RESEARCH ARTICLE

Incorpating technology to improve service quality and customer satisfaction in healthcare, insight from Malaysia

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Abstract

The purpose of this particular research will be to check out, from your sights of numerous stakeholders, the web link among customer support experience as well as the increasing utilization of technologies within the healthcare business. A study around the partnership in between applying technological innovation plus individual joy in addition to support exposed an excellent partnership involving 118 individual individuals and even twenty-eight medical center employees. Individuals, however, considered there ought to be a runner element towards the patient-medical personnel connection, especially while carrying out analysis in addition restorative procedures within the individual. Age group must have been an important element in the choice of the particular sufferers in order to connect to technologies to be able to reached their own individual functions. With regards to contributing to understanding, this specific study helps policymakers as well as clinic managers inside improving guidelines additionally building ways of improve affected person fulfillment and also support high quality due to technical developments within health care through Malaysia together with Parts of asia, and a lot more..

Citation

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Introduction

The particular dual-tiered program is present within Malaysia, having a government-funded general public field along with a profit-driven individual field which has observed the changeover lately from the fee-for-service for some pay-for-performance type of healthcare shipping (Institute with regard to Public well-being, 2015; Ministry associated with Wellbeing, 2014). Because the beginning, the treatment business has already established continuous growth, along with forty-nine percent from the Malaysian labor force involved in the region, using the vast majority (49. eight percent) categorized because administration, expert, and even professional, plus 30 4. two % classified because paperwork in addition management (Department related to Data Malaysia, 2015; Company with regard to General public Wellness, 2015). Healthcare is viewed as an intricate as well as high-contact support industry, using its main organization in line with the shipping and delivery connected with proper care in addition to treatment simply by health care experts (Heath, 2017). It truly is dependent upon people and even human being hyperlink, and therefore, it really is viewed as complicated together with high-contact. An increase within the quantity of issues centered on conversation between individual as well as the doctor remains seen in the particular field (Ganasegeran ainsi que ing., 2015; Hasyimah ainsi que ing., 2014; Sarwar, 2014), that has just motivated conversations concerning the make use of plus usefulness regarding technologies inside the distribution involving health-related solutions in order to individuals.

Technical developments inside synthetic cleverness (AI), robotics, nanotechnology, large information stats, along with the Web associated with Points (IoT) (Morgan, 2017; Schwab, 2016) offer for you to enhance management procedures inside the medical care industry, individual analysis in addition to therapy, and also the general 'customer' experience (Morgan, 2017; Schwab, 2016). (Beasley, this season; Deloitte, 2017; Donnelly, 2017). Company specialists from the broad variety of industries around the world had been polled and even forty five per-cent of these polled remarked that typically the health care field is going to be the majority of gained through execution from your 4th Commercial Pattern (Industrie four. 0). (Swabey, 2016). Individuals, however, might be resistant to improved utilization of systems. Based on a written report by simply Cost Waterhouse Cooper (2017), a substantial section of the public will not completely believe in automated programs additionally unnatural brains all through crucial occasions, like surgical treatment together with examine analysis, plus wish to possess a human being physician create choices after remedies in addition to methods. Thus is situated the specific predicament: just how can the actual health-related occupation include technological innovation in a way this improves instead of counters the individual come across? Nevertheless , in spite of evidence that this usage of technology may enhance the delivery regarding health care (Ho ou 's., 2017; Miah, Hasan, and also Gammack, 2017), earlier attempts by simply clinic supervision to be able to incorporate technologies to enhance the individual encounter possess sometimes created unsatisfactory results (Adamy, this year; Robbins, 2015), partially due to failing to discover the importance involving people inside affected person fulfillment (Adamy, this coming year; Robbins, 2015). (Rau, 2015).

Because systems gets a lot more integrated in to contemporary health-related (Gruessner, 2016), extra studies necessary to much better understand affected person approval associated with current solutions plus the anticipated effect on stakeholders along with other stakeholders. Even though the ongoing future of software and even automated programs within the health care field continues to be looked into (Christie, 2018; Deloitte, 2017; Glatter, 2016; Mettler, Sprenger, together with Winter season, 2017), there is certainly nonetheless deficiencies in regarding the particular ownership plus the concern regarding patients' furthermore health-related professionals' understanding of the utilization in addition effectiveness involving systems throughout private hospitals (Christie, 2018; Deloitte, 2017; Mettler, Sprenger, as well as Winter season, 2017). The web link among services top quality, sufferer joy, additionally technological innovation within private hospitals has additionally obtained little interest coming from academic experts. This particular study will certainly enhance the study around the long term part associated with technologies in the Malaysian health care industry, especially inside the framework of higher individual pleasure plus support high quality, and can give rise to typically the development through the industry (Macleod, 2017; Ministry regarding Health and fitness, 2014).

Literature Review

Heppel (2016) information which will individual fulfillment is unquestionably viewed as the most crucial top quality indication with regard to clinic support overall performance (see furthermore Amole, Oyatoye, plus Kuye, 2015). They have recently been turned out to be related to much better individual security, enhanced patients' wellness, in addition to devotion towards the personal healthcare services (Meesala in addition John, 2018; Prakash, the year 2010; Shanmugapriya ainsi que ing. 2017). Depending on Linder-Pelz (1982), the thought of affected person fulfillment will be based on the particular antecedent's worth, anticipation, entitlements, and even social evaluations, along with waiting around time period likewise regarded as a problem that will affects anticipation together with awareness connected with benefit (Martnez-López-de-Castro ou 's., 2017; Nadi ainsi que approach., 2016; Martnez-López-de-Castro ou ing., 2016; Martnez-L (Aragon plus Gesell, the entire year the year 2003; Mehta, 2015). Patients' fulfillment continues to be analyzed previously (API Healthcare, 2015; Aragon as well as Gesell, the year 2003; Hekkert ain way. this year; Sitzia in addition to Wood, 1997), contextualised inside the assistance encounter (Hawthorne tout autant que ing. 2014; Ganasegeran au même tire que 's. 2015; Ibrahim, Mohtar and even Dutse, 2015), together with associated with customers within the framework linked to program advertising (Hawthorne de plus 's (Mahadi de surcroît. approach. 2017; Neupane plus Devkota, 2017; Panchapakesan, Prakash in addition to Chandrasekharan, 2015; Vogus and even McClelland, 2016).

With regards to becoming each an individual along with a client, it has an organic paradoxon from the point of view that may people are individuals who is going to call and make an knowledgeable option as to what to purchase, have any control of their own proper together with selection to buy, plus obtain enjoyment using their acquiring the item or even provider (Solomon, 2017). Someone who will be ill or perhaps hurt, nevertheless , might look for health advice or even therapy whenever they are inside a vulnerable condition in addition to as well as need restricted control of their own capability to buy due to insufficient specialist understanding and the amount related to emergency linked to the bill associated with health care (Torpie, 2015). Individual relationships together with health care companies are simply no unique through sufferer relationships together with some other kind of company. Individuals anticipate a good knowledge as well as the fulfilment of the requirements very much the same they might assume via every other form of provider, whatever the motives related to possibly (Neupane and even Devkota, 2017). Clinton and even Wellington (2013) together with Seni additionally Marinkovi (2012) possess the two recommended that this books upon customer happiness can be utilized like an assumptive kind of understanding with this circumstance (Clinton and also Wellington, 2013).

Customer Satisfaction Models

Consumers' intellectual reactions for his or her anticipation plus understanding of an item or even support throughout period are usually referred to as their own degree of satisfaction (Parasuraman, Zeithaml, in addition Fruit, 1988, eighty-five; Zeithaml, Bitner as well as Gremler, 2013). A number of versions in addition to frames happen to be suggested by simply teachers (Yuksel, 2008) to supply the much more crucial knowledge of the concept, using the 'expectancy disconfirmation model' (Figure 1) probably probably the most popular to describe client and even individual fulfillment inside the health care business (Grimmelikhuijsen and even Porumbescu, 2017; Oliver, 2014). This specific idea emphasises the importance associated with customer anticipations from the services plus feels that will any kind of difference among all those anticipation together with fact offers the probability of impact individuals objectives inside whether good or perhaps an unfavorable method (East ainsi que ing. 2013; Zeithaml, Bitner, additionally Gremler, 2013). It really is not even close to without having detractors, nonetheless, along with Clinton and also Wellington (2013) fighting, possibly harshly, that this expectations disconfirmation style can simply be used with regard to dimension in the post-purchase assistance stage (Che Nawi, Ing Mamun, plus Raston, 2015), in the viewpoint which will client satisfaction way of measuring must also build relationships the particular pre-purchasing period (Che Nawi, 's Mamun furthermore Raston, 2015), from your thoughts and opinions that this dimensions regarding client satisfaction also needs to build relationships typically the pre-pur (Clinton in addition to Wellington, 2013).

Figure 1: Expectancy-Disconfirmation Model of Satisfaction

Source: Oliver (2014).

Since the 'value-percept' concept related to fulfillment views customer happiness as the psychological response caused by the particular client's intellectual assessment from your item or even service's worth (Westbrook in addition Reilly, 1983), the specific pleasure of the client's requirements is recognized as since the fulfillment of the user's requirements (Clinton as well as Wellington, 2013; Far eastern ainsi que ing., 2013). Based on the speculation, the higher the level of contour among recognized really worth plus merchandise ideals, the higher the chance which will clients will be happy (Olubusola, 2014). Due to the fact this idea considers the facts associated with feelings additionally benefit, it really is regarded as helpful to mix the actual theory/models to be able to provide an a lot more extensive and also logical description connected with client satisfaction (Forero furthermore Gómez, 2017; Zeithaml, Bitner in addition to Gremler, 2013). This particular theory/model must be combined with support high quality (SERVQUAL) style, which is often used to judge amounts of top quality within customer support (Forero and even Gómez, 2017; Zeitham

The specific support good quality design and style (SERVQUAL) was created by simply Zeithaml, Parasuraman, in addition Fruit (1990) in fact it is depending on 5 sizes: tangibles, dependability, responsiveness, guarantee, together with compassion. It is often popular inside the framework regarding health care solutions (Al-Neyadi, Abdallah, plus Malik, 2016; Aliman in addition to Mohamad, 2016; Alrubaiee as well as Alkaa'i, 2016; Zeithaml, Bitner, and contains recently been found that you will tangibility, stability, and even guarantee are 3 of the very most solid predictors linked to individual pleasure inside a Malaysian atmosphere (Aliman together with Mohamad, 2016). It has to be taken into account that this some other features have been considered substantial as well, because proved merely by numerous research in the health-related business, through which almost all several areas of affected person fulfillment have been discovered to become cautiously related: tangibles, empathy, confidence, responsiveness, additionally reliability (Rathee, Rajain, plus Isha, 2016; Subashini in addition to Poongodi, 2016).

The Importance of the Human in the Service Experience

Employees are usually intrinsically linked to the shipping related to top quality solutions, which can be the topic of earlier study within the service provider (Khosravi plus Anvari, 2013; Marinkovi, Loncaric, in addition to Loncaric, 2014; Siddiqi, 2015; Saxena and even Singh, 2015; Saxena together with Singh, 2015). Within the healthcare business, the particular part from the worker is very substantial, because of the normal plus immediate conversation that develops among individuals in addition to medical center personnel throughout the entire support encounter (from entry in order to discharge) (Jeve, Oppenheimer and even Konje, 2015; Sherwood, 2013; Wirtz ainsi que ing., 2012). Produce a good environment that will stimulates worker participation, in addition workers could be more willing to supply high quality services, that will possess an advantageous impact upon patients' anticipation associated with assistance high quality (Lee ainsi que ing., 2012). (Janicijevic, ou 's. 2013; Lowe, this year; Steve, Sharma together with Kumar, 2013). The particular health professional wedding rating, which is used simply by a few private hospitals plus shows of which higher doctor proposal ratings are often connected with decreased individual problem directories, is definitely a sort of this particular (Paller in addition to Perkin, 2014). With regards to making sure regularity and even visibility working shipping and delivery, a few wellbeing organizations possess built personnel assessment applications, other people depend on understanding through stakeholders, although some depend nearly totally about comments via customers (Cornerstone OnDemand, 2014; Vizzuso, 2015). Patients' disappointment may be brought on by the amount of time it requires to solve the prolonged situation, or even it might be linked to a good unsolved problem that may be past typically the power over health care staff. The final results linked to suggestions, especially customer opinions, should be construed within framework (Pan, Liu, together with, Ali, 2015). Rawal et. al (2021), Poongodi et. al(2022), Ramesh TR et.al (2022), Ahila A et.al (2022), Muniyappan et. al(2022) , Y. Shi et. al (2020), Guobin Chen et.al (2020), Yuanjin Xu et. al (2021), Ding Li et. al (2021) , Bin Yuan et. al (2021), Chi Z et. al (2021)

The Moderating Impact of Patient Characteristics

Earlier studies have looked into the individual characteristics that will effect sights associated with in addition amounts of fulfillment using the high quality of the individuals health care encounter, along with the aspects of which effect these types of awareness as well as degrees of pleasure (Mosadeghrad, 2014). Consumers' satisfaction using their doctor remains discovered to become attained by a number of aspects, which includes sex, age bracket, schooling degree, additionally earnings (Chumbler, ainsi que ing. 2016; Lis, Patel, plus Gupta, 2015; Rojas-Mendez, Parasuraman, in addition to Papadopoulos, 2017; Samsudin and even Abdullah, 2017; Stepurko, Pavlova, together with Groot, 2016; Xiao plus Barb Besides the intensity from your illness, the reason behind

requiring something, as well as the rate of recurrence regarding outings towards medical center, it is often mentioned that will elements influence individual fulfillment (Batbaatar, ainsi que 's. 2016; Southard, 2010). Individuals who have been going through pain or even more serious signs or symptoms, extensive sickness, plus much more compared to 1 prolonged disease had been recorded to get reduce amounts of pleasure along with clinic solutions (Carlin ou approach. this year; Lis, Patel, in addition to Gupta, 2015). This can be due to the fact those individuals visit the medical center more often and they are consequently interesting with all the clinic atmosphere more regularly, growing the possibilities of a negative knowledge plus the analyzing involving earlier activities (Carlin ou ing. spring 2012; Lis, Pa (Footman ain 's. 2013). Based on study, older individuals are certainly more susceptible as compared to more youthful sufferers to find higher treatment and private attention through providers (Otani, Waterman, and even Dunagan, 2012), and thus, they have increased anticipation through the providers these people get (Carlin tout autant que ing. 2012). However, young people, who had been more hours limited, experienced better anticipations concerning the option of physicians with regard to discussion (Li, Wayne, and also, McKibben, 2016). Precisely what these kinds of prior properly exposed regarding the troubles related to keeping individual fulfillment throughout a comprehensive range associated with individuals, along with the requirement for improved regularity together with, probably, extra staff, offers provided increase for the discussion encircling the specific part regarding systems within health-related, which has bring the current study.

Integration of Technology in Healthcare

Offered the rise in every area of your life period, healthcare developments, in addition enhancements within individual standard of living, wellness is becoming essential than ever before for people, and also getting effects for that economic climate as well as community. Technical improvements, like synthetic brains, robotics, and also the precise product information stats, enhance the capacity of health care experts to supply much better analysis, enhanced decision-making, additionally far better remedying of individuals in the current bothersome market place caused by your fourth Industrial Trend (the fourth Commercial Revolution) (Bakar, Giboso plus Jasin, 2017; Donnelly, 2017). Improvement inside artificial cleverness, particularly, offers increased individual medical diagnosis in addition to therapy. For example, improvements throughout AJE possess permitted to come with an embrace precision up to 99 % inside the evaluation and even meaning associated with mammogram results, decreasing the advantages of unneeded biopsies as well as the risk regarding misdiagnosis (Clarke, Hamburger, together with, Paxton, 2018; Griffith, 2018; Huang, 2018). Businesses for example IBM's Watson with regard to Health insurance and the specific health care automatic robot 'Da Vinci Si', which are free from intellectual biases (Price Waterhouse Cooper, 2017) plus capable to access in addition to convert vast amounts related to information, could make far better and much more constant choices with an increase of reliability (Beasley, this year; Huang, 2018; Mohamad, 2017).

Together with surgical treatment and even analysis, we now have observed the creation of computer-controlled automatic medicine dishing out (Omnicell, 2017), which usually reduces work expenses whilst growing effectiveness via greater stock manage along with the decrease of drugs mistake. Incorporated systems is not only restricted to surgical treatment together with analysis (Grissinger, spring 2012; Pedersen, Schneider, plus, Scheckelhoff, 2016). Along with management and also nonclinical jobs like cleansing in addition to home cleaning, software and even robotics are utilized within private hospitals for numerous sorts additional duties. Due to the developing with regard to info storage space together with discussing amongst stakeholders, for example medical center sections, sufferers, plus insurance providers, systems has been acclaimed since the answer (Bakar ainsi que ing. 2017), since it has got the probability of improve performance and also have a good effect through the affected person journey-from sign up to be able to medical diagnosis in addition to treatment in order to expenses deal (Martinho, Rijo, furthermore, Nunes, 2015; Zhao ainsi que 's. 2017). The opportunity to boost the possibility of a far more good end result regarding individuals while furthermore offering a much more steady encounter ought to raise the probability of individual fulfillment; however how can health-related 'customers' knowledge interesting along with technology?

To ensure that technologies to be effectively incorporated in addition recognized inside healthcare, affected person wedding as well as expertise for making utilization of technology-driven support relationships are crucial aspects (Lee, 2018). Using an enjoyable experience of solutions will act as good encouragement for your identified power from the technological innovation additionally stimulates you replicate the knowledge later on (Lee, 2018; Li, Wayne, and even McKibben, 2016). Yet based on the study, clinic employees and also sufferers possess some

trepidation regarding developing using technologies throughout healthcare shipping (Ahlan furthermore Ahmad, 2014; Em relação à Rosis together with Barsanti, 2016; Flynn, Gregory, Makki plus Gabbay, this year; Ganapathy-Wallace, 2017). Is it feasible that this carried on ownership involving systems will certainly allow visitors to much better handle their own wellness? Might their particular amounts of pleasure boost when they had been a far more energetic participator inside their remedy? (See, for example, Shelter (2018), Miah, Hasan, in addition to Gammack (2017), and even Price Waterhouse Cooper (2017). Individuals, especially aged people that are a lot less skilled and far much less more comfortable with technological innovation, may encounter a feeling of lower self-pride whenever confronted by having to connect to a completely independent, computerised health-related system (Ahlan together with Ahmad, 2014; Vaportzis, Clausen, plus Gow, 2017). Consequently, the provision of preference, as a substitute with regard to affected individuals, could be the long term associated with technologies in the healthcare field (Larivière ou approach. 2017). Based on this, people might work together together with technological innovation so as to sustain degrees of believe in (Li, Wayne, in addition to, McKibben, 2016; Vehicle Doorn ain way., 2017), handle anticipation (Alaiad tout autant que ing., 2014), and even assistance the actual improved functionality connected with technologies between individuals as a way to enhance amounts of services high quality in addition, consequently, sufferer satisfaction (Barbash au même tire que ing. 2014; Phichitchaisopa as well as Naenna, 2013; Piesing, 2014).

This will certainly analyze four ideas around the part technological innovation performs working top quality, person happiness, plus the hyperlink among assistance good quality additionally affected individual fulfillment in order to obtain a far much deeper knowledge of these types of associations (MM Kamruzzaman et. al 2022). This particular study will certainly fill up the formerly recognized space inside the books concerning stakeholder awareness regarding systems as well as part inside individual pleasure, and also enhance analysis around the numbers of approval for that incorporation involving technology in to the numerous clinic divisions together with crucial medical surgery, along with management nonclinical methods, so that you can increase affected person fulfillment.

H1. There is a positive relationship between incorporating technology and patients' satisfaction.
H2. There is a positive relationship between incorporating technology and service quality.
H3. There is a positive relationship between service quality and patients' satisfaction.
H4. Service quality mediates the relationship between incorporating technology and patients' satisfaction.

METHODOLOGY

An online study along with 118 individuals plus qualitative selection interviews together with twenty-eight medical center staff have been used in the particular 2018 research, that was carried out utilizing a combined strategy. Participants for that political election had been Malaysian adults from your Sum Region within Malaysia, who have been chosen utilizing a comfort and ease test procedure in addition who acquired health care solutions via hostipal wards within the last 12 months. 118 response have been considered sufficient given that this particular examine simply wanted to check into people that frequented private hospitals inside the Tone Area, this is a small trial economic system, combined with the proven fact that there have been just a few linked aspects associated with this specific study. The particular review by itself was separated in to 3 components, the initial which centered on the specific respondents' experience as well as incorporated queries concerning their own sex, age bracket, schooling, earnings level, in addition to rate of recurrence related to clinic appointments. The second component dedicated to the actual respondents' encounters in the medical center and even incorporated concerns regarding their own activities within the clinic. Component 2 integrated inquiries regarding client awareness associated with the hospital support high quality, additionally portion about three involved issues related to consumer awareness from the use regarding technologies directly into clinic providers. Almost all problems have been ranked on the five-point Likert level, using 1 becoming highly argue together with five becoming firmly concur.

To be able to reached the choice interview, typically the individuals have been medical center workers by means of each medical and also management sections in order to acquire because broad a variety of viewpoints around the effect involving systems as you possibly can. Typically the sample was halted anytime vividness has been arrived at, meaning that whenever completely new info was not a lot more becoming given by individuals, there was clearly you do not have for just about any extra selection interviews to be carried out (Kuper, Lingard plus Livinson, 2008). An overall total associated with twenty-eight individuals took part with this analyze, leading to vividness. Inside a comparable problematic vein towards the study, this job interview routine has been broken into a few elements: element 1 handled the particular respondents' skills, including questions of their sexual

intercourse, age group, revenue diploma, in addition to profession; element two handled the specific respondents' points of views within the review; and even part three or more managed the actual respondents' views for the study (Y. Shi et. al 2020) . A number of concerns associated with views connected with clinic services top quality had been a part of Element a couple of, and some inquiries concerning medical center staff' facets upon including technological innovation in to clinic companies have been a part of Portion several.
All of the participants had been over the age of eighteen, according to this Malaysian Healthcare Government bodies Recommendations (2016), which often designate that will 18 many years may be the minimum era where the first is regarding enough growth to supply lawful authorization in order to health care. Respondents' assistance together with participation inside the study have been cautiously regarded as, together with involvement getting totally non-reflex minus intimidation (Guobin Chen et. al 2020). Even though simply no requests have been mentioned the specific respondent's health background, queries concerning their particular co-operation plus engagement within the study was requested in addition to clarified.

It had been chose to carry out the initial study having 10 the hospital clients who does not require already been contained in the final review to deal with the problems involving review gadget understandability and even stability. It absolutely was furthermore chose to carry out a new reliability check utilizing a Cronbach alpha dog to verify typically the dimension system (Ponto, 2015). The specific producing Cronbach alpha dog pourcentage has been absolutely no. 854 (0. 7), signifies that this analyze design utilized in the research experienced higher size furthermore inner regularity, in line with the outcomes (Malhotra in addition Birks, 06\; Tavakol together with Dennick, 2011). Nevertheless , even though members inside the preliminary analysis comprehended the particular text in the concerns as well as failed to think about one to become misleading, repeated, or even unnecessary consequently, there have been a few findings produced the exploration group required into account plus integrated in to the last analysis due to the last research changes. The particular recommendation was going to burglary the queue "The clinic atmosphere in addition to developing are usually appealing" straight into a couple of unique states allow it to be a lot more easy to understand. The majority of people who replied considered of which atmosphere and even design have been 2 specific elements that needs to be evaluated separately.

RESULTS AND DISCUSSION

With this research, 118 people that used solutions related to hostipal wards at least one time annually were contained in the test. The majority of people who required component had been woman (n sama dengan seventy four, or even sixty two. 7 % from the total). Whilst thirty six individuals (30. five percent) documented becoming between age groups associated with 25 plus thirty four, 30 4 participants (28. eight percent) noted becoming older than fifty five, 25 members (21. 2 percent) described getting between age range connected with thirty-five in addition to forty-four, and even eighteen people (15. a few percent) claimed getting involving the age ranges regarding forty five in order to fifty-five. fifty four individuals (45. eight percent) mentioned using a bachelors level, whilst twenty-seven members (22. nine percent) documented using an experts level. So far as generating possible is involved, most (53. three or more percent) gained a lot more than 6, 500 RM every year, along with individuals with higher earnings together with improved amounts of schooling becoming observed as the group probably to utilize health care providers, the summary which is verified from the books (Institute with regard to Public well-being, 2015). Because to the fact that individuals with an amount involving tertiary schooling may be applied ready that delivers far better worker advantages like employer-sponsored insurance coverage as well as generate a new month-to-month income which allows these types of to buy personal individual medical health insurance, this particular obtaining can come because no real surprise. All those who have00 medical insurance are much less probably compared to individuals that don't have medical insurance to find medical assistance more regularly, however in the big event linked to sickness, those individuals possess the secure knowledge they might go to a medical center plus specialist, instead of people that don't have medical insurance (Institute with regard to General public Wellbeing, 2015).

Service Quality

When the experts looked at the specific views of shoppers with regards to the particular support top quality features, these people found that there are particular spaces inside the current flow of healthcare. Nearly all participants made the decision or even highly determined using the tangibles, like that will private hospitals have been nicely managed (80. a few percent), have been thoroughly clean (89 percent), together an attractive atmosphere (70. six percent), that is in line with earlier study (Li, Wayne, plus McKibben, 2016; Nadi ainsi que ing. 2016; Teshnizi ainsi que ing. 2018), nonetheless they experienced much less agreement or perhaps solid deal in regards to typically the hospital's responsiveness, stability, guarantee, in addition to compassion focusing the The

specific books has received which will personnel are usually crucial towards the services reference to individuals (Jeve ou 's. 2015; Wirtz ou approach. 2012), and when they may not be providing sufficient amounts of therapy, the particular drive to be able to expose technologies will certainly obtain energy (Jeve ain way. 2012). Within the study, simply fifty eight. three or more percent associated with participants made a decision or even firmly chose which they obtained quick assistance through clinic workers, which usually impacts anticipation and even understanding of worth (Aragon together with Gesell, the entire year the year 2003; Mehta, 2015) and contains ramifications for any individuals belief regarding support high quality (Meesala in addition John, 2018; Seni plus Marinkovi, 2012), especially amongst more youthful sufferers, with regard to that the involving health care personnel is really important (Aragon in addition to Gesell, the year 2003; Meht (Li, Wayne, and even, McKibben, 2016).

Whilst sixty-eight. eight % of those who else clarified the actual review decided as well as highly arranged that may medical center workers have been qualified, just 50 9. two per cent chosen together with firmly opted of which clinic employees had been sympathetic additionally comforting, fifty-one. 4 pct decided and also highly arranged that could medical center staff offered all of them interest, plus 53. 7 % decided furthermore firmly arranged that can invoicing has been exact, based on the study results. Individual displeasure may develop in a similar fashion in order to response talking about typically the responsiveness of the medical center in case people think that personnel may be a lot more knowing. The majority of clinic staff concur that will requirements associated with treatment are often decreasing in addition to problem inadequate practicing intermittent degrees of interest, together with common reactions for example "patient treatment, understanding, and even top quality related to medical personnel possess damaged on the years" together with "nursing personnel seem to be really not skilled plus badly qualified. inch Northsteien (2016) shows that this kind of variations operating shipping in addition overall performance could be the result of getting to deal with infrequent in addition to complicated info (Nordsteien, 2016). These kinds of incongruencies happen to be recognized within the materials (Kwateng tout autant que. ing. 2017; Meesala and even Steve, 2018; Neyadi, Abdallah, together with, Malik, 2016; Rathee, Rajain, as well as Isha, 2016). May technological innovation, however, execute a much better work? Enhanced incorporation regarding systems in to the invoicing process may unquestionably enhance payment precision (Zhao au même tire que 's. 2017). Nevertheless. Inside the insufficient a definite general opinion, this part involving technology within changing your user interface remains talked about, the birth of the particular discussion associated with appropriate use regarding technologies, which often keeps of which systems much more suitable for improve a few sections in comparison to other people.

Patient Satisfaction and the Introduction of Technology

Anytime requested if they happen to have already been pleased with the treatment, most participants made the decision plus highly determined (76. six percent). What exactly is amazing, although, will be the way the most of medical center staff noticed delighted individuals within their place of work. Following a study in to exactly how clinic staff decided in case an individual has been delighted, these styles surfaced: "they acquired simply no immediate issues, inch "people returned towards the medical center, inch in addition to "whether somebody stated many thanks prior to leaving behind. inches The truth that non-e of those response certifies individual fulfillment shows the particular belief space among clinic personnel and even individuals along with the anticipation of shoppers concerning the high quality from the support (East ainsi que ing. 2013; Zeithaml, Bitner, together with, Gremler, 2013). Participants had been separated upon if the intro associated with technologies may enhance amounts of satisfaction, using the vast majority saying yes plus firmly tallying which they used internet to check on their own signs or symptoms just before browsing specialist. Whenever requested whether or not the intro related to technological innovation can improve degrees of pleasure, age bracket was obviously a substantial flexible (p. 001), together with viewpoint separated in addition in line with the job becoming carried out (67 percent). Due to their own study within 2016, the specific experts found that net healthcare study could hardly become depended on totally with regard to self-diagnosis and may not have to get used as an alternative regarding doctors, emphasising the advantages of human being conversation inside inpatient analysis (Glatter, 2016). With regards to making sure individual fulfillment in addition to high quality support, the majority of individuals decided and even extremely arranged that will assistance in between systems as well as people was your finest strategy. Sixty-six percent decided together with very arranged of which co-operation must be utilized to offer affected person medical diagnosis, while fifty. four per-cent decided plus remarkably arranged that will cohesiveness ought to be accustomed to carry out surgical procedures. Probably the reduce numbers of contract in addition to treatments may be explained from the proven fact that technology throughout surgical treatment is just not too founded because it is within prognosis (Barbash ou ing., 2014; Piesing, 2014). In addition , respondents' fairly increased

examples of arrangement additionally solid contract using the concept of automatic doctor prescribed reordering have been in addition very easily understood (61 percent). Around the much more management jobs, almost all participants in addition to clinic personnel decided that this carried on launch connected with technologies might boost the general top quality linked to services supply. These people reported scheduled appointment arranging and even arranging related to medicines because places where nearly entirely computerized procedures could be applied along with minimal human being participation. inches[The ownership connected with technology] might help sections like invoicing together with dishing away, that sections are often suited to software, inch a typical response via medical center employees. When questioned regardless of whether solutions needs to be utilized to almost all divisions, nearly all the hospital staff members declared that it ought to be "restricted to choose locations like payment and also sign up. very well For me of which assistance services within sections for example wards plus treatment centers need individual treatment given that automated programs are not able to express sympathy. inches This particular remark from your clinic worker is very significant because through the previous outcome which will sufferers considered the actual workers may carry out a lot more in order to create accord amongst on their own.

A Measurement Model and Hypothesis Testing

The particular calculating design has been utilized to analyze back links among individual joy, support high quality, in addition technologies. The outcomes are often offered within Table one Statistically considerable in zero. 001 was your element starting of most constructs, which was a lot more than. seven for all those buildings. Inner regularity plus create stability of constructs have been verified simply by Cronbach's alpha dog ideals a lot more than. several (ranging via zero. 813 to be able to zero. 917) as well as amalgamated dependability ideals more than. 8 (ranging through zero. 888 in order to zero. 948), correspondingly. An additional obtaining was that this typical distinction gathered coming from almost all constructs has been larger than. five (ranged by means of zero. 6339 so as to zero. 858), which often pointed out the constructs experienced solid concourant quality. In addition, the typical difference recovered by way of every build had been bigger than the specific optimum discussed variation (which went from absolutely no. 417 to be able to no. 655), demonstrating that the specific constructs got discriminant abilities (discriminant top quality sama dengan higher than the most contributed variance).

TABLE 1. The Results of the Measurement Model Assessment

Construct/items	Factor loading	Average variance extracted	Composite Reliability	Cronbach's Alpha	Communality	Redundancy	Shared variance
Service quality		0.741	0.934	0.911	0.741	0.052	0.581
Tangibility	0.760						
Assurance	0.916						
Empathy	0.808						
Reliability	0.907						
Responsiveness	0.900						
Tangibility		0.639	0.899	0.859	0.639	0.016	0.417
Tangibility 1	0.760						
Tangibility 2	0.798						
Tangibility 3	0.841						
Tangibility 4	0.787						
Tangibility 5	0.810						
Assurance		0.775	0.912	0.855	0.775	0.049	0.655
Assurance 1	0.884						
Assurance 2	0.898						
Assurance 3	0.858						
Empathy		0.754	0.902	0.837	0.754	0.052	0.478
Empathy 1	0.851						

Empathy 2	0.876						
Empathy 3	0.879						
Reliability		0.726	0.888	0.813	0.726	0.031	0.638
Reliability 1	0.865						
Reliability 2	0.871						
Reliability 3	0.820						
Responsiveness		0.739	0.919	0.883	0.739	0.047	0.655
Responsiveness 1	0.847						
Responsiveness 2	0.901						
Responsiveness 3	0.856						
Responsiveness 4	0.834						
Satisfaction		0.858	0.948	0.917	0.858	0.325	0.581
Satisfaction 1	0.922						
Satisfaction 2	0.939						
Satisfaction 3	0.917						

. The particular strength design evaluation plus speculation screening were carried out, along with the results are usually offered within Desk 2nd. Typically the ideas have been examined with this study utilizing a two-step process. 1st, the style has been authenticated making use of the particular lower-order aspects of support high quality to make sure that it absolutely was legitimate. 2nd, the specific valuable adjustable ranking from the lower-order constructs has been calculated, and also the design has been explained along with support top quality like a higher-order create, leading to the last style. The constituents associated with services top quality, however, was the important flexible rating produced from the actual lower-order constructs. In order to figure out the conventional error in the organizations in addition their own p-values, typically the bootstrapping process together with 2k replications has been performed. The outcomes says the overall a result of implementing systems upon individual satisfaction has been good as well as statistically substantial (sama dengan zero. 167, g sama dengan absolutely no. 051), almost completely credit reporting speculation 1 (H1). In addition, this use regarding systems has been proved to be positively connected in order to assistance good quality (r persis oleh zero. 268, g. 001), therefore credit rating speculation second . H3 had been backed from the finding of the incredibly considerable good business among services premium quality in addition to affected person satisfaction (r sama dengan no. 774, l actually zero. 001), which usually offered extra proof. To conclude, the particular roundabout corporation in between taking on technology and even patients' joy through assistance top quality has been been shown to be good together with statistically considerable (r sama dengan absolutely nothing. 207, s totally free. 01), which often supported typically the speculation H4. The particular type referred to seven. two percent with the difference working high quality plus 50 8. a couple of % from your deviation inside individual fulfillment, based on the outcomes

TABLE 2. The Results of the Structural Model Assessment

Paths	Standardized path coefficient	95% confidence level		Hypothesis
		Lower Bound	Upper Bound	
Total effect Incorporating technology → Patient's satisfaction	0.167[†]	-0.327	0.327	H1
Direct effects Incorporating technology → Service quality	0.268[***]	0.107	0.428	H2
Service quality → Patient's satisfaction	0.774[***]	0.661	0.886	H3
Incorporating technology → Patient's	-0.043	-0.202	0.116	

satisfaction					
Indirect effect Incorporating technology → Service quality → Patient's satisfaction	0.207¨	0.076	0.338		H4

P < 0.1, ˙ P < 0.05, ¨ P < 0.01, ¨˙ P < 0.001

In line with the results, H2, H3, plus H4 are often backed, whilst H1 is just partly supported, demonstrating that technologies is essential within the shipping related to support high quality, which is consequently associated with individual fulfillment, yet it has an roundabout partnership among integrating systems in addition to individual satisfaction, rather than immediate connection. The importance old inside technical approval, which has recently been exhibited inside the books (Chumbler ainsi que ing. 2017; Rojas-Méndez, Parasuraman, and even Papadopoulos, 2017; Samasudin in addition Abdullah, 2017), assists in the conclusions from your materials (Lee, 2018; Miah, Hasan, as well as Gammack, 2017; Price Waterhouse Cooper, 2017), together with shows the benefits of the assessed way of applying technologies in the health care field Healthcare supervisors ought to concentrate on the particular management functions connected with medication 1st, instead of having a duvet method of the creation of technology, to be able to provide really worth plus handle anticipation pertaining to services delivery. It is because, although customers are usually disappointed using the present human being provide, these people stay sceptical that will technological innovation can provide the right formula.

CONCLUSION

Generally, participants experienced good awareness from the support high quality sizes in addition had been pleased with the whole medical center support; nonetheless, there was clearly a qualification related to not caring particularly connected with clinic workers along with the regions of guarantee, responsiveness, stability, plus compassion which were examined (Aliman in addition to Mohamad, 2016; Meesala and even Steve, 2018; Wu as well as Li, 2016). Even though it holds true that will people will usually expose the certification associated with disparity in to the services encounter (Lowe, this year; Heath, 2017; Siddiq, 2015), this might not really exclude the opportunity of which technologies can execute a much better work. Possibly due to the fact health care is recognized as to become an extremely customised together with human-centered services (Lee, 2018), almost all participants favored the particular combined method of analysis plus therapy, which could possibly slow up the incongruencies in addition to stresses around the human being problem. Invoicing, sign up, and even scheduled appointment arranging are usually samples of nonclinical procedures that have been recognized because places where growing software program may enhance the current knowledge.

The information acquired out of this study will certainly promote enhancement linked to assistance top quality additionally client satisfaction within healthcare solutions simply by showing technological innovation in to facets of functional functions, therapeutic remedies, together with evaluation methods. In addition, this specific research offered useful understanding towards the medical care business within their attempts in order to improve guidelines plus create methods for enhance individual satisfaction searching in customers' awareness around the assistance good quality measurements (tangibles, confidence, dependability, responsiveness, empathy) in addition to, consequently, to produce a patient-centered medical company inside Malaysia (Macleod, 2017).

The study, however, is just not without having the disadvantages, the initial which was your test dimension, which usually, while not too young to supply statistically legitimate outcomes, might have gained through becoming bigger throughout variety. Additionally , typically the study's information has been gathered coming from personal individuals within Malaysia's Sum Area, which often offered another disadvantage. It had been not necessarily considered to become substantial downside because the participants for this study are usually common related to exclusive individuals through Malaysia. That being said, the study failed to protect the specific viewpoints regarding sufferers that obtained general public health care and also people that would not get healthcare treatment in the area, which is resolved inside a long term study.
The particular writers suggest to perform an assessment analysis among general public and also hostipal wards inside Malaysia, that will not have to get limited to just one town, among all of their some other topics involving long term research. Second of all, additional exploration must be carried out to the numerous health-related techniques, medical stores, physician's surgeries/clinics, and even private hospitals enabling person furthermore comparison research in to exactly how individuals expertise adding technologies in to the distinctive systems connected with medical therapy. It might be good with regard to repeat analysis upon cross-cultural issues, and also to expand the actual range in the researching to incorporate each produced together with building countries, along with analyzing any type of possible disparities among countryside plus towns. A final region that could take advantage of extra evaluation will be the views linked to sufferers who else considered there is a substantial link in between developing systems in addition to enhancing the conventional associated with program. They displayed a % with the populace in several conditions, nevertheless opinions have been important to achieve a far more extensive knowledge of exactly how technologies could be used to improve healthcare shipping.

References

1. Adamy, J. (2012). 'U.S. Ties Hospital Payments to Making Patients Happy'. *The Wall Street Journal* [online]. https://www.wsj.com/articles/SB10000872396390443890304578010264156073132 (Accessed 22 October 2019).
2. Ahlan, A. & Ahmad, B. (2014). 'User Acceptance of Health Information Technology (HIT) in Developing Countries: A Conceptual Model'. *Procedia Technology*, Vol.16, pp.1287-1296.
3. Alaiad, A., Zhou, L. & Koru, G. (2014). 'An Exploratory Study of Home Healthcare Robots Adoption Applying the UTAUT', Model. *International Journal of Healthcare Information Systems and Informatics*, Vol.9 No.4, pp.44-59.

4. Aliman, N. & Mohamad, W. (2016). 'Linking Service Quality, Patients' Satisfaction, and Behavioral Intentions: An Investigation on Private Healthcare in Malaysia'. *Procedia - Social and Behavioral Sciences*, Vol.224, pp.141-148.
5. Al-Neyadi, H., Abdallah, S. & Malik, M. (2016). 'Measuring patient's satisfaction of healthcare services in the UAE hospitals: Using SERVQUAL'. *International Journal of Healthcare Management*, Vol.11 No.2, pp.96-105.
6. Alrubaiee, L. & Alkaa'ida, F. (2011). 'The Mediating Effect of Patient Satisfaction in the Patients' Perceptions of Healthcare Quality – Patient Trust Relationship'. *International Journal of Marketing Studies*, Vol.3 No.1, pp.103-127.
7. Amole B. B., Oyatoye E. O. & Kuye O. L. (2015). 'Determinants of Patient Satisfaction on Service Quality Dimensions in The Nigeria Teaching Hospitals'. *Economics, Management, Innovation*, Vol.7 No.3, pp.3-20.
8. API Healthcare (2015). 'The Rising Importance of Patient Satisfaction in a Value-Based Environment'. *API Healthcare*, [online] https://apihealthcare.com/sites/default/files/MC_CL_PAS_PPA_0000000001.pdf (Accessed 22 October 2019).
9. Aragon, S. & Gesell, S. (2003). 'A Patient Satisfaction Theory and Its Robustness Across Gender in Emergency Departments: A Multigroup Structural Equation Modeling Investigation'. *American Journal of Medical Quality*, Vol.18 No.6, pp.229-241.
10. Bakar, N. A., ChePa, N. & Md Jasin, N. (2017). 'Challenges in the implementation of hospital information systems in Malaysian public hospitals' in Zulikha, J. & N. H. Zakaria (Eds.), Proceedings of the 6th International Conference on Computing & Informatics (pp 636-642). Sintok: School of Computing.
11. Batbaatar, E., Dorjdagva, J., Luvsannyam, A., Savino, M. & Amenta, P. (2016). 'Determinants of patient satisfaction: a systematic review'. *Perspectives in Public Health*, Vol.137 No.2, pp.89-101.
12. Beasley, R. A. (2012). 'Medical Robots: Current Systems and Research Directions'. *Journal of Robotics*, Issue.2012, pp.1- 14.
13. Carlin, C.S., Christianson, J.B., Keenan, P. & Finch, M. (2012). 'Chronic illness and Patient Satisfaction'. *Health Services Research*, Vol.47 No.6, pp.2250–2272.
14. Clarke, H. Burger, J. & Paxton, V. (2018). 'Does robotics and artificial intelligence have a future in the healthcare space?' *Corrs Chambers Westgarth*. [online]. http://www.corrs.com.au/thinking/insights/does-robotics-and-artificial-intelligence-have-a-future-in-the-healthcare-space/ (Accessed 20 October 2019).
15. MM Kamruzzaman, Bingxin Yan, Md Nazirul Islam Sarker, Omar Alruwaili, Min Wu, Ibrahim Alrashdi. (2022). Blockchain and Fog Computing in IoT-Driven Healthcare Services for Smart Cities. *Journal of Healthcare Engineering*, Volume 2022, https://doi.org/10.1155/2022/9957888
16. Chakraborty, R. & Majumbar, A (2011). 'Measuring consumer satisfaction in health care sector: the applicability of SERVQUAL'. *Journal of Arts, Science & Commerce*, Vol.2 No.4, pp.149 – 160.
17. Che Nawi, N., Al Mamun, A. & Raston, A. N. (2015). 'Examining Customer Satisfaction at the Point-of-Purchase Phase: A Study on Malaysian e-Consumers'. *Asian Social Science*, Vol.11 No.16, pp.88-97.
18. Christie, S. (2018). 'Robotic revolution: How a robot could be your next surgeon'. *The Telegraph*. [online]. https://www.telegraph.co.uk/business/2017/11/28/robotic-revolution-robot-could-next-surgeon/ (Accessed 18 October 20190.
19. Chumbler, N., Otani, K., Desai, S., Herrmann, P. & Kurz, R. (2016). 'Hospitalized Older Adults' Patient Satisfaction'. *SAGE Open*, Vol.6 No.2, pp.1-7.
20. Clinton, A. & Wellington, T. (2013). 'A Theoretical Framework of Users' Satisfaction/Dissatisfaction Theories and Models', *2nd International Conference on Arts, Behavioral Sciences and Economics Issues*, pp.48-53.
21. Cornerstone OnDemand (2014). 'The Challenging State of Employee Engagement in Healthcare Today - and Strategies to Improve It'. *Cornerstone OnDemand*, [online]. http://go.cornerstoneondemand.com/rs/sonar6/images/csod-wp-healthcare-employee-engagement.pdf (Accessed 18 October 2019).
22. De Rosis, S. & Barsanti, S. (2016). 'Patient satisfaction, e-health, and the evolution of the patient–general practitioner relationship: Evidence from an Italian survey'. *Health Policy*, Vol.120 No.11, pp.1279-1292.

23. Deloitte (2017). 'The hospital of the future: How digital technology can change hospitals globally'. *Deloitte*, [online] https://www2.deloitte.com/content/dam/.../global/.../us-lshc-hospital-of-the-future.pdf (Accessed 20 October 2019).
24. Department of Statistics Malaysia (2016). 'Press Release: Services Statistics Health (Private Sector)', *Department of Statistics Malaysia.* [online]. https://www.dosm.gov.my/v1/index.php?r=column/pdfPrev&id=bTZTQnhDMzlUdDVhVzRkdVFwZDVKUT09 (Accessed 18 October 2019).
25. Donnelly, L. (2017). 'Forget your GP, robots will 'soon be able to diagnose more accurately than almost any doctor'. *The Telegraph*. [online]. https://www.telegraph.co.uk/technology/2017/03/07/robots-will-soon-able-diagnose-accurately-almost-doctor/ (Accessed 19 October 2019).
26. East, R., Singh, J., Wright, M. & Vanhuele, M. (2013). *Consumer Behavior: Application in Marketing*, 2nd Edition. Singapore: SAGE Publications.
27. Y. Shi, S. Wang, S. Zhou and M. M. Kamruzzaman. (2020). Study on Modeling Method of Forest Tree Image Recognition Based on CCD and Theodolite. *IEEE Access*, vol. 8, pp. 159067-159076, 2020, doi: 10.1109/ACCESS.2020.3018180
28. Flynn, D., Gregory, P., Makki, H. & Gabbay, M. (2009). 'Expectations and experiences of eHealth in primary care: A qualitative practice-based investigation'. *International Journal of Medical Informatics*, Vol.78 No.9, pp.588-604.
29. Footman, K., Roberts, B., Mills, A., Richardson, E. & McKee, M. (2013). 'Public satisfaction as a measure of health system performance: a study of nine countries in the former Soviet Union'. *Health Policy*, Vol.112, pp.62–69.
30. Forero, D. & Gómez, A. (2017). 'Comparison of measurement models based on expectations and perceived performance for the satisfaction study in health services'. *Suma Psicológica*, Vol.24 No.2, pp.87-96.
31. Ganapathy-Wallace, S. (2017). 'Scepticism still surrounds medical technology'. *Digital News Asia*. [online]. https://www.digitalnewsasia.com/business/scepticism-still-surrounds-medical-technology (Accessed 18 October 2019).
32. Ganasegeran, K., Perianayagam, W., Abdul Manaf, R., Ali Jadoo, S. & Al-Dubai, S. (2015). 'Patient Satisfaction in Malaysia's Busiest Outpatient Medical Care'. *The Scientific World Journal*, Issue.2015, pp.1-6.
33. Glatter, R. (2016). 'Your Doctor Vs. Dr. Google: And The Winner Is....', *Forbes*. [online]. https://www.forbes.com/sites/robertglatter/2016/10/13/doctors-beat-online-symptom-checkers-new-study-finds/ (Accessed 17 October 2019).
34. Griffiths, S. (2018). This AI software can tell if you're at risk from cancer before symptoms appear. *Wired*. [online]. https://www.wired.co.uk/article/cancer-risk-ai-mammograms (Accessed 17 October 2019).
35. Guobin Chen, Zhiyong Jiang, M.M. Kamruzzaman. (2020). Radar remote sensing image retrieval algorithm based on improved Sobel operator, *Journal of Visual Communication and Image Representation*, Volume 71, 2020, 102720, ISSN 1047-3203 https://doi.org/10.1016/j.jvcir.2019.102720
36. Grimmelikhuijsen, S. & Porumbescu, G. A. (2017). 'Reconsidering the expectancy disconfirmation model. Three experimental replications', *Public Management Review*, Vol.19 No.9, pp.1272-1292.
37. Grissinger, M. (2012). 'Safeguards for Using and designing automated dispensing cabinets'. *Pharmacy and Therapeutics*, Vol.37 No.9, pp.490–530.
38. Gruessner, V. (2016). 'How IT Automation Improves Customer Satisfaction'. *HealthPayer Intelligence*. [online]. https://healthpayerintelligence.com/news/how-health-it-automation-improves-consumer-satisfaction (Accessed 19 October 2019).
39. Haque, A., Mamun Sarwar, A. A., Yasmin, F., Anwar, A. & Nuruzzaman. (2012). 'The Impact of Customer Perceived Service Quality on Customer Satisfaction for Private Health Centre in Malaysia: A Structural Equation Modeling Approach'. *Information Management and Business Review*, Vol.4 No.5, pp.257-267.
40. Hasyimah, R., Aniza, I., Ahmad Taufik, J., Jamsiah, M. & Azimatun Noor, M. (2014). 'Factors affecting outpatients' satisfaction at University Kebangsaan Malaysia Medical Centre (UKMMC)'. *Malaysian Journal of Public Health Medicine*, Vol.14 No.2, pp.77-85.
41. Hawthorne, G., Sansoni, J., Hayes, L., Marosszeky, N. & Sansoni, E. (2014). 'Measuring patient satisfaction with health care treatment using the Short Assessment of Patient Satisfaction measure delivered superior and robust satisfaction estimates'. *Journal of Clinical Epidemiology*, Vol.67 No.5, pp.527-537.

42. Heath, S. (2017). 'Creating Provider, Patient Engagement in Value-Based Care Models'. *Patient Satisfaction News*. [online]. https://patientengagementhit.com/news/creating-provider-patient-engagement-in-value-based-care-models (Accessed 18 October 2019).
43. Hekkert, K., Cihangir, S., Kleefstra, S., Van den Berg, B. & Kool, R. (2009). 'Patient satisfaction revisited: A multilevel approach'. *Social Science & Medicine*, Vol.69 No.1, pp.68-75.
44. Heppel L. F. (2016). 'Strategies to Improve Patient Satisfaction and Organizational performance in Healthcare'. *Walden University ScholarWorks*. [online]. http://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=3391&context=dissertations (Accessed 18 October 2019).
45. Ho, S. A., Lee, M. H., Broadbent, E. & MacDonald, B. A. (2017). 'Gathering healthcare service robot requirements from young people's perceptions of an older care robot'. *First IEEE International Conference on Robotic Computing*, n/p.
46. Huang, E. (2018). 'A Chinese hospital is betting big on artificial intelligence to treat patients'. *World Economic Forum*. [online] https://qz.com/1244410/faced-with-a-doctor-shortage-a-chinese-hospital-is-betting-big-on-artificial-intelligence-to-treat-patients/ (Accessed 18 October 2019).
47. Ibrahim, Y., Mohtar, S. & Dutse, G. A. (2015). 'Patient Perception on Service Quality Improvement among Public and Private Healthcare Providers in Nigeria and Malaysia'. *World Journal of Preventive Medicine*, Vol.3 No.4, pp.83-93.
48. Institute for Public Health (2015). 'National Health & Morbidity Survey, 2015: Healthcare Demand, Volume III'. *Institute for Public Health*. [online]. http://iku.moh.gov.my/images/IKU/Document/REPORT/NHMS2015-VolumeIII.pdf (Accessed 18 October 2019).
49. Janicijevic, I., Seke, K., Djokovic, A. & Filipovic, J. 'Healthcare workers satisfaction and patient satisfaction – where is the linkage?' *Hippokratia*, Vol.17 No.2, pp.157-162.
50. Jeve, Y., Oppenheimer, C. & Konje, J. (2015). 'Employee engagement within the NHS: a cross-sectional study'. *International Journal of Health Policy and Management*, Vol.4 No.2, pp.85-90.
51. John, S., Sharma, R. & Kumar Dhingra, M. (2013). 'Role of Employee Satisfaction in Influencing Patient Satisfaction'. *International Journal of Research Foundation of Hospital and Health Care Administration*, Vol.1 No.1, pp.13-18.
52. Khosravi, A. & Anvari, A. (2013). 'A comparative study of factors affecting customer satisfaction in private and public sector hospitals in Tehran'. *European Online Journal of Natural and Social Sciences*, Vol.2 No.3, pp.1088-1093.
53. Kuper, A., Lingard L. & Levinson, W. (2008). 'Critically appraising qualitative research'. *The British Medical Journal*. Vol.337(7671), No.a1035, pp.687-692.
54. Larivière, B., Bowen, D., Andreassen, T., Kunz, W., Sirianni, N., Voss, C., Wünderlich, N. & De Keyser, A. (2017). 'Service Encounter 2.0: An investigation into the roles of technology, employees, and customers'. *Journal of Business Research*, Vol.79, pp.238-246.
55. Lee, D. (2018). 'Strategies for technology-driven service encounters for patient experience satisfaction in hospitals'. *Technological Forecasting and Social Change*. [online]. https://www.sciencedirect.com/science/article/pii/S0040162518303962 (Accessed 21 October 2019).
56. Lee, H.W., Ramayah, T. & Zakaria, N. (2012). 'External factors in hospital information system (HIS) adoption model: A case on Malaysia', *Journal of Medical Systems*, Vol.36 No.4, pp.2129-2140.
57. Lee, S., Lee, D. & Kang, C. (2012). 'The impact of high-performance work systems in the health-care industry: employee reactions, service quality, customer satisfaction, and customer loyalty'. *The Service Industries Journal*, Vol.32 No.1, pp.17-36.
58. Li, M., Lowrie, D., Huang, C., Lu, X., Zhu, Y., Wu, X., Shayiti, M., Tan, Q., Yang, H., Chen, S., Zhao, P., He, S., Wang, X. & Lu, H. (2015). 'Evaluating patients' perception of service quality at hospitals in nine Chinese cities by use of the ServQual scale'. *Asian Pacific Journal of Tropical Biomedicine*, Vol.5 No.6, pp.497-504.
59. Li, Y., James, L. & McKibben, J. (2016). 'Trust between physicians and patients in the e-health era'. *Technology in Society*, Vol.46, pp.28-34.
60. Linder-Pelz, S. (1982). 'Toward a theory of patient satisfaction'. *Social Science & Medicine*. Vol.16 No.5, pp.577-582.
61. Lis, C. G., Patel, K. & Gupta, D. (2015) The Relationship between Patient Satisfaction with Service Quality and Survival in Non-Small Cell Lung Cancer – Is Self-Rated Health a Potential Confounder? *PLoS One*, Vol.10 No.7, pp.1-14.

62. Lovelock C. & Wirtz J. (2011). *Services Marketing: People, Technology, Strategy*, 7th Ed. London: Pearson Education Limited.
63. Lowe, G. (2012). 'How employee engagement matters for hospital performance'. *Healthcare Quarterly*, Vol.15 No.2, pp.29-40.
64. Macleod, A. (2017). 'Special Report: Malaysia's Healthcare Sector Provides a Catalyst for Growth'. *Global Risk Insights*. [online]. https://globalriskinsights.com/2017/04/malaysia-healthcare-sector/ (Accessed 20 October 2019).
65. Mahadi, N., Aziz. F., Zainal Ariffin, Z., Omar, S. S. & Yaakob, A. Y. (2017). 'How to Establish Customers Satisfaction in Healthcare Industry?' *International Journal of Academic Research in Business and Social Sciences, Human Resource Management Academic Research Society, International Journal of Academic Research in Business and Social Sciences*, Vol.7 No.10, pp.585-591.
66. Malaysian Medical Council (2016). 'Consent for Treatment of Patients by Registered Medical Practitioners', *Malaysian Medical Council*. [online]. http://www.mmc.gov.my/images/contents/ethical/Consent%20Guideline_21062016.pdf (Accessed 19 October 2019).
67. Malhotra, N.K. & Birks, D.F. (2006), *Marketing Research: An applied approach*. 2nd European Ed. Essex: Pearson Education Limited.
68. Martínez-López-de-Castro, N., Álvarez-Payero, M., Martín-Vila, A., Samartín-Ucha, M., Iglesias-Neiro, P., Gayoso-Rey, M., Feijoo-Meléndez, D., Casanova-Martínez, C., Fariña-Conde, M. & Piñeiro-Corrales, G. (2017). 'Factors associated with patient satisfaction in an outpatient hospital pharmacy'. *European Journal of Hospital Pharmacy*, Vol.25 No.4, pp.183-188.
69. Martinho, R., Rijo, R. & Nunes, A. (2015). 'Complexity Analysis of a Business Process Automation: Case Study on a Healthcare Organization'. *Procedia Computer Science*, Vol.64, pp.1226-1231.
70. Mehta, P. (2015). 'Experiential Marketing: Reconceptualizing mix elements for Health Services'. *Afro Asian Journal of Science and Technology*, Vol.2 No.1, pp.218-230.
71. Meesala, A. & Paul, J. (2018). 'Service quality, consumer satisfaction, and loyalty in hospitals: Thinking for the future'. *Journal of Retailing and Consumer Services*, Vol.40, pp.261-269.
72. Mettler, T., Sprenger, M. & Winter, R. (2017). 'Service robots in hospitals: new perspectives on niche evolution and technology affordances'. *European Journal of Information Systems*, Vol.26 No.5, pp.451-468.
73. Miah, S., Hasan, J. & Gammack, J. (2017). 'On-Cloud Healthcare Clinic: An e-health consultancy approach for remote communities in a developing country'. *Telematics and Informatics*, Vol.34 No.1, pp.311-322.
74. Ministry of Health (2014). Annual Report 2014. *Ministry of Health Malaysia.* Available from: http://www.moh.gov.my/images/gallery/publications/Annual%20Report%202014.pdf
75. Mohamad, F. (2017). 'Will Robots Replace Human Doctors?', *JSTOR Daily*. [online]. https://daily.jstor.org/will-robots-replace-human-doctors/ (Accessed 19 October 2019).
76. Morgan, B. (2017). '10 Things Robots Can't Do Better Than Humans'. *Forbes.* [online]. https://www.forbes.com/sites/blakemorgan/2017/08/16/10-things-robots-cant-do-better-than-humans/ (Accessed 20 October 2019).
77. Mosadeghrad, A. (2014). 'Factors Influencing Healthcare Service Quality'. *International Journal of Health Policy and Management*, Vol.3 No.2, pp.77-89.
78. Nadi, A., Shojaee, J., Abedi, G., Siamian, H., Abedini, E. & Rostami, F. (2016). 'Patients' expectations and perceptions of service quality in the selected hospitals'. *Med Arch*, Vol.70 No.2, pp.135–139.
79. Neupane, R. & Devkota, M. (2017). 'Evaluation of the Impacts of Service Quality Dimensions on Patient/Customer Satisfaction: A Study of Private Hospitals in Nepal'. *International Journal of Social Sciences and Management*, Vol.4 No.3, p.165.
80. Nordsteien, A. (2016). 'Handling inconsistencies between information modalities - workplace learning of newly qualified nurses'. *Proceedings of the Ninth International Conference on Conceptions of Library and Information Science*, Vol.22 No.1, n/p.
81. Oliver, R. (2014). *Satisfaction: A Behavioral Perspective on the Consumer*, 2nd Ed. Florence: Taylor and Francis.
82. Olubusola, A. O. (2014). 'User Satisfaction in Mobile Applications'. *University of Birmingham*. [online]. http://www.cs.bham.ac.uk/~rjh/courses/ResearchTopicsInHCI/2014-15/Submissions/ajayi--oluwande.pdf (Accessed 18 October 2019).

83. Omnicell (2017). 'Automated Dispensing Cabinet'. *Omnicell*. [online]. https://www.omnicell.com/mts/products_and_solutions_for_pharmacy/automated_dispensing_cabinets.aspx (Accessed 19 October 2019).
84. Otani, K., Waterman, B. & Dunagan, W. (2012). 'Patient Satisfaction: How Patient Health Conditions Influence Their Satisfaction'. *Journal of Healthcare Management*, Vol.57 No.4, pp.276-293.
85. Panchapakesan, P. L. Prakesh, S. & Chandrasekharan, R. (2015). 'Customer Satisfaction in Indian Hospitals: Moderators and Mediators', *Quality Management Journal*, Vol.22 No.1, pp.10-29.
86. Parasuraman, A., Zeithaml, V.A. & Berry, L.L. (1985). 'A Conceptual Model of Service Quality and Its Implications for Future Research'. *Journal of Marketing*, Vol.49 (Fall), pp.41-50.
87. Parasuraman, A., Zeithaml, V.A. & Berry, L.L. (1988). 'SERVQUAL: a multiple item scale for measuring, consumer perceptions of service quality'. *Journal of Retailing*, Vol.64 No.1, pp.12-40.
88. Paller D. A., & Perkin E. (2014). 'What's the Key to Providing Quality Healthcare?' *Gallup Business Journal*. [online]. http://businessjournal.gallup.com/content/14296/whats-key-providingqualityhealthcare.aspx (Accessed 19 October 2019).
89. Pan, J., Liu, D. & Ali, S. (2015). 'Patient dissatisfaction in China: What matters'. *Social Science & Medicine*, Vol.143, pp.145-153.
90. Pedersen, C., Schneider, P. & Scheckelhoff, D. (2016). 'ASHP national survey of pharmacy practice in hospital settings: Monitoring and patient education—2015'. *American Journal of Health-System Pharmacy*, Vol.73 No.17, pp.1307-1330.
91. Phichitchaisopa, N. & Naenna, T. (2013). 'Factors affecting the adoption of healthcare information technology'. *EXCLI Journal*, Vol.12, pp.413-436.
92. Piesing, M. (2014). 'Medical robotics: Would you trust a robot with a scalpel?' *The Guardian*. [online]. https://www.theguardian.com/technology/2014/oct/10/medical-robots-surgery-trust-future (Accessed 19 October 2019).
93. Ponto, J. (2015). 'Understanding and Evaluating Survey Research'. *Journal of the Advanced Practitioner in Oncology*, Vol.6 No.2, pp.168-171.
94. Prakash, B. (2010). 'Patient Satisfaction'. *Journal of Cutaneous and Aesthetic Surgery*, Vol.3 No.3, pp.151-155.
95. Price Waterhouse Cooper (2017). 'What doctor? Why AI and robotics will define New Health'. *PwC*. [online]. https://www.pwc.com/gx/en/industries/healthcare/publications/ai-robotics-new-health/ai-robotics-new-health.pdf (Accessed 20 October 2019).
96. Rau, J. (2015). 'Hundreds of Hospitals Struggle to Improve Patient Satisfaction'. *Kaiser Health News*. [online]. https://www.usnews.com/news/articles/2015/03/10/hundreds-of-hospitals-struggle-to-improve-patient-satisfaction (Accessed 19 October 2019).
97. Rashid, M. H., Mansor, A. A. & Hamzah, M. I. (2011). 'Service Quality and Patients' Satisfaction in Healthcare Service in Malaysia'. *International Journal of Customer Service Management*, Vol.1 No.1, pp.41-49.
98. Rathee, R., Rajain, P. & Isha, P.T. (2016). 'Confirmatory Factor Analysis of Service Quality Dimensions in Healthcare'. *International Journal of Science and Research*, Vol.5 No.5, pp.1740-1744.
99. Robbins, A. (2015). 'The Problem with Satisfied Patients'. *The Atlantic Daily*. [online] https://www.theatlantic.com/health/archive/2015/04/the-problem-with-satisfied-patients/390684/ (Accessed 20 October 2019).
100. Rojas-Méndez, J., Parasuraman, A. & Papadopoulos, N. (2017). 'Demographics, attitudes, and technology readiness'. *Marketing Intelligence & Planning*, Vol.35 No.1, pp.18-39.
101. Samsudin, S. & Abdullah, N. (2017). 'Healthcare Utilization by Older Age Groups in Northern States of Peninsular Malaysia: The Role of Predisposing, Enabling and Need Factors'. *Journal of Cross-Cultural Gerontology,* Vol.32 No.2, pp.223-237.
102. Sarwar, A. (2014). 'Healthcare Services Quality in Malaysian Private Hospitals: A Qualitative Study'. *International Journal of Hospital Research,* Vol.3 No.3, pp.103-112.
103. Saxena, M. & Singh, L. B. (2015). 'Customer Loyalty through Employee Engagement: A Conceptual Model'. *International Journal of Research in Management & Technology,* Vol.5 No.4, pp.289-297.
104. Schwab, K. (2016). 'The Fourth Industrial Revolution: what it means and how to respond'. *World Economic Forum*. [online]. https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/ (Accessed 20 October 2019).
105. Senić, V. & Marinković, V. (2012). 'Patient care, satisfaction, and service quality in health care'. *International Journal of Consumer Studies*, Vol.37 No.3, pp.312-319.

106. Shanmugapriya, S., Arun Kumar, K., Kiruthika, P. & Priya, L. (2017). 'An Empirical Study on Impact of Customers' Satisfaction and Loyalty Towards Hospitals in Coimbatore City'. *Biomedical Statistics and Informatics*, Vol.2 No.2, pp.69-72.
107. Sherwood R. (2013). 'Employee Engagement Drives Health Care Quality and Financial Returns'. *Harvard Business Review: Health*. [online]. https://hbr.org/2013/10/employee-engagement-drives-health-care-quality-and-financial-returns (Accessed 19 October 2019).
108. Sitzia, J. & Wood, N. (1997). 'Patient satisfaction: A review of issues and concepts'. *Social Science & Medicine*, Vol.45 No.12, pp.1829-1843.
109. Siddiqi, M. (2015). 'Work Engagement and Job Crafting of Service Employees Influencing Customer Outcomes'. *Vikalpa*, Vol.40 No.3, pp.277-292.
110. Solomon M. (2017). 'Customer Service in Healthcare: The Paradox Of Patient Satisfaction And Patient Experience'. *Forbes*. [online]. https://www.forbes.com/sites/micahsolomon/2017/05/11/delivering-customer-service-in-healthcare-patient-satisfaction-and-the-patient-experience/#3acc07aa3a7b (Accessed 19 October 2019).
111. Southard, R. N. (2010). 'Employee Engagement and Service Quality'. *Washington State University*. [online]. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.428.377&rep=rep1&type=pdf (Accessed 20 October 2019).
112. Stepurko, T., Pavlova, M. & Groot, W. (2016). 'Overall satisfaction of health care users with the quality of and access to health care services: a cross-sectional study in six Central and Eastern European countries'. *BMC Health Services Research*, Vol.16 No.1, n/p.
113. Subashini, D. & Poongodi, S. (2016). 'Service Quality and Patient's Satisfaction In Health Care Sector With Special Reference To Erode District'. *IOSR Journal Of Humanities And Social Science* (IOSR-JHSS), pp.23–27.
114. Swabey, P. (2016). 'Healthcare to benefit most from the Fourth Industrial Revolution, executives predict'. *Perspectives from The Economist Intelligence Unit (EIU)*. [online] https://www.eiuperspectives.economist.com/technology-innovation/healthcare-benefit-most-fourth-industrial-revolution-executives-predict (Accessed 18 October 2019).
115. Tavakol, M. & Dennick, R. (2011). 'Making sense of Cronbach's alpha'. *International Journal of Medical Education*, Vol.2, pp.53-55.
116. Teshnizi, S., Aghamolaei, T., Kahnouji, K., Teshnizi, S. & Ghani, J. (2018). 'Assessing quality of health services with the SERVQUAL model in Iran. A systematic review and meta-analysis'. *International Journal for Quality in Health Care*, Vol. 30 No.2, pp.82-89.
117. Torpie, K. (2015). 'Customer Service vs Patient Care'. *Patient Experience Journal*, Vol.1 No.2, pp.6-8.
118. Van Doorn, J., Mende, M., Noble, S., Hulland, J., Ostrom, A., Grewal, D. & Petersen, J. (2017). 'Domo Arigato Mr. Roboto'. *Journal of Service Research*, Vol.20 No.1, pp.43-58.
119. Vaportzis, E., Clausen, M. G. & Gow, A. J. (2017). 'Older Adults Perceptions of Technology and Barriers to Interacting with Tablet Computers: A Focus Group Study'. *Frontiers in Psychology*, Vol.8 No.1687, pp.1-4.
120. Vizzuso, J.D. (2015). 'Leadership Strategies to Influence Employee Engagement in Health Care. *Walden University*. [online] https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1473&context=dissertations (Accessed 19 October 2019).
121. Vogus, T. & McClelland, L. (2016). 'When the customer is the patient: Lessons from healthcare research on patient satisfaction and service quality ratings'. *Human Resource Management Review*. Vol.26 No.1, pp.37-49.
122. Westbrook, R. & Reilly, M. D. (1983). 'Value-percept disparity: An alternative to the disconfirmation of expectations theory of consumer satisfaction'. *Advances in Consumer Research*, Vol.10 No.1, pp.256–261.
123. Wu, H., Li, T. & Li, M. (2016). 'A Study of Behavioral Intentions, Patient Satisfaction, Perceived Value, Patient Trust, and Experiential Quality for Medical Tourists'. *Journal of Quality Assurance in Hospitality & Tourism*, Vol.17 No.2, pp.114-150.
124. Xiao, H. & Barber, J.P. (2008). 'The Effect of Perceived Health Status on Patient Satisfaction'. *Value in Health*, Vol.11 No.4, pp.719-725.
125. Yuksel, A. (2008). 'Consumer Satisfaction Theories: A Critical Review'. *Adnan Menderes University*, [online]

https://www.researchgate.net/publication/258224400_Consumer_Satisfaction_Theories_A_Critical_Review (Accessed 22 October 2019).
126. Zarei, E., Daneshkohan, A., Pouragha, B. & Marzban, S. A. (2015). 'An Empirical Study of the Impact of Service Quality on Patient Satisfaction in Private Hospitals, Iran'. *Global Journal of Health Science*, Vol.7 No.1, pp.1-9.
127. Zeithaml, V., Parasuraman, A. & Berry, L. (1990). *Delivering Quality Service*. New York: The Free Press.
128. Zeithaml, V., Bitner, M. & Gremler, D. (2013). *Services Marketing*. Nueva York: McGraw-Hill.
129. Zhao, P., Yoo, I., Lavoie, J., Lavoie, B. J. & Simoes, E. (2017). 'Web-Based Medical Appointment Systems: A Systematic Review'. *Journal of Medical Internet Research*, Vol.19 No.4, pp.e134.
130. Zubayer, M. (2017). 'Measuring Healthcare Services Quality in the Private Hospitals of Dhaka City, Bangladesh: An Empirical Study'. *British Journal of Marketing Studies*, Vol.5 No.1, pp.6-26.
131. Bharat S. Rawal, Poongodi M., Gunasekaran Manogaran, and Mounir Hamdi. 2021. Multi-Tier Stack of Block Chain with Proxy Re-Encryption Method Scheme on the Internet of Things Platform. ACM Trans. Internet Technol. 22, 2, Article 41 (May 2022), 20 pages. https://doi.org/10.1145/3421508
132. Poongodi, M., Hamdi, M., & Wang, H. (2022). Image and audio caps: automated captioning of background sounds and images using deep learning. Multimedia Systems, 1-9. https://doi.org/10.1007/s00530-022-00902-0
133. Ramesh, T. R., Vijayaragavan, M., Poongodi, M., Hamdi, M., Wang, H., & Bourouis, S. (2022). Peer-to-peer trust management in intelligent transportation system: An Aumann's agreement theorem based approach. ICT Express. https://doi.org/10.1016/j.icte.2022.02.004
134. Poongodi, M., Nguyen, T. N., Hamdi, M., & Cengiz, K. (2021). A Measurement Approach Using Smart-IoT Based Architecture for Detecting the COVID-19. Neural Processing Letters, 1-15. https://doi.org/10.1007/s11063-021-10602-x
135. A, M P, Hamdi M, Bourouis S, Rastislav K and Mohmed F (2022) Evaluation of Neuro Images for the Diagnosis of Alzheimer's Disease Using Deep Learning Neural Network. Front. Public Health 10:834032. doi: 10.3389/fpubh.2022.834032
136. Poongodi, M., Hamdi, M., Gao, J., & Rauf, H. T. (2021, December). A Novel Security Mechanism of 6G for IMD using Authentication and Key Agreement Scheme. In 2021 IEEE Globecom Workshops (GC Wkshps) (pp. 1-6). IEEE., Spain, DOI: 10.1109/GCWkshps52748.2021.9715537
137. Muniyappan, A.; Sundarappan, B.; Manoharan, P.; Hamdi, M.; Raahemifar, K.; Bourouis, S.; Varadarajan, V. Stability and Numerical Solutions of Second Wave Mathematical Modeling on COVID-19 and Omicron Outbreak Strategy of Pandemic: Analytical and Error Analysis of Approximate Series Solutions by Using HPM. *Mathematics* 2022, *10*, 343. https://doi.org/10.3390/math10030343
138. Y. Shi, S. Wang, S. Zhou and M. M. Kamruzzaman. (2020). Study on Modeling Method of Forest Tree Image Recognition Based on CCD and Theodolite. IEEE Access, vol. 8, pp. 159067-159076, 2020, doi: 10.1109/ACCESS.2020.3018180
139. Guobin Chen, Zhiyong Jiang, M.M. Kamruzzaman. (2020). Radar remote sensing image retrieval algorithm based on improved Sobel operator, Journal of Visual Communication and Image Representation, Volume 71, 2020, 102720, ISSN 1047-3203 https://doi.org/10.1016/j.jvcir.2019.102720
140. Yuanjin Xu, Ming Wei, M.M. Kamruzzaman, Inter/intra-category discriminative features for aerial image classification: A quality-aware selection model,Future Generation Computer Systems,Volume 119,2021,Pages 77-83,ISSN 0167-739X,https://doi.org/10.1016/j.future.2020.11.015.
141. Xing Li, Junpei Zhong, M.M. Kamruzzaman, "Complicated robot activity recognition by quality-aware deep reinforcement learning", Future Generation Computer Systems,Volume 117, 2021, Pages 480-485.
142. Bin Yuan, M. M. Kamruzzaman, Shaonan Shan, "Application of Motion Sensor Based on Neural Network in Basketball Technology and Physical Fitness Evaluation System", Wireless Communications and Mobile Computing, vol. 2021, Article ID 5562954, 11 pages, 2021. https://doi.org/10.1155/2021/5562954
143. Chi, Z., Jiang, Z., Kamruzzaman, M.M. et al. Adaptive momentum-based optimization to train deep neural network for simulating the static stability of the composite structure. Engineering with Computers (2021). https://doi.org/10.1007/s00366-021-01335-5

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