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EDITORIAL

The editorial board of IJ-CIM are pleased to introduce the first issue of the second volume to 2022 year of the "International Journal of Computations, Information and Manufacturing" (IJCIM). The IJCIM is published by Global Academic Forum on Technology, Innovation and Management (GAF-TIM). The IJCIM aims to bring out the best of quality manuscripts from the field of technology, computation, and information. IJCIM's focus is on research that brings out the best of technological world that is not only theoretical but is realistically practical. IJCIM makes sure that the research published in it, is genuine and new in the market to provide the academics, businesses and concerned audience the right track towards their growth and development. IJCIM's mission is to deliver the advancement of technology, which is a never-ending road, to its readers.

The inaugural special issue1, volume1, of IJCIM includes six articles. In this issue, the The role of VR games to minimize the obesity of video gamers is discussed. The management and treatment of type-2 diabetes introduced. Improving home security using Blockchain also highlighted. The issue shed the light on the internet's role in undermining the credibility of the healthcare industry is discussed. As well as, studying human robot interaction and its characteristics. And finally, machine learning for intelligent energy consumption in smart homes.

This versatile range of articles being published in the first issue of 2022 is proof that IJCIM is aimed for high achievements. But the team of IJCIM is highly motivated to make sure that IJCIM achieves great results and reader and viewership within its first year. This can only be done, if the quality of articles is not being compromised at any cost.

IJCIM appreciates all the support that it is receiving from its members as well as from its readers.

Editors-in-Chief
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THE ROLE OF VR GAMES TO MINIMIZE THE OBESITY OF VIDEO GAMERS

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ABSTRACT

Video games have become something very famous all over the world, in the past, there were only a few gamers, and becoming a gamer was something very odd to do but these days the number of gamers is increasing as it reached 2.8 billion gamers in 2021. Games are a tool for entertainment where you can spend long hours without noticing and it canlead to addiction most of the time which leads us to the main problem caused by video games which is obesity. The main cause of obesity is eating too much food and moving too little and that is what will happen when you spend a lot of time on video games. And as we all know getting an obese body will not be the only problem because obesity also causes a lot of other diseases such as heart diseases, stroke, asthma, and more.

To solve this problem there are some recommended solutions to follow that can end this problem such as VR games which requires body movement, changing your lifestyle because a healthy lifestyle will prevent your body from diseases, educational programs that contain some physical activities for the kids in schools and finally mobile apps that motivate people to do physical activities in return of offering a prize or some amount of money.

Keywords: VR Games, Obesity, Video Gamers.

INTRODUCTION

In the past people used to play games that requires a lot of body movementunlike today's games, that's why obesity wasn't something normal to hear about.

We can't say that video games are the main reason for obesity, but we can assume that video games are one of the important reasons nowadays that lead obesity to increase, as we mentioned before that sitting for long hours without moving a muscle will cause obesity and the number of obese peopleis increasing as well as the number of gamers. In 2016 around 13% of people above 18 years old suffered from obesity and the number increased in 2020, it became 30% of people above 18 years old are suffering from obesity, and39 million children under the age of 5 were considered obese in 2020, the most three countries with obese people are Nauru, Cook Island, and Palau [1,2,3].

Table 1 top three countries with obese people

country	Percentage of Adults that are obese
Nauru	61.0%
Cook Island	55.9%
Palau	55.3%

A study found out that 4.03% of gamers are obese, and the number of gamers is increasing as well all over the world with no specific age as anyoneis becoming a gamer no matter how old they are, which lead us to the mainproblem which is gamers obesity [4,5].

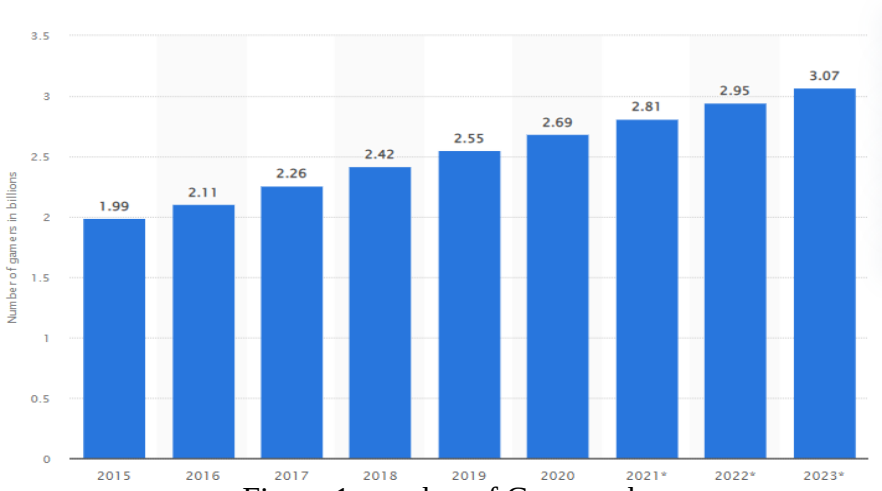

Figure 1: number of Gamers chart

so, we can notice that the number is increasing passing the time which is a major problem facing every person and we need to spread awareness aboutthe problem to everyone especially the kids because it's easy to teach themat a Younge age what's wrong and what's to do and why is this problem interesting? Because most gamers are lazy to do any physical activities, they will prefer sitting and playing for long hours rather than doing some exercisesand that's what makes them in danger of getting an obese body [6,7,8].

Finding solutions that are fun anduseful at the same time is very important to encourage people tofollow these solutions and every person will prefer a different solution that they find the easiest to do and there are many suggested solutions to fight the problem of gamers obesity [9].

Related work

Obesity is widely recognized as a serious public health problem and is of great interest in health sciences. In addition to proprietaryresearch using traditional scientificmethods, research in this area often discusses prevention, treatment, and quality of life for obese people through new methods such as SLR and ML. This section summarizes some relevant studies in preparation for comparison with current studies and outlines the current literature addressing obesity from different perspectives [10].

Simmonds et al.conducted a systematic review later combined with meta-analysis to examine whether BMI and similar measures used to calculate childhood obesity could also predict adult obesity. Their review supported the conclusion that teenage obesity is a notable public health crisis because it often continues into adulthood [11,12,13,14,15]. Accordingly, acting to reduce teen obesity can also reduce adult obesity. Early action is one of the most suitable approaches because once children have become overweight, this trend often persists through their adolescence and adulthood.

VR Games

The first solution is VR gaming, it's interesting to solve a problem but have fun at the same time, VR gaming or virtual reality gaming is all about realistic and immersive simulation of a three- dimensional environment. So, playing VR games will make you feel as if you are a real character in the actual game which will leadus to the solution of our problem "obesity".

VR games require a lot of body movement so why not replace them with normal video games asanybody of any age can play VR games, Exercising using VR is a trick to lose weight. VR can help people improve their physical and mental health. you do certain gestures and actions in VR that make your body sweat and your calories burn eventually leading toa decrease in your body's weight.

There are many games that youcan enjoy playing and benefit from it as an exercise for your body at the same time such as a game called Takken which is a fighting game where you will choose a character of a fighter tofight another character which I personally tried before and I find it interesting, I felt so energetic while playing it as If I was really at an arena, another game I found interesting is called just dance where you choose one of the songs and then you have to follow the dance steps shown on the screen and you can play it with another player in that way you will be more motivated and comparative.

Figure 2. VR Gaming

This technic was suggested in UAE university as they create a VR Game called EMEL whichrefers to Enjoy, Move, Educate and Lose weight, to play this gameyou have to wear VR glasses, special shoes, and a shirt toobserve heart rate and the game lasts for 45 min, so this technic was suggested to preventand educate children about obesity. This EMEL game is available nowin the Australian pavilion in Expo 2020. So, many countries are using VR games to fight obesity starting fromchildren such as Peru and UK because Video games are especially attractive to children. it'san interesting way to teach them that physical activity is important.

Educational programs in schools

Childhood obesity is a serious health threat, and schools are avital way to reach children and their families to reduce risks and promote health," said lead author Jeannette Ickovics. Schools play a critical role in fighting obesity so teaching children at a young age about how dangerous obesity is, will help to decrease the number ofobese people especially since most of the gamers are young people. Every person spends atleast 6 hours at school for 12 to 13years and this is enough for any person to be affected by somethingwhether it is good or bad.

therefore, offering health promotion activities in schools may equalize health disparities by providing access to a healthy environment for most people at a young age. In addition, health behaviors, including physical activity and nutrition, are related to academic achievement.

So, schools can make competition based on physical activities where students can play games that requires a lot of body movement like running marathon, any kind of ball games or bike races in return to give them a prize at the end of the competition, this way will encourage them to play physical games instead of playing online games.

Figure 3. Physical Activity program

Another thing that schools can do to fight obesity is that measure thestudent weight from time to time and offer a special diet for the student based on their health condition so if there were any students that suffer from obesity will benefit from the nutrition program by following the right dietand to motivate the student to reach the healthy weight, the school should offer a prize for the student who reached the healthy weight.

Change lifestyle

Your lifestyle is an important element that can affect your healthbased on if it is healthy or not.Gamers spend a lot of time playingvideo games so they will prefer to eat fast food because it needs less effort to get rather than cook something healthy and as we all know that fast food contains a lot offat which will cause obesity as it willcause a lot of other diseases. Following a healthy and balanced diet help prevent obesity if you areoverweight or otherwise at risk. What should you eat in a healthy diet?

Fruits and vegetables are very important to strengthen your health as well as to lose weight, did you know that different fruit andvegetable colors contain different types of vitamins? For example, the red color ones like strawberries and red beans are packed with vitamin C and vitamin A, Yellow andorange fruits, and vegetables, suchas carrots, peaches, are also loaded with vitamin C, vitamin A, and potassium. They can also boost the immune system and enhance vision so replacing a bowlof chips or cookies with a bowl full of colorful fruits and vegetables is a recommended tip to do in your healthy diet. You should drink plenty of water every day to keep your body hydrated is very necessary as it prevents your body from diseases,will help you to refresh your mind, itwill brighten your skin and it makesyou feel full so you will not need toeat more food so try to put a reminder to drink 8 glasses of waterevery day [44,45,46,47]. Every game has a warning for the player about how can the gameaffect their health if they continuedplaying without stopping so try to set a reminder from time to time for you to stop playing and try to stretch your muscles as well as tryto walk around the house, that waywill not be enough to cover the exercising time but it will at least make your muscles a bit relaxed and it will reduce the chance ofoverweight your body. There is calories limit each day andit is different based on your age

Table 2. Total calories from fat each day

Age	Percentage total calories each day from fat
Kids and teens	25% to 35%
Toddlers from 1 to 3 years	30% to 40%
Healthy adult	20% to 35%

Low-fat food also is very importantin your diet so you should avoid food that contains a lot of fat such as fast food especially fried ones, red meat, and processed meat, and sugary food such as cookiesand chocolate [47,48,49].

Mobile Applications

Technology has become a very essential part of our life, and mobile is a part of technology thatwe use in our daily life, no one nowadays can stay a minute eventhe kids are using mobile these days so why not find a solution to fight obesity through using mobile? Many apps encourage people and even kids to fight obesity [50,51,52,53,54].

Exercising is very good for your physical and mental health, it can protect your body from getting diseases and the most important thing it keeps your body fit which is the main thing in exercising anditt helps you to avoid getting depressed as it can refresh your mind, you know how hard to motivate someone to do exercises so many apps can solve this problem such as sweatcoin, Sweatcoin pays you with cryptocurrency for walking. The basic app is free, but there is a limited step daily [41,42,55,56,57,58]. Every 2,000 steps, it converts into their currency, which may be used for various rewards. One disadvantage of this app is that it requires you to walk outsidebecause it uses GPS. It doesn't connect to any fitness trackers and instead relies on your phone's GPS and accelerometer. It also uses an algorithm to ensure that you are walking rather than driving, thus a speed limit will be enforced. Gift cards are among the featured rewards, but supply islimited. They highlight the opportunity to exchange 20,000 Sweatcoins for $1,000 in cash [18,19,37,38,39,40]. And from the user's view, manypeople benefit from the app and get motivated to do exercises more often. In 2019, there were 68.7 million smartphone owners in the United States who used at least one health or fitness app at last once per month. Number of health andfitness app users in the United States from 2018 to 2022 (in millions).

Table 3. App fitness users [33,34,35,36,59,60,61,62,63].

year	Number of fitness app users
2018	62.7
2019	68.7
2020	87.4
2021	84
2022	86.3

There [29,30,31,32] are many other mobile apps that you can use to strengthen your ability to follow a healthy diet such as Water Drink Reminder that am currently using, it send you notifications to remind you to drink water, you have to enter your sleeping time and your weight so it can measure the amount of water your body needs based on your weight and to set the reminder timing based on your sleeping hours. So, as we use our mobile every day, we can benefit from it by downloading useful apps rather than spending time playing gameson the phone [17,20,21,22,23].

METHODOLOGY

Obesity is a major problem that we are facing these days because the number of people who are obese is huge, why is the specification ofgamers obese? Because games have spread like a virus all over the world and we all know that games are so attractive so playing for hours will make you lazier, passing the time all of this will cause obesity so to connect gamers with obesity when the number of gamers increases so will the obese people [65,66,67]. I looked up at the number of people who are suffering from obesity passing the years as well as the number of gamers, so I used some graphs to understand the problem better and to comparehow the numbers are increasing every year.

I tried to find easy and interesting solutions for this problem so I have read many articles about the problem to analyze how serious is the problem first then I search for the possible solutions that can suit people of all ages because the problem targets everyone from kids to elderly [68,69,70,71,72,73,74].

I found the solutions based on people experiences and what I mean by experiment is people thattried the solution and it worked so all the solutions that I mentioned are actually being used starting bythe first solution the VR games which I found it the most interesting solution for people at all ages especially that the problem am discussing is about gamers and what motivated me tolook up more for this solution is that it's being used in the UAE in Expo 2020 and the idea

was recommended by the UAE university students [16,21,25,26,27,28], the second solution is also used in many schools and I personally experienced that in my school where they gave rewards for the students who won in competitionsthat requires physical movement and also for the student who followed the doctor instructions about their diet, third solution which is the easiest and the most common solution, as we all know eating healthy will for sure keep your body in shape and will protectyou from getting ill, last solution is the mobile apps I found it very useful and I have read people's review about it if they benefited from it. So, all the pieces of information that I have gathered were based on articles I have readand on people's experiences.

CONCLUSION

as our world is developing each day and as we rely on technology more and more, laziness will also be a part of our life and people willprefer to find ways to have fun rather than work because we will prefer to use the easy way to get done with our work to save time for having fun later and that's the big issue we are suffering from right now and if we didn't commit to the solution it will get bigger and it will be harder to get rid of it.

Obesity has been always aproblem facing us and it still tillthese days and if we got back to the main reason, we would find thateating too much and moving too little is what cause obesity, that's why gamers are in danger of getting obese as I mentioned before that playing games will make you lose track of time by just sitting and even some peoplecontinue playing while eating.

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MANAGEMENT AND TREATMENT OF TYPE-2 DIABETES

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ABSTRACT.

Diabetes is a diseas caused by insufficient insulin production by the pancreas. Diabetic people aged 18 and older accounted for 8.5% of the total adult population in 2014. From 2000 to 2010, the early death rate from diabetes was reduced in high-income nations, but then grew again from 2010 to 2016. Premature mortality from diabetes rose in low- and middle-income nations across both time periods. Noncommunicable illnesses (cardiovascular diseases, cancer, chronic respiratory diseases, and diabetes) between the ages of 30 and 70 have declined by 18 percent worldwide since 2020. Cardiovascular events are markedly increased in people with diabetes. Diabetes treatment must be based on a thorough understanding of the disease's pathophysiology. To treat type 1 diabetics, insulin is necessary since insulin production is impaired. When insulin secretion and action are both impaired in people with type 2 diabetes, treatment becomes more difficult. As a result, the patient's stage of the disease and personal characteristics will influence the type of treatment he or she receives. Type 2 diabetes management and treatment objectives are discussed in this research.

Keywords: Type-2 Diabetes, UN organizations, Descriptive statistics.

INTRODUCTION.

When it comes to healthcare expenses, diabetes mellitus is a chronic condition that has a three to four-fold increase in cardiovascular morbidity and death. When it comes to diabetic people, ischemic heart disease is the leading cause of mortality. 1,2 Type 2 diabetes is the most common and, as a result, the one most likely to result in cardiovascular morbidity and death, which is why this article focuses on its treatment [1].

Diabetic therapy must be founded on a thorough knowledge of the disease's underlying mechanisms. Because of this, the only therapy for type 1 diabetes mellitus is the injection of insulin or insulin analogues. Insulin resistance predominates in the early stages of type 2 diabetes mellitus; nevertheless, this illness is much more complicated [2,3,4,5]. While insulin sensitivity remains,

the shortfall in insulin secretion becomes increasingly apparent in later phases. Consequently, the treatment strategy will be determined by the illness stage and the features of the patient.

In a single document, the WHO module on diagnosis and treatment of type 2 diabetes provides information on diagnosis, categorization, and management of the disease. Those who plan diabetes care service delivery [7], who educate and supervise service providers, and who work in facilities and primary care settings would all benefit from this module, which is aimed for policymakers, programmed managers, and clinicians.

It was announced in April 2021 that WHO will begin the Global Diabetes Compact, an international project that aims to help countries in low- and moderate-income levels make significant advancements in their diabetes prevention and treatment programmers. International donors and people with diabetes come together in the Compact to work on a shared vision of reducing the risk of diabetes and ensuring that everyone who is diagnosed has equitable, comprehensive, affordable, and high-quality treatment and care. The Compact also brings together national governments, [8] UN organizations and nongovernmental organizations. There will be a resolution on diabetes prevention and management passed by the World Health Assembly in May 2021. Access to insulin and other diabetes medicines and health products should be improved, regulatory requirements for these products should be harmonized to ensure they are all treated the same, and a web-based tool to share market transparency information should be evaluated for its feasibility and potential value [9,10,11].

Problem Definition.

Acute decompensation is avoided, late disease consequences are delayed or avoided, mortality is decreased, and a high standard of living is maintained as a general objective of diabetes management. Controlling blood sugar levels may help prevent microvascular complications (retinopathy, kidney disease, and neuropathy), but it doesn't seem to be as important in the prevention of macrovascular complications (e.g., cardiovascular disease) (ischemic heart disease, cerebrovascular disease, peripheral arteriopathy) [12,13,14]. 4 When treating these individuals' risk factors, the management of hyperglycemia should be seen as a component of a comprehensive strategy (arterial hypertension [AHT], dyslipidemia, smoking). In other words, a strategy for controlling blood sugar that ignores other cardiovascular risk factors is irrational. Even if all of the diabetic patient's objectives aren't met, it's in their best interest to focus on reducing cardiovascular risk factors as a whole. Table 1 lists the goals of therapy [15,16,17]. 5-7 It is ideal to use HbA1c as a measure of diabetes management since it offers information on the past two to three months of glycemic control and should stay below 7%. Even in elderly or terminally ill patients, it is not required to achieve this therapeutic aim due to the danger of severe hypoglycemia. A diabetic patient's risk of developing ischemic heart disease is comparable to a nondiabetic patient who already has ischemic heart disease, thus the target values for the lipid profile and blood pressure should be based on these considerations. 8 Patients with known coronary artery disease, such as those with diabetes, should have stricter target values than diabetics do.

Research Objectives.

Descriptive statistics (frequency, mean, and standard deviation) were used to characterize patient socio-demographic variables, and the Chi-square test was employed to analyses the association between predictors and knowledge and practice levels while collecting data. In order to have a clearer picture of the relationship between various aspects of knowledge and practice, we need to merge these two elements [18]. The multi-variate models comprised variables with a P-value of less than 0.1. It was decided that a P-value of less than 0.05 was the threshold for statistical significance. SPSS version 18 was used for all analyses.

1.3 million individuals died because of diabetes in the United States in 2010. (2.4 percent of all death). The Eastern Mediterranean Region's diabetes prevalence varies from nation to country (EMR) [19,20].

- Neuropathy puts 20 percent of diabetics at risk for developing foot ulcers.
- With a frequency of 0–4 percent, diabetic foot ulcers (DFUs) are one of the most prominent diabetes complications.
- Diabetic foot issues and, finally, amputation may be prevented with adequate knowledge and practice of DFU.

Solution Suggested.

It has been shown that certain demographic factors of individuals with diabetes have a substantial association with knowledge and practice scores when it comes to the prevention and management of DFUs. As a consequence, a specific educational campaign to enhance diabetes understanding is necessary. Diabetic patients' attitudes toward foot care are connected to a decreased probability of acquiring ulcers. Regular shoe inspections, shoe selection, nail clipping, and daily foot management are just a few of the foot care behaviors that should be performed [21,22]. Furthermore, although education is vital for proper foot care, a lack of understanding might contribute to diabetic foot ulcers. Over the past two decades, researchers have focused on diabetes patients' foot care knowledge, attitudes, and behaviors in order to identify obstacles to receiving medical treatment, enhance self-care, and make lifestyle changes.

METHODOLOGY.

The feet are the most sensitive organs to injury, trauma, and infection in both healthy and diabetic persons. There's a link between a higher risk of developing peripheral vascular disease, dryness, and cracks on the feet due to a lack of sweating, as well as less protective feeling in the feet. The risk of foot damage and ulceration increases in diabetic patients if they do not obtain adequate foot care training. Foot care should include everything from cleaning to creaming to nail care to shoe management. When it comes to other behaviors, there is no discernible difference between those who are well-educated and those who are not. These findings could be explained

by the limited substance of the education program offered to patients who had previously been educated [23,24].

Planning Claims

Knowledge and application have a clear and undeniable link. Predictors of practice score included levels of knowledge, location, marital status, and previous hospitalizations owing to diabetic foot problems. Studies have indicated that having a better degree of information and a favorable attitude toward diabetic foot care improves diabetic foot care practice. As a result of these results, the goal of this research is to assess patients' knowledge and attitudes about foot care among those with diabetic foot ulcers and to contribute to the literature.

Principles General to Treatment

In the management of diabetes, a healthy diet and regular exercise are essential. To meet the treatment's overall goals, diet suggestions must be tailored to each patient's specific needs. Type 2 diabetics are prone to obesity, thus losing weight should be a primary goal for them. Each person's caloric intake should be tailored to his or her specific BMI and level of regular exercise. Proteins should make up 10% to 20% of calories consumed, while fats should make up less than 30% of calories consumed, with less than 10% of those calories coming from saturated fats. However, fast-absorbing carbs should be avoided, the focus should be on overall consumption rather than source when it comes to carbohydrates.

Other than helping diabetic people manage their condition, regular physical activity may help prevent the disease from developing in the first place.

It is very useful for individuals with type 2 diabetes to engage in 30 minutes of moderate intensity exercise each day, which decreases glycemia, improves cholesterol, lowers blood pressure, and aids in weight reduction (decreased heart rate at rest, increased systolic volume, and decreased cardiac work). The patient feels better and has a higher quality of life because of it. Hypoglycemia, which may develop hours after exercise and need alterations to the treatment regimen, is the primary drawback for diabetics. Hyperglycemic decompensation or even ketosis may occur in people with type 1 diabetes and poor metabolic control, particularly after anaerobic activity. Table 2 outlines the various dangers of physical activity, which include disrupting glucose metabolism. As a result, each patient's exercise regimen must be tailored to their physical capabilities and possible hazards.

Diabetic education provided by skilled healthcare professionals is critical to reaching treatment goals. Patients may learn more about their glycemic control by self-testing their capillary blood glucose, for example, which can assist them recognize hypoglycemia that might otherwise go unnoticed. For this reason, self-assessments are essential for making timely adjustments to treatment. A patient who has been taught how to use capillary blood glucose readings to adjust therapy and has been given guidance about dealing with different conditions like hypoglycemia or

hyperglycemic-kenotic decompensation would need fewer hospital admissions and have a higher quality of life.

DIABETES MELLITUS TYPE 2 TREATMENT.

Principles and methods of therapy in general

To manage type 2 diabetes, patients must follow a low-calorie diet and engage in regular physical activity on a regular basis. The use of pharmaceutical therapy must begin when appropriate metabolic control is not established, either because the patient does not adjust to changes in their lifestyle or because, despite adhering to the diet and exercising frequently, therapeutic goals are not accomplished, Type 2 diabetes treatment is shown graphically.

The planned treatment plan for type 2 diabetes. Repaglinide and Nate glinide are two of the fastest acting secretagogues. There are currently no TZDs that can be used as a single treatment for type 2 diabetes. It is based on the patient's specific needs. For example, if the patient is already on sulfonylureas (SU) and has a history of hyperglycemia, metformin might be added. A secretagogue or alpha-glycosidase inhibitor should be administered if inadequate control is achieved by postprandial hyperglycemic peaks after therapy with MET. Insulin therapy should begin with a single nocturnal dosage, according to current recommendations.

The use of medication

Sulfonylureas

Sus was originally commercialized in the mid-1950s, when the first sulfonylureas were created (carbetamide and tolbutamide). Tolbutamide, acetohexamide, tolazamide, and chlorpropamide were the first-generation Sus when they hit the market in the mid-1960s. Second-generation Sus were launched around the end of the 1960s (glipalamide, glipizide, gliquidone, and gliclazide). There were findings published in 1970 that suggested that tolbutamide, which was used to treat diabetes, was inefficient and increased cardiovascular mortality. This research had a significant influence not just in the United States, but also in other European nations, leading to a significant decline in the use of Sus. Despite this, the American Diabetes Society voted to lift limits on SU usage in 1979 and they have been available in the US since 1984.17 Another SU that has just been launched is glimepiride [48,49,50].

Action-reaction mechanism [44,45,46,47]. To put it another way, the Sus induce the release of produced insulin from pancreatic beta cells. 19 In order for the Sus to function, there must be a sufficient number of beta cells with insulin-secretory capability. As a result, Sus won't work for people with pancreatectomized or type 1 diabetes. Sus work by interacting with pancreatic beta cells, which have receptors with high affinity for their ligands. 20 Binding to these receptors blocks ATP-sensitive potassium channels from opening and prevents potassium outflow across the cell membrane, causing the cell membrane to depolarize. When the calcium channels open,

intracellular calcium levels rise and calmodulin binds to calcium, causing micro filament contraction and the exocytosis of insulin granules (Figure 2) [25,26,27,28].

Other cardio protective mechanisms [41,42,43] found in the heart and throughout the circulatory system include SU receptors and ATP-sensitive potassium channels. Sus may cause ischemia by blocking these channels. Despite this, the UKDPS trial showed that this potential adverse impact does not seem to be clinically meaningful, even when large dosages of Sus are provided abruptly [52,53,54,56,57,58].

DISCUSSION

Pharmacology in the clinic. Aside from potency, each SU has unique pharmacological qualities like as duration of action, metabolism, side effects, and more. Summarize some of the Sus most important pharmacological properties. More powerful and less poisonous are the second-generation Sus, which are more potent and less toxic than their predecessors. In the gastrointestinal system, all of the Sus are promptly absorbed and reach their peak plasma levels within two to four hours. Other medications may dislodge them from albumin, where they mostly adhere. The liver is responsible for the majority of metabolism, and the waste products that result from it are excreted in the urine and, to a lesser degree, the bile. For patients with mild to severe renal failure (creatinine levels less than or equal to 2 mg/dL) [32], Gliquidone may be an option [29,30,31].

Effects that aren't ideal. They're typically well-received by the public. The most common side effect is hypoglycemia, which is directly tied to the effectiveness and duration of the drug's action. 24 In contrast to tolbutamide [33,34,35,36,37,38], it occurs more often with chlorpropamide or glipalamide. Sufferers with SU are less likely to have hypoglycemia, but it might last longer and need IV glucose infusion therapy for many days. SU-induced hypoglycemia might be exacerbated by kidney or liver disease. Sus effects may be amplified by reducing drug consumption and use (e.g., aspirin, MAO inhibitors, pyrazolines, fibrates). All these variables are often present in diabetics who have reached an advanced [39,40] stage of their disease. Hypoglycemia symptoms may also be missing in some people, and they may instead be indicated by mental or neurological problems. Reversible side effects are rare (less than 5%) and readily tolerated.25 There are four tables in this section [59,60,61,62,63].

Precautions, indications, and medication selection

So is regarded first-line treatments for type 2 diabetes mellitus in patients who are not overweight and whose therapeutic goals cannot be met with a tailored diet and activity regimen [64,65,66,67]. Because the second-generation Sus are the most regularly used, the physician should prescribe the preparation she is most familiar with, as there is no evident superiority to the others. The decreased risk of life-threatening hypoglycemia with tolbutamide and glimepiride has led to their recommendation for the elderly population in general. In order to prevent hypoglycemia, treatment should begin with a modest dosage (usually half a tablet) and be

increased monthly until excellent metabolic control has been obtained or the suggested maximum dose has been reached, whichever comes first. Reducing dosages may be an option if a satisfactory response is achieved. Diet alone may be enough to keep symptoms under control if a lesser dosage is used. If the highest dosage of SU fails to produce satisfactory glycemic control, metformin may be taken in combination with SU, or the patient can be converted to insulin [32,33,34,35,36].

Because Sus is only effective if the patient has some insulin-secreting capability, they should not be used in individuals with type 1 diabetes or pancreas-deficient diabetes (e.g., after pancreatitis or pancreatectomy). Because they may penetrate the placental barrier and are secreted in mother's milk, they cannot be recommended during pregnancy and nursing. Under stressful conditions, it's not suggested to use Sus because they won't be able to provide enough insulin to keep the patient alive [65,66,67,68,69]. As a result, in critical cases like an AMI, a severe trauma, or a potentially life-threatening infection, it is better to begin insulin therapy first and then reevaluate SU treatment after the stress has passed. Because of the stress and the requirement for fasting, they should not be employed in the event of severe surgical operations. Because of this, insulin therapy and intravenous glucose infusion should be implemented in individuals with diabetes [70,71,73,74,75].

CONCLUSION

Rising focus has been paid to Preventing or delaying the onset of later-stage disease complications, lowering mortality, and preserving a high standard of living are the primary aims of diabetes management. Controlling blood sugar levels may help prevent microvascular complications (retinopathy, kidney disease, and neuropathy), but it doesn't seem to be as important in the prevention of macrovascular complications (e.g., cardiovascular disease) (ischemic heart disease, cerebrovascular disease, peripheral arteriopathy) [76,77,78]. As a result, treating hyperglycemia as part of a comprehensive strategy to address all of the patient's risk factors should be considered (arterial hypertension [AHT], dyslipidemia, smoking). An approach that prioritizes glucose management at the expense of other potential dangers to cardiovascular health is, therefore, counterproductive. Even if all of the diabetic patient's objectives aren't met, it's in their best interest to focus on reducing cardiovascular risk factors as a whole. Table provides a summary of the treatment goals [79,80,81,82]. 5-7 The greatest indicator of diabetes management is HbA1c (glycosylated hemoglobin), which measures how well blood glucose levels have been controlled over the previous two to three months and should be less than 7 percent. However, in elderly patients or those with a short life expectancy, this treatment aim is not essential since it has a significant risk of producing severe hypoglycemia. Remember that ischemic heart disease is the leading cause of death in diabetics1,2 and that diabetics' cardiovascular risk is comparable to that of nondiabetic patients who already have ischemic heart disease when setting goals for lipids and blood pressure. 8 As a result, diabetic individuals should be subjected to the same stringent standards as those with coronary artery disease.

Future work

Diabetes is a complex difficult metabolic disorder characterized by high blood glucose levels caused by insulin resistance, insufficient insulin production, or a combination of the two. Hyperglycemia is the most prevalent clinical sign of diabetes. Insulin deficiency and/or insulin resistance, on the other hand, are associated to alterations in lipid and protein metabolism, as well as mineral and electrolyte abnormalities. Treatment should begin with modest dosages of intermediate action insulin (0.3-0.5 U/kg/day) delivered in one or two injections each day. Depending on the patient's glycemic profile, the insulin dosage is either raised or adjusted. Type 1 diabetics should begin with a schedule of 3-4 insulin injections per day that includes both rapid and intermediate-acting insulin. In patients who are either unaware of their diabetes or who have poor glycemic control due to a variety of factors (e.g., AMI, surgery, infections, corticoid treatment), a good therapeutic strategy is to administer subcutaneous insulin in relation to blood glucose readings obtained every six hours, along with a meal containing 50 g of carbohydrates.

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IMPROVING HOME SECURITY USING BLOCKCHAIN

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ABSTRACT

The major problem with the use of smart home technology is that it often leads to various security issues. This mainly happens because the devices use open internet connections that may be vulnerable and subjected to multiple threats, hackers, and viruses. Some household IoT devices are forcefully introduced to the market, exposing the customers to significant risk factors. The websites and links do not have any copyright information or any privacy policies, due to which the hackers may immediately steal the confidential information of the user. For instance, the door locking password may be hacked by cyber criminals, and they may use it to attack the home when there is nobody in the home. This paper presents how to use block-chain to improve home security.

Keywords: Home Security, Blockchain, Internet of Things.

INTRODUCTION

The entire population is now getting revolutionized into tech-savvy functions and activities in today's digital world. With the advancement of technological devices in every tiny aspect of life, people are growing more innovative and more intelligent day-by-day in performing their regular essential activities. In recent years, innovative home technology has become one of the most useful and advancing trends. Reports confirm that around 37.5% of the world's population has already adopted smart home technologies in performing their domestic activities such as operating the television, door locking, heating, and lighting [1]. The technology is controlled by the Internet of Things (IoT), through which any device in a smart home can be connected to a single controller. The controller would control multiple things simultaneously, one of the most significant advantages of smart home technology. This is essentially important for regular busy professionals, who cannot manage enough time for household activities [2]. The user gets controlled over everything, from wifi and TV to electricity, equipment handling, etc. When the house and devices are connected to a single network, it becomes easier for people to perform the essential activities and enjoy a happy life. The users need to install a smart home app on their mobile devices, which will help them operate the smart home equipment (Oliveira et al. 2020). As a result, the user will get efficient energy consumption, improved security of the devices, convenience, and comfort. Smart home technology is also known as domotics or home automation, derived from the Latin word 'Domus' meaning home. The equipment and systems of innovative home technology are linked

to IoT, which helps the users constantly communicate with the devices, exchange automated activities, and consumer use data as per their own decisions [1]. However, the technology has one major drawback connecting the devices with the internet, leading to significant security issues and problems for the owner. This report will discuss the impact of using blockchain technology in reducing hacking in smart homes to resolve security issues related to the use of smart devices.

Problem definition

It has been reported that nearly 35% of smart house owners have encountered major security concerns occurring due to information breaching [4,5,6]. More than 40% of smart house devices are prone to cyber-attacks, and around 65% of savvy home users do not have sufficient innovative support systems to protect their privacy and security. In the absence of adequate protection, it is not only the (IoT) data subjected to a significant compromise by the hacker ([2]. The criminals can also easily access the user's social media accounts, bank accounts, emails, and other essential and confidential information. Smart home devices are also related to various technical issues that may cause these security issues to arise. For instance, if the user faces significant connection problems, from their smartphones to domestic devices, they will most likely be no longer able to control the smart home device any further [9,12,13,14]. As a result, the device may again be highly exposed to huge threats and cyber-attack risks. Even if users realize that their data is getting stolen, they cannot do anything about it, as they do not have any control over the device due to technical errors.

Proposed solution

One of the best ideas to solve the security and hacking issues of smart home devices is blockchain technology. Current research has shown that blockchain devices are the most reliable and robust security mechanisms that can be used for various purposes; one of them is meeting security issues [6,7]. With the increased use of smart home devices globally, blockchain devices are also gaining significant importance in the market. The solution works by effectively securing the critical information on a particular blockchain device that can also be widely implemented on a range of information platforms if required [3]. This is more essential when it comes to using multiple smart home devices at the same time. The blockchain technology (if installed by the owner) will simultaneously help protect the essential data of all the smart home devices that are currently connected to the IoT and are used by the owner). The tools detect the blockchain ecosystem, analyze the risk factors and threats to apps, data, and various other digital assets that are connected. The blockchain technology system decentralizes the management systems of the connected devices (that is, the Domain Name System or DNS entries) [7]. This helps reduce the associated assaults of the Distributed Denial of Services (DDoS). Apart from this, blockchain devices also help protect the information to be accessed by unauthorized third parties during its transition or encryption. It helps store the data over a network of computers, making the hacking process much more complex and time-consuming [9] With the installation of blockchain technology, hacking is only possible when the entire network is compromised instead of a single server. The hacker needs to connect every stem simultaneously to affect the whole networking system. Despite having the most experienced hacker in the team, this is nearly impossible.

Related work

Past works	Authors	Methods used
IoT-based smart homes: A review of system architecture, software, communications, privacy, and security	Mocrii *et al.* [11]	To mitigate the security issues faced in smart homes, the method used in IoT is to gather information regarding system architecture, communications, software, security, and privacy.
Blockchain for smart homes: Review of current trends and research challenges	● Moniruzzaman *et al.* [10]	This article has used a P2P energy trading platform that is blockchain-based. This was implemented in the laboratory by the authors.
Investigating Smart Home Security: Is Blockchain the Answer?	● Arif *et al[9]*	To operate the safety in the smart home, the homeowners are given access to wireless connectivity Sensors of the home appliances, which can be gained from sensors.
Multiple cloud storage mechanisms based on blockchain in smart homes	Ren *et al.* [8]	To improve the efficiency of the signature verification, this article focuses on an identity-based proxy aggregate signature.

There are several problems that Trivodaliev and Risteska-Stojkoska have identified in IoT smart homes. The authors state that it is integral to optimise communication in the area of edge computing among the SH devices. Among the devices, they state that lightweight algorithms can be developed for local data processing and a reduction in the number of transmissions among the devices. The storage and integration of the data collected from the devices must be transferred into big data approaches. Smart homes are no longer considered to be the domain of science fiction.

Moniruzzaman *et al.* [10] stated that for smart home applications, the opening of new avenues is the potential of blockchain technology. However, before adopting blockchain technology to main security in smart homes, further investigation of the mainstream is very necessary. The advancement made in communication and information technologies triggers a

transition under the ecosystem of IoT smart homes. Ensuring security and privacy is a serious issue faced by smart home applications. Due to this, blockchain technology could be the best solution for these issues.

However, Arif *et al.* [6,60,61] stated that a decentralised database had been introduced with cryptographic techniques known as the blockchain to ensure security within the IoT smart homes. The blockchain framework is considered the substitute for centralised models under the IoT systems. However, these species contain few concerns that can meet smart home security.

Various issues are faced by smart homes to maintain security. However, to improve the efficiency of the signature verification [62,63,64,65,66,67], Ren *et al.* focus on an identity-based proxy aggregate signature along with reduction of communication bandwidth and compression of storage space. From the research that has been conducted in this research, it has been evaluated that compared to that of the ordinary signature scheme, the communication cost of identity-based proxy aggregate signature is 12% to 39%. However, the storage performance is superior since the performance is better than 20% of the blockchain itself in identity-based proxy aggregate signature [52,53,54,55,56,57,58].

METHODOLOGY

Various methods are used in this research to gather the necessary information. These are as follows: -

Research philosophy

With the help of which data is collected within the research, the belief is termed as research philosophy. There are three types of research philosophies: positivism, interpretivism, and realism. In this research, the researcher has used the interpretivism philosophy. The researcher in this research has collected secondary data. The data collected by him were interpreted and jotted down to the audience ([7,8,9,49,50,51]. Under the interpretivism, there is a specific role of the researcher which includes observing the social world before deriving any conclusions [22,23,24].

Research approach

The plan with the help of which the entire data for the research is collected and analysed is known as the research approach. There are two types of research approaches. These are indicative approaches and deductive approaches. The researcher has used the deductive approach [13] This means that no new theory was induced by him and can be derived from existing researchers. Under the deductive method, information is deduced from past research [45,46,47].

Research design

The framework with the help of which the entire data for the research is collected and analysed is known as research design. There are five types of research design. These are

explanatory, exploratory, diagnostic, descriptive and correlational. In this research, the researcher has used the explanatory research design. With the limited information gained by the researchers, the main reason for the occurrence of issues in smart homes has been identified [14]. This method is also known as the cause and effect method, where the researcher has evaluated the causes of issues in smart homes along with the outcomes received. However, according to a few researchers, this design is also used to identify the loopholes of the research within this given topic [25,26,27].

Data collection technique

Data collection techniques are the procedure with the help of which the data for the specific research is collected. There are two methods of data collection. These are the primary method and secondary method [47,47,48,49]. The primary method is divided into two parts: the qualitative and quantitative methods [15,68,69]. In this research, the researcher has used the secondary method. This means that the researcher used the data from the existing research. No new theories have been derived.

Ethics

To conduct research, various ethics have to be maintained. In secondary research, the researcher ensures that he gathers existing data. However, he must ensure that these data are not modified and changed. The exact findings have to be stated in the research. Under the Data Protection Act 1998, keeping the data safe and secure is necessary. No data can be disclosed before the publication of the research [31,32,33]. The privacy of the data is in the hands of the researcher. The researcher also has to ensure social responsibility. This means that no data can be published in a manner that can harm society or a specific group of people [39,40,41,42,43].

CONCLUSIONS

IoT products and the use of smart home appliances has become common in the last decade, however there is not much discussion on the security of those devices [34,35,36]. Therefore, the emergence of Blockchain technology has become one of the most reliable security measures for smart homes. The blockchain technology provides a simple and straightforward solution for any IoT related devices, it allows the homeowners to securely control every security aspect of smart homes [10]. Controlling a simple function such as turning a switch on or off and controlling complicated hardwares such as door locks, house lighting, smart locks etc. can be done securely using the blockchain technology[37,38].

The research focuses on the emerging threats of using IoT devices in smart homes, the IoT devices in the market are not perfect and could be compromised easily by hackers. Due to the security flaw in the IoT devices, the hackers can access the private network of the homeowners without them being aware of the breach. The homeowners are prone to threats such as information leaks, malware invasion, data and identity theft, service denial and execution failure [11]. These threats have become an alarming issue for the smart home owners, that is 37.5% of the entire world population. Thus, the research sheds light on the use of blockchain technology in smart homes and how this technology helps to improve the security. The research elaborates how blockchain technology has benefited the digital universe by providing a robust cybersecurity protocol [10]. The technology has been used in the

cryptocurrency market making cryptocurrency transactions secure and unhackable. Pondering on the effectiveness of blockchain technology in cybersecurity, the technology is also being incorporated in smart home networks and IoT devices.

The research has found that among all the cybersecurity technologies used by smart homeowners, blockchain has emerged as the most secure technology in the digital universe. Security breaches such as unauthorised access, data leaks, identity theft, etc. have become nearly impossible by hackers [9] The research also found that the technology uses a decentralised data system, meaning that the information on the private network of homeowners is spread over numerous servers instead of being in a single server network. It significantly reduces the changes of security networks being compromised thus helping to improve smart home security [9].

The research has provided information on how the blockchain technology will benefit smart homeowners to improve their security measures. However, the technology has a broader application in terms of cybersecurity. The technology can be used in other industries to improve the cyber security, the technology can be applied in banking industries, agriculture industry, education, healthcare, accounting etc [9]. The industries will significantly benefit by incorporating blockchain technology as it will improve the network security measures. The research helps to understand the importance and advantages of blockchain technology, moreover it also highlights how users of the technology have benefited from it. Hence, it can be concluded that blockchain technology has great potential to improve the cybersecurity of not only smart homes but also numerous other industries [10].

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STUDYING HUMAN ROBOT INTERACTION AND ITS CHARACTERISTICS

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ABSTRACT

The process of human-robot interaction focuses on the analysis of different forms of communication between humans and the robots through the application of technologies like artificial intelligence and machine learning. However, there can be different challenges associated with the process like security risks and challenges related to mapping environment and manufacturing procedures.

For analysis of the process of mitigation of the challenges, secondary qualitative data have been collected from different journals and websites. Theoretical analysis has been done for the collected data and the application of a cognitive modelling model has been done for this study. The main results include that application of a cognitive model can help in simulating the human problem-solving process and can help to improve the human cognition techniques.

Keywords: Robot, Human Robot Interaction, cognitive modelling

INTRODUCTION

The process of human-robot interaction is associated with the communication process between the robots and the humans through the application of different techniques like artificial intelligence and computer modelling. Proper understanding of the human-robot interaction process can help to make robotics effective by solving numerous real-world challenges. However, in the process of human-robot interaction, there can be different problems like privacy and security risks, challenges related to teaching the robots and mapping the environment [1,2,3]

The basic approach for solving the problem shall be through the collection of secondary data from previous researches and focus on the process of creating social interactions with the robots. The basic results of this study shall focus on the analysis of the ways by which challenges related to human-robot interaction can be resolved like the application of cognitive modelling and focusing on behaviour recognition technologies. Moreover, this study shall also focus on the ways

by which mixed-initiative interaction that includes information exchange in the complex environment can be implemented to solve the problems of human-robot interactions.

Problem definition

The process of human-robot interaction can help in eliminating dangerous jobs for humans and can help in physical interactions with the humans in shared workplaces. The problem for this study is associated with the challenges related to the human-robot interaction process like understanding the emotional state and verbal communication of humans for the robots and privacy issues [2]. The problem is interesting and important as mitigation of the challenges related to human-robot interaction can help in solving the complex tasks of the humans in a short period of time and designing exoskeleton rehabilitation robots.

Problem solution

Mitigation of the challenges related to human-robot interaction can help in the successful application of robots in different fields like industry and medicine. For addressing the problem of this study, the collection of secondary qualitative data shall be done and analysis of the data shall be done by the creation of themes. The application of the 'Cognitive modelling model' can help in mitigation of the challenges related to human-robot interaction as it focuses on psychological notions and helps in the understanding of the ways by which people can go about problem-solving and performing tasks.

Moreover, it can help in the creation of realistic expectations and form the basis of communication between humans and robots. As per the opinion of Galin & Meshcheryakov [3]. the application of interactive learning technologies can help in improving the perceptual ability, autonomy and the process of communication between the humans and robots. Thus, it can be said that the application of these techniques can help in solving the challenges related to the human-robot interaction process like challenges related to social interactions as well as privacy risks (Schulz *et al.* 2019). Thus, the problem of this study shall be solved by proper analysis of secondary qualitative data collected by previous researches and application of different interactive modelling techniques [78,79,80,81,82,83,84].

Related Work

Previous researches were conducted on different topics like safety bounds in human-robot interactions and success factors for human-robot collaboration. In the previous research, the methods that were taken into consideration include the collection of secondary qualitative data on the topics and usage of different models like the human-robot interactive model (Galin & Meshcheryakov 2020). From the previous studies, it has been found out that for improving the process of human-robot interaction it is essential for the robots to communicate and establish a set of shared beliefs. As per the opinion of Esterwood & Robert (2020), the challenges associated with the human-robot interaction process also includes the way people share and interpret information with the robots [33,34,35,36,37].

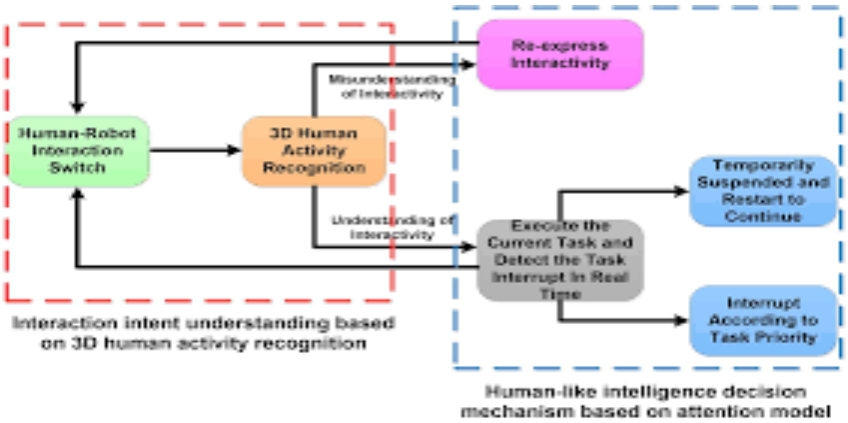
From the analysis of the study conducted by Schulz *et al.* (2019), it has been found out that the application of secondary qualitative data can help in understanding the robot personality and human-robot interactions. Based on the comparison of the present approach of this study to the related works associated with the topic it can be said that usage of cognitive modelling can help in mitigation of the challenges associated with the human-robot interaction process.

RESEARCH METHODOLOGY

For the understanding of the ways by which challenges related to human-robot interaction can be mitigated **'Positivism Research Philosophy'** has been taken into consideration as it supports the gathering of factual knowledge through observation. The chosen approach is **'Deductive'** as it is a top-down approach and helps in the process of understanding of the role of artificial intelligence and natural language understanding in the human-robot interaction process (Schulz *et al.* 2019). The choice of **'descriptive research design'** has helped in better understanding of the concepts related to the importance of human-robot interaction by taking into consideration of the previous theories. The criteria that are used for the evaluation of the method includes the collection of '**secondary qualitative data'** about the topic and analyzing them properly (Camargo *et al.* 2019). The criteria that are used for the evaluation of the proposed method includes the collection of data only from those journals and websites that contain relevant information about the topic.

The claims that are being tested include mitigation of the challenges associated with human-robot interaction like security risks and challenges associated with mapping environment can help in improving the process. **Theoretical analysis** has been taken into consideration for this study and secondary data have been collected from different journals, books and websites that contain relevant information about the topic. The process of conduction of theoretical analysis includes identification of specific themes of the collected data and classifying the data based on codes (Sanders *et al.* 2019).

Figure 1: Cognitive modelling model of human-robot interaction.

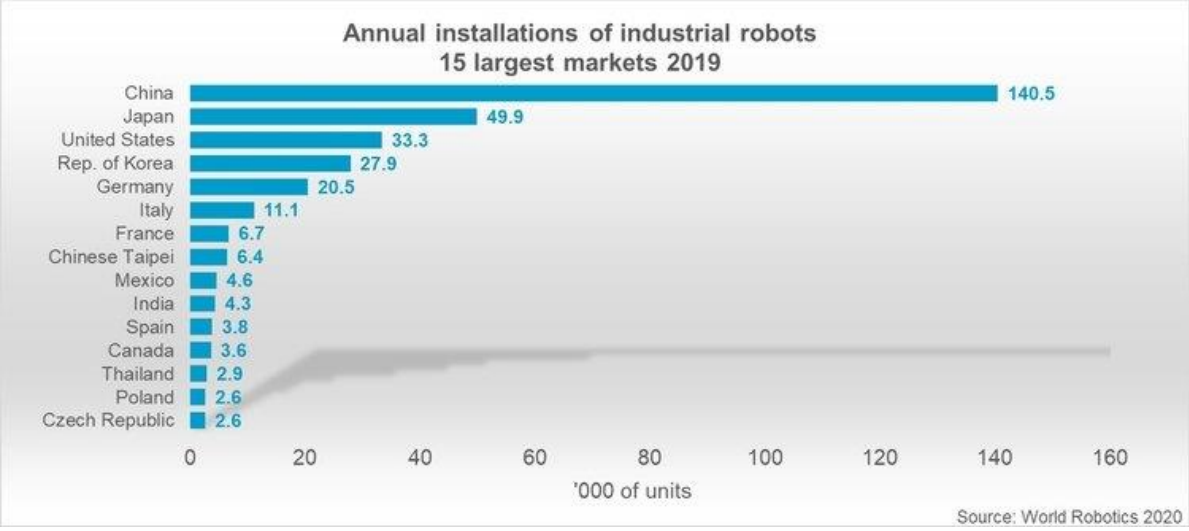


From the analysis of the above figure, it has been found out that the cognitive model of human-robot interaction can help in better analysis of the challenges associated with it. As per the opinion of Filippini *et al.* (2020), the cognitive model is a type of model that behaves like a human being by using the cognitive processes to complete a task. The model can include different processes like human-robot interaction switch, 3-D human activity recognition and executing the current tasks. Thus, it can be said that the data that are used are realistic and interesting as it helps to train the robots to understand the human emotions and interpret the information associated with it [51,52,53,54,55,56,57].

As stated by Malik & Bilberg (2019), the secondary data that have been collected for this topic are realistic and interesting as it can help in the application of techniques like imitation learning and artificial intelligence to make the robots adapt to the complex tasks of the human. Thus, it can be said that proper focusing on the challenges of human-robot interaction can help in the deployment of the robotics technology in any hazardous environment [60,61,62,63,64,65,66]. As per the opinion of Oliff *et al.* (2020), different methods have been taken into consideration by the previous researches that address the same problem like the 3-D model for perceiving humans as well as models for motion planning. Thus, it can be said that the application of this model helps to consider cognition, objects and tasks as interrelated components in human-robot interaction process [67,68,69,70].

It has been found out that the application of neuroscience can help to develop joint action in the human-robot collaboration process. Thus, through the cognitive model application of various methods can be implemented for controlling the mechanisms of the robots including eye-tracking and making interferences about the human task [71,72,73].

Figure 2: Annual installations of a number of industrial robots across the globe [74,75,76,77]



From the analysis of the above graph, it has been found out that the number of industrial robots' installation is highest across different countries of the globe like China, Japan and the USA. The basic differences that have been revealed in the data collected from different secondary sources include the process of conduction of the study and the model that has been taken into consideration for different studies [3,4,5,6]. The cognitive model is based on the fact that during initial interactions the people are uncertain and they are responsible for attributing personality characteristics to the robots [7].

DISCUSSION

The strengths of the method of collection of secondary qualitative data include that it can help in better understanding of the challenges related to human-robot interaction and in what ways the cognitive model can help in mitigation of the challenges. The strength of the conduction of theoretical analysis in this study includes finding out the gaps and deficiencies in previous research. As stated by Khoramshahi & Billard [8], the application of qualitative research method helps in the analysis of the non-numerical data and understanding of the concepts related to improving the collaboration between the humans and robots more easily. Moreover, this process requires less time than the quantitative method and helps in a better understanding of the ways by which the cognitive modelling model of human-robot interaction can help to mitigate the challenges associated with the process [9].

From the analysis of the findings of the study, it has been found out that the interactive behaviour of the robots is associated with a combination of information access and solving the mutual constraints associated with it [10,11] The cognitive model of human-robot interaction is an interactive system and can properly represent the steps associated with providing mental commands to the robots. As per the opinion of Oliff *et al.* [12,13, 14], improvement in the process of human robot interaction can contribute significantly in different areas like agriculture, industry and medicine.

However as stated by Clarke & Visser (2019), the weakness of the chosen qualitative research methods includes that it can lead to misleading findings and can lead to generalization of the study. As per the opinion of Newman & Gough [3], the creation of real systems like robot autonomy and interaction modes can help in a proper understanding of the usage of robotics technology in different sectors. The conclusions from the results of this study support the fact that the application of cognitive modelling and usage of technologies like artificial intelligence can help in simulating human problem solving and mental processing techniques within the robots [15,16].

The application of the cognitive model is associated with the principle of changing the user as a guide for adaptive interaction and can help to improve the process of group interactions with the robots. It has been found out that remote interaction with mobile robots is associated with the

technology of telemanipulation and it can help the robots to better understand the commands of humans [17,18]. Thus, it can be said that the application of the qualitative research method can help in providing insights into the challenges associated with the process of interaction of the humans with the robots.

Previous researches were conducted on different processes associated with human-robot interaction and the methods that have been taken into consideration include the usage of the PRISMA model for the understanding of human-robot interaction and application of quantitative data. The weakness of theatrical analysis for this study as compared to other methods include getting not specific answers to the research questions and requiring a lot of effort [19,20] Based on the underlying properties of the collected secondary data the results can explain in better understanding of the processes associated with human-robot interaction [26,27,28,29]. The underlying properties of qualitative data include that it lacks numerical characteristics and it takes into consideration the researcher as the key instrument of this study. Thus, the application of secondary qualitative data in this study has helped in a proper understanding of the ways by which cognitive models can help in designing and evaluating of the alternative interfaces associated with the human-robot interaction process [23,30,31,32,50,51,52].

The results of this study can be properly explained in terms of underlying properties of the data as it is found out that the robots perform a proactive behaviour and thus it becomes easier to operate them from a safe distance [33,34,35,36]. Thus, it can be said that the application of the cognitive model can help in predicting the human behaviours and implementation of adaptive interactions with the robots. Thus, the results can be [387,38,39,40] explained in terms of the underlying properties of the collected secondary qualitative data as the robots mainly perform a proactive behavior [41,42,43,44,45,46].

CONCLUSION AND FUTURE WORK

Thus, in conclusion, it can be said that proper understanding of the human-robot interactions can help in understanding and evaluating the robotics system and improve the process of communication between the robots and humans [47,48,49]. Secondary qualitative data has been taken into consideration for this study and theoretical analysis has been done for finding out the solutions of the problems related to human-robot interaction. The most important points illustrated in the work include that application of the cognitive modelling model can help the robots to understand human psychology and behaviours in a proper way. It has been found out from this study that improvement in the areas of human robot interaction can play a vital role in improvement of industrial production and manufacturing.

The results can be improved in future research by focusing more on the ways by which collaboration can be done with the robots in a more logical way. Thus, it can help in better understanding of the issues associated with human-robot interactions and understanding of how

the interactions can be shaped for achieving specific goals. If I had more time for the conduction of this study, I can focus on taking into consideration of other models related to human-robot interaction like 'Motion planning' and transfer the learning process. The major limitations of this project include scarcity of sufficient budget and time. Because of these constraints, a large number of journals cannot be taken into consideration and the research has been conducted based on limited websites and journals. Thus, improving the process of human-robot interaction can help in the process of application of the robots in different fields like automatic driving, space exploration and rehabilitation process.

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THE INTERNET'S ROLE IN UNDERMINING THE CREDIBILITY OF THE HEALTHCARE INDUSTRY

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ABSTRACT

The widespread popularity of the internet can be considered both advantageous and detrimental to society, as the age of technological advancement sparks innovative ways in which people receive information. On one hand, the availability of the internet has allowed people to research their own health concerns and symptoms, which enables them to seek treatment faster. On the other hand, this can turn into an obsessive habit by cyberchondriacs who relentlessly scour the internet over any trivial health concern. Furthermore, the widespread popularity of the internet is also responsible for a surge in spreading misinformation, namely about the COVID-19 pandemic, which has led to undermining the credibility of trusted healthcare officials and organizations.

This paper aims to not only explore the problems that arise with the widespread availability of information via the internet, but to also explore possible solutions that would benefit society on both an individualized and collective scale. The solutions presented in this paper seek to assist individuals in rendering professional therapy services for Cognitive Behavior Therapy, and to assist the collective population in maintaining responsible internet usage.

Keywords: healthcare, COVID-19 pandemic.

INTRODUCTION

Decades prior to the invention and popularity of the internet, people sought products and services from physical venues and people. When in need of clothes or groceries, people would visit shops; when seeking medical services and treatments, people would make appointments with their physicians. Nowadays, the widespread use of the internet as a tool for everyday life has resulted in services and apps that no longer require physical spaces and people. This has resulted in endless quantity of services and information are readily available at anyone's fingertips – all one needs is a stable internet connection. Despite the innumerable benefits that this technological advancement has provided to societies around the world, there are significant drawbacks to the vast amount of readily available information at the hands of average people. This has been made

even more apparent with the rampant spread of misinformation during the height of the COVID-19 pandemic[1,2,3,4,5]. The overarching issue is that the internet has produced an environment where people can take their healthcare into their own hands, as opposed to relying on licensed medical professionals for diagnosis, advice, and treatment.

Physicians [6,7], pharmacists, and other professions inclusive of the healthcare industry were once regarded as distinguished sources of accurate medical advice and treatment; rarely did people contest the validity of their physicians' guidelines to curing diseases and maintaining their health. However, due to the widespread availability of information on social media and search engines, people now feel entitled to be knowledgeable on healthcare. Sites like Web.MD and MayoClinic provide comprehensive information on thousands of diseases - while the information these sites provide is helpful [8,9,10], it detracts from the understanding that these sites are intended to be mere references, not sources for diagnosis.

Problem Definition

These 'cyberchondriacs', or people who obsessively search the internet for information about health and disease, immediately begin feeling anxious and other negative emotions due to the overwhelming amount of information. This is mainly because, "seeking to 'diagnose' one's symptoms online may increase the likelihood of noticing and misinterpreting benign stimuli as evidence for disease; triggering anxiety and illness preoccupation" (Singh, K., Fox, J. R. E., & Brown, R. J. (2016). This is a great cause for concern in the healthcare industry because self-diagnosis is often times inaccurate [11.12.13.14], and may lead to dangerous and erroneous methods of self-medication.

Another detrimental effect of the rise in misinformation is the tendency to discredit trusted medical professionals and health organizations. This trend became apparent especially during the COVID-19 pandemic, when quarantines and lockdowns spread across the globe, effectively minimizing opportunities for people to visit hospitals and doctors' offices for accurate medical treatment and advice [15,16,17]. The World Health Organization (WHO) labels this phenomenon as an 'infodemic', when "too much information including false or misleading information in digital and physical environments during a disease outbreak", that "leads to mistrust in health authorities and undermines the public health response", which ultimately can "intensify or lengthen outbreaks when people are unsure about what they need to do to protect their health and the health of people around them." [18,19]

As the abundance of misinformation grows during an infodemic, so does the public's reluctance to undermine the credibility of public health officials and organizations. The rate of growth of the pandemic, vaccines and their side effects, medical treatments, and preventative measures are the main topics susceptible to public panic and misinformation during the COVID-19 pandemic. In desperate attempts to quell public panic, official health sector representatives and their respective organizations made grave attempts to emphasize the importance of trusting the health industry for reliable information and best practices for navigating through the pandemic.

However, these attempts could not ultimately change the impact of the infodemic and its influence on public health behaviors, which includes "panic buying" and disregarding sound health advice, such as stay-at-home orders, from public health officials [44,45,46,47,48].

The infodemic's impact on the credibility of the COVID-19 vaccination fundamentally changed the way the public viewed the vaccine as a legitimate preventative measure to COVID-19 infections. As trials of different versions of the vaccine began, popular social media platforms such as Facebook, Instagram, and Twitter began circulating posts with dramatized infographics, inflated statistics, and false information [49,50,51,52,53,54,55]. These posts perpetuated anti-vaccination sentiment from a large majority of the global population, resulting in panic and mistrust. According to the National Library of Medicine, spreading "vaccine-related misinformation on social media may exacerbate the levels of vaccine hesitancy, hampering progress toward vaccine-induced herd immunity, and could potentially increase the number of infections related to new COVID-19 variants." All of these effects negatively impact the health sector because they discredit safe and preventative measures, and instead, propagate further infections, which can ultimately lead to a spike in population deaths.

Proposed Solution

In spite of the dangers presented by the actions of cyberchondriacs and by the detrimental effects of the infodemic in discrediting the reputable healthcare industry, there are numerous, productive solutions that can be implemented by government and private organizations to ensure a healthier and more trustworthy dynamic between the public and the healthcare sector. These solutions rely on both responsible internet usage and moral personal responsibility, and can be easily implemented by the rise of awareness campaigns.

The fear and anxiety that is prevalent in cyberchondriacs stems from searching their mild symptoms on internet search engines such as Google or Bing, and spiraling into a rabbit hole of searching until they gather enough information to validate their fears. This is part of a larger cycle, where the more that they worry about a symptom, then the more they feel that specific symptom. Despite the notion that cyberchondria is an extremely difficult condition to treat, there have been strides in the scientific and medical fields to attempt solutions to solve it.

Cyberchondriacs can ease their panic and lead less anxious lives by learning how use the internet as an added resource and not their sole healthcare provider, and by learning how to seek professional medical services to manage stress effectively. Though cyberchondriacs may assume that their internet searches will provide them with answers, it is never enough to satisfy them and their dramatic health concerns. Instead, cyberchondriacs who want to heal from their condition must focus on breaking their continuous and harmful cycle of worrying about a symptom and then checking the internet for hours, even days, on end in order to find the answers that they are searching for [32,33,34,35,36].

Simply put, cyberchondriacs must use Googles less often, and schedule appointments with their doctors more often. In this case, doctors can evaluate the mental and physical fitness of cyberchondriacs [37,38,39,40], and prescribe medication and treatments accordingly. Besides treating any illnesses, doctors can also prescribe anti-anxiety medication such as alprazolam, diazepam, or clonazepam in order to alleviate their patients' constant and urgent need to scour the internet for every minor symptom they may experience in their bodies. As cyberchondriacs seek professional medical help, they can also strengthen the trust and bond they have with their healthcare providers. Healing from constant worry and anxiety for cyberchondriacs is possible through the active desire to become better, and through family and friend support [41,42,43,44,45]

Related Work

In the event that self-awareness and self-medication is not enough to implement positive change in their lives, cyberchondriacs can also seek professional medical services through Cognitive Behavioral Therapy, or through Hypnotherapy. By speaking to behavioral therapists or hypnotherapists, cyberchondriacs can unlearn their unhealthy behaviors and tendencies in order to implement lifestyle changes that take their minds away from constantly overthinking about their health and potential diseases. According to WebMD, cyberchondriacs can use therapy sessions to "challenge their assumptions and change their behavior" and can curb panic-induced behavior by agreeing on "a regular checkup every few months, instead of making emergency appointments every time they get freaked out."

Leading research suggests that Cognitive Behavioral Therapy (CBT) is by far the most popular and effective therapeutic treatment option for people who suffer from cyberchondria [42,43,44,45,46]. Cognitive Behavioral Therapy involves a mixture of comprehensive psychological education and exposure therapy. When a cyberchondriacs begin Cognitive Behavioral Therapy, they first examine the psychology of their unhealthy thinking patterns. With the guidance of a license therapist, cyberchondriacs educate themselves on the notions that their tendencies are based on unhelpful methods of thinking, on learned patterns of unhelpful behavior, and that despite their suffering from psychological issues, they can learn and implement more constructive methods of coping with their stress and anxiety, which ultimately allows them to regain control of their lives.

According to the American Psychological Association (APA), individuals suffering from cyberchondria can also alleviate their suffering using Cognitive Behavioral Therapy by "Learning to recognize one's distortions in thinking that are creating problems, and then to reevaluate them in light of reality" so that they can distinguish what are true, practical reasons for concern, among what are false or dramatic reasons for concern. This allows them to gain a more solid understanding of their own cyberchondria. By gaining that level of understanding, cyberchondriacs can then rely on newly gathered problem-solving skills to cope with any potentially difficult and anxiety-provoking situations. Ultimately, Cognitive Behavioral Therapy will allow cyberchondriacs to

develop a greater sense of confidence in their own abilities, as well as a greater level of trust towards certified healthcare professionals.

In spite of all the progress cyberchondriacs may make towards becoming less anxious about their health, the widespread availability of the internet will always provide platforms for rampant misinformation to fester and spread among the global masses. As this paper previously stated, the most practical solution to this issue is to raise awareness about misinformation, and to promote responsible internet usage and moral personal responsibility. Understandably so, it is easy for the average person to become caught up in the massive amounts of available information on the COVID-19 pandemic. However, it is everyone's duty to practice responsible internet usage by listening carefully to the misinformation being spread through social media. According to the Centers for Disease Control and Prevention (CDC), people can monitor "social media channels and traditional media outlets for misinformation" and then create "a log of that misinformation to identify trends in [their] area. This can help [them] understand where, when, why, and how misinformation is spreading in [their] community."

Moreover, according to the Centers for Disease Control and Prevention (CDC), people should "use trusted messengers to boost credibility and the likelihood of being seen and believed over misinformation" since "some people may not trust public health professionals or visit the health department website." The rise of social media influencers has put people in a unique position – they can inform and educate through their platform, and may reach people who would listen to them over any traditional trusted public health officials.

People across the world must practice responsible internet usage in hand with continuing to maintain personal moral responsibility in curbing the spread of deceptive misinformation about health and diseases, namely COVID-19. Instead of relying on a friend's Instagram post, or Facebook post about the dangers of the COVID-19 vaccination, people should take the time to briefly validate the credibility of the post they see by referencing a credible website to see whether or not it matches with the information they see on social media. If the information matches, then it is deemed valid information. However, if the information is inaccurate, then it is considered misinformation, and thus, the information should either be removed, reported, or shared with the strong disclaimer that it is incorrect, so that people who come across it can know it is inaccurate and unreliable [20,21,22,23].

On a grander scale than of the individual, global health organizations can also partner with local communities and governments to launch social media campaigns that generate more accurate awareness of COVID-19. According to the World Health Organization (WHO) [24,25,26,27], it has liaised with "the UN family, tech sector, media, civil society and other amplifying communities to understand concerns, co-develop messages, extend the reach of health information, and to respond to the information needs of communities." This level of community outreach can combat the rampant spreading of misinformation, and in turn, facilitate a more genuine and constructive trusting bond between people and the global healthcare [28,29,30] industry. This outreach

campaign would also be paramount in rebranding the negative reputation that COVID-19 vaccinations have garnered through the spread of misinformation. According to the National Library of Medicine, "False claims about COVID-19 vaccines can undermine public trust in ongoing vaccination campaigns, posing a threat to global public health" and that "the vaccine-related misinformation on social media may exacerbate the levels of vaccine hesitancy [31,32,33,34] hampering progress toward vaccine-induced herd immunity, and could potentially increase the number of infections related to new COVID-19 variants." Due to the disastrous effects of misinformation about COVID-19 vaccinations, it is imperative that these large global health organizations prioritize the awareness and education of the importance of individuals trusting the COVID-19 vaccine[56,57,58,59,60].

CONCLUSION

Though the United Nations (UN) and The Red Cross have been instrumental in stopping the spread of rampant COVID-19 misinformation, the World Health Organization (WHO) has made great strides to provide "universal access to credible health information, and building resilience to misinformation for people worldwide." However, the World Health Organization (WHO) also understands that "more efforts are needed to better understand the scale of the infodemic, and impact of strategies used to manage it, in order to develop new toolkits for countries." That being said, the future of mitigating infodemics seems positive, but there is much work left to be done. The World Health Organization (WHO) is currently in the process of "fostering new approaches to meet changing needs for an evolving health emergency infodemic response" which essentially provides "a foundation for further collaborations to also improve preparedness and early detection of emerging and resurgent health threats."

False claims about COVID-19, or practically any health and disease discourse, can easily undermine the reputation and credibility of trusted health officials and organizations on a global scale. Misinformation usually originates from panic, fear, and other sources of unfounded bias – it is never objective and statistically accurate. Though the notion of misinformation is not a new concept – in fact, it has been traced to centuries before the invention of the internet and technology – its effects can still be considered catastrophic, even to this day.

Due to the accessibility of the internet, social media platforms such as Twitter, Instagram, and Facebook have cultivated spaces for people to spread virtually any claim, regardless of its accuracy. For cyberchondriacs and people who spread misinformation alike, evidence and data-based solutions have been created and implemented to curb the continued spread of these detrimental practices. With the massive support of global health and wellness organizations, misinformation and misconceptions about the COVID-19 pandemic, as well as general disease and illness, is well en route to be curbed to a more manageable scale. By partnering with local authorities and societies, these larger health and wellness organizations can engage communities and ultimately gain their trust, so that the public will no longer be susceptible to falling for the lies

and deceptive information of unreliable and uncredible sources from the internet and from social media.

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MACHINE LEARNING FOR INTELLIGENT ENERGY CONSUMPTION IN SMART HOMES

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ABSTRACT

The growth of personal pleasure is a direct result of a person's ability to provide themselves with energy. Since people may construct and enhance their way of life more swiftly with current innovation, valuable energy has become a sought-after expansion for many years due to the utilization of smart houses and structures. The demand for energy is greater than the supply, resulting in a lack of energy. In order to keep up with the demand for energy, new strategies are being developed. Many areas' residential energy use is between 30 and 40 percent. There has been an increase in the need for intelligence in applications like as asset management, energy-efficient automating, safety, and healthcare monitoring as a result of smart homes coming into existence and expanding. Energy consumption optimization is being tackled with the use of an energy management approach in this study. There has been a recent surge in interest in data fusion in the context of building energy efficiency. Accuracy and miss rate of energy consumption predictions were calculated utilizing the data fusion technique presented by the proposed study. Simulated findings are being compared with those of previously reported methods. It also has a prediction accuracy of 92 percent, which is greater than that of any other technique that has been previously reported. It's becoming increasingly important for households to keep their power costs down as the amount of electricity they consume rises and dispersed new energy sources are introduced. The installation of a home energy management system is a practical solution to these issues.

Keywords: Intelligent, Energy Consumption, Smart Homes , Fused Machine.

INTRODUCTION

The model of home energy management given in this research aims to optimize the energy mix in the house. Electric cars, household appliances, distributed generation, energy storage, and electric vehicle charging, and discharging are all taken into account. Self-regulating hems is able to adapt to changes in rates and household power use [1,2,3,4]. Hem's structure and method for optimum scheduling are described. Discussed include the smart grid and demand response, smart home technology, new energy production, energy storage, and other related technologies. It is also discussed and examined how the hems and other future development

paths may best schedule and use power consumption devices and energy sources to maximize efficiency. On the basis of advanced metering infrastructure, a hems architecture is given. Data storage and scheduling in the house are handled by a local information management terminal. It is possible to create an optimum simulation model for the scheduling of a new home energy management system based on timely grid purchases and power production in conjunction with photovoltaics. It is also discussed how artificial intelligence may be used in the hems [5,6].

The smart grid, house, and meters of the hems make it an intelligent network control system. An all-in-one management and control system for power production, consumption, and energy storage. hems can help consumers save money on their power costs by increasing the efficiency of their home's renewable energy sources [7,8,9,10]. The conventional power market lacks consumer engagement and has a single electricity pricing structure, resulting in both an inadequate supply of energy during peak hours and wasted electricity during low hours. As a result, the peak and off-peak rate system is implemented, which aids consumers in adjusting their power usage schedules [11]. Nevertheless, it lacks the ability to adapt to changes in demand and supply, making it less accurate. In addition, hems can fully interact with the power grid to obtain an accurate real-time price, cooperate with generation, and load forecasting, perform an intelligent allocation of household energy, optimize the allocation of household load in the time dimension, achieve demand response on the customer side, relieve grid pressure during peak hours, and improve grid stability. This new generation of information technologies, including internet of things and cloud computing, mobile internet, and big data — coupled with the home as a carrier to create a low-carbon and safe family lifestyle is called a "Smart grid," And hems is its smallest component. Flexible control of numerous home appliances is achieved by integrating distributed power technologies such as photovoltaics and energy storage [12,13,14,15,16]. An increasing number of researchers are looking at how to make hems more efficient in terms of cost, comfort, and load shedding [18,19].

Problem definition:

According to extensive study, a smart model for a house's electrical consumption has been developed that aims to maximize peak load-shedding and minimize cost. A different approach is to examine how home appliances and household power use are linked, with the objective of reducing electricity costs and increasing comfort [20,21,22,23,24,25]. The influence of electric cars and energy storage devices on the optimization of smart houses is also being studied by researchers to suggest a real-time control strategy for energy storage devices. Studies on smart home energy management, charging and discharging procedures for energy storage devices, as well as rational allocation approaches have been mostly absent from the literature. Optimal scheduling of power consumption devices and energy in the hems is examined in this study, as are smart grid and demand response, smart home, new energy production, and energy storage technologies; and an analysis of the hems is presented. The hems framework is also discussed in this paper because of the importance of this technology. Optimized simulation

model for hems scheduling is designed based on timely grid purchases and system production. Artificial intelligence in the hems is being suggested as a potential use [27].

Research Objectives:

Rising focus has been paid to decreasing the cost of electricity for residential users as a result of increased home power usage and the introduction of distributed new sources of energy. These problems may easily be solved by installing a home energy management system (hems). As a result of this study, a model for optimizing the residential energy mix is provided. There are considerations for electric vehicle charging and discharging, as well as the operation of household power consumption equipment, distributed generation systems, and energy storage devices [28,29,30]. It is possible for hems to adapt to variations in energy costs and use patterns inside the home. The construction of hems and the most effective scheduling method are discussed. It includes smart grid and demand response, in addition to smart houses and other essential technologies like novel energy production, energy storage and more. Also mentioned and investigated are the optimal scheduling of power consumption devices and energy sources in the hems. The advanced metering infrastructure serves as the foundation for a hems design (ami). Homeowners may access their personal data through a local information management interface. A simulation model for the scheduling of a new home energy management system is created based on the timely purchase of power from the grid and the generation of electricity in combination with pv systems. The hems may potentially benefit from the usage of artificial intelligence.

Solution suggested:

A distributed intelligent solution may be built in a given way. Self-contained object with semantic interoperability and protocol interaction. It is a distributed technique in the field of artificial intelligence. Because of its adaptability and openness, it has a promising future in today's dispatching automation systems. There are two modules: One for actions and objectives to be accomplished, and one for external information. Data from the sensor is processed by the information processing module, which makes suitable decisions based on the information. In order for the agents to cooperate, the communication module provides the essential conditions. For more flexibility and effectiveness, the agent makes use of its own rule library. The mobile agent server (mas) accomplishes the overall system goal by coordinating and guiding each agent. There are three basic forms of mas system architecture, as previously mentioned: Centralized, decentralized, and hybrid [31,32].

Our edge-based energy forecasting system for smart grids, as well as the subsequent contributions, are designed to address these issues in regulated networks utilizing deep learning algorithms quickly and effectively.by using an edge intelligence-based unique and adaptable architecture, we control energy demand changes by connecting suppliers and consumers to one platform for effective communication based on our algorithm's future projections [33,64,65,66,67,68].

or the deployment of resource-constrained devices at various consumer locations (smart homes or industries), we offer an architecture that uses an iot network to connect to a cloud supervisor server and upload current demands and inform about future requirements. To provide effective energy management, smart grids transfer the precise amount of energy necessary in response to cloud server requests from homes and businesses. In order to identify any unexpected energy usage by users, the cloud server filters out all requests. As a bonus, it stores energy projection data that may be used for further investigation [69,70,71,72,73,74,75,76,78].

We show that our framework provides a paradigm for future edge-intelligence-based energy forecasting systems based on our thorough testing. After picking a normalization method and a sequential model, we evaluate our framework's performance to that of each model. Series learning models are studied in terms of their execution times to identify the correlation between model running time and accuracy [79,80,81].

METHODOLOGY:

Two load prediction datasets were used to try out this new research method, and the results reveal that it outperforms the current state of the art. Follow-up research on stiff used wavelet transform and evolutionary elm to forecast energy. An algorithm that predicts up to 24 hours in the future using elm and a modified artificial bee colony algorithm has been proposed. With the artificial bee colony approach, a set of input weights is used to help the elm pick the best parameters. The authors used ISO new England and North American electric utility data to produce new, cutting-edge results. The full structure is shown, which divides industrial and household energy usage into two basic tiers. For example, the first layer depicts energy management in terms of demand and supply in both the household and industrial. The resources (windmills and solar plants) provide energy to grid stations, which distribute it to a wide range of customers, mainly in residential and industrial areas. Predicting and controlling energy use is the primary responsibility of the energy management layer, with a cloud server serving as a middleman between clients and smart grids [34,35].

The cloud server saves, processes, and delivers energy demands from families and businesses to the grid station for distribution to the relevant consumer. It is essential to our strategy because it supplies consumers with a resource-constrained gadget for forecasting future energy demand. For now, we can only assume that the grid station will acquire enough energy from the available resources, as we have no way of knowing for sure [81,82,83,84]. As a component of the iot personal and social application sector, home automation provides a wealth of possibilities for new and helpful applications. It is possible to automate a house's security, energy management, and well-being by using a variety of home automation systems. In a home automation system, the term "Comfort" Refers to all of the actions taken to enhance the way residents of a home feel while in it. Despite this, iot-based home automation confronts a significant obstacle [85,86,87]: The lack of interoperability amongst communication

technologies [50]. Unified protocols and various lifestyles among users in smart cities are to blame for this dilemma. Our system, hems-iot, is described in the following sections, and a case study is discussed in which our system is used.

Architecture Description:

Home energy management system (hems-IoT) is a technology that aims to improve the safety and security of smart homes while also reducing their use of electricity. Machine learning and big data technologies are used to control energy usage in hems-IoT. Home sensors and demotic devices may be monitored in real time using hems-IoT. Energy usage and user activity patterns are assessed using machine learning algorithms, and suitable suggestions are made for reducing energy waste [88,89,90,91,92,93,94,95].

Hems-IoT: Design and usability of a wireless sensor network:

In order to keep the system running smoothly, hems-IoT employs a seven-layered design. As shown in figure 1, the hems-IoT architecture includes the presentation layer, the IoT services layer, the security layer, the management layer, the communication layer, the data layer, and the device layer. Each layer has a distinct purpose and contains many components that each serve a specific purpose inside their own layer. In the same vein

Using the internet of things (IoT), people are migrating from conventional homes to smart homes. Control, monitoring, and management of energy use according to personal preferences are all possible in modern "Smart" Homes [32,33,34]. Here, we'll take a look at some of the IoT-based efforts being made to improve energy efficiency in modern homes. We pay special attention to efforts that make use of big data and machine learning. According to kang et al., an IoT-based system that leverages an environment-sensitive service context generation model in the demotic space was presented. As an IoT platform, ims was built using open source software and hardware. Ims-based smart home services for health care and disaster management were also tried using the system. Additionally, a smart home design was used to develop a wsn optimization protocol. An access point connects the outdoor and interior surroundings of this structure. A smart phone may be used to operate the user's house from any location at any time. The SQLite [50,51,52,53] database system was utilized for the implementation, and several tests were run to verify the results. For home service settings, a web services architecture was suggested. The structure is made up of three layers:

- Information Layer
- Management Layer
- Presentation Layer

New IoT service composition was generated using the service overlay network. Montesdeoca- Contreras, on the other hand, created an internet of things (IoT) application to manage and monitor smart dwellings. In other words, the app gives customers the ability to keep

an eye on and operate demotic devices through voice or tactile features, as well as a safety net. App inventor and android studio were used to create the app [35,36,37,54,55,56].

An IoT application model-creation technique was presented to help create robust, energy-efficient systems for home protection. To save energy, the model leveraged the overlap between device features to temporarily deactivate portion of them. Smart home energy management system architecture and shedding algorithm for house energy consumption based on domestic renewable energy sources, wireless connection between demotic devices, a control system, and a home management system, and on grid management [57,58,59]. It also provided an efficient and intelligent approach for saving power the heat dispersion in the kitchen area of IoT-based houses with a cooling system was presented using a virtual model of flow. When a person leaves or enters the kitchen, the system remotely adjusts the temperature and lighting. They developed a smart home energy management system (ems). The ems depends on mqtt (message queue telemetry transport) [60,61,62,63], which is driven by business intelligence (bi) and analytic, and employs big data to make sense of the information. The h vac (heating, ventilation, and air conditioning) system was used to test the system in a modest residential area.

The management of energy in smart homes

Neural fuzzy networks have been used to regulate household appliances. Matlab was used to build a neural fuzzy logic controller, which was then translated into a tool using hardware and internet technologies. Using this method, household appliances may be programmed to operate at certain times and consume less energy. In essence, it mimics a human's behaviour by watching and perceiving the actions of its residents within the house and providing them with the services they need. It is possible for household equipment to keep track of occupants' daily schedules. These activities are coordinated in such a manner that the residents feel safe and secure. Makes use of an energy-saving technique based on data gleaned from household appliances. Ip, XML, and java-based networks are used by most home appliance manufacturers in order to manage and control devices that operate on the basis of operational information from the user. To communicate code, XML is utilized to send data, while java is used to develop software for appliances. By replicating 100 households with 16 distinct home appliances, an experiment has been carried out to see how one item affects the other. The simulation findings revealed that the appliances reduced energy usage by 15.6 percent when compared to manually operated equipment. As a result, smart homes were shown to be an effective way to cut down on energy waste by employing equipment that run on their own. Another benefit of conserving energy is that it may be put to good use elsewhere.

Efficiency in the use of zigbee in the question for efficient energy resources

Residential power usage has skyrocketed in recent years as a result of rising energy prices and the proliferation of unnecessary household equipment. Humans have had to develop new sources of energy due to increasing power use and depletion of natural supplies. Many environmental issues, such as rising global temperatures, ozone depletion caused by pollution,

and more, have raised demand for natural resources that are not abundant. In order to develop an efficient source of energy, we will need to change both the way energy is delivered and the way it is used [18]. In order for the devices being utilized to deliver uninterrupted service, an effective and continuous communication protocol is required. When wireless technology and output optimization are combined, the end user may reap the benefits of wireless technology in most power-related applications. Home energy management systems often use the zigbee wireless network. As a generic communication protocol, it uses less power and is more cost-effective than most others.

DISCUSSION

Researchers in the field of energy monitoring utilizing different energy sensing devices are interested in accurately predicting future energy use. Many academics have turned to machine learning, deep learning, and their many in variants to help them accurately anticipate the future energy needs of various real-world situations. A few researchers have been able to provide findings that can be used in the real world, despite the difficulties in the ilf domain. Researchers found that ilf approaches focused on smart grid synchronization and residential structures are lacking. For effective and instantaneous decision-making, there is no existing literature on transforming energy forecasting methodologies into edge nodes [38,39,40.41].

The evaluated literature includes open research topics about the practical use of functional algorithms. Energy forecasting-related research articles need remote sensing capabilities with implementation potentials that can demonstrate the practical application of these algorithms in residential and industrial buildings. The adaptability of any method for various time horizons is another research question in the reviewed literature. When it comes to long-term sequences and series, for example, how will an stiff technique perform? In the same vein, consider the accuracy of any forecasting method under conditions where weather conditions, government policies, local resident behavior, and a host of other influencing factors are highly variable [42,43,44].

First and foremost, we hope to conduct a comparative study of the currently used techniques by putting their algorithms into practice. Next, we'll look at how if can be used in smart cities, smart homes, and smart industries with resource-constrained devices. Similarly, there aren't any methods for predicting consumption over the long term, so we plan to look into this in the near future [445,46,47,48,49].

CONCLUSION

With a broad range of applications, energy forecasting methods play an important role in energy management, from tiny residential consumption and production prediction to big

industrial/smart networks. These methods aid in the planning of energy production and consumption, the control of the duration of power loads, and the scheduling of grid systems to guarantee dependable and stable functioning. Modern energy utilization necessitates the use of ilf methods to keep things running smoothly. For this reason, we conduct a complete review of the current literature on load forecasting, which spans from 2011 to the present day.

In this study, we looked at ilf methods from a variety of angles and discussed their benefits and drawbacks. It is important to note that we began by looking at the ilf domain as a whole, including its origins and uses. Next, we discussed divisions of ilf techniques on the basis of prediction duration and supported each category with appropriate references from the related literature. Our introductory part concluded with a discussion of the ilf domain's issues and the need for our review paper and its unique contributions. As we progressed, we covered the ilf literature year-by-year trends, followed by a complete overview of the current surveys, before presenting the ilf methodologies' working flow. Next, we discussed how ilf datasets may be used in a variety of ways, as well as the strategic information that can be gleaned from their utilization. The section on performance assessment of load forecasting methods follows, in which we highlight the key measures used in literature to compare ilf systems and assess their practical acceptability. For the last half of our work, we used past information and derivations from a thorough analysis of ilf methodologies to propose future research paths and present new trending components of research in the ilf area.

Future Work

Sb's have a bright future ahead of them. The alarm will wake you up, and the sensors accessible will be aware of your waking up as well. In addition to the thermostat warming the space you are going to use, additional sensors such as light sensors switch on the lights in the building automatically. As you wait for your coffee to brew, a weather alert will appear on your phone. Other sensors in the kitchen and refrigerator will remind you of what you'll need to buy on your way home from work to prepare supper. When you leave the home, all you have to do is push a button on your phone to activate your car's self-driving capabilities. It will then begin monitoring and regulating your residence. As a result, the doors will be locked by themselves. As a result, appliances will be put into an energy-saving mode. A geofencing system may be used to detect that you've returned and prepare your house for your arrival. The thermostat warms things up, your garage door opens as you drive up, and your favourite music begins to play as soon as you step in.

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