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The Development and Analysis of a Framework for Enhancing the Philippines' Competitiveness in ASEAN Surveying*

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Abstract

Aim: The research aimed to develop and critically analyze a framework focused on enhancing the competitiveness of surveying professionals in the Philippines within the ASEAN context.
Methodology: Employing a qualitative research approach, the study utilizes Focus Group Discussions (FGDs) as its primary data collection method. These FGDs were conducted as breakout sessions during an International Conference and involved stakeholders from academia, professional practice, and government services.
Results: The framework offers actionable insights for various stakeholders, from individual professionals to academic institutions and governing bodies. Focusing on internal and external factors provides a roadmap for targeted interventions that can enhance competitiveness. The framework is highly relevant given the Philippines' growing engineering sector and the government's focus on enhancing professional competitiveness. Its flexibility allows adaptation to local conditions, such as specific regulatory frameworks or cultural nuances. Moreover, the framework's emphasis on stakeholder involvement aligns well with the Philippines' community-centric approach to professional development.
Conclusion: The Framework offers a multi-dimensional, comprehensive approach that experts in the field have validated. It identifies key factors affecting competitiveness, challenges, and strategies for enhancement. It also presents a holistic and adaptable approach to understanding and enhancing competitiveness in surveying and geodetic engineering. While its strengths include its comprehensive nature and expert validation, its complexity and resource-intensive attributes pose challenges for easy comprehension and quick implementation.

Keywords: *Competitiveness Enhancement, ASEAN Surveying, Framework Development, Philippines*

*This originates from the International Conference held to establish the ASEAN Qualification Reference Framework on Surveying, which took place from October 4 to 7, 2023, at the Hilton Manila in Pasay City, Philippines. The funding for this conference was provided through the International Commitments Fund (ICF).

INTRODUCTION

A. Background and Context

The International Conference on the Establishment of the ASEAN Qualification Reference Framework (AQRF) on Surveying, specifically Geodetic and Survey Engineering, held at Hilton Manila, Pasay City, Philippines, from October 4 to 7, 2023, serves as a significant gathering of stakeholders in the field of surveying. This conference was conceived as a platform to address the profession's critical issues and meet specific legal requirements. It plays a pivotal role in the development and growth of the geodetic and survey engineering profession, not only within the Philippines but also in the broader ASEAN context.

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Rationale for the International Conference

The rationale for convening the International Conference is rooted in the recognition that a country's development and growth are intrinsically linked to multiple factors, with its workforce representing a cornerstone. Moreover, the conference underscores the pivotal role of government-regulated professionals, especially in enhancing the nation's competitive advantage. In response to the ever-evolving global landscape, governments must actively pursue strategies to harness the potential and leverage the strengths of their skilled professionals. This pursuit is particularly relevant in the context of geodetic and survey engineering, given its significance in various sectors, including land management, infrastructure development, and disaster risk reduction.

Legal Basis for the Conference

The International Conference on the Establishment of the AQRF on Surveying is firmly anchored in a robust legal framework. This framework encompasses various laws and regulations that guide the practice of geodetic and survey engineering in the Philippines and aligns with regional ASEAN initiatives. Key legal foundations for the conference include:

a. ASEAN Charter: The ASEAN Charter, signed by ASEAN Leaders in Singapore on November 20, 2007, provides the fundamental basis for the development of an AQRF, highlighting the importance of harmonizing qualifications within the ASEAN region.

b. Republic Act No. 8560, also known as the "Philippine Geodetic Engineering Act of 1989," sets forth the legal framework for the regulation of the geodetic engineering profession in the Philippines.

c. Republic Act No. 8981, known as the "PRC Modernization Act of 2000," addresses the modernization and professional regulation of various fields, including geodetic engineering.

d. Republic Act No. 10968, referred to as the "Philippine Qualifications Framework Law of 2019," lays the groundwork for establishing a qualifications framework that aligns with international standards.

e. Terms of Reference (ToR) endorsed by ACACS: The ASEAN Competent Authority Committee on Surveying (ACACS) endorsed specific Terms of Reference in October 2021, further solidifying the mandate for the conference.

Significance of the Study

The significance of this study lies in its potential to contribute to the advancement of the geodetic and survey engineering profession, not only in the Philippines but also within the ASEAN region. The study's findings and analysis hold several key implications:

1. Professional Advancement: By comprehensively exploring the factors affecting the competitiveness of surveying professionals and analyzing the framework developed during the International Conference, this study can provide valuable insights that can inform policies and initiatives aimed at enhancing the professional standing and competitiveness of geodetic and survey engineers.
2. Legal Compliance: Given the legal basis underpinning the International Conference, the study's outcomes can help ensure that the conference aligns with the legal requirements and obligations stipulated by Republic Acts and international agreements. This alignment is crucial for regulatory compliance and the effective governance of the profession.
3. Regional Collaboration: Understanding how the framework aligns with ASEAN goals and initiatives is pivotal for fostering collaboration and harmonization of qualifications within the ASEAN region. The study can serve as a catalyst for greater cooperation among ASEAN member states in the field of geodetic and survey engineering.
4. Education and Training: The study's insights into factors affecting competitiveness can inform curriculum development and continuing professional development (CPD) programs for geodetic and survey engineers. It can help educational institutions and professional organizations tailor their offerings to address specific challenges and needs.

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Scope and Limitations

Scope:

The scope of this study encompasses an in-depth analysis of the discussions, recommendations, and framework developed during the International Conference on the Establishment of the AQRF on Surveying. It includes the examination of factors affecting the competitiveness of surveying professionals, as discussed in the context of the conference.

Limitations:

1. Conference Focus: This study is limited to the content and outcomes of the International Conference, specifically focusing on the geodetic and survey engineering profession.
2. Time Constraints: The study's analysis is based on the information and discussions available up to the date of the conference in October 2023. Any subsequent developments or changes in the field may not be considered.
3. Generalizability: The findings and framework analyzed in this study are specific to the context of the International Conference and may not be directly generalizable to other professions or regions. The framework's applicability in other contexts requires further examination.
4. Data Availability: The study relies on the availability of data, documents, and transcripts from the conference proceedings. Any limitations in data access or completeness may impact the comprehensiveness of the analysis.
5. Subjectivity: Qualitative research, such as thematic analysis, involves subjectivity in data interpretation. Efforts will be made to minimize bias, but individual perspectives and interpretations may influence the analysis.

Despite these limitations, this study aims to provide a thorough and insightful analysis of the International Conference's discussions and framework development, shedding light on critical aspects related to the competitiveness of surveying professionals in the Philippines and the ASEAN region.

II. LITERATURE REVIEW

A. Competitiveness in ASEAN Surveying

The competitiveness of professionals in the field of geodetic and survey engineering within the ASEAN region has been a subject of considerable interest in recent years (Galović, 2021). Geodetic and survey engineers play a vital role in various sectors, including land management, infrastructure development, and disaster risk reduction (Ezeomedo, 2019). As such, understanding the factors that influence their competitiveness is of paramount importance.

Ochotorena (2020) highlighted the significance of continuous professional development (CPD) in enhancing the competitiveness of professionals. This study emphasized the importance of staying updated with the latest technologies and methodologies in a profession like geodetic and survey engineering to remain competitive in the dynamic ASEAN landscape.

Additionally, Ahmed, Amin Chowdhury, and Huey (2019) examined the impact of globalization on the competitiveness of surveyors in ASEAN countries. They found that globalization has led to increased client expectations, differences in pricing strategies, and the need for standardized practices. These challenges underscore the importance of competitiveness enhancement strategies tailored to the ASEAN context.

B. Frameworks for Enhancing Competitiveness

Frameworks for enhancing the competitiveness of professionals have gained traction in recent years as governments and professional bodies seek to optimize the potential of their workforce (Suntharasaj & Kocaoglu, 2008).These frameworks provide a structured approach to identifying and addressing the factors that impact competitiveness.

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The work of Ketels (2016) explored the development and implementation of Competitiveness Road Maps (CRMs) for regulated professions. CRMs are comprehensive frameworks that aim to enhance the competitiveness of professionals through targeted strategies. This approach aligns with the efforts of governments, including the Philippines, to formulate CRMs for various professions through their Professional Regulatory Boards (PRBs).

Synthesis:

Competitiveness in ASEAN Surveying:

The introduction highlights the growing significance of competitiveness among professionals in geodetic and survey engineering within the ASEAN region. Professionals in this field are crucial contributors to various sectors, including land management, infrastructure development, and disaster risk reduction. Notably, the discussion emphasizes the critical importance of understanding the factors that influence their competitiveness (Galović, 2021).

Continuous professional development (CPD) emerges as a vital aspect of enhancing competitiveness in geodetic and survey engineering, as highlighted by Ochotorena (2020). Staying updated with the latest technologies and methodologies is essential in a dynamic ASEAN landscape. Furthermore, Ahmed, Amin Chowdhury, and Huey (2019) shed light on the impact of globalization on surveyors in ASEAN countries. Their research underscores how globalization has brought about increased client expectations, differences in pricing, and the need for standardized practices. These challenges accentuate the importance of devising competitiveness enhancement strategies tailored to the unique ASEAN context.

Frameworks for Enhancing Competitiveness:

The second theme discusses the growing adoption of competitiveness frameworks in recent years. These frameworks offer a systematic approach to recognizing and addressing the factors influencing competitiveness, aligning with the broader aim of optimizing the workforce's potential (Suntharasaj & Kocaoglu, 2008; Carvajal & dela Cruz, 2023).

Ketels (2016) specifically explores the development and implementation of Competitiveness Road Maps (CRMs) for regulated professions. CRMs serve as comprehensive frameworks designed to enhance the competitiveness of professionals by employing targeted strategies. The adoption of CRMs aligns with government and professional body efforts, including those in the Philippines, to create CRMs for various professions through their Professional Regulatory Boards (PRBs).

The synthesis highlights the significance of competitiveness in the field of geodetic and survey engineering in the ASEAN region. It underscores the role of CPD, globalization, and the need for tailored competitiveness enhancement strategies. Additionally, it recognizes the growing adoption of competitiveness frameworks such as CRMs to optimize the competitiveness of professionals within this dynamic landscape. These discussions collectively contribute to a deeper understanding of the challenges and strategies related to competitiveness in ASEAN surveying and the broader professional context.

III. THEORETICAL FRAMEWORK

A. Theoretical Underpinnings for Framework Development

The development of a framework for enhancing the competitiveness of surveying professionals within the context of the ASEAN region draws upon several theoretical foundations. These theories provide valuable insights and guidance for constructing a comprehensive and effective framework.

1. **Human Capital Theory:** Human capital theory, as proposed by Gary Becker (1964), posits that individuals' investments in education, training, and skills development contribute significantly to their productivity and earning potential. In the context of surveying professionals, this theory underscores the importance of continuous learning and skill development to enhance competitiveness.

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2. Institutional Theory: Institutional theory, advanced by Meyer and Rowan (1977) and DiMaggio and Powell (1983), focuses on the influence of formal and informal institutions on organizational behavior. Applied to the development of a competitiveness framework, this theory highlights the role of regulatory bodies, professional associations, and government institutions in shaping the competitive landscape for surveyors.

3. Stakeholder Theory: Stakeholder theory, introduced by Freeman (1984), emphasizes the importance of considering the interests and perspectives of various stakeholders in decision-making processes. In the context of framework development, this theory encourages the inclusion of input from surveying professionals, educational institutions, government agencies, and industry stakeholders to ensure the framework's relevance and effectiveness.

4. Diffusion of Innovation Theory: Everett Rogers' diffusion of innovation theory (1962) explores the process by which new ideas, practices, or technologies spread through a society or organization. When applied to competitiveness enhancement, this theory underscores the need to assess the adoption and diffusion of innovative practices and technologies within the surveying profession.

5. Systems Theory: Systems theory, as developed by Ludwig von Bertalanffy (1968), views organizations and processes as interconnected systems with interdependent components. In the context of framework development, systems thinking can help identify and address the complex interplay of factors affecting competitiveness, considering the profession's holistic ecosystem.

The theoretical framework for developing a framework to enhance the competitiveness of surveying professionals within ASEAN draws from multiple theoretical perspectives. Human capital theory highlights the importance of continuous learning and skill development. Institutional theory underscores the role of regulatory and professional institutions. Stakeholder theory emphasizes the inclusion of diverse perspectives. Diffusion of innovation theory informs the assessment of innovative practices, and systems theory aids in understanding the profession as a complex, interconnected system. These theoretical underpinnings collectively guide the construction of a comprehensive framework that addresses the multifaceted factors influencing the competitiveness of surveying professionals within the dynamic ASEAN context.

RESEARCH OBJECTIVES

The research problem addressed in this study revolves around the need to comprehensively understand and enhance the competitiveness of Filipino professionals in the geodetic and survey engineering field in the Philippines and the wider ASEAN region. This research seeks to analyze the discussions and outcomes of the focus group discussion–breakout sessions, particularly focusing on the development and analysis of a framework for enhancing the Philippines' competitiveness in ASEAN surveying.

Research Questions

1. To define and/or validate the factors that affect the competitiveness of a professional.
2. To identify issues and challenges and to define the recommendations and strategies for the enhancement of the competitiveness of Surveyors.
3. To draw up and analyze a Framework for Competitiveness Enhancement.

METHOD

A. Research Design

1. Qualitative Research Approach

This research employs a qualitative research approach to investigate and gain an in-depth understanding of the factors affecting the competitiveness of surveying professionals in the ASEAN region. Qualitative research is well-suited for exploring complex phenomena, such as competitiveness enhancement strategies, by capturing the perspectives and experiences of participants (Merriam & Tisdell, 2016). It allows for a nuanced examination of the issues discussed during the International Conference on Surveying and the development of the competitiveness framework.

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2. Rationale for Focus Group Discussion

Focus Group Discussions (FGDs) are chosen as the primary data collection method due to their effectiveness in generating rich, context-specific data (Krueger & Casey, 2015). FGDs enable participants to engage in open and dynamic discussions, sharing their insights, experiences, and recommendations (Stewart et al., 2007). The FGD format, conducted as a breakout sessions during the International Conference, facilitates the exploration of diverse perspectives among different surveyors in the academe, in professional practice, and in government services.

B. Data Collection

1. Participants Selection

Participants for the FGD sessions will be selected based on their expertise and involvement in the field of geodetic and survey engineering. This includes professionals, academicians, government representatives, and industry stakeholders who attended the International Conference on Surveying. Purposeful sampling will be employed to ensure that participants represent a range of experiences and viewpoints, fostering a diverse and comprehensive discussion (Palinkas et al., 2015).

2. Data Gathering Instruments

Semi-structured interview guides tailored to the FGD format will be used as data gathering instruments. These guides will contain open-ended questions that prompt participants to discuss their perceptions of competitiveness, challenges, and recommendations. Additionally, the guides will include questions related to the framework developed during the conference and its alignment with the conference's objectives and legal basis.

3. Conducting the FGD as a Breakout Session

The FGD sessions will be conducted as breakout sessions during the International Conference on Surveying. These sessions will be facilitated by a skilled moderator who will guide the discussions, ensure active participation, and maintain a respectful and open atmosphere. An observer will document the discussions, and audio recordings will be made to facilitate transcription and data analysis.

C. Data Analysis

1. Transcription and Data Management

Audio recordings of the FGD sessions will be transcribed verbatim. Transcripts will be carefully reviewed to ensure accuracy. Data management software will be employed to organize and code the data, facilitating the subsequent analysis process.

2. Thematic Analysis

Thematic analysis, following Braun and Clarke's (2006) guidelines, will be used to analyze the data. This approach involves the identification of key themes, patterns, and recurring concepts within the transcripts. The analysis will involve a systematic process of coding, categorizing, and interpreting the data to derive meaningful insights regarding competitiveness factors, challenges, recommendations, and the developed framework's alignment with the conference's goals.

D. Ethical Considerations

Ethical considerations will be rigorously adhered to throughout the research process. The study complies with ethical guidelines related to research involving human subjects, safeguarding participants' rights and privacy (American Psychological Association, 2020).

1. Obtaining Informed Consent: Ensured that the materials used for analysis were acquired through appropriate means and adhered to any confidentiality agreements or legal requirements. In cases where the documents contained sensitive or confidential information, proper permissions were sought, and confidentiality was diligently maintained.
2. Preservation of Data Privacy and Anonymity: Safeguarded the privacy and anonymity of individuals or organizations mentioned in the documents. Personally identifiable information or confidential details that could compromise privacy or confidentiality were carefully removed.
3. Adherence to Transparency and Methodological Precision: Maintained transparency and methodological rigor throughout the analysis process. The methods employed for document selection, analysis techniques, and coding procedures were meticulously documented. The analysis was conducted in a thorough, unbiased manner to accurately reflect the content of the documents.

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4. Safeguarding Confidentiality and Data Security: Ensured the collected documents were stored securely, with access restricted to authorized researchers. Measures were taken to protect the data from unauthorized disclosure or misuse, upholding the principles of data security.
5. Exemplary Ethical Conduct of the Researcher: Maintained a professional code of conduct throughout the research process. Interactions were characterized by honesty, respect, and consideration for the perspectives and rights of all stakeholders involved in the research.

Research Setting

A. Description of the Breakout Session

The breakout session selected for this research took place during the International Conference on the Establishment of the ASEAN Qualification Reference Framework (AQRF) on Surveying. The specific objective of this session, as outlined in the abstract, was to "define and validate the factors that affect competitiveness of surveying professionals, identify specific issues and challenges, define competitiveness enhancement strategies, and draw up and analyze the Framework on Competitiveness Enhancement which may serve as a common platform for possible adoption domestically and by the ASEAN Competent Authority Committee on Surveying (ACACS)." This session aimed to engage a diverse group of surveyors, including those from academia, professional practice, and government services, in discussions pertaining to the competitiveness of the surveying profession.

B. International Conference Details

The International Conference on the Establishment of the AQRF on Surveying (Geodetic/Survey Engineering) – Stage I was held at the Hilton Manila in Pasay City, Philippines, from October 4-7, 2023. This conference served as a significant platform for addressing critical aspects of the geodetic and survey engineering profession within the ASEAN region. It was conceptualized to update the Road Map of Geodetic Engineering – International Practice Component, finalize the Philippine Qualifications Framework (PQF) of Geodetic Engineering, prepare the ASEAN-wide Referencing Report, and endorse recommendations crucial to the practice of the profession overseas. Additionally, the conference aimed to fulfill the requirements stipulated in Republic Act Nos. 8560, as amended, 10912, and 10968, aligning it with legal obligations related to the geodetic and survey engineering profession (International Conference Abstract).

C. Participant Profiles

The breakout session participants represented a diverse cross-section of the geodetic and survey engineering field. This included individuals from different sectors:

- Academicians: Participants from academic institutions involved in geodetic and survey engineering education and research.
- Professional Practitioners: Surveying professionals actively engaged in private practice, contributing their expertise to various projects and applications.
- Government Representatives: Surveyors working in government agencies responsible for land management, infrastructure development, and regulatory oversight related to surveying.

The inclusion of participants from these varied backgrounds ensured a comprehensive and multifaceted exploration of competitiveness factors and strategies relevant to the geodetic and survey engineering profession in the ASEAN context.

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RESULTS and DISCUSSION

Figure 1. Schema of Stakeholders in Pursuing Competitiveness as Framework for Enhancing the Philippines' Competitiveness in ASEAN Surveying (Vicente, 2023)

Goals & Objectives of Competitiveness:

1. Natural: This could refer to inherent qualities such as talent or aptitude for the field. It may also encompass environmental factors like geographic location, which could provide natural advantages or disadvantages.
2. Personal: This involves individual attributes like motivation, work ethic, and personal skills. These are often developed over time and can be honed through self-improvement and personal development activities.
3. Professional: This is about the technical skills and competencies acquired through formal education and on-the-job experience. It also includes professional ethics and standards that one must adhere to.
4. Legal: This involves the regulatory frameworks and laws that govern the profession. Understanding and navigating these can provide a competitive edge, as it ensures compliance and minimizes legal risks.
5. Institutional: This refers to the influence of organizational structures, policies, and culture on a professional's competitiveness. For example, some institutions may offer better training programs, resources, or networking opportunities.
6. Authority: This could refer to the governing bodies or individuals who have decision-making power in the field. Their decisions can have a direct impact on the competitiveness of professionals.

Factors Influencing Competitiveness:

1. Internal Factors: These are elements within the control of the individual, such as skill set, knowledge, and attitude. They can be improved through education, training, and experience.
2. External Factors: These are elements outside the control of the individual, such as market demand, technological advancements, and regulatory changes. Being aware of these can help in strategic planning and adaptability.

Stakeholders Involved:

1. Surveyor/Geodetic Engineer: They are at the core of this schema. Their skills, knowledge, and adaptability are crucial for competitiveness.

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2. Academic Institutions & CPD Providers: These entities play a significant role in shaping the skills and knowledge base of professionals. They also provide avenues for continuous learning.
3. Professional-Friends, Family Members & Others + Personal: Personal networks can offer emotional support, mentorship, and even job opportunities, which can be crucial for career advancement.
4. Professional Organizations: These bodies often set the standards for the profession and offer networking opportunities, further training, and a platform for advocacy.
5. Government & Private Entities: These organizations can offer employment opportunities and also set regulatory standards that professionals must adhere to.
6. Movers: This term could refer to key influencers or change agents who drive innovation and change in the field, thereby affecting competitiveness.

Each of these components and stakeholders plays a unique role in shaping the competitiveness of professionals. Understanding this schema can provide a holistic view of what it takes to be competitive in the field of surveying and geodetic engineering. It's a complex interplay of individual attributes, external factors, and multiple stakeholders, each contributing to the overall landscape of competitiveness.

Interrelationships Among Goals & Objectives:
1. Natural vs. Personal: Natural abilities can be enhanced or hindered by personal attributes. For example, someone with a natural aptitude for spatial reasoning (Natural) may excel in surveying if they also possess a strong work ethic (Personal).
2. Professional vs. Legal: Professional competencies must align with legal requirements. For instance, a highly skilled surveyor must also be aware of and comply with legal standards to maintain their professional standing.
3. Institutional vs. Authority: Institutions often derive their policies and practices from governing bodies (Authority). The alignment or misalignment between these can significantly impact a professional's ability to be competitive.

Interrelationships Among Factors:
1. Internal vs. External Factors: Internal factors like skills and knowledge can sometimes mitigate the challenges posed by external factors like market demand. For example, a well-skilled surveyor may still find opportunities in a saturated market.

Interrelationships Among Stakeholders:
1. Academic Institutions & CPD Providers vs. Surveyor/Geodetic Engineer: The quality of education and ongoing training directly impacts the skill level of the professional.
2. Professional Organizations vs. Government & Private Entities: Professional organizations often lobby or collaborate with government and private entities to set standards, which in turn affects the legal landscape.
3. Personal Network vs. Professional Network: Friends and family can provide emotional support and initial networking opportunities, which can be further expanded through professional organizations.

Cross-Category Interrelationships:
1. Goals & Objectives vs. Factors: The objectives for competitiveness (e.g., Professional development) often dictate the factors to focus on (e.g., Internal factors like skill development).
2. Factors vs. Stakeholders: The internal and external factors affecting competitiveness are often influenced by various stakeholders. For example, market demand (an external factor) can be shaped by government policies.
3. Stakeholders vs. Goals & Objectives: Stakeholders often have a role in defining the goals and objectives of competitiveness. For instance, academic institutions may focus on professional development as a key objective.

In summary, the schema suggests that competitiveness is not an isolated attribute but a complex outcome influenced by multiple interrelated factors and stakeholders. Understanding these relationships can help in formulating more effective strategies for enhancing competitiveness, whether at the individual or institutional level.

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Framework Analysis

A. Evaluation Criteria

a) Objective Metrics: The number of stakeholders actively engaged in the framework could serve as a quantitative measure.
b) Subjective Metrics: Stakeholder satisfaction and perceived ease of implementation can be gauged through surveys or interviews.
c) Benchmark Comparisons: The framework can be compared to existing models in the field of surveying and geodetic engineering to assess its uniqueness or superiority.
d) Timeframe: An initial evaluation could be conducted six months after implementation, with subsequent evaluations annually.

B. Analysis of the Developed Framework

1. Strengths

a) Comprehensiveness: One of the framework's major strengths is its holistic approach. It doesn't just focus on the individual surveyor but also considers a wide array of factors and stakeholders, from academic institutions to government bodies.
b) Expert Validation: The inclusion of insights from HON. RANDOLF S. VICENTE lends the framework a degree of expert credibility, which could facilitate its acceptance in academic and professional circles.
c) Flexibility: The framework is designed to be adaptable, allowing for its application in various contexts, whether it be different fields of engineering or geographic locations.
d) Actionability: The framework is not just theoretical; its components like "Goals & Objectives" and "Factors" are actionable, providing a roadmap for enhancing competitiveness.

2. Weaknesses

a) Complexity: The framework's comprehensive nature is a double-edged sword; its complexity could make it difficult for some stakeholders to quickly grasp its full scope and utility.
b) Resource Intensiveness: Implementing the framework could require a significant investment of time and expertise, which might be a barrier for smaller organizations or individual professionals.
c) Potential Gaps: While the framework is comprehensive, there's always the risk of overlooking certain stakeholders or factors, which could limit its effectiveness.

3. Relevance

a) Industry Relevance: Given the current emphasis on competitiveness in the engineering sector, the framework is highly relevant. It addresses both the "how" and the "why" of competitiveness, making it a timely tool.
b) Geographic Relevance: The framework's flexibility allows for its application in different geographic contexts, making it globally relevant.
c) Temporal Relevance: The framework is designed to be adaptable to changes in technology, regulations, and market conditions, ensuring its long-term relevance.

Discussion

A. Interpretation of Findings

The Competitiveness Schema provides a multi-dimensional approach to understanding competitiveness in the field of surveying and geodetic engineering. Its strengths lie in its comprehensiveness and adaptability, while its weaknesses point to areas that require further refinement, such as reducing complexity and identifying potential gaps.

B. Implications for Enhancing Competitiveness

The framework offers actionable insights for various stakeholders, from individual professionals to academic institutions and governing bodies. By focusing on both internal and external factors, it provides a roadmap for targeted interventions that can enhance competitiveness. For example, academic institutions can tailor their curricula to address the identified "Goals & Objectives," while professional organizations can offer training programs that align with the "Factors" outlined in the framework.

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C. Framework's Applicability to the Philippines

Given the Philippines' growing engineering sector and the government's focus on enhancing professional competitiveness, the framework is highly relevant. Its flexibility allows for adaptation to local conditions, such as specific regulatory frameworks or cultural nuances. Moreover, the framework's emphasis on stakeholder involvement aligns well with the Philippines' community-centric approach to professional development.

D. Recommendations for Implementation

1. Pilot Testing: Before full-scale implementation, a pilot test involving a small group of stakeholders could provide valuable feedback and identify areas for improvement.
2. Stakeholder Engagement: Actively involve all identified stakeholders in the implementation process to ensure buy-in and facilitate smoother execution.
3. Resource Allocation: Given the framework's resource-intensive nature, a detailed budget and timeline should be prepared. Partnerships with academic institutions and government bodies could help in resource mobilization.
4. Monitoring and Evaluation: Establish key performance indicators (KPIs) based on the evaluation criteria discussed earlier. Regular monitoring can help in timely course corrections.
5. Continuous Improvement: Post-implementation, the framework should be periodically reviewed and updated to incorporate new insights and adapt to changing conditions.

Conclusions

The Competitiveness Schema offers a comprehensive and multi-dimensional framework for understanding and enhancing competitiveness in the field of surveying and geodetic engineering. Its strengths include its holistic approach, expert validation, and adaptability across different contexts. However, its complexity and resource-intensive nature pose challenges for easy comprehension and quick implementation.

The framework fills a critical gap by providing a structured approach to studying competitiveness, incorporating both internal and external factors as well as a diverse range of stakeholders. It offers actionable insights and a roadmap for targeted interventions, thereby serving as a valuable tool for both academic research and

The framework's complexity may limit its accessibility for some stakeholders, particularly those with limited resources or expertise.

While comprehensive, there may still be gaps in stakeholder representation or overlooked factors that could affect its overall effectiveness. Further studies could focus on simplifying the framework without compromising its comprehensiveness. Research could also explore the framework's applicability in other fields or geographic regions, providing comparative analyses. Longitudinal studies could assess the framework's long-term impact on enhancing competitiveness, providing empirical data to support its efficacy.

Recommendations

1. Pilot Testing: Conduct a pilot test with a select group of stakeholders to gather initial feedback and identify areas for improvement. This will help fine-tune the framework before a broader rollout.
2. Stakeholder Engagement: Ensure active participation from all identified stakeholders, including academic institutions, professional organizations, and government bodies. Their involvement will not only provide diverse perspectives but also facilitate smoother implementation.
3. Resource Allocation: Develop a detailed budget and timeline for implementing the framework. Given its resource-intensive nature, consider forming partnerships with academic institutions, government agencies, or industry bodies to mobilize necessary resources.
4. Monitoring and Evaluation: Establish key performance indicators (KPIs) based on the previously discussed evaluation criteria. Implement regular monitoring mechanisms to track progress and make timely adjustments as needed.
5. Continuous Improvement: After the initial implementation phase, periodically review and update the framework to incorporate new insights, technologies, or changes in market conditions. This will ensure the framework remains relevant and effective over time.
6. Training and Capacity Building: Offer training programs or workshops to familiarize stakeholders with the framework's components and objectives. This will help in effective utilization and could enhance stakeholder buy-in.

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7. Communication Strategy: Develop a communication plan to keep all stakeholders informed about the framework's progress, successes, and challenges. Transparent communication can foster a sense of ownership and accountability among participants.
8. Legal and Regulatory Compliance: Ensure that the framework aligns with existing laws and regulations, particularly if it is to be implemented across different geographic regions. Consult legal experts to navigate any potential compliance issues.
9. Feedback Mechanism: Implement a structured feedback mechanism to collect insights from stakeholders during and after the implementation process. This could be in the form of surveys, interviews, or focus group discussions.
10. Documentation and Reporting: Maintain thorough documentation of the implementation process, challenges encountered, and solutions deployed. This will not only serve as a valuable resource for future implementations but also contribute to the academic literature on the subject.

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