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Artificial Homosapien: Exploring the Classical Inventions of Robotics in Human History

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ABSTRACT

One of the uniqueness of man between the Angels, Jinn, and the brute animals is the development of our Brain and to use knowledge to conquer nature. Such ingenuities are borne out of the Classical Theories of Robotics and Drones, and the making of artificial Homosapien to reach places where humans cannot survive such as in space, underwater, terrible heat, clean up, containment of hazardous materials, and radiation and detection and deactivation of bombs. This study explores the etymology of robotics in helping humanity domestically, commercially, militarily, and in embarking on research. It traces the threshold to the period of King Solomon (970 B.C. – 932 B.C.), a Prophet, King, Judge, Knowledgeable, Wealthy, Wise, and Powerful that speak the language of humans, jinn, animals, birds, insects, ants, and others. The study unveils how King Solomon inspired contemporary robotics, through the control the wind to fly the first airplane; used the jinn to build monuments, and Al-Aqsa Mosque in Jerusalem; and to acquire gold, brass, copper, and other minerals for wealth from the sea; and controlled birds for courier services and explore other territories. In narrative form, this investigation exposes how the concept of modern robots are developed in the Classical Times of the Islamic Empire between 7th and 16th Centuries, as inspired by King Solomon. Apart from juxtaposing how robots help in human labor, the study concludes that the artificial humans are of great benefits to humanity in exploring nature and to complement in management of human and material resources that replaces the factors of production in the new age of economics.

Introduction

The technologies of Robots have been magical and unique in human history as they are assisting greatly the Scientists, security agencies, individuals, industries, governments, and multinationals in carrying out duties that are difficult for humans to carry out. Robotics is the branch of technology that deals with the design, construction, operation, and application of robots. Robotics is an interdisciplinary field that integrates computer science and engineering (German National Library, 2020). Robots can mimic a lifelike form or automate movements. This way, different kinds of robots might express intelligent sense or form a thought of their own. Robotics equally includes the study of computer systems designed for controlling robots, developing sensory feedback, and handling of information. It is the science that studies the robot (Angelina, 2019).

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In her definition of robotics, Tesler (2005) notes that there's no precise definition, but by general agreement a robot is a programmable machine that imitates the actions or appearance of an intelligent creature–usually a human. And she emphasizes that to qualify as a robot, a machine has to be able to do two things: 1) get information from its surroundings, and 2) do something physical–such as move or manipulate objects.

Academically, Robotics is an interdisciplinary branch of engineering and science that includes mechanical engineering, electronics engineering, information engineering, computer science, and other artificial intelligence, mechatronics, nanotechnology, and bio-engineering (Stems, 2010).

However, Nocks (2007) confirms that many robots are built to do jobs that are hazardous to people, such as defusing bombs, finding survivors in unstable ruins, and exploring mines and shipwrecks. Robotics is also used in STEM (science, technology, engineering, and mathematics) as a teaching aid in the academics.

Apart from designs, construction, and operations, robotics deals with computer systems for their control, sensory feedback, and information processing. These technologies are used to develop machines that can substitute for humans and replicate human actions. Robots are used in (Rosheim, 1994):

a. Dangerous Environments, including Bomb Detection and Deactivation. Finding survivors in unstable ruins, exploring mines, and shipwrecks.

b. Manufacturing Processes.

c. Places where humans cannot survive such as in Space, under water, in high heat, clean up, and containment of hazardous materials and radiation.

d. Domestically where robots and drones can be used at home to pick stuffs for us.

e. Commercially, where robots and drones carry out chores at grocery stores to serve customers.

f. Militarily, where army, police, national guards, and state security like Federal Bureau of Intelligence (FBI) use robots to get intelligence reports, monitor areas online, sniff information, and even attack enemies. In fact, robots are designed in any form for military purposes, such as made in human form to help;

i. In the acceptance of a robot in certain replicative Behaviors usually performed by people. They replicate Walking, Lifting, Speech, Cognition, or any other human activity.

ii. To contribute to the field of bio-inspired robotics through nature.

g. Robots are used in STEM – Science, Technology, Engineering, and Mathematics as a teaching aid.

h. Drones are used by the State intelligence services, Police, Military, scientists, individuals, and others to gather intelligence reports, monitor events around specific places, attack designated areas or people, conduct research, and among others.

Indeed, the super inventor of robotics is the Almighty God through the creation of the world, especially the heavens and the earth; the moon; the sun; the stars; the space; planets; the clouds; mountains; hills; valleys; oceans and seas; human being; animals; birds; winds; and among others (Holy Qur'an 2:29, 117; 6:73; 7:54; 11:6 – 7; 25:61 – 62). The contemporary robotics have been developed from these through ages.

> It is He (God) Who hath created for you all things that are on earth; Moreover, His design comprehended the heavens, for He gave order and perfection to the seven firmaments; and of all things He hath perfect knowledge (Q. 2:29) …He knoweth the unseen as well as that which is open. For He is the Wise, well acquainted (with all things) (Q. 6:73).

Each of the Prophets of God sent at different times in history since the creation of the world were given different miracles. Since the chain of the Prophets and Messengers of God is the same as all the 124,000[1] of them sent to the world at different times

[1] It is narrated from Abu Dharr that one day he asked the Messenger of Allah (S): How many prophets are there in all? He replied: One hundred and twenty four thousand. He then asked: How many of them were messenger prophets? He replied: Three hundred thirteen from the above group. He asked: Who was the first of them? He replied: Adam. He asked: Was he a messenger prophet? He replied: Yes, Almighty Allah created him with His own hands and blew His spirit into him. At that moment the Holy Prophet (S) said: O Abu Dharr: There were four from the Syriac prophets: Adam, Sheeth, and Ukhnuh, who is also called Idris and who was the first to write and Nuh. Four of them were Arabs: Hud, Salih, Shuaib and your prophet, Muhammad. The first prophet among Bani Israel was Musa and the last of them was Isa and they were in all six hundred prophets. Abu Dharr asked: O Messenger of Allah (S), how many heavenly scriptures descended? He replied: One hundred and four, of which Almighty Allah revealed to Sheeth fifty scrolls, thirty on Idris and twenty on Ibrahim. He also revealed Taurat, Injeel, Zabur and Quran. Five great divine prophets brought new sets of laws (Shariah) and they are known as Ulul Azm prophets. They were: Nuh, Ibrahim, Musa, Isa and Muhammad (S). Ismail Jofi has narrated from Imam Muhammad Baqir (a.s.) that he said: The Ulul Azm prophets are five in number: Nuh, Ibrahim, Musa, Isa and Muhammad (S). We do not have detailed information about the names of all the prophets; in

in history from Adam to Noah, to Abraham to Ishmael, Isaac, Jacob, Moses, Jesus Christ, and Muhammad (SAW) preached the unity and indivisibility of God under the banner of Islam. The 313 of them are Messengers, while the stories of twenty-five Prophets are told in the Holy Qur'an, 104 of the Prophets were given Holy Books; and five of them are considered as unique. But while all of them were national Prophets sent to their families, communities and nations only, Prophet Muhammad (SAW) is the last Prophet sent to the entire humanity with the message of the Holy Qur'an till eternity.

The one brotherhood of the Prophets of God at different times in history since the creation of the world, demonstrates the continuous line of God's covenant for them to rehearse the signs of God to the people without vacuum (Q. 23: 52 – 54; 3: 33 – 34; 4: 163 – 165; 7: 35 – 36). God (Q. 7: 35) says,

> …whenever there come to you apostles from amongst you rehearsing my signs unto you those who are righteous and mend (their lives) on them shall be no fear nor shall they grieve.

But part of the Signs of God being rehearsed to the people by the Prophets are the scriptures, Laws, and miracles (Mujiza) given to the Messengers as proof of Message from the Creator. At least, Prophet Noah preached the oneness of God to the people for 950 years; had unrighteous wife and unrighteous son that were drowned with unbelievers; those who believed were saved in the Ark from the flood of destruction (Q.66:10; 11:45-47; 7:59-64; 11:25-48; 23:23-32; 26:105-122; 37:75-82). Almighty God says in Qur'an 6:84,

> And We bestowed upon Abraham (offspring) Ishaq (Isaac) and Ya'qub (Jacob) and each of them did We guide to the right way as We had earlier guided Noah to the right way; and (of his descendants We guided) Da'ud (David) and Sulayman (Solomon), Ayyub (Job), Yusuf (Joseph), Musa (Moses) and Harun (Aaron). Thus, do We reward those who do good.

Similarly, Prophet Hud, was sent to the 'Ad people; the fourth generation and descendants of Prophet Noah, in the Arabian tradition, having been a son of 'Aus, son of Aram, the son of Aram, the son of Sam, the son of Noah. The 'Ad people occupied large of the Southern Arabia, extending from Umman at the mouth of the Arabian Gulf to Hadhramut and Yemen at the southern end of the Red Sea (Ali, 1989). Prophet Hud preached the worship of One God to them; the leaders of the unbelievers called him liar and folly; God visited the 'Ad people with famine and were overwhelmed in the final blast of hot wind (Q. 7:65-72; 11:50-60; 26:123-140; 46:21-26).

Likewise, Abraham was saved from the furnace of King Nimrod; the Almighty Allah disgraced and eventually killed King Nimrod with mere insect of mosquito, when he challenged God to a battle with his retinue of well-armed soldiers that were all destroyed with mosquitoes; built the Ka'ba Mosque in Makkah to establish the religion; Divine Guide to experiment on birds on life to the dead; ransomness of son's life (Ismail) from sacrifice; given scripture; and Angels visit to give message on birth of Ishaq by wife, Sarah at old age of 86 (Q. 21:69; 2:125 – 127,258; 3:96,97; 2:260; 37:99-111;53:37; 87:19; 11:69-73; 15:51-56; 51:24-30).

Also, Prophet Noah preached the oneness of God to the people for 950 years; had unrighteous wife and unrighteous son that were drowned with unbelievers; those who believed were saved in the Ark from the flood of destruction (Q.6:84; 66:10; 11:45-47).

Besides, Prophet Salih was given the she-camel from the mountain as signs to the Thamud people (Q.7:73-79;11:61-68; 17:59; 26:141-159; 27:45-53). Prophet Yusuf (Joseph) was son of Prophet Yakub (Jacob) who gave birth to twelve Prophets; saw vision of greatness; his jealousy by brothers led to plot against him; thrown into well; sold by brethren at peanuts to Aziz of Egypt; tempted by Aziz's wife; imprisoned; interprets King's vision; established in power; and reunion of whole family (Q. 12:4-6; 12:7-10; 12:11-18; 12:19-20; 12:21; 12:22-29; 12:35-42; 12:43-54; 12:55-57).

Moreover, King Daud (David) is the father of King Solomon; a prophet; given the scripture of Psalm (Zabur); a Judge; fights and conquered Goliath; inspired with knowledge and wisdom; made first warfare vest (Q. 6:84; 21:78-80; 34:10-11; 38:17-26; 2:251).

Furthermore, Prophet Shuaib (Jethro) was sent to the Madyan people and preached oneness of God; preached against profiteering; married her daughter to Prophet Moses, who stayed with him for ten years, helping to care for the sheep farming; gave the stick to Moses for rearing animals (Q. 7:85-93; 11:84:95; 29:36-37). Prophet Moses sees Glory on Mount Sinai, after leaving Shuaib with wife and child; was given the Signs to covert Stick to snake and hand under arm to turn bright white as snow, spoke with God, and given the Torah scripture; converts Egyptian magicians with his super stick (Q. 7:159-162; 27:7-14; 28:29-35; 53:36; 87:19; 20:70-73; 26:46-52).

books of history also only some of their names are mentioned. In the Holy Quran, twenty-six of them are mentioned by names: They are: Adam, Nuh, Idris, Hud, Salih, Ibrahim, Lut, Ismail, Al-Yasa, Zulkifl, Ilyas, Ayyub, Yunus, Ishaq, Yaqub, Yusuf, Shuaib, Musa, Harun, Dawood, Sulaiman, Zakariya, Yahya, Ismail the keeper of his word, Isa and Muhammad (S).

Also, Prophet Jesus (Isa) was born without a biological father, and born by virgin Mary; he talked in the cradle as a Prophet of God, given the scripture of Gospel; cured the sick, and raise the dead; and was taken to the heaven without natural death, among others (Q. 3:35-37; 3:42-51; 4:156; 5:110; 19:16-21; 119:23-26; 19:27-33; 21:91; 66:12).

Meanwhile, the seal of all Prophets; who was foretold by Moses and Jesus; ascended to heaven through Ka'ba Mosque in Makkah, and Al-Aqsa Mosque in Jerusalem; Muhammad SAW came with the ultimate miracle of the Holy Quran which cannot be editioned till eternity (Q. 17:88; 33:40; 61:6,9; 46:10; 56:75—81; 98:2).

However, modern science and digital technologies have been used to develop robotics which are artificial machines, to accomplish different ranges of human tasks or actions. These actions can either be autonomous or independent of humans or through the use of remote control. Thus, some robots are autonomous, while others are semi-autonomous. Robotics machines are programmable using a computer. Some types of robotics have internal control mechanisms. However, some operate through an external control device. Moreover, some kinds of robots replicate the human structure. However, many robot examples are just machine performing tasks irrespective of their looks (Angelina, 2019).

Historically in the Western model of robotics, the word *robotics* was derived from the word *robot*, which was introduced to the public by Czech writer Karel Capek in his play *R.U.R. (Rossum's Universal Robots)*, which was published in 1920 (Zunt , 2013). The word *robot* comes from the Slavic word robota, which means slave/servant. The play begins in a factory that makes artificial people called *robots*, creatures who can be mistaken for humans – very similar to the modern ideas of androids. Karel Capek himself did not coin the word. He wrote a short letter in reference to an etymology in the *Oxford English Dictionary* in which he named his brother Josef Capek as its actual originator (Zunt , 2013).

According to the *Oxford English Dictionary*, the word *robotics* was first used in print by Isaac Asimov, in his science fiction short story *"Liar!"*, published in May 1941 in "*Astounding Science Fiction*". Asimov was unaware that he was coining the term; since the science and technology of electrical devices is *electronics*, he assumed *robotics* already referred to the science and technology of robots. In some of Asimov's other works, he states that the first use of the word *robotics* was in his short story *Runaround* (Astounding Science Fiction, March 1942), where he introduced his concept of "The Three Laws of Robotics" (Asimov , 1996; Asimov , 1983; Zunt , 2013). However, the original publication of "Liar!" predates that of "Runaround" by ten months, so the former is generally cited as the word's origin.

Historically, it was in 1948 that Nobert Wiener formulated the principles of cybernetics, the basis of practical robotics. Norbert Wiener was an American mathematician and philosopher. He was a professor of mathematics at the Massachusetts Institute of Technology (MIT). A child prodigy, Wiener later became an early researcher in stochastic and mathematical noise processes, contributing work relevant to electronic engineering, electronic communication, and control systems (Wiener, 1950). Wiener (1948) defines cybernetics as "the scientific study of control and communication in the animal and the machine".

Fully autonomous robots only appeared in the second half of the 20th century. The first digitally operated and programmable robot, the Unimate, was installed in 1961 to lift hot pieces of metal from a die casting machine and stack them. Commercial and industrial robots are widespread today and used to perform jobs more cheaply, more accurately and more reliably, than humans. They are also employed in some jobs which are too dirty, dangerous, or dull to be suitable for humans. Robots are widely used in manufacturing, assembly, packing and packaging, mining, transport, earth and space exploration, surgery, weaponry, laboratory research, safety, and the mass production of consumer and industrial goods (Angelina , 2019).

In the views of Tesler (2005) about robotics, she enthuses that:

> If you think robots are mainly the stuff of space movies, think again. Right now, all over the world, robots are on the move. They're painting cars at Ford plants, assembling Milano cookies for Pepperidge Farms, walking into live volcanoes, driving trains in Paris, and defusing bombs in Northern Ireland. As they grow tougher, nimbler, and smarter, today's robots are doing more and more things we can't –or don't want to–do. Robots have been with us for less than 50 years, but the idea of inanimate creations to do our bidding is much, much older. The ancient Greek poet Homer described maidens of gold, metallic helpers for the Hephaistos, the Greek god of the forge. The golems of medieval Jewish legend were robot-like servants made of clay, brought to life by a spoken charm. Leonardo da Vinci drew plans for a mechanical man in 1495. But real robots wouldn't become possible until the 1950's and 60's, with the invention of transistors and integrated circuits. Compact, reliable electronics and a growing computer

> industry added brains to the brawn of already existing machines. In 1959, researchers demonstrated the possibility of robotic manufacturing when they unveiled a computer-controlled milling machine. Its first product: ashtrays.

Meanwhile, this study, no doubt unveils how King Solomon (970 B.C. – 932 B.C.) controlled the wind to fly the first airplane; used the jinn to build monuments, and Al-Aqsa Mosque in Jerusalem; and to acquire gold, brass, copper, and other minerals for wealth from the sea; and controlled birds for courier services and explore other territories.

In narrative form, this investigation exposes how the concept of modern robots are developed in the Classical Times of the Islamic Empire between 7th and 16th Centuries when Early Muslims stunned the world with the inventions of medicine, pharmacy, surgery, hospital, experimental physics, alchemy and chemistry, algebra/trigonometry, numbering system, anesthesia, calligraphy, architectural innovation, optics, airplane, university, crank-shaft, internal combustion engine, paper manufacturing, braille, windmill, treatment of cowpox, and more.

This investigation discloses the true Father of Robotics as Badi az-Zaman al-Jazari (1136 – 1206 A.D.) with his Book in Knowledge of Engineering Tricks where he patented 100 Mechanical Devices including Robotics in 1206 A.D. and how to build them. This research establishes King Solomon model of robotics as the foundation in the contemporary robots, points out the synergy between Solomon's natural model with Al-Jazari's artificial model of the medieval period, and the contemporary model of robotics of the West.

Apart from juxtaposing how robots help in human labor, the study concludes that the artificial humans are of great benefits to humanity in exploring nature and to complement in management of human and material resources that replaces the factors of production in the new age economics.

Types of Robotics

The field of cybernetics continue to meet the challenges of humanity in the production of different robots to meet certain needs in different disciplines and profession. Meanwhile, as **the technologies of robots** are being developed daily as the need arises**, they can be classified into the following types:**

1. **Industrial Robots**: These are robots developed to build cars, and carry out functions in the industries. Factories are utilizing robots for building precast houses, candy bars, and electronics. As Angelina (2019) and Al-Hassan (2010) enthuse, the Main Types of Industrial Robots are into six classifications. These include the articulated robots, Cartesian robots, the SCARA robots, the cylindrical robots, delta robots, and polar robots. Nonetheless, there are other types of robots' structures. All of these features and various type of joint structures with the joints known as axes.

   The standard type of industrial robots is articulated robots. Articulated robots come with rotational joints which can differ from two to ten joints. Additionally, some robots come with more than ten joints. The most common types of articulated robots come with six axes.

   The axes give the robot optimal mobility or flexibility. A joint that twists is linking the arm of these robots to the base. Robots that have six axes are of big help in handling materials, tending machines, welding an arc, or spot welding.

2. **Medical Robots**: These are robotics used in the hospitals, and other health institutions for medical care for humans. The introduction of nanorobots is yet another advancement made in robotics. They transform medicine and human health. These are microscopic robots introduced into a human body for medical reasons.

3. **Entertainment Robots**: These are robotics developed in the entertainment industry in shooting of films, games, set in the theater, football, and some others. Entertainment robots are types of robots intended to arouse our emotions (Russell , 1990). Robots for entertainment purposes include Rob Thespian; a robot comedian, Navi Shaman; a Disney theme park robot, and Partner; a robotic musician.

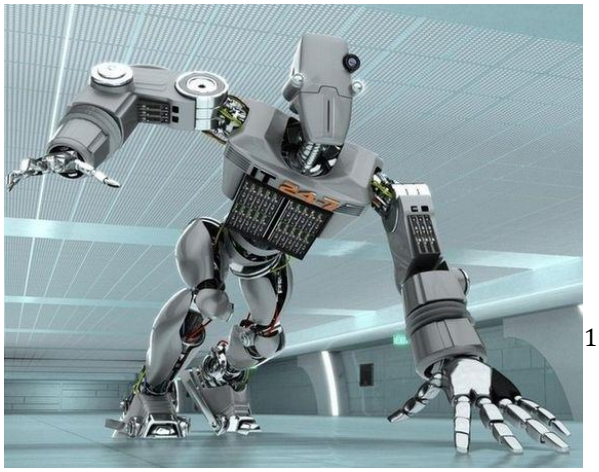
4. **Military Robots**: These are robots developed for use in military intelligence, surveillance, combat, and other purposes. Some of these robots are performing tasks that are too dangerous for humans like neutralizing bombs. Some robots are useful in place with a potential bomb. They help in bomb detection and deactivation. Furthermore, robots can help to search for human survivors in insecure ruins.

5. **Humanoid:** These are robotics used as teaching aids in STEM i.e., Science, Technology, Engineering, and Mathematics. They are used to teach in the classrooms too or online. Robots that replicate human appearance makes it easy to accept them in specific repetitive actions that people usually do. These types of robots try to imitate the way of walking, lifting objects, speaking, reasoning, and other human-related actions.

6. **Service Robots**: These are robots developed for different purposes to meet certain needs, to

meet human needs for specific purposes and services. Robotic technology is beneficial for individuals with no arms or legs. In a lot of instances and for a lot of different reasons, robots are in-demand. Some are using robots in places where it isn't possible for humans to go. For instance, in an extremely hot environment or high heat and for cleaning or controlling of dangerous substances and radiation. Robots that replicate human appearance makes it easy to accept them in specific repetitive actions that people usually do. These types of robots try to imitate the way of walking, lifting objects, speaking, reasoning, and other human-related actions.

7. **Aerospace Engineering Robots**: These are robots developed for aerospace engineering, especially the development, maintenance, and discovery of jets in space, and among others.



8. **Space Robots**: These are robots developed to travel and make discoveries into space, and for exploring other planets.

9. **Oceanic Diving Robotics**: These are robots developed to travel into the deep seas and oceans to make discoveries, and acquire mineral resources. Such robots are developed to make objects discovery underwater. Beneath the surface of the water is where deploying these robots are possible. Examples of these types of robots include marine submersibles such as Aquanaut, humanoids that dive. Other examples are Ocean One and biological motivated robotics like the snakebot known as ACM-R5H.

10. **Commercial Robotics**: These are robots developed for commercial purposes to help in stores, to take and make stocks, and among others attend to customers.

11. **Mechanical Robotics**: These are robotics that are designed for mechanical services purposes such as welding, drilling, painting, and others purposes. Robots can perform a singular task repetitively without being bored. Moreover, different kinds of robots can grip dangerous substances. In a lot of instances, robots produced more precise results compared to their human counterparts. This, in turn, minimizes production costs by eliminating costly mistakes and potential hazards. Robots don't fall sick. They don't sleep or need to break to eat. Moreover, they don't go on vacation or get tired. And so, the benefits and uses of robots to man are numerous.

12. **Drones**: Drones are aerial vehicles not controlled by humans. These vehicles come in a wide variety of sizes and come with varying degrees of autonomy. Examples of drones are the Global Hawk military system, the well-known Phantom series of DJI, and the Anafi Parrot.

13. **Exoskeleton Robot:** For physical therapy, there are exoskeleton robots. This type of robot can make a paralyzed individual get back on his or her feet again. However, the military and other industry are also using exoskeleton robots. They offer extra mobility capacity to the user. They enable him or her to have more strength to lift heavy loads.

14. **Security robots:** Military robots are for security, surveillance, and combat purposes. This type includes the Endeavor Robotics' PackBot. This is for discovering makeshift explosives in Iraq and Afghanistan. It equally includes robot types like the Big Dog. This helps in lifting heavy tools and different types of machinery. An example of a security robot is the self-governing mobile edifices like Cobalt.

15. **Research Robot:** Some robotics are designed for research purposes, to assist in discoveries, inventions, and explorations to develop knowledge in science and technology. University and company's research laboratories developed most types of robots today. However, research robots are different. The primary reason for designing them is to assist researchers in their research work. This means that some robots that fall into different classifications may equally qualify as research robots.

16. **Self-Driving Car Robots:** There are different types of robotic self-driving cars around. Many of these cars can as well drive human beings. The primary designs of self-driving cars include vehicles designed for the DARPA's self-driving vehicle contests. Also, Google pioneered self-driving Toyota Prius. This one gave rise to Waymo.

17. **Telepresence Robots:** These are the types of robots that enable you to explore a location remotely and be present in the location while remaining where you are. You can sign into a robot avatar through the internet. Once you log in, you can drive the robot around. Moreover, you can view the things that the robot sees. Also, you can speak to people in that location without being there physically. Remote workers can utilize this type of robots to work together with their co-workers at a far-away office. Additionally, medical practitioners can use these types of robots to verify how their patients are doing.

18. **Robotics for A Modern World**: There are different types of robots. These vary widely and can range from humanoids like the Advanced Step in Innovative Mobility (ASIMO), developed by Honda. Another one is the TOSY Ping Pong Playing Robot (TOPIO), developed by TOSY. Also, there are medical and healthcare robots, like the microscopic nanorobots. These different types of robots, irrespective of their form, take care of repetitive tasks that are better automated and tasks that are risky for human workers. The benefits of robotics to humanity continue to evolve by day with technological advancements. No doubt, robots and the robotics industry are there to revolutionize our modern world for the better.

19. **Domestic Robots:** These are robotics that are used for personal security purposes, pets, to run errands in the house, to serve as guide for the physically challenged people, and among others.

It is noteworthy as Angelina (2019) notes, that these different types of robots, irrespective of their form, take care of repetitive tasks that are better automated and tasks that are risky for human workers. The benefits of robotics to humanity continue to evolve by day with technological advancements. No doubt, robots and the robotics industry are there to revolutionize our modern world for the better.

CLASSICAL THEORIES OF ROBOTICS

The classical theories for the inventions of modern robotics, can be traced to King Solomon (970 B.C. – 932 B.C.), son of King David (1011 B.C. – 1005 B.C.). King Solomon was a Prophet of Israel, who succeeded his father, and reigned between 970 and 931 BCE. Jedidiah, as Solomon was also called was imbued with knowledge, wisdom, wealth, and power to control the wind, jinn, spring, birds, ants, and speak the language of animals (Barton , 1906). The evolution of Robotics can be traced to the Divine endowment of Solomon to control:

1. **Winds,** by directing them to do whatever he wanted them to do, development purposes, destruction during wars and hostilities, among others. The Holy Quran 21: 81 - 82 says "(It was Our power that Made) the violent (unruly) Wind flow (tamely) for Solomon, to his order, to the land Which We had blessed: For We do know all things. And of the evil ones, were some who dived for him, and did other work Besides; and it was We Who guarded them" (Quran 34:12 – 13).

2. **Thus,** King Solomon was the first person to fly in an airplane in this process with entourage of aides, and fed in the air by chef and air hostesses, using flying carpet made of green silk with golden weft, the carpet of sixty miles long and just as wide, occupying 40,000 men (Seaworth , 2016). The flying sixty miles square long and width of green silk carpet represent the contemporary flying airplane, and the Jinn serving as cook, attendants and waiters for King Solomon and his entourage represent the chef and air hostesses in modern times. But the contemporary airplane is unmatched to the flying green carpet of King Solomon, as the flying carpet cannot crash, miss its way, or get lost to unknown region. Besides, King Solomon's flying carpet was taking about one thousand people in the air, and flew for a month non-stop which the current airplanes cannot match, as they needed to fly for few hours, and refuel and get maintained or serviced by the aeronautic engineers. Solomon flew in the air with his entourage by the Command of God. Also, the use of violent wind by Solomon, to destroy regions that refuse God's Message of monotheism, with the Guidance of God represent the contemporary Military robotics that are used in wars and strife. And the Jinn that are used to dive for Solomon represent the contemporary Oceanic Diving robotics, Aerospace Engineering robotics, Space robotics and among others.

3. **Jinn,** as they were used to harness gold, silver, diamonds, and other minerals from the ocean (Quran 21: 82; 34:12-13; 38: 37). The Jinn were also used by King Solomon to construct The Temple Mount i.e., Mount of the House of God – the Temple in Jerusalem, known to the Muslims as Noble Sanctuary of Jerusalem (Al-Aqsa Mosque), in 957 BCE and destroyed by the Neo-Babylonian Empire in 586 BCE. The venerated Mosque remains Holy Site for Judaism,

Christianity and Islam. The Jinn served King Solomon in the construction of houses till his death, without realizing that he had died while supervising their construction works. It contains Al-Aqsa Mosque, the Dome of the Rock, and Dome of the Chain, as well as four minarets (Pullan et al , 2013; Faizer , 1998;).

4. **Ants**, King Solomon was inspired to appreciate the Blessings of God for hearing the wise ant from far distance for ample defense against them (Q.27:15-19).

5. **Birds**, as the Hoopoe who was absent at his muster, was yet serving him as she discovered the Kingdom of Queen of Sheba for King Solomon, and the People of Sheba submitted with conviction to the Wisdom of Solomon and the Kingdom of God (Qur'an 27:20-44).

The inventions of robotics are borne out of these classical theories, where King Solomon took control of the Winds, Jinn, Ants, Birds, and speak the language of animals and birds with Divine inspirations. The wealthy Prophet of God may be considered as the inventor and Great Grand-father of Digital Robotics. This is because, as a Divinely Guided Prophet of Israel, the technologies of airplane, robotics, and drones were developed from the theories and practices of his using Flying Carpet as first airplane.

Also, King Solomon used multiple of Jinns to harness gold, diamond, and other minerals from the oceans for wealth, and using the unseen Jinn in the constructions of Al-Aqsa Mosque, Palaces, and houses and public buildings (Barton , 1906).

This contrasts with the many wonderful tales of occult power and magic attributed to King Solomon, because the Jews and Christians had ignored their own Holy Books (Torah to Moses and the Gospel to Jesus), and twisted or distorted them according to their own fancies (Ali , 1989:41). They followed falsehood, mischief, and inspired to follow evil, magic and sorcery, as King Solomon dealt in no art of evil or blasphemy, but truth and Divine Guidance (Barton , 1906; 2 Epistle of Peter 2: 4;Epistle of Jude, Verse 6; Qur'an 2:101-103).

It was from this theory and practices that Robotics have been developed for domestic, industrial, military, and other purposes, especially to reach far, difficult places, hot, cold places that are injurious to human. Just as King Solomon used birds for courier services, as Hoopoe discovered Sheba Kingdom, got intelligence reports, security, and was sent with letter to Queen of Sheba (Quran 27: 22 – 44), the technology of Drones has been developed for such purposes in the new age.

DEVELOPMENT OF TECHNOLOGIES OF ROBOTICS FROM THE CLASSICAL THEORIES OF KING SOLOMON

Indeed, Al-Jazari, a Muslim scholar is regarded as the Father of Robotics, as he inspired the current technologies of robotics through his Book of Mechanical Engineering and practices. Badi az-Zaman Abu i-Izz Ismail ibn ar-Razaz al-Jazari (1136 – 1206 AD) is a Turkish scholar, Muslim polymath, inventor, mechanical engineer, artisan, artist, and mathematician. He is the author of Book in Knowledge of Engineering Tricks in 1206 AD, and gave 100 Mechanical Devices with instructions on How to Construct them (Nadarajan , 2007). Ismail Al-Jazari served as the chief engineer at the Artuklu Palace, like his father before him. Despite his work traversing the ages, almost nothing is known about his personal life.

The Book of Knowledge of Ingenious Mechanical Devices Published in 1206, the year of his death, became quite popular and is considered among the first occurrence of the "do it yourself" philosophy. Indeed, Ismail Al-Jazari was more interested in the craftsmanship necessary to build a mechanical device rather than in the theory or the technology behind it. The Book of Knowledge of Ingenious Mechanical Devices gathers 100 devices he built, and the instructions to build them. The inventor was inspired by previous works of other inventors and makers, which he tried to improve and innovate upon (Valery , 2017).

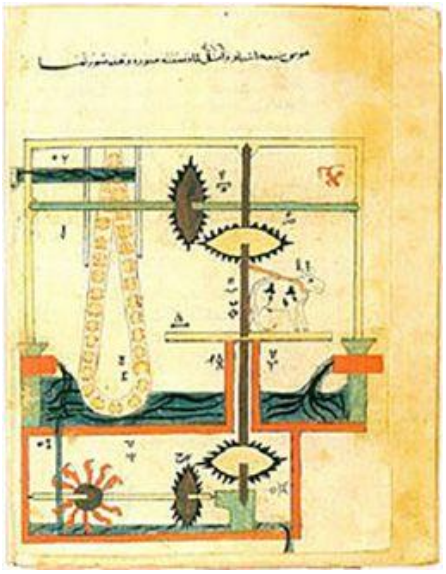
Fathers of Robotics -Robotic Elephant Clock (Al-Jazari ,1206; Valery, 2017)

The ingenuity of Al-Jazari was novel and unique as the theoretical base of his etymology of robotics were developed from King Solomon classical

theories. The concepts, methodology, and mechanisms were unique and practical, as they were based on Technical-Know-How. From crankshafts, escapement mechanism, segmental gear, to double-action suction pump with valves and reciprocating piston motion, many inventions displayed revolutionary mechanisms (Pullan et al , 1998).

Fathers of Robotics – Robotics Shema (Al-Jazari ,1206; Valery,2017)

In Al-Jazari's adventurism and scientific exploits, he used these technicality models and built the first automata and robots. While Da Vinci's legacy and genius were given wider publicity, very few know that he was inspired by Al-Jazari's work and inventions. He built many automated mechanisms such as moving peacocks powered by hydropower, but also the first automatic gates and doors (Valery, 2017).



Fathers of Robotics – Robotics Mechanism (Al-Jazari, 1206; Valery,2017)

In a study of over 2,000 years of robotic history, Rosheim (1994) acknowledge the great influence of Al-Jazari, on the inventions and development of robotic technologies, and impact on Arab engineers at the time. According to him:

> Unlike the Greek designs, these Arab examples reveal an interest, not only in dramatic illusion, but in manipulating the environment for human comfort. Thus, the greatest contribution the Arabs made, besides preserving, disseminating and building on the work of the Greeks, was the concept of practical application. This was the key element that was missing in Greek robotic science. The Arabs, on the other hand, displayed an interest in creating human-like machines for practical purposes but lacked, like other preindustrial societies, any real impetus to pursue their robotic science.

One of his most elaborated robots was a musical robot band. It was a boat that floated on a lake and entertained guests with 4 robot musicians. It's also among the first programmable automata: you could define the drum machine's rhythms and patterns using pegs.

Fathers of Robotics – Robotics Musicians (Al-Jazari, 1206; Valery , 2017)

One of the forgotten legacies in the etymology of robotics, centuries before computers and digital technologies is that Ismail Al-Jazari built the first automated devices, and was among the first to introduce the concept of programming (Stems, 2010). As a visionary inventor and developer, Al-Jazari remains one of the fathers of robotics, with his ingenuities in the technical-know-how concept of "do it yourself" and maker philosophies (Al-Hassani, 2010).

Data Analysis

The peculiar miracle (Mu'jiza) of Prophet Solomon in the usage of the Wind; the Jinn; Ants; the Birds; and others in his mission are unique in history. It is apposite to carry out the Data Analysis based on the facts revealed above, on the miracles of King Solomon in tandem with the Medieval period development of robotics by Al-Jazari, and the 20th Century development of robotics. This can be shown in the table below:

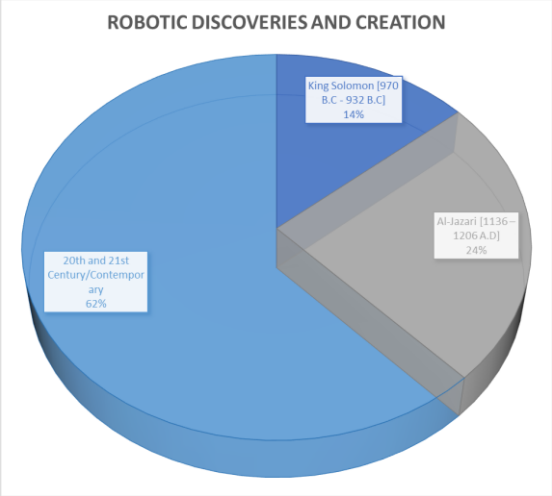
MODELS OF ROBOTICS

ROBOTIC MODELS ROBOTIC DISCROVERIES AND CREATIONS

Robotic Models	Robotic Inventions	Symbols	Robotic Images	Robotic Discoveries	Robotic Creations	Robotic Developments	Robotic Manufactures	Robotic Concepts
1. King Solomon Model 970 B.C -932 B.C	Winds	Jinn	Ants	Birds				
2. I-Jazari Model 1136 – 1206 A.D.	Robotic elephant	Moving Peacocks by hydropower	First Robot for automatic gates and doors	First automated robots	Human-like robots	Musical robot band	First programming of robots	
3. 0th and 21st Century/Contemporary Model	Industrial, Military, Aerospace Engineering, Space, and Mechanical robots	Oceanic diving, Medical, Entertainment, Humanoid, and Service robots	Drones, Commercial, and Exoskeleton robots	Security and Research robots	Self-Driving Car robots	Telepresence Robots	Domestic robots	Robotics for a Modern World

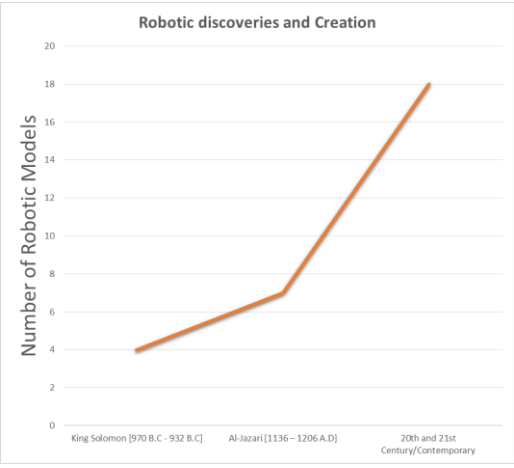
Model of Robotics, Table, Sulaiman Osho (February 12, 2021)

Pie chart representation



Model of Robotics, Pie Chart, Sulaiman A. Osho (2021)

Line Graph



Model of Robotics, Line Graph, Sulaiman A. Osho (2021)

Interpretation

The Table of Models of Robotics depict the models of King Solomon (970 – 932 B.C.); Al-Jazari (1136 – 1206 A.D.); and the contemporary Models of the 20th and 21st Centuries from the Western countries. The Models of King Solomon form the Foundation from the creations of God, Who sent him as a Prophet to the Israelites.

The creations used by King Solomon with the Guidance of God are:

1. Winds

a. which were used to fly one-square mile green mat, for over a month on air, with about a thousand on the entourage;

b. The Winds are also used to violently attack the territory of disbelievers in monotheism, after King Solomon must have preached to them, and they refused to worship one God (Qur'an 21: 81 – 82; 34: 12 – 13; 38: 36 – 40).

2. Jinn,

a. which serve as cooks, servers, and waiters for King Solomon and his entourage during flights;

b. They also served as builders of monuments, palaces, Al-Aqsa mosque, houses, and public buildings for Solomon;

c. The Jinn, run errands to bring Queen of Sheba Throne within the wink of an eye to King Solomon palace and others;

d. Also, multiple Jinn were also used by Solomon to harness mineral resources from the deep seas as wealth, including gold, silver, diamonds (Qur'an 21:82; 34: 12 – 13).

3. Ants

a. manifests the power of King Solomon to communicate and listen to the voice of humans, animals, birds, and even ants from very long distance;

b. King Solomon heard the bigger ant, over five miles away, instructing the younger ones to move off the road, so that King Solomon and his entourage wouldn't crush them on the way without knowing;

c. Hence, King Solomon smiled, and give gratitude to God for His Grace (Quran 27: 15 – 19).

4. **Birds**

a. Which were used by King Solomon for intelligence purposes to monitor the

deliberations at the palace of Queen Bilqis of Sheba on their discussions on his letter sent to them to worship one God;

b. to explore new cities and towns as Hoopee Bird discovered the Kingdom of Queen of Sheba;

c. render courier services to deliver letters to Queen of Sheba; among others (Quran 27: 20 – 44).

It is noteworthy that King Solomon used natural creations of God in his exploits to carry out his mission as a Prophet of God, in preaching of the message of the worship of oneness of God.

Secondly, the table depicts the inventions of robotics by Al-Jazari, through his authorship of the Book in Knowledge of Engineering Tricks in 1206 AD, and gave 100 Mechanical Devices with instructions on How to Construct them (Nadarajan, 2007). This includes the mechanical production of:

a. Robotic elephant.

b. Moving robotic peacocks by hydropower.

c. Robots for automatic gates and doors.

d. First automated robots.

e. Human-like robots

f. Musical robot Band

g. First programming of robots

Majorly, Al-Jazari invented the mechanical, theories, programming, and automatic production of robotics which are artificial humans. This has led to the further improvements by the West in the manufacture of different robots, as the need arises.

Thirdly, we have various manufacture of artificial humans by the West in the 20th and 21st centuries, which continues to unravel and trail the ingenuities of the King Solomon model. As shown in the table above, these include:

i. Industrial robots

ii. Medical robots

iii. Entertainment robots

iv. Military robots

v. Service robots

vi. Aerospace engineering robots

vii. Humanoid robots

viii. Space robots

ix. Oceanic Diving robots

x. Commercial robots

xi. Mechanical robots

xii. Drones

xiii. Exoskeleton robot

xiv. Security robots

xv. Research robots

xvi. Self-Driving robot

xvii. Telepresence robot

xviii. Domestic robot

xix. Robotics for a modern world

Observations and Comments

There is a synergy among the three robotic models of King Solomon, Al-Jazari and Western creations. They all carry out functions that are difficult for humans to carry out. Though, King Solomon used natural creations, the artificial homosapien that Al-Jazari developed mechanically, automatically, and programming were developed from the robotic conceptions of King Solomon. And the West has developed further from the Al-Jazari robotic creations.

Digital Technology and Robotics

The digital technology has actually improved the quality of robotics technologies, as the hardware and software make it easier and faster for them to be used for domestic, industrial, security, and other purposes. The use of robots for industrial purposes as workers in the factories, stores, and others are astonishing as this has astronomically increased the figure of unemployment.

The purchase of Robots for industrial purposes to replace human jobs has increased by 1.6% in 2019 compared to 2018 results with 29,988 Robotic units ordered (Robotics Online, 2020). Robots are increasingly used in manufacturing (since the 1960s). According to the Robotic Industries Association US data, in 2016 automotive industry was the main customer of industrial robots with 52% of total sales (Robotic Industries Association (RIA), 2018). In the auto industry, they can amount for more than half of the "labor". There are even "lights off" factories such as an IBM keyboard manufacturing factory in Texas that was fully automated as early as 2003. In a 2016 article in The Guardian, Stephen Hawking stated "The automation of factories has already decimated jobs in traditional manufacturing, and the rise of artificial intelligence is likely to extend this job destruction deep into the

middle classes, with only the most caring, creative or supervisory roles remaining" (Hawking , 2016).

Meanwhile, Pollock (2018) has revealed that construction robotics will increase exponentially by 2023. According to him, the global construction robot market is set to more than double by 2023, going from $76.6 million to an estimated $166.4 million". The Research and Markets (2018) study unveils that:

If the report's predicted results become reality, it would mark a significant change in the industry. When it comes to artificial intelligence and robotics use, construction has traditionally lagged behind factories or warehouses…The report separated construction robots into three types: traditional, robotic arm, and robotic exoskeleton (a wearable suit that boosts users' physical capabilities, a little like Iron Man). Traditional robots hold the largest share of the market…they are still expected to hold that share by the end of 2023.

It has been observed that crime rates have fallen in recent decades for a number of reasons, especially the use of robotics for security surveillance and digital technology. The President and Founder of Group 77, a security and public safety consulting firm, Brian Higgins (2018) notes that:

The growth and influence of technology in law enforcement (has changed) how crime is handled and the reduction in certain crimes…Robots equipped with cameras, lasers and other sensors offer a much more eye-level view of a situation. As they move around an area such as a perimeter fence, they can recognize anomalies such as an open gate or an object that shouldn't be there.

In fact, Southerland (2021) postulates the digital inspired robotics in the new age to stimulate employment, especially in difficult terrain where humans cannot reach. According to him,

Robots come in all shapes and sizes from small tracked vehicles to large upright cylinders and cart-like devices on wheels. They fly through the air and glide underwater…The new crop of robots enhances security and safety and does a better job than human security personnel… Robots are getting smarter as lasers, cameras and other sensors enable them to "see" where they're going and report back on what they observe to background networks.

This development confirms the postulations of Drucker (2010) that management functions and levels of management has replaced factors of production, viz: land, labour, capital, and entrepreneur. In this Knowledge society, management innovates through the three levels of Physical Level; Economic Level; and Human Level to improve trade and commerce, industries, government operations, social services, healthcare, and among others (Drucker , 2009).

Thus, the technologies of robotics and drones have been developed from the inventions, creativity, and Divine inspirations of King Solomon to improve labour, and not to increase unemployment. Further innovations in management will create jobs for humans in the digital age, because knowledge is increasing at increasing rate. More so, robots and drones are being used most especially for purposes that are difficult for humans to carry out in difficult places.

Conclusion

From the foregoing, this study has been able to establish that the etymology of robotics and drones started with King Solomon, Prophet of Israel (970 – 932 B.C.). It was through God's knowledge, wisdom, inspiration, and power to control the wind, Jinn, springs et al that he was able to ride on airplane; used the Jinn to construct the Al-Aqsa Mosque, palaces, houses, public buildings, and used the Jinns to harness gold, diamonds, and other mineral resources from the oceans for wealth, and to farm in plantations. Besides, King Solomon spoke the language of animals and birds, and ants, and could hear them from miles or kilometers away. Furthermore, he used the birds for courier services, to explore unknown regions, spies, intelligence reports, and for other purposes. Jedidiah, as King Solomon is called used the Jinns to metaphysically take or bring things from far distance within the wink of an eye, as did by Ifrit to bring the Royal Throne of Queen Bilikis of Sheba to his palace. The modern and digital science and technology continues to explore the ingenuities in the Royal exploits and opulence of King Solomon. The robotics, drones, airplanes and others have been developed to meet those inventions. Yet, they continue to trail the wonderful nature of King Solomon's luxury, magnificence, and magic. At least, robots are yet to be developed to bring a Royal Throne from far distance within a second. And airplane is yet to fly for a month, non-stop. Yet, King Solomon did, and was grateful to God and submitted in praises and worship.

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