International Journal of Industrial Engineering and Operational Research (IJIEOR)

Contents lists available at IJIEOR
International Journal of Industrial Engineering and Operational Research
journal homepage: http://ijieor.ir
Volume 7, No. 1, 2025

Examining the Dimensions of Future Hospital Development in Iran with Intelligentization Approach

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ARTICLE INFO

Received: 2024/09/10

Revised: 2024/10/15

Accept: 2024/11/01

Keywords:

Treatment Centers, Hospital Future, Technology, Flexibility Acceptance, Smartness

ABSTRACT

Centers treatment throughout the world in now change fig and substitute to become fast give meaning that needs now and the future particle for direct object supply do with passed the time stand up direction planning for hospitals effort to do that satisfaction and safety patients particle for the direct object in the future cover give and environments safe and cared for employed in the field of care health provide bring development hospitals must for everyone in the helpful future be acceptance technology also direction improvement quality and safety sick, from necessities development hospitals in the future is. This article discusses that with a design suitable to challenges to care health superior. These challenges are decreased costs, decreased consumption of energy and improved quality care, limitations in finance, forced work and matching with technology modernization, and smartening of the hospital. This article's method of research is descriptive and analytical and on-base studies. The findings are a library, and the findings are scientifically authentic and new to the nature of future research. The article presents opinion purposes, practical opinion collection data, and a descriptive study. Evidence authentic in context design centers treatment that causes thrifty joy in operational expenses, improvement status patients and ability create change in the future be made justification accept. Execution to meaning efficiency extended duration centers treatment to designer's centers treatment help centers flexibility acceptable and necessary is to this meaning that with the future compatible b and in the same now satisfaction user's particle for direct object catch do and results practical and clinical better in p had to be. To design hospitals smart and provide care, can totals from technologies new particle for a direct object like the trap medicine, Artificial Intelligence (AI), robotics, reality added, reality virtual, reality generalization found internet objects, print three next, etc. particle for direct object integration did until the witness facilitate circulation work people and trend improvement patients, we went.

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Available online 11/04/2024

2676-3311/BGSA Ltd.

1. Introduction

The hospitals of the future will be different from the hospitals of today. In the new healthcare field, cooperation between medical groups, hospitals, medical centers, and insurance experts in a virtual environment allows many patients to access remote medical services.

Create an organizational culture suitable for acceptance of change and conformity with conditions new and future conditions in the right becoming pure and create abilities managerial for diagnosis and definition issues organizational that movement to the future hospital begins has done is, presentation and execution the way solutions and evaluation results and creation abilities necessary for doing work a group in one hospital, create ability essential for program ritzy strategic, creating systems motivation needed for encouragement and incentive people to direction pursuit new goals in a hospital for a bright and proud future is one of the goals of change for the hospital in the future.

1.1. Factors affecting hospital design in the future

1.1.1. Changes in the care model

Patient-centered care is a concept that the joint commission has proposed for several years. This concept is considered an essential part of high-quality and safe care. In addition, family members and other relatives of the patient are also part of their healthcare partners. The following measures are recommended to achieve patient-centered care:

Adopt patient-centered care values as a priority to improve patient safety and patient and staff satisfaction;

Involving the principles of patient-centered care in the activities of hospital regulatory bodies and clarification measures;

Dealing with barriers to the participation of the patient and his family members, such as low health literacy and cultural and personnel preferences;

Eliminate disparities in quality of care for minorities, the poor, the elderly, and the mentally ill;

Improving the quality of care for chronic diseases through coordinated and multidisciplinary care;

Using process improvement tools to improve quality and safety (Torani, 2019).

1.2. Aging patient population

In years the last old age to title phenomenon a comprehensive in the world conversion done is, organization nations increase group 80 years old to up particle for the direct object before nose has done and that fast the most increase groups age in 50 years the future particle for direct object related with this group age estimate hit is this increase age population in the world consequences

several has that in topic services health consequences more will had, experts hygiene and treatment coverings caring in regions far away and even countries industrial particle for the direct object from major problems the future may they know.

Patients with more suitable conditions are cared for at home through diagnostic care and treatment by doctors and nurses. The research conducted by the researchers of this medical center showed that patients who are cared for at home instead of being admitted to the hospital receive timely care; compared to hospitalized patients, it, by the standards, resulted in fewer adverse side effects, lower cost and more satisfaction (Leff, burton, Mader, Naughton, Burl et al., 2005). In addition, older adults with chronic diseases can live independently at home with the help of innovative therapeutic and information technologies.

Virtual health networks that connect health care providers and support networks to global network health plans, personalized medical notes, daily health reports, and online prescription renewals or diagnostic test ordering are all emerging (Coye, 2006).

1.3. Financial constraints

In the future, it is predicted that medical services will have a reimbursement system that charges for all types of medical care. As healthcare reserves run out in the next few decades, it is necessary to restructure the reimbursement method completely.

With the increase of financial problems in many country hospitals, economic continuity is the first main area for study and investigation. Due to the growing gap between for-profit and non-profit hospitals, the projected increase in the elderly, poor, and vulnerable populations, as well as the decline in employer insurance and government-funded and uncompensated care, will increase. Gave

Guidelines for maintaining the continuity of the hospital economy are provided as follows:

Align performance and payment systems to meet quality and efficiency goals;

Using process improvement tools to increase efficiency and reduce costs;

Service coverage options to ensure patient access to health care services and increase their ability to pay (Torani, 2019).

1.4. Technology

Today, we do not know what new technology will be available. We are only confident that the latest technology will change the beneficial performance and treatment results. We can also be sure that the new technology will affect the treatment centers and their facilities.

It is necessary to improve quality and patient safety. Information technology supports continuity of care for social care and home care. This change in the form of a technology-based system will cause care providers and managers to re-evaluate the definition of the hospital (Mardami et al., 2012, 167).

With the expansion of the role of robotic technology in delivering essential supplies such as drugs and test samples, delivery of prescriptions, arresting patients at the bedside, transportation of bed sheets, garbage, and food for patients, the role of nurses is more preserved. As medical reports and records become increasingly computerized, caregivers working behind fixed desks are gradually becoming obsolete.

Wireless and portable information and communication technology will be the most critical technology in changing the shape of the nursing department of hospitalized patients. While 90% of healthcare is done via paper, fax, or phone, this change must evolve gradually. Designers should see how, along with the introduction of new technology, changes in the workplace and the habits of nurses in the patient department will be changed and designed over time. Some examples of the design characteristics of "future" medical centers that are flexible and adaptable are:

Appropriate and sufficient height of the floors

Planning to create a flexible space

Modular and multipurpose spaces

Leveled and bright rooms for patients

Rooms of one hand and one shape

Bathrooms and toilets for patients are located on the external walls

Coherent and coordinated infrastructure facilities

Combining similar spaces

Ability to install and operate (Mardami et al., 1392, 171).

2. Designing the hospital of the future

2.1. Industrialization in hospital construction

Design and made hospitals one of the most important buildings in general and a place for increased comfort and improved conditions for physical and psychological patients always from degree importance a lot possess is to that's it cause in made it performance and design hand in hand too they give and with employment principles and the methods of technically correct and advanced

design and make, cause improvement efficiency and quality hospital, increase life helpful and decrease expenses in time made and interest vector they will become.

The methods of advanced made, including kidney groups construction (architecture, structure, facilities electric and mechanical), become in industrial making and before made-to-do hospitals may power with design, made and control accurate kidney groups mention done hospitals with the best bag and the most efficiency particle for direct object make in decades of recent in most countries industrial and advanced world, industry hospital also making next to other buildings in flow industrial making building come in done is and with success whatever more to trend self-continue may give in years of recent this flow in many from countries Asian and domain the bay fars also results impressive and able a consideration had (Qurbani, 2014).

2.2. Smartening the hospital

Phenomenon new intelligence hospital in the truth a combination from design architecture customary and systems electronic and modern telecommunications is that with create one identity unique to the person and code for sick doctor, personnel and equipment inside hospital the possibility of communication and exchange information fast more, security more in treatment patients and comfort environmental desirable more particle for direct object for kidney users it is provided brought with attention to role essential factors such as speed, precision and assurance in network treatment and in consideration catch some injuries irreparable in system sanitary and therapy because of errors human, intelligence hospitals cause comfort and security most patients optimal to become consumption energy, communication better the patient and doctor, access fast to file the patient and information insurance e and medicine, control equipment and the devices existing and improvement and upgrade indicators health society may gared (Qurbani, Vafamahr, 2014).

Systems gradually emerged around 1990 in a standard form. The main reasons for this have been the increase in energy prices, population growth, and the urgent need to control energy consumption in buildings. Before the new century, most prominent companies used their own protocols for intelligent management of buildings due to the limited nature of the intelligentization projects at that time. After this period, the emergence of many protocols for use in intelligent buildings and the expansion of building smartness, in order to facilitate the development of this system, reduce costs, and increase efficiency in projects, it was decided to specify a series of

standards. Several standards were selected as the primary standards for creating an intelligent management of the building (Yar Mohammadi, 2014).

2.3. Smart materials

It is also possible in all three systems of structures, facades, and facilities; there are many cases of designing based on intelligent materials in hospitals, including better efficiency of patients, greater safety of patients and employees, increasing their satisfaction, better perception of the society, more savings and more usefulness (Georji, Haj Abutalebi), 1388).

Saving costs through optimal performance: one of the essentials of design based on smart materials is a long-term attitude to the economic issue; therefore, the life cycle cost of a building is as important as the initial investment. They design smart buildings for flexibility, long-term use, and high efficiency. Buildings designed to optimize functions and maintenance will ultimately cost less in the long run.

Improvement of treatment results and patient safety: by increasing the number of design strategies based on smart materials in medical environments, a valid platform of evidence to confirm the theory that building green buildings leads to better efficiency in-hospital treatment to formed patients with depression need hospitalization for an average of 16.9 days with access to sunlight; while depressed patients stay in the hospital for 19.5 days in dark rooms (Beauchemin & Hays, 1996) A similar study at a university hospital in Korea indicated a 41% reduction in the average length of stay of patients (gynecological diseases) who were in light rooms (Benya, 2007).

Increasing employee safety: in the design of medical centers based on smart materials, issues related to the safety of employees are very important. The first national survey on the exposure of religious workers to chemical substances, drugs, and radiation during work, and its relationship with serious problems such as cancer, asthma, unintended abortion, and congenital disabilities of children, and the duration and intensity of these encounters., done in the United States.

Increasing the well-being and satisfaction of employees and patients: many studies have shown that people in buildings with designs based on intelligent materials are more satisfied. These effects are related to better-quality indoor air, access to the natural environment, access to sunlight and scenery, and feeling better about the whole environment (Heerwagen, 2000).

Increased efficiency: the relationship of 1:10:200 between the investment in a medical building and the 30-year performance of that building means that for every dollar spent on construction, ten dollars are spent on building operations (cost energy and maintenance). Two hundred dollars will

be spent on staff salaries (the cost of medical staff) during the first 30 years. The central part of the cost related to the wages of the employees shows that investing in the performance and sustainable design of medical buildings has many long-term effectiveness and financial benefits (Hosseini et al., 2017).

2.4. Virtual hospital

The evolution of the virtual hospital is practically divided into four periods. The first period is from the sixties to the middle of the nineties when the virtual hospital was introduced with the approach of the digital medical library. The second period is from the second half of the 1990s to the beginning of the 21st century, when a virtual hospital providing remote medical consultation services is proposed worldwide. From the first decade of the 21st century, there is the third period in which the virtual hospital is called the virtual university of medicine. Finally, the fourth period, present since the beginning of the 21st century, is a virtual hospital with a three-dimensional environment approach based on reality. Virtual has been introduced (Abam, Abam, 2014). Patients and health care professionals will be able to interact with the patient using their quadrilaterals in the 3d environment of virtual reality. They will be able to interact with each other and deliver or inject prescribed drugs under ideal conditions through the "on-site care system". After that, the virtual hospital's ability to follow up and take care of the patient was possible. In unnecessary cases, it could replace the hospitalization of patients in real hospitals (Alizadeh et al., 2013).

The first virtual hospital was created in 1998 in Finland following the emergence of many problems in the healthcare system and the increasing number of older people in this country. In the aforementioned virtual hospital, it was possible to access the drug database, chat and interact online, and provide medical and care information (Mehrabi, 2017). After that, many predictions were made about the expansion of virtual hospitals, and different countries tried to make it possible for all people to use these hospitals widely (Alizadeh et al., 2013). It was even predicted that the launch of this system could reduce one-third to one-half of hospital admissions and hospital beds (Graschewet et al., 2007), but what can be used as a virtual hospital today is often in the form of the inclusion of medical-care information and familiarity with the physical space of the hospital is real.

Virtual hospitals can provide many basic goals for the healthcare system, which include:

Education of patients, the general public, staff and students

Reducing the stress of patients and families

Facilitating the process of patient admission and follow-up

Remote monitoring and control of the patient's vital systems

To provide the possibility of research and exchange information on the surface of global

Reduction of treatment-care and education costs and reduction of hospital infections (Abam, Abam, 2014).

2.5. Telemedicine

Video surveillance and the subsequent digital transmission of information, called "telemedicine" or telemedicine, enable remote diagnosis and care management of patients with acute and chronic diseases. This technology is increasingly being used to care for patients at home and in remote rural centers, and it provides the possibility of managing diagnosis and advanced care directly from the hospital to the patient.

Doctors and nurses' section the cares of special continuous item invasion warnings numerous devices established in the section are that cause tiredness and be a difference that ratio to this symptom may to be and as potential cause increase amount error will become. In like conditions, the trap A C Yu such as one pair the eye second caring action has done and role supervisory support in treatment particle for direct object performance may sometimes do importance existence the team experienced the trap A C Yu particle for a direct object with system control flight airport direction guidance and control flights aerial comparison may do the team caring Tele - I C Yu with the cooperation the team caring a hospital may can without that involved distraction possible in section high-density A C Yu to be in one place minutes and seconds a lot with importance are, with intervention in time suitable in presentation services with quality technological progress and political changes promise a future to all people that includes security and better results, powerful consumers, technology and information therapy, efficient performance and care (Talib Khoani, Asdin-Ejad, 2014) as well as reimbursement of care. Remotely increasing, this method is becoming more common day by day. Also, nowadays, many hospitals in the intensive care unit or the same ICU use the remote care system; they allow the caregiver to remotely monitor several sensitive patients in one or more departments. Such programs have shown positive and important changes in patient mortality, length of stay, and hospitalization expenses (Ceron, 2007, Mardami et al., 1392, 172).

2.6. Artificial Intelligence (AI)

AI refers to systems that can react similarly to intelligent human behaviors, such as understanding environmental conditions, modeling thinking processes, etc. Human reasoning skills and a successful answer to them can acquire knowledge and reason to solve problems. AI for expanding knowledge in medicine and the complexity of decision-making related to diagnosis and clinical management – to a phase of human life - the attention it has attracted experts to use decision support systems in medical affairs.For the same reason, the use of different types of intelligent systems in medicine is increasing, so the effect of various intelligent systems in medicine is being studied today. Has taken

In the broader healthcare landscape, AI is poised to act as a transformative force, harnessing the wealth of available data to bring about fundamental changes in medicine. Humans gain insights into diagnosis, treatment approaches, and care methods using AI and its learning algorithms. Here are concrete examples of the application of AI in medicine, which is helpful for both patients and healthcare professionals.

Disease diagnosis with AI

Rapid production of medicine with AI

Virtual nursing

The proper treatment for the individual

Strengthening genetic manipulation (Hassanpour, Makoyi, 2017)

AI has enormous potential, and its full use will require the joint efforts of experts in medicine, computer science, mathematics, and beyond. AI is poised to revolutionize medicine in various fields. Below are some of these areas.

Reducing medical errors

Humanizing healthcare

Diagnosis through imaging

Democratizing access to data

Convergence of the Internet of Medical Things

Combining AI and medicine (the same)

2.7. Internet Of Things (IOT)

The term IOT refers to the communication between mechanical and digital computing devices on the Internet platform without human intervention. Smart parts are embedded in these devices to connect with the central system and collect and send data from the surrounding environment.

Devices select basic data to perform a specific action to help them make decisions. For example, sound sensors collect data related to the change in sound level and send it to the data processing center to measure the environment's noise level.

The IOT aims to make communication and interaction between devices connected to the network more accessible by establishing a connection between sensors and devices with the Internet. On the other hand, users can view and control the equipment.

One of the most important applications of the IOT is in the field of health. The use of wearable gadgets or sensors attached to the patient allows the treatment staff to monitor the patient's condition in real-time and even remotely and take preventive measures if necessary. The research results show that applying IOT in the treatment field significantly reduces the number of fatal accidents. Due to constant monitoring, any signs of danger are detected quickly, and to maintain vital signs, it is even possible to inject medicine into the patient automatically through smart devices. The following section will mention some important applications of the IOT in this field.

Remote monitoring tool

Was done in person and by physically observing the patient's condition at different intervals. The entry of the IOT into the medical field caused a huge change in monitoring patients.

Connecting medical equipment to the Internet made it possible to check the patient's vital parameters such as heart rate, blood pressure, and body temperature easily and remotely; in other words, doctors can be with the patient virtually 24 hours a day. Of course, using the IOT in medicine is not limited to displaying the patient's condition. According to the patient's condition, doctors can consider a certain interval for his normal condition; in this way, if the vital parameters are out of the normal range, the system will automatically warn the doctor and the medical staff of the hospital.

Glucose level monitoring

Visiting in person to monitor the glucose level and record it manually, despite the fact that it takes a lot of time from the patients; it does not provide accurate information to doctors. Due to the fact that glucose monitoring in the traditional way shows the level of glucose at the time of monitoring;

for patients who have a lot of fluctuations in their glucose levels, it will not provide accurate statistics. In such a situation, using the IOT and connecting it to the devices connected to the patient's body can show the glucose level and its fluctuations to the doctor permanently and accurately.

Heart rate monitoring

Checking heart rate periodically does not protect patients from momentary and sudden fluctuations of the heart, while in permanent monitoring, heart patients are always under observation and care. The presence of the IOT in medicine and in the heart rate monitoring sector is very effective and vital. Heart rate measurement devices connected to the patient and connected to the Internet; his conditions are constantly reported; also, in case of sudden heart fluctuations and heart attacks, the patient's family members and doctor will be informed quickly.

Monitoring the health of hospitals

The IOT in medicine has also entered the field of public health monitoring. When the public cleaning equipment is connected to the Internet, they will announce health measures to the people who are present in the hospital environment and even warn them about the lack of hygiene.

Identification of depression and the onset of aggression

It is straightforward today to identify such cases using AI and the IOT. The IOT allows doctors to insert tools into the bodies of people prone to aggression or those that in era depression appointment have connected done and with attention to parameters najir beat heart, pressure blood and or even movements eye, amount depression and threshold aggression they particle for direct object item put an evaluation.

Parkinson's disease

Before the advent of the IOT in medicine, parkinson's patients had to stay in the hospital for a long time to check the symptoms of the disease; in addition to increasing the cost of treating such patients, this problem also caused them to lose their morale and sometimes depression. The IOT has made it possible for parkinson's patients to continue the treatment process without the need to be in the hospital and by living their daily lives. Sensors that can be attached to the patient can continuously collect data related to the disease and send it to doctors.

Helping asthma patients

Using this technology, whenever the affected person intends to leave the house, a warning to remove the spray is sent to his mobile phone. Also, the level of gas in the spray can be seen and the person is warned before it ends.

Monitoring of alzheimer's patients

Installing sensors on the clothes of these people makes monitoring very easy. Such sensors warn his family if a person leaves the specified area and also determine his exact location.

Robotic surgery

With the advancement of the IOT and its integration with AI, all objects can be connected, and perfect cooperation can be established. Also, AI helps medical devices update information and has a "self-developing" mechanism.

3. Final summary

With attention to this that hospitals today in space competitive and dynamic appointment have necessary is that for development hospitals significantly upgrades quality they, yourself to as grandfather in arena competition and challenge with other organizations in the global arena let's see obviously, in like that conditions the teams work hospital also for decision catches basically. It is vital to be agile and self-particle for direct objects with needs, demands, and changes that coordinate and match to represent, and those who play a role in the design of medical centers should consider these possibilities with a comprehensive view in the design process. At the same time, the implementation of the project should be used to provide ideal services. Since only one factor or force cannot exist and be effective, the designers of medical centers should prepare themselves for all possible possibilities and plans. Plans for successful and effective treatment centers will be flexible and adaptable to any potential change in the future.

It is necessary to improve quality and patient safety. Information technology supports continuity of care for social care and home care. This change to a technology-based system will cause care providers and administrators to re-evaluate the definition of a hospital. Today, how do we prepare ourselves to accept these inevitable doubts. It is significant for our success in the future. Healthcare centers of the future must adapt to the evolving technological changes without spending a lot of money to transform.

Today, AI has become a pervasive issue. It is used in many fields, including medicine, health, and psychiatry (use of VR technology in treatment, pharmaceuticals). It is used in medicine management) and dentistry (diagnosing complications and performing complex activities) and

even medical education. AI's growth continues, increasing the performance, efficiency, and improvement of medical methods, and will improve them day by day. AI helps tools to accurately identify the internal patterns of the body and various diseases, and it can perform surgery even better and more accurately than most experienced doctors worldwide.

Smart hospitals have many advantages, such as reducing costs, reducing hospitalization time, increasing public awareness, etc. In our country, due to the increasing trend of globalization, healthcare providers must provide the necessary infrastructure for a virtual hospital, including developing internet speed, increasing public awareness of the use of computers, training medical staff, and using the successful experience of other countries. Do

Although almost two decades have passed since the 21st century, we still use systems created in the last century. With time, we should try to plan for hospitals that cover patients' quality and safety needs in the future to provide safe and efficient environments for those working in the healthcare field. The development of hospitals should benefit everyone in the future.

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