

## **Establishing a Case for Developing a Governance Framework for AI Regulations in the Gulf Cooperation Council Countries**

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*Abstract.* Despite AI adoption in the Gulf Cooperation Council (GCC) countries being relatively recent, it has become an integral part in the Information Technology (IT) agenda of most of these countries. Therefore, this paper establishes a case for developing a common governance framework for AI regulations in the GCC countries. With this goal in mind, this paper examines the status of AI governance globally and in the GCC countries specifically. A framework for AI governance in the GCC countries is presented, which is based on a layered and modular approach towards AI governance.

*Keywords:* Artificial Intelligence, AI, AI Governance, Layered Governance Model, Ethical AI, Regional AI Governance, International AI Governance, AI Governance Current Status.

### **1. Introduction**

In the year 1942, Isaac Asimov published a short story titled “Runaround” in which he wrote about a fictional government handbook of robotics in the year 2058 (Moor, 2009). Asimov’s handbook included three rules: “A robot may not injure a human being or, through inaction, allow a human being to come to harm. A robot must obey orders given it by human beings except where such orders would conflict with the First Law. A robot must protect its own existence as long as such protection does not conflict with the First or Second Law” (Clarke, 1994). Bearing in mind that Artificial Intelligence (AI) was first cited in the 1940s (Sousa, *et al.*, 2019), literary depictions such as Asimov’s highlight the ethical and legal concerns that have accompanied AI since it was an idea in its infancy. These concerns continue to accompany AI-based services and solutions

due to the ways in which AI can intertwine with our daily lives in more profound ways than anybody has ever imagined (Webb, 2019). From chatbots to smart government services, AI has played and is continuing to play a key role in reshaping the ways in which humans interact with technology (Mehr, 2017).

Recent years have witnessed a proliferation in AI innovations and applications that are integrated with a wide variety of devices and services (Romeo, 2019). Furthermore, rapid advancements in AI have led to its incorporation in a plethora of government services in countries around the world (Sousa, *et al.*, 2019). Notably, growth in AI adoption has been further strengthened by the increasing levels of government investment in AI-related initiatives globally (Loucks, *et al.*, 2019).

Despite AI's potential, its utilization comes with its own risks and considerations. As pointed out by Keskinbora (2019), technological advancements in AI have contributed to generating a lot of debate and serious ethical concerns. Ethical considerations must be further highlighted due to AI applications' intelligence and problem-solving skills that surpass those of human beings. Therefore, despite the many apparent benefits of AI utilization both in the public and government sectors, its use needs to be fully regulated and systematized to avoid any resultant legal or ethical issues (Mehr, 2017).

Despite the rapid growth in adoption of AI technologies by governments around the world, the levels of maturity of AI governance models differ from one country to another (Amico, 2019). This issue is further complicated by the fact that government bodies still mostly provide AI services following old practices (Sousa, *et al.*, 2019). Such practices better suit legacy systems rather than intelligent applications and services. Interestingly enough, most of the pioneering countries in AI adoption (such as the USA, China, and UK) still do not have full AI-dedicated governance models (Google, 2019). In some countries such as Singapore, efforts have already started to formulate country-wide regulations that specifically target AI and its applications (Amico, 2019). However, the general observation is that AI governance is an area that is still severely underdeveloped as compared to the massive leaps that AI technologies have made over the last few years.

Against this backdrop, it may be pointed out that AI governance models are at different levels of maturity in countries and regions where AI adoption is a new phenomenon. This can be looked at in the wider context of the global AI dominance race (Dutton, 2020). A good example within this context is the Gulf Cooperation Council (GCC) countries where

AI is positioned at the forefront of their information technology initiatives (EY, 2019). Among the GCC countries, the Kingdom of Saudi Arabia (KSA) (Ahmed, 2019) and the United Arab Emirates (UAE) (Groth, *et al.*, 2019) stand out as countries that have great potential for AI adoption in the coming years. Other GCC countries differ in the levels of AI governance maturity just as they vary in terms of the extent of AI adoption nationally. Therefore, the GCC countries represent a good case study where the debate is still in its early stages allowing for the development of local and regional AI governance models. Such models can be potentially pioneering on a global level. Accordingly, this research aims to investigate the current status of AI governance globally and in the GCC countries specifically. It also presents a suggested framework for AI governance to be adopted in the GCC countries.

This paper is organized as follows: Section 2 covers the current status of AI governance globally. Section 3 covers the status of AI governance in the GCC countries. Section 4 outlines the suggested framework for AI governance in GCC countries. Finally, section 5 presents the paper's conclusions and future work.

## 2. Current Status of AI Governance

Due to the sheer influence of AI technologies on everyday life and their ability to change societies for the better (or for the worse), there has always been a strong emphasis on AI's adherence to ethical principles (Daly, *et al.*, 2019). This concern has given rise to several issues among which AI governance takes the forefront. Furthermore, AI governance can be a decisive factor in how AI will evolve and mature in the concerned societies over the years [see Leenes & Lucivero, 2014 cited in Daly, *et al.* (2019)].

Pointing out that AI can deliver great benefits for economies and societies, a white

paper by Google observes that current AI governance discussions around the world have been high level (Google, 2019). Furthermore, the ethical debate surrounding AI has only recently entered the mainstream as previous discussions were largely confined to purely technical and academic debates (Daly, *et al.*, 2019). This means that debate on the topic is still to evolve to cover all the aspects needed to establish effective governance models for AI services around the world. This observation is further strengthened by the fact that AI-dedicated government models are scarce (Forbes, 2019) despite its widespread use worldwide.

An industry survey by Forbes shows that AI governance development levels vary from one country to another (Forbes 2019). Although USA and China are deemed to be AI pioneers globally (Chitturu, *et al.*, 2017), it is evident that they have been surpassed by other players in terms of AI governance development. Notably, countries such as Singapore and regional entities such as the European Commission (EC) have marched well ahead compared to USA and China (Amico, 2019).

### **2.1 Asia Pacific**

On the sidelines of the World Economic Forum 2019, Singapore's Minister of Communications and Information announced that his country would launch its national framework for AI governance (Amico, 2019). Launched in January 2019, this framework is considered to be Asia's first AI governance model adopted at a national level (Tan, 2019). This initiative is an integral part of Singapore's quest to be the world's leader in AI (Deoras, 2019). Singapore's AI ambitions are also visible in the AI Singapore Initiative (Amico, 2019). This initiative aims to promote research and innovation on AI not only from a technical perspective, but also from a regulatory and ethical point of view (Groth, *et al.*, 2019).

Other notable governance efforts in the Asia Pacific region include China's issuance of a set of guidelines in July 2017 that emphasised "safe, reliable and controllable development" of AI applications (Cui, 2019). Furthermore, China strengthened its exploratory efforts in AI governance by establishing an AI ethics committee in the year 2018 (Roberts, *et al.*, 2020). This committee is mandated with eliminating the risks of AI via the development of a set of ethical guidelines (Roberts, *et al.*, 2020). China topped up these efforts by releasing its principles of "next-generation AI governance" (Bo, 2019). According to CISTP (2018), these principles primarily aim at developing and utilising responsible AI applications and systems within China.

### **2.2 Europe**

The European Commission (EC) was among the first regional actors to recognise the importance of AI governance (Amico, 2019). In the year 2018, the EC issued the "Draft Ethics Guidelines for a Trustworthy AI" (EC, 2019). Despite their optional nature, the published guidelines can be used as an effective benchmark for assessing the development of responsible AI systems and applications (Peets, *et al.*, 2019; Floridi, *et al.* 2018). Additionally, one of the most notable regulatory developments was the General Data Protection Regulation (GDPR), which was drafted by the European Union (EU) in 2016 (Goddard, 2017). The GDPR was enforced on all EU members in 2018 (Greenleaf, 2018). Although it does not target AI specifically, GDPR's data protection and privacy rules affect AI implementation within the EU directly (Forbes, 2019).

The United Kingdom (UK) and France stand out as compared to other countries of Europe. The UK's House of Lords Select Committee on Artificial Intelligence published a report titled "AI in the UK: Ready, Willing and Able?" (Renda, 2019). Among its

recommendations, the report suggested that “the Government Office for AI, with the Centre for Data Ethics and Innovation, needs to identify the gaps, if any, where existing regulation may not be adequate” (House of Lords, 2018). Moreover, as indicated by Slaughter and May (2018) these recommendations were met with full government agreement. Hence, the UK government committed itself to supporting regulatory bodies and encouraging industry regulators to fill any gaps in AI and data related regulations.

In France, the National Commission for Information Technology and Libraries (CNIL) was mandated with organizing an AI ethical debate at the national level (CNIL, 2015). The goal of this debate was to discuss the possible impact of widespread AI adoption in the country (FLI, 2018). The result of this nationwide debate was a report titled “How Can Humans Keep the Upper Hand?” published in 2017. This report tackles the ethical issues resulting from AI algorithms. It also included recommendations that were oriented towards strengthening the ethical aspects of AI adoption in both the private and public sectors in France. Furthermore, in 2018 the French President announced his strategy to position France as a world leader in Artificial Intelligence (OECD, 2018). According to Cui (2019), the strategy places special emphasis on the development of regulations to ensure transparent and ethical use of AI technologies.

### **2.3 The United States of America**

In USA, it can be observed that there are no collective AI legislations at a federal level yet (Forbes, 2019). However, there are several notable initiatives that aim to pave the way for the development of federal legislation targeting various aspects of AI governance. For example, the US National Highway Traffic Safety Administration and the Department of

Transportation jointly released a guide in 2016 that targets driver-assistance technologies (NHSA, 2018). Another example is the bill that was introduced by federal legislators under the title “Future of Artificial Intelligence Act of 2017” (Rossino, 2018). This bill mandates the Department of Commerce to establish a Federal Advisory Committee on the Development and Implementation of Artificial Intelligence (SciPol, 2017). Furthermore, former US President Donald Trump issued an executive order in February 2019 to launch the American AI initiative (Luo, 2019). According to the New York Times (2019), this initiative encompasses several AI related aspects ranging from technical issues to ethical and regulatory considerations.

### **2.4 Oceania**

In Australia, AI governance efforts are still largely exploratory (Forbes, 2019). The most significant development in this area was in 2018 when the government announced that it would provide funding for developing an ethical framework for AI in Australia (Dawson, *et al.*, 2019). This framework was released in November 2019 and it contains a set of principles for designing and implementing AI solutions (Hennessy, 2019).

Like Australia, AI governance efforts in New Zealand are also still largely exploratory. New Zealand’s federal government announced in 2018 that it would work swiftly on formulating an ethical framework for AI technologies and algorithms (Duckett, 2019). However, there is still room for improvement here as noted by Gavaghan, *et al.* (2019) who suggested the creation of a regulatory body to help govern AI utilization in the country.

## **3. Current status of AI Governance in the GCC**

The Gulf Cooperation Council (GCC) is a regional body comprising six member states, Saudi Arabia, United Arab Emirates (UAE),

Oman, Kuwait, Qatar and Bahrain (Al-Faris, 2002). The GCC countries are keen to prepare for the global shift towards AI technologies (Diwakar, 2019). In particular, Saudi Arabia, Qatar and the UAE have all shown strong commitment to developing their AI infrastructure. This commitment is evident in these countries' heavy investment in AI-related projects and initiatives (Oxford Insights, 2019).

At the country level, Bahrain is among those that are showing great interest in terms of AI-related investment (PWC, 2019). Bahrain's national development plan (Bahrain 2030) emphasizes investment in AI solutions as one of the enablers of the development process in the country (Microsoft, 2018). To pave the way for a wider AI adoption in the country, Bahrain announced that it would adopt (on a pilot basis) the guidelines for the procurement of AI in the public sector (Bahrain Online News, 2019). These guidelines are derived from the set of AI guidelines produced by the World Economic Forum (WEF) Center for the Fourth Industrial Revolution (WEF, 2019).

In the UAE, the National Program for Artificial Intelligence (BRAIN) is mandated to consolidate the required resources to realize the country's AI policy objectives. These objectives include the goal of becoming a global leader in the responsible use of AI applications and services (BRAIN, 2019). To realize such an ambitious goal, in the year 2017, the UAE launched its official AI strategy titled "UAE Strategy for Artificial Intelligence (AI)" (NMC, 2017). It followed this up with the "National Artificial Intelligence Strategy 2031," which was launched in April 2019 (Arabian Business, 2019). BRAIN underscores that better governance of AI is one of the cornerstones of UAE's National Artificial Intelligence Strategy 2031. This strategy also aims to facilitate the development of innovative AI solutions in the country (Alexander & Cafiero, 2020). Furthermore, the UAE has gone

a step ahead of other countries by appointing the first AI minister in the world in 2017 (Halaweh, 2018).

Similar to other GCC countries, Qatar has equally ambitious plans in terms of global AI leadership. Qatar National Vision 2030 aims to transform the country into a knowledge economy, which means placing a heavy emphasis on AI systems (Oxford Business, 2020). In line with this aim, Qatar's Center for Artificial Intelligence (QCAI) published the "National Artificial Intelligence Strategy for Qatar" which includes a set of guidelines to foster AI growth in the country (Dickson, 2019). These guidelines are meant to be a blueprint to identify the key pillars to "build a great AI research and innovation ecosystem in Qatar and follow those with recommendations for action" (QCAI, 2019). Ethics and AI governance are among the top pillars identified in these guidelines aiming to make Qatar a global role model in AI adoption: "Qatar must be an efficient consumer of AI, with a properly educated citizenry, sound laws, and ethical guidelines." (QCAI, 2019).

Kuwait's government recognizes AI as one of the enablers of its strategic national development initiative, New Kuwait 2035 (CITRA, 2018). Fueled by the directives of New Kuwait 2035 (Olver-Ellis, 2020), Kuwait has witnessed an accelerated rate of digital transformation over the last two years (Asmyatullin, *et al.*, 2020). The country's rapid transformation towards digitization has manifested itself in an increased adoption of AI solutions in the public and private sectors (Deloitte 2017). However, compared to its GCC counterparts, Kuwait still has some way to go in terms of developing AI governance policies, laws and regulations. According to the "Artificial Intelligence 2019 Government Readiness Index" issued by Oxford Insights (Miller & Stirling, 2019), Kuwait is ranked fifth among the six GCC countries in terms of AI

readiness levels. Hence, there is a gap to be bridged if Kuwait is to reap the best fruits of its ambitious AI plans.

The Sultanate of Oman is placing special emphasis on digital transformation as one of the main objectives of its national information technology strategies (Prabhu, 2019). Furthermore, Oman's Vision 2040 has been fostering innovation to support economic growth and diversification (Oman Observer, 2019). However, no notable AI governance initiatives have been taken by the Sultanate. This shortcoming can be attributed to the fact that the AI debate is still in its very early stages in this country. Nonetheless, it is noteworthy that the number of national workshops to discuss the AI phenomenon has increased lately which signals Oman's desire to capitalise on the opportunities that AI innovations offer (Preiss, 2020).

Although KSA has shown great interest in integrating AI in its governmental services, initiatives and debates in relation to AI governance are just starting to gain momentum. Despite its focus on the area being relatively recent, AI in Saudi Arabia is now at the center of increasing government interest. Therefore, Vision 2030, Saudi Arabia's development blueprint till the year 2030, has placed emphasis on AI incorporation in both the government and private sectors (Jewell, 2018). Among the initiatives undertaken as part of Vision 2030 was the introduction of AI programs in Saudi schools and universities (Al-Kinani, 2019). Moreover, Vision 2030 aims to "develop key economic sectors for the future, as well as sectors that address the issue of economic leakage in Saudi Arabia" (Vision 2030, 2016). Consequently, among the nine key economic sectors targeted by Vision 2030, technical and digital science (including Artificial Intelligence) take the centerstage of this nationwide strategy (Vision 2030, 2016). Furthermore, the importance of AI governance

has not gone unnoticed by Saudi lawmakers. In September 2019, a royal decree mandated the Saudi government to establish the Saudi Data and Artificial Intelligence Authority (SADIA). The royal decree was accompanied with two other decrees to establish two specialized national bodies linked to SADIA. The purpose of these bodies is to manage and regulate different aspects of AI utilization in the Kingdom. The first is the National Center for AI (NCAI) (MCIT, 2019). This center is considered as a part of the drive "toward innovation and digital transformation in Saudi Arabia" as noted by the Saudi Minister of Communications and Information Technology (Arab News, 2019). The second is the National Data Management Office (NDMO) (MCIT, 2019). Such developments highlight the Saudi government's interest and realisation of the importance of AI in social and economic development.

This review of the status of AI governance in the GCC countries shows that regulatory efforts are largely in their initial stages. All the GCC countries are taking the initiative to integrate digital transformation and Artificial Intelligence in their national development strategies and initiatives. As a result, the GCC countries have ventured into the establishment of specialized AI and data management bodies to pave the way for optimal utilization AI systems and algorithms.

Adoption of regulatory efforts and frameworks vary at the country level. In this context, Saudi Arabia and the UAE seem to lead the way compared to their regional counterparts.

Table 1 provides an overview of the current AI organizational structure in the GCC countries. It is clear that these countries vary in terms of having dedicated national AI bodies as well as AI governance in the form of related laws and regulations.

**Table 1. AI Maturity Levels in GCC Countries.**

Country	National Development Plan	AI National Body	AI Governance*
Bahrain	Bahrain 2030	None	No
Kuwait	New Kuwait 2035	None	Yes
Saudi Arabia	Vision 2030	Saudi Data and Artificial Intelligence Authority National AI Center National Data Management Office	No
Sultanate of Oman	Vision 2040	None	Yes
UAE	-	National Program for Artificial Intelligence (BRAIN) Ministry of Artificial Intelligence	Yes
Qatar	National Vision 2030	None	Yes

\* Based on the Government Artificial Intelligence Readiness Index 2019 (Miller & Stirling, 2019).

#### 4. Suggested Framework for AI Governance in GCC Countries

Without a solid legal and ethical framework for AI adoption, the benefits of its incorporation in the public and private sectors may not be fully realized (Mehr, 2017). The risk lies in the potential inability to deal with any legal and/or ethical issues that may arise in conjunction with the use of AI-based services and applications. Furthermore, some have warned that the design of “imprecise regulation”, which handles AI systems separately, is a dangerous practice (Wachter, *et al.*, 2017). The danger stems from the potential misinterpretation of AI ethical challenges that could be faced by society. Therefore, AI governance frameworks should not overlook

the specific societal contexts that they are targeting.

There have been several noticeable developments in the AI field in the GCC countries (PWC, 2019). However, these countries should realise the transformative nature of AI (Slaughter&May, 2018). From a pragmatic stance, they should aim to create governance frameworks that can foster the development of this sector at all levels in the short and long terms. Although AI governance and regulatory efforts in the GCC countries vary in their development levels, there are many commonalities that can form the basis of a common governance framework which can be applied across the member states.

#### 4.1 Why a Common Framework for AI Governance in the GCC?

Developing common regional regulations that target specific technologies such as AI is not a new phenomenon. One of the noteworthy developments in this context was the declaration that was released by the International Conference of Data Protection & Privacy Commissioners (ICDPPC) in 2018. This declaration focused on the Data Protection and Ethics in AI and was adopted by delegates from various countries (EDPS, 2018). The General Data Protection Regulation (GDPR) is another good example of a regional regulation that affected AI applications in a certain region, in this case the EU. (Tankard, 2016). GDPR's effect on AI applications stems from the restrictions it places on personal data processing and retention within the EU member states (Eskens, 2016). Regardless of any regulatory differences that may exist in EU countries, the GDPR focus is to "integrate the necessary safeguards into the processing in order to meet the requirements of this Regulation and protect the rights of data subjects" (EDPS, 2018). On the other hand, the United Nations and its specialized bodies are undertaking various activities relating to AI governance [see ITU (2018) cited in Daly, *et al.* (2019)]. Notable cross-nation initiatives include the multi-stakeholder Partnership on AI (Daly, *et al.*, 2019), UNESCO's normative instruments (work in progress) (UNESCO, 2020) and the United Nations Interregional Crime and Justice Research Centre for Artificial Intelligence and Robotics (UNICRI, 2020).

In the GCC, cooperation, coordination, and integration levels between the member countries have witnessed notable developments since the inception of the group in 1981. One of them was the signing of the GCC Economic Agreement in 2001 (Puig & Al-Haddab, 2011). Besides, there are 10 agreements aiming to

strengthen cooperation and bridging the regulatory gaps between the GCC countries (GCCSG, 2020). The areas that these agreements cover range from defense to economy and free trade (GCCSG, 2020). For example, the previously mentioned economic agreement calls for a common GCC market, a customs union and a unified currency (Dennis, 2006).

The GCC countries share the desire and drive to move towards a knowledge economy in the quest to diversify their economies (Al-Busaidi, 2016). This drive is further strengthened by the instability of oil prices which has compelled these countries to find other sources of national income (Diwakar, 2019). As a result, investment in AI has witnessed a significant growth in the GCC countries over the last few years and is expected to grow further in the years to come (PWC, 2019). The GCC countries also share an Information and Communication Technology (ICT) landscape with many similarities including high-speed Internet and mobile penetration rates (Hakmeh, 2017), fast growth of cloud computing solutions (Gartner, 2019), and increased levels of investment in the ICT infrastructure as a whole (Al-Busaidi, 2016). More importantly, none of the GCC countries has fully developed AI/Data protection regulations yet as indicated in the findings of the Government Artificial Intelligence Readiness Index 2019 (Miller & Stirling, 2019). As clear from this index, solid regulatory efforts are mainly sporadic and have resulted in a limited number of laws and regulations.

Being members of a regional group and sharing a lot of similarities, developing common AI regulations that can be applied across the GCC countries seems to be a viable option. One advantage here is that the pressure on individual countries to develop relevant AI regulations can be lessened (Google, 2019). Furthermore, joint governance efforts can



speed up the regulatory lifecycle resulting in more rapid introduction and integration of AI laws and regulations. Another benefit of a common AI governance framework is the fact that having a common regulatory framework will allow for interoperability of digital services (Hert, *et al.*, 2018) across GCC countries. This, in turn, can contribute to further strengthening the cooperation among GCC member countries. Therefore, if the GCC countries are to realise their goals of AI leadership in the Middle East region, collaboration seems to be the best approach. Failing to do so may result in the adoption of ethics and governance models devised in other countries (Daly, *et al.*, 2019), which may not exactly fit the specific needs and requirements of the GCC countries and their citizens.

#### 4.2 Model Specifications

As it is inefficient to govern AI applications through technical means alone (WEF, 2019), it is vital to have a solid conceptual framework for AI governance in the GCC countries. This paper suggests a layered and modular model for AI governance in the GCC countries. This model combines the best features of the AI governance models suggested by Gasser & Almeida (2017), PDPC (2019) and WEF (2019). The suggested model also considers the specific nature and potential requirements of the GCC countries from both technical and societal perspectives. For example, it includes a dedicated layer for defense and security to address the GCC countries' concerns pertaining to this area.

The proposed governance model can be considered a foundation for formulating relevant laws and regulations that can be applied across the GCC countries to govern AI applications and services. The model has three guiding principles from which are derived its structure and layers. These principles are as follows:

**Flexibility:** Gasser & Almeida (2017) argue that governance systems and regimes should be flexible enough to be able to address cultural differences and bridge the regulatory gaps among different nations. This is particularly important for the GCC countries if they are to have a consolidated effort towards AI governance. Furthermore, the ever-growing nature of AI necessitates the existence of flexible regulatory frameworks that can handle its dynamic nature. Flexibility can contribute to speeding up responses to the emerging AI trends without being hampered by prolonged bureaucratic and legal procedures and dialogues.

**Balance.** Similar to the “Balanced Scorecard” approach discussed by Grembergen & Haes (2005), what is meant by balance in the context of this paper is to cover all related aspects of AI governance in a holistic way. WEF (2019) emphasizes a holistic AI governance regime that embodies a balanced mix of technical measures as well as legislation. The concept of balance implies that no area of AI governance should be overlooked when formulating laws and regulations to govern its behavior and impact. It also means that the overall success of the governance model should be measured according to its success in adequately covering all the layers and areas of interest.

**Modularity.** The requirements of the six member states of the GCC can be best addressed by a modular and layered approach. According to Bache (2007), a multi-layered governance regime best suits the scenario where the laws and regulations that result from the devised governance model apply to various state players. This is a setup similar to the EU where the necessities of coexistence and interaction led to the adoption of multilevel governance systems (Panara & Varney, 2013).

Based on the aforementioned guiding principles, a conceptual model for AI governance can be formulated which can act as a guideline for further development of common AI regulations for the GCC member states. The proposed model captures five logical layers, namely Technology, Ethical, Legal, Societal, Defense and Security. The last layer specifically targets the security concerns which are becoming increasingly associated with AI and automated decision-making systems.

**Technology Layer.** AI is the result of advanced computer algorithms, therefore, having a dedicated technology layer is a vital part of any regulatory and governance efforts in this context. Since some aspects of AI governance can be partially managed and controlled via technical means (Winfield, *et al.*, 2019), the technology layer will embody the technical measures needed to ensure ethical use of AI applications. Ultimately, this layer should pave the way for AI applications that are ethical by design (Mittelstadt, *et al.*, 2016). To achieve this goal, an important component of this layer will be the existence of concrete data governance measures that can be applied when

designing and implementing AI-based systems and services. This should be combined with rules and principles for “accountable algorithms” in a similar way that led to the GDPR which tackles algorithmic discrimination (Goodman, 2016).

**Ethical Layer.** This layer will address the ethical considerations associated with the utilization of AI applications. This paper recommends the ethical considerations suggested by Floridi *et al.* (2018). These ethical considerations are summarized in the form of the following principles: “Beneficence: Promoting Well-Being, Preserving Dignity, and Sustaining the Planet; Non-maleficence: Privacy, Security and “Capability Caution”; Autonomy: The Power to Decide (Whether to Decide); Justice: Promoting Prosperity and Preserving Solidarity, Explicability: Enabling the Other Principles through Intelligibility and Accountability” (Floridi, *et al.*, 2018). Due to the inclusive nature of these principles, they can potentially address the ethical considerations arising from the utilization of AI in the GCC countries.

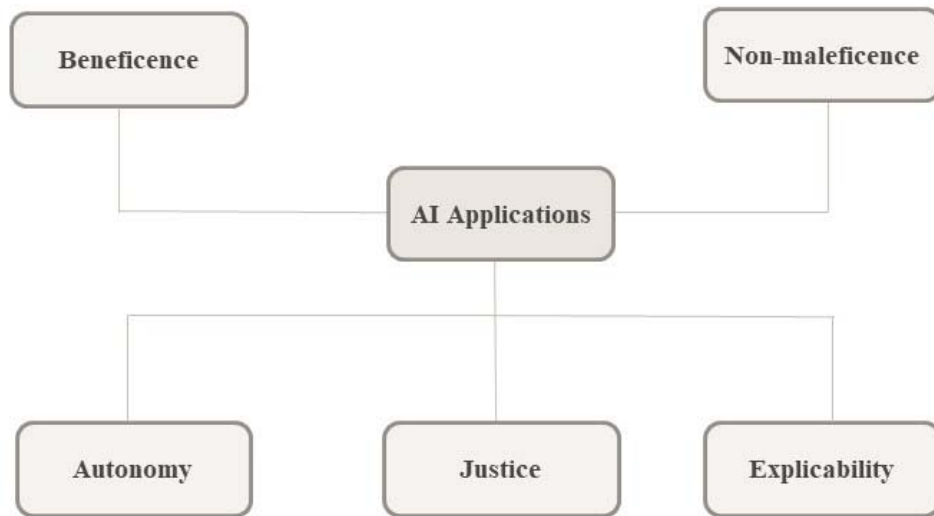


Fig. 1. AI Ethical Principles (adopted from Floridi *et al.* (2018)).

**Legal Layer.** The legal layer will steer the efforts for establishing laws and regulations to govern AI use and applications across the GCC. This layer can address the process of founding regulatory bodies to regulate AI systems (Gasser & Almeida, 2017). These bodies can be regional in nature with the main goal of serving the common best interests of the GCC member states.

**Society Layer.** There is no denial of the profound effects that AI is having on society. Hence, this layer will deal with the far-reaching effects of AI on society. An important factor to consider here is that the lack of societal engagement is a serious threat to AI regulatory efforts as noted by Beining, *et al.* (2020). Therefore, the prime goal of this layer is to integrate societal input in the AI regulatory decision-making process to ensure full alignment with the society’s evolving needs. To achieve this goal, active research will need to be integrated with the AI regulatory process. Such an integration will ensure that AI “is accountable, transparent, and its operation will remain consistent with human values and aspirations” (Cath, *et al.*, 2018).

**Defense and Security Layer.** Jensen *et al.* argue that recent developments show that AI

will have profound influence on military power and strategic competition around the world. In a general sense, defense and security remains a significant concern in the GCC countries due to their geopolitical position. Hence, a dedicated layer for defense and security will address the security concerns of the GCC member states. Such a layer can provide the necessary governance instruments to protect member states from AI-related threats such as automated cyber operations, algorithmic targeting, automated planning and manpower allocation, target systems, etc., to name but a few of the topics that are closely related to AI’s defense and security aspects (Spiegeleire, *et al.*, 2017).

Figure 2 illustrates the proposed model. It is evident that the Technology Layer is the foundation of the governance model in which technological and technical considerations can be addressed. The Ethical and Legal layers are transitional layers paving the way for solid regulatory instruments to address societal interests represented in the Society Layer. Finally, the Defense and Security Layer sits at the top of the governance model to address the strategic interests of the GCC countries.

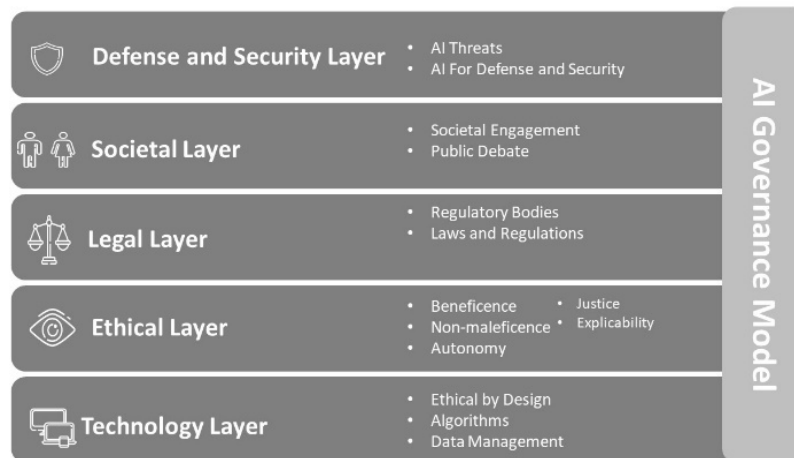


Fig. 2. Layers of AI Governance Model for GCC Countries.

## Conclusions and Future Work

This paper contributes to knowledge on the current status of AI governance globally through a review of the literature concerning this topic. It particularly focused on the GCC countries as a case study of a regional body that can benefit from common AI governance frameworks, laws and regulations. The findings underscore that AI governance efforts on a global level are still in their initial stages and that AI governance, in particular, can be one of the main arenas in the global race towards AI leadership and dominance.

A layered model for AI governance in the GCC countries has been proposed. This model was adopted from Gasser & Almeida (2017), PDPC (2019), WEF (2019), while making some adjustments to meet the requirements of the GCC countries. The proposed model builds on three guiding principles which are flexibility, balance, and modularity. Furthermore, the model includes five interdependent layers, namely the Technology, Ethical, Legal, Societal and the Defense and Security layers. This model can be a good basis for a more elaborate AI governance model that can be adopted by GCC countries.

In future, we plan to detail each layer of the proposed model to specify the exact areas that need to be covered to arrive at viable AI laws and regulations that can be implemented across the GCC. Such areas include governance structures and measures, risk management, decision-making models, etc., among other factors which may be vital in formulating a full-fledged AI governance model. To achieve this goal, more in-depth analysis will be required on a country level by employing secondary as well as primary research data.

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## نموذج مقترح لحوكمة تقنيات وتطبيقات الذكاء الاصطناعي في دول مجلس التعاون

### الخليجي لدول الخليج العربية

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المستخلص. رغم أن تبني تقنيات وتطبيقات الذكاء الاصطناعي (AI) في دول مجلس التعاون الخليجي لدول الخليج العربية يعتبر حديث نسبياً، إلا أن تلك التقنيات أصبحت جزءاً لا يتجزأ من خطط واستراتيجيات تقنية المعلومات في تلك الدول. يسلط هذا البحث الضوء على أهمية حوكمة تقنيات وتطبيقات الذكاء الاصطناعي، ويقترح نموذجاً موحداً لحوكمة تلك التقنيات في دول مجالس التعاون الخليجي لدول الخليج العربية، نظراً للعوامل المشتركة العديدة بين تلك الدول. كما يفصل هذا البحث الوضع الحالي لحوكمة الذكاء الاصطناعي عالمياً، وفي دول مجلس التعاون الخليجي على وجه التحديد. بناءً على تحليل الوضع الحالي واحتياجات دول مجلس التعاون الخليجي، يقدم هذا البحث إطار عمل لنموذج لحوكمة تقنيات الذكاء الاصطناعي في دول المجلس، وهو نموذج طبقي مبني على عدة محاور، تشمل على: التقنية، والأخلاقيات، والقانون، والمجتمع، والأمن والدفاع.

الكلمات المفتاحية: الذكاء الاصطناعي، حوكمة الذكاء الاصطناعي، تشريعات التقنية.

