SMART-FTO SYSTEM MODEL BASED ON ISHIKAWA DIAGRAM IN NEEDS MAPPING ANALYSIS FOR BUILDING BRAND QUALITY OF HIGHER EDUCATION INSTITUTIONS

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Abstract

To improve brand quality, the National University of Laos (NUOL) implemented the Smart-Figuring Things Out (FTO) System Model based on the Ishikawa Diagram. This article discusses the application of the model in analyzing organizational needs mapping and identifying factors that influence the brand quality of higher education institutions. The analysis reveals several key factors, including academic quality, facilities, services, and community engagement. These factors are associated with eight dimensions of brand quality: performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality. By identifying and addressing these factors, NUOL can develop comprehensive strategies to enhance its reputation and competitiveness. The application of this model shows an increase in public perception of NUOL, a rise in the number of applicants, and improvements in academic rankings, which can serve as a reference for other universities in similar efforts.

Keywords: Brand Quality, Smart-FTO System, Ishikawa Diagram

INTRODUCTION

In the era of globalization and increasing competition, universities around the world are required to continuously improve their quality and reputation (Statsenko & Zubielqui, 2020). One crucial aspect of this is the development and management of a strong and widely recognized brand quality (Bourne et al., 2019). Brand quality is not just about name recognition, but also encompasses public perception of the quality of education, facilities, and services offered by the university. To achieve this goal, it is essential for higher education institutions to effectively understand and map organizational needs.

The National University of Laos (NUOL), as one of the leading universities in Laos, has the vision to enhance its brand quality to compete at both regional and international levels. Compared to the other three public universities in Lao PDR Souphanavong

University, Champasak University, and Lao-Korean College has a significant potential to build its brand quality. This is based on the fact that NUOL has the largest number of students, accounting for 87% of the total compared to the others. Research results indicate that the process of needs assessment for quality improvement is a priority agenda (Hill et al., 2021). There are four key areas to achieve quality: (1) organizational structure, (2) resources, (3) technology, and (4) culture. Additionally, connectivity computation becomes a nurturant effect (Sunder, 2016; Kundu, 2017). To accommodate this, the utilization of smart system technology supports the facilities and organizational needs. One method to achieve this goal is by implementing the Smart-Figuring Things Out (FTO) System Model based on the Ishikawa Diagram.

The FTO System Model is a systematic approach that helps organizations identify and understand various factors that influence brand quality. By using the Ishikawa Diagram, also known as the Fishbone Diagram, NUOL can break down and analyze different aspects affecting brand quality, such as academic, administrative, facilities, and service aspects. The application of the Ishikawa Diagram in the FTO System Model allows NUOL to map organizational needs in a more structured and focused manner. This diagram helps identify the root causes of problems and determine the strategic steps needed to enhance the quality and reputation of the institution.

This article aims to examine how the Smart-Figuring Things Out (FTO) System Model based on the Ishikawa Diagram can be applied in needs mapping analysis to build brand quality in higher education institutions, particularly at the National University of Laos. This research is expected to make a significant contribution to strategies for enhancing brand quality in higher education and serve as a reference for other institutions with similar visions.

LITERATURE REVIEW

A Smart System is a model used to integrate university strategies with data processing, enabling the collection, analysis, and decision-making processes to be conducted automatically or semi-automatically. This involves the breakdown of strategic objectives from the top down and the implementation of bottom-up measurements to support the university's vision (Yusufu & Nathan, 2020; Demir, 2021). Smart system

technology can be employed to flexibly facilitate the development of organizational needs according to specific requirements.

The performance approach of Smart Systems can simultaneously enhance external effectiveness and internal efficiency within universities (Uskov et al., 2018). Each strategy includes several indicators that serve as benchmarks for performance evaluation (Wang & Yu, 2022, Shoikova et al., 2017). A holistic performance measurement approach offers solutions to performance evaluations that overly focus on financial aspects, which are often too abstract, delayed, and non-adaptive. This helps universities understand the root causes of issues and formulate appropriate corrective actions.

Essentially, smart system technology offers various advantages for organizational development. This system is capable of collecting data to serve as a foundation for more meaningful and efficient analysis processes. Its primary advantage lies in providing innovative solutions to address complex challenges, thereby improving efficiency and effectiveness across various sectors.

The Figuring Things Out (FTO) Model is a framework for needs and task analysis. This model, pioneered by Zemke and Kramlinger, consists of factors influencing organizational performance, detailed into three main areas: individuals, the work environment, and organizational climate (Ahren, 2017). As a framework, the FTO model is used to understand problems, identify solutions, and take action based on processes of exploration, learning, and adaptation (Hattie & Donoghue, 2016).

The FTO model serves as a tool for mapping organizational needs, involving several stages that assist in identifying, analyzing, and formulating those needs. The model emphasizes the importance of information gathering, data analysis, and a deep understanding of existing situations or conditions to produce effective decisions (Hattie & Donoghue, 2016). In its application, the FTO model helps individuals or organizations explore complex problems, find appropriate solutions, and overcome challenges in innovative and adaptive ways.

FTO studies reveal that data on organizational climate and culture, including the mission and goals of the organization, are translated into actionable steps (Philips, 2015). This model encourages users not only to rely on existing knowledge but also to actively

seek new understanding and adjust strategies according to changes in their environment. Thus, the FTO model becomes a valuable tool in addressing dynamic and unpredictable situations, helping to make better and more effective decisions.

The Ishikawa Diagram is one of the tools used in Total Quality Management (TQM). It was first introduced by Kaoru Ishikawa and is also known as a cause-and-effect diagram or fishbone diagram (Radziwill, 2017). In practice, it is used to identify factors that are the root causes of problems. Problem-solving using this tool can be carried out individually or by top management. This is done by gathering people with sufficient experience and expertise related to the problem at hand. The diagram is considered practical and guides teams to continually think and identify the primary causes of a problem.

In the context of higher education, brand quality refers to the reputation and image of an institution in terms of the quality of education, facilities, academic programs, research, and community service (Clark et al, 2020; Nguyen et al, 2016). Brand quality is a critical factor for universities as it impacts the institution's value and prestige (Fay & Zavattaro, 2016; Mampaet et al, 2015). A strong brand quality can also enhance alumni loyalty, attract donor support, and increase the likelihood of achieving higher rankings in national and international standings. To build a strong brand quality, universities must focus on improving academic quality and student experience, strengthening networks with alumni and industry partners, and effectively communicating the institution's achievements and values.

RESEARCH METHODS

The research was conducted using a Systematic Literature Review (SLR) approach, which is a research method based on previous studies to analyze the research gaps with the latest updates on needs mapping for building brand quality in higher education institutions. This aligns with the concept of SLR as described by Rozi (2020). A Systematic Literature Review, or SLR, is a secondary study that maps, identifies, evaluates important information, collects, and compiles findings from primary studies in a specific field of study (Thomé et al., 2016; Felizardo et al., 2020). SLR is an accepted approach to gathering information through a review of previous research in the field (Suhartono, 2017). The aims of the Systematic Literature Review (SLR) are to: (1) Sort and select research related to

needs mapping for building brand quality in higher education institutions; (2) Identify the publication year, publisher, country, and relevance of the topic that can help analyze needs mapping for building brand quality in higher education institutions; (3) Analyze the methods applied and their rationale; and (4) Analyze research problem gaps related to needs mapping for building brand quality in higher education institutions (Van Dinter et al., 2021; Mohamed Shaffril et al., 2021). The following is the research prisma framework:

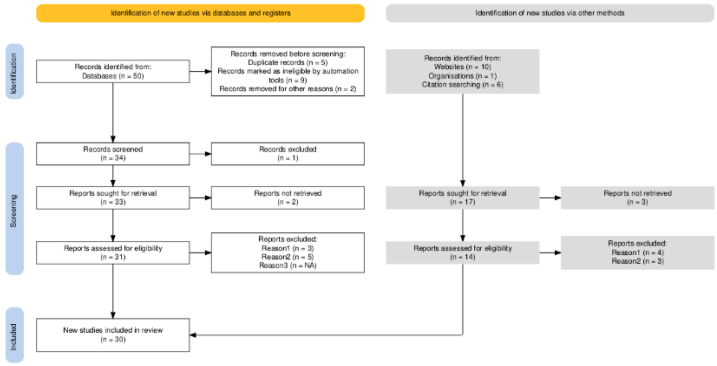

Figure 1. Prism Diagram

These procedures were followed to ensure that the data list only includes relevant published articles and excludes irrelevant ones. Article data was collected from several available journal databases. After identifying 50 articles from various types of publications through the search and sorting process, the articles were then filtered based on factors such as citation scores, publication types, and topics relevant to the research questions addressing needs mapping for building brand quality in higher education institutions.

Results and Discussion

Results

Smart-FTO System Model Based on Ishikawa Diagram as an Analytical Tool

The Smart-Figuring Things Out (FTO) System Model is an analytical approach designed to help organizations map needs and identify critical factors influencing goal achievement. This model combines strategic management principles and structured analysis techniques to produce effective solutions. One of the tools used in this model is the Ishikawa Diagram, which helps break down and analyze various factors contributing to a problem or goal.

The approach to Smart System performance can help simultaneously enhance the external effectiveness and internal efficiency of higher education institutions (Uskov et al., 2018). Each strategy has several indicators that serve as performance benchmarks (Wang & Yu, 2022; Shoikova et al., 2017). A holistic performance measurement approach will provide solutions to performance measurement that focus solely on financial aspects, which can be too abstract, delayed, and non-adaptive, thereby helping universities understand root problems and develop appropriate corrective actions. Essentially, smart system technology offers numerous advantages for organizational development. This system can collect data as the basis for a more meaningful and efficient analysis process. Its main advantage is providing innovative solutions to overcome complex challenges and enhance efficiency and effectiveness across various sectors.

The FTO Model serves as a needs mapping tool involving several stages that can help identify, analyze, and formulate organizational needs. This model emphasizes the importance of information gathering, data analysis, and a deep understanding of the current situation to produce effective decisions (Hattie & Donoghue, 2016). In its application context, the FTO model helps individuals or organizations explore complex issues, find appropriate solutions, and address challenges innovatively and adaptively.

The FTO study results reveal that organizational climate and culture data, including the organization's mission and goals, are translated into actions (Phillips, 2015). This model encourages users not only to rely on existing knowledge but also to actively seek new understandings and adjust strategies based on changes that occur. Thus, the FTO Model becomes a useful tool in dealing with dynamic and unpredictable situations and helps make better and more effective decisions.

The Ishikawa Diagram, also known as the Fishbone Diagram or Cause-and-Effect Diagram, is a visual tool used to identify the root causes of a problem (Gopinath & Santhi, 2021). This diagram helps organize causal factors into more understandable and analyzable categories. In the context of building brand quality in higher education institutions, the Ishikawa Diagram can be used to identify factors that influence the institution's perception and reputation, such as academic quality, facilities, services, and community engagement.

There are five main components in the Ishikawa Diagram: (1) Manpower, (2) Methods, (3) Materials, (4) Machine, and (5) Environment (Liliana, 2016; Silva, 2014). Its usage can be seen in the image above. For example, there is a main problem of increasing production (the head). Then several problem factors can be identified as large bones, such as quality. Based on the problem factors on the large bones, the causes (small bones) that affect production increase (the head) from each side (large bones) are sought (Hermens, 2016).

Therefore, a Smart-FTO System was developed as an application to assist in analyzing and mapping organizational needs in building the brand quality of higher education institutions (Mehmood et al., 2023). This model's innovation is a needs assessment application integrated with branding components within the organization. This product is based on a smart application. This model emphasizes the importance of information gathering, data analysis, and a deep understanding of the current situation to produce effective and sustainable decisions. The application is based on the Smart-Figuring Things Out (FTO) model, which uses the Ishikawa Diagram as the main analytical tool, referring to the five main components to identify root causes. This aims to identify and explore the root causes of problems and find solutions. Below is the Smart-FTO System application:

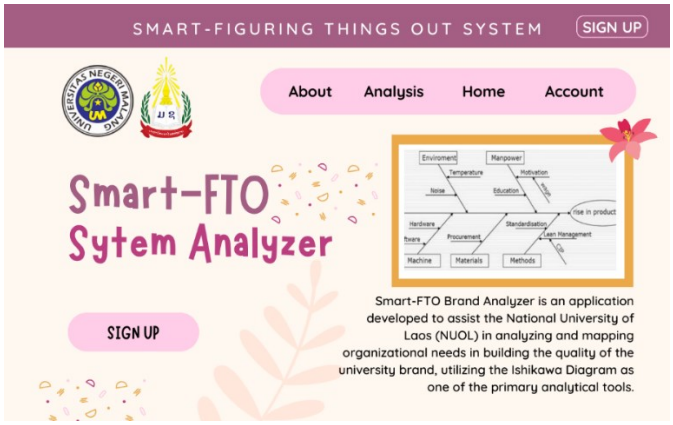

Figure 2. Smart-FTO Analyzer

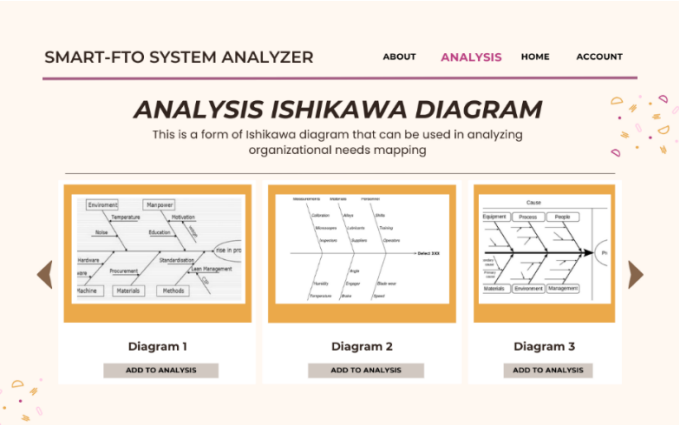

Figure 3. Smart-FTO Analyzer

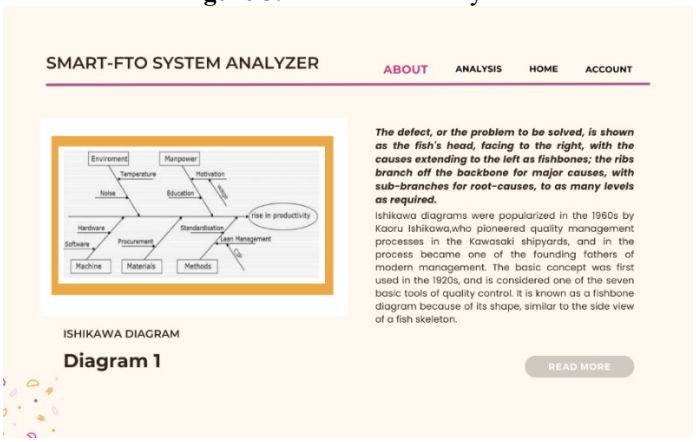

Figure 4. Smart-FTO Analyzer

Through the Smart-FTO System, users are encouraged not only to rely on existing knowledge but also to actively seek new understanding and adjust strategies based on changes in their environment. This model serves as a starting point for organizations to drive and guide universities towards productivity and agility in facing dynamic situations and to assist in making better decisions. Users can easily identify factors that influence the brand quality of higher education institutions and plan effective strategies to enhance it. To build a strong brand quality, universities need to focus on improving academic quality and student experience, strengthening networks with alumni and industry partners, and effectively communicating to promote the institution's achievements and values.

Discussion

The National University of Laos (NUOL) is committed to enhancing its brand quality to compete at both regional and international levels. To achieve this goal, NUOL implements the FTO System Model based on the Ishikawa Diagram in the process of

analyzing organizational needs mapping to identify and explore the root causes of problems and find solutions (Liliana 2016; Wong et al., 2016). Organizational needs mapping analysis plays a vital role in the development of institutions to achieve their quality goals (Starbuck, 2017). The steps taken by NUOL include:

- Identify Goals: Establish the main goal, which is to enhance NUOL's brand quality.
- Data Collection: Gather data from various sources, including surveys, interviews, and document analysis, to understand the factors influencing public perception of NUOL.
- Create Ishikawa Diagram: Use the Ishikawa Diagram to break down the factors affecting brand quality into categories such as academic quality, facilities, services, and community engagement.
- Analyze Causal Factors: Identify the root causes within each category of factors.
- Develop Strategies: Formulate strategies to address the root causes of the issues and enhance NUOL's brand quality.

Identifying Goals is a crucial initial step in the effort to improve NUOL's brand quality. By setting this primary goal, NUOL can focus on the strategic steps needed to achieve the desired brand quality improvements. Data Collection involves gathering information from various sources such as surveys, interviews, and document analysis. This step aims to obtain a comprehensive understanding of the factors influencing public perception of NUOL. The collected data will provide a strong foundation for further analysis.

Creating the Ishikawa Diagram is the next step, where factors affecting brand quality are categorized into key areas such as academic quality, facilities, services, and community engagement. This diagram helps organize and visualize the contributing factors to brand quality systematically. Analyzing Causal Factors involves identifying the root causes within each of the previously identified factor categories. Understanding these root causes allows NUOL to prioritize and focus on aspects that require the most attention.

Developing Strategies is the final crucial step, where NUOL devises action plans to address the root causes of identified problems. These strategies are designed to comprehensively improve brand quality, including enhancements in academic quality, facility improvements, service refinements, and increased community engagement. With

effective strategies, NUOL can achieve its main goal of strengthening brand quality and enhancing its reputation in the eyes of the public.

The application of the Smart-FTO System Model based on the Ishikawa Diagram at NUOL has yielded several significant findings. Key factors influencing NUOL's brand quality have been identified, including:

- Manpower: Including the quality of lecturers, staff, and administrative personnel, as well as professional development programs.
- Methods: Covering curriculum design, teaching methods, and evaluation systems implemented at NUOL.
- Materials: Including teaching materials, academic resources, and learning materials used.
- Machines: Encompassing physical facilities such as laboratories, libraries, and available technology equipment.
- Environment: Covering the campus environment, relationships with the surrounding community, and a conducive academic climate (Ishikawa, 1960; Silva, 2014; Kusumah & Yusuf, 2020; Fauzia et al., 2024).

Manpower at NUOL includes the quality of lecturers, staff, and administrative personnel, which play a crucial role in supporting the educational process. Structured and continuous professional development programs help enhance their competence and performance, ensuring that each individual contributes optimally to achieving academic and institutional goals. Methods for achieving a quality university at NUOL include a curriculum designed to meet current educational standards, innovative and interactive teaching methods, and a fair and comprehensive evaluation system. This approach aims to optimize student learning and development, preparing them to face challenges in the workforce and society.

Materials to support brand quality include high-quality teaching materials, rich academic resources, and relevant learning materials. The availability of up-to-date teaching materials and easy access to academic resources such as books, journals, and online databases are crucial to supporting effective teaching and learning processes. Additionally, Machines encompass physical facilities such as laboratories equipped with modern

equipment, libraries with extensive literature collections, and technological equipment such as computers and software supporting academic and research activities. Adequate facilities ensure that students and lecturers can carry out teaching and research activities optimally. The environment at NUOL includes a conducive campus environment for learning, good relationships with the surrounding community, and an academic climate that supports collaboration and innovation. This positive and inclusive environment plays a significant role in creating a comfortable and productive atmosphere for the entire academic community.

Brand quality in the context of higher education refers to the reputation and image held by the institution regarding the quality of education, facilities, academic programs, research, and community service (Clark et al., 2020; Nguyen et al., 2016). Brand quality is an important factor for higher education institutions in terms of value and prestige (Fay & Zavattaro, 2015; Mampaey et al., 2015). A strong brand quality can also increase alumni loyalty and donor support, as well as enhance the likelihood of achieving higher rankings in national and international ratings. When building strong brand quality, universities need to focus on improving academic quality and student experience, strengthening networks with alumni and industry partners, and effectively communicating to promote the institution's achievements and values. These efforts can include organizational management based on quality dimensions, as seen in Figure 4.

Figure 6. Quality Dimension

Based on these factors, the process of improving brand quality must be accompanied by organizational management according to quality dimensions, which include: (1) **Performance**, referring to the key characteristics of a product. This quality dimension involves measurable attributes. The brand is ranked based on its performance goals or

aspects; (2) **Features**, the attributes of a product or service that appeal to users; (3) **Reliability**, the quality value based on a zero-defect principle; (4) **Conformance**, adherence to specific standards; (5) **Durability**, measuring the product against predetermined standards; (6) **Serviceability**, the ease of providing quality service; (7) **Aesthetics**, related to the perceived appearance of the service; and (8) **Perceived Quality**, the quality associated with a product or service based on indirect measures (Kapferer, 2017).

The implementation of the FTO System Model based on the Ishikawa Diagram at the National University of Laos (NUOL) has yielded significant findings that can be linked to the eight dimensions of brand quality. High academic quality and effective teaching methods are key characteristics of the educational products offered by NUOL, enhancing the academic performance of students and the institution as a whole. Updated campus facilities such as libraries, laboratories, and classrooms are crucial features supporting the teaching and learning process, improving user appeal and satisfaction with the services provided by NUOL.

Value quality adhering to a zero-defect principle relates to consistency in academic and administrative services, ensuring reliable daily operations through improved administrative services and student support. Conformance to specific standards is reflected in the curriculum and teaching methods adopted by NUOL, ensuring that the education provided meets national and international expectations. Updated and maintained campus facilities must meet certain durability standards to ensure long-term resilience, supporting the educational process in the long run.

Enhancing administrative services and student support pertains to the ease and quality of service provision, ensuring that students can easily access the various services they need during their studies. Perceived service aesthetics relate to the campus atmosphere and the presentation of physical facilities, where an attractive campus environment and well-designed facilities will positively impact perceptions of NUOL. The public's perception of the academic quality and facilities provided by NUOL is the result of the interaction of the aforementioned factors, with community involvement through cooperation programs and external activities also influencing how NUOL’s quality is perceived by the public.

By linking the results of the Ishikawa Diagram with the eight dimensions of brand quality, NUOL can develop a comprehensive strategy to enhance its brand quality, which will not only improve NUOL's reputation but also help attract more students and partnerships in the future.

CONCLUSION

The application of the Smart-Figuring Things Out (FTO) System Model based on the Ishikawa Diagram at the National University of Laos (NUOL) has proven effective in analyzing organizational needs mapping to enhance the quality of the university's brand. By identifying key factors such as academic quality, facilities, services, and community involvement, NUOL has been able to develop a comprehensive and targeted strategy. These factors are further linked to the eight dimensions of brand quality: performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality.

The results of implementing this model indicate significant improvements in public perception of NUOL, an increase in the number of applicants, and enhancements in various academic rankings. This demonstrates that a structured and systematic approach to identifying and addressing factors affecting brand quality can yield positive outcomes. The application of the FTO System Model based on the Ishikawa Diagram at NUOL can serve as a model and reference for other universities aiming to enhance their reputation and competitiveness at both regional and international levels.

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