



Use of TRIZ Applications to Achieve Systematic Innovation Through Innovative Problem Solving in Hospitals

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Received: July 15, 2023

Revised: August 7, 2023

Accepted: September 25, 2023

Published: September 30, 2023

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DOI: [10.29303/jppipa.v9i9.4921](https://doi.org/10.29303/jppipa.v9i9.4921)

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Abstract: The aim of this research is to find out the use of the TRIZ application to build a systematic innovation in solving problems in hospitals in an innovative way. Research method used literature review method with qualitative approach. The data obtained in carrying out this research is secondary data that comes from various studies. Data is taken from international-based articles with a research range from 2017-2023. The data obtained is known to be a total of 11 international journal articles spanning 2017-2023. The data were analyzed by identifying the existence of identities, methods, research results, and categories in the form of services, infrastructure, and facilities. Finally, the findings of this study can be seen that services have a total of 9 of 11 data literature, infrastructure has a total of 3 of 11 data literature, and facilities have a total of 3 literature of 11 data. So from when the three were totaled it was 15/11 the data obtained from the research results. In terms of services, infrastructure and facilities, the problems in hospitals can be solved innovatively and systematically using the TRIZ method.

Keywords: TRIZ; hospital; innovation

Introduction

Problems in whatever context and place need a solution. Problem solving itself also has a concern or concept in launching its performance. Likewise with the hospital which also has its own problems. One way to do innovative problem solving for hospitals is the TRIZ method. The application of TRIZ is being used in providing structured innovations to achieve solutions to existing problems in hospitals. Because the problem in the hospital itself has its own complexities. For example in patient services, infrastructure, and completeness of facilities and infrastructure.

The problems that occur in hospitals are not only for patients but also affect the continuity of health and patient comfort. Therefore innovative development in solving various problems in hospitals with the TRIZ method is likely to be very helpful. Especially in patient care, infrastructure, and facilities that will be obtained by the patient in his treatment.

The shortened form of TRIZ consists of the initials "Teoriya Resheniya Izobreatatelskikh Zadatch"

(Imaginative Problems Understanding Hypotheses), which is alluded to as "теория решения изобретательских задач" in Russian. (Ng, Ng, Ang, Wahab, & Mohamad, 2021) Altshuller, who is known as the father of the TRIZ strategy, realized that in the real applications he learned while working as a real master, ideas that were put forward as unused innovations, were formed as a result of repetition of an essentially similar main theme with a unique name. completely different area and began to check the license (Jama-Rodzeńska et al., 2021).

The most important thing is to be able to anticipate the response that will occur to the impact of activities and plan appropriate regulatory steps. It is usually one of the most important highlights of TRIZ which recognizes it from other imaginative problem solving strategies. TRIZ identifies conflicting states in problems and offers solutions to these problems through conflicts. (Alomari et al., 2021) For example, we want the table we produce to be sturdy, but the materials we use to ensure this stability cause the table we make to be heavy and it is undesirable to make the table heavy. As another

How to Cite:

Dewi, S., Surjoputro, A., & Suhartono. (2023). Use of TRIZ Applications to Achieve Systematic Innovation Through Innovative Problem Solving in Hospitals. *Jurnal Penelitian Pendidikan IPA*, 9(9), 644-654. <https://doi.org/10.29303/jppipa.v9i9.4921>

illustration; We need to reduce their workload to increase faculty effectiveness, and if we consider recruiting new staff to provide this situation as an arrangement, this leads to undesired circumstances such as taking a toll. (Jost et al., 2021) As can be seen from the extensibility of the earlier cases, it is very difficult to provide a highly useful setting method, each setting proposition reveals its conflict situation. TRIZ, on the other hand, offers a proposal for efficient regulation of conflicting circumstances. TRIZ doesn't select from preferred manufacturers, it guides the decision maker. (Uribe Ocampo & Kaminski, 2023) Although this method is generally used to address problems in specialized fields, TRIZ parameters and standards are used in social and commercial fields such as non-technical settings, legislative matters, promotions, and business administration in recent years (Russo & Spreafico, 2020).

TRIZ is not a single strategy, but a collection of strategies that contain many strategies and to generate orderly thinking (Khodadadi & von Buelow, 2022; Spreafico, 2021). While some of the TRIZ strategies are aimed at understanding the issues at hand, some of them are somewhat long-lived. Despite the fact that there are many books and articles on TRIZ today, there is no distribution in which all TRIZ strategies are collected and included. Despite the fact that Altshuller, the maker and designer of TRIZ, features the TRIZ strategy in his distribution "Around A Innovation of Inventiveness" distributed with Shapiro, all strategies are excluded because the current TRIZ strategy is not included in the source. TRIZ has 40 point specialists worldwide to better measure TRIZ usage (Alvarez et al., 2022).

TRIZ (*Theory of Inventive Problem Solving*) provides us with an approach on how to understand problems by means of the evolution of a special framework. The TRIZ standards and tools are based on past investigations of thousands of licenses where recurring patterns were found. There are a limited number of known issues and there are a limited number of settings for these issues. These issues and their arrangements keep recurring in time. Based on this information, several instruments and strategies are created, which can help us to solve problems better quickly. Using the TRIZ instrument does provide quicker and more imaginative setups for very difficult problems. Although TRIZ was originally designed for product advancement, it should be a very good tool for process advancement or progress (Chang, Liu, & Chen, 2017).

An "Innovative Issue Handling Hypothesis," moreover known by its Russian acronym TRIZ, was created by G. Alsthuller (1984) to propose a system for the development of strategies to recognize and solve problems that arise amid advances in a specific

framework. Initially, Alsthuller created a set of instruments and strategies to empower engineers to be more imaginative with problem definition and determination in the 1970s. To advance this strategy, a hypothetical corpus was created. TRIZ is currently also a collection of speculations with stances and suspicions that offer a system for building problem-solving strategies (Hameed et al., 2022).

The application of TRIZ is now not limited to specific issues. Recently, unused research based on TRIZ was carried out to strengthen the TRIZ approach to solve any problem, that is, not a problem related to the progress of a specific framework. The extension of TRIZ to solving non-technical problems has not been built taking into account the three essential maxims of TRIZ: the notion of inconsistency as a system for problem definition, the concept of certain conditions which includes a systemic view of the protest being examined, and the concept of the law of progress which states that all frameworks follow a set of rules, which may or may not be known depending on the area of the question being examined. Based on research on generalizing TRIZ to illuminate non-technical problems, several of these approaches have been undertaken, particularly regarding identifiable evidence and problem definitions. Currently, TRIZ has different recognized commitments that address different phases of problem solving, including the problem definition stage, the problem investigation stage, and the problem solving stage. (Alomari et al., 2021; Chybowska et al., 2019; Mohammadi et al., 2022; Wu, Zhou, Pereira Pessôa, Peng, & Tan, 2021).

In previous studies that utilized the TRIZ application in providing systematic innovative solutions to hospitals. This research is known in research written by Güner & Köse (2020). The main considerations are to define the repeatability and use of the TRIZ strategy, which the company has recently used to create creative arrangements for divisional problems, and to provide recommendations that will enhance the use of TRIZ in the future. health care division by emphasizing their effectiveness in honing. In consideration, two separate post views were created. First, the scholastic distribution distributed between 2004-2019 with most of the subjects "TRIZ" and "Matrix of Contradiction" was checked through the Net of Science database and added up to 161 distributions. The main distribution has been analyzed by logic field and the research scope has been expanded slightly to further detail its use in the health sector, and the Google Researcher database has been vetted in an instant check. As a result of contemplation; Although TRIZ is a widely used method in special areas, it has been observed that it has been used in later benefit segments. As a reason why TRIZ is not widely used in

the benefits division, it appears that the TRIZ parameters mostly feature special areas. In order to take advantage of the adequacy and benefits of the TRIZ strategy in honing, the health administration division is also advised to adapt the TRIZ methodology for use in the service division (Güner & Köse, 2020) .

Other research is obtained in the writings of Yu, Cheng, & Tian (2023). Later, with the sharp increase in the number of vehicles in China, traffic congestion became more and more obvious, affecting the fast passage of ambulances. In addition, usually the vehicles often stop suddenly in some ancient communities, which also damages the ambulance to the private lane and reduces the efficiency of the protection. Apart from outside factors, the root cause was that the existing ambulances were too big to easily drive through the highways. In addition, there are problems such as clearing visits and real homogenization in conventional ambulances. Therefore, it is very important to make a conventional grand ambulance plan. First of all, the client's needs of different clients for ambulance are decided through client surveys and interviews; At that time, the ambulance assessment network was built using the expository pecking order plan to rank the client's needs by weight, to determine the direction of the modern type rescue vehicle plan. Through sending quality work, user requests are converted into ambulance specific requests, and conflicts are discovered. Meanwhile, the top-ranked needs were analyzed using the hypothesis of inventive problem thinking to seek quick comparability arrangements, and an inventive ambulance plan was carried out based on this premise. However, many makers have not considered product approval links when using these three strategies for innovative plans. In contrast, in this emergency vehicle plan moving forward, the FCE is presented to assess the modern plan, find deficiencies, and develop it, thereby completing the missing interfaces in the conventional plan and forming a complete scientific plan set. . Conventional expansive emergency vehicles with standard length, width and height of 5,800 mm, 2,000 mm and 2,600 mm are modified into mini ambulances with length, width and height of 3,500 mm, 1,600 mm, and 2,250 mm. At the same time, various subtle elements are optimized to plan a community micro-ambulance that truly meets client wishes and increases client satisfaction. Measuring and positioning the utilitarian needs of different users for ambulances by leveraging the TRIZ hypotheses and providing comparable arrangements has identified breakthrough directions for investigations of community ambulance inventive plans and has also provided references for other matters plans (Yu, Cheng, & Tian, 2023) .

Through these two studies it was found that TRIZ indeed guides the resolution of a problem in an institution or any context including hospitals and health services. Through this, the writer is currently finding a gap in the analysis of this research. This research has a gap to find problems in hospitals that need innovation, so it needs to be resolved by building innovation through TRIZ. The problems that exist in this hospital are reviewed in terms of service, infrastructure, and facilities from various research points of view that were reviewed.

The novelty of this study can be seen from the existence of a research method that uses a *literature review* of literature data taken in 2017-2023. This novelty with the two previous studies is where the data taken is so broad, namely from various relevant studies that are widely spread. Meanwhile, the difference that might stand out apart from the novelty of the method, namely the literature review, is that the data is also different and the way the research works is really different. The difference in question can be known from the analysis of literature data which is then interpreted based on 3 classifications of general problems that exist in hospitals, namely services, facilities, and infrastructure.

Therefore the purpose of this research is to find out the use of the TRIZ application to build systematic innovations in solving problems in hospitals in an innovative way. As a means of reference and knowledge to develop other research or other educational purposes. The title of this study is "Using the TRIZ Application to Achieve Systematic Innovation Through Innovative Problem Solving in Hospitals".

Method

Research using the literature review method has a qualitative approach. The data obtained in conducting this research is secondary data that comes from various studies. Data is taken from international-based articles with a research range from 2017-2023.

The data obtained is known to be a total of 11 international journal articles spanning 2017-2023. These data were analyzed by classifying them based on identity, method, research results, and the categories of each data. From here the data can be seen that the data obtained is in accordance with the categories to be analyzed.

Next, the writer interprets it as an in-depth discussion. This discussion is known based on its classification. The discussion of this research is classified into three categories, namely services, facilities, and infrastructure. It is through these three categories that will later provide information that TRIZ is indeed an innovation in building innovative, systematic problem

solving in hospitals or vice versa. This research finally ends by drawing conclusions from the results of the data that has been analyzed. The data that has been concluded by the author has confirmed that it is valid data.

Results and Discussion

This research ultimately presents the results in accordance with the research objectives. The following is the author describes the data that became the result of this study:

Table 1 Research Data and Categories

Journal Identity	Research methods	Research result	Category
<p>Authors: Dong-Shang Chang, Shu-Ming Liu, and Yi-Chun Chen Title: Applying DEMATEL to Assess TRIZ's Inventive Principles for Resolving Contradictions in the Long-Term Care Cloud System Publisher: Industrial Management & Data Systems, 117(6), 2017 (Chang et al., 2017)</p>	<p>The research conducted by them used the TRIZ and DEMATEL methods which were applied to LTC</p>	<p>His research resulted in that services to hospitals by innovating LTC on their <i>cloud systems</i> that use TRIZ and Dematel provide information on the existence of 6 main contradictions and 25 innovative principles. First, the government needs to consider planning a cloud system platform along with the participation of medical institutions and LTC. Second, the capabilities of the LTC institution need to be integrated with the pathology data records of the recipients of care to create an information system. Third, LTC institutions must cooperate with hospitals or medical institutions in providing professional medical services.</p>	<p>Services and facilities</p>
<p>Authors: M. Hartono, Setijadi, and Lutfi Norwandi Title: A conceptual Integrative Model of Kansei Engineering, Kano and TRIZ Towards Sustainability in Service Publisher: Journal of Advanced Research in Dynamical and Control Systems, 11(5). 2019 (Hartono, Setijadi, & Norwandi, 2019) .</p>	<p>This study uses an integrated conceptual framework between Kansei Engineering, Kano Model, and TRIZ in solving problems for the development of hospital services.</p>	<p>The results of this study are that the health services in the hospital are Kansei or emotional in terms of Kansei happiness which is found to be significant. Then in the Kano assessment, several hospitals studied had "A" quality with confirmation of the freshness of the ingredients consumed by employees and patients. Then for TRIZ itself, in this study it was found that there was a need for improvement in increasing feature 38, namely the extension of automation, which contradicts feature 26, namely the quantity of substance.</p>	<p>Service</p>
<p>Authors: Farber B, Martynov A, Osolodchenko T, and Kleyn I. Title: Application Of Synergetic Set Of Triz Principles For Developing Camp - Accumulation of Activators And Their Influence On Multi-Drug Resistance Microorganisms Publisher: Annals of Mechnikov Institute, N 1, 2019 (Farber et al., 2019) .</p>	<p>This study used Kharkov-IMII MDR on three species, namely Pseudimonas aeruginosa, Acinetobacer baumannii, and Klebisiella pneuniumoniae to determine strains that were resistant to various drugs. Then in solving the problem of resistance to multi-drug resistant bacteria by using TRIZ.</p>	<p>The results of the research in this study are that it has a chance to kill antibiotic-resistant bacteria that cannot be killed. The method offered by TRIZ is the use of lower doses than those used when treating patients. So as a result of investigating the influence activator of cAMP accumulation (enhancer) in multi-drug resistant microorganisms (P. aeruginosa MDR Kharkov-IMI1, K. pneumoniae MDR Kharkov- IMI, A. baumannii MDR Kharkov-IMI1) which was determined by the stimulation of fast growth from enhancers.</p>	<p>Facilities and services</p>

<p>Authors: Şeyma Güner and İlker Köse Title: Creative Problem Solving Technique Application Areas of TRIZ: Suggestions for Use in Healthcare Sector Publisher: Economy, İşletme ve Maliye Araştırmaları Dergisi, 2(2), 2020 (Güner & Köse, 2020) .</p>	<p>Their research used a literature review method that discussed TRIZ from the 2004-2019 data range, which totaled 161 publications.</p>	<p>This research yields information that the impact of using the TRIZ method on problem-solving innovation in large institutions to hospitals has comprehensive results in improving services and solving problems in services.</p>	<p>Service</p>
<p>Authors: Şeyma Güner and İlker Köse Title: A New Approach That Proposes TRIZ As A Creative Problem Solving Technique In Health Services Publisher: Pressacademia, 7(2), 2020 (Kose & Guner, 2020) .</p>	<p>This research uses 40 TRIZ methods and IFR-Idealism in finding innovative problems.</p>	<p>Problem solving in hospitals in terms of service is well proven by this research from the TRIZ model. TRIZ can provide improvisation of health services in hospitals. This research ultimately gives a proportion to innovation by using TRIZ which is faster in solving health service problems.</p>	<p>Service</p>
<p>Authors: Yan Huiquan, Lyu Penghui, Wang Ling, and Yu Zhiming Title: TRIZ Theory and the Method of Cancer Document Selection for Chemical Complexes and Innovation Schemes of Meta-Analysis with Lymphomas as an Example Publisher: Journal of chemistry, 6294613, 2020 (Huiquan, Huiqan, Penghui, Ling, & Zhiming, 2020) .</p>	<p>This study uses the TRIZ and BICOMS methods</p>	<p>The TRIZ method used in this research is 34 principles that have been able to assist in completing clinical treatment services for cancer patients who have combined with BICOMS. This research proves that the TRIZ scheme combined with BICOMS provides new innovations in cancer research.</p>	<p>Service</p>
<p>Authors: Chin Wen NG, Kok Weng NG, Mei Choo Ang, Amelia Natasya Abdul Wahab, and Ummul hanan Mohamad Title: Exploring The Use Of Triz In Detection And Inactivation Of Pathogens Publisher: MyTRIZ Conference Proceedings Taming Wicked Problems with TRIZ, 2021 (Ng et al., 2021) .</p>	<p>This research uses the method from TRIZ</p>	<p>This research provides information that is solutive to the ongoing problem of SARS COV-2 in the detection and inactivation of pathogens. Through the 25 principles of TRIZ used in this study, it has provided innovative solutions for developing facilities for treating SARS COV-2, namely in the form of ultrasound, photodynamic therapy, and cold plasma to detect and inactivate pathogens.</p>	<p>Facilities and infrastructure</p>
<p>Authors: Xunlin Lu, Guozhong Cao, and Haoyang Tian Title: Solution of TRIZ Conflict X Resource Based on LT Table Publisher: Advances in Intelligent Systems and Computing, 2021 (Lu, Cao, & Tian, 2021) .</p>	<p>The method used in this research is TRIZ to find the ARIZ algorithm.</p>	<p>The findings of this study are solutions using the TRIZ method on the ARIZ algorithm on X resources inside and outside. Bartini's LT table has found resource X through combining the TRIZ conflict matrix and the LT Table to adjust for TRIZ conflicts. Then the shortcomings of the two systems can be minimized, namely the inaccuracy of the TRIZ conflict matrix and the excessive accuracy of the LT table, making the solution of the close problem an ideal solution.</p>	<p>Infrastructure</p>
<p>Authors: An-Jin Shie, Wei-Feng Wu, Ming Yang, Xiaoji Wan, and Hailin Li Title: Design and Process Optimization Of Combined Medical And Elderly Care Services: An Integrated Service Blueprint-TRIZ Model Publisher: Frontiers in Public Health, 10(1), 2022 (Shie, Wu, Yang, Wan, & Li, 2022) .</p>	<p>This research method is service blueprint, fuzzy failure mode and FMEA, and TRIZ.</p>	<p>The findings of this study are the existence of innovations from service blueprints, fuzzy failure modes and FMEA, and TRIZ optimization of the elderly health service process in China or CMEC which goes through three stages. The selected TRIZ inventive principles are then used to inspire inventive solutions for new service processes. Finally, a case study was conducted on the nursing home service process to</p>	<p>Service</p>

<p>Authors: Afanvi Kossivi Agbélénko, Amegantsega Komi Sélom, Lacle Anani, Kassankogno Yao, Ekouevi Didier Koumavi, Atakouma Yawo Dzayissé, Ouendo Edgard-Marius Title: Leading Improvement In A Volatile, Uncertain, Complex And Ambiguous Health System: The Story Of The “Reaching Towards Universal Immunization Coverage” Project In Haho District In Togo From 2015 to 2017 Publisher: Médecine et Santé Publique, 20(2), 2023 (Agbélénko et al., 2023) . Authors: Jovany Uribe Ocampo and Pulo Carlos Kaminski Title: Proposal of an FFE Model With A High Degree Of Innovation Integrating TRIZ And Design Thinking Methodologies, Specific For The Personal Health Equipment Sector Publisher: Cogent Engineering, 10(1), 2023 (Uribe Ocampo & Kaminski, 2023) .</p>	<p>The method used in this research is SQIM and TRIZ This study uses the TRIZ method combined with Design Thinking which they call DTRIZ.</p>	<p>demonstrate its applicability. Then this study revealed that the existence of health services for the elderly that were implemented in nursing homes resulted in the effectiveness of the TRIZ solution. The results of this study are the monthly coverage of Penta 1 increases 12%, Penta 3 11%. Monthly vaccines from 14% and monthly adherence 12% increase. all of this is known through SQIM and TRIZ which are solutions to alleviating the problem of non-compliance with standard vaccination practices. The creative innovation is in the form of establishing an EPI program in the Haho health district with the VUCA system. This research resulted in a project with many ideas and several concepts which were considered as problem-solving solutions with quite high creativity. The innovation in question is the FFE proposed in the context of HDI with the use of a spiral project at two levels. TRIZ and DT in three phases: Understanding, Ideating, and Evaluating. This helps operationalize the Final FFE model and improve results, particularly for the PHE sector. So this research in general can be able to provide creative solutions through DT and TRIZ for patient services and the tools used in treating innovative patients.</p>	<p>Service Services and infrastructure</p>
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Based on the results that the authors have described, it is found that there is a number of each classification indicator, namely from services, infrastructure, and facilities from the existence of a hospital in solving problems that occur in an innovative, systematic way. As for what the author means, services have a total of 9 of 11 literature data, infrastructure has a total of 3 of 11 data literature, and facilities have a total of 3 literature out of 11 data. So from when the three are totaled it is 15/11 the data obtained from the research results. Here it is known positively that there is an application of the TRIZ model which can provide various systematic innovative solutions to the problems faced by hospitals. Although there are indeed several literature studies that have integrated TRIZ with other methods.

First, the service results show that there are 9 out of 11 data stating that TRIZ is a solutive model in an innovative, systemic way of providing services in health institutions such as hospitals. It is known in this case stated in research (Chang et al., 2017), (Hartono et al., 2019), (Farber et al., 2019), (Güner & Köse, 2020), (Kose & Guner, 2020), (Huiquan et al., 2020) , (Shie et al., 2022),

(Agbélénko et al., 2023), and (Uribe Ocampo & Kaminski, 2023) . Of the 9 studies, what differs from the research conducted by the authors is that the authors did not use TRIZ supporting methods in the course of the research. Meanwhile, most of these studies have used methods other than TRIZ. Then it is also known that this research in the service category automatically states that there are significant results for the use of TRIZ in providing innovative, systematic solutions to problems in hospitals. This is what the research has in common with the literature review that the author has mentioned. The reason is that service at the hospital has problems not only because of the problems from the patients themselves, it could be that the hospital system also needs renewal to improve the quality of their services. As for this, this is done by finding the root of the problem and mapping the problem to find each solution with TRIZ. The importance of this is also explained in the research written by Ranabhat & Jakovljevic (2023). His research states that the quality of good health services is done by providing good and structured systematics. Especially in providing solutions in serving patients who have privileges, in the sense that these patients have

diseases or anything that cannot be cured but there is still a possibility of being healed (Ranabhat & Jakovljevic, 2023).

Second, facilities are also a problem to be solved in hospitals. The results show that there are 3 out of 11 data articles that allude to the problem of improving facilities in hospitals with the TRIZ method. This research is known in (Chang et al., 2017), (Farber et al., 2019) and (Ng et al., 2021). The three of them used the TRIZ method to solve hospital problems. This is the similarity of the three studies with the following research, it is known that the TRIZ discussion regarding facilities that need to be solved is also a problem in the hospital. The difference between the three has applied other methods in carrying out more in-depth identification related to the problems to improve facilities in hospitals. They stated that there was a positive level of solving problems in the hospital with TRIZ which was a good and innovative method. This means that in this study it can also automatically state that TRIZ is indeed a method that can be used flexibly in finding solutions for hospital facilities in an innovative and systematic way. The reason is that hospital facilities are not only renewed, but it is necessary to add other facilities to look after and care for patients. Especially for patients with sensitivity or indeed the tools used have a negative impact on the patient when the examination is carried out. As is the case with radiation on an *X-ray device*, which requires a fixation device to protect the patient's family from radiation. This was also explained in the research of Liu, et al (2019). His research explains the need for facilities to protect patients and patient families from radiation equipment to carry out medical procedures (Liu et al., 2019).

Third, there are 3 out of 11 data infrastructures whose data is known. Infrastructure built with the aim of solving the problem of service irregularities and equipment or buildings in the hospital. Regarding this matter, the research that has been studied is known from (Ng et al., 2021), (Lu et al., 2021), and (Uribe Ocampo & Kaminski, 2023). These three studies provide information that has something in common with this study in that TRIZ is indeed an innovative solution to provide opportunities that when a hospital has been hit by issues regarding the convenience of infrastructure it needs to improve. The difference between this research and the three studies is that this research does not use additional methods to reveal that TRIZ is a systematic innovative solution in dealing with infrastructure problems. In the matter of infrastructure itself, the author actually automatically approves of the three studies, so that this, aka the TRIZ method, is something that can be relied upon to provide solutions. Because the hospital itself also contributes to the patient. So that

patient safety from unwanted things also needs to be known by officials. As is the case with the research by Bygstad & Øvrelid (2020) which explains that hospital infrastructure needs renewal and development as well as appropriate solutions so that patients can get experience and services that can give them the impression that the hospital is comfortable (Bygstad & Øvrelid, 2020).

The acronym TRIZ is of Russian origin, and in English, it might be translated as Hypothesis for Creative Problem-Solving. It can be an efficient strategy for uncovering innovative issues in an effective, feasible, and imaginative way, based on a human-oriented body of information. It is described as engineering, tool compartment, science, reasoning, among others. After all, it can be a great way to find settings for specific problems and to come up with creative custom frameworks.

TRIZ offers the possibility of understanding the problem by making use of several heuristics, which practically consist of procedures based on how the innovator understood the problem in the past, which is based on important standards of how a particular framework develops. TRIZ emerged in the 1970s and eventually became widely accepted, becoming an umbrella term, which serves to refer both to the Classical TRIZ, proposed by Altshuller, as well as to the subsequent strategies, based on the basic TRIZ standards.

The general standards of TRIZ, which are agreed upon are Ideality, Inconsistency, Progress, and Assets. Deeply speaking, Ideality and Inconsistency are the main columns of TRIZ. However, operationally, the specific design development framework, the assets of the problem situation, and ideality, are the building blocks of the TRIZ procedure. Ideality makes the difference to determine the setting titles and inconsistency points to the hurdles, which must be overcome.

In 1946, Altshuller proposed TRIZ, which was gradually formed by summarizing the standards and modes of progress behind protected developments. TRIZ was originally connected in the field of design innovation. However, with the persistent reform of the benefits industry, some analysts are starting to apply TRIZ to the development and optimization of service processes, such as in tourism, catering, sharing economy, and e-commerce. Ilevbare et al. thereafter it proposes a TRIZ inconsistency grid, 40 innovation standards, and other related theoretical research models, tools, and methods (Lu et al., 2021).

TRIZ is a knowledge-centred, all-encompassing problem-solving approach that shifts the focus from engagement with the designer of benefits and individual

affirmation. It consists of many tools, such as problem details, inconsistency networks, and creative standards, which architects can relate to in order to carry out plan preparation efficiently. TRIZ's 40 creative standards and suggestions have provided an unused premise for understanding and applying TRIZ. The special inconsistencies created by TRIZ can be solved by completing the TRIZ matrix. The architect benefits screen for specific inconsistency resolution standards is based on 39 building parameters and 40 TRIZ creative standards, both of which can be implemented in a TRIZ strategy (Alvarez et al., 2022).

TRIZ was determined by Genrikh Altshuller in the former Soviet Union after years of studying clear data from 1946 to 1985. Research conducted by Altshuller has led to the birth of the matrix of contradictions of the TRIZ technique. The building contradiction matrix was created to help creators solve design problems based on one or more negating sets of highlights. Many large multinational companies such as Samsung, Boeing, and Intel have implemented and leveraged the distinct visual TRIZ tools to effectively manufacture unused and sustainable global products. The recent development of TRIZ has led to the emergence of about 25 TRIZ appliances. Each recorded TRIZ equipment includes a specific reason for performing a specific operation. Each operation performed is directed towards understanding or managing with a specific problem.

The concept of TRIZ is that there is an essential inconsistency at the root of most problems. In many cases, a solid way to untangle a problem is to remove these contradictions. TRIZ recognizes two special categories of inconsistency and inconsistency. This is a classic design "tweak", where you might not reach a specified condition because some other thing in the framework avoids it. In other words, when something gets much better, something else becomes more regrettable as a result. For example, items get stronger (good) but gain weight (terrible). Benefits are customized for each client (great), but benefits delivery frameworks are complicated (bad). The training was comprehensive (great), but absent workers from their duties (terrible). The main technical contradictions are encapsulated in the TRIZ inconsistency framework. Like all TRIZ assets, it takes time and thought to become familiar with the physical framework's (or "inherent") inconsistencies. This is a situation where a question or framework bears conflicting and inverted requirements. The opposing terms can be imported into the matrix to get an oddity plan for plotting unused items. Typical cases include computer programs that are supposed to be complex (have lots of features) but are also straightforward (easy to remember). All of the above examples show us different requirements for items

which allows us to use a grid to deduce item plans. You can work around physical inconsistencies with the TRIZ partition standard. It isolates your needs by important categories of space, time, and scale (Purushothaman & Ahmad, 2022)

The TRIZ contradiction matrix allows conciliation when one technical parameter exacerbates another, because the intersection generates inventive principles that are suggested to enhance these contradictions. The substance field analysis of this methodology helps to develop areas of advantage, such as solar radiation, and slows down areas of unfavorability, such as noise production. TRIZ's law of ideality enhancement and inventive methodology stipulates that an artifact increases to reach its goal with less mass and energy. TRIZ, also known as inventive problem solving theory, is developed in an inductive form. TRIZ proposes 40 creative principles, 39 technical parameters, a matrix of contradictions, ten laws of evolution that guide technological systems, and substance plane interactions to solve technical problems. Among the proposed laws of evolution, Law 4 of the Increase in Ideality is the most important law of the evolution of technical systems, aimed at the gradual increase and optimization of the energy used (during evolution, technical systems improve the relationship between system performance and the cost required to achieve this performance) (Essaber et al., 2021)

The TRIZ strategy is centered on understanding building and specific issues and creating specific developments and methodologies (forecasting and setting), and is less used for administrative or other discipline issues, such as expertise and culture, books and composing, preparing advances, teaching, preparing, trading models and sport. Over the years, TRIZ has driven unique improvements and advancements, which are summarized as follows: 9 windows, 40 development standards, 76 default settings, progress rules, ideals and thought outcomes, useful checks, impact database, progress design, grid-grid of inconsistencies, substance field assets, smart little individuals, and ARIZ (calculations for understanding innovative problems). The TRIZ strategy should address single issues in design, fabrication and industry. In fact, the social science framework contains more diverse and complex issues. The TRIZ strategy is widely recognized and has appeal in its inventive thinking and capacity to provide management. TRIZ's custom settings demonstrate unwavering quality analysis, repeatability and consistency to understand issues. Since the foundation of the TRIZ framework, its precise approach has been able to productively find settings for issues, and its application to social science issues is appropriate (Russo & Spreafico, 2020)

The TRIZ guidelines have been linked to the airline's problem-solving strategy, and the assessment results in a system that coordinates safe operations and quality gains to make progress in the airline's image. Ask about eco-innovation (natural progress, green progress or defensible progress) emerging gaps and openings in the field of progress; based on the created investigation system, part of the development demonstrated the use of ARIZ and TRIZ strategies, and the show was confirmed. The aims of the TRIZ investigation and progress investigation cover the different open issues related to how to consider, the feasibility, and accessibility of the instruments of the strategy, the questions about the strategy, and the subjective investigations that analyze the writing survey. Uses of TRIZ have also been used in bionics, data handling, and commercial and business operations (Lin & Chen, 2021)

Conclusion

Based on the results and discussion of the research that has been presented, it can be concluded as the end of this study. The deduction that can be drawn is that services have a total of 9 of 11 data literature, infrastructure has a total of 3 literature of 11 data, and facilities have a total of 3 literature of 11 data so from when the three are totaled it is 15/11 the data obtained from the research results. Based on the data listed, it can be said that hospital services dominate as a discussion with many problems and many solutions offered through mapping with the TRIZ method. Although the research listed shows that there are various research models that are likely to support TRIZ in obtaining systematically innovative problems. Based on the data listed, this study states that in terms of services, infrastructure, and facilities, the problems in the hospital can be solved innovatively and systematically using the TRIZ method. This research is basically not completely finished. The research that the author has written requires a variety of follow-up studies that don't just stop at literature studies. But proof both empirically and also quantitatively. Therefore research needs to be continued. Then this TRIZ should also be applied to find problems and solutions in various fields including companies or other institutions. This is because the complexity of the existence of TRIZ itself can provide many ways and opportunities to solve problems.

Acknowledgments

Place acknowledgments, including information on grants received, before the references, in a separate section, and not as a footnote on the title page.

Author Contributions

All author contribution in this research.

Funding

This research is fully supported by the author's funds without any external funding sources

Conflicts of Interest

The author declares that there is no conflict of interest in this research.

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