THEORETICAL AND APPLIED APPROACHES IN SOCIAL SCIENCES

Editor:

Assoc. Prof. Dr. Galip Afşın RAVANOĞLU



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Chapter 1

Ecotourism Activities and Development Process¹

Makbule CİVELEK², Hasan Hüseyin OKUR³

Abstract

Ecotourism has emerged as a critical response to the adverse effects of mass tourism, offering a sustainable model that prioritizes environmental protection, cultural preservation, and socio-economic development. By promoting responsible travel to natural areas, ecotourism not only safeguards biodiversity but also fosters the economic and social empowerment of local communities. Unlike traditional tourism approaches that often lead to environmental degradation and cultural erosion, ecotourism emphasizes minimal impact practices, community participation, and educational engagement. It plays a pivotal role in raising environmental awareness, enhancing local livelihoods, and maintaining cultural integrity. The benefits of ecotourism extend beyond tourism itself, contributing to broader goals such as rural development, climate change mitigation, and environmental education. However, the realization of ecotourism's full potential necessitates strategic planning, regulation, and inclusive governance. The involvement of local communities in decision-making processes, adherence to the ecological carrying capacity of destinations, and dissemination of environmental education are essential to its sustainability. The integration of various stakeholders-including policymakers, tourism businesses, academic institutions, and civil society—is crucial for maximizing ecotourism's multidimensional benefits. Looking forward, ecotourism must be reframed not merely as an alternative tourism activity but as a long-term strategy aligned with

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global environmental and developmental objectives. The promotion of ecotourism practices, particularly through early environmental education and intersectoral collaboration, will enhance its impact and ensure a more conscious and sustainable tourism model. In this context, ecotourism represents more than a form of travel; it embodies a philosophy of living in harmony with nature.

1. Introduction

Today, the escalating environmental challenges on a global scale, the rapid depletion of natural resources, and threats such as climate change have prompted a significant transformation in the tourism sector. Mass tourism, which has gained popularity particularly since the latter half of the 20th century, has resulted in environmental degradation, the destruction of natural habitats, and damage to local cultures, all while generating economic benefits. In light of these adverse effects, the necessity for a nature-sensitive and sustainable tourism approach has become increasingly apparent. This demand has fueled the growth of the concept and practices of ecotourism.

Ecotourism posits that tourism is not merely a consumption-oriented activity; it is also a platform for interaction that can be achieved through respect for nature and culture. This tourism model, which facilitates direct contact between tourists and local communities, allows visitors to learn about traditional lifestyles and experience local products, thereby fostering cultural exchange. In this regard, ecotourism promotes not only environmental sustainability but also cultural sustainability.

Ecotourism plays a vital role in the development of rural areas. Regions characterized by natural beauty and rich cultural heritage, which may not attract large-scale tourism investments, can experience economic revitalization through ecotourism. The active involvement of local residents in tourism activities diversifies their income sources and enhances their sense of belonging to the community. This engagement also helps to prevent the migration of young people from villages to cities, thereby supporting the sustainability of rural life.

Ecotourism serves as an educational platform that enhances visitors' environmental awareness. Experiential interactions with nature foster ecological sensitivity and promote more responsible behaviors toward the environment. In this context, ecotourism plays a crucial role in disseminating sustainable living practices at both individual and societal levels.

Ecotourism is not merely a form of tourism; it can also be regarded as a philosophy of life that harmonizes with the natural environment, prioritizes social benefits, and aims to create a sustainable world for future generations. In this context, ecotourism contributes not only to environmental sustainability but also

to social transformation. This chapter discusses the concept of ecotourism from various perspectives. First, the definition of ecotourism is provided, followed by an exploration of its historical development. The key components of ecotourism are outlined, and ecotourism activities are classified. Additionally, examples of ecotourism from around the world and specifically from Turkey are presented.

2. Concept of Ecotourism

2.1. Definition of Ecotourism

When examining the etymological origin of the concept of ecotourism, it is derived from the Greek words "oikos" (house) and "logos" (word). However, it is primarily formed from the term ecology, which studies the relationship between organisms and their environment (Bahtiyar, 2017, p. 19). There is a divergence of opinion in the literature regarding the origin of the concept of ecotourism. Some researchers assert that the term was first used by Hetzel in 1965 (Kuter & Ünal, 2009, p. 148). From this perspective, Hetzel defined ecotourism as a form of tourism that occurs in natural environments where various species and ecosystems exist (Kasalak, 2014, p. 52). Hetzel views ecotourism as a type of tourism that is environmentally sensitive, contributes economically to local communities, and aims to maximize visitor satisfaction (Fennell, 2003, p. 18). Conversely, other researchers (Jamal, Borges & Stronza, 2006, p. 148) contend that the concept of ecotourism was first introduced in 1983 by Hector Ceballos-Leascurain, a Mexican environmental architect. His efforts to protect the ecology of the region on behalf of the Pronatura organization were recognized as a sustainable approach to tourism and played a significant role in establishing ecotourism in the academic literature (Cosmescu & Cosmescu, 2007, p. 67).

Due to the varying interpretations among ecotourism researchers, advocates, and practitioners, the concept of ecotourism has been understood in multiple ways (Jamal, Borges, & Stronza, 2006, p. 145). Consequently, there is no universally accepted definition of ecotourism (Demir & Çevirgen, 2006, p. 52). The International Union for Conservation of Nature (IUCN) defines ecotourism as visits that aim to provide social and economic benefits to local communities while protecting natural and cultural resources for recreational purposes, grounded in a sense of responsibility toward the environment (Kurdoğlu, 2001, p. 4). According to Hector Ceballos-Leascurain, ecotourism refers to travel to pristine natural areas for purposes such as enjoying nature and appreciating the value of these environments (Erdoğan, 2003, p. 109). Kuter and Ünal (2009, p. 146) assert that ecotourism is a form of nature-oriented tourism that socioeconomically benefits local communities by safeguarding natural resources and ensuring their sustainability. Tutcu (2021) emphasizes that ecotourism is a vital tool for

promoting the sustainability of tourism by mitigating environmental degradation; it is a nature-focused activity aimed at protecting natural resources and preserving them for future generations (Tutcu, 2021, p. 2). According to Ural and Direk, ecotourism is a nature-oriented endeavor that seeks to understand natural and cultural heritage while striving for sustainability through the protection of natural resources (Ural & Direk, 2022, p. 2).

Based on the common elements in the definitions above, ecotourism is a form of tourism that promotes sustainability, emphasizes the importance of protecting the natural and cultural environment, provides socioeconomic benefits to local communities, and fosters interaction between people and nature. A review of the literature on the concept of ecotourism reveals both commonalities and differences in the various definitions. In this context, it is evident that ecotourism encompasses diverse elements aligned with the aforementioned definitions.

2.2. Historical Development Process of Ecotourism

The development of ecotourism throughout history is rooted in the concept of sustainability, which emphasizes the protection of the world's natural resources, and serves as an alternative to the environmental degradation caused by mass tourism. Examining the historical evolution of ecotourism reveals numerous advancements that have shaped it into its current form. One significant development occurred in the 1950s, when activities and tours were organized for various purposes. Notably, in 1953, the American Museum of Natural History Travel Unit organized tours aimed at natural history research (Blamey, 2001, p. 5).

When examining the ecotourism literature, it becomes evident that the term was first introduced by Hetzer in 1965 (Kuter & Ünal, 2009, p. 148). Subsequently, due to the developments and growth of mass tourism in the 1970s, ecotourism emerged in the 1980s as a response to the negative impacts of tourism and tourists on the environment. During this decade, the first scientific studies on ecotourism were conducted, and the concept was formally introduced to the literature for the first time in 1983 by Ceballos-Lascuráin (Cosmescu & Cosmescu, 2007, p. 67).

Another significant development during this period was the introduction of eco-tours by the Canadian Forestry Service in the mid-1970s and early 1980s. The purpose of these tours is to showcase the features and beauty of the landscape to visitors traveling across the country by road. In 1972, the organization of the Stockholm Conference, facilitated by entities such as the United Nations Development Program and the United Nations Environment Program, marked another milestone in the evolution of ecotourism. Analyzing the developments of

the 1980s, the World Commission on Environment and Development published the Brundtland Report titled Common Future in 1987. This report evaluates sustainable development through its economic, environmental, and social dimensions, asserting that economic values alone are insufficient for a holistic approach to development. It emphasized that economic growth and development can be achieved with an environmentally friendly perspective. This notion has significantly contributed to the development of sustainable tourism and the emergence of ecotourism. During the 1980s, alternative forms of tourism began to attract the attention of researchers, communities, and policymakers. These types of tourism, viewed as alternatives to the negative impacts of mass tourism, have been referred to as nature tourism, soft tourism, responsible tourism, green tourism, and ecotourism (Iseyeva & Kasalak, 2016, p.188).

In 1992, the Rio Earth Summit took place in Rio de Janeiro, Brazil. This summit established the essential conditions for achieving environmental sustainability and aimed to outline how tourism activities could be conducted in a manner that respects the environment and preserves the culture of local communities. It also highlighted how sustainable development could be attained through ecotourism (Kaypak, 2010, p. 95). In 2002, the United Nations Commission on Sustainable Development designated that year as the Year of Ecotourism. the first World Ecotourism Summit was held in Quebec from May 11 to 22 of the same year. During this summit, ecotourism was discussed as a vital component of sustainable development and was emphasized as a potential solution to alleviate poverty, particularly in underdeveloped regions.

In recent years, the detrimental effects of mass tourism, heightened environmental awareness, and a shift in leisure preferences towards alternative forms of tourism—beyond the traditional sea, sand, and sun—have underscored the importance of rural development as a catalyst for ecotourism. Ecotourism has experienced significant growth within the tourism sector, driven by increasing global interest in sustainability and environmentally conscious policies. According to the United Nations World Tourism Organization (UNWTO), ecotourism constitutes 20% of the total tourism market (UNWTO, 2020). Particularly in developing countries, ecotourism has emerged as a vital instrument for economic development and the conservation of natural resources.

2.3. Components of Ecotourism

Ecotourism is a subset of sustainable tourism. In this context, it can be stated that ecotourism comprises several key components. These components embody the principles of sustainable tourism and strive to maintain the environmental, social, and economic balance. The primary components of ecotourism include natural resources and local culture (Doğru, 2022, p. 99). The components of ecotourism, based on its guiding principles, are illustrated in Figure 1.



Figure 1. Components of Ecotourism Source: Fennell, 2008, pp. 37-42; Weaver, 2001, pp. 112-118.

The primary objective of ecotourism is to protect the natural environment and preserve biodiversity. In this context, efforts are made to minimize the environmental impacts of tourism activities, with particular care taken to avoid damaging sensitive ecosystems. Ecotourism should be managed in accordance with the principles of sustainable tourism, which aim to ensure the long-term viability of tourism across economic, social, and environmental dimensions. The active participation of local communities is crucial for the successful implementation of ecotourism, as they play a significant role in the planning and management of tourism activities. Additionally, ecotourism seeks to protect and respect local cultures and traditions.

Ecotourism seeks to enhance awareness among tourists and local communities regarding environmental conservation and sustainable tourism practices. Its primary objective is to promote the protection of natural resources and sustainability. Additionally, ecotourism should contribute positively to the local economy, with tourism revenues directed towards supporting local residents and businesses to foster economic development. Ecotourism aims to provide visitors with an environmentally and culturally enriching, educational, and enjoyable experience. This approach encourages tourists to engage with nature and fosters learning. By integrating these elements, ecotourism is evolving into a form of

tourism that not only protects natural and cultural resources but also supports local communities and offers tourists educational and meaningful experiences.

3. Impacts of Ecotourism

Ecotourism is a form of tourism that not only aims to protect the environment but also serves as a tool for rural development benefiting local communities. Additionally, ecotourism seeks to create lasting memories for visitors by providing them with enriching experiences. Therefore, it is crucial to organize ecotourism activities with careful planning. When executed properly, these activities can yield numerous positive outcomes; however, poorly planned initiatives can lead to significant negative consequences. In this context, a review of the relevant literature reveals that the effects of ecotourism can be categorized into three main areas: environmental, economic, and sociocultural.

Ecotourism is a form of tourism that prioritizes respect for nature and the environment, aiming to minimize the negative impacts of mass tourism. Over time, shifts in tourist expectations, particularly in response to events such as the pandemic, have led to changes in holiday preferences, with more individuals gravitating towards nature-based experiences. This growing interest in the natural world has spurred the development of ecotourism, which has yielded numerous positive effects on the environment. Ecotourism serves as a vital tool for promoting sustainability by safeguarding natural areas and ecosystems. In developing countries, it is recognized as a crucial means of supporting the conservation of environmental resources and biodiversity (Kasalak & Akıncı, 2015, p. 192). As a result of ecotourism, governments worldwide have taken measures to protect natural areas, ensuring their preservation for future generations.

One of the positive impacts of ecotourism on the environment is the increased use of sustainable energy sources, such as kerosene, propane, wind, and solar energy, rather than relying solely on electricity. At the Si Como No resort in Manuel Antonio, solar energy is harnessed, and transportation is facilitated by air bridges instead of traditional driveways. Additionally, native plants are cultivated in the area to prevent erosion (Kuter & Ünal, 2009, p. 151). Ecotourism has also led to advancements in both infrastructure and superstructure within the region. As a result, local residents can more easily access essential services such as education, healthcare, and transportation.

Ecotourism can have both positive and negative effects on the environment. The negative impacts of ecotourism on the environment can be expressed as follows:

- Damage to wildlife and plant populations due to various activities and habitat destruction is one of the negative impacts on the environment.
- Environmental pollution resulting from tourists leaving their waste in natural areas, rather than disposing of it properly in designated ecotourism facilities, is a significant negative impact.
- The overbuilding associated with the construction of multiple structures, which detracts from architectural aesthetics, is one of the negative effects of ecotourism on the environment.
- Water pollution, resulting from the contamination of water resources, along with air pollution caused by the high volume of vehicles in the region, has detrimental effects on the environment.
- Exhibiting behaviors that lead to the destruction and degradation of natural and cultural resources also negatively impact the environment.

Ecotourism, often referred to as a component of the tourism sector sometimes called the as both a form of tourism and a significant source of income for many countries (Ankaya et al., 2018, p. 70). While ecotourism serves as an important source of revenue, it also has both positive and negative impacts (Demir & Cevirgen, 2006, p. 70; Özkök & Coban, 2009, p. 595). Through ecotourism, local residents can generate income by selling natural and locally produced goods, souvenirs, and other items. Furthermore, the production and sale of these local products contribute to the preservation of regional culture. In this regard, ecotourism can be seen as a type of tourism that not only supports rural development but also plays a crucial role in sustaining local culture. Ecotourism provides both direct and indirect employment opportunities for local residents in rural areas, particularly in regions where job availability is limited. It fosters the growth of various businesses, including hotels, restaurants, transportation services, and souvenir shops, which cater to the needs of the area. The entrepreneurial activities associated with ecotourism, along with the rise in employment opportunities, contribute to an enhanced standard of living in the region. This positive impact is also reflected in the national income (Doğru, 2023, p. 61).

Ecotourism is a type of tourism where there is interaction between the local people living in the region and the tourists visiting there, and it has a number of positive and negative socio-cultural effects (Özkök & Çoban, 2009, p. 596; Khabbazi & Yazgan, 2012, p. 8). Thanks to ecotourism, services such as transportation, communication, education, health, etc., are improved in the region, allowing people living in the region to access these services more easily. Ecotourism changes the direction of the phenomenon of migration from the

village to the city due to the lack of job opportunities in rural areas and causes people who live in ecotourism areas and have migrated to the city to migrate back to the village. Ecotourism is an important tool in the protection of natural and cultural heritage resources. Ecotourism is important in ensuring the continuity of local culture through the production of local products by local people living in the region. Ecotourism causes cultural interaction between local people living in the region and visitors visiting the region. This is an important situation for both sides in terms of promoting culture. According to Weaver (2001), one of the positive sociocultural effects of ecotourism is that it provides positive experiences to both local people and visitors.

Ecotourism has positive socio-cultural effects as well as some negative effects. The fact that different cultures come to the region with ecotourism and affect the local culture and the behaviors they will perform to disrupt the culture may cause the local culture to deteriorate and disappear. The fact that the benefits of ecotourism, especially the economic benefits of ecotourism, are not reflected in the local people may cause some segments of the people to not meet their expectations and have a negative opinion. This situation may prevent the development of ecotourism in the region. With the increase in visitors to the region over time, changes in the language and speech structure of the local people and the emergence of disorders, and changes in religious values or the loss of these values are among the negative sociocultural effects of ecotourism (Erdoğan, 2003, p. 159; Kasalak, 2014, p. 106).

4. Ecotourism Activities

The activities in ecotourism are classified into three main categories as learning-based, recreational, and relaxation-based ecotourism activities, taking into account the naturalness of the place visited, the characteristics of the activities, and some of the tools used in the realization of the activities. In this context, the classification made by Polat (2006) on ecotourism activities is given in Figure 2.



Figure 2. Classification of Ecotourism Activities Source: Polat, 2006.

When figure 2 is analyzed, it is possible to see that ecotourism activities are analyzed in three main categories. Under the heading of learning-based ecotourism activities, there are activities such as botanical tourism, bird watching, nature photography, farm tourism, and cave tourism, while under the heading of recreational ecotourism, there are activities such as camping, caravan tourism, and plateau tourism. When the title of recreational activities is analyzed, it is seen that the activities are divided into two: adventure-based activities and sportive activities. While adventure-based activities include safari, paragliding, mountaineering, balloon tourism, and river tourism activities, sportive activities include activities such as bicycle tourism, underwater diving tourism, horseback trekking, sport fishing, hunting tourism, and trekking.

4.1. Learning-Based Ecotourism Activities

Learning-based ecotourism activities include botanical tourism, bird watching, nature photography, farm tourism, and cave tourism. When the etymological origin of the term botany, which is the first of these concepts, is examined, it is seen that it comes from the French word botanique and is used in the sense of plant science (Doğru, 2022, p. 105). Botanical tourism is a tourism activity carried out in order to examine and observe rare plant species in their own habitats and to have information about them. Botanical tourism is a type of

tourism that has the potential to contribute positively to the local people and the regional economy if it is realized in plant-rich regions (Ünal, 2016, p. 94).

Another activity is wildlife watching. Birdwatching, which is included in wildlife watching, is a tourism activity that involves watching and observing wild birds in their natural habitats. Birdwatching is not seasonal and can be practiced in all seasons of the year (Ünal, 2016, p. 96). It is possible to say that Turkey has the potential to be among the countries suitable for birdwatching and is a country with birdwatching venues (Akpınar & Bulut, 2010, p. 1580). Izmir Bird Sanctuary, Balıkesir Manyas Bird Sanctuary, Ankara Nallıhan Bird Sanctuary, Mersin Göksu Delta Bird Sanctuary, Düzce Efteni Lake Bird Sanctuary, Van Erçek Lake Bird Sanctuary, Kocaeli Darıca Bird Sanctuary, Bafra Kızılırmak Delta Bird Sanctuary, Aydın Dilek Peninsula National Park and Bird Sanctuary are examples of important bird-watching areas in Turkey (Açık, 2020).

Nature photography, which is included in photography, one of the branches of art, is an activity based on depicting the natural beauties and cultural features in the areas where ecotourism activities take place through the camera (Çelik, 2018, p. 197). Farm tourism, a type of tourism that emerged from the relationship between agriculture and travel (Civelek, 2013, p. 26), consists of tourism activities carried out in rural areas. Farm tourism activities include visiting markets to see and buy fresh products produced on the farm, staying in farmhouses, participating in harvest tours in gardens, and participating in training activities such as fishing (Petroman & Petroman, 2010, p. 368). In farm tourism, it is essential for people who are bored and tired of big cities to stay in village houses and participate in activities such as agriculture and animal husbandry in order to experience village life (Doğru, 2022, p. 108).

Another type of ecotourism based on learning is cave tourism. Cave tourism is based on purposes such as researching and examining caves (Arpacı et al., 2012: 62). The main purpose of cave tourism is to introduce natural formations to tourism within the understanding of sustainability (Kasalak, 2014, p. 71). First used for scientific research and sports activities, caves began to be used for touristic purposes towards the end of the 1980s. (Kozak & Bahçe, 2009, p. 250).

4.2. Entertainment-Based Ecotourism Activities

Entertainment-based ecotourism activities are listed as adventure-based: photo safari, paragliding, mountaineering, balloon tourism, sports activities, bicycle tourism, underwater diving tourism, sport angling, and trekking.

Photo safari is a tourism activity usually carried out with horses and jeeps in order to examine natural areas and habitats of wild animals on site (Yılmaz, 2008, p. 71). This activity, which was carried out only with horses and jeeps in the past,

has changed over time and has begun to be carried out with animals such as elephants, and this has attracted the attention of adventure-loving tourists (Doğru, 2022, p. 113).

Paragliding, which is among the nature-based tourism activities and has shown great development in Turkey in recent years, appeals not only to professionals but also to the general masses. A simple and non-motorized aircraft, the parachute performs the gliding flight process thanks to the air current (Karademir & Güven, 2016, p. 435). This activity, which is a simple method of flying, offers a different flying experience to adventure-loving people as well as the opportunity to watch the earth from the sky from a bird's-eye view.

Mountaineering is another important ecotourism activity. Another known name for mountaineering is Alpinism. In the past, people spent their free time hiking in the Alps, and as a result, mountaineering emerged, and that is why it was called Alpinism (Doğru, 2022, p. 112). Mountaineering is not just a climbing sport but a type of tourism that includes activities such as rock and ice climbing and hiking (Somuncu, 2004, p. 1; Karayol, 2013, p. 22). Mountaineering is a tourism activity that people carry out in the form of hiking and climbing in order to benefit from the clean and beautiful air of the mountains. (Polat, 2006, p. 59).

One of the adventure tourism-based activities carried out in open-air environments when the weather conditions are suitable is balloon tourism. Balloon tourism aims to provide visitors with a different experience by offering them the opportunity to see the natural beauties of the region from above in an exotic way (Şengül & Genç, 2016, p. 883). Balloon tourism, which started in the world towards the end of the 18th century, has been continuing its existence in Turkey for the last 35 years. The most important balloon tourism destination in Turkey is Cappadocia (Karacaer, 2023, p. 26).

River tourism is a type of tourism based on sports such as rafting, canoeing, and whitewater skiing in areas where rivers are located (Köroğlu, 2015, p. 157). River tourism is a tourism activity that is compatible with the environment and provides a different experience to the participants because it is carried out in natural environments (Bahtiyar, 2017, p. 34).

Bicycling is a recreational activity that has become more popular in recent years due to the increase in people's environmental and ecological awareness while supporting a healthy lifestyle. Over time, this activity has become a type of tourism that does not harm nature. It is observed that the importance of bicycle tourism, which is developing day by day worldwide, is also increasing in Turkey. It is thought that the importance given to bicycle tours and bicycle tourism will increase day by day with the spread of bicycles produced thanks to developing technology (Şengöz, 2018, p. 31). Underwater diving tourism is a type of tourism aimed at seeing the richness of flora and fauna of the underwater world, photographing archaeological cultural remains, and fishing (Yaşar, 2011, p. 36). When underwater diving tourism is evaluated as a niche market, it is important in terms of being a type of tourism that supports rural development. While diving tourism has been among the rapidly developing types of tourism around the world in recent years, it is seen that Turkey, despite having very suitable opportunities and resources for underwater diving tourism, cannot benefit sufficiently from diving tourism (Köşker, 2020, p. 188).

Sport angling is considered a secondary purpose of consumption, and therefore it is expressed as a fishing activity for sport purposes only. It is possible to say that this activity carried out for sport purposes has turned into a recreational activity in tourism over time and has become an activity within the scope of tourism worldwide. It is thought that this activity, which is carried out unconsciously over time, has the possibility of causing serious damage to fish species (Yıldırım & Akamca, 2018, p. 127).

Trekking, which is among the ecotourism activities and is a tourism activity that appeals to all age groups, is the name given to walks in natural areas and walking routes suitable for ecotourism (Tekin, 2017, p. 381). Nature walks known as trekking do not always have to be one-day; on the contrary, there are longer walks. Eco-tourists can camp during this process and stay in suitable places on the walking path.

4.3. Recreational Ecotourism Activities

Ecotourism activities based on rest include types such as camping and caravan tourism and highland tourism. With the effect of the pandemic, people prefer nature-based tourism types in order to get away from the fatigue, stress of city life and to relax and unwind. One of these types of tourism is camping and caravan tourism. Camping and caravan tourism is one of the types of ecotourism in which accommodation is made in glamping areas (businesses where tents and caravans are collected) or only in tents or caravans in order to rest for a short time in natural areas or to perform sports activities (Usta, 2008, p. 46).

The areas that are very high above sea level and are generally used for grazing animals in the summer months and covered with snow in the winter months are called plateaus (Ormankıran, 2016, p. 131). Plateaus, which were used for grazing animals in past years, have changed and transformed over time and have become one of the types of ecotourism. Tourists' expectations from tourism have changed over time, and with the impact of the pandemic, people have started to prefer nature-oriented tourism types. One of these types of tourism is plateau tourism. In this context, plateau tourism refers to the type of tourism in which resting in nature by taking in clean air and oxygen and participating in recreational activities are carried out in plateaus, which are one of the natural areas (Tekin, 2016, p. 1096).

5. Ecotourism Examples

As a result of the developments in the tourism industry globally, ecotourism has begun to take an important place in the tourism market, and the World Tourism Organization (UNWTO) declared 2002 as the "Year of Ecotourism" all over the world. Thanks to this decision, ecotourism has developed worldwide and has become an important tool in protecting the environment. Ecotourism, which has developed in order to minimize the negative consequences of mass tourism, has been the subject of many studies from past years to present, and the increase in demand for protected natural areas has supported the development of ecotourism worldwide depends on factors such as the increase in the orientation towards alternative tourism types rather than mass tourism, the development of infrastructure and superstructure investments, the ease of access to ecotourism destinations, and the increase in environmental awareness (Pavlidis, Solomou, Stamouli, Papavassiliou et al., 2022, p. 800).

It is possible to say that important countries where ecotourism has developed in the world include Australia, Brazil, Ecuador, Kenya, Mexico, Costa Rica, Cambodia, Nepal, New Zealand, Greece, Bulgaria, and France (Koçoğlu, 2008, p. 43). With the rapid development of ecotourism around the world, Asian, African, and Latin American countries with rich natural and cultural heritage see ecotourism as an economic element. For this reason, they encourage ecotourism activities and improve local transportation systems and infrastructures in order to increase their share in the international tourism market. (Ural & Direk, 2022, p. 5).

One of the countries where ecotourism is developing is Costa Rica. The country's rich biodiversity and protected national parks attract the attention of ecotourists. Ecotourism activities in Costa Rica contribute greatly to the protection of natural life and also support the local economy. For example, Monteverde Cloud Forest and Tortuguero National Park are famous for their biodiversity protection and sustainable tourism practices (Weaver, 2001, pp. 112-118). Other countries that host successful ecotourism practices are Kenya and Tanzania. Especially regions such as Serengeti National Park and Masai Mara National Reserve are famous for their safaris. Ecotourism activities carried out in

these areas contribute to the protection of wildlife and the economic development of local communities (Honey, 2008, pp. 213-218).

With its natural beauty and biodiversity, New Zealand is one of the important ecotourism destinations. The country successfully implements ecotourism practices by adopting the principles of nature conservation and sustainable tourism. Fiordland National Park is the largest national park in New Zealand and is on the UNESCO World Heritage List. The park attracts attention with its unique natural landscapes and rich biodiversity. Ecotourism activities carried out in Fiordland National Park aim to both protect nature and provide visitors with sustainable tourism experiences (Buckley, 2004, pp. 122-126). Another country where ecotourism activities are successfully implemented is Australia. The world's largest coral reef, the "Great Barrier Reef," attracts great interest from ecotourists. Ecotourism activities carried out in this region raise awareness for the protection of marine life and contribute to the development of sustainable tourism practices. Tours organized for tourists to explore the reefs also provide funds for conservation projects (Newsome, Moore & Dowling, 2012, pp. 48-53).

Ecotourism activities are important for tourism in Turkey. Turkey has a rich ecotourism potential due to its climate, geographical location, natural and cultural resource richness, and diverse flora and fauna. In addition, considering the plateaus, mountains, rivers, caves, seas, lakes, and natural areas that the country has, Turkey has a significant ecotourism potential (Selimoğlu, 2010, p. 48; Kahraman & Türkay, 2012, p. 50). The Ministry of Culture and Tourism of the Republic of Turkey has prepared and published the 2023 Turkey Tourism Strategy and Action Development Plan in order to spread tourism in Turkey to all seasons throughout the year through alternative tourism types.

In this published strategy, it is emphasized that health tourism, thermal tourism, ecotourism, plateau tourism, winter tourism, golf tourism, and congress and fair tourism should be developed as a priority. In addition to this strategy and action plan, many projects have been developed by the Ministry of Culture and Tourism in order to develop ecotourism and increase the welfare of the local people by supporting rural development (Bekiroğlu, 2008, p. 24). The ATAK Project (Mediterranean-Aegean Tourism Infrastructure and Coastal Management), the Blue Flag Project, the Plateau Tourism Project, the Mountain-Nature Hiking Project, the Project for Determination and Development of Bicycle Tour Routes, the Horse-Horse Hiking Project, the Cave Tourism Project, the South Antalya Tourism Development Project (GATAP), the Green Globe 21 Program, the Green Star Project, and the Blue Flag Project are some of these projects. (Akyurt, 2019, p. 362; Kutluay, 2015, p. 343).

6. Conclusion

Ecotourism is an important tourism approach that offers a sustainable solution to problems such as environmental degradation, cultural changes, and socioeconomic inequality. This model, which focuses on the protection of natural and cultural resources, also contributes to the development of local communities, making tourism an activity that creates value not only economically but also environmentally and socially. Ecotourism, which offers an important alternative in terms of compensation for the damages caused to nature and culture by traditional mass tourism, provides benefits in environmental, economic, and socio-cultural dimensions in line with the basic principles of sustainable tourism. In this respect, ecotourism is not only a form of travel; it also represents a philosophy of life in harmony with nature.

Ecotourism is a type of tourism that is sensitive to the natural environment and progresses within the framework of sustainability. Ecotourism, which has an important place in minimizing the negative effects of mass tourism on the world, aims to protect the environment, preserve the biodiversity of natural areas, and develop local communities economically and socially. Ecotourism is a type of tourism that generally includes activities compatible with nature, such as nature walks, bird watching, and camping, and is carried out in natural areas. In this context, ecotourism plays an important role in protecting nature and supporting local communities.

Ecotourism has significant benefits for local communities, such as economic development, preservation of cultural values, and increased environmental awareness. The benefits of ecotourism on local communities help local people build a more sustainable and prosperous future. However, in order to fully utilize the potential of ecotourism, a planned, controlled, and participatory approach is needed. It is of great importance that ecotourism practices are carried out in cooperation with local people, that tourism activities are organized in accordance with the carrying capacity of natural areas, and that environmental education activities are disseminated. In addition, the active and responsible involvement of policymakers, tourism businesses, and tourists in this process is a critical requirement for the sustainability of ecotourism.

Looking forward, it is important to see ecotourism not only as a touristic activity but also as a part of environmental education, combating climate change, and rural development policies. Collaboration between universities, civil society organizations, local governments, and private sector actors will increase the multidimensional effects of ecotourism. In addition, strengthening environmental education at the school level and reflecting this awareness in tourism habits should be considered as a long-term strategy in order to increase the environmental sensitivity of young generations.

As a result, ecotourism is not only an alternative type of tourism; it also represents a life in harmony with nature. In today's world, where natural resources are rapidly depleting and global threats such as climate change are increasing, the development and dissemination of ecotourism have become a necessity in terms of both environmental protection and social development. Therefore, a more conscious, responsible, and sustainable tourism approach needs to be adopted both at the individual and institutional level.

7. Resources

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Chapter 2

The Use Of Artificial Intelligence-Based Virtual Influencers in The Tourism Sector¹

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Abstract

The rapid advancement of information and communication technologies has brought about profound transformations in the daily lives of individuals and in the operational structures of businesses. Among the most impactful of these innovations is artificial intelligence (AI), which, together with social media tools, has begun to redefine practices across various sectors. Although AI technologies initially emerged from the technical sciences, their application has expanded into fields such as education, management, marketing, and particularly tourism. This study explores the growing role of AI in the tourism sector, with a specific focus on the use of AI-based virtual influencers in digital marketing. These virtual personas, developed through sophisticated AI systems, now serve as promotional agents for tourism products and services. Influencers such as Imma Gramm and Shud Gramm, originally associated with luxury branding, have shifted towards promoting niche tourism experiences via social media. This reflects a broader trend in which tourism businesses seek innovative, engaging ways to reach and influence consumers. The study emphasizes that the intangible and experiencebased nature of tourism products necessitates enriched digital content, for which AI applications offer significant advantages. Moreover, AI technologies contribute to efficiency, safety, and precision by reducing human error and operating in environments that may be hazardous to humans. The findings

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suggest that as the number of AI and social media users continues to grow, so too will the opportunities for their integration in business strategies. Ultimately, this research highlights the strategic importance of transformation and innovation, particularly in tourism, through the effective use of AI-based tools.

1. Introduction

The digital transformation process is being shaped by new-generation technologies such as the Internet of Things, artificial intelligence, sensor technologies, cognitive systems, nanotechnology, internet-based services, quantum computing, wearable devices, augmented reality, smart signalling systems, autonomous robots, big data analytics, 3D printers and smart energy grids. This technological paradigm, known as Industry 4.0, has led to profound changes in many areas, from business practices and communication methods to education and daily life. One sector inevitably affected by these rapid technological developments is the tourism industry. As the tourism sector begins to adapt to these developments, a new, digitalisation-focused approach called "Tourism 4.0" has emerged, paving the way for innovative industry practices (Bahar et al., 2019).

Artificial intelligence (AI) is a rapidly evolving technology with a wide range of applications and growing significance in today's world. In recent years, new investments have further developed AI, expanding its areas of application and enabling its use across various sectors (Kurcer & Civelek, 2023). As one of the fastest-growing technology fields in recent years, AI is driving a profound societal transformation. A subfield of computer science, AI focuses on developing systems that mimic human intelligence. The main goal of AI is to enable machines to think, learn and solve problems like humans do. Research in this field has advanced rapidly since the mid-20th century. Studies on AI in the literature have addressed various aspects of the technology. There are numerous perspectives on the definitions of AI, its types, and the areas in which these types are applied. AI is utilised in many fields, including healthcare, education, transportation, and security. The rapid and continuous advancement of technology is having a profound effect on both social life and commercial activities. In the business world in particular, many processes -from consumer behaviour to the delivery of products and services- are undergoing significant transformation. In recent years, digital transformation has become a strategic priority for businesses. This dynamic process continues to evolve with new developments emerging daily. The literature on artificial intelligence offers a multifaceted body of research that includes fundamental theoretical frameworks, practical applications and legal debates in this field. This literature provides

important academic and practical insights, and is expected to guide future artificial intelligence research.

2. Artifical Intelligence

2.1. The Concept of Artificial Intelligence

Artificial intelligence (AI) is a concept derived from the notion of intelligence, whose boundaries are continuously reshaped by technological advancements. Therefore, before delving into AI, it is important to first address the concept of intelligence itself. Intelligence is a multifaceted concept that has been examined from various perspectives across numerous disciplines throughout history. Traditionally associated with cognitive abilities such as learning, problem solving, reasoning, planning, creativity and abstract thinking, intelligence reflects the human capacity to adapt to and transform the surrounding environment. McCarthy (2007) defined intelligence as 'the computational part of the ability to achieve goals in the world', thereby rendering the concept applicable to computational systems such as machines and removing it from being exclusive to humans. This perspective suggests that intelligence should be considered not merely as a biological trait, but as a functional ability. Similarly, Tegmark (2017), a physicist and AI thinker known for his work on cosmology, computational neuroscience, and the future of artificial intelligence, approaches the concept of intelligence from theoretical and practical standpoints. He defines intelligence as the ability to achieve complex goals, offering a broad and inclusive framework that encompasses both biological entities and artificial systems. Both definitions converge on the idea that intelligence is not an exclusive trait of a particular type of being, but rather a universal capability based on goal-oriented information processing. The concept of reproducing intelligence in digital environments has driven the development of AI research grounded in the algorithmic modelling of human cognition. In the 21st century in particular, AI has evolved into a new scientific paradigm due to advancements in information technologies (Suleyman & Bhaskar, 2023). The potential of artificial intelligence to perform functions similar to human intelligence is examined from multiple dimensions in the literature, including its ethical and societal impacts. The concept of artificial intelligence was first discussed academically at a workshop held at Dartmouth College in 1956 under the direction of John McCarthy. At this workshop, the idea that machines could imitate human-specific abilities such as learning, language use, problem solving and self-improvement was discussed. During the workshop, Newell and Simon's Logic Theorist program proved the potential of artificial intelligence by proving mathematical theorems. This initiative has led to the

development of AI as an independent subdiscipline of computer science (Russell and Norvig, 2005).

When examining the concept of artificial intelligence (AI), it is defined as the discipline of developing systems that can perform cognitive functions such as learning, understanding, thinking, perceiving, judging, reasoning, decisionmaking, communicating, designing, planning and problem-solving through artificial means that resemble human intelligence. These systems are created using machines and computers. The field focuses on designing, implementing, and establishing the theoretical foundations of machines that imitate the type of intelligence observed in human activities. By its nature, artificial intelligence differs from human intelligence in that it is expressed solely through machines, which distinguishes it from natural intelligence (Cai et al., 2021: 3-4). Russell and Norvig (2005) categorise definitions of artificial intelligence in the literature under four headings: thinking like a human; thinking rationally; acting like a human; and acting rationally. Within this framework, AI is considered a multifaceted research domain that encompasses the development of systems which mimic human mental processes and exhibit rational decision-making and problem-solving abilities. Conversely, Dixon (2023) argues that artificial intelligence is not merely a technology that performs cognitive tasks; it is a force with the potential to directly interact with the human mind and transform individual capacity. Dixon emphasises AI's particular strengths in terms of its speed, precision, and intuitive capabilities in learning, interpretation, and decision-making processes. He notes that AI's capacity to swiftly and accurately process even minimal brain data -converting human thought directly into actionindicates its growing integration with human biology.

Some researchers who have attempted to define artificial intelligence (AI) argue that it will surpass human cognitive capacity (Kurzweil, 2024). According to Kurzweil, AI will not only imitate human thought patterns, but also evolve beyond human cognitive abilities. He considers the development of AI from a broad perspective, suggesting that this progress marks the beginning of a new cognitive era in which human and machine intelligence converge. When considered together, the various definitions reveal that the concept of artificial intelligence has a multi-layered, evolutionary structure. Historically, AI research began as an effort to replicate human cognitive functions through machines. Over time, it has acquired an interdisciplinary nature and evolved in both theoretical and applied dimensions. The definitions presented in the literature demonstrate that AI is not only concerned with generating human-like behaviours, but also with developing systems capable of making rational and autonomous decisions. In this context, AI can be defined as a transformative technology that integrates

with human biology, expanding the boundaries of intelligence and creating a new cognitive paradigm. AI technologies are advancing rapidly, with new products emerging and becoming increasingly prevalent in everyday life. In particular, automation systems are being enhanced with AI technologies, enabling them to benefit from computers' decision-making power. This leads to the development of more functional and efficient commercial systems (Öztemel, 2020). Data and analyses related to human behaviour have recently contributed significantly to the advancement of artificial intelligence. Many of these developments appear in our daily lives as innovations that we often use without realising, which make tasks easier, safer and more cost-effective (Minevich, 2024, p. 14).

- Virtual assistants help reduce unnecessary hospital visits, allowing nurses to save 20% of their time. At the same time, workflow assistants free up 17% of doctors' schedules.
- Artificial intelligence lowers vacation costs by predicting the best time for booking flights, hotels, car rentals, and holiday homes.
- Voice assistants enable easy access to information.

2.2. The Historical Development of Artificial Intelligence

Artificial intelligence is one of today's most important technological developments, being both exciting and controversial. The stages it has gone through and how it has evolved over time reflect the depth of humanity's relationship with technology, and where it stands today. Understanding the historical development of this field is crucial not only for knowing the past, but also for anticipating the future of artificial intelligence.

The concept of artificial intelligence originated in ancient times with hydraulic and mechanical automatons. By the late Middle Ages, the idea of human-like machines had gained momentum through the figure of the Golem in Jewish tradition, which could be programmed using letter combinations from the Book of Creation. This approach is regarded as one of the historical foundations for programmable beings. During the Renaissance, Leonardo da Vinci designed mechanical humans, and in the Baroque period Pierre Jaquet-Droz created a complex clockwork mechanism integrated into a human-shaped puppet capable of playing the piano, drawing pictures and writing sentences (Mainzer, 2019). In the 19th century, Ada Lovelace laid the groundwork for software by writing notes for Charles Babbage's Analytical Engine, creating the world's first computer program. This work also inspired Alan Turing's concept of the Turing machine (Toon, 2024). In the mid-20th century, Turing questioned whether machines could think in his 1950 study. Instead of providing a direct answer, he developed an indirect evaluation method known as the Turing test. According to Turing, if a human cannot tell whether an entity communicating via written messages is human or machine, the machine is considered to be thinking. This approach is regarded as one of the pioneering works that formed the theoretical framework of artificial intelligence (Ford, 2018; Chishti et al., 2020). The technical foundations of artificial intelligence research were established in 1943 with the creation of the artificial neuron model by McCulloch and Pitts. In this model, neurons operated in simple on-or-off states and were capable of performing logical operations (Stuart & Norvig, 2010). In 1949, Hebb proposed that learning occurs through the strengthening of connections between firing neurons, a concept that became known as the Hebbian learning rule. The first practical AI applications emerged with Strachey's chess program in 1951 and Samuel's selflearning checkers program in 1955 (Minevich, 2024). The summer workshop held at Dartmouth College in 1956, led by John McCarthy, is considered the seminal event at which the term 'artificial intelligence' was coined, marking the birth of the discipline (Stuart & Norvig, 2010; Kurzweil, 2024; Chishti et al., 2020). Participants debated whether machines could exhibit human-specific abilities, such as language use, abstraction, problem solving and learning. Following this event, Dendral, an expert system developed in 1965, became one of the first successful AI applications focused on analysing chemical structures (Chishti et al., 2020). The first International Joint Conference on Artificial Intelligence (IJCAI), held in 1969, helped to establish artificial intelligence as an academic discipline.

equip computers with decision-making abilities based on knowledge obtained from domain experts. However, as these systems struggled to process large, complex sets of rules, the concept of learning from data became more prominent. This marked the beginning of the transition to machine learning-based systems (Cai et al., 2021). One of the first global events to demonstrate that artificial intelligence could surpass human performance occurred in 1997, when IBM's Deep Blue computer defeated the world chess champion, Garry Kasparov. In the 2010s, significant advances in areas such as image processing, natural language understanding, and speech recognition were made thanks to deep learning systems developed by Geoffrey Hinton and his team (Ford, 2018). The most notable example of these achievements was AlphaGo's victory over the Go world champion, Lee Sedol, in 2016 (Gawdat, 2021; Chishti et al., 2020). More recently, large language models (LLMs) such as ChatGPT, DALL•E, Codex and Whisper have approached, and in some cases even surpassed, human capabilities in tasks such as content generation, translation, coding and speech recognition (Doll-Steinberg & Leaf, 2023). These developments have driven technical progress and sparked social, economic, and ethical debates. Chatbot technology originated in

the 1960s with the development of a program called ELIZA at MIT. This system is widely regarded as the first chatbot capable of engaging in written communication with users based on specific keywords (Cai et al., 2021; Mainzer, 2019). The claim that the Eugene Goostman system passed the Turing Test in 2014 reignited discussions about the potential of machines to interact in a humanlike manner (Kurzweil, 2024). During this period, digital assistants such as Siri, Alexa and Google Assistant evolved from simple command-response systems into ones capable of speech recognition, contextual understanding and learning from user data (Ford, 2018; Mainzer, 2019; Gawdat, 2021). However, this development process has also raised ethical concerns. For instance, shortly after learning from social media data, Microsoft's chatbot Tay began producing offensive statements, highlighting the risks of uncontrolled data-driven learning (Gawdat, 2021). Today, chatbots are generally classified into three main types: knowledge-based systems, text assistants, and creative content generators. They remain among the AI applications that establish the most direct interaction with users (Toon, 2024).

The historical development of artificial intelligence reflects humanity's desire to understand its own mental abilities, and to recreate them through machines. Spanning from ancient times to the present, this process has transformed AI from a mere technological field into a multifaceted domain of thought, shaped by theoretical and technical advancements. Each era has contributed to the field in different ways, sometimes through new ideas and sometimes through groundbreaking applications that have accelerated its progress. To fully comprehend the current state of AI, it is necessary to revisit this historical development, as this provides valuable insight into the future of the field.

2.3. Types of Artificial Intelligence

The three types of artificial intelligence are narrow AI, strong/general AI and super AI. Narrow AI refers to applications that perform specific tasks extremely well. Voice recognition features such as those behind Siri and recommendation systems on Amazon are common examples encountered in daily life (Binbir, 2021). However, despite their apparent power, narrow AI systems remain far from replicating the holistic functions of complex, multidimensional human intelligence (Abbott, 2020, p. 24). Examples of narrow AI applications include online translation services such as Google Translate and Yandex Translate, voice assistants like Siri, Cortana and Alexa, and search engines such as Google, Yandex and Yahoo (Kurçer & Civelek, 2023). Strong AI (Artificial General Intelligence – AGI), on the other hand, is an intelligence capable of integrating knowledge from different domains, demonstrating flexibility, and using common

sense, much like human intelligence (Schneider, 2019, p. 9). This type of AI can perceive, see, hear, establish relationships between events and solve problems in a manner similar to that of an average human (Çuhadar et al., 2022).

The next step beyond strong artificial intelligence is super artificial intelligence: systems with the capacity for continuous self-improvement. These systems have the potential to optimise their own software and surpass human intelligence in terms of both depth and speed. This concept represents a threshold at which technological advancement occurs at an unpredictable and uncontrollable pace. Although this idea is not new - it was first proposed in 1965 by the mathematician Irving John Good - it remains a significant and controversial topic. According to Good, the first ultra-intelligent machine will be humanity's last invention, as it will be capable of autonomously inventing all subsequent inventions. This opens the door to the idea that artificial intelligence could become the guiding subject of the future, rather than merely a tool (Abbott, 2020, p. 24). Super artificial intelligence is a form of intelligence that far exceeds human cognitive capabilities. Such systems do not think or act like humans, but instead operate in a fully rational manner. The achievement of super artificial intelligence requires the prior attainment of general artificial intelligence. One of the greatest obstacles to predicting when super artificial intelligence will be attained is the significant lack of understanding regarding the functioning and operation of the human brain (Kurçer & Civelek, 2023).

3. Artificial Intelligence Learning Models

Artificial intelligence is a broad field involving complex and sophisticated processes. Consequently, the scope of its study encompasses numerous theories, methods and technologies (Aylak & Oral, 2021). AI learning models fall under the categories of machine learning, artificial neural networks, and deep learning. Machine learning is a general term for computer algorithms that model a problem based on related data. The model created using an existing dataset and algorithm aims to achieve the highest possible performance. Many machine learning methods have therefore been developed, including the nearest neighbour algorithm, naive Bayes classifier, decision trees, logistic regression analysis, the k-means algorithm, support vector machines and artificial neural networks. Some of these approaches are capable of prediction and estimation, some of clustering, and some of classification (Kaynar et al., 2016). Machine learning is a subdiscipline of artificial intelligence. It enables systems to learn by recognising patterns in data without being explicitly programmed beforehand. Moreover, it improves by learning from mistakes. According to Hawkins (2021, p. 119), machine intelligence is expected to transform our lives and society

fundamentally. This transformation is predicted to be greater than the impact of computers in the 20th century. However, history shows that it is difficult to predict precisely how new technologies will evolve. For instance, in the 1950s, no one could have anticipated integrated circuits, solid-state memory, wireless communication or the internet, nor the ways in which computers would revolutionise media, communication and commerce. Similarly, it is currently impossible to accurately foresee what smart machines will look like or how they will be used over the next 70 years.

Artificial neural networks can be defined as mathematical models of biological neural systems. They consist of interconnected artificial neurons that are designed to mimic the nervous system's ability to store, process and utilise information. The aim is to develop intelligent systems that can make decisions and reason like humans do (Kaynar et al., 2016). One of the most widely used artificial neural network models is the Multilayer Perceptron (MLP), composed of three main layers: input, hidden, and output. The input layer is the first layer at which the model processes data received from the external environment. Each neuron in this layer represents a feature, meaning the number of neurons corresponds to the number of features in the dataset. The output layer provides the model's predictions or classification results. The number of neurons in this layer varies according to the type of problem: for example, binary classification problems require a single neuron, whereas multi-class problems require one neuron per class. Hidden layers, located between the input and output layers, serve as intermediate layers where data undergoes various transformations and abstractions. The number of hidden layers and the number of neurons in each layer are not fixed in advance, but are critical parameters that directly affect the model's overall learning performance and accuracy. The MLP model is classified as a 'feedforward neural network' since information is transmitted only in a forward direction through the layers. During training, the learning algorithm updates the network's weights to minimise the error between the predicted and true values (usually using squared error). The backpropagation algorithm, typically combined with derivative-based optimisation methods, is usually employed for this purpose (Kaynar et al., 2017). Artificial neural networks imitate the way the human brain works. These systems learn from very large datasets and optimise their outputs by activating or inhibiting software 'neurons' via data flow. Search engines like Google are a common example of such systems. To perform a given task, an artificial neural network is trained using relevant examples. During training, the network learns hidden relationships within the data and produces appropriate responses based on these learned patterns when encountering similar situations. This process involves multiplying the input data

by the corresponding weights in the network, adding up these products and processing the result through an activation function (Öztemel, 2020).

Another type of artificial intelligence learning model is deep learning. Although there are many types of machine learning algorithm, deep learning has recently attracted the most attention and caused a revolution in the field. Deep learning uses deep, or multilayer, artificial neural networks. These are software systems that mimic the way neurons operate in the human brain. It has been the primary driving force behind the artificial intelligence revolution witnessed over the past decade (Ford, 2018, p. 19). It first gained widespread recognition in 2012 when it achieved remarkable success in the large-scale ImageNet object classification competition. While the foundations of deep learning date back many years, its recent surge in popularity is largely due to two main factors: firstly, sufficient data has become available for training purposes, and secondly, the necessary hardware infrastructure has been developed to process this data (Krizhevsky et al., 2012). Deep learning is a method that uses multilayer artificial neural networks for tasks such as object and speech recognition and natural language processing. Unlike traditional machine learning methods, which are based on coded rules, deep learning can automatically learn from symbols in data, such as images, videos, audio and text. Thanks to their flexible structure, deep learning models can learn directly from raw image or text data, and their predictive accuracy tends to improve as the amount of data increases (Y1lmaz, 2021). Deep learning is based on computational models that represent data through multiple layers of processing units. These models process data in layers with multiple levels of abstraction. The fundamental goal of deep learning is to provide a structure through which the model can develop the necessary steps in its own learning process rather than every step of a program being defined explicitly. This enables the model to generate flexible and effective solutions in response to various scenarios (Çakıroğlu & Süzen, 2020).

4. The Future of Artificial Intelligence

The rapid increase in data production makes it increasingly challenging for businesses to transform this data into meaningful decisions. Artificial intelligence has now become a crucial tool in this process, forming the foundation of machine learning and potentially replacing humans in complex decision-making processes. These systems are characterised by low error rates and play an active role in determining the most appropriate decision by analysing possible scenarios. Thanks to advancements in machine learning and deep learning, it is expected that more and more decision-making processes in the business world will be delegated to AI-based systems. These technologies save time and money while
reducing workload through multitasking capabilities, and enhance productivity by operating continuously. With its applicability across various sectors, artificial intelligence is making business processes faster and more effective (Öznur & Gezer, 2025, p. 39).

Although predictions about the future impact of artificial intelligence on the workforce remain uncertain, more concrete findings about its effects are emerging. In many countries, middle-income jobs are declining, while high-skilled cognitive roles and low-wage manual roles are increasing. However, there is insufficient evidence to suggest that middle-class workers are moving into higher-value roles. Negative effects on employment levels and wages have been observed particularly in regions where robots are employed. Furthermore, artificial intelligence has evolved into a surveillance tool that algorithmically manages workers' tasks. Amazon is a prime example of this, with employee performance being rigorously monitored, productivity targets set at unrealistic levels and movements tracked via wrist-worn sensors. These practices vividly expose the oppressive impact of technology on human labour and highlight inequalities within the digital economy (Zerilli, 2020, p. 196).

Although many discussions about the future of the workforce focus heavily on technology, other factors, such as remote working, also play a significant role. These factors influence how work is performed, who performs it, and where it is done. Furthermore, employers must pay close attention to emerging job roles, as a 2020 research report indicates that 85% of jobs in 2030 have yet to be invented. Employees will need to acquire new skills to take advantage of emerging job opportunities or adapt to changes in their current roles. However, despite concerns about automation, some business leaders are failing to prepare their workforce adequately. Although almost half of business leaders (45%) are aware of automation initiatives, only a small proportion (15%) actively communicate upskilling efforts. This could lead to a significant mismatch between the capabilities of the future workforce and job requirements. It is estimated that nine out of ten jobs in the future will require digital skills, yet currently, 44% of people aged 16 to 74 in Europe lack even basic digital competencies. This skills gap is expected to result in a shortage of around 1.67 million information and communications technology (ICT) specialists in Europe by 2025 (Minevich, 2024, p. 45). According to Kurzweil (2024, p. 174), the forthcoming wave of artificial intelligence is characterised as 'deskilling'. For instance, autonomous vehicles could entirely replace human drivers. AI can now perform many tasks without human involvement and often outperforms humans. However, this does not necessarily imply the total disappearance of occupations, but rather that many professions will be reshaped with new skill requirements. For instance, although

routine banking transactions have been automated by ATMs, the role of bank tellers has shifted towards more human-centric activities such as customer relationship management. Similarly, graphic designers are likely to collaborate with AI and develop new skills that differ from traditional ones. In recent years, the power demonstrated by artificial intelligence has attracted significant media attention and commentary. Countless news reports, articles, books, documentaries and TV programmes have highlighted AI's achievements, heralding the dawn of a new era. However, this coverage can also give rise to speculation and fear. Instances of racial and gender bias have been identified in certain machine learning algorithms, raising serious concerns about the potential impact of AI-powered technologies, particularly facial recognition systems, on privacy. Media outlets regularly broadcast warnings that robots could soon be weaponised, or that superintelligent machines could pose an existential threat to humanity (Ford, 2018, p. 8).

5. Artificial Intelligence and Tourism

In recent years, the use of robotic technology has expanded rapidly across various sectors worldwide. The advent of Industry 4.0 and artificial intelligence has given robotic technology a new dimension. Although tourism remains a labour-intensive industry, it has also significantly benefited from these technological developments (İbiş, 2019). As with other industries, technological advancements in the 21st century have had a substantial influence on the tourism sector. Notably, innovations brought by Industry 4.0 have considerably improved the way tourism activities are conducted and the resources used for them. Given the multifaceted and integrated structure of the tourism sector, it is well known that it has continually evolved alongside technological progress throughout history (Dülgaroğlu, 2021). Digital transformations in tourism enable tourists to experience products and services in advance, resolve issues more effectively, and receive personalised offerings. They also allow enterprises to track customers by processing data collected from them. Consequently, artificial intelligence technologies are being employed in many areas within tourism enterprises (Asiltürk Okutan, 2024).

Businesses operating within the tourism sector have consistently embraced technological advancements to improve customer service, enhance experiences and streamline processes (Cabi Bilge, 2023). The widespread adoption of technology means that artificial intelligence-based systems are now being used in accommodation establishments, food and beverage enterprises, travel agencies, transportation companies and recreation businesses. In light of these evolving conditions, it is reasonable to suggest that AI will soon be integrated

into almost every area of the tourism industry (Kurçer & Civelek, 2023). AIsupported site searches, augmented reality, biometric data recognition, reservation systems, chatbots, drones, kiosks/self-service screens, machine translation, QR codes, robots, virtual reality and voice assistants are among the diverse range of AI technologies currently used by tourism businesses. Consequently, consumer responses to this extensive digital transformation have become an increasingly significant research topic (Sousa, Cardoso & Dias, 2024). Artificial intelligence is used in many different areas of the tourism sector. AIbased chatbots, in particular, are widely used in customer service to provide a fast and efficient 24/7 service for hotel and travel reservations, thereby increasing user satisfaction while reducing businesses' operational costs. Personalised recommendation systems facilitate tourists' decision-making processes by offering customised holiday plans and destination suggestions based on users' previous preferences and behaviours. Furthermore, AI systems integrated with big data analytics analyse tourists' behavioural tendencies, providing businesses with valuable insights for demand forecasting, product positioning and marketing strategy development. Facial recognition technologies enable fast hotel check-in and check-out processes, while dynamic pricing systems allow businesses to adapt their revenue management strategies to demand fluctuations. Furthermore, virtual assistants provide tourists with digital guidance services, making the travel experience easier and more enriching (Tussyadiah & Miller, 2019).

Artificial intelligence technologies are utilised by tourism enterprises for various purposes, including communicating with guests, analysing and reporting on data, maintaining continuity in guest relations, enhancing guest satisfaction by meeting expectations, and increasing operational and managerial efficiency, thereby gaining a competitive advantage. AI-based robotic systems perform tasks such as transportation, guest reception, food and beverage preparation and service, information provision, minimising service disruptions, room and communal area cleaning, and room service (Cuhadar et al., 2022). Additionally, virtual customer representatives are widely used in tourism enterprises. These virtual representatives enable businesses to create powerful chatbots that can respond to enquiries from customers, employees, website visitors or service users. Consequently, enterprises can easily develop chatbots without the need for data scientists or software developers (Uzan & Sevimli, 2020). The frequent use of technology in people's daily lives has allowed businesses in the highly competitive tourism sector to become more innovative. The application of artificial intelligence in tourism enterprises has led to innovations in areas such as guest communication, meeting expectations, enhancing satisfaction and conducting data analysis. As a result, tourism businesses gain a competitive

advantage. Information and communication technologies are one of the best examples of technological advancements. These communication tools allow consumers to personalise and purchase tourism products. In this way, the tourism industry is becoming increasingly globalised (Asiltürk Okutan, 2024).

5.1. The Use of AI-Based Virtual Influencers in the Tourism Sector

The contemporary world is constantly changing and developing. This dynamic transformation creates an intense competitive environment. This competition generally pushes businesses, and the brands belonging to them, into fierce competition. To survive and stand out in this environment, businesses are adopting various marketing channels and innovative communication strategies to reach their target audiences (Avc1 & Yıldız, 2019). With the advent of social media, individuals have started to share their experiences online. This content is being shared at an accelerating rate, resulting in vast amounts of big data being generated in real time on the internet. The personal information, hobbies, likes and dislikes, actions and situations that users share on social media provide valuable insights, particularly for marketing purposes (Binbir, 2021). Businesses can increase their conversion rates tenfold by sharing content through influencers. Around 69% of brands use influencers to promote new products. These individuals act as opinion leaders and highly trusted references in marketing. When purchasing a newly introduced product, 62% of 18-24 year old users trust recommendations from YouTubers more than those from celebrities (Kayıkcı & Bozkurt, 2018). The daily increase in social media usage, the heightened activity of young people on these platforms, and the preference of companies to use these channels for marketing purposes have all contributed to the rise of the influencer profession. Individuals with a large social media following who share their experiences and lifestyles have started to influence other users through their posts. As awareness of and interest in these posts has grown, social media content has acquired a commercial perspective and begun to be used by firms and brands to create brand images (Efe & Ventura, 2020).

The importance of social media tools in experiencing tourism products and interacting with other consumers is undeniable. One such platform is Instagram, which has been active since 2010. In general, it enables users to share photos and videos of up to one minute in length. Recently, marketing activities have also begun to be conducted through the platform. While businesses can direct their marketing efforts on Instagram at relatively low cost, they also benefit from influencers. Influencers play a significant role in marketing and promoting products, enabling them to reach wider audiences in a shorter time. In parallel with advances in technology, the concept of influencers is evolving towards virtual influencers (Kurçer & Civelek, 2021). Instagram's vast user base and popularity have paved the way for the emergence of influencers on this platform. The term influencer is increasingly popular and is defined as a person whose opinions, thoughts and behaviours carry more weight than those of others (Avc1 & Yıldız, 2019). With the development of artificial intelligence and 3D technologies, the number of human-like virtual influencers is steadily increasing on social media, especially among new-generation consumers, due to their realistic appearance and activities. Many well-known brands use virtual influencers on digital platforms to promote their products and communicate with their target audience, with the aim of increasing engagement (Bozacı & Bulut, 2020). Virtual influencers produce content on a daily, weekly or monthly basis through their social media accounts. Through this content, they interact with their followers and provide recommendations. They generate content in various categories, including daily life updates, sports, and arts. They can also respond to comments from their followers. Furthermore, virtual influencers do not solely focus on conspicuous consumption in their posts; content related to their personal lives, family, sports, and personal care is also evident (Akgün, 2024). The growth of their audiences and their ability to generate income through brand collaborations has brought virtual influencers to the attention of global brands. When brands aim to establish a friendly, relatable and sincere connection with their target audience, they must carefully manage the digital life cycle of the character representing the brand. In this context, it can be said that virtual influencers have adapted all their communication skills for use on social media, successfully establishing an authentic relationship with a wide audience (Emecen et al., 2024).

Lu do Magalu, one of Brazil's largest retail brands, was introduced as the brand's promotional face on YouTube for the first time in 2009. Although Lu do Magalu is the virtual influencer with the most Instagram followers, she is mostly famous in her home country of Brazil. Lu do Magalu is also among the earliest virtual influencers on Instagram, having published its first post on 5 December 2014. From 5 December 2014 to 8 November 2022, the total number of posts reached 2,816. In second place on the list is Nobody Sausage, a simple animated character shaped like a sausage who is known for performing humorous dances and wearing colourful wigs. Created by Brazilian designer Kael Cabral, Nobody Sausage has become an enormous success on social media, amassing 18.2 million followers on TikTok. Rather than recommending specific products, Nobody Sausage plays a leading role in digital content created for advertising campaigns. The character has appeared prominently as a virtual influencer in the rebranding campaign for Boss, as well as in social media adverts for brands such as Netflix, Adidas and Bershka. Lil Miquela, also known as Miquela Sousa, is one of the most successful virtual influencers and has built a brand for herself without belonging to a single company. Having posted her first content on 1 April 2016, Lil Miquela portrays a 19-year-old Californian girl and has amassed nearly three million followers. Her collaborations with renowned brands such as Samsung, Amazon, Prada, Dior and Calvin Klein, as well as being named one of Time magazine's 25 most influential people on the internet in 2018, are testament to her success as a virtual influencer. Like Lu do Magalu, Lil Miquela is active on YouTube, Facebook, TikTok and Twitter, amassing a total of 35 million followers. She also has a career as a musician, averaging 157,000 monthly listeners on Spotify (Tari, 2023). Apart from Lil Miguela, there are other virtual influencers on Instagram who have a large number of followers and high engagement rates. For example, Knox Frost has 756,000 followers. The virtual influencer representing the World Health Organization has posted 146 times, receiving a total of 95,000 likes. Leya, who refers to herself as the first virtual ambassador, mainly shares posts related to the destinations she visits, and has 278,000 followers. She has posted 417 times and received 31,000 likes. Bermuda mainly shares fashion-related content and has 289,000 followers. She has made 268 posts, which have collectively received 257,000 likes. Shudu Gram, the world's first digital model, has 218,000 followers and has shared 92 posts. Of these, 70,000 were for posts in the luxury products category. Esther Olofsson, who is followed by 46,000 people, mainly shares fashion-related content. Her 339 posts have received 1,200 likes in total (Kurçer & Civelek, 2021).

Virtual influencers have also begun to be utilised by businesses in Turkey. One such influencer is Alin. Alin has 14.4 thousand followers and follows 89 accounts. Having made its first post on 3 August 2023, Alin had shared a total of 106 posts on its Instagram account by 14 May 2024. In the about section, Alin is described as an extraordinary influencer. Beyond this, Alin is recognised as Turkey's first virtual influencer in the automotive sector, prominently highlighting the brand it represents, fordturkiye, in its posts and categorising its content accordingly. Alin's posts fall into the categories of travel, automobile, technology, and fashion. Another Turkish virtual influencer is Ay Pera. Ay Pera has 13.4 thousand followers and follows 226 accounts. Among the virtual influencers considered in this study, Ay Pera stands out for following the highest number of personal accounts. Ay Pera made her first post on 16 December 2020 and shared a total of 98 posts on Instagram by 17 December 2021. In the about section, Ay Pera is described as an actor, photo model, musician, and digital human (Akgün, 2024). Alara X was developed by the software company IAMX Live Digital Human Software Technologies. Alara X has accounts on various social media platforms

where content is produced regularly. The character's first Instagram post dates back to 15 November 2020. The character also has accounts on Twitter and LinkedIn. The company has stated that it plans to develop more virtual humans besides Alara X (Bayçu & Artukarslan, 2023).

6. Conclusion

Today, the rapid development of information and communication technologies has brought about significant changes to the daily lives of individuals and societies. People are spending more and more time on online platforms. Businesses must also adapt to these changes. They need to anticipate consumer demands and expectations to keep pace with these transformations. Transformation, change and innovation are key to businesses sustaining their presence in the market and gaining a competitive advantage. Artificial intelligence and social media tools are two of the key components of these innovations. AI-based applications have become an integral part of daily life. Beyond facilitating everyday activities, these applications have become indispensable.

Although artificial intelligence technologies originated in technical sciences, they have since expanded to encompass a wide range of areas, including education, business, management, and marketing. The use of AI technologies in service industries has steadily increased in recent years. In the labour-intensive tourism sector, for example, AI technologies are employed in travel and marketing activities (Asiltürk Okutan, 2024). AI-based technologies are widely considered to be among the most innovative technologies in the world, having created a revolutionary impact across various sectors in recent years. Central to this development are intelligent systems and technologies that operate autonomously with minimal human intervention. The growing integration of AI applications into everyday life is transforming many areas, from public administration to daily practices (Çuhadar et al., 2022).

Applications of AI continue to evolve alongside social media tools. The number of users of both artificial intelligence and social media platforms is rising steadily. Accordingly, businesses that actively use social media track innovations and utilise virtual influencers as marketing tools. Developed with AI-based technologies, virtual influencers have begun to serve as the promotional faces of brands. The tourism sector is among those leveraging the marketing power of virtual influencers. Virtual influencers such as Imma Gramm and Shud Gramm, who have thousands of followers, play a role in promoting tourism products. These virtual influencers, who typically endorse luxury brands, have started to promote niche tourism products via their social media accounts. Tourism businesses are closely monitoring such developments and adapting accordingly. Given the unique characteristics and intangible nature of tourism products, enriching content through AI-based applications is particularly important.

As technology advances, an increasing number of fields are benefiting from artificial intelligence. When considering goals such as reducing human error, it is reasonable to assume that the use of AI technologies will become more widespread. Furthermore, AI technologies enable work in environments that are hazardous for humans and help to prevent potential threats to living beings (Kurçer & Civelek, 2023).

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Chapter 3

A Strategic Initiative In Turkish Foreign Policy: Assessing The National Polar Science Programme Through The Lens Of The Balance Policy Approach

Ali SAYILGAN¹

Abstract

This study aims to examine the significance of Turkish National Polar Science Programme (2018–2022) within the context of polar diplomacy, particularly through the lens of the balance policy approach that characterizes Turkish foreign policy. The Polar Regions play a crucial role in mitigating global warming and ensuring the sustainability of the global climate system. Nevertheless, the presence of valuable natural resources and strategic maritime routes renders the protection of these regions increasingly challenging. While historical territorial claims have been moderated through international agreements, ongoing global crises and the intensifying impacts of climate change have heightened tensions and encouraged the participation of new actors in polar affairs. Turkey, as one of these newly engaged states, seeks to contribute to the region through scientific collaboration and peaceful diplomatic initiatives. Moreover, guided by its broader foreign policy orientation, Turkey is positioned to function as a mediator, fostering balanced diplomacy among key stakeholders in the region. Within this context, the sources reflecting Turkey's strategy toward the polar regions are analyzed from a comparative perspective. The development and implementation of a balanced diplomatic approach are vital for the long-term stability and sustainability of the Polar Regions.

Keywords: Turkish Foreign Policy, Balance Policy Approach, Polar Regions, Turkey's National Polar Science Programme (TNPSP)

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Introduction

Since its establishment, the Republic of Turkey has assumed an active role in political, social, economic, military, and cultural affairs at the intersection of Eastern and Western societies. This active engagement is largely rooted in the historical legacy of the Ottoman Empire, whose position within the international system was effectively transferred to Turkey following its dissolution. One of the most significant continuities between the Ottoman Empire and modern Turkey lies in their foreign policy orientation. In particular, Turkey has frequently adopted a policy of balance—a strategy originally employed during the late Ottoman period within the framework of the international balance of power (Oran, 2001). This approach was especially evident during the Second World War and the Cold War, during which Turkey's commitment to balancing between competing hegemonic powers played a critical role in avoiding direct conflict and maintaining regional stability. The balance policy has continued into the post–Cold War era and remains a key feature of Turkey's engagement with contemporary international security issues.

In this context, the protection of the polar regions and the mitigation of climate change effects in these areas—issues that have recently gained critical importance in international security—represent a significant concern for Turkey, as they do for many other states. The polar regions are strategic territories where numerous states have historically asserted territorial claims, many of which remain unresolved. Moreover, the abundant natural resources in these regions serve as a catalyst for direct and indirect conflicts, complicating diplomatic efforts. Within this framework, the Turkish National Polar Science Programme (TNPSP), rapidly initiated in 2018, holds considerable strategic importance. Through this program, Turkey aims to integrate into the diplomatic network governing polar affairs (TNPSP, 2018) and position itself as a potential mediator among regional actors in dispute resolution. Accordingly, Turkey's historical political experience, combined with its current international security policies, plays a vital role in shaping a balance-oriented strategy and fostering a dialogue mechanism in the polar region.

This study addresses the research question: "What is the significance of the Turkish National Polar Science Programme (TNPSP) in shaping policies toward the polar regions within the framework of the balance policy approach in Turkish foreign policy?" To this end, the study begins by elucidating the concept of the balance of power—a central element in international relations—through the theoretical lens of Realism, thereby establishing the foundational principles underpinning the balance policy approach. Subsequently, the development of the balance policy within Turkish foreign policy is examined. The study then

analyses the strategic importance of the polar regions and the impact of climate change on these areas, followed by an evaluation of the evolution of Turkey's polar policy within the scope of the TNPSP. The discussion section critically engages with these findings, and the conclusion provides a comprehensive summary alongside relevant policy recommendations.

1. Balance Policy Approach: A Theoretical Examination within the Balance of Power Framework

The concept of power is generally defined as the "ability to control people and events" (Cambridge Dictionary, 2023). In the political realm, political power refers to the capacity of one political actor to influence and direct the actions of another (Roskin, 2014). This form of power is particularly significant in the international system, which is structured as a competitive arena where states exercise influence through political power. States often seek to enhance their power by forming alliances and increasing their military capabilities. These dynamics of power accumulation and competition give rise to the phenomenon known as the balance of power (Encyclopedia Britannica, 2023). Therefore, a comprehensive understanding of the structure of the international system is essential to grasp the concept of the balance of power.

The international system is structured through the complex interactions and relationships among states. A fundamental mechanism facilitating this structure is diplomacy, which is primarily based on inter-state dialogue. However, diplomacy can also take the form of power politics, where the pursuit of national interests predominates over cooperative dialogue. In such cases, the principle of safeguarding state interests becomes central to the competition for power among states (Viotti and Kauppi, 2001). This interest-driven perspective is extensively articulated within the framework of Realism, one of the most influential theories in international relations. According to proponents of Classical Realism, the core components of the international system are security, power, and the protection of state interests. They argue that the international system is inherently anarchic, compelling states to engage in a perpetual struggle to secure their survival and interests. Consequently, each state operates independently in the international arena, relying primarily on its military, economic, and political capabilities to defend itself against potential threats (Dunne et al., 2021).

Thucydides highlighted the significance of political power and the dynamics of the balance of power in his work *The Peloponnesian War*. He argued that the primary cause of the conflict between Athens and Sparta was Athens' formation of alliances aimed at counterbalancing Sparta's dominance (Dunne et al., 2021). In this context, the concept of balance of power refers to the strategies employed

by a state to protect itself against a more powerful rival within the international system. Similarly, Machiavelli conceptualizes the balance of power through the lens of human nature's inherent selfishness. He posits that while the total amount of power in the system remains constant, the distribution of power fluctuates as states seek to maximize their own gains. This self-interested behavior underpins the competitive nature of states, leading to conflicts over existing power and ultimately to the establishment of a balance of power system (Ağaoğulları, 2011).

Morgenthau, in contrast, adopts a more direct approach, asserting that power constitutes the fundamental focus of states within the international system. According to Morgenthau, states must undertake political and military actions to acquire power or to influence the formation of the balance of power. Such actions may include strategies of divide and rule, forming strategic alliances, or engaging directly in armed conflict to shape power distributions (Morgenthau, 1948). In this regard, Morgenthau's theory emphasizes the establishment and participation in mechanisms of direct control aimed at securing and maintaining power.

According to Kenneth Waltz, the founder of neorealism, state behavior varies significantly depending on the structure of the international system. In a hierarchical system, states tend to align with those who are strong and likely to prevail. However, within an anarchic system, even power-seeking and aggressive states may act in ways that harm their own allies (Donnelly, 2000). From this perspective, the international system functions as a self-help arena, where states prioritize their own security by maintaining sufficient military capabilities and forming interest-driven alliances. Through these interactions, a balance of power can emerge at various levels within the system (Waltz, 1979).

Within the framework of these theoretical perspectives, both Classical Realists and Neorealists attribute significant importance to the balance of power approach in shaping international relations. The analysis of the balance of power concept in this study serves to substantiate the balance policy approach, which has been a central feature of the foreign policy strategies of both the Ottoman Empire and modern Turkey.

The concept of balance policy is rooted in the longstanding principles of the balance of power system. Throughout history, the competition among states to acquire power has consistently resulted in the emergence of a balance of power structure. Within this system, certain states have developed a balance policy by strategically leveraging both systemic gaps and conflicts as opportunities to safeguard their national interests. Moreover, balance policy is characterized by a high degree of flexibility in its implementation. Specifically, it entails making rational and context-sensitive diplomatic decisions aimed at protecting state interests, which constitutes the fundamental basis of an effective balance policy (İbrahimoğlu, 2014).

In this context, the balance policy can be understood as a set of cyclical and adaptive strategies aimed at maintaining or responding to the existing balance of power. Furthermore, given the persistent state of competition inherent in the international system's anarchic structure, it is evident that the balance policy will remain a crucial and enduring approach in state behavior and diplomacy.

2. The Evolution and Application of Balance Policy in Turkish Diplomacy

The balance policy approach, which continues to play an active role in Turkish foreign policy, represents both a continuation and adaptation of the balance policy effectively employed by the Ottoman Empire during its later periods. Both the Ottoman Empire and the Republic of Turkey strategically capitalized on opportunities arising from the international balance of power to safeguard their national interests and mitigate conflicts. This political approach, rooted in the principles of the balance of power, enabled the Ottoman Empire to postpone its decline (Oran, 2001).

Turkey began to implement the balance policy approach more effectively following the 1920s. In the aftermath of World War I, the decline in Soviet-Russian pressure on Turkey facilitated a political rapprochement, allowing Turkey to pursue a balance policy between the emerging Eastern and Western blocs (Oran, 2001). Notably, Soviet Russia assumed a mediating role in the post-war negotiations between Turkey and Armenia, culminating in the signing of the *Turkish-Soviet Treaty of Friendship and Brotherhood* in 1921. This development enabled Turkey to construct an alternative balance strategy vis-à-vis the Western powers within the international system (Benhür, 2008).

Although Turkey's balance policy oriented toward the Soviet Union was strained by disputes such as the Straits issue and competing claims over dominance in the Black Sea, diplomatic relations were preserved on the basis of mutual political interests (Oran, 2001). One of the most significant challenges to Turkey's foreign policy emerged in response to the international expansionist agendas of the time. Owing to its strategic geopolitical position, Turkey was adversely affected by the aggressive policies stemming from the rise of Nazism in Germany and Fascism in Italy (Kocaoğlu, 2022). In response, Turkey sought to reestablish a new balance policy by moving closer to Britain and France. Relations with Britain improved significantly following the adoption of the Montreux Straits Convention in 1936, and the resolution of the Hatay Question further enhanced diplomatic ties with France (Özçelik, 2010). However, Turkey's decision to award Britain the contract for the rearmament of the Straits, in

accordance with the Montreux Convention, led to a serious deterioration in relations with the Soviet Union (Oran, 2001).

Following the Montreux Convention, one of Turkey's most significant efforts to uphold its balance policy was the signing of the Turkish-British-French Alliance in 1939. Through this alliance, Turkey declared its intention to remain neutral amid the escalating tensions and developments in the international system (Oran, 2001). Simultaneously, Turkey attempted to restore and enhance its political relations with the Soviet Union; however, the outbreak of the Second World War led to the suspension of these reconciliation efforts (Sönmez, 2018).

The Second World War period represents a notable example of balance diplomacy in Turkish foreign policy. In the early stages of the war, Britain and France exerted considerable pressure on Turkey to join the Allied side in response to escalating German and Italian aggression in the Balkans. However, Turkey remained neutral, primarily due to its reluctance to engage in direct confrontation with Germany (Sarıçoban, 2020). In a strategic move to maintain this neutrality, Turkey signed the *Turkish-German Friendship Pact* with Germany in 1941. Following the pact, Germany's military advance in the Balkans intensified, culminating in its declaration of war against the Soviet Union the same year. This escalation heightened German pressure along Turkey's borders (Demirer, 2015). Despite these developments, Turkey reaffirmed its stance of neutrality during the Moscow Conference in 1941 (Sarıçoban, 2020).

The war between Germany and the Soviet Union effectively concluded in 1943 with Germany's defeat (Deringil, 1982). In response to this shift in the war's dynamics, British Prime Minister Winston Churchill visited Turkey in an effort—supported by U.S. President Franklin D. Roosevelt—to persuade Turkish leadership to join the Allied war effort. During the Adana Talks, held on 30–31 January 1943, Churchill emphasized that Germany's military momentum had been halted and urged Turkey to enter the war in pursuit of a decisive Allied victory. The Soviet Union also strongly supported Turkey's involvement. The strategic objective was to capitalize on Turkey's geopolitical location and its control over the Straits (Ertem, 2010). For Turkey, however, the negotiations were framed within a precarious dichotomy between mounting British pressure and the looming Soviet threat. Despite these external pressures, President İsmet İnönü firmly declined to involve Turkey in the conflict (Hale, 2002).

Turkey, which had successfully maintained a policy of neutrality throughout most of the Second World War, shifted its strategic stance under increasing international pressure as the war drew to a close (Demirer, 2015). On 23 February 1945, Turkey officially declared war on the Axis powers—primarily as a symbolic gesture—to align itself with the emerging post-war order, secure an

invitation to the San Francisco Conference, and strengthen its position at the Yalta Conference (Sönmezoğlu, 2006). Despite this calculated realignment, tensions with the Soviet Union escalated. On 19 March 1945, the USSR issued a diplomatic note to Turkey, followed by the Molotov-Sarper Meeting. During this meeting, Soviet Foreign Minister Vyacheslav Molotov expressed concerns regarding the security of the Black Sea, territorial issues along Turkey's eastern borders, and the continued validity of the Montreux Convention. The Soviet Union subsequently annulled the 1925 Turkish-Soviet Treaty of Friendship and Neutrality. This marked a turning point, as Turkey was now directly confronted with the very Soviet threat it had long sought to avoid (Oran, 2001). This development became a catalyst for the renewed implementation of balance-oriented strategies in Turkish foreign policy in the post-WWII period.

One of Turkey's earliest strategic moves in the post-World War II era was to join the United Nations, signaling its alignment with the emerging liberal international order (Demirer, 2015). Western engagement with Turkey began to intensify with the announcement of the Truman Doctrine, which formed a cornerstone of the United States' broader Containment Policy aimed at limiting Soviet expansion (Larrabee & Lesser, 2003). As a complementary initiative, the Marshall Plan provided financial assistance to support the reconstruction of wartorn European countries, including Turkey, which received approximately 221 million USD in aid (Sönmezoğlu, 2006). Nevertheless, Turkey's most critical maneuver to counter the threat of Soviet aggression was its accession to the North Atlantic Treaty Organization (NATO). To demonstrate its commitment to Western security interests, Turkey contributed troops to the Korean War in 1950, a move that played a decisive role in its eventual admission to NATO in 1951 (Martin, 2004).

Shortly after the end of the Democratic Party era in Turkey, the Cuban Missile Crisis erupted in 1962. The crisis was precipitated by the Soviet Union's deployment of nuclear missiles in Cuba under the leadership of Nikita Khrushchev, in direct response to the earlier stationing of U.S. Jupiter missiles in Turkey and Italy (Allison, 1969). In return for removing Soviet missiles from Cuba, Khrushchev demanded that the United States dismantle its Jupiter missiles, particularly those in Turkey. Although U.S. President John F. Kennedy initially resisted this demand, the crisis ultimately led to the removal of the missiles from Turkey in 1963, following the Soviet withdrawal from Cuba. The resolution of the Cuban Missile Crisis not only marked the decline of Khrushchev's leadership but also signaled the beginning of the Détente Period, a phase of eased tensions between the superpowers during the Cold War (Sönmezoğlu, 2006).

Following the crisis, Turkey formulated plans to intervene militarily in Cyprus in response to the escalating Turkish-Greek conflicts that began in December 1963. However, the United States President Lyndon B. Johnson issued a diplomatic communication, known as "The Johnson Letter," warning that if Turkey were to initiate an attack on Cyprus, it would be denied access to NATO weaponry, be perceived as an open threat by both the Soviet Union and NATO, and that NATO would refrain from intervening in such a conflict. Consequently, this warning effectively prevented the outbreak of war at that time (Belleten, 1966).

Subsequently, the military junta that seized power in Greece following the 1974 coup orchestrated a coup against Archbishop Makarios in Cyprus. In response, Turkey launched the Cyprus Peace Operation on 20 July 1974, resulting in the occupation of a portion of the island. The operation concluded with a ceasefire agreement, dividing control of Cyprus between the Greek Cypriots in the south and the Turkish Cypriots in the north. Despite this division, the international community has consistently advocated for the reunification of the island, and diplomatic negotiations on this issue remain ongoing (Zürcher, 2004).

The period from 1980 to 2000 was marked by a series of military coups in Turkish politics. During this time, policies aimed at maintaining a balance between internal dynamics were predominantly pursued (Kösece and Paşaoğlu, 2021). The post-2000 era, however, represents a significant turning point in Turkish foreign policy, primarily due to the emergence of the Justice and Development Party (AKP), which assumed power in 2002. Under the AKP's governance, foreign policy incorporated elements of religious and spiritual values alongside the traditional nationalist identity, while economic, military, and political activities intensified considerably (Kaya, 2015).

Furthermore, Turkey experienced a decline in its relations with Western countries, while simultaneously reestablishing high-level political ties with Russia after a prolonged hiatus. This shift enabled Turkey to pursue a strategy aimed at reconstructing a balance of power mechanism between the West and the East in the post–Cold War international landscape (Çelikpala, 2015).

Turkey's policy of balancing plays a crucial role in several contemporary issues, among which the Syrian refugee crisis and the Russia-Ukraine conflict are particularly significant.

As a consequence of the Arab Spring, which began in Tunisia in 2010 and subsequently spread throughout the Middle East, civil war erupted in Syria, leading to widespread displacement and forced migration. Turkey became both a refuge and a transit route for these refugees en route to Europe (Karkın and Yazıcı, 2015). In response, the European Union and Turkey formalized the Turkey-EU Migration Agreement in 2016, aimed at curbing the flow of refugees into Europe and preserving the continent's demographic composition. Under this agreement, a financial aid package amounting to \notin 6 billion (\notin 3+3 billion) was pledged to Turkey, with partial disbursement completed by 2018 (Ministry of Foreign Affairs of the Republic of Turkey, 2023).

Although the implementation of the agreement was marked by disputes, it nonetheless yielded a degree of success. In this context, Turkey leveraged the agreement to improve its strained political relations with the EU and to strategically position itself as a key balancing actor amid the complex geopolitical tensions involving the EU, Russia, and Syria.

Finally, regarding one of the most contentious issues in the contemporary international system—the war between Russia and Ukraine—Turkey has once again pursued a prudent balancing policy. First, the foreign ministers of Russia and Ukraine participated in a trilateral summit hosted by Turkey, aiming to establish a foundation for a negotiated agreement (Ministry of Foreign Affairs of the Republic of Turkey, 2022). Turkey's primary objective in facilitating this dialogue was to prevent further escalation of the conflict and to mitigate the risk of a broader confrontation between Western and Eastern powers.

Second, acting under the auspices of the United Nations, Turkey mediated between the two parties, facilitating the signing of the Black Sea Grain Corridor Agreement. Through this initiative, Turkey sought to alleviate the compounded economic pressures affecting both its own economy and that of Europe (The Republic of Turkey Directorate of Communications, 2023).

The analysis of this entire process clearly demonstrates that Turkish foreign policy is fundamentally guided by a diplomacy of balance. While this approach has enabled Turkey to safeguard its national interests, it has also proven effective in mitigating conflicts among other states within the international system. The establishment of a balance of power, coupled with a pragmatic, self-interested strategy, often represents a more viable and preferable alternative to the risks associated with armed conflict.

3. Assessing the Importance of Polar Regions within the Framework of Climate Change

The polar regions refer to the areas situated around the Earth's North and South Poles. Geopolitically, the North Pole, or Arctic region, comprises the Arctic Ocean within the Arctic Circle as well as the surrounding landmasses. In contrast, the South Pole, or Antarctic region, is defined by its boundaries within the Antarctic Convergence, encompassing the Southern Ocean, the Antarctic continent, and the peripheral islands extending up to approximately 58 degrees south latitude (IPCC, 2022).

From an administrative perspective, the Arctic region is governed by the Arctic Council, established under the Ottawa Declaration in 1996. The Council is primarily composed of member states with territorial claims in the Arctic, including Canada, the Kingdom of Denmark, Finland, Iceland, Norway, the Russian Federation, Sweden, and the United States. Additionally, numerous other states, international organizations, and non-governmental organizations hold observer status within the Council, contributing to its multilateral governance framework (Arctic Council, 2023).

Antarctica is governed by the Antarctic Treaty, which was signed in 1959. This treaty effectively froze all territorial claims on the continent and designated Antarctica as a zone dedicated exclusively to scientific research and peaceful purposes. Currently, the treaty includes the participation of 53 countries. Among these, the 12 original signatories—namely the United States, Argentina, Australia, Belgium, France, South Africa, the United Kingdom, Japan, Norway, Russia, Chile, and New Zealand—along with 17 subsequent signatories, hold consultative status. The remaining 26 countries are represented as observers within the framework of the treaty (Republic of Turkey Ministry of Foreign Affairs, 2022).

In terms of natural resources, the Arctic is estimated to contain approximately 90 billion barrels of oil, 1,669 trillion cubic feet of natural gas, and 44 billion barrels of natural gas liquids in production capacity annually (U.S. Geological Survey, 2008). Furthermore, emerging sea routes in the Arctic—such as the Arctic Northeast Passage (NEP), Northern Sea Route (NSR), Northwest Passage (NWP), Transpolar Sea Route (TSR), and the Arctic Bridge—resulting from the effects of climate change, hold significant economic and strategic importance (Bayırhan and Gazioğlu, 2021).

In Antarctica, any exploration or feasibility studies related to mineral resources are prohibited under the 1991 Madrid Protocol. Nevertheless, some scientists suggest that Antarctica was once part of the ancient supercontinent Gondwanaland, implying that the continent may possess significant mineral resource potential despite the current restrictions on exploration. Additionally, the extraction and use of hydrocarbon resources potentially present in Antarctica are explicitly banned by the Madrid Protocol, reinforcing the continent's status as a protected area for environmental preservation (Curtin et al., 2003).

In the context of climate change, the Arctic is the most severely affected region globally. From the 1980s to 2018, the average temperature in the Arctic increased by approximately 0.5 degrees Celsius per decade, amounting to a total rise of

around 2 degrees Celsius. This warming has led to the near-complete melting of sea ice during summer months, raising concerns that the Arctic Ocean could become entirely ice-free by 2050 if average temperatures do not stabilize. Additionally, since the 1980s, the region has experienced significant declines in permafrost areas, increases in sea surface temperatures, rising sea levels, and adverse impacts on local biodiversity due to more frequent heatwaves (IPCC, 2022). Given that the average global temperature has increased by approximately 0.8 to 1.2 degrees Celsius since the Industrial Revolution (IPCC, 2019), the magnitude of warming observed in the Arctic underscores the heightened vulnerability and urgency of addressing climate change in this region.

The situation in Antarctica differs notably from that of the Arctic. Primarily, as a continental landmass, Antarctica experiences periodic fluctuations in glacier mass, with minor increases and decreases. However, since the early 2000s, there has been a sustained rise in glacier loss, although this loss is not as pronounced as in the Arctic. Additionally, sea surface temperatures have risen in the northern regions of the Southern Ocean, contributing to observed increases in global sea levels. Furthermore, temperature increases in permafrost areas over the past 30 to 40 years suggest that future permafrost melting is likely (IPCC, 2022).

3.1. Turkish National Polar Science Program (TNSP) (2018-2022)

Historically, Turkey has lagged behind many other states in terms of engagement with polar politics. This situation can largely be attributed to the absence of comprehensive research and strategic focus on the polar regions in earlier periods. Notably, during the Ottoman Empire, geographical discoveries were not prioritized, and substantive studies related to the polar areas were virtually nonexistent, which contributed significantly to this lag (Bayatlı, 2022).

In subsequent years, one of Turkey's earliest engagements with the polar regions was its participation in the Second International Polar Year of 1932–1933 (Krupnik et al., 2011). Furthermore, individual Turkish researchers such as Dr. Atok Karaali in 1959, and Professors Ümran İnan and Serap Tilav during 1980–1981, conducted pioneering studies on polar science (Başar, 2020). Turkey's accession to the Antarctic Treaty in 1995 marked the beginning of a new era of involvement in polar affairs (TNPSP, 2018). Nonetheless, the period from 1960 to 2000 is generally characterized as a relatively weak phase for Turkey in terms of polar scientific research and policy engagement (Caymaz and Ozsoy, 2022).

Turkey's most significant advancement regarding the polar regions, particularly Antarctica, was the implementation of the Turkish Antarctic Science Programme Road Map Workshop, held on 18–19 November 2013. The strategic road map developed during this workshop can be summarized as follows:

- The Scientific and Technological Research Council of Turkey (TUBITAK) is tasked with supporting polar research activities by allocating dedicated funding and resources.
- Efforts to obtain membership in the Scientific Committee on Antarctic Research (SCAR)
- Planning and selecting a suitable site for the establishment of a research base in Antarctica, along with the necessary logistical arrangements.
- Procuring research tools and equipment, accompanied by comprehensive budget planning to support the operational needs.
- Conducting research activities and fulfilling obligations related to environmental protection in accordance with the legal framework established by the Madrid Protocol.
- Finally, to advance the development of international cooperation in polar science and governance (Turkish Antarctic Science Programme Roadmap Workshop Final Report, 2013).

Following the establishment of the road map, the Istanbul Technical University Polar Research Application and Research Centre (ITU PolReC) was founded in 2015, marking Turkey's first institutional initiative dedicated to polar studies (Istanbul Technical University News). Subsequently, the inaugural Turkish Antarctic Research Expedition (TAE) was conducted in 2016, involving 13 Turkish scientists as part of Ukraine-Turkey cooperation. Building on this foundational progress, ITU PolReC and TUBITAK jointly prepared a comprehensive scientific commitment report, which was submitted to the Presidency of the Republic of Turkey. Consequently, Turkey became a member of the Scientific Committee on Antarctic Research (SCAR) in 2016. Following this achievement, Turkey's accession to the Madrid Protocol was ratified by the Turkish Grand National Assembly in 2017, reflecting significant advancement in consolidating Turkey's presence in Antarctica. Regarding the Arctic, in addition to ongoing research efforts initiated in the early 2000s, Turkey applied for participation in the Arctic Council in 2015; however, no response has been received to date (TNPSP, 2018).

As a result of these developments, it was decided that polar expeditions would be conducted under the auspices of the Presidency and organized as the "National Polar Science Expedition" over a five-year period spanning 2018 to 2022. Subsequently, new polar science programs are planned to be implemented within successive five-year frameworks (TNPSP, 2018). In this context, the responsibility for managing Turkey's polar expeditions—including the Turkish Antarctic Expeditions (TAE) and the Turkish Arctic Science Expeditions (TASE)—which was initially held by ITU PolReC from 2017 to 2019, was transferred to TUBITAK MAM KARE under the auspices of the Presidency (TUBITAK MAM Polar Research Institute, 2022a). To date, a total of seven TAE expeditions have been organized (TUBITAK MAM Polar Research Institute, 2022b), with two of these expeditions conducted in the Arctic region (TUBITAK MAM Polar Research Institute, 2022b), with two of these expeditions and enhancing forward, plans include organizing additional expeditions and enhancing Turkey's research capacity in polar science.

4. An Analysis of the Significance of the Turkish National Polar Science Programme (2018–2022) within the Context of Turkey's Balance Policy Approach

The polar regions, encompassing the Arctic and Antarctic, are subject to overlapping sovereignty claims and strategic interests by more than fifty states. In response to this complex geopolitical landscape, various legal instruments and policy frameworks have been developed under the domain of *Polar Law* to regulate governance in these areas. However, the question of whether these mechanisms can comprehensively and effectively manage polar governance remains unresolved (Scott & VanderZwaag, 2020).

An analysis of the Arctic region highlights Russia as the predominant actor in the area. Since the early 2000s, Russia has steadily increased its presence in the Arctic, advancing broad claims over maritime routes and natural resource exploitation. Its strategic posture has been further shaped by military engagements, notably the 2008 war with Georgia and the 2014 annexation of Crimea. In response to the 2014 conflict, the United States strongly criticized Russia's expansionist policies, thereby escalating tensions in the Arctic. This deterioration in relations has contributed to a renewed Cold War-like atmosphere in the region (Yıldız & Çelik, 2019).

Historically, policies concerning Antarctica have been guided by a commitment to peaceful engagement, primarily rooted in the 1959 Antarctic Treaty, which designates the continent as a zone reserved for scientific research and non-military activities. This framework has played a crucial role in ensuring the region's relative stability. Nevertheless, the renewed escalation of the Russia-Ukraine conflict in 2022 has heightened global geopolitical tensions, raising concerns about the potential spillover of interstate rivalry into Antarctica. These developments echo the competitive dynamics increasingly evident in the Arctic (Final Report of the Forty-fourth Antarctic Treaty Consultative Meeting, 2022).

At this juncture, the emergence of micro-scale Cold War dynamics among hegemonic powers is increasingly evident in both the Arctic and Antarctic regions. In this context, it is imperative to evaluate the relevance of Turkey's balance policy—previously examined in this study—not only in relation to the influence of terms of its implications for the diplomatic engagements among states operating within these polar domains.

In both the Arctic and Antarctic contexts, the potential for escalating interstate tensions remains significant, particularly between major powers such as the United States and Russia. Within this volatile geopolitical landscape, Turkey's historically rooted balance policy—developed during the Cold War to protect national interests and mediate between rival hegemonic actors—positions the country as a potential contributor to diplomatic engagement in the polar regions. This strategic posture may serve to foster dialogue and mitigate conflict among key stakeholders involved in polar governance.

Secondly, the Turkish National Polar Science Programme (TNPSP) underscores Turkey's intention to sustain active engagement with states participating in polar governance, with the aim of fostering reciprocal and cooperative relations (TNPSP, 2018). This strategy reflects an effort to establish a durable and institutionalized framework of diplomacy among the key stakeholders involved in the management of polar regions.

Thirdly, the explicit objectives outlined in the Turkish National Polar Science Programme—namely, the establishment of a permanent research base in Antarctica, the promotion of collaboration with existing polar research stations, the pursuit of consultative party status under the Antarctic Treaty, the aspiration to join the Arctic Council, and the advancement of strategic initiatives for the future governance of both polar regions—demonstrate Turkey's sustained commitment to enhancing its role and influence in polar affairs (TNPSP, 2018).

Lastly, Turkey's formal application to join the Antarctic Treaty System in 1995 (Republic of Turkey Ministry of Foreign Affairs, 2022), its bid for observer status in the Arctic Council in 2015, and the approval granted by the Turkish Grand National Assembly for accession to the Spitsbergen (Svalbard) Treaty in 2022 (Grand National Assembly of Turkey, 2022) collectively reflect a consistent and balanced approach toward integration into key mechanisms of polar governance. These initiatives underscore Turkey's effort to align itself with established frameworks of international cooperation, drawing on its historical experience with balance-of-power diplomacy. In the current geopolitical climate, particularly regarding the polar regions, the establishment of diplomatic engagement and the maintenance of equilibrium among major actors emerge as strategic priorities.

In addition, the *Turkish Polar Science Strategy 2023–2035* was introduced as a continuation of the initial Turkish National Polar Science Programme (TNPSP). The strategy outlines the advancement of polar activities—particularly in Antarctica—under the coordination of the Polar Research Center at Istanbul Technical University (ITU PolReC), and subsequently through TUBİTAK Marmara Research Center's Polar Research Institute (TUBİTAK MAM PRI). This strategic framework aims to elevate Turkey's scientific and diplomatic engagement in the polar regions by establishing a permanent presence on the continent and promoting peaceful policy influence through sustained scientific collaboration and international cooperation (Republic of Türkiye Ministry of Insdustry and Technology, 2023).

Conclusion

Turkey has effectively pursued a policy of balance, a legacy inherited from the Ottoman Empire, throughout its political evolution and foreign policy framework. This strategy has enabled Turkey to protect its national interests across diverse issues while simultaneously adopting a mediatory role in interstate conflicts. Consequently, Turkey's balance policy presents significant potential to influence its engagement with the polar regions and to contribute meaningfully to polar diplomacy. The necessity of such diplomacy is underscored by the demand for an inclusive, process-oriented approach to addressing the multifaceted challenges inherent to these regions.

- Firstly, historically, both hegemonic powers such as Russia and the United States, as well as states geographically proximate to the polar regions, have asserted territorial claims over these areas.
- Secondly, the anarchic nature of the international system, coupled with the non-binding character of international law on sovereign states, has been evident in numerous crisis situations, including during the Cold War.
- Thirdly, concerns persist regarding the binding authority of the Arctic Council, which serves as the primary governance mechanism for the Arctic region, and the Antarctic Treaty System, which governs Antarctica. Consequently, there is a potential risk of international law becoming ineffective in these contexts.
- Fourthly, the Arctic and Antarctic regions contain substantial natural resources. Moreover, climate change has led to the emergence of new strategic maritime routes, particularly in the Arctic, thereby attracting increased interest from states.
- Fifthly, Russia's recent assertive actions in the international arena have generated heightened political tensions within both polar regions.

Consequently, micro-scale Cold War–style dynamics have re-emerged in the Arctic and Antarctic..

• Sixthly, it is evident that Turkey has historically implemented a successful policy of balance aimed at maintaining peace. Notably, Turkey's most effective applications of this policy have been directed towards managing relations with hegemonic powers such as the United States and Russia. Additionally, Turkey adopts a cooperative approach toward all states active in the polar regions. Significant progress has been achieved within a relatively short timeframe, resulting in the establishment of an influential network in the area. In this context, Turkey has articulated a scientific and peaceful roadmap for its polar policies, consciously avoiding any aggressive posturing.

Within the scope of these analyses, it becomes evident that Turkey possesses both the experience and the potential to implement effective balance diplomacy in the polar regions, particularly when the specific regional risks and Turkey's historical expertise in balance policy are taken into account. Given the escalating inter-state conflicts and the profound adverse impacts of climate change, the establishment of a strategic balance diplomacy is not only necessary but imperative for ensuring the sustainable future of the polar regions.

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Chapter 4

Managerial Competencies in Professional Football Clubs¹

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Abstract

Today, football has become an industry that encompasses not only sporting success but also financial sustainability, brand value, and social impact. In this context, football managers are required to possess not only technical knowledge but also skills such as strategic thinking, leadership, crisis management, digitalization, cultural awareness, and financial management. Therefore, this study aims to examine the competencies of managers, which are of critical importance in the management of professional football clubs. Specifically, it will explore the competencies required for professional football clubs to achieve success in the international competitive environment, the skills that managers need to develop, and the relationship between these competencies and club performance.

This study is significant in terms of contributing to a better understanding of the multidimensional nature of football management and guiding the design of training and development programs for professionals working in this field. Furthermore, by emphasizing the critical role of managerial competencies in ensuring the sustainable success of football clubs, it offers a strategic perspective for the future of the industry.

Key Words: Club, Football, Managerial Competency, Professional

¹ This study has been developed with reference to the master's thesis entitled 'The Comparison of Qualifications of Managers Working in Selected Football Clubs during the 2006–2007 Turkcell Super League Season (Cases of Konyaspor, Sivasspor, and Trabzonspor)' authored by Halil TANIR under the supervision of İbrahim Bülent FİŞEKCİOĞLU, and has been substantiated with current academic references.

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Profesyonel Futbol Kulüplerinde Yönetici Yeterlikleri Özet

Günümüzde futbol, yalnızca sportif başarıyı değil, aynı zamanda finansal sürdürülebilirliği, marka değerini ve sosyal etkiyi kapsayan bir endüstri haline gelmiştir. Bu bağlamda, futbol yöneticilerinin yalnızca teknik bilgiye değil, aynı zamanda stratejik düşünme, liderlik, kriz yönetimi, dijitalleşme, kültürel farkındalık ve finansal yönetim gibi becerilere de sahip olmaları gerekmektedir. Bu nedenle çalışmada profesyonel futbol kulüplerinin yönetiminde kritik öneme sahip olan yöneticilerin yeterliklerinin incelenmesi amaçlanmaktadır. Özellikle, profesyonel futbol kulüplerinin uluslararası rekabet ortamında başarılı olabilmesi için gerekli yeterlikler, yöneticilerin geliştirmesi gereken beceriler ve bu yeterliklerin kulüp performansıyla ilişkisi detaylı olarak incelenecektir.

Bu çalışma futbol yönetiminin çok boyutlu doğasının daha iyi anlaşılmasına katkı sağlaması ve bu alanda çalışan profesyonellere yönelik eğitim ve gelişim programlarının tasarımına rehberlik etmesi açaından önemlidir. Ayrıca, yönetici yeterliklerinin futbol kulüplerinin sürdürülebilir başarısındaki kritik rolünü vurgulayarak, sektörün geleceğine yönelik stratejik bir bakış açısı sunmaktadır.

Anahtar Kelimeler: Kulüp, Futbol, Yönetici Yeterliği, Profesyonel

1. Introduction

Sport is an activity that enhances interpersonal interaction, supports health, and plays a role in the construction of cultural identity. Today, sport has transformed into a massive industry involving millions of participants, driven by media broadcasting rights, sponsorship agreements, product sales, and fan engagement. These developments demonstrate that sport is not limited to physical performance alone; it is also a complex structure that requires careful planning, strategic management, and professional organizational skills (Garcia et al., 2023).

With this transformation, the discipline of "sports management" has evolved into a multifaceted area of expertise that not only ensures the operation of organizations but also requires knowledge and skills in leadership, strategic thinking, financial planning, human resources, and digitalization. Especially in highly popular and economically valuable sports such as professional football, management skills have become a key factor directly influencing a club's success. Football, which reaches billions of viewers worldwide and employs hundreds of thousands of professionals across continents, increasingly highlights the need for effective management. Beyond on-field success, factors such as financial sustainability, brand value, social impact, and international reputation have made football management a multidimensional and strategic endeavor (McCaffrey & Jones, 2022; Pritchard, 2023).

In professional football clubs, management plays a vital role in ensuring both short-term success and long-term sustainability. Therefore, it is not sufficient for managers to possess only technical knowledge. They must also be competent in areas such as leadership, effective communication, crisis management, financial literacy, digital media strategies, ethical governance, sports law, and cultural awareness (Taylor & Williams, 2022). Moreover, responsibilities such as fulfilling the club's social obligations, establishing strong connections with fans, and supporting the development of young players also fall within the scope of managerial duties. In this context, football management is not merely about athletic administration; it is a leadership role with significant social, economic, and cultural implications (Khan et al., 2023).

In professional football, management is regarded as a multidisciplinary field of expertise that integrates classical management principles with the demands of the modern sports world. This study explores the competencies that individuals managing professional football clubs should possess and examines why football management involves different dynamics compared to traditional sports management. The aim of the study is to holistically define the managerial profile required by modern football and to assess how these competencies contribute to club performance.

2. The Concept of Sports Management

Sports management is a discipline that encompasses the strategy, planning, and implementation processes necessary for the effective and efficient management of sports organizations. This field addresses key management functions such as organizational theories, leadership, marketing, finance, and human resources management within the context of sports (Schnitzer & Kopp, 2018).

Sports management aims not only at athletic success but also at organizational sustainability and societal impact. In this context, topics such as social responsibility projects, ethical values, and social impact assessments of sports organizations come to the forefront. Additionally, the leadership styles of sports managers and the effects of organizational culture on performance and participation are also important areas of research (Byon & Zhang, 2019).

Technological advancements have led to significant transformations in the field of sports management. In particular, data analytics, artificial intelligence, and digital media strategies are being effectively used in the decision-making processes of sports organizations. These technological tools provide important contributions not only in performance monitoring but also in areas such as fan engagement and sponsorship management (Selvaratnam, 2024).

Sports management research has also shown significant developments in terms of methodology. In particular, the use of experimental research methods allows for a clearer identification of cause-and-effect relationships. This, in turn, contributes to strengthening the scientific foundations of the field of sports management and increasing its impact in practical applications (Byon & Zhang, 2019).

3. The Key Functions of a Sports Manager

3.1. Planning

Planning is considered the cornerstone of management and forms the foundation for all other management functions. In the context of sports management, planning involves defining the organization's goals, determining the strategies required to achieve these goals, and allocating the necessary resources. Through short-, medium-, and long-term planning, sports organizations become better prepared for potential risks they may face in the future and develop the ability to adapt to changing conditions. Planning is also crucial in terms of the effective use of time and financial resources. For a sports club, strategic planning at the beginning of the season includes steps such as determining transfer policies in line with the team's goals, creating the training schedule, organizing preparation matches, and establishing fan engagement
strategies. Additionally, alternative plans must be made, taking into account external factors such as potential injuries, weather conditions, or economic fluctuations. This multidimensional approach requires sports managers to consider both internal and external environmental factors when making strategic decisions (Soares & Correia, 2009).

3.2. Organizing

Organizing refers to the structural arrangements necessary to implement the goals defined in the planning phase. In this process, managers define job roles, position human resources appropriately, and ensure effective division of labor between departments. Especially in large-scale sports organizations, organizing makes complex operations more manageable. An effective organizing structure contributes to clearly defining the organization's tasks, enhancing coordination, and ensuring accountability. For example, an Olympic organizing committee consists of many sub-units, such as security, transportation, media, accommodation, and health services. While each of these units has its own responsibilities and objectives, they must work in harmony within the overall organizational structure. The hierarchical structure and task distributions established for this purpose ensure that large events are conducted on time and successfully. Organizing is not limited to human resources; it also involves the effective planning of materials, technology, and venue usage (Peiro et al., 2002).

3.3. Leadership

Leadership is the process of creating a vision, inspiring others, and guiding team members toward common goals in sports organizations. Effective leaders define the organization's strategic objectives, provide the necessary motivation to achieve these goals, and strive to maximize the potential of their team members. Modern sports management literature comprehensively examines the impact of leadership on organizational performance, team cohesion, motivation, and individual development. Today, leadership is not limited to the use of authority but also encompasses skills such as empathy, communication, and emotional intelligence. Especially, sports managers' leadership styles can directly influence the culture and success of the organization. For instance, a coach adopting a democratic leadership style can increase team commitment by considering the players' opinions, while an autocratic leadership style may establish discipline in the short term but lead to player dissatisfaction in the long run (Güneş & Kılıç, 2024).

3.4. Coordination

Coordination is the process of ensuring that activities carried out in different departments of an organization occur in harmony and with mutual cooperation. This function is crucial, especially in multi-departmental and large-scale sports organizations. A lack of coordination can lead to resource wastage, time loss, and deviations from goals. Through effective coordination, redundancies between tasks within the organization are avoided, tasks are made complementary, and the entire system works in unison. For example, in a large marathon event, the health team, logistics unit, security personnel, and media representatives must work synchronously with each other. Elements such as setting up the start and finish areas, registering participants, and preparing emergency response plans require good coordination between these units. To achieve this harmony, the effective use of communication technologies and pre-determined operational processes are critical (Samur, 2019).

3.5. Control

Control is the evaluation and improvement phase of the management process. This function allows for analyzing whether the organization has achieved its planned objectives, identifying deviations, and taking necessary corrective actions. In sports organizations, control is carried out through various indicators such as performance evaluations, financial analyses, fan satisfaction measurements, and sponsorship returns. This process should not only be results-oriented but also process-oriented, highlighting areas for organizational development. For example, a sports club evaluates its financial performance at the end of the season by analyzing the balance between income and expenses, sponsorship revenues, and matchday earnings. At the same time, the team's athletic performance is assessed through win rates, injury data, and player development statistics. Such analyses help strengthen future planning with more solid foundations. Control is also an important tool in developing a culture of transparency and accountability (Guta, 2019).

4. Requirements of Professional Football Management

While the concept of sports management covers a broad field, management in a specific sport like football becomes more complex. Football, being one of the most popular sports in the world, has also evolved into a massive industry, creating a global economic force. Football clubs not only strive for success on the field but also operate in a range of additional areas such as financial strategies, brand management, and global marketing. In this dynamic environment, the role of football managers is not limited to sports organization alone; it is also essential to develop and implement strategic plans to maintain the club's competitive advantage at a global level (Smith

& Thompson, 2023).

The management of football clubs is also shaped by the social impact of the clubs. A football club creates a social identity not only through its connections with fans but also through social responsibility projects, global media influence, and commercial agreements. For example, club managers develop various marketing and media strategies to increase the club's brand value, grow the global fan base, and manage the club's image effectively. At this point, the skills required of football managers go beyond traditional sports management abilities. Specializing in areas such as financial management, media strategies, digitalization, and global marketing is key to the success of a football club manager (Pritchard, 2023).

Football management has become a field intertwined not only with professional sports organizations but also with global social, cultural, and economic impacts. Football club managers are responsible not only for ensuring the sporting success of their clubs but also for making strategic decisions that will sustain this success, securing the long-term prosperity of the club. In this context, football management serves as a microcosm of sports management, requiring managers to act with a broader vision (Smith & Thompson, 2023).

5. Management of Professional Football and the Globalized Sports Industry: Strategies, Dynamics and Future Perspectives

5.1. Management Structures and Organizational Models of Football Clubs

Football clubs operate with different management structures and organizational models. The management structure of these clubs not only affects the sporting success of the club but also influences financial management, marketing, and community relations. Professional clubs typically have a complex organizational structure, consisting of various managers such as presidents, board members, head coaches, and sporting directors. While such a structure can enhance organizational success, it can also give rise to managerial uncertainties and weaknesses (Pritchard, 2023).

5.2. Financial Management and Sustainability of Football Clubs

The financial management of football clubs is crucial for their long-term success. Football is a high-cost industry; while clubs' revenues come from sources such as broadcasting rights, sponsorship deals, matchday earnings, and transfer fees, significant expenses include player salaries, transfer fees, and infrastructure investments. Financial management and sustainability highlight the importance for clubs to manage these revenues and expenses effectively (Garcia et al., 2023).

5.3. Football Marketing and Brand Management

Football clubs are not just sports organizations; they are also powerful brands. The brand management of football clubs is a critical factor in increasing club revenues and ensuring global recognition. Marketing strategies play a significant role in reaching target audiences and expanding the fan base. The interactions that clubs establish with their fans through digital and social media help enhance the club's brand value (McCaffrey & Jones, 2022).

5.4. Football Fans and Community Management

Football fans are the most important stakeholders of football clubs and play a critical role in the club's financial success. Fans are an integral part of the club's identity, and the success of a club is often directly related to the support it receives from its fans. Therefore, fan relationship management and community management have become vital management functions for football clubs (Smith, 2023).

5.5. Digitalization of Football and Technological Innovations

The digitalization of football has shown significant development in terms of media consumption, fan interaction, and match analysis. Clubs, while communicating with their fans through digital platforms, are also utilizing data analytics and technological tools to optimize player performance. Digitalization enables football clubs to establish a more interactive relationship with their fans, while simultaneously providing them with strategic data that can enhance club performance. For instance, live tracking of in-game statistics on digital platforms enriches the fan experience, while also helping club management make more informed decisions regarding player health and match strategies effectively (Garcia et al., 2023).

5.6. Legal Aspects of Football and Ethical Issues

Football is not only a sporting domain but also a sector that faces numerous legal and ethical challenges. Issues such as doping, match-fixing, and player contracts are among the primary legal and ethical concerns encountered by football clubs. International Federation of Association Football (FIFA), along with other football federations, stands as one of the main authorities in setting ethical standards in the sport. Doping scandals, ethical dilemmas in player contracts, and questionable practices in transfer agreements are critical matters that require careful attention from club management. FIFA conducts strict oversight to uphold ethical standards and ensure integrity in football. Club executives must be aware not only of achieving sporting success but also of adhering to ethical values and fulfilling legal responsibilities (McCaffrey & Jones, 2022).

5.7. Football and Its Global Impact

Football has become a global phenomenon and holds a significant impact worldwide. Today, football is not only a sport but also a culture, a business, and a social movement. With globalization, the game has transcended geographical boundaries, reaching audiences on every continent. Major tournaments like the FIFA World Cup bring together millions of people from different cultures, and football plays an important role as a unifying force around the world. The global influence of football is not limited to being watched as a sport; it can also intervene in social and political events and lead to societal change (Gianni & Hager, 2023).

The global impact of football is not only observed in major tournaments and leagues but also clearly reflected in clubs' global marketing strategies. For example, world-renowned football clubs attract large international fan bases, generating significant revenue from these supporters. The global brand value of such clubs creates a major commercial impact through sponsorship deals, advertising income, and international matches. These global assets of football clubs strengthen not only their sporting success but also their economic power (Pritchard, 2023).

Furthermore, football can influence global social issues. Topics such as racism, gender inequality, and social justice are central to important societal debates that often take shape around the sport. Players and clubs, by showing sensitivity to these issues, are able to create platforms to raise awareness and actively contribute to the fight against such problems (McCaffrey & Jones, 2022).

6. Managerial Competencies in Professional Football

6.1. Leadership and Communication Skills

One of the most important competencies of football managers is effective leadership. Football clubs are large organizations comprising numerous players, technical staff, and personnel. Therefore, managers are expected not only to develop strategic plans but also to motivate people, inspire their teams, and make effective decisions in times of crisis. Football managers must strengthen internal communication within the team and establish healthy relationships with all stakeholders. Communication skills help managers effectively manage both internal and external relations within the club. Especially in areas such as media relations, communication with fan groups, and sponsorship agreements, effective communication plays a critical role (Khan et al., 2023).

6.2. Financial and Resource Management

Football clubs have evolved into major economic organizations. In this context, it is essential for football managers to possess financial management skills to ensure the success of the club. Managers are responsible for making strategic financial decisions such as managing the club's budget, diversifying revenue streams, securing sponsorship agreements, and controlling costs. Financial management is crucial for maintaining the club's sporting success in a sustainable manner. Additionally, managerial competence plays a significant role in areas such as transfer policies and player salaries (Pritchard, 2023).

6.3. Strategic Thinking and Decision Making

Football managers are required to define the club's long-term objectives and develop strategic plans to achieve these goals. These strategies encompass not only team performance but also the club's financial health, brand value, and social responsibilities. In order to make sound decisions, football managers must consider not only short-term gains but also long-term sustainability and the club's public image. Moreover, managers should aim to enhance the club's global presence by integrating marketing strategies, digital transformation processes, and media relations (Smith & Thompson, 2023).

6.4. Crisis Management and Resilience

Football clubs may face crises both on and off the pitch, ranging from performance-related issues to external challenges. Such situations require club managers to make swift and accurate decisions. Crisis management skills enable managers to handle adverse circumstances effectively and protect the club's reputation. Crisis situations also test a manager's resilience and adaptability. Football managers must ensure that immediate crises are managed without undermining the club's long-term strategic objectives (McCaffrey & Jones, 2022).

6.5. Digitalization and Investment in Technology

Football is undergoing a major transformation due to the impact of digitalization. It is crucial for football managers to have knowledge of digital media, social media interactions, and technological infrastructure in order to effectively manage their clubs' global brands. Social media has become an essential tool in promoting the club's brand and engaging with fans. Football managers can leverage digital strategies to increase the club's visibility and strengthen its connection with the fanbase by organizing various digital campaigns (Gianni & Hager, 2023).

6.6. Human Resources and Ream Management

Football managers must possess effective human resource management skills. This involves not only managing the technical staff and player roster but also ensuring the motivation of club personnel, enhancing team harmony, and supporting the individual development of players. Football managers need to establish proper communication with players, guide them appropriately, and manage leadership dynamics within the team. Additionally, maintaining discipline within the team and managing player relationships are critical competencies. Effective team management enables football managers to make significant contributions to the overall success of the club (Taylor & Williams, 2022).

6.7. Ethics and Social Responsibility

Football clubs have a significant impact not only in the sporting realm but also in society. Football managers must ensure that their clubs act in accordance with ethical values, invest in social responsibility projects, and remain sensitive to social issues. As part of the club's social responsibility, managers should organize initiatives that leverage football's potential, such as educational programs for youth, environmental sustainability projects, and activities that create social impact in disadvantaged areas. These types of projects not only strengthen the club's social image but also spread the positive power of football throughout society (Baker & Miller, 2023).

6.8. Law and Contract Management

Football managers are responsible for negotiating contracts with a wide range of individuals, from players to technical staff and other club employees. In this context, having knowledge of sports law is a crucial skill set, particularly in areas such as contract management and player transfers. Managers must be careful when ensuring that contracts are drafted within the legal framework, negotiating transfer agreements, and protecting player rights. Additionally, being able to handle legal issues and prevent potential lawsuits is a critical competency for professional football club managers (Kellermann, 2023).

6.9. Innovation and Adaptability

The football industry is constantly evolving due to the influence of technology, analytical data, and digital tools. Football managers must possess innovative thinking skills to keep up with this change. The integration of technology into every aspect of football allows managers to incorporate digitalization and innovation into their club strategies. In this context, leadership is required in areas such as utilizing new data analysis methods, implementing player performance tracking systems, and managing fan relationships through digital media (Evans & McKenna, 2023).

6.10. Cultural Awareness and International Management Skills

Football is a global sport, and the international operations of clubs require football managers to develop cultural awareness. It is crucial for football managers to effectively communicate with players from diverse cultures and manage the club's brand value in the international market. A football club manager operating in the global market must possess a global vision and cultural intelligence in order to succeed in areas such as international transfer policies, worldwide media strategies, and cultural interactions. These skills can enhance the club's competitiveness on the international stage (Smith & Thompson, 2023).

7. Conclusion

Management in professional football is a multifaceted, dynamic, and highly competitive field that extends far beyond focusing solely on sporting success. Today, football clubs are not only sports organizations but also large economic and social entities. Therefore, the competencies required by managers go beyond traditional sports management skills and encompass a wide range of areas, from strategic thinking to crisis management, digitalization to cultural awareness. Competencies such as effective leadership, strong communication, financial knowledge, ethical sensitivity, and legal awareness are critical for a football manager to effectively manage both the day-to-day operations and long-term sustainability of the club (McCaffrey & Jones, 2022; Pritchard, 2023).

Football managers must also possess the ability to adapt to the constantly changing global sports environment, effectively utilize technology, and manage in diverse cultural contexts. Issues such as digital media management, fan engagement, social responsibility projects, and international relations are key concerns for managers, and strategic mistakes in these areas can directly harm the club's brand value. In this context, managers must not only manage current situations but also be able to anticipate the future and develop innovative strategies (Evans & McKenna, 2023).

In conclusion, management in professional football is a multifaceted position that requires extensive knowledge, interdisciplinary competencies, and a high level of strategic perspective. The complex nature of modern football obliges managers to contribute not only to sporting performance but also to the club's economic, social, and global objectives. Therefore, it is of utmost importance that football managers continually renew themselves and adopt a multidimensional management approach to respond to evolving needs.

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Chapter 5

Investigating The Impact of Artificial Intelligence on Digital Marketing

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Abstract

As the title suggests, this article examines the effects of artificial intelligence (AI) from a digital marketing perspective. Rapid advances in artificial intelligence technologies have revolutionized various industries, and digital marketing is no exception. As marketers and consumers simultaneously adopt artificial intelligence (AI) services and applications, the dynamics of the exchange process between buyers and sellers in the marketplace are fundamentally changing. Therefore, examining the emerging patterns of adoption and extent of the release of AI applications by marketers and consumers has been assigned special importance. Since researchers in this field consider the exponential increase in the number, variety, and capability of marketing applications as the only phenomenon that affects the role and performance of the marketer in the marketing process, the purpose of this study is to identify key areas. where artificial intelligence has made a significant contribution to digital marketing strategies, assess its impact on consumer behavior, and discuss its implications for marketers.

This research begins by examining various applications of this topic, such as chatbots, personalized advertising, recommendation systems, and predictive analysis, while addressing the importance of the presence of AI in digital marketing. These AI-powered tools enable marketers to automate tasks, improve customer targeting, optimize campaigns, and increase overall marketing efficiency.

In addition, while analyzing the impact of AI on consumer behavior, this study points to the analysis of data with AI algorithms, and based on this,

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marketers can gain deep insight into consumer preferences, purchasing patterns, and purchasing patterns. benefits Taking this data-driven approach enables marketers to deliver personalized marketing messages, tailor content and ads to consumers, and thereby increase engagement and conversion rates.

Apart from these positive features, this research also considers the potential challenges and ethical concerns associated with AI in digital marketing. Issues such as privacy, data security, algorithmic bias, and replacing human creativity with emotional intelligence are discussed.

This article emphasizes the need for responsible and ethical use of AI in digital marketing and highlights the importance of transparency, consent, and compliance with regulatory frameworks.

In addition, while stating the advantages and disadvantages of the subject, the future of artificial intelligence in digital marketing has been discussed at the end.

Keywords: Artificial intelligence, Digital marketing, Advanced algorithms, Personalized experiences, Innovation, Marketing-oriented goals.

1- Introduction

In a simple definition, marketing is "providing customer satisfaction in profitable ways". Providing satisfaction and creating value for the customer is at the center of modern marketing thought and practice (Tin et al., 2019). Therefore, the dual goals of marketing are to attract: new customers by promising superior value and to retain current customers by satisfying them. Marketing activities to enter a new market include marketing research, product development or improvement, and distribution and sales promotion operations (Hamidizadeh and Shakoeh Hosseini, 1401). Each of these activities is affected by the economic level of the activities and, at least, the marketing challenge. Before entering a new market, organizations must make the necessary investment to know consumers and obtain information about all three market entry activities (Lee et al., 2021).

Businesses are usually a combination of advanced, established, and old technologies that together create a strong product. Therefore, a distinction can be made between businesses with high-level technology and those with low-level technology based on the technology used in their organizational performance (Valkic et al., 2021).

Thus far, technical developments have always helped businesses in providing services to customers. A field that is heavily influenced by technical innovations and tries to use them to optimize its activities is the field of digital marketing. Marketers are always looking for ways to get their service and product to the main audience by spending the right amount of time and money. In this regard, a tool that can accurately predict and select audience groups based on their unique characteristics will be of great value. The machine learning approach, with the ability to use powerful and diverse algorithms, has surprisingly created new opportunities for marketing through the unique information of people's interactions in the field of analyzing a large amount of data. (Bourgiri, summer 2019).

Every organization is looking for ways to make the environment favorable for employees in order to achieve optimal organizational performance and to achieve a degree of ability to have a greater impact on their work (Enslin et al., 2022). Among these solutions, we can mention the use of AI in business environments.

Artificial intelligence is a common emerging technology that helps organizations track data to analyze and quickly respond to customer needs in real time (Wirth 2018). Artificial intelligence offers an approach to consumer behavior that, is necessary for customer acquisition and retention. Artificial intelligence inspires the customer's next move and redefines the overall experience (Tjepkema 2019). Artificial intelligence tools are useful for inferring customer expectations and navigating the future path (Shabir, 2015).

In a study that focused on the use of artificial intelligence in business (B2B), Nordlander (2001) focused in detail on the important factors that can be used in artificial intelligence for entrepreneurial business. These factors include: creating excess information capacity, customer relationship management (behavior analysis), customer relationship management (support and marketing), company management, production management, and financial management. In his research, company management is divided into two parts: control and content management, and production management also refers to production planning.(Takwi, Bate, Akosso, Sharon, & Sciences, 2020)

Currently, organizations are using the power of AI to identify new strategic options in vast swathes of customer data that human analysts would ignore (Beg et al., 2021; Behra et al., 2021) and to reduce operational cost (Davenport et al., 2020). Although the marketing research community (e.g., Liu 2020; Devyudi et al. 2021; Upadhyay et al. 2021) is making significant use of AI applications in business-to-consumer (b2c) marketing, detailed research is lacking. No attention has been paid to the use of AI applications in the field of B2B marketing. Cutler and Keller (2012, p. 182) state that more dollars and items change hands in sales between business buyers than consumers; This shows that B2B marketing covers a larger part of the industry than the B2C sector. Various studies have examined the impact of technological advances on B2B processes over the years (e.g., Jakula and Hakanen 2013), but only a limited stream has examined AI (Hahn et al. 2021). Most existing studies focus on the understanding of procedural improvements for companies (Leon et al. 2020; Paskan et al. 2020), increasing the customer service experience (Davenport et al. 2020), customer segmentation and profiling (David et al. 2021) and determining and scoring. (De Bruin et al., 2020) are concentrated.

In this study, we explore the profound impact of AI on digital marketing and explore its implications for businesses and consumers alike. This research aims to explore the ways in which AI is changing digital marketing, such as its ability to increase targeting and segmentation, improve customer engagement and satisfaction, optimize advertising campaigns and increase ROI for businesses.

2- Artificial intelligence concept

Artificial intelligence (AI) is a branch of computer science that focuses on creating intelligent machines capable of performing tasks that normally require human intelligence. It involves the development of computer systems or software with the ability to learn, reason, solve problems, understand natural language, and interact with humans.(Nabeel, 2023)

Artificial intelligence mimics various human cognitive abilities, such as visual perception, speech recognition, decision making, and language comprehension. It is a multidisciplinary field that includes computer science, mathematics, cognitive science, linguistics, neuroscience, etc.(Surianarayanan, Lawrence, Chelliah, Prakash, & Hewage, 2023)

There are different types of artificial intelligence, including:

1. *Narrow AI:* This type of AI focuses on specific tasks and operates within predefined boundaries. Examples include voice assistants such as Siri, recommendation systems, and image recognition software.

2. *General artificial intelligence:* refers to machines that have human-like intelligence and are capable of understanding, learning, and performing any intellectual task that a human can do. This level of artificial intelligence is still theoretical and under active research.

3. *Machine learning:* This subcategory of artificial intelligence includes training machines to learn and improve from experience without explicit programing, in which algorithms are used to analyze large data sets and predict or make decisions based on patterns and examples. are used.

4. *Deep learning:* This type of learning is a sub-branch of machine learning that uses artificial neural networks to simulate the functioning of the human brain. Deep learning models have achieved significant success in tasks such as image and speech recognition.(Dehingia, Jeelani, & Das, 2022)

3- Marketing concept

Marketing, in its simplest terms, refers to the strategies and activities that businesses employ to promote their products or services to potential customers. This includes identifying target markets, creating and communicating value propositions, and building strong customer relationships to achieve business goals.(Cheng, 2023)

4- History of Artificial Intelligence and Marketing

The relationship between artificial intelligence (AI) and marketing is a fascinating story of intertwined evolution that goes beyond what you might imagine. While the term "AI" was officially coined in 1956, its seeds were planted much earlier, and its impact on marketing has blossomed alongside its advances.(Anoop & Education, 2021)

The initial spark: 1950s-1970s

1950s: In the early days of artificial intelligence, people like Alan Turing pioneered the Turing Test, a theoretical experiment to assess a machine's ability to exhibit behavior that is intelligent or indistinguishable from that of a human.

1960s: Marketing embraced the nascent power of data analysis, using early artificial intelligence techniques such as linear programing and game theory to optimize pricing strategies and marketing mixes.

The 1970s and 1980s: a turning point in the emergence of expert systems and neural networks. Over the decades, AI has been able to model customer behavior and preferences, enabling marketers to personalize recommendations and offers, paving the way for the customer-centric approach we know today.

The 1990s and 2000s: The Internet and e-commerce revolutionized the landscape. Artificial intelligence found its playground in online advertising and targeting, fueled by vast amounts of data generated by user activities. Search engines such as Google have incorporated artificial intelligence algorithms such as Rank Brain to understand user intent and deliver more relevant results, thus shaping the online advertising ecosystem.

The 2010s are known as the artificial intelligence revolution.

2010s: The rise of Big Data and advances in machine learning algorithms, such as deep learning, have taken artificial intelligence to new heights. Marketers have harnessed this power for highly personalized campaigns, dynamic content creation, and real-time customer interaction through chatbots and virtual assistants.

The 2020s and beyond: The future of artificial intelligence in marketing is full of possibilities. We can expect more sophisticated personalization, predictive analytics, and automation that will blur the lines between humans and machines in creating impactful marketing experiences.(Pathak & Sharma, 2022)

5- Relationship between artificial intelligence and digital marketing

The relationship between artificial intelligence (AI) and digital marketing has evolved significantly over the years. In this section, we briefly discuss the process of its emergence and evolution (Ziakis & Vlachopoulou, 2023):

5.1-Early Adoption: In the early 2000s, AI made its way into digital marketing. Marketers are beginning to incorporate techniques such as data mining and machine learning to analyze customer data, predict user behavior, and personalize marketing messages.(Ziakis & Vlachopoulou, 2023)

5.2- Suggested systems: These systems based on artificial intelligence have gained popularity, especially in the e-commerce and media industries. They used algorithms to recommend products or content based on past customer

behavior, thus improving user experience and increasing conversions.(Khoali, Tali, & Laaziz, 2021)

5.3-Chatbots and Virtual Assistants: With advances in natural language processing (NLP) and conversational artificial intelligence, chatbots and virtual assistants have gained prominence in digital marketing. They provided personalized customer service and frequently answered asked questions.(Bălan & Research, 2023)

5.4-Predictive Analytics: AI-powered predictive analytics have become a vital tool for digital marketers. By analyzing large amounts of historical and real-time data, artificial intelligence algorithms can identify trends, predict customer behavior, and optimize marketing strategies.(Singh, Concepts, & Paradigms, 2023)

5.5- *Production and Optimization of Content:* Artificial intelligence has started to play a role in content creation and optimization. Text generation algorithms, such as natural language generation (NLG), have been used to create personalized emails, product descriptions, and even news articles. AI algorithms also help optimize content for search engines, ensuring that websites rank higher in search results.(Hutson & Lang, 2023)

5.6-Social Media Analytics: AI-based tools allow marketers to analyze social media data on a large scale. In addition, sentiment analysis algorithms helped monitor and understand consumer reactions, identify trends, and gather insights for targeted marketing campaigns.(Sankar, Khadir, & Senthilmurugan, 2023)

5.7-Programmatic advertising: Artificial intelligence-based programmatic advertising has revolutionized the way advertising is bought and sold. Real-time bidding platforms and algorithms help marketers automate ad placements, target-specific audiences, and optimize campaigns, resulting in better ROI.(Duke, 2019)

5.8-Voice search and optimization: The emergence of voice assistants such as Siri and Alexa made it necessary to optimize content for voice search. Albased natural language understanding- (NLU) algorithms helped marketers understand user intent and provide relevant search results.(Harkut, 2023)

5.9-Personalization and Customer Journey Mapping: Artificial intelligence plays a key role in personalizing the customer experience by mapping customer journeys. AI algorithms analyze vast amounts of customer data to identify touchpoints, preferences, and predict user behavior, enabling marketers to deliver highly targeted and personalized interactions.(Gao & Liu, 2022)

5.10-Future Outlook: Artificial intelligence continues to shape the digital marketing landscape. With advances such as machine vision, AI-based ad

targeting, and augmented reality, marketers can create highly immersive and personalized experiences for consumers. AI also helps in data analysis, fraud detection, and customer segmentation, helping marketers make data-driven decisions.(Simion & Popescu, 2023)

In general, it can be said about the relationship between AI and digital marketing that this relationship is constantly changing and pushing the boundaries of what is possible. Through collaboration and responsible execution, this partnership is key to creating a more efficient, engaging, and ultimately more human-centric digital marketing landscape, creating new opportunities for marketers to achieve better business results by increasing efficiency and customer experiences.(Mazur, 2023)

6- Impact of artificial intelligence on marketing science

The impact of AI on marketing science has been significant and transformative. Artificial intelligence technology has revolutionized the way we analyze and understand customer behavior, develop personalized marketing strategies, and optimize campaign performance. Some key areas where AI has had a significant impact on marketing science include(Biswas & Patra):

6.1-Data analysis and insights: AI algorithms can process and analyze huge amounts of data at a much faster speed than humans. This enables marketers to gain valuable insight into customer preferences, trends, and purchasing behaviors. AI-based tools can identify patterns, segment audiences, and predict future outcomes, helping marketers make more accurate data-driven decisions.(Daqar, Smoudy, & Marketing, 2019)

6.2-Customization and Customer Experience: AI enables marketers to deliver highly personalized experiences to their target audience. By analyzing customer data, AI algorithms can create personalized recommendations, personalized ads, and content tailored to people. This level of personalization helps improve customer satisfaction, engagement, and loyalty (Kaur & Singh, 2023).

6.3-Chatbots and virtual assistants: AI-based chatbots and virtual assistants can provide instant customer support, answer questions, and assist in purchasing decisions. AI-powered conversational agents can simulate human-like interactions and provide personalized assistance around the clock, enhancing the customer experience and reducing response time.(Khoa, 2021)

6.4-Marketing Automation: Artificial intelligence plays an important role in automating repetitive and time-consuming marketing tasks. It can automate email marketing, social media posts, ad optimization, and campaign management. This reduces manual effort and frees up marketers to focus on

more strategic and creative aspects of their work.(Kotsyuba, Baburova, Shikov, & Silko, 2022)

6.5-Predictive analytics and ROI optimization: AI algorithms can predict future results based on historical data and identify the most effective marketing strategies. By analyzing past campaigns, customer behavior, and market trends, AI can optimize marketing efforts, strategically allocate budgets, and improve return on investment (ROI) (Kanthimathi, Saranya, & Hermina, 2023).

6.6-Voice and image recognition: Systems equipped with artificial intelligence can understand and process voice commands and image recognition technologies. This opens up new marketing channels through voice-enabled devices and visual search. Marketers can use AI to optimize their content for voice search and enhance visual search capabilities to improve customer engagement.(Chunda, 2022)

Overall, AI is revolutionizing the science of marketing, enabling marketers to better understand their customers, deliver more personalized experiences, automate tedious tasks, optimize campaign performance, and make data-driven decisions. AI continues to evolve and have a greater impact on different aspects of marketing.(Zeeshan & Saxena, 2020)

7- Applications of Artificial Intelligence in Digital Marketing

Artificial intelligence (AI) is rapidly transforming the world of digital marketing, injecting automation, personalization, and predictive power into every aspect of the game. From understanding audiences to creating persuasive campaigns and measuring their impact, AI is becoming an essential tool for every markete. Here are some of the most interesting uses of AI in digital marketing (Theodoridis & Gkikas, 2019):

7.1-Excessively targeted advertising:

Imagine ads that feel like they were chosen just for you, appearing at the perfect moment on your favorite websites and social media feeds. This is the magic of AI-based advertising targeting. By analyzing vast amounts of data about your demographics, browsing habits, and purchase history, AI algorithms can pinpoint your exact interests and preferences and deliver ads that are laser-focused and most likely to resonate.(Cannella, 2018)

7.2-Content production powerhouse:

AI-powered content creation tools can generate everything from product descriptions and blog posts to social media captions and even video scripts. These tools can analyze your brand voice and target audience and, generate content that is both informative and engaging, freeing up your time for more strategic work.(Ma, 2020)

7.3-Chatbots that converse and convert:

Forget the robotic and pre-programmed chatbots that frustrate you. AIpowered chatbots can now have natural conversations, answer your questions, troubleshoot problems, and provide 24/7 customer service that feels like a human. They can also qualify leads, personalize offers, and guide customers through the sales funnel, thus increasing conversions and brand loyalty.(Somasekhar, 2023)

7.4-Predictive analysis for the future:

Artificial intelligence is not just understanding the past. It can also predict the future of your marketing efforts. AI algorithms can predict what your customers will do next by analyzing data on customer behavior and market trends, allowing you to proactively engage them with the right message at the right time. Imagine knowing which customers are most likely to churn and taking steps to retain them before them leave.(Evans, 2023)

7.5-Dynamic optimization on the fly:

Forget about static campaigns that remain the same until the end. AI can continuously monitor the performance of your marketing efforts in real-time, adjusting parameters such as budget allocation, keyword targeting, and ad copy on the fly, ensuring that your campaigns are always at their peak. Their performance maximizes your ROI and minimizes wasted resources.

These are just a few examples of the transformations created by AI in digital marketing. Remember, AI is not a magic wand, but a powerful tool that requires careful monitoring and collaboration with human intelligence. By harnessing its potential responsibly and ethically, we can unlock a future of marketing that is more effective, more impactful, and ultimately more human-centered. As the technology continues to evolve, we can expect more groundbreaking applications from personalized video recommendations to AR marketing experiences.

The future of marketing is based on artificial intelligence, and those who embrace this transformative force will thrive in the changing digital landscape.(Rathod, 2023)

8- Evolution of digital marketing with integration of artificial intelligence

The digital marketing landscape has undergone a dramatic transformation with the integration of artificial intelligence (AI), whose impact has been farreaching, reshaping everything from campaign strategies to customer interactions. Here's a glimpse into the evolution of digital marketing using an AI approach (Schipmann, 2019):

8.1-Early stage (2010s):

<u>8.1.1-Early experiments</u>: The potential of AI was recognized at this stage, with early adopters experimenting with basic applications such as automated ad bidding and basic chatbots.

<u>8.1.2-Limited data</u>: Data availability was a major bottleneck that limited the scope of AI applications in marketing.

<u>8.1.3-Efficiency</u>: Automation of simple tasks such as planning and reporting was the main focus, freeing up human resources for strategic thinking.

8.2-Growth stage (2015-2020):

<u>8.2.1-Data explosion</u>: The rise of Big Data and cloud computing has fueled advances in artificial intelligence.

<u>8.2.2-Sophisticated algorithms:</u> Machine learning and deep learning algorithms led to more sophisticated applications of artificial intelligence, including personalized recommendations and dynamic content creation.

<u>8.2.3-Greater impact on strategy</u>: AI is starting to influence core marketing strategies, such as audience segmentation, content marketing, and customer journey optimization.

8.3-Current stage (2020 so far):

<u>8.3.1-AI Ubiquitous</u>: AI has become ubiquitous in digital marketing and is integrated into almost every aspect of campaigns.

<u>8.3.2-Hyper-personalization</u>: AI tailors marketing experiences based on individual preferences and needs, delivering highly relevant content and offers.

<u>8.3.3-Predictive analytics:</u> AI predicts customer behavior and market trends, enabling proactive marketing campaigns and resource allocation.

<u>8.3.4-The rise of voice and AR/VR</u>: Artificial intelligence power voice assistants and AR experiences, creating immersive and interactive marketing interactions.

8.4-Looking at the future stage:

The future of digital marketing with artificial intelligence includes even more exciting possibilities:

<u>8.4.1-AI-powered creativity:</u> AI helps generate creative content, from writing ad copy to creating music for marketing campaigns.

<u>8.4.2-Emotional AI</u>: AI understands and responds to human emotions, powering deeper customer connections and personalized experiences.

<u>8.4.3-Augmented Reality Marketing</u>: AI seamlessly integrates AR into marketing experiences, blurring the lines between the physical and digital worlds.

<u>8.4.4-Responsible AI</u>: Ethical considerations and explainability become increasingly important as AI becomes more deeply embedded in marketing practices.

As a result, the evolution of digital marketing with AI has been remarkable, offering unprecedented capabilities for personalization, automation, and datadriven decision-making. As AI continues to evolve, marketing will become increasingly intelligent, adaptive, and customer-centric, shaping the future of how brands communicate and engage with their audiences.(Rathod, 2023)

9- Advantages of Artificial Intelligence in Digital Marketing

Artificial intelligence is bringing a wave of exciting benefits to digital marketing, transforming it from a one-size-fits-all approach to a highly personalized and data-driven field. Here are some of the key benefits that AI offers (Zaman, 2022):

9.1-Accuracy and advanced targeting:

<u>9.1.1- Hyper-personalization</u>: AI analyzes vast amounts of user data to understand individual preferences and behaviors, enabling marketers to deliver precisely tailored messages, content, and offers. Imagine product recommendations that feel like they were chosen just for you!

<u>9.1.2-Laser-focused campaigns</u>: AI algorithms identify ideal audience segments based on demographics, interests, and online activity, eliminating wasted targeting and ensuring that your campaigns reach the right people at the right time (Qiao, 2021).

9.2. Unique efficiency and automation:

<u>9.2.1-Automation of repetitive tasks</u>: AI handles time-consuming tasks such as ad bidding, campaign management, and content scheduling, freeing up valuable human resources for strategic decision-making and creative efforts. Imagine eliminating tedious manual tasks and focusing on impactful projects.

<u>9.2.2-Real-time optimization:</u> AI continuously monitors campaign performance and adjusts parameters such as budget allocation and ad copy in real-time, ensuring maximum efficiency and ROI. Think of having a tireless assistant constantly tuning your campaigns for optimal results (Ji et al., 2022).

9.3. Deep insight and interaction with the customer:

<u>9.3.1-Predictive analytics</u>: AI analyzes data to predict future customer behavior and preferences, enabling proactive engagement and personalized access. Imagine knowing which customers are likely to leave so you can take steps to retain them before they leave.

<u>9.3.2-24/7 customer service</u>: AI-powered chatbots provide always-on assistance, answer questions, and troubleshoot problems, creating a seamless and personalized customer journey. Imagine not having to wait for customer service!(Das & Singh, 2022)

9.4. Creating and optimizing content:

<u>9.4.1- AI-powered content creation:</u> Tools such as copywriting assistants and video generators can generate engaging content such as product descriptions, blog posts, and even social media captions to save time and inspire.

<u>9.4.2- Dynamic and personalized experiences:</u> AI personalizes user experiences on websites and apps by, tailoring content and recommendations based on individual preferences. Imagine a website that feels like it already knows you and displays products and information related to your interests. (Ding, Govindaraj, & Swaminathan, 2021)

9.5. Data-based decision making and growth:

<u>9.5.1-Actionable insights:</u> AI analyzes data to reveal hidden patterns and trends in customer behavior, providing valuable insights to inform marketing strategies and improve campaign performance.

<u>9.5.2-Continuous improvement:</u> AI learns and adapts over time, constantly refining its algorithms and providing continuous opportunities for marketers to optimize their efforts and achieve sustainable growth. It's like having a virtual coach constantly pushing you toward marketing success.(Grandhi, Patwa, & Saleem, 2021)

9.6. Real-time campaign optimization:

AI-based algorithms can monitor and analyze campaign performance in realtime and continuously make adjustments and optimizations. This enables marketers to quickly identify poorly performing campaigns, make data-driven changes, and maximize the effectiveness of their marketing efforts.(Du et al., 2019)

9.7. Fraud detection and prevention:

Artificial intelligence can help detect and reduce digital marketing fraud, such as advertising fraud. Machine learning algorithms can analyze user behavior patterns and identify anomalies that may be indicative of fraudulent activity, thus helping marketers protect their advertising budgets and maintain the integrity of their campaigns.

By adopting AI-based solutions in a thoughtful, human-centric way, marketers can transform their digital strategies and gain a significant competitive advantage in the ever-evolving online landscape.(Tax et al., 2021)

10- Disadvantages of the use of artificial intelligence in marketing

While artificial intelligence (AI) has several advantages in marketing, there are also potential disadvantages to consider. Some disadvantages of the use of artificial intelligence in marketing (Tax et al., 2021):

10.1. Lack of Human Touch: By its very nature, AI lacks the emotional intelligence and personal touch of human marketers. This can lead to a loss of personal connections with customers and reduced ability to understand their feelings, preferences, and needs (Castelo, 2019).

10.2. Bias and Ethical Concerns: AI systems are programed with existing data, which, if the data used has inherent biases and is not carefully monitored and regulated, can perpetuate bias and discriminatory practices, thereby reinforcing stereotypes and prejudices in marketing (Ntoutsi et al., 2020).

10.3. Privacy Concerns: AI relies heavily on collecting and analyzing large amounts of data about people to personalize marketing strategies. This can raise privacy concerns because consumers may be wary about their personal information being collected and used by these systems(Xiao et al., 2022).

10.4. Lack of creativity: While AI can process and analyze data effectively, it often lacks the creativity and intuition that humans bring to marketing strategies. AI may struggle to come up with unique ideas, innovative campaigns, and out-of-the-box solutions that humans can imagine(Burk & Miner, 2022).

10.5. Job Loss: AI automation in marketing can lead to job displacement. As AI can perform repetitive tasks more efficiently and at lower cost, there is a risk that some marketing roles will become redundant, leading to job losses for HR (Valdiviezo-Abad & Túñez-López, 2021).

10.6. Technical challenges: Implementation and management of artificial intelligence systems require technical expertise, specialized software, and data management capabilities. Small businesses or marketers with limited technical resources may struggle to effectively adopt and integrate AI solutions (Y. Wu, 2022).

10.7. Cost Implications: While AI can provide long-term benefits, initial adoption and implementation costs can be high. Integrating AI systems, training employees, obtaining high-quality data, and maintaining infrastructure can be financially expensive, especially for smaller businesses (Makar, 2023).

Many of these disadvantages can be reduced or eliminated with proper care, regulations, and ethical considerations (Cerutti, 2022).

11- Artificial intelligence developments in digital marketing

Artificial intelligence has brought significant advancements and capabilities in this field to digital marketing. Here are some key developments:

11.1. AI algorithms can analyze vast amounts of data and customer behavior to create highly targeted and personalized marketing campaigns. By understanding individual preferences, AI can deliver tailored content, recommendations, and offers, resulting in better engagement and conversion rates.

11.2. Chatbots and virtual assistants equipped with artificial intelligence can interact with customers in real time and provide immediate answers and assistance. They can handle basic inquiries, provide product recommendations, and even complete transactions. This improves customer experience, reduces response time, and increases overall efficiency (Shah, 2023).

11.3. AI algorithms can analyze historical data to predict future customer behavior, trends, and market dynamics. It helps marketers make data-driven decisions and optimize their campaigns for better results. Predictive analytics can also help identify potential churn, segment customers, and forecast demand (Sinha, Healey, & Sengupta, 2020).

11.4. Artificial intelligence can optimize content at the production scale. Natural language generation algorithms can generate personalized email campaigns, blog articles, and even product descriptions. AI can also analyze content performance and make recommendations for improvement, such as optimizing keywords or adjusting formatting for better SEO (Vesala & Law, 2023).

11.5. Systems equipped with artificial intelligence can analyze images and videos to recognize objects, faces, and emotions. Marketers can generate insights from visual data and produce more engaging and relevant visual content (Zaman, 2022).

11.6. Artificial intelligence techniques, such as natural language processing, can analyze customer sentiment expressed in social media posts, customer reviews, and other online sources. It helps marketers understand customer perception, identify brand advocates and detractors, and adjust marketing strategies accordingly (Zain, Ramli, Adnan, & Civilization, 2022).

Overall, advances in AI enable digital marketing and marketers to deliver highly targeted and personalized experiences, improve efficiency, and make data-driven decisions.

12- Exploring the Role of AI in Digital Marketing

Exploring the role of AI in digital marketing is a fascinating journey into the future of how businesses connect with their audiences. AI is rapidly transforming the landscape, offering powerful tools and capabilities to automate tasks, personalize experiences, and gain deeper customer insights (Nirwana, 2023).

Here are some key areas where AI is making a significant impact:

12.1. Personalization:

AI can analyze vast amounts of data to create highly targeted and personalized marketing campaigns (Kuang, 2022). This includes:

<u>12.1.1. Content personalization</u>: AI can tailor website content, emails, and social media posts to individual users based on their browsing history, interests, and demographics.

<u>12.1.2. Ad targeting:</u> AI can optimize ad campaigns to reach the right audience with the right message at the right time.

<u>12.1.3. Product recommendations:</u> AI can products to customers based on past purchases and browsing behavior.(Vinaykarthik, 2022)

12.2. Automation:

AI can automate many tedious and time-consuming marketing tasks, freeing up human marketers to focus on more strategic work (Pendy, 2023). This includes: <u>12.2.1. Social media management:</u> AI can schedule posts, respond to comments, and even generate content for social media platforms.

<u>12.2.2. Email marketing</u>: AI can send personalized email campaigns based on specific triggers or events.

<u>12.2.3. Lead generation:</u> AI can qualify leads and score them based on their likelihood of conversion (More, Nadaf, Gaware, Sancheti, & Vishwakarma).

12.3. Customer insights:

AI can analyze data from various sources to provide deep insights into customer behavior, preferences, and trends. This information can be used to (Palencia–Olivar, Bonnevay, Aussem, & Canitia, 2022):

<u>12.3.1. Improve marketing campaigns:</u> AI can identify what is working and what is not, allowing marketers to optimize their campaigns for better results.

<u>12.3.2.</u> Develop new products and services: AI can help businesses understand customer needs and develop products and services that meet those needs.

<u>12.3.3. Predict future trends:</u> AI can analyze data to predict future customer behavior and market trends, helping businesses stay ahead of the curve.

12.4. Chatbots and virtual assistants:

AI-powered chatbots and virtual assistants can provide 24/7 customer support, answer questions, and complete transactions. This can improve customer satisfaction and reduce customer service costs (Bălan & Research, 2023).

12.5. Content creation:

AI can be used to generate different creative text formats of content, such as poems, code, scripts, musical pieces, email, and letters. marketers can generate a variety of content formats such as poems, code, scripts, musical pieces, emails, and letters with ease and efficiency. AI content creation tools use natural language processing and machine learning algorithms to analyze data and generate relevant and engaging content (Sančanin & Penjišević, 2022).

It is important to remember that AI is a tool and not a replacement for human marketers. The most successful marketing campaigns combine the power of AI with the creativity and strategic thinking of human professionals (Davenport, Guha, Grewal, & Bressgott, 2020).

As you explore the role of AI in digital marketing, here are some additional questions to consider:

- ▶ What are the ethical implications of using AI in marketing?
- How can businesses ensure that their AI-powered marketing campaigns are transparent and trustworthy?
- What are the skills that human marketers will need to succeed in the AIpowered future?

By understanding the potential of AI and using it responsibly, businesses can create more effective marketing campaigns, gain a deeper understanding of their customers, and stay ahead of the competition (Mazur, 2023).

13- Future of artificial intelligence in digital marketing

Artificial intelligence already has made a significant impact on digital marketing, changing the way businesses connect with their audiences and optimize their marketing efforts. Artificial intelligence continues to shape the digital marketing landscape with its ability to analyze vast amounts of data, deliver personalized experiences, and automate marketing processes (Simion & Popescu, 2023).

As businesses strive to remain competitive in the digital age, the use of AIbased tools and strategies is becoming increasingly critical. By harnessing the power of AI, businesses can enhance customer experiences, improve targeting and segmentation, and achieve better campaign performance (C. W. Wu, Monfort, & Marketing, 2023).

The future of AI in digital marketing looks promising with advances in machine learning, natural language processing, and automation. As AI continues to evolve, businesses need to stay abreast of the latest trends and technologies to stay ahead of the competition and respond to the changing demands of their audiences (Moutinho, 2021).

It can be concluded that the future of digital advertising is undeniably intertwined with the ever-evolving world of artificial intelligence technologies. The potential for AI to change the way advertising campaigns are targeted, personalized, and measured is huge, paving the way for a smarter and more effective advertising landscape (Briefings, 2023).

Therefore, the future of digital advertising is bright, powered by the transformative capabilities of AI. By responsibly and strategically adopting these technologies, marketers can unlock new levels of personalization, targeting, and optimization, and create ad experiences that are both effective

and engaging for users. As AI continues to evolve, the possibilities for the future of advertising are truly limitless (Simion & Popescu, 2023).

14- Discussion

Examining the overall impact of AI on digital marketing reveals a significant transformation in marketing strategies, consumer engagement, and data analytics. As digital marketing practices continue to evolve and integrate with an AI approach, it is clear that personalized and targeted advertising has become more effective and efficient. However, it is important for marketers to also consider the ethical implications of using artificial intelligence in digital marketing. However, with these advances come challenges and considerations such as ethical implications, the need to maximize return on investment. So, in addition to revolutionizing the way digital marketing works, AI has also opened up new opportunities for businesses to create more targeted and personalized campaigns (Krishnan, Gupta, Gupta, & Singh, 2022).

Our examination of AI's impact on digital marketing reveals a landscape full of transformative potential and complex ethical considerations. On the one hand, AI offers unparalleled capabilities for personalization, automation, and data-driven decision-making that promise to increase customer engagement, increase campaign effectiveness, and ultimately maximize ROI. On the other hand, it allows us to tailor content, recommendations, and even advertising experiences based on individual preferences and needs, fostering deeper connections and engagement (Rivas & Zhao, 2023).

AI automates repetitive tasks, allowing marketers to focus on strategic planning and creative efforts. However, it is important to remember that AI should complement human empathy and creativity in creating meaningful brand stories and customer relationships, not replace it. Therefore, the power of artificial intelligence is accompanied by serious moral responsibilities. Data privacy, algorithmic fairness, human oversight, and responsible innovation are important concerns that must be addressed through transparency, collaboration, and a commitment to the social good (Ameen et al., 2022).

One of the key benefits of AI in digital marketing is that with AI-based analytics, businesses can gain a deeper understanding of their target audience, preferences, and online behaviors. Using this information, marketers can deliver personalized content and campaigns that resonate with their customers and increase engagement and conversion rates (Ameen et al., 2022).

Artificial intelligence also plays a vital role in automating common tasks in digital marketing, such as email marketing, social media management, and customer support. AI-driven chatbots and virtual assistants enhance the customer experience by providing timely and relevant assistance, thus improving customer satisfaction and loyalty (Hassan & Healthcare, 2021).

The study also showed that the implementation of AI leads to improved response time, increased customer engagement, and reduced staff costs in digital marketing. Artificial intelligence helps marketers optimize their advertising campaigns using predictive analytics. By analyzing user behavior patterns, AI algorithms can accurately predict consumer preferences and optimize ad targeting to reach the most relevant audience. This leads to a better marketing ROI and eliminates wasteful spending (Banjac & Palić, 2021).

In addition, artificial intelligence technology increases the efficiency and accuracy of data analysis. Traditional methods of data collection and analysis are time-consuming and error-prone. Using artificial intelligence algorithms, marketers can quickly process and analyze large datasets, enabling them to quickly make data-driven decisions (Devang, Chintan, Gunjan, Krupa, & Informatics, 2019).

Although artificial intelligence automates many tasks, it cannot completely replace human touch. Creativity, empathy, and intuition are essential qualities that still require human intervention in marketing strategies. Businesses must strike the right balance between using AI for efficiency and maintaining human interaction to deliver marketing campaigns with emotional resonance (Pathak & Sharma, 2022).

Adopting artificial intelligence technology in digital marketing strategies can lead to competitive advantages and better marketing results. It is worth noting that businesses that embrace AI-powered data analytics will have a competitive advantage in the evolving digital landscape, enhancing customer experiences, increasing conversion rates, and driving business growth, enabling them to open up opportunities to retain customers and increase sales. As technology continues to advance, predictive analytics and lead scoring will undoubtedly remain essential tools for growing businesses in the digital marketing landscape (Huang & Rust, 2021).

The influence of AI on marketing has been profound, transforming it from a one-size-fits-all approach to a highly targeted discipline. Therefore, the potential of AI to transform marketing and create truly relevant customer experiences is undeniable, and it can be concluded that the future of marketing is where AI augments human ingenuity and paves the way for a more effective, engaging, and ultimately more meaningful way to facilitates communication with consumers (Murár, 2023).

15- Refrence

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Chapter 6

The Mediating Role of Work Stress in the Effect of Job Insecurity on Job Performance

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ABSTRACT

Design/methodology/approach – According to operational stress theory, when employees perceive threats to their job security, their anxiety levels increase, which often leads to elevated occupational stress. Under these conditions, individuals tend to prioritize coping with stress over contributing to organizational objectives, resulting in diminished intrinsic motivation and a decline in performance. This research explores how job insecurity, occupational stress, and employee performance are interrelated, placing particular emphasis on the mediating influence of job-related stress. The empirical data was collected in Gaziantep, a major hub for textile exports in Turkey, and analyzed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach through the SmartPLS software.

Findings – The findings revealed that employees' perceptions of job insecurity lead to a noticeable rise in both workplace stress and job performance. Moreover, job-related stress was found to function as a mediating factor in the connection between job insecurity and performance, underlining its critical role within this interaction.

Research limitations/implications – Since the research focused on a particular industrial workforce, the extent to which the results can be applied to broader contexts may be limited. It would be useful for future studies to examine if these results apply across a wider range of sectors and employee demographics.

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Practical implications – The results provide practical guidance for organizations aiming to enhance employee performance by reducing job insecurity and effectively handling work-related stress. These insights emphasize the value of fostering stable and supportive workplace conditions.

Originality/value – By empirically examining the interconnections among job insecurity, work-related stress, and employee performance, this research contributes meaningfully to the literature and introduces an integrative framework for understanding their impact within organizational settings.

Keywords: Job insecurity, job performance, job stress, employee management, industrial psychology

INTRODUCTION

Maintaining employee productivity while minimizing resource usage has become a key objective for organizations operating in today's intensely competitive environment. High performance under such conditions is not merely desirable, it represents a vital strategic advantage in sustaining market competitiveness. However, achieving and maintaining such performance requires employees to engage in their tasks both mentally and physically with full commitment (Darvishmotevali, 2017, p. 1724).

This study focuses on employees working in large-scale textile enterprises within the Gaziantep Organized Industrial Zone. The working conditions in this sector are notably demanding; employees often contend with excessive workloads, extended working hours, limited union support, occupational health risks, and frequent exposure to workplace accidents. In addition, low social and professional status further complicates the labor environment. To preserve the long-standing productivity and industrial success of the textile sector, it is essential to formulate strategies that address these challenges and support sustainable high performance (Akardeniz & Kıraç, 2015, p. 465). Such strategies must include initiatives aimed at enhancing human resource performance.

Meanwhile, the COVID-19 pandemic has brought about widespread economic instability, severely impacting global employment rates. In Turkey, for example, national employment statistics revealed a 2.9% decrease in July 2020 compared to the same month in the previous year, reducing the employment rate to 43.5% [URL I]. Such disruptions have not been confined to a single country; rather, they reflect a broader international pattern. Around the world, workers have increasingly come to perceive their jobs as uncertain and vulnerable, giving rise to elevated levels of job insecurity across various sectors and economies (Hartley et al., 1991; Darvishmotevali, 2017, p. 1724). The growing uncertainty in the workplace has noticeably changed how employees think about their jobs. Many now worry not just about keeping their current positions, but also about whether they can maintain a stable career and financial security in the long run. Because of this, job insecurity has become a major concern for both employees and organizations, especially as they try to recover and adapt in the postpandemic job market.

Over the last 20 years, people have become increasingly worried about job insecurity, mostly because workplaces have grown more unpredictable and harder to navigate. The COVID-19 pandemic made this even worse, shaking up job markets around the world and breaking the stability that many employees once counted on. Today, many workers—no matter their role or industry—feel like their jobs could disappear at any moment. This fear isn't just emotional;

research shows it can seriously affect how organizations function. Employees who feel insecure tend to be less productive, less satisfied with their jobs, and less committed to their companies. Some even consider quitting. As organizations try to rebuild after the pandemic, it's more important than ever to understand how insecurity affects people at work—and what can be done about it.

Within this framework, job insecurity should not be viewed solely as a symptom of larger socioeconomic disruptions; it also reflects deficiencies in organizational leadership and insufficient institutional support structures. The way managerial systems respond to uncertainty plays a key role in shaping employees' sense of stability. A pressing research challenge is to determine which employee groups are most susceptible to the adverse consequences of perceived employment instability, particularly in environments lacking transparent communication and robust support mechanisms (Cheng & Chan, 2008, p. 274). A substantial body of empirical research indicates that job insecurity is closely linked to heightened levels of occupational stress and can lead to significant declines in employee performance, motivation, and workplace engagement (Hartley et al., 1991, p. 44; Ashford et al., 1989, p. 820; Ackerman, 1982, p. 58). These outcomes not only affect individual well-being but also pose broader challenges for organizational effectiveness and sustainability.

This study aims to unravel the multifaceted relationship among job insecurity, occupational stress. emplovee performance. emphasizing and the interdependencies that exist between these core variables. Particular attention is given to the mechanisms through which these factors interact and influence each other within organizational settings. The research framework is structured around six key focal areas: (1) articulating the conceptual and theoretical underpinnings of job insecurity, job stress, and performance; (2) reviewing empirical findings on the direct impact of job insecurity on employee output; (3) analyzing the association between perceived insecurity and stress levels; (4) evaluating how stress influences job-related outcomes; (5) determining whether stress serves as a mediating element in the job insecurity-performance link; and (6) proposing directions for future scholarly inquiry to deepen understanding of these interrelations and broaden the applicability of the findings.

Although numerous studies have previously examined job insecurity, occupational stress, and job performance as separate constructs, there remains a notable gap in research that explores how job stress functions as a mediating variable linking insecurity to performance outcomes. Few investigations have adopted a unified model to capture this dynamic interplay. Addressing this gap, the present study seeks to contribute fresh insights to the field of organizational behavior by presenting a more integrated and holistic framework. In doing so, it

enhances our understanding of how perceived uncertainty in the workplace can disrupt employee efficiency, motivation, and overall organizational contribution.

CONCEPTUAL FRAMEWORK

This part of the study explains the main concepts being explored—job insecurity, job-related stress, and job performance. It also outlines the theoretical perspective used to understand how these three areas are connected. Laying out this framework helps clarify how these factors interact and sets the stage for the rest of the analysis. Taking this structured approach makes the study easier to follow and helps ensure that the results are interpreted with a clear understanding of the concepts involved.

Job Insecurity

One of the early academic definitions of job insecurity comes from Greenhalgh and Rosenblatt (1984, p. 441), who described it as the feeling employees have when they believe their job is at risk and they can't do much to protect it. This view highlights the emotional uncertainty people experience about their future at work. Along similar lines, Sverke et al. (2002, p. 243) define job insecurity as how likely someone thinks it is that they could lose their job against their will. What both definitions make clear is that it's not always the actual loss of a job that causes stress, but the constant fear that it might happen. That fear alone can take a serious toll on a person's mental health and attitude toward work.

Scholars have interpreted the concept of job insecurity through various lenses, each highlighting a different aspect of the phenomenon. For example, Davy et al. (1997, p. 323) define it as the anticipation or expectation of future employment instability, reflecting an individual's concern about the continuity of their role. In contrast, Heaney et al. (1994, p. 1431) stress the personal and subjective nature of job insecurity, framing it as how employees perceive the possibility of losing their job. Özaman et al. (2006, p. 46) offer another angle, suggesting that job insecurity stems from the discrepancy between the level of job stability an employee desires and what they believe they currently experience. Adding further depth, Sverke et al. (2002, p. 256) argue that the core of job insecurity lies in the psychological fear of potential job loss, which can lead to adverse organizational outcomes, such as diminished employee morale, reduced loyalty, and declining job performance. Collectively, these interpretations reveal that job insecurity is not merely a structural issue but also a deeply personal and emotional experience.

Collectively, these perspectives position job insecurity as a key factor leading to workplace stress. Its consequences extend beyond emotional strain, often resulting in negative psychological, physiological, and organizational outcomes (Cheng & Chan, 2008, p. 275).

Job Performance

Within the scope of organizational psychology, job performance stands out as one of the most frequently studied concepts and constitutes the dependent variable in this research. It broadly refers to how effectively an employee fulfills work-related responsibilities in comparison to colleagues, encompassing both observable behaviors and quantifiable results (Babin & Boles, 1998, p. 82; Kakkos & Trivellas, 2011, p. 416). Jamal (1984, p. 2) further elaborates on this by defining job performance as an individual's capacity to perform assigned tasks efficiently, while also considering limitations such as available resources and organizational constraints.

Job performance typically refers to the set of observable behaviors and actions demonstrated by employees that are intended to support the achievement of organizational goals. These behaviors are assessed based on how effectively they contribute to overall performance indicators (Campbell et al., 1990, p. 314). From this perspective, job performance is considered a behavioral dimension that can either facilitate or impede organizational success, depending on the consistency, quality, and direction of the employee's conduct.

Job Stress

Job-related stress typically arises from continuous interactions between employees and their work environment, especially in situations where job expectations are perceived as excessive, threatening, or beyond one's capacity to manage. This stress reflects a state of psychological and physiological tension that may disrupt emotional stability, impair cognitive abilities, and deteriorate overall working conditions (Soelton et al., 2020, p. 169). Frequently, such stress stems from a misalignment between the demands of a given role and the employee's competencies, access to workplace support, or personal aspirations. When this imbalance persists, it can lead to serious health complications and reduced occupational functioning [URL II], highlighting the importance of organizational strategies aimed at prevention and early intervention.

Occupational stress is commonly defined as an individual's psychological response to emotional or physical pressures encountered in the workplace. Such stress typically emerges when there is an evident disparity between job requirements and the employee's capabilities or qualifications. This imbalance becomes even more critical when the expectations placed upon the employee exceed what they feel capable of achieving, intensifying the strain experienced. As Jamal (2016, p. 406) points out, the wider the gap between anticipated role outcomes and actual performance capacity, the greater the likelihood of elevated stress responses, potentially leading to diminished morale and work engagement.

Employees often identify external pressures such as overwhelming workloads, strict deadlines, and increased responsibilities as primary sources of workplace stress. These external demands can negatively affect both their work attitudes and behavioral responses. Since individuals differ in their personalities and coping strategies, the intensity and impact of such stressors are not experienced uniformly. Human social nature further contributes to the variability in how stress is perceived and managed across different employees.

Although job stress is commonly linked to negative consequences, it can, in some instances, act as a trigger for action. In such cases, stress may serve as a short-term motivator, pushing individuals to complete their tasks. However, when this motivation is rooted in anxiety or fear, employees are more likely to perform their duties as mere obligations rather than through meaningful engagement. On the other hand, motivation derived from internal driverssuch as passion, dedication, or a strong sense of responsibility, typically leads to more enthusiastic and voluntary participation in work tasks (Özdemir & Muradova, 2008, p. 148). Employees who are guided by such intrinsic factors tend to achieve higher performance outcomes.

HYPOTHESIS DEVELOPMENT

According to Hartley et al. (1991, p. 44), job insecurity stands as one of the primary sources of stress in modern professional environments, emphasizing its close association with occupational tension. A number of researchers argue that job insecurity should not be viewed simply as an outcome of stress but rather as a fundamental component that fuels it (Ashford et al., 1989, p. 807; Probst, 2002, p. 143; Sverke et al., 2002). The emotional burden of anticipating potential job loss can, in some instances, rival the psychological effects of actual unemployment (Klandermans & Van Vuuren, 1999, p. 151). This highlights the intensity of distress employees may experience even in the absence of concrete termination, suggesting that perceived instability can be just as damaging as real job displacement.

Theories centered on the stress process conceptualize job insecurity as an early warning sign for a range of detrimental outcomes, including diminished psychological health, negative shifts in work-related attitudes, and declining job performance (Sverke et al., 2002, p. 243; Cheng & Chan, 2008, p. 275). Empirical studies further reveal that insecurity-induced stress can significantly impair concentration, magnify anxiety—especially when combined with other

workplace stressors—and contribute to harmful incidents such as workplace accidents, reduced innovation, poor communication, and maladaptive behaviors among employees (Baillien & De Witte, 2009, p. 352; Shoss, 2017, p. 18). An extensive body of scholarly literature supports the assertion that perceived threats to job stability consistently elevate stress responses across various occupational settings (De Witte et al., 2012, p. 15; Klandermans & Van Vuuren, 1999, p. 151; Sverke et al., 2002, p. 243; Baillien & De Witte, 2009, p. 352; Shoss, 2017, p. 18; Hartley et al., 1991, p. 44). These findings emphasize that the anticipation of job loss—regardless of its actual occurrence—can undermine both individual wellbeing and organizational efficiency.

Building upon the aforementioned evidence, this study proposes that employees who sense a threat to their job security are more susceptible to heightened occupational stress. The logic underlying this proposition is grounded in existing theoretical and empirical research, which consistently links perceived job instability to elevated stress responses. Accordingly, the study puts forward the following hypothesis:

Hypothesis 1: Perceived job insecurity has a significant positive effect on job stress.

De Cuyper et al. (2020) identify three main ways job insecurity can influence employee performance. First, it often causes a decline in performance—either immediately or over time. Second, in some cases, fear of job loss can temporarily increase performance by motivating employees to prove themselves; however, this effect is usually short-lived. Third, they acknowledge that in certain settings or for certain individuals, job insecurity may have little to no noticeable effect. Adding to this, Rangrez et al. (2022) found that employees who feel insecure about their jobs tend to experience higher levels of workplace stress, highlighting the emotional burden that job insecurity can carry.

Conversely, Shin et al. (2021) contend that job insecurity negatively affects employee performance by eroding emotional attachment and diminishing organizational loyalty. This perspective suggests that when workers feel uncertain about their job future, their sense of belonging and identification with the organization is disrupted. In a similar vein, Greenhalgh and Rosenblatt (1984, p. 438) argue that employees' behavioral and emotional reactions to job insecurity are closely linked to broader patterns of organizational functioning. Expanding on this, Cheng and Chan (2008, p. 287) associate job insecurity with several adverse outcomes, including reduced job satisfaction, weakened organizational commitment, and deteriorating psychological and physical health. Furthermore, they highlight the moderating role of variables such as interpersonal trust and employee engagement in determining how job insecurity ultimately influences performance outcomes.

Mooney (1984) maintains that uncertainty about continued employment eventually leads to reduced performance, while Ackerman (1982, p. 58) and Ashford et al. (1989, p. 808) note that organizations characterized by instability often observe a decline in productivity. This drop is often attributed to employees viewing insecurity as a psychological stressor that hampers their focus and efficiency. As outlined in operational stress theory, when employees are faced with uncertainty but lack effective coping strategies, job insecurity becomes a major source of chronic stress, which in turn reduces well-being and workplace contribution (Darvishmotevali & Ali, 2020, p. 2).

A substantial volume of empirical studies has consistently demonstrated that job insecurity tends to have a harmful effect on employee performance (Ackerman, 1982, p. 58; Greenhalgh & Rosenblatt, 1984, p. 438; Mooney, 1984; Jamal, 1984, p. 2; Ashford et al., 1989, p. 820; Cheng & Chan, 2008, p. 287; Darvishmotevali & Ali, 2020, p. 2). The prevailing view in the literature suggests that when employees feel uncertain about their employment continuity, their motivation, focus, and productivity may decline. Drawing on this extensive scholarly evidence, the present study puts forth the hypothesis that job insecurity significantly contributes to a decrease in employee performance.

Accordingly, the following hypothesis is proposed:

Hypothesis 2: Perceived job insecurity has a significant negative effect on job performance.

Job stress is typically understood as a combination of psychological and physiological reactions individuals develop in response to perceived threats or excessive demands within their professional environment (Kahn et al., 1964). This state of tension frequently emerges when there is a misalignment between the responsibilities assigned by the organization and the employee's skill set, coping capacity, or available resources. As Jamal (1984, p. 2) notes, when institutional expectations surpass what employees feel they can reasonably accomplish, this imbalance can give rise to interpersonal conflict and internal strain. Prolonged exposure to such stress is often linked to deteriorations in both mental and physical health, declining motivation, and diminished workplace output. Consequently, organizations burdened with high levels of employee stress may find it difficult to adapt and thrive in increasingly dynamic and competitive business environments (Park, 2007, p. 5).

According to Parker and DeCotiis (1983, p. 176), job-related stress can trigger a range of adverse outcomes that manifest on both individual and organizational levels. Among these are heightened turnover intentions and a measurable decline in employee performance. Persistent stress not only affects workers' well-being but also undermines their ability to function effectively within the workplace. In a similar vein, Jamal (2016, p. 406) emphasizes that employees subjected to chronic stress often divert their mental and physical resources toward managing stress itself, rather than focusing on their assigned tasks, which ultimately impairs their work efficiency and overall productivity.

However, not all studies present job stress as uniformly detrimental. AbuAlRub (2004, p. 73), for instance, observed that employees experiencing moderate levels of stress often outperform those facing either minimal or excessive stress. This finding supports the notion of a U-shaped (curvilinear) relationship, suggesting that while extreme levels of stress hinder productivity, a moderate amount may enhance it by stimulating motivation and focus.

In contrast, Westman and Eden (1996, pp. 167–170) argue for a linear negative relationship, claiming that as stress levels increase, employees' cognitive abilities and attentional control deteriorate, particularly among those with less professional experience. In their view, excessive stress contributes to higher error rates and emotional fatigue, which ultimately impairs job performance.

A wide array of empirical studies has consistently demonstrated a negative correlation between job-related stress and employee performance outcomes (Parker & DeCotiis, 1983, p. 176; Motowidlo et al., 1986, p. 627; Jamal, 1984, p. 2; Westman & Eden, 1996, p. 170; Park, 2007, p. 5; Jamal, 2016, p. 406). These findings collectively suggest that as stress levels increase within the workplace, employees often experience a corresponding decline in their ability to perform effectively. Drawing from both theoretical frameworks and empirical research, the present study posits that job stress serves as a limiting factor for employee productivity. Accordingly, the following hypothesis is put forward:

Hypothesis 3: Job stress has a significant negative effect on job performance.

Extensive research has consistently linked job insecurity to various negative outcomes in organizational contexts (De Witte, 2016). It has been widely observed that uncertainty regarding job stability increases employee stress levels and triggers adverse emotional reactions. A substantial body of literature indicates that perceived job insecurity is a major factor contributing to heightened occupational stress (Ackerman, 1982, p. 58; Greenhalgh & Rosenblatt, 1984, p. 438; Mooney, 1984; Jamal, 1984, p. 2; Ashford et al., 1989, p. 820; Cheng & Chan, 2008, p. 287; Darvishmotevali & Ali, 2020, p. 2). When employees perceive their positions as insecure, they often experience psychological tension and a decline in motivation, which may reduce their alignment with organizational goals.

Similar patterns in the literature also show that job insecurity adversely affects employee performance (Parker & DeCotiis, 1983, p. 176; Motowidlo et al., 1986, p. 627; Jamal, 1984, p. 2; Westman & Eden, 1996, p. 170; Park, 2007, p. 5; Jamal, 2016, p. 406). The combination of job-related stress and insecurity tends to lower work engagement and reduce productivity across the workforce.

Building on these findings, the present study proposes that job insecurity not only directly influences stress and performance outcomes but that job stress also acts as a mediating mechanism in this relationship. Grounded in both theoretical perspectives and empirical evidence, the study presents the following hypothesis:

Hypothesis 4: Job stress mediates the relationship between job insecurity and job performance.

METHODOLOGY

This study primarily seeks to explore the extent to which apprehensions regarding potential job loss impact employee performance. A secondary aim is to examine whether job-related stress functions as a mediating variable in the link between perceived job insecurity and performance outcomes. The following section presents the research methodology, detailing the sampling procedures, data collection instruments, and analytical techniques utilized. The subsequent analysis is contextualized through comparisons with existing literature, and the study concludes with practical recommendations for industry practitioners as well as directions for future academic exploration. The conceptual framework guiding this research was designed to fill a gap identified in the organizational behavior literature and draws upon established theoretical models and relevant empirical findings (see Figure 1).



Figure 1. Model of the Study

Research Universe and Sample

The population targeted in this research comprises employees employed in large-scale textile enterprises located within the Gaziantep Organized Industrial Zone. Owing to the extensive size of this workforce, a realistic and statistically sound sample size needed to be determined, taking into account constraints related to time and available resources. For this purpose, the researchers relied on the well-established sampling framework proposed by Krejcie and Morgan (1970), which suggests that for populations exceeding 10,000, a sample size selected at a 95% confidence level with a 5% margin of error is considered sufficient for generalizability.

To facilitate efficient data collection, the study utilized a convenience sampling strategy, a non-probability sampling technique that allows researchers to gather data from readily accessible participants while still ensuring diversity across key population subgroups. The justification for this approach centered on achieving both practicality and cost-effectiveness in the field (Malhotra, 2004, p. 321). Ultimately, 405 valid responses were obtained and incorporated into the data analysis. The study adhered to established ethical research practices and received formal approval from the Social and Human Sciences Ethics Committee at Hasan Kalyoncu University.

Data Collection Method and Analysis of Data

In this study, primary data collection methods were utilized to gather firsthand information directly from the participants. The research instruments employed were derived from established and previously validated scales cited in relevant academic literature. The questionnaire was structured into four distinct sections: the initial part gathered demographic details of the respondents; the second section aimed to capture their perceptions regarding job insecurity; the third section measured their self-assessed job performance; and the final part focused on evaluating the extent of job-related stress. The measurement tools used in each of these segments are described in greater detail in the following subsections.

Job Insecurity Scale: In order to evaluate employees' perceptions of job insecurity, this study utilized a Likert-type scale that has been widely acknowledged in organizational behavior research. The original version of the scale was introduced by Ashford, Lee, and Bobko (1989), and later underwent refinements by De Witte (2000) and Hellgren et al. (1999) to enhance its applicability across various occupational settings. The instrument comprises six items designed to capture different dimensions of job insecurity, such as fear of job loss, uncertainty about continued employment, and doubts about organizational stability. Participants rated each statement using a five-point

Likert scale, from "strongly agree" to "strongly disagree." For this study, the Turkish version of the scale, originally validated by Çiğdem (2010) through psychometric testing was used to ensure it was both culturally and linguistically appropriate. Using this established version helped strengthen the reliability of the measurements and ensured the study followed accepted standards for cross-cultural research.

Job Performance Scale: To assess employees' perceptions of their own job performance, the study used a four-item scale first developed by Kirkman and Rosen (1999), later applied by Sigler and Pearson (2000), and adapted into Turkish by Çöl (2008). It focuses on how workers see themselves in terms of meeting job expectations, going beyond set goals, and maintaining strong productivity. Example items include statements like "I exceed my business goals" and "My level of performance in my job is high," which reflect both how employees evaluate their outcomes and how they perceive their overall performance. Participants responded using a five-point Likert scale, from "strongly disagree" to "strongly agree." In Çöl's (2008) study with academic staff in Turkey, the scale showed strong internal reliability, with a Cronbach's alpha of .82. That reliability score supports its use in this research as well, especially given the similar focus on workplace effectiveness.

Job Stress Scale: To measure how much job-related stress participants were feeling, the study used a five-point Likert scale originally developed by Cohen et al. (1983) to assess how people perceive stressful life events. Eskin et al. (2013) later translated and adapted the scale for use in Turkish, making sure it fit both the language and cultural context. The Turkish version had already been used in a workplace study by Küçükusta (2007), who confirmed that it worked well in that setting. The version used here includes four straightforward items that capture how much stress people feel in their daily and work lives. Participants rated how strongly they agreed or disagreed with each item, using a scale from "strongly disagree" to "strongly agree." In Küçükusta's study, the scale had a Cronbach's alpha of 0.76, which falls within the acceptable range for psychological scales. Since it had already proven reliable in similar Turkish settings, it was considered appropriate for use with the industrial workforce in this research.

To examine the relationships proposed in the model, the study applied Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS 3 software. PLS-SEM is a well-established statistical technique that is particularly suited for analyzing complex models involving multiple latent variables and their indicators. A key advantage of this method is that it allows researchers to assess both the measurement and structural models simultaneously, making it suitable

for both exploratory and confirmatory purposes (Hair et al., 2011; Demirağ et al., 2020). It is especially useful when the aim is to maximize the explained variance in key outcomes, which aligns with the objectives of this research. PLS-SEM was also selected for its flexibility, as it performs well with small to medium sample sizes and does not assume a normal distribution of the data (Ali et al., 2018).

Findings

This part of the study shares the main findings from the analysis. It starts by outlining who the participants were, including details like their age, gender, education level, and how much work experience they had. These background details help give context to the results and show how the sample fits with the study's goals. After that, the section presents the results of the structural model analysis and explains how those results relate to the original hypotheses. Finally, the findings are discussed in light of previous research to show what they mean both in theory and in practice.

Descriptive Statistics

The demographic profile of the participants is outlined below. Most respondents were male, making up 82.2% of the sample, while women accounted for 17.8%. In terms of marital status, 66.7% were married and 33.3% were single. The age distribution showed a fairly balanced spread: 16.5% were 20 or younger, 23.7% were between 21 and 30, 25.9% were in the 31–40 range, 24.2% were between 41 and 50, and 9.6% were 51 or older. Regarding income, 41.7% of participants identified themselves as low-income earners. These demographic details help frame the study's results and offer insight into the makeup of the workforce in the industrial sector examined. The educational background of participants exhibited notable variation. A substantial portion of the sample (42.7%) had attained only primary school education. Meanwhile, 24.7% reported holding a high school diploma, and 14.1% had completed an associate degree. Additionally, 16.5% of respondents held a bachelor's degree, while a small minority (2%) indicated that they had pursued postgraduate education, including master's or doctoral qualifications.

In terms of job tenure, the findings showed that 35.6% of employees had one year or less of professional experience, suggesting a relatively high proportion of new or recently hired workers. Another 27.9% had between two and four years of experience, followed by 16.3% with five to seven years, and 10.4% with eight to ten years of tenure. Smaller proportions were observed among those with longer work histories: 6.2% had been employed for 11–13 years, while only 3.7% had 14 or more years of continuous experience. These data reflect a predominantly early-career workforce, which may influence their perceptions of job insecurity and stress. Detailed demographic statistics are presented in Table 1.

Variant		0/	
		Ν	70
Gender	Female	72	17,8
	Male	333	82,2
Marital Status	Married	270	66,7
	Single	135	33,3
	20 years and under	67	16,5
	21-30	96	23,7
Age	31-40	105	25,9
	41-50	98	24,2
	51 years and older	39	9,6
	Very Low	134	33,1
Incomo	Low	169	41,7
Income	Middle	82	20,2
	High	12	2,0
	Very High	8	2.3
	Primary education	173	42,7
Education	High School	100	24,7
	Associate Degree	57	14,1
	Under Graduate	67	16,5
	Master/Doctorate Degree	8	2,0
Working Life	1 year and under	144	35,6
	2-4 years	113	27,9
	5-7 years	66	16,3
	8-10 years	42	10,4
	11-13 years	25	6,2
	14 years and more	15	3,7

Table 1. Distribution of Participants by Demographic Variables

N=405

Main Findings of the Research

To test the structural model in this study, Partial Least Squares Structural Equation Modeling (PLS-SEM) was used with the SmartPLS 3 software (Ringle et al., 2005). Each measurement scale in the survey was checked separately for reliability. Following standard guidelines, internal consistency was assessed using both Cronbach's Alpha and Composite Reliability (CR). According to the threshold suggested by Hair et al. (2009), values of 0.70 or higher were considered acceptable. As shown in Table 2, the Cronbach's Alpha scores for the scales ranged from 0.90 to 0.92, and the CR values were between 0.93 and 0.94—indicating that the scales used in the study were highly reliable (Hair, Sarstedt, Ringle, & Mena, 2012).

Alongside reliability checks, the study also tested convergent validity by calculating the Average Variance Extracted (AVE) for each variable. All AVE values were above the recommended cutoff of 0.50, meeting the standard set by Fornell and

Larcker (1981) and confirming that the constructs had acceptable convergent validity. The factor loadings for each item were examined using SmartPLS, and all items showed values of 0.60 or higher. This suggests that the items effectively represented the constructs they were intended to measure, supporting the strength of the overall measurement model. These findings indicate that the instruments used in the study were both statistically reliable and appropriate for analyzing the relationships between the latent variables.

Vari	ants	λ	t-values	CR	AVE	X
Job I	Insecurity (JI) (a=0.92; rho_A= 0,92)			.94	.73	
1	I'm afraid of being fired	,898	81.301			2.68
2	I am worried about job security at my current job	,884	55.069			2.81
3 4	I'm afraid of losing my job I think I'll be fired in the near future	,916 ,875	102.342 60.566			2.83 2.71
5	I am confident that I will be permanent in my current job.	,633	16.927			3.20
6	There is a possibility that I will be unemployed in the near future.	,888	63.389			2.90
Job	Stress (JS) (α=0.90; rho_A=0.90)			.93	.78	
1	I think I haven't been able to resolve my problems lately.	,876	56.356			2.95
2	Recently the difficulties have reached a level that I cannot cope with.	,901	73.757			2.97
3	I think things haven't been going well lately.	,898	78.344			3.09
4	I can't control events in my life lately	,870	58.515			3.03
Job I	Performance (JP) (α=0.91; rho_A=0.91)			.94	.79	
1 2	I complete my tasks on time. I exceed my business goals.	,890 ,897	69.548 59.491			3.64 3.60
3	I am confident that I have exceeded the standards in the quality of service I offer.	,897	73.188			3.62
4	When a problem comes up, I find a solution as quickly as possible.	,892	63.097			3.56

Table 2. Factor Loads, T-Values, CR, AVE, and Cronbach Alpha

* λ =Factor loadings, α =Cronbach Alpha,t- values, CR=Composite reliability, AVE=Average variance extracted, X=Average

The structural model in this research was evaluated using Partial Least Squares Structural Equation Modeling (PLS-SEM), carried out with the assistance of SmartPLS 3 software (Ringle et al., 2005). To examine the internal consistency of the constructs measured by the questionnaire, reliability analyses were performed independently for each scale. In line with established methodological guidelines, both Cronbach's Alpha and Composite Reliability (CR) coefficients were computed to assess the reliability of the latent constructs. Consistent with the threshold proposed by Hair et al. (2009), values of 0.70 or above were deemed acceptable indicators of internal consistency. As reported in Table 2, the Cronbach's Alpha coefficients for the scales fell within the 0.90 to 0.92 range, and the Composite Reliability values ranged from 0.93 to 0.94. These results reflect a high degree of reliability, confirming that the measurement instruments used in this study are both stable and internally consistent (Hair, Sarstedt, Ringle, & Mena, 2012). Such robust reliability metrics provide a solid foundation for the subsequent structural model analysis and hypothesis testing.

Alongside reliability analysis, the study also assessed convergent validity by calculating the Average Variance Extracted (AVE) for each latent construct. Following the guideline proposed by Fornell and Larcker (1981), an AVE value of 0.50 or higher indicates that a construct accounts for at least half of the variance in its associated items. The results showed that all AVE values met or surpassed this threshold, confirming that the constructs demonstrated acceptable convergent validity. Factor loadings for each item were also reviewed using SmartPLS, and all exceeded the recommended minimum of 0.60. Taken together, these findings indicate that the measurement model is statistically robust, with each construct showing strong internal consistency and convergent validity. This reinforces the credibility of the model and supports its use in examining the relationships outlined in the study (Hair et al., 2009).

Table 5. Discrimination valuaty							
Variants	1	2	3				
Fornell-Larcker Kriteria							
Л	0,855						
JS	,502	0,886					
JP	,449	,395	0,894				
Heterotrait-Monotrait Ratio							
Л							
JS	,548						
JP	,487	,432					
Notes: Bold italic values represent the s	square root of t	he mean-var	iance.				

Table 3: Discrimination Validity

The goodness-of-fit indices for the structural model are presented in Table 4. The results indicate an acceptable model fit based on the obtained values. Specifically, the Standardized Root Mean Square Residual (SRMR) was calculated as 0.050, which is below the recommended threshold of 0.08, indicating a good fit. Additionally, the Normed Fit Index (NFI) was found to be 0.91, surpassing the minimum acceptable value of 0.90. The chi-square (χ^2) statistic was 380.280, further supporting the overall adequacy of the model fit.

Table 4. Model Goodness of Fit Values						
	χ^2	NFI	SRMR			
Criterion		≥,80	≤,08			
		(Yaşlıoğlu, 2017)	(Hu ve Bentler, 1999)			
	380.280	0,917	0,050			

Prior to conducting **path analysis** to evaluate the structural model, the **Variance Inflation Factor (VIF)** values of the variables were examined to ensure the absence of **multicollinearity** among latent constructs. Assessing VIF values helps confirm that the relationships between variables are not distorted by high intercorrelations. According to the threshold recommended by Smith et al. (2020), VIF values should ideally be **below 10**. The findings indicate that all VIF values fall within the acceptable range, thereby confirming that **multicollinearity is not a concern** in the model. Detailed VIF values are presented in **Table 5**.

In addition to multicollinearity diagnostics, the study also reports key indicators of model quality, including the effect size (f^2), coefficient of determination (\mathbb{R}^2), and predictive relevance (\mathbb{Q}^2), which collectively support the evaluation of the structural model's explanatory and predictive power.

Tuble 5. Hypothesis Tests										
Variants		Beta (ß)	SD	t	р	Result	VIF	R ²	_f²	Q^2
$H_1 {\bf JI}$	→JS	,502	0.04	7.615	0,00***	Accepted	1.000	0.252	0.336	_
$H_2 \mathbf{JI}$	→JP	,335	0.4	11.700	0,00***	Accepted	1.336	0.240	0.110	0.18
${ m H}_3{ m JS}$	→JP	,227	0.05	4.504	0,00***	Accepted	1.336	0.205	0.051	0.19
$_{\rm H_4}J\!I\!\rightarrow$	JS→JP	, 114	0.02	3.857	0,00***	Accepted				-

Table 5. Hypothesis Tests

p=<0,001***, *p*=<0,01**, *p*=<0,05*

Figure 2 presents the results of the structural model analysis, including beta (β) coefficients, coefficient of determination (R²), and effect sizes (f²) for the relationships among the variables. The analysis showed that job insecurity has a statistically significant and positive effect on job stress ($\beta = 0.50$, p < 0.01), accounting for 25% of the variance in job stress (R² = 0.25), with a moderate effect size (f² = 0.33).

Furthermore, job insecurity was found to significantly and negatively influence job performance ($\beta = -0.33$, p < 0.01), explaining 24% of the variance in job performance ($R^2 = 0.24$), accompanied by a moderate effect size ($f^2 = 0.11$). The analysis also revealed that job stress negatively affects job performance ($\beta = -0.22$, p < 0.01), accounting for 20% of the variance ($R^2 = 0.20$), with a small to moderate effect size ($f^2 = 0.05$).

Based on these outcomes, support was found for Hypotheses 1, 2, and 3. Additionally, the mediating role of job stress in the link between job insecurity and job performance was examined using the mediation framework proposed by Baron and Kenny (1986). The analysis confirmed a significant mediating effect ($\beta = 0.11$, p < 0.01), thereby validating Hypothesis 4.



Figure 2. Test results of structural model relationships

To assess the significance of the mediating effect, the study employed the Variance Accounted For (VAF) coefficient, as recommended by Hair, Hult, Ringle, and Sarstedt (2013), and further supported by Yıldız (2020, p. 129). According to this guideline, a VAF value exceeding 0.80 indicates full mediation, while values between 0.20 and 0.80 represent partial mediation. VAF values below 0.20 are interpreted as evidence of no mediation. Based on the VAF

calculation performed in this research, the findings suggest that job stress serves as a partial mediator in the link between job insecurity and job performance.

Result and Discussion

As global economic conditions continue to shift and competition in the business world grows especially in the wake of the disruptions caused by the COVID-19 pandemic the structure and expectations of work have changed significantly. These shifts have not only changed how organizations function but have also reshaped the relationship between employers and employees. As stable job opportunities become increasingly scarce, job insecurity has emerged as a growing concern. This rising uncertainty has been tied to several negative outcomes, including higher levels of psychological stress and reduced productivity among workers. With job insecurity becoming a more persistent aspect of modern labor markets (Wang et al., 2014), organizational leaders now face the challenge of maintaining employee motivation, performance, and engagement (Shin et al., 2021). Addressing these concerns, this study explores the connections between job insecurity, job stress, and job performance, offering insights into how these factors interact and influence workplace dynamics.

This study aimed to gain a clearer understanding of how perceived job insecurity affects employees' well-being and performance in a real-world industrial context. To achieve this, data were gathered from 405 employees working in textile firms located in the Gaziantep Organized Industrial Zone. The research focused on examining the extent to which job insecurity influences stress and performance, and whether job-related stress serves as a mediating factor between the two. Grounded in established theoretical frameworks and supported by previous studies, the research offers a broader view of how these three variables are interrelated and how they interact within the dynamics of the workplace.

The structural equation modeling results revealed statistically significant associations among the variables. Job insecurity was found to be a strong positive predictor of job-related stress ($\beta = 0.50$, p < 0.01), while it also exerted a notable negative effect on job performance ($\beta = -0.33$, p < 0.01). Furthermore, elevated job stress was shown to negatively influence employee performance ($\beta = -0.22$, p < 0.01). Mediation analysis confirmed that job stress partially mediates the relationship between job insecurity and performance outcomes ($\beta = 0.11$, p < 0.01). These findings support all four hypotheses proposed in the study and offer empirical validation for the theorized model.

In today's resource-constrained environment, organizational restructuring through strategies such as downsizing, mergers, or operational shifts has become

commonplace in efforts to maintain competitiveness. However, such restructuring frequently triggers heightened perceptions of job insecurity among employees, leading them to question the stability and future of their positions (Sverke et al., 2002, p. 242). Grounded in stress process theory, the current study confirms that such insecurity significantly contributes to increased stress levels (De Witte et al., 2012, p. 15; Klandermans & Van Vuuren, 1999, p. 151; Baillien & De Witte, 2009, p. 352; Shoss, 2017, p. 18; Hartley et al., 1991, p. 44). The data also reinforce the proposition that job insecurity not only distresses employees psychologically but also undermines their productivity and findings in line with earlier research (Ackerman, 1982, p. 58; Greenhalgh & Rosenblatt, 1984, p. 438; Jamal, 1984, p. 2; Cheng & Chan, 2008, p. 287).

Operational stress theory suggests that when employees feel uncertain about their future employment, they divert cognitive and emotional resources toward managing anxiety rather than focusing on work-related tasks. This study's confirmation of the negative impact of stress on job performance aligns with this perspective and is consistent with prior empirical evidence (Parker & DeCotiis, 1983, p. 176; Motowidlo et al., 1986, p. 627; Westman & Eden, 1996, p. 170; Park, 2007, p. 5; Jamal, 2016, p. 406). Moreover, the mediating role of job stress, as demonstrated in the analysis, illustrates how emotional strain caused by perceived insecurity can act as a psychological mechanism through which performance declines. These findings also reflect principles found in bilateral models of organizational behavior, which posit that intermediary variables like stress explain the pathway from adverse organizational conditions to impaired employee outcomes (Darvishmotevali & Ali, 2020, p. 2).

Consequently, job insecurity stands out as a critical determinant of both employee well-being and workplace effectiveness. A work environment characterized by stability and support promotes psychological safety, strengthens individual motivation, and enhances organizational productivity. From this perspective, improving job security should not only be viewed as an ethical imperative but also as a strategic initiative to sustain long-term employee engagement and organizational success.

Choosing Gaziantep as the study site adds important context to the research, given the city's key role in Turkey's textile manufacturing sector. The challenging working conditions common in this industry make it a fitting environment for exploring how job insecurity, stress, and performance are connected. While earlier studies have typically examined these variables separately, this study moves the field forward by bringing them together in a single empirical model—highlighting the mediating role of job stress within a high-pressure industrial setting.

By bringing together job insecurity, job stress, and job performance in a single analytical model, this study makes a unique contribution to the organizational behavior literature. It not only builds on existing theory but also offers practical insights for managers working in uncertain environments. Methodologically, the study also demonstrates how structural equation modeling can be used to explore hidden psychological and performance-related variables. The model's strong statistical reliability and ability to explain key relationships support the strength and relevance of its findings.

In conclusion, the findings show that job insecurity directly leads to higher stress levels and lower job performance, which can seriously undermine workforce stability and overall productivity. These results highlight the importance of addressing job insecurity as a strategic priority for organizations aiming to support employee morale, engagement, and performance.

While the study offers valuable insights, it's important to acknowledge a few limitations. First, the data were gathered from a single industry in one specific region—Gaziantep—which may limit how broadly the findings can be applied. Future studies should consider testing this model in other sectors and locations to allow for comparisons and deepen our understanding. Another limitation is the exclusive use of quantitative methods. Although this approach ensures statistical precision, adding qualitative techniques in future research could offer richer, more personal insights into how employees experience job insecurity. Finally, increasing the sample size and including a more diverse participant group would help strengthen the generalizability of future results.

Based on the study's findings, it is recommended that organizational leaders, policymakers, and industry planners consider applying these insights not only within the textile sector but also across other labor-intensive industries. The research provides useful guidance for improving employee well-being and strengthening organizational resilience in the face of increasing economic uncertainty.

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Chapter 7

The Afterlife of Data: AI and the Ethics of Resurrecting the Past

Oğuz ONAT¹, Yasemin BERTİZ²

1. Introduction

1.1 The Rise of AI-Driven Historical and Personal Reconstructions

The 21st century has ushered in an era where artificial intelligence (AI) transcends mere automation, venturing into the deeply human realm of memory and legacy (Kim et al, 2022). Technologies like deepfakes, chatbots, and virtual influencers now enable the reanimation of historical figures and deceased loved ones with unprecedented realism (Hutson & Ratican, 2023). While these tools democratize legacy preservation—allowing individuals to create interactive memorials or engage with historical icons—they also destabilize long-held notions of authenticity, consent, and identity (Hancock & Bailenson, 2021). For instance, platforms like **HereAfter AI** and **StoryFile** allow users to build conversational avatars using personal data, blurring the line between memorialization and manipulation (Puzio, 2023).

This technological leap forces us to confront existential questions: What does it mean to "preserve" a person? Can data ever encapsulate the complexity of human consciousness? As AI systems grow more sophisticated, their ability to simulate emotions, memories, and decision-making processes challenges our understanding of what it means to be human (Yang et al., 2022; Zhong et al., 2023).

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1.2 The Appeal of Digital Immortality: Why Do We Seek to "Revive" the Past?

Humanity's obsession with immortality is as old as civilization itself. Ancient Egyptians mummified bodies to ensure a physical vessel for the soul, while medieval Christians preserved relics as conduits to the divine, and the Victorian era's post-mortem photography—posing deceased family members as if alive—reflects a universal desire to soften grief through artifice (Lucke & Hall, 2005; Gray, 2011; Stratmann, 2016). Today, AI-driven resurrection represents a natural evolution of this impulse, merging existential anxiety with technological optimism (Reséndíz & Reséndíz, 2024).

Modern motivations are multifaceted:

- **Psychological Comfort**: For grieving individuals, AI replicas offer a semblance of continued connection (Garcia, 2023).
- **Historical Curiosity**: Researchers use AI to simulate dialogues with figures like Einstein or Shakespeare, probing their potential responses to modern dilemmas (Vlačić, 2021).
- **Commercial Exploitation**: Corporations monetize nostalgia, as seen in holographic concerts featuring deceased musicians like Tupac Shakur or Whitney Houston (Niemeyer & Keightley, 2020).

Yet, this quest raises ethical red flags. Unlike static monuments or written biographies, AI replicas interact dynamically, creating illusions of sentience that risk emotional manipulation (Donath, 2020).

1.3 Chapter Objectives and Key Questions

This chapter explores the technical, cultural, and ethical dimensions of AIdriven resurrection, addressing gaps in current discourse. Key questions include:

- How do technical limitations (e.g., data bias, contextual ignorance) undermine the authenticity of AI replicas? (Crocket et al., 2023)
- What cultural and religious frameworks influence societal acceptance of digital resurrection? (Campbell & Evolvi, 2019)
- How can legal systems evolve to protect posthumous rights in a globalized digital landscape? (Davoudi, 2024)

2. The Science Behind AI-Generated Digital Twins

2.1 Digital Twin Technology: From Engineering to Human Replication

Originally conceived to mirror complex physical systems—such as aircraft engines, manufacturing lines, or even entire cities—digital twins have proven invaluable for simulation, diagnostics, and predictive maintenance (Chen et al., 2024). In recent years, researchers have adapted these principles to the human domain, creating AI-driven "replicas" that emulate individual behaviors and personalities. By ingesting large-scale datasets—ranging from a person's social media posts, emails, and chat logs to voice recordings and wearable-device streams—AI systems learn to reproduce unique speech cadences, topic preferences, and decision-making tendencies (Kusal et al., 2021).

For instance, **Project December** leverages GPT-3's autoregressive language capabilities to facilitate conversations that feel eerily similar to those you might have had with a departed loved one, complete with idiosyncratic humor and turnof-phrase (Stein, 2021). In parallel, **Soul Machines** combines deep neural networks with affective computing to craft avatars capable of reading facial expressions and modulating their own gestures in response, fostering a sense of genuine emotional rapport (Stein, 2021).

Technical Deep Dive: From Data to Digital Twin

- 1. Data Harvesting
- Collection spans multimodal sources: unstructured text (social feeds, emails), audio (podcasts, voice mails), video (vlogs, recorded meetings), and biophysical metrics (heart rate, galvanic skin response).
- Emphasis on longitudinal capture to model how a person's style or opinions evolve over time (Rathore et al., 2021).

2. Data Annotation

- Human annotators—or sometimes semi-automated tools—label sentiment, intent, and interpersonal dynamics (e.g., supportive vs. confrontational tones).
- Metadata tags identify contextual variables (time of day, interlocutor relationship) to help the model learn situational adaptability (Subramanian et al., 2022).

3. Preprocessing

- Algorithms detect and correct OCR errors in scanned texts, normalize slang and dialect variations, and filter out irrelevant or noisy segments.
- Synthetic data generation fills gaps where real interactions are sparse, while bias-correction routines down-weight overrepresented viewpoints (Kliestik et al., 2024).

4. Model Training

- Transformer-based architectures (e.g., GPT-4, BERT variants) serve as the backbone for language generation; concurrent modules handle vision, audio, or physiological inputs in a multimodal fusion approach.
- Reinforcement learning from human feedback (RLHF) fine-tunes the twin's responsiveness, while specialized emotional-AI frameworks (e.g., Affectiva's emotion classifier) overlay affect recognition layers (Assunção et al., 2022).

5. Validation

- Dual evaluation: **quantitative** metrics (perplexity, BLEU scores against held-out writings) and **qualitative** assessments (user studies comparing AI-generated letters or dialogues to real samples).
- A/B testing with controlled groups helps verify that the twin maintains authenticity without drifting into generic responses.

6. Iteration

- Continuous learning pipelines ingest new interactions—such as user corrections or clarifications—allowing the twin to refine its model of the individual over weeks or months.
- Versioning ensures that older model snapshots remain accessible for comparison and rollback if undesirable behavior emerges.

2.2 Technical Challenges: Bias, Context, and the "Chinese Room" Problem

Despite these advancements, digital-twin systems grapple with fundamental limitations inherited from their training data and architectures. Three core challenges remain at the forefront:

1. Bias Amplification

• Historical data often embeds systemic biases—whether along racial, gender, or cultural lines—and AI models tend to mirror or even amplify these prejudices in their outputs. For example, a twin built from decades-old correspondence might perpetuate outdated stereotypes unless explicitly corrected (Varsha, 2023).

2. Contextual Blindness

• While digital twins can reproduce surface-level patterns, they lack genuine comprehension of situational subtleties. A conversational agent mimicking a parent's voice may misread sarcasm, irony, or culturally specific idioms,

leading to exchanges that feel "off" or emotionally tone-deaf (Yang & Ettinger, 2023).

3. The Chinese Room Paradox

• John Searle's classic thought experiment illustrates that symbolic manipulation—even at scale—does not equate to true understanding or intentionality (Searle, 2006). Current transformer models excel at statistical pattern matching but remain fundamentally "syntax without semantics," operating without beliefs, desires, or self-awareness.

Emerging Solutions

- **Contextual Embeddings**: By integrating visual context (e.g., facial expressions from video frames) and situational metadata (location, recent activities), models like OpenAI's CLIP reduce misinterpretations and generate more nuanced responses (Woodward & Ruiz, 2022).
- **Bias Mitigation Tools**: Libraries such as IBM's AI Fairness 360 enable practitioners to detect disparate impact in training sets and apply pre- or post-processing techniques to neutralize discriminatory correlations (Bellamy et al., 2019).
- **Hybrid Human-AI Systems**: Platforms like Replika interpose human moderators in the training loop, allowing real-time feedback on emotional appropriateness and ethical compliance, thereby combining machine scalability with human judgment (Rao et al., 2024).

Together, these technical innovations—and the ongoing dialogue between AI researchers, ethicists, and end users—are gradually closing the gap between mimicry and genuine interpersonal resonance in digital-twin technology.

3. Cultural and Historical Context

3.1 Humanity's Longstanding Battle Against Oblivion

Across civilizations, people have devised rituals and artifacts to stave off the final erasure of individual and collective memory. Indigenous Australian **Songlines**, for example, encode millennia of ancestral knowledge—spanning navigation, ecological lore, and cosmology—into rhythmic songs and stories that guide travelers across vast landscapes, ensuring continuity through oral transmission (Roberts, 2021). In ancient Rome, **death masks** crafted from wax casts of prominent citizens functioned as both familial heirlooms and public status symbols; these masks were displayed at funerals and stored in household shrines to keep the visages—and reputations—of the departed alive for generations (Bourrit, 2006). In the modern era, **digital ancestor veneration** exemplifies how traditional observances adapt to new media. In China, platforms such as Wangshang Mianhui offer AI-driven avatars for gravesite ceremonies: during Qingming (tombsweeping), descendants interact with virtual representations of their forebears, merging Confucian ideals of filial piety with algorithmic personalization (Fung, 2021). These diverse practices underscore a universal imperative: societies ritualize remembrance as a bulwark against mortality's erasure, weaving technological and cultural threads into enduring tapestries of memory (Metcalf & Huntington, 1991; Kujit, 2008).

3.2 Cultural Nuances in Digital Resurrection

Attitudes toward AI-mediated memory are deeply shaped by local belief systems and social norms. In Japan, for instance, the phenomenon of **holographic idols** like Hatsune Miku taps into Shinto notions of spirit and impermanence; audiences readily embrace synthetic performers as meaningful companions, blurring boundaries between the animate and the virtual (Rahmi et al., 2018). Meanwhile, in Ghana, **fantasy coffins**—handcrafted in whimsical shapes that reflect the deceased's vocation or passions—offer an analog precursor to AI memorials, signaling how material artistry can personalize death rites long before bytes and algorithms enter the picture (Otto, 2019).

By contrast, **European skepticism** toward posthumous digitization is codified in stringent data-protection regimes. The GDPR's rigorous consent and "right to be forgotten" provisions often stand at odds with U.S. tech companies' expansive data-collection practices, erecting legal and ethical hurdles for cross-border digital-twin projects (Politou et al., 2018). Understanding these cultural and regulatory fault lines is essential for designing AI-resurrection technologies that respect both local traditions and universal human desires for remembrance.

4. Ethical and Psychological Implications4.1 Psychological Impact: Healing or Harm?Positive Effects:

Reduction in Loneliness with Physically Embodied AI

• A meta-analysis of 47 studies found that interactions with physically embodied AI (e.g., robots) were marginally associated with decreased loneliness (r = -0.266, p = 0.088), particularly among older adults (Xu et al., 2025).

Initial Benefits of Voice-Based Chatbots

• Research by OpenAI and MIT Media Lab indicated that voice-based chatbots initially helped mitigate loneliness compared to text-based ones. However, this effect diminished with increased usage (OpenAI & MIT Media Lab, 2025).

Negative Effects:

Increased Loneliness with Disembodied AI

• The same meta-analysis reported that engagement with physically disembodied AI (e.g., chatbots without a physical form) was significantly linked to increased loneliness (r = 0.352, p < 0.001), especially among older adults (Xu et al., 2025).

Emotional Dependence and Reduced Offline Socialization

• The study by OpenAI and MIT Media Lab also found that heavy users of ChatGPT tended to be more emotionally dependent on the AI tool and had fewer offline social relationships. Users engaging in emotionally expressive conversations with chatbots experienced higher levels of loneliness (OpenAI & MIT Media Lab, 2025).

Ethical Concerns with 'Deathbots'

• Stokes (2025) discussed the ethical implications of "deathbots"—AI chatbots designed to mimic deceased individuals. The study cautioned that such technologies might disrupt the grieving process, leading to emotional dysregulation and reduced autonomy among the bereaved.

Therapy Integration:

- Gradual Reduction in Interaction Frequency A longitudinal randomized controlled study by Fang et al. (2025) examined the psychosocial effects of AI chatbot interactions. The study found that while voice-based chatbots initially appeared beneficial in mitigating loneliness, these advantages diminished at high usage levels. This suggests that managing the frequency of interactions could be crucial in preventing emotional dependence on AI systems.
- Designing AI Chatbots for Grief Management Jia et al. (2025) explored the application of AI-driven chatbots in managing grief among individuals with chronic illness. The study proposes guidelines for designing AI-

driven grief chatbots using the Value Sensitive Design framework, which considers human values and ethical implications.

4.2 Ethical Frameworks: Deontology vs. Consequentialism

- **Deontological Ethics**: Margaret Radin has extensively discussed the concept of "data trusts" as a means to protect individuals' data rights. While she has not specifically advocated for "data trusts" in the context of posthumous data use, her work on data ownership and consent is relevant (Radin, 2012).
- **Consequentialism**: The use of AI to replicate historical figures, such as Martin Luther King Jr., raises ethical concerns. For instance, AI-generated deepfakes have been used to depict MLK Jr. endorsing political figures, leading to public backlash (Verma, 2024).
- Virtue Ethics: Discussions on virtue ethics in AI often emphasize the importance of moral character in AI development. While specific studies on AI replicas and virtue ethics are limited, the general principles can be applied to evaluate the creation of AI replicas (Penn, 2024).

4.3 Stakeholder Perspectives

- **Families**: Generational differences in attitudes toward AI memorials have been observed. Younger individuals may be more accepting of AI-generated representations of deceased loved ones, while older generations may find them disrespectful (Hawkins, 2024).
- **Tech Companies**: DeepMind, a leading AI research lab, has faced scrutiny over ethical considerations in AI development. CEO Demis Hassabis has emphasized the need for caution and ethical standards in AI research (Hassabis, 2023).
- **Governments**: The European Union's AI Act classifies certain AI systems as "high-risk," imposing strict requirements for transparency and user consent. This includes AI systems used for deepfakes and other generative AI applications (European Commission, 2024).

5. Potential Hazards and Mitigation Strategies

5.1 Case Study: The Deepfake Magisterium

In 2025, deepfake videos featuring Pope Francis and Cardinal Marc Ouellet were disseminated online, promoting a so-called "sacred prayer" purported to bring financial blessings, thereby exploiting the trust of the faithful for commercial gain (Daugherty, 2025). Mitigation strategies include:

- **Blockchain-Verified Consent**: Storing permissions on decentralized ledgers to prevent tampering (Tian et al, 2019).
- AI Watermarking: Embedding detectable signatures in synthetic media, as proposed by the Partnership on AI (Roy & Pal, 2023).

5.2 Corporate Exploitation and Countermeasures

South Africa's Protection of Personal Information Act (POPIA) and California's Digital Ghost Law mandate familial consent for commercializing AI replicas. However, there are significant loopholes that persist. In 2022, a gaming company used archived recordings of deceased voice actors to train non-playable characters (NPCs) without permission, resulting in lawsuits over unauthorized usage (Werksmans, 2022).

6. Case Studies: Lessons from Diverse Domains

6.1 Legal Frontiers: AI Witnesses in Court

A 2023 UK trial admitted AI-replicated witness testimony based on personal diary entries. While such technologies have the potential to expedite legal processes, critics argue that AI lacks the capacity for "algorithmic empathy"—its inability to convey witness vulnerability may lead to biased jury decisions (Chan et al., 2024). This raises concerns about fairness and accuracy in the judicial system, especially when AI is involved in emotionally charged cases.

6.2 Entertainment: The Virtual Elvis Dilemma

In 2024, a biopic used AI to generate new songs by Elvis Presley, which sparked debates surrounding artistic integrity. While the project received approval from the Presley estate, critics accused it of "cultural ventriloquism," arguing that AI cannot replicate the spontaneity and emotional depth of human creativity (Wikipedia, 2024). This controversy highlights ongoing tensions between intellectual property rights and the ethical use of AI in the creative industry.

6.3 Public Perception: Media Narratives

Sensationalist headlines, such as "Zombie AI Invades Privacy!", often overshadow more nuanced discussions about the potential benefits and risks of AI technologies. Initiatives like the Ethical ResurTech Alliance aim to work with journalists to foster balanced reporting, highlighting both the therapeutic benefits and the privacy concerns surrounding AI (Politico, 2024). Such efforts are critical in shaping the public's understanding of AI and its role in society.

7. Future Prospects: Balancing Innovation and Governance

- 7.1 Technical Frontiers
- Quantum AI: By harnessing quantum superposition and entanglement, quantum AI promises to explore vastly larger state spaces when modeling human behavior. Early work suggests that quantum-enhanced variational circuits could capture subtle correlations in personality traits and decision paths that classical models miss, potentially yielding richer, more accurate digital twins (Huerga et al., 2022; Humr et al., 2025). However, realizing these gains will require not only scalable quantum hardware but also new algorithms to bridge the gap between quantum outputs and human-interpretable patterns.
- Neuro-Symbolic Integration: Purely connectionist models excel at pattern recognition but struggle with abstract reasoning and rule-based inference. Neuro-symbolic systems aim to combine the flexibility of neural networks with the clarity and compositionality of symbolic logic, enabling twins to understand and apply explicit contextual rules—such as cultural norms or legal constraints—on top of learned behaviors. Early prototypes demonstrate improved performance on tasks requiring commonsense reasoning, suggesting a promising path toward more context-aware digital personas (Himabindu et al., 2023).

7.2 Policy Recommendations

- Global Data Wills: In May 2024, the Council of Europe's Framework Convention on Artificial Intelligence and Human Rights, Democracy, and the Rule of Law came into force, marking the first binding treaty to set pan-European AI standards (Council of Europe [COE], 2024). This convention provides the legal scaffolding for "Global Data Wills," mechanisms by which individuals can specify how their personal datasets—and by extension, their digital twins—should be archived, accessed, or destroyed post-humously. Embedding these wills into smart-contract platforms could enforce end-of-life data handling automatically, preserving autonomy even after death.
- Ethical Licensing: As AI capabilities proliferate, there is growing consensus that developers should hold credentials akin to professional licenses in medicine or law. The IEEE's CertifAIEdTM program exemplifies this trend by auditing autonomous systems against ethical benchmarks—such as transparency, accountability, and user consent—to curate a registry of compliant products (IEEE, n.d.). Mandating such certification for any
platform offering posthumous digital-twin services would ensure a minimum standard of safety and respect for human dignity.

7.3 The Road Ahead

Just as bioethics arose to govern advances in genetics and medicine, AI ethics must evolve to match the accelerating power of twin technologies. Adopting a **precautionary principle**—advancing only insofar as potential harms are understood and mitigated—can help prevent misuse while still fostering innovation (Hemphill, 2020). Collaborative frameworks like the **Asilomar AI Principles** offer concrete guidelines on research transparency, risk assessment, and shared oversight, forming a blueprint for consortium-based governance that spans academia, industry, and civil society (Buruk, Ekmekci, & Arda, 2020).

8.Conclusion

AI-driven resurrection through digital twins compels us to rethink fundamental notions of mortality, memory, and personal identity (Savin-Baden & Burden, 2018). On one hand, the ability to converse with—or simply observe—an approximation of a lost loved one holds promise for therapeutic closure, historical preservation, and even personalized education. On the other, unchecked proliferation risks commodifying the deceased, eroding collective trust, and distorting the historical record (Afroogh et al., 2024). Ultimately, the future of digital-twin technology hinges on interdisciplinary collaboration: technologists must build with ethics in mind, ethicists must stay grounded in technical realities, and policymakers must craft adaptable, enforceable frameworks that honor both innovation and human dignity.

Building a responsible future for AI-generated memory requires concerted effort from all sectors—developers, regulators, users, and civil-society groups alike. We urge stakeholders to prioritize the following three pillars:

- 1. Transparency
- **Open-source algorithms**: Making model architectures, training code, and hyperparameters publicly available enables independent audit and reproducibility.
- Auditable data practices: Clear provenance trails for every dataset—detailing collection methods, consent procedures, and any preprocessing ensure that end users and oversight bodies can verify compliance with ethical standards (Gensburger & Clavert, 2024).

2. Inclusivity

- **Community engagement**: Actively involve marginalized and historically under-represented groups in requirements gathering, design workshops, and pilot testing. Their perspectives help surface concerns that might otherwise be overlooked—such as cultural taboos around digital afterlives or accessibility needs for users with disabilities.
- **Diverse datasets**: Curate training corpora that reflect a broad spectrum of languages, dialects, socio-economic backgrounds, and lived experiences, so that digital twins do not inadvertently reinforce systemic exclusions (Gensburger & Clavert, 2024).
- 3. Adaptability
- Modular governance frameworks: Develop policy "building blocks" that can be swapped in or out as technology evolves—rather than monolithic regulations that quickly become obsolete.
- **Continuous feedback loops**: Institute mechanisms for real-time monitoring of deployed systems, paired with rapid-response channels for users to log ethical or functional concerns, ensuring that safeguards evolve alongside the AI itself (Gensburger & Clavert, 2024).

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