- Lack of emotional intelligence (Turkle, 2011)
- Uncanny Valley discomfort (Mori, 2012; Saygin et al., 2012)
- Technological limitations in speech recognition and adaptability (Dautenhahn, 2007; Lee et al., 2023)
- High costs with low perceived value (Fong et al., 2003)

While devices like Aibo and Kismet were innovative, they failed to create lasting engagement due to mechanical interactions and poor adaptability. Companion Technology Theory (Turkle, 2017) explains that users seek emotionally responsive and context-aware technology-criteria which the earlier social robots failed to meet.

This study aims to examine noteworthy instances in this field emphasizing their importance and contributions. Examining the difficulties, possibilities, and possible outcomes of using social robots in executive positions is the aim of this study which will concentrate on a few key areas. Assessing the current state of artificial intelligence, machine learning and social robotics to see if robots can mimic human cognitive and affective capacities in order to potentially replace people in leadership roles is known as technological viability.

- **Decision-Making And Leadership Qualities:** While operational decisions can be aided by robots according to some theoretical models, this thesis suggests there is scant evidence that social robots have the strategic insight, ethical reasoning, or multicultural competence necessary for upper-level leadership. Conversations with AI experts indicate that although robots are capable of optimizing basic decision-making tasks, there is

currently no sufficient contextual awareness on the part of the robots for organizational fog or any associated ethical concerns.

- **Interaction Between Humans And Robots:** The human factor still constitutes a major obstacle. The acceptance gap issues remain problematic. Trust in and compliance with robot leaders remains uncertain. The use of AI by Pepper, a robot, improved emotion recognition which raises the critical question of whether employees will accept or operate under a robot leader. Experts asked whether robots would be able to help resolve trust and interpersonal differences that seem to transcend reasoning. This situation is worsened by wandering cultural and generational differences in how martial differences manifest in the working environment.
- **Effect on Organizations:** We must consider the advantages and disadvantages of appointing social robots as CEOs. Additionally, we ought to think about whether they are more capable than people of increasing corporate productivity fostering creative thinking overseeing financial operations and enhancing general efficacy.
- **Cost:** Cost-saving arguments such as replacing high-salary CEOs and concerns about intellectual property leakage are speculative unless balanced by organizational performance metrics. Current empirical data does not support the claim that replacing CEOs with robots enhances organizational effectiveness. Instead, hybrid models-where robots support human decision-making-show more practical promise.
- **Legal And Regulatory Considerations:** Stressing how important it is to take legal and regulatory frameworks into account when implementing social robots as CEO substitutes. addressing liability employee rights and business privacy concerns in order to guarantee appropriate resolution and adherence. The legal identity of robots remains unresolved. The case of Sophia's citizenship (Sini, 2017) sparked debates on rights without responsibilities. This research emphasizes that robot CEOs raise profound legal issues regarding

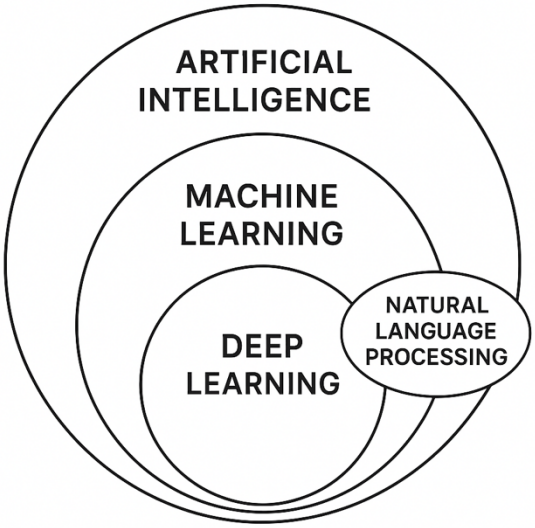
accountability, privacy, and corporate liability. Expert opinions and literature agree that without legal personhood or a framework for culpability, robots cannot currently assume executive authority.

5.1.2 Capabilities of Artificial Intelligence: Enhancing the Performance of Social Robots

In this research paper, we will be studying the importance of Artificial Intelligence and its role in the development of social robots in detail. As science and technology have advanced the concept of artificial intelligence (AI) has also evolved. The field of robotics has seen significant change as a result of the development of artificial intelligence. The development of AI has given previously simple machines like robot's new capabilities. These formerly inert machines have assumed a new function as social robots imitating human behaviour and exhibiting human-like cognitive capacities. The ability to think, act and react like humans is one of the main characteristics of social robots (Goodfellow et al., 2016). These robots need to be as intelligent as people in order to act like people.

Along with assessing the costs dependability and safety of developing such social robots for humans and other assets we also need to tackle the technical issues pertaining to perception decision-making and management of AI-powered social robots.

Figure 3: Features of AI Powered Social Robot



Combining AI with new emerging technologies such as augmented reality or virtual reality will enable social robots to profound evolution as robotics develop. We can therefore advance to creating new complex social robots that will interact with their environment better and communicate faster with both social robots and people. These intelligent social robots will be highly valuable in assisting humans in challenging situations and performing duties that may be dangerous for a human being which can improve collective productivity overall.

5.1.3 Integration Of Advanced Artificial Intelligence (AI) With Social Robots

Artificial Intelligence, or AI, is the study of creating intelligent social robots that can perform tasks independently along with perceiving, reasoning, learning, updating, and showing problem solving (Russell & Norvig, 2021). Social robots implementing AI are designed to complete tasks that require considerable labour. Social robots are not required to perform repetitive tasks in the same manner as humans. Given that social robots do not fatigue, they are uniquely designed and trained to scan defects with an accuracy not evident by humans. They also can perform all their assigned and taught tasks without the human ego judging the success

or accuracy of the robot. The roles typically occupied by many humans can be performed more quickly and accurately by robots.

5.1.4 Improvements in AI for Robotics

Traditional robots were often confined by instructed commands and could not adapt to unstructured or changing environments. Traditional robots had difficulties in critical scenarios, they functioned only on restricted pre-written commands and could not operate effectively on their own (Siciliano & Khatib, 2016). With the advancement and development of Artificial Intelligence, social robots are now starting to operate independently, allowing them to complete more complicated tasks, follow human characteristics, and monitor the surroundings (Goodrich & Schultz, 2007). Artificial Intelligence has moved social robots considerably further in understanding their capabilities of making decisions, perceiving, learning, and adapting.

The development of AI for robotics possesses several challenges, including significant challenges in terms of safety, ethics, and the consequences on society.

5.1.4.1 Perception and Sensing in Social Robots Through AI

Social Robots are able to comprehend and react to complicated situations as a result of their robotics perception and sensing capabilities using Artificial Intelligence. Although these developments show promise we must exercise caution when implementing them in critical positions such as executive leadership. This section acknowledges recent advancements in AI for robotic perception and sensing both their potential and limitations.

- **Computer Vision:** Computer vision has changed as a result of artificial intelligence and machine learning which allow robots to recognize visual information and extract insightful

information from images and videos. To execute tasks like object detection; object recognition; and tracking convolutional neural networks (CNNs); a subset of deep learning techniques has shown immaculate performances (LeCun, Bengio, & Hinton, 2015). This skill is necessary for jobs involving warehouse management product picking and organization in manufacturing and even household chores. By analysing item features and comprehending their spatial relationships AI robots are able to plan and carry out intricate manipulation tasks.

- **Manipulate And Recognize Objects:** Social robots are able to manipulate and recognize objects, track their movements and make defensible decisions based on visual input thanks to artificial intelligence (AI) techniques like computer vision. Social robots have the capability now to identify and classify objects even in cluttered environments (Siciliano & Khatib, 2016). Jobs requiring product organization and picking in manufacturing warehouse management and even housework require this skill. By evaluating item characteristics and understanding their spatial relationships artificially intelligent (AI) robots are able to plan and execute complex manipulation tasks.
- **Semantic Scene Understanding:** Thanks to AI technology algorithms have been created that allow robots to understand the semantic context of a scene. Identifying and interpreting how objects interact with their spatial arrangements is part of this. Social robots will have the capability to make better decisions and complete tasks faster as compared to humans when they understand the semantic structure of a scene (Zhu et al., 2017). For example, in a manufacturing industry, social robots will be able to move around by identifying and avoiding obstacles or by locating areas to carry out tasks. Although this aids mobility and planning in robotics, it does not equate to understanding human organizational dynamics

or cultural context. A common aspect of strategic leadership is interpreting social cues and unspoken rules which is something that contemporary AI cannot replicate.

- **Recognition of Gestures and Emotions:** Social robots enabled with Artificial Intelligence (AI) can identify and comprehend to human emotions and body language. As a result of this achievement, human-machine interactions have become more productive and meaningful. Through the analysis of facial expressions hand gestures and body language robots can respond to human emotions and intentions. They make use of machine learning and computer vision techniques (Pavlovic et al., 1997). This skill has uses in a variety of fields including education healthcare and social robotics. Cultural individual and situational variations can still cause errors in emotion recognition though. These systems have the potential to misinterpret intent which could result in bad choices in delicate leadership circumstances.

- **Perception Of The Environment:** Because social robots can sense their environment thanks to artificial intelligence they can interact and engage with their environment more effectively. Visual data analysis and interpretation are now possible for robots. Because of developments in computer vision sensor fusion and machine learning they are able to identify objects comprehend scenes and even perceive human intentions and emotions (Thrun et al., 2005).

In many industries these advancements have made human-robot collaboration more effective secure and organic. Though it improves safety and teamwork in industries like manufacturing this is less important for high-level decision-making tasks. Executive perception often involves

assessing abstract risks—such as reputational damage or regulatory changes-that cannot be sensed through environmental data alone.

Understanding artificial intelligence (AI) and robotics in depth is necessary to appreciate the advancements in AI that are relevant to robotics. The engineering and scientific field of robotics is centered on the design, build, use and maintenance of robots. A mechanical or virtual agent that can perform tasks either alone or in cooperation with its surroundings is called a robot. Similar knowledge of these two fields is necessary to analyse AIs developments in robotics. Artificial intelligence on the other hand aims to create intelligent machines that will have the ability to overpower humans in terms of perception, learning things faster and by possessing critical decision-making abilities. In order to achieve the goal of inheriting human characteristics, Artificial intelligence uses a wide range of methods and techniques such as NLP, computer vision and machine learning (Russell & Norvig, 2021). Artificial intelligence (AI) combined with robotics opens up a whole world of possibilities which shows that robots are no longer just mechanical workers, but they are becoming responsive and intuitive contributors to our everyday lives.

5.1.4.2 Planning And Decision-Making Advances In Artificial Intelligence For Robotics

Social robots have the ability to plan and make critical decisions with the help of advancement in artificial intelligence. This has enabled social robots to make better planning, organise various tasks and make decisions based on the situation. The following are relevant advances in this area.

- **Path Planning And Navigation:** AI has made substantial improvements to the techniques robots use to search for paths and navigate complex spaces. A* search, Dijkstra's algorithm,

and rapidly exploring random trees (RRT) help autonomous robot systems to output optimum collision free paths. Moreover, these systems allow any autonomous robot system to adapt to the world and respond dynamically to unforeseen changes in their path of travel.

- **Task Planning And Scheduling:** AI has improved robots' ability to organize tasks in both timing and organization. Automated planning, for example, gives a robot the ability to organize an effective schedule, taking into account task timing, order of tasks, limited resources and deadlines. This is very helpful in an industrial environment where a robot is expected to carry out complex tasks quickly, and for that to be done successfully, they need to know what tasks they have to carry out and take a scheduled approach.

  With the rise of artificial intelligence, social robots can organize and manage the task either by themselves or with almost no human input. This is a great advantage in an industrial scene where social robots must execute significant and repetitive tasks and operate under multi-tasks.

- **Reinforcement Learning For Smarter Decisions:** One important method for assisting robots in making decisions is Reinforcement Learning (RL). Reinforcement learning is basically how robots learn by doing that is by acting and learning from the reward or penalty they receive. They are already capable of performing complex tasks all alone because of reinforcement learning. They can make their way through difficult environments, and they can also decide in the moment without explicit pre-programming.

- **Working Together: Human-Robot Decision Making:** AI also helps enhance collaboration between humans and robots by allowing them to improve their ability to

understand human language and vision through natural processing language and computer vision, allowing robots to interpret their intentions and desires for their choices. This human understanding and matching of expectations is critical in the robotics industry. In manufacturing, healthcare, and personal assistance, all involving some human-robot interaction and the success of that probably is the key to their success in the end. AI developments have made it possible for robotics to accomplish previously unthinkable tasks. The development of social robots with intelligence levels comparable to humans is being made easier by AI and machine learning. Robots and humans can now collaborate to make decisions thanks to artificial intelligence (AI) which is essential when robots must work near people in public areas.

- **Ability Of Social Robots To Learn And Adapt Over Time:** The use of AI in robotics is exciting because it allows a robot to learn from its own experience, allowing modifications to its planning / strategy based on its past history on what worked and what didn't work. Use of specific AI tools like neural networks and genetic algorithms helps robots learn how to plan and allow robots to learn and make their planning system more reliable and effective over time (Kober et al., 2013).

Social robots have been very helpful to people. In certain cases, these machines have taken the place of hazardous jobs that could endanger lives. These social robots are trained for dangerous jobs like bomb defusal. They can reach the places where it is risky for human beings to go. The important functionality of adaptive learning is that they can make decisions on their own based on their previous experiences. In short, these social robots can work autonomously without any interference or assistance from humans.

5.1.4.3 Environmental Awareness

Social robots also have the capability to perceive their environments, just like they can demonstrate emotional intelligence. Advances in artificial intelligence also provide social robots with the ability to comprehend their environment more deeply. They have the potential to identify things like traffic signals, pedestrian speeds, and lane markings now, making them safer for general road use with humans. Environment perception is also present in many other contexts. For example, in information workplaces, robots have the ability to perceive obstacles, navigate accurately and comprehend who are persons and who are objects. With machine perception systems and sensors powered by artificial intelligence, social robots can avoid collisions, detect dangerous situations, and map their environment with precision, increasing both safety and effectiveness of every environmental condition they operate in (Thrun, 2005).

Thus, while machine perception has advanced significantly, equating it with comprehensive executive awareness risks conflating technical capability with leadership judgment. Future research must explore how, and if, these sensory advancements can meaningfully contribute to organizational leadership without undermining human-centric values and decision processes.

Despite the benefits there are some challenges associated with developing robotic Artificial Intelligence

Though social robots have excelled in features like path planning; motion detection; decision-making; and human-robot interaction with the advanced AI in robotics, there are still some challenges that the social robot will have to face in a leadership position. Resolving these issues is essential to creating intelligent systems that function well in practical environments. The following are the biggest obstacles and chances for further advancement.

Challenges With Perception And Sensing

- Making the social robots to see, understand and behave as per the situations or surroundings with the same perspective as human beings would do, can be a real challenge for them. Effective perception and sensing enable social robots to engage in safe and dynamic interactions with their environment which is an important element of autonomous capability (Shield AI, 2020).
- In dynamic or unstructured environments like crowded public areas or shifting weather perception systems may malfunction.
- Inadequate object detection and scene comprehension can result in misunderstandings endangering task completion and safety.
- Sensor fusion is difficult because LiDAR radar and camera sensors each have their own advantages and disadvantages.

Learning With Limited Information

- Large volumes of labelled data are frequently needed by robotics AI systems for training which can be expensive and impractical in some cases particularly for tasks involving rare events or dynamic environments. Effectively learning with sparse data is therefore a crucial research topic including (Amodei et al., 2016).
- In order for traditional machine learning and deep learning algorithms to generalize they require enormous volumes of data.
- Without intensive retraining, social robots frequently fail to generalize to new tasks or environments.
- Gathering and labelling data from real-world robotics is time-consuming, expensive and sometimes dangerous.

5.2 Discussion of Research Question One: Can an organization perform well or more efficiently if it replaces its CEO with a social robot powered by Artificial Intelligence (AI)?

According to Russell & Norvig (2021), AI is excellent at automating repetitive tasks optimizing workflows and resolving structured problems. In some sectors a CEO who is a robot could increase productivity. But leadership is more than task optimization. It entails motivating people controlling uncertainty and formulating a long-term plan-tasks that AI is currently unable to perform (Davenport & Ronanki 2018). Accordingly, overall organizational performance is unlikely to reach the levels observed under human leadership even though efficiency may increase in certain tasks.

In this thesis, we have analysed the current state of artificial intelligence, machine learning and social robotics to see if robots can mimic human cognitive and affective capacities in order to potentially replace people in leadership roles is known as technological viability.

- **Decision-Making And Leadership Qualities:** While operational decisions can be aided by social robots according to some theoretical models, this thesis suggests there is scant evidence that social robots have the strategic insight, ethical reasoning, or multicultural competence necessary for upper-level leadership. Conversations with AI experts indicate that although robots are capable of optimizing basic decision-making tasks, there is currently no sufficient contextual awareness on the part of the robots for organizational fog or any associated ethical concerns.
- **Interaction Between Humans And Robots:** The human factor still constitutes a major obstacle. The acceptance gap issues remain problematic. Trust in and compliance with robot leaders remains uncertain. The use of AI by Pepper, a robot, improved emotion

recognition which raises the critical question of whether employees will accept or operate under a robot leader. Experts asked whether robots would be able to help resolve trust and interpersonal differences that seem to transcend reasoning. This situation is worsened by wandering cultural and generational differences in how martial differences manifest in the working environment.

- **Effect on Organizations:** We must consider the advantages and disadvantages of appointing social robots as CEOs. Additionally, we ought to think about whether they are more capable than people of increasing corporate productivity fostering creative thinking overseeing financial operations and enhancing general efficacy.
- **Cost:** Cost-saving arguments such as replacing high-salary CEOs and concerns about intellectual property leakage are speculative unless balanced by organizational performance metrics. Current empirical data does not support the claim that replacing CEOs with robots enhances organizational effectiveness. Instead, hybrid models-where robots support human decision-making-show more practical promise.
- **Legal And Regulatory Considerations:** Stressing how important it is to take legal and regulatory frameworks into account when implementing social robots as CEO substitutes. addressing liability employee rights and business privacy concerns in order to guarantee appropriate resolution and adherence. The legal identity of robots remains unresolved. The case of Sophia's citizenship (Sini, 2017) sparked debates on rights without responsibilities. This research emphasizes that robot CEOs raise profound legal issues regarding accountability, privacy, and corporate liability. Expert opinions and literature agree that without legal personhood or a framework for culpability, robots cannot currently assume executive authority.

5.3 Discussion of Research Question Two: Can replacing human CEOs with social robots lead to success or will it lead to failure?

As per the findings of the study “the appointment of Tang Yu, a virtual CEO developed by NetDragon Websoft in China, has attracted widespread attention; however, there is currently no independent empirical evidence to evaluate its success or failure (Xu, 2022). While some organizations experiment with AI in executive roles, researchers such as (Brynjolfsson a& McAfee, 2017) suggest that the real use of artificial intelligence lies in complementing and not substituting the human capabilities. The complete replacement of human CEOs risks undermining strategic depth, ethical reasoning, and emotional intelligence, which are integral to complex decision-making. Thus, without proper human oversight, such a shift may lead more toward organizational fragility than progress.

In the history of social robotics, numerous studies show that the social robots released in the consumer market have failed terribly. These failures resulted in substantial losses for their creators and the closure of multiple developmental companies. Such setbacks underscore the inherent complexity and challenges involved in crafting functional social robots (de Graaf et al., 2015). However, we should not forget that human intelligence has the capability to overcome any challenges and solve complex problems and hence humans have the capability to build social robots that can overcome all the past failures. The advancements in natural language processing, machine learning and artificial intelligence are outstanding human accomplishments that could overcome the constraints of previous social robot models. The development of social robots with a variety of human-like traits including critical thinking, emotional expression and smooth interaction with both humans and machines is made possible by these technological advancements (de Graaf et al., 2015). But there is not enough evidence that artificial intelligence has the potential to build robots that can work autonomously.

Building intelligent robots with improved cognitive abilities is made possible by cognitive frameworks like Soar ACT-R CLARION LIDA SPA Sigma and NARS. Robots can perform tasks ranging from simple actions to complex problem-solving thanks to these frameworks which combine symbolic reasoning learning and decision-making processes. They serve as the building blocks for robots to acquire complex cognitive capacities. However, there are still a lot of obstacles in achieving this. It is required to focus on the important areas that needs to improve such as robot perception and sensing abilities, ethical consideration and addressing the limitations of learning from limited data and guaranteeing the transparency and clarity of AI models. Increased human-robot interaction, sustained autonomy, scaling AI-driven robots for real-world applications and promoting cooperation between several robots are some of the areas that require more research and development. The world will develop as artificial intelligence in robotics blends with other cutting-edge technologies like AR/VR IoT edge computing and 5G communication. In distributed robotic systems, this synergy can enhance real-time decision-making, expand the capabilities of social robots and facilitate seamless connectivity.

5.4 Discussion of Research Question Three: Despite lacking human experience and emotional intelligence, are social robots capable of leading organizations and making critical decisions for the company, and can they address problems pertaining to team motivation, effective participation of employees, and collaboration?

Even though social robots have trouble with true emotional understanding and learning from experience they are getting better at simulating emotional intelligence and making data-driven decisions. These robots are able to use technologies such as affective computing and sophisticated natural language processing to customize their communication and identify emotional cues. They are unable to resolve interpersonal conflicts inspire intrinsic motivation

or establish enduring trust in teamwork though because they lack true empathy. These machines may instead only encourage surface-level participation and collaboration. According to Huang and Rust (2021) the way robots' mimic empathy may cause people to feel alienated in professional settings.

This article has explored a number of important topics such as cognitive architecture difficulties and potential applications of AI in robotics. Significant advancements have been made in the field of artificial intelligence (AI) in robotics which has advanced our understanding of intelligent and capable robotic systems. AI techniques combined with robotics have given social robots the ability to see, think, learn and interact with their environment in sophisticated ways (Russell & Norvig, 2021).

Advancement in Artificial Intelligence

The development of artificial intelligence (AI) for robotics has produced amazing advances in the building of intelligent and capable robots. By addressing the problems and taking the future directions discussed in this article we can further improve the capabilities of robots and judiciously use AI to discover new applications in a range of industries. Robotics' future depends on continued collaboration and AI innovation that allows robots to become more integrated into society and our daily lives.

Integration Of Machine Learning (ML) With Artificial Intelligence (AI) For A Smart Robotic CEO

Robotics relies heavily on artificial intelligence and machine learning (Goodfellow et al., 2016). Machine learning is one of prime advancements in the field of artificial intelligence. When considering social robots, it is imperative that they constantly update themselves because

the world is changing every day. We cannot continue using antiquated techniques to build robots. It is essential that we create robots that can continuously improve and adapt to fit into this ever-changing environment given the speed at which technology is developing and the changes that are occurring in our surroundings.

Through data collection, observation of their environment and people and frequent improvement based on the information acquired, machine learning is a technique that allows these social robots to adapt to their surroundings. In particular this becomes important if we want social robots to behave and look like humans. Several machine learning approaches used in robotics will be examined in this research paper in order to build social robots that can mimic human behaviour and develop the knowledge required for leadership positions.

Let us study some of the **Machine Learning Methods** in detail below:

- **Learning Under Supervision:** Robotics uses supervised learning, a fundamental machine learning concept to train a social robot or any machine learning model where each input is linked to a desired output. Through the recognition of patterns in the given examples the model gains the ability to link inputs and outputs. The quantity and quality of available labelled training data have an impact on the effectiveness of supervised learning in robotics. Accurate and robust models that can function well with new unseen data require the collection of representative and diverse datasets. Additionally in order to address problems like data scarcity domain adaptation and robustness to environmental fluctuations in real-world robotics scenarios research is being done to improve supervised learning algorithms (Rayhan, 2023).

- **Unsupervised Learning:** It is important that our social robots have the ability to think critically unlike traditional robots. For a social robot to accomplish leadership goals merely obeying human commands is insufficient. These social robots have the potential to perform human tasks at a remarkable rate without growing weary. Humans are not only focused on that though. Technology has advanced to the point where we need to build robots that perform exceptionally well outperform humans and flourish in unsupervised environments. This is possible through unsupervised learning which trains a social robot with unlabelled data so that the robot can recognize patterns or structures on its own (Rayhan, 2023).

- **Learning by Reinforcement:** Reinforcement Learning (RL) is an important method for teaching the social robots to make sequential decisions to navigate between dynamic environments. Using this approach, a social robot engages with its surroundings and is rewarded or imposed venality according to how it behaves in different scenarios. By trying out various behaviours and implementing the best methods for completing tasks social robots aim to receive rewards. Social robots can get better over time thanks to this process.

- **One Machine Learning Technique:** This technique has been proven remarkably effective in deep learning. The field of robotics has seen a substantial transformation as a result. Social robots can better comprehend intricate patterns and representations by using Deep Neural Networks. This development has improved social robots' perception and decision-making abilities. These social robots also perform better in sequential and time series analysis since they can use Convolutional Neural Networks (CNNs) to analyse images and videos.

- **Transfer Learning:** Another strategy that helps social robots learn more quickly is transfer learning. Social robots use transfer learning to tackle new tasks in the same domain by drawing on their prior knowledge and abilities from prior tasks. This approach works well and saves a lot of time. Social robots can now complete tasks without having to start from scratch every time thanks to this. By applying a previously trained model to a specific task this learning technique prepares the model to perform related tasks. Social robots can therefore pick things up faster and adapt to different settings.

- **Online Learning:** Online learning is a machine learning technique that has new data that allows robots to learn new information and modify their traits or tactics to carry out tasks in real time. These social robots must constantly update their policies and themselves in response to new information because it is essential that they adapt to the changing world. When the robots must respond quickly in circumstances where human intervention is impractical this flexibility becomes even more important.

- **Generative Models:** The use of generative models is another machine learning strategy. This approach trains social robots using models like variational autoencoders (VAEs) and generative adversarial networks (GANs). Using this method social robots use these generative models to produce fresh data samples that replicate the training datasets distribution. When it comes to creating synthetic data for simulation-based training these models are especially useful.

- **Active Learning:** The active learning method is a sophisticated technique. This method involves social robots interacting directly with people to gather important data. Social robots can interactively request more instructive training data from people or other

information sources thanks to active learning techniques. By asking questions of people or other sources to gather more useful training data this technique helps robots learn more effectively. The social robot can learn more quickly and precisely by using this method. This is especially helpful when labelled data is hard to come by or when getting it is expensive. With the help of machine learning, social robots can now see and comprehend their environment and are capable of making defensible decisions and adapt to changing circumstances. By employing these strategies robots can develop new skills and learn from data which will gradually enhance their performance so they can become more versatile and effective for a wide range of tasks.

5.5 Discussion of Research Question Four: Do social robots have the capacity to handle moral complexity, and how will they handle ethical dilemmas in leadership roles?

The philosophical underpinnings contextual awareness and moral reasoning required to resolve moral dilemmas independently are absent from social robots and other contemporary AI systems. While rule-based ethical programming and algorithmic decision-making yield trustworthy outcomes they cannot take into consideration the moral complexity required in circumstances involving ambiguous leadership (Mittelstadt et al., 2020). It has been empirically shown that robot CEOs may struggle to reconcile conflicting human values because they are incapable of thinking ethically beyond pre-encoded logic (Gerdes & Dignum, 2022).

Though social robots are sophisticated in data processing and optimizing, they cannot completely understand the human needs or have the knowledge of the employee's personal situation. A social robot lacks the ability to understand when the employees need a break from the work schedule as the robot cannot think like humans, it cannot understand the whereabouts

of the humans. Because of the lack of the ability to understand human emotions and needs, a social robot might implement strict policies and schedules that fail to consider the different situations of the employees. Resulting in dissatisfaction towards the work, and ultimately a decline in overall productivity and morale as employees feel their personal needs are being ignored.

5.6 Discussion of Research Question Five: How efficient can a social robot be in decision-making as compared with human CEOs?

Social robots can make sound operational decisions particularly in structured scenarios thanks to quick data processing and bias reduction. Because they are capable of making algorithmic decisions devoid of emotional influence, they are comparable to (Simon,1947) Rational Decision-Making Model. In certain analytical tasks such as those in banking and logistics AI-powered systems have surpassed humans (Heaton Polson & Witte, 2017). In unstructured decision-making which calls for moral discernment adaptable reasoning and strategic planning they are still less successful.

A few years ago, it seemed impossible for robots to behave like humans, but tremendous advancements have already been made demonstrating how well they can function and understand human needs. They can respond to human questions and concerns in an intelligent manner. The study of artificial intelligence holds the key to understanding how this change took place. Although machines are not inherently intelligent it is possible to give them intelligence so that they can behave similarly to humans. The idea of artificial intelligence is introduced at this point. Social robots of today have developed beyond the limitations of conventional robotic characteristics. They are now able to emotionally connect with people. These robots are made to socially engage with other robots as well as people. They are able to read human emotions and react to circumstances similarly to people. The field of artificial

intelligence studies how to build machines that can do tasks that typically require human intelligence. This field of study encompasses the development of speech recognition machine vision, natural language processing pattern recognition and expert systems. This shows that it is possible to incorporate intelligence into machines so that they can make data-driven decisions and learn from their surroundings, human behaviour and other elements. Designing machines with human-like perception of their environment, human-like responses to events, human-like problem-solving skills and the capacity to continuously learn from their experiences and maintain updates is the aim. The capacity of AI-driven robots to understand human emotions and behave like fellow humans sets them apart from traditional robots (Breazeal, 2003). The goal of incorporating AI into social robots is to improve human-robot interactions. To make social robots seem more engaging and natural like people the goal is to improve their social skills. Social robots are unique because they comprehend human psychology and emotions which sets them apart from previous robotic models. The goal of AI-enhanced social robots is to simulate interacting with a human rather than a machine.

Significant advances in robotics have resulted from the combination of artificial intelligence and social robots. The recent developments in robotics brought about by advances in artificial intelligence will be examined in this research paper with a focus on cognitive architectures, learning capacities, sensory perceptions, and human-robot interactions. With the use of cognitive architectures, social robots that integrate perception, reasoning, learning, and decision-making are intended to mimic human cognitive processes. They improve social robots' perception and sensing abilities. These architectures aim to comprehend possible drawbacks that may occur when learning with sparse data and to address these issues. They also take into account the ethical and social benefits of combining artificial intelligence with social robots. Future advancements in robotics are expected to focus on a few key areas like improving communication between people and social robots, developing social robots that will

understand human emotions, identify facial expressions and react correctly to commands in natural language is part of this, creating social robots that can function with people in shared spaces and exhibit behaviours similar to those of humans and achieving long-term autonomy in robots is another important objective. This enables social robots to function independently for a longer period of time without the need of human intervention. In order for social robots to perform the tasks in dangerous or remote areas where human supervision may not be possible then long-term autonomy is essential. Ensuring long-term autonomy in robotics is a major challenge in the development of AI-powered social robots. Thus, we should develop social robots in a manner that can work for extended periods of time without human supervision. Social robots must possess sufficient intelligence to function effectively with minimal assistance and to make choices on their own. Social robots must react to their surroundings. They must possess the versatility to adjust to the conditions in which they work and the ability to carry out a variety of tasks in a variety of settings.

5.7 Discussion of Research Question Six: How much can social robots adapt to the characteristics of humans such as critical decision-making and leadership styles, and what are the possible consequences?

Through the use of machine learning reinforcement learning and cognitive systems like Soar and LIDA social robots can mimic some aspects of human leadership including task delegation scheduling and consistent strategy (Russell & Norvig, 2021). But function is more important to this flexibility than consideration. Some outcomes of this limited adaptation include inflexible leadership styles a failure to respond to crises and an inability to comprehend cultural or emotional nuances (Grover & Ketchen, 2023) caution that an over-reliance on robotic leadership may erode the flexibility and depth of relationships required for executive success.

Integration of Natural Language Processing (NLP) With Artificial Intelligence for Better Human-Robot Interaction

One area of artificial intelligence called natural language processing (NLP) facilitates communication between humans and machines. With advances in natural language processing (NLP) human-robot interaction has advanced to a new level. Social robots can now comprehend and react to natural language commands interpreting and producing human language resulting in more natural communication between humans and robots. Here are some notable advancements in NLP for HRI which will help in building an efficient social robot CEO that will think, behave, act, and show emotions like humans.

- **Speech Recognition:** Natural Language Processing helps social robots to transcribe the natural language that is spoken language into a text using Automatic Speech Recognition (ASR) systems. The technique requires deep learning models such as recurrent neural networks (RNNs) or transformer models like BERT for converting spoken language into text. This feature makes social robots understand natural commands from humans. In short, the process of converting audio signals from humans into the digital information that social robots can process and analyze for its use is known as speech recognition (Bou Nassif et al., 2019).
- **Natural Language Understanding (NLU):** Natural Language Understanding (NLU) is a technique used by the social robots to understand the meaning obtained from the human language inputs. With the help of artificial intelligence, machine learning and natural language processing these social robots use techniques like syntactic parsing, sentiment analysis and semantic role labelling to interpret and analyse the sentiments and emotions that are present in the text received. This technique makes it possible for social robots to respond back meaningfully to the human input (Giachos et al. (2017).

- **Dialogue Systems:** The NLP driven dialogue system also known as a chatbot, or conversational robot uses NLP technology to communicate intelligently and interactively with humans. They pay attention to what you are asking, highlight pertinent information and maintain a smooth dialogue. These robots are handy for customer service, personal help, and social interactions. To understand what users, want and keep conversations interesting, these systems use methods such as figuring out intentions, named entity recognition, and managing how the conversation flows (Alazzam et al., 2023).
- **Natural Language Generation:** Natural Language Generation is a technique in which social robots can generate human-like responses which means they can give the output in natural language. Techniques like template-based systems and rule-based systems are used to help these social robots to generate natural language. These social robots also use advanced deep learning models such as transformers or sequence-to-sequence models which helps these social robots to generate appropriate human-like responses. This is one of the prominent functionalities of Natural language processing as this is how we can make our social robots smart enough to communicate like humans (Foster, 2019).
- **Sentiment Analysis And Emotion Recognition:** This NLP technique will help robots to analyze human emotions and interpret them accurately. The functionality of sentiment analysis algorithm is to examine the feelings, opinion or sentiment of a human that is conveyed either through text or speech. Sentiment analysis is like a tool that will help the social robot to determines whether a human being who is speaking is talking in a neutral, negative or positive tone. This feature will make it easier for social robots to comprehend human sentiment expressed through speech or text and react appropriately. This enables robots to react in a manner consistent with the mood. Robots can detect emotions in speech or text thanks to emotion recognition which goes one step further. In order to identify these emotions, they employ sophisticated algorithms which improve robot comprehension and

communication with humans. By employing these techniques social robots will be able to sound more human and react to human questions with more empathy and compassion (Kumar & Jena, 2024).

- **Multilingual And Intercultural Communication:** Natural Language Processing is an advanced learning technique which has enhanced the performance of the social robot by taking it to another level. Human communication is limited to interacting with others in at most 3-4 languages. But these social robots with the help of Multilingual and Cross-Cultural Communication techniques can communicate in multiple languages, overpowering human capabilities. With natural language processing technique, the social robots can communicate with humans from diverse linguistic backgrounds. With the help of machine translation algorithm, the social robots can convert words from one language to another language. In order to make multi-lingual human-robot interaction smooth, social robots have the ability to translate speech or text from one language to the preferred language. Due to the robot's ability to translate French into English or any other language people can easily understand one another. Accordingly, robots must be respectful and sensitive to cultural differences (Dong & Zhou, 2023). This is aided by cross-cultural adaptation techniques. They teach robots to identify the minute variations in speech and behavior that occur across cultures. Because of this these social robots can make sure that every word they use is courteous and respectful which facilitates conversations for all parties. Due to these characteristics future robots may be able to communicate with humans through a variety of movements including facial expressions and improved aptitude for expressing emotions. This will lead to more natural communication between human and social robots.

- **Context-Aware Communication:** Context-aware communication is a way of providing more personalized responses to the human by keeping track of their previous chats, understanding their preferences and by keeping in mind the environment and current task. For social robots to respond appropriately and take appropriate action they need to understand the concept of the whole conversation. Robots can provide more instinctive and natural responses that meet the needs of the user by integrating contextual information into their interactions (Antony et al., 2025). With the help of NLP and AI, the social robots will be able to understand the words that the humans talk to them, and they will have the intelligence to understand the whole context in which those words are used.

- **Social And Pragmatic Language Understanding:** In the above descriptions we study various Natural Language Processing Techniques. We learned how with these varied techniques we can make social robots appear more natural in communicating with humans. We learned how these social robots can be trained and programmed to exhibit emotions like humans, show empathy, or make more personalized communication with humans. But despite all these, there is another feature that is crucial to make these social robots to appear more like humans and that is it enables the social robots to understand the social and pragmatic aspects of language. Sense of humour is a quality of humans which he has been blessed with.

  Along with AI, NLP and Machine Learning, it is possible for social robots to acquire human characteristics and become a leader with the ability of critical decision making and to follow human leadership styles but yet there is not enough evidence practically.

5.8 Discussion of Research Question Seven: What potential effects might a social robot CEO have on organizational performance and workplace culture?

Although they may increase operational efficiency and lessen emotional instability robotic CEOs run the risk of undermining important facets of company culture such as interpersonal trust empathy and informal communication. Business cultures depend on relational warmth and psychological safety two areas where robots still struggle according to the Harvard Business Review in the year 2022. These settings run the risk of becoming overly transactional which could reduce long-term employee engagement and creativity according to research (West et al. , 2021).

Social robots can keep the deadlines from getting missed and save the human employees from workloads. Robots can establish rules that promote regular breaks, vacation utilization, and workload distribution to prevent excessive overtime within teams. Focusing on the balance between work-life and personal life, social robots can contribute to a workspace that is healthier for employees and they can feel supported and happy that their well-being is taken into consideration. Adequate rest and freedom from excessive work ensure maximum productivity since the employees remain fresh and even more interested in achieving their targets.
Nevertheless, evidence suggests that over-automated employees can reduce relationships and reduce motivation. Thus, while robots can help apply a period of comfort, the absence of real anxiety may reduce confidence.

Social robots adapt data-driven approach, and unbiased decision-making strategy to facilitate the sustainable growth of the organization (Cui et al., 2021). Nonetheless, in order for social robots to be truly efficient in the positions of leadership, they have to be made in such a way that they can understand and fulfil the psychological aspects of work, like the well-being of employees, interpersonal relationships, and trust. AI and robotics, when combined with a

heartfelt understanding of human needs, can carry an organization to the peak of success under the leadership of a social robot CEO. However, creativity, intuition, and ethical judgment - essential traits for transformational leadership - remain beyond current AI capabilities. Thus, social robots are better suited for analytical roles than visionary leadership.

5.9 Discussion of Research Question Eight: In a corporate world, is it possible for a social robot to gain the trust of all workers and make wise decisions?

As per the findings the gaining of organizational trust is a major obstacle for robot CEOs. Research indicates that scepticism regarding the sincerity of robots and their incapacity to handle interpersonal disputes undermines employee trust. Even emotionally intelligent robots like Pepper and Sophia can attest to this. Because trust-building is situational and complex current AI systems are unable to handle it effectively enough for broad adoption (Fischer et al., 2023).

These social robots should possess the ability to understand human humour. If the social robots show the same nature of conversation, same expressions then over time humans will start finding it less interesting and will lose all interest to communicate with these robots just as now Amazon Alexa and other such pre-programmed machines become boring for humans over time. So, it is important that these social robots understand human sarcasm, indirect human speech acts and other such pragmatic elements. By incorporating the social and pragmatic features in social robots, these robots will be able to deliver satisfying human robot interaction (Hameed, 2016).

It is important that the interaction between human and robot should be interesting, engaging, and seamless so that the person doesn't find it boring to communicate more with robots. Natural Language Processing helps social robots interact with humans by understanding their needs, their interests and trying to respond back in a way that delights them. NLP-driven Human-Robot Interaction (HRI) makes communication between them more intimate organic and efficient which makes it easier for robots to be incorporated into human-interaction-focused environments. While these NLP advancements support more natural HRI, they are insufficient for executive leadership. Communication at the CEO level requires ethical judgment, negotiation, persuasion, and cultural fluency—capabilities not fully achievable through current NLP systems.

5.10 Discussion of Research Question Nine: How likely are workers to accept a machine as their boss, and what factors affect their willingness to accept it?

As per the research findings how employees embrace robotic leadership depends on a number of factors including demographics culture and experience. As per cross-cultural research conducted by (Li et al., 2022) discovered that tech-savvy younger employees are more receptive to robot leadership. On the other hand, older or more conventional workers are more likely to be hesitant particularly in positions that call for charm and emotional intelligence. The robot's capacity to manage interpersonal interactions perceived fairness and transparency are additional crucial considerations.

Let us see in detail what are the factors that influences that acceptance of social robot CEO below.

- Social And Cultural Reluctance To Use Household Robots: In certain cultures, social robots particularly those made for companionship were considered as a bad idea. The idea of incorporating robots into daily life was met with scepticism and unease in many cultures particularly in households (Dautenhahn, 2003). People were generally not ready to welcome robots into their families and the technology's failure to meet expectations only served to increase their mistrust.
- Fear Of Technology And Robot Apprehension: Robot anxiety is a psychological barrier that causes people to be uncomfortable, afraid, or suspicious of robots particularly those intended for social interaction. The failure of early social robots was largely caused by this problem. As robots developed, they threatened social norms and values related to work technology and interpersonal relationships (Waytz, Cacioppo, & Epley, 2014).
- Social And Psychological Disconnect Theory: According to the social and psychological disconnect theory people may be able to accept the idea of robots on an intellectual level but they are frequently psychologically unprepared for the closeness and emotional bond required to build relationships with them.

Early robots, especially humanoid ones usually had trouble bridging the gap between human and mechanical which made users uncomfortable or even alienated (Goetz, Kiesler, & Powers, 2003). One reason why these robots weren't more widely accepted in human society was because of this emotional gap.

5.11 Discussion of Research Question Ten: Despite knowing that previous social robots have failed in the consumer market, can we create one that can overcome these obstacles and succeed in a Chief Executive Role?

As per the findings the lack of emotional depth high cost and low engagement of earlier social robots such as Jibo and Aibo caused them to fail (Mitchell, 2018). However more adaptable and emotionally sensitive robotic systems might be made possible by recent developments in AI such as deep learning natural language processing and context-aware computing. The development of moral and legal safeguards will be crucial to the success of robot CEOs in addition to technological advancement (Turkle, 2017).

On Going Research In Making Social Robot Closer To Human- An Example of Nadine

AI-powered CEOs are able to modify their plans in real time in response to market feedback and performance indicators. Social robots are able to learn and improve themselves continuously which makes them adaptable leaders in quickly evolving industries.

Furthermore, research by (Thalmann et al., 2021) highlights the importance of lifelike humanoid robots such as Nadine in exploring long-term human–robot interaction, memory, and emotion, illustrating both the promise and challenges of socially intelligent machines.

Nadine, a gynoid humanoid robot was another interesting and useful creation which was created in the year 2013 by Kokoro in Japan (Thalmann et al., 2021). This social robot was modelled after Professor Nadia Magenant Thalmann. Nadine looked realistic in appearance, with human-like natural skin, hair and hands. Nadine is a socially intelligent social robot who knows how to greet the people, remember the people whom it had met before and indulge in meaningful conversations with them as continuations of the previous conversations. Nadine can make eye contact with the users too. The most interesting part of Nadine was the **ability of having 27 degrees of freedom for facial expressions** and making upper body movements (Thalmann et al., 2021). Nadine is successor from Eva. Eva is the head of the humanoid robot and was quite famous when it was developed in the year 2008 by Hanson Robotics. Nadine

was developed with several added features like it can answer to all the queries being asked and her advantage is that it can speak in several languages which is helpful for the users. Nadine is more than a normal robot, it was able to put on skype sessions, and familiar with sending mails. It also assisted the specially challenged people by keeping them engage by reading stories for them. Nadine can take over different roles, like being an office receptionist or a personal coach. It was the first humanoid robot to be served as the customer service agent ever, when it served for AIA Insurance Company, Singapore as Customer Service Agent. She can engage in natural conversations, recognizing individuals, and even displaying emotions through her facial expressions and gestures.

Representative Case Studies Of Social Robots In Leadership Roles – Example Of COIN

Even though Sophia isn't a CEO she has served as an ambassador and representative for a number of organizations improving brand awareness and public relations. Despite being symbolic it significantly contributes to the global conversation about AI-human cooperation in leadership positions.

We studied the example of Tang Yu humanoid of NetDragon Websoft in China. At a big tech company Tang Yu, a virtual AI humanoid appointed as a rotating CEO, is in charge of day-to-day operations, data analysis and workflow effectiveness. As the first real-world application of a robotic CEO, it offers insightful information about AIs role in strategic leadership (Pandey, 2022).

Another instance is of the **COIN AI at JP Morgan**, which is one of the leading financial institutions in the world (Filipsson, 2025). COIN is AI based contract intelligence. Usually, the methods that we use for analysing contracts and legal reviews are a time taking procedures,

which also requires a greater number of staffs to perform the task with accuracy. Such tasks when performed by humans can often lead to errors.

But by implementing COIN, JP Morgan was able to review about 12000 contacts in just seconds, thus saving lots of efforts, and time. But this way, JP Morgan was able to save 360,000 hours annually in analysing such data. (Filipsson, 2025). This has not only reduced the human efforts, workload on the employees, but has also increased efficiency and reduced the errors which usually occurs when humans do this task. COIN, despite not being a humanoid robot, automates the review of legal documents demonstrating AIs capacity to perform cognitive tasks at the leadership level in high-stakes financial settings (Filipsson, 2025).

5.12 Discussion of Research Question Eleventh: How can advancements in Artificial Intelligence (AI) and Machine Learning (ML) help in the development of a social robot that will be intelligent like humans and will also have other characteristics like humans which will make them capable of leading a company?

Because of the advancements in AI and ML social robots are now able to learn think contextually and model behaviours. By reacting to real-time feedback, they can use supervised and reinforcement learning to make better decisions. While cognitive architectures like NARS and CLARION facilitate situational learning and symbolic reasoning natural language processing enables more nuanced communication (Russell & Norvig, 2021). Current systems still lack the entire spectrum of human intelligence and emotional competencies required for full executive functioning notwithstanding these developments.

Organizational effectiveness may be redefined by the incorporation of social robots into executive leadership. As machine learning natural language processing and ethical AI continue to progress robotic CEOs could completely transform industries by providing scalable unbiased and flexible leadership models. For industries that value data over human opinion early adoption seems ideal.

When a social robot is appointed CEO, it offers an interesting vision of leadership in the future that is marked by data accuracy, operational efficacy, and technological advancements. Hybrid models governance frameworks and public engagement can strategically mitigate the challenges that exist especially in the areas of ethical considerations trust and emotional intelligence. The best course of action might be collaborative leadership in which social robots serve as independent advisors or executive collaborators rather than completely replacing human leaders. This would allow businesses to use AI while maintaining human-centered principles. In conclusion robotic CEOs are both a technological advancement and a step forward in leadership. They could efficiently perceptively and impartially redefine what it means to lead in the age of artificial intelligence if the right systems were in place.

5.13 Discussion of Research Question Twelve: Who will take the responsibility for a social robot CEO's choices and actions in the event of failure or moral issues?

Due to the lack of legal status for social robots' responsibility currently rests with the developers' businesses using robots or pertinent decision makers. According to (Gless & Decker, 2021) independent AI agents are not supported by current legal frameworks under conventional corporate liability laws. In case if the social robots' failure or misconduct, then

there should be legal frameworks that will undoubtedly hold human stakeholders accountable (Gerdes & Dignum, 2022).

5.14 Discussion of Research Question Thirteen: To maintain accountability, transparency, and fairness while regulating social robots in executive roles, what legal frameworks and governance models are required?

As per the finings proactive governance frameworks that incorporate data protection regulations AI-specific liability rules and standards for algorithm transparency are encouraged by legal experts. To incorporate moral principles into the creation of AI systems ideas such as ethics-by-design and accountability by architecture are suggested (Buiten & Kesan 2020). International regulatory approaches grounded in human rights are also advised in order to guarantee equitable access avoid discrimination and safeguard human autonomy (Chang & Ke, 2023).

Ethical Frameworks:

According to Huang & Rust (2021), the recent psychological studies have noted that although AI can mimic emotional reactions it is unable to exhibit the true empathy required to promote worker well-being. This restriction could lead to mental health issues and employee alienation particularly if human oversight is inadequate.

According to research on human-robot interaction published in Frontiers in Robotics and AI in the year 2022, emotional engagement with robots can result in dependency or a disengagement from human relationships highlighting the persistent problem of the illusion of companionship.

Legal Frameworks:

Recent studies by (Shen et al., 2021) on data security and privacy draw attention to the dangers that come with AI-powered decision-makers managing private client and employee information. Many AI algorithms opaque nature makes it more difficult to comply with laws like the GDPR. As noted by Buiten & Kesan (2020), there is a growing need for "ethics-by-design," an approach to ensure transparency, accountability, and legal compliance.

As per the Li et al. (2022) cross-cultural study the younger tech-savvy individuals are more open to accept social robots in leadership role. Older or more conventional groups on the other hand are more likely to be cynical particularly in positions requiring charisma emotional intelligence and interpersonal skills. Finally, one of the biggest obstacles is organizational culture.

According to a Harvard Business Review article from 2022 AI leadership may erode the unofficial compassionate and trust-based connections that are essential to a positive company culture. Robotic CEOs may lead to transactional sterile workplaces that prioritize efficiency over long-term employee engagement and well-being according to scholars like (Grover & Ketchen, 2023).

5.15 Discussion of Research Question fourteen: Would traditional industries disagree with the widespread deployment of robot CEOs, or could it deepen social inequality?

This may be opposed by traditional sectors particularly those that place a high value on unionized labour craftsmanship and interpersonal leadership. By concentrating power in tech-savvy businesses and marginalizing those without digital skills the rise of robot CEOs may also

exacerbate socioeconomic inequality (West et al., 2021). Social cohesiveness and the concept of meritocracy may be in jeopardy if machines symbolically take the place of human leaders.

5.16 Discussion of Research Question Fifteen: How can social robots handle high-stakes decision-making, allocation of resources, and planning for strategies, which are typically conducted by human CEOs?"

With the help of optimization algorithms and predictive analytics social robots can efficiently process massive datasets to support strategic planning and resource allocation. According to (Smith & Kosslyn, 2017) they are perfect for long-term operational oversight due to their dependability lack of fatigue and data integration capabilities. Unfortunately making high-stakes decisions frequently requires navigating intricate circumstances competing interests and unanticipated events—areas in which current robotic systems fall short in terms of morality intuition and a holistic viewpoint.

5.17 Discussion of Research Question Sixteen: How might social robots solve traditional leadership problems, and what traits and abilities qualify them for executive leadership?

Because of artificial intelligence (AI) social robots are evolving rapidly. Instead of simply following preset instructions AI-enabled robots can now learn, adapt and make decisions based on their interactions and experiences (Russell & Norvig, 2021).

1. Self-improvement and Machine Learning

   With AI, ML, NLP and deep learning, these robots can learn from their experiences and adjust their behaviour to suit user preferences to perform tasks more quickly.

When a robot interacts with humans it discovers which behaviours produce positive results for instance if it is an establishing emotional bond or carrying out tasks effectively and adjustments that a social robot can make in their behaviour as required.

2. Autonomous Decision-Making

   The independence of AI-enabled robots is one of their most remarkable features. Robots' ability to make decisions on their own without constant human supervision creates new opportunities for their use in both personal and professional contexts (Breazeal, 2002).

3. Enhancing Communication Through Natural Language Processing (NLP)

   Recent developments in Natural Language Processing (NLP) have made it possible for robots to understand and carry out human-like speech which has made interactions less robotic and more organic (Devlin et al., 2019).

4. Making Communication Easier

   The conversational AI those modern social robots are equipped with enables them to have rational and contextually relevant conversations with people. This functionality has led the social robots to process complex conversations and to provide the responses suitable to the questions.

5. Contextual Understanding in Dialogue Systems

   This system allows social robots to understand the context of conversations are being incorporated into them more frequently. This allows them to provide more relevant and customized responses. The social robots that possess the ability to understand emotions and the conversations based on the scenario can act more intelligently in several situations and will be useful in critical roles.

6. Working Towards Human-Robot Collaboration

> Robots can now work intelligently with humans in a wide range of fields by responding to any questions in a way that is tailored to the human needs because of the advancement of collaborative robotics, machine learning, emotional intelligence and natural language processing which has significantly increased the capabilities of social robots.

As per the findings common leadership issues like cognitive bias emotional instability and inconsistency can be lessened with the aid of social robots. They are excellent at calculations logic and strategic consistency. Data-driven decision-making long-term planning adaptive scheduling and emotional recognition are all crucial characteristics (Goleman, 1998). Their suitability for executive leadership still depends on their integration with human judgment ethical oversight and empirical validation in complex scenarios (Grover & Ketchen, 2023). Though social robots may have several benefits over human CEOs but there is not yet enough tests that has been carried out yet to come to the conclusions that these social robots can work flawlessly without human guidance. So in the initial, the most effective way is human-social robot collaboration to avoid any legal and ethical issues.

CHAPTER 6 SUMMARY, IMPLICATION, RECOMMENDATION AND CONCLUSION

6.1 Summary

The concept of social robot becoming the CEO was predicted long before. One of the greatest leaders, the Founder and Chairman of Alibaba once said that in 30 years CEO's will be replaced by robots and soon, they will be seen on the magazine's cover as one of the best CEO. He predicted that this robot can be a threat to the job security of other humans. They will be replaced by humans thus leading to unemployment (Lauder, 2017).

But he also stated that in the long run these robots will become capable of doing things that humans can't do and these robots will make the human life easier and in future they will partner and cooperate with humans, helping human in all the possible way. He also added that these robots instead of becoming the biggest enemy of human beings, will work towards helping the mankind (Lauder, 2017).

This vision has begun materializing with real-world examples such as **Tang Yu** (NetDragon Websoft) and **Mika** (Dictador Rum), AI-powered humanoids that have taken on executive roles. This thesis explored the technological, strategic, and organizational potential of such appointments. It evaluated both the benefits including data-driven decision-making, operational efficiency, and bias reduction as well as the drawbacks, such as emotional intelligence limitations and legal ambiguity. The capabilities of AI are demonstrated by case studies such as Nadine and COIN at JP Morgan which range from emotional engagement to cognitive automation in urgent circumstances. Despite being merely symbolic these instances show a larger trend in corporate governance that emphasizes human-AI collaboration. The thesis also notes that a large number of these initiatives are still in the experimental stage and do not yet have conclusive proof of long-term success.

6.1.1. From Concept to Reality: Example Of AI-Powered Social Robot CEOs

In this research paper, we have studied the potentials of social robots if they attain the position of the CEO in an organization. We have seen how beneficial they can be to a company; and how they can reduce the workload on other employees also because of their ability to take decisions, make apt schedules and the innovative ideas, it can implement in an organization. With the potentials of social robots CEO, we also studied the drawbacks related to it.

Let us see some real-world examples of AI-powered social robots. While the research is still going on about the capabilities of social robot as CEO, there are some companies who have already made this concept real. Let us explore them in this chapter.

6.1.2. Example 1 - Tang Yu: The First AI CEO At NetDragon Websoft

In September 2022 the AI-powered humanoid robot Tang Yu was named the part-time Chief Executive Officer of Fujian NetDragon Websoft a division of the Chinese technology company NetDragon Websoft. This represented the first time a robot held an executive position in a company (Pandey, 2022).

6.1.3. Background and Role Of Tang Yu as CEO

The virtual humanoid robot Tang Yu created by NetDragon Websoft is modelled after a female human and uses cutting-edge artificial intelligence (AI) and machine learning techniques to carry out executive tasks. She helps the business make data-driven decisions, improves organizational effectiveness, and supervises operations. responsibilities and capabilities. Increasing the effectiveness of company operations is one of Tang Yu's responsibilities as CEO (Pandey, 2022).

The duties of the Tang Yu also include maintaining high standards for assignments. She provides information to help with logical decision-making. Her responsibilities include putting more efficient procedures into place (Pandey, 2022).

6.1.4. Industry Significance And Implications

The appointment of Tang Yu as the CEO of a company shows that everything is possible in this world with the help of technology. If technology is used in a right way, without proper planning and integration, miracles can happen. The appointment of Tang Yu shows that it is possible for a social robot to become a leader with the integration of Artificial Intelligence (AI) and Machine Learning (ML). Al and ML plays an important role in enhancing the efficiency of these social robots and helping them in making critical decisions which needs intelligent as equal or better than human intelligence. Tang Yu's position as CEO is a prime example of how corporate leadership is changing and marks a major step forward for the integration of AI into corporate governance (Pandey, 2022).

6.1.5. Example 2 - Mika: The AI CEO At Dictador Rum Company

The appointment of a humanoid robot as the new Chief Executive Officer of Dictador, a Rum company based in Colombia represents a significant step forward in the integration of artificial intelligence into business leadership (Sukheja, 2023). The global company created a remarkable significance in the robotics field by making 'Mika,' the humanoid robot as their first ever social robot CEO. Mika is also Board Member at Dictador. As per Fox, the President of Dictador, Marek Szoldrowski stated that the decisions taken in their company are always bold and revolutionary, and Mika equipped with artificial intelligence being part of Dictador board members, possess the power to change the world.

6.1.6. Overview Of Mika And Her Origins

The humanoid robot Mika is the result of years of research by the firm Dictador and Hanson Robotics. Mika said in the company's video "With advanced artificial intelligence and machine learning algorithm, I can swiftly and accurately make data-driven decisions". "My decision-making process relies on extensive data analysis and aligning with the company's strategic objectives," it said, adding that it is devoid of personal bias, ensuring strategic choices that prioritise the organisation's best interest. (Sukheja, 2023)

6.1.7. Functions Of Mika In An Executive Role And Its Strategic Contributions

With the help of Artificial Intelligence (AI) and Machine Learning (ML) technologies, Mika can make data driven decisions faster and more accurately as compared to humans. She uses data analysis methods to form the basis of her decision-making process that will compliment with the strategic goals of the company.

Mikas' AI capabilities ensure that decisions taken by AI put the organizations best interests as first priority, says Dictador. Additionally, Mika has been recognized as an honorary professor at the Collegium Humanum University in Warsaw where she emphasized the benefits of artificial intelligence in a speech (Sukheja, 2023).

6.1.8. Broader Significance of Social Robot CEO's In Business Innovation

Mika's nomination as CEO is a bold move for the business community. It shows the potential of AI in leadership role. While some considers this as a publicity stunt, others believe that it's a progress towards a bright future where AI and humans work together to make business decisions. The company's commitment to blending art, technology, and long-term investments to transform the industry through artificial intelligence and new technologies is evident in the

Dictadors program. Mika's role as CEO provides a new example of how AI can fit into corporate leadership role. This could lead to more decisions being driven by AI (Sukheja, 2023).

The integration of humanoid CEOs into contemporary corporations is the thesis conclusion. The advent of humanoid artificial intelligence as leaders in organizations marks a major turning point in corporate governance. The above examples of social robot CEOs states that humanoids possess the needed potential to transform efficiency, transparency and strategic capabilities in an organization across a large sector of industries.

6.2 Implications

Introduction of social robots in leadership role can have huge impact on organizational ethics, employee relations, and management in an organization.

Key implications include:

- **Organizational Transformation**: By offering scalable trustworthy and impartial leadership humanoid CEOs have the potential to alter organizational structures in data-heavy industries.
- **Workforce Redesign**: As AI leadership pushes human workers to assume more creative collaborative and emotional roles traditional job hierarchies may change.
- **Ethical and Legal Challenges**: Transparency accountability and moral reasoning continue to be important issues. Human values cannot be replicated by robots, and they are not subject to legal responsibility.

- **AI-Human Symbiosis**: Rather than total replacement the best strategy might be a **collaborative leadership** model that blends AIs analytical abilities with human moral and emotional discernment.

Social robot CEOs have the following main benefits:

- **No Biased In Decision:** By removing prejudices emotional problems and personal biases AI-driven leadership encourages equitable and just business practices.
- **Data-informed Precision:** Due to their ability to swiftly evaluate and process vast amounts of data social robot CEOs are able to make decisions more quickly and accurately than human leaders.
- **Enhanced Operational Efficiency:** AI executives provide results consistently and stay involved in international markets by working nonstop.
- **Cost-Effectiveness:** AI executives can lower long-term costs related to management overhead and executive salaries even though integration and initial development require investment.
- **Flexibility and Scalability:** Humanoid CEOs help businesses stay ahead in a market that is changing quickly by quickly adjusting to new information trends and risks.

The cases of Mika and Tang Yu demonstrate what is technically possible but also highlight the **symbolic nature** of current implementations. Without full strategic autonomy, these AI leaders are often more representative than functional in real decision-making.

The integration of machine learning and human feedback loops enables humanoid leaders to contextually adjust to the culture of their organizations.

It is not a question of whether humanoid robots will replace human CEOs but rather of how and when this will occur. AI-powered humanoid CEOs have the potential to completely transform corporate leadership with careful integration, strategic direction, and continued engineering advancement. They are intelligent systems rather than just tools that can lead with operational excellence, data-driven insights, and consistency. Adopting humanoid leadership is no longer merely a futuristic idea, it is now a strategic necessity for companies hoping to prosper in the future's more intricate and AI-driven economy.

6.3 Recommendations for Future Research

Future research should concentrate on interdisciplinary practical and legal approaches to address the present difficulties in comprehending the viability and consequences of designating social robots as CEOs.

The following recommendations aim to guide more rigorous investigation into the viability, risks, and governance of AI-powered leadership:

1. **Empirical Case Studies of AI-led Organizations**

   Future studies should conduct longitudinal case studies on organizations that have implemented AI or social robot leadership such to evaluate strategic effectiveness, organizational adaptation, employee satisfaction, and market performance over time. These real world insights will help move the discourse beyond theoretical assumptions.

2. **Comparative Experimental Research on Leadership Effectiveness**

   Controlled experiments should be conducted a comparison between humans and social robots in terms of their decision making capability in simulated business scenarios. This

can help to evaluate the leadership and performance of social robots under the critical conditions like uncertainty, crisis, and ethical dilemma. Such comparative studies would provide a robust evidence base for assessing under what conditions, the social robots may excel or fail in executive roles.

3. **Developing Models for Legal and Ethical Governance:**

   Researchers, ethicists, and legal professionals who are working towards the AI developments should collaborate to create governance models that will address the rights, accountability, transparency, and liability of social robots in CEO roles. There should be more research on the regulatory frameworks for decision ownership, risk mitigation, and stakeholder protection.

4. **Exploration of Hybrid Human-Robot Leadership Models:**

   Instead of trying to replace human CEOs entirely research should focus on hybrid models where social robots act as operational assistants, advisors, or co-leaders for human CEOs by finding a balance between the AI's data processing powers, and human emotional and ethical intuition. This approach may provide a more realistic transition route.

5. **Advancements in Affective Computing and Context-Aware AI**

   Further research is required to enhance the emotional intelligence of social robots through affective computing, natural language processing, and behavioural adaptation as such developments could improve the ability of social robot to understand human needs, foster trust, and help them in participating in meaningful leadership communication.

By pursuing these directions, future studies can critically assess whether social robots can genuinely assume CEO roles or whether their function is better suited to supportive and operational domains within executive leadership.

6.4 Conclusion

This thesis concludes that the integration of social robots powered by AI and ML into executive leadership is both possible and transformative**,** though currently speculative, and largely symbolic**.** While robots like Mika and Tang Yu suggest how AI can contribute to strategic leadership, they do not yet demonstrate full autonomy or human-equivalent judgment.

There is still significant gap in empirical evidence. The majority of examples are not operationally authorized. Legal accountability, general intelligence, and emotional intelligence are some of the important features that modern AI systems lacks.

The concept of a CEO who is entirely autonomous will always remain a concept that is difficult to get turn into reality, until these problems are resolved by solid peer-reviewed research. However, the potential of hybrid leadership models; where AI based robots can work in support to human CEOs is a workable solution for the near future. While utilizing AIs advantages these models might uphold human values. In a business setting that depends more on data this model would guarantee ethical effective and adaptable leadership.

APPENDIX A: SURVEY COVER LETTER

August 10, 2024

Dear Participant,

My name is Shani L Ganga from Swiss School of Business and Management Geneva. I am conducting research on "SOCIAL ROBOT, THE NEW CEO: REVOLUTIONIZE THE ROBOTICS WORLD BY REPLACING THE CEO'S WITH SOCIAL ROBOTS USING MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE."

I am inviting you to participate in the study as a respondent to the survey because you meet the selection criteria for this study. Privacy and confidentiality will be maintained throughout the course of this study. Your data will be kept for only 30 days and then deleted. You may withdraw from the study at any point.

Thank you very much for agreeing to participate in this survey.

Sincerely,

Shani L Ganga

Email: shani@ssbm.ch

Mentor's Name: Dr. Hemant Panvela

Mentor's Email Address: hemant@ssbm.ch

APPENDIX A: INTERVIEW GUIDE

Dear Participant,

The aim of this interview is to collect data for an academic study on Is It Possible to Replace The CEO Of An Organization With Social Robots? Kindly fill the parts of survey as indicated. Your details will be kept private and confidential and will be destroyed after the completion of this study.

1. What is your opinion on social robots participating in executive decision-making?
2. What future effects do you think AI will have on organizational leadership?
3. What are the ethical or operational concerns in replacing human CEOs with machines?
4. Can machine learning sufficiently replicate or even improve strategic thinking at the executive level?
5. What skills do you believe are irreplaceable in a human CEO?

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