

## Article

# Civil Engineering Standard Measurement Method Adoption Using a Structural Equation Modelling Approach

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**Abstract:** The adoption of a standardized technique of measuring in civil construction projects is influenced both by the drivers and the strategies used, particularly in emerging nations such as Malaysia. So, the authors of this study used structural equation modeling and the PLS-SEM technique to inquire into the connection between the driver and strategy elements of the adoption. Quantity surveyors at quantity surveying consultancy companies using the standard measurement technique were polled using a questionnaire. Using the PLS-SEM technique provided by the SmartPLS 3 software, a hierarchical model was created to determine the components and their impacts on the adoption of the measuring method. The results indicated that all classes considerably influence the adoption of the standard technique of assessment, but the barrier factors had the most impact. The adoption of a standardized technique of measuring was significantly impacted by the driver and strategy elements. The coefficient of determination (R-squared value) of 0.400 indicates that the dependent variable(s) can be explained by the predictor variable(s) in the model. Moreover, Q<sup>2</sup> is significantly different from zero, suggesting that endogenous latent components may be predicted by the conceptual model. Because of its high explanatory power, the created model has given a goodness-of-fit (GoF) index of 0.214. This means that the model adequately represents the link between the variables that affect measuring technique adoption and the effects of these factors. The first stage in determining what motivates people to utilize the most up-to-date standardized measurement approach in civil engineering construction projects is to develop a research model of the variables and to explain the connection between the driver and strategy factors on standard adoption.

**Keywords:** standard measurement method; drivers; strategies; construction projects; structural equation modeling; PLS-SEM



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## 1. Introduction

The construction sector is recognized as one of Malaysia's key economic sectors that generate economic growth, along with agriculture, mining, manufacturing and services. Quarterly construction statistics [1] show that Malaysia's construction sector shrank by 14.2% in the fourth quarter of 2020. The value of the construction work carried out reaches RMB 31.7 billion. The value of construction works in 2020 shrank by 19.4% to RMB 117.9 billion compared to RMB 146.4 billion in 2019. Other subsectors, such as civil engineering and residential and non-residential buildings, declined, while specialty trade activity surged at 29.3%. However, since the fourth quarter of 2015, the civil engineering subsector has maintained its dominance in the value of construction works performed with a 39.6% share for the 21st consecutive quarter. Statistics show that civil works are essential in supporting economic growth, as efficient infrastructure is the backbone of economic development.

Standard measurement technique is a document that provides the foundation for measuring building and civil engineering works, as defined by the Royal Institute of

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**Wenbin Ji**



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*Cost Modelling and Computers* Peter S. Brandon,1987      **Engineering and Contracting** ,1926      **Transactions and Notes of the Concrete Institute** ,1928      **Engineering Software III** R. A. Adey,1983-04-01 These proceedings contain the papers presented at the Third International Conference and Exhibition on Engineering Software held at Imperial College London during the period April 11th 13th 1983 I must thank again the authors who submitted the large numbers of papers which made selection a difficult task The theme of the conference is the use and application of computers in engineering Many abbreviations have been invented to describe the use of computers from CAD CAM CADMAT etc but the term which best describes the scope of the conference is Computer Aided Engineering CAE The papers have been split into sections covering different application areas such as Mechanical Engineering Civil Engineering Other sections cover techniques such as Finite Elements Boundary Elements and General Simulation An important session at the conference was the new field of engineering databases and as in past conferences the special sessions were devoted to microcomputers R A ADEY EDITOR ENGINEERING SOFTWARE DESIGN 3 MENU INPUT GENERATING SYSTEM FOR THE FORTRAN PROGRAMS I Kovacic Institute of Structural and Earthquake Engineering Department of Civil Engineering University Edvard Kardelj of Ljubljana Yugoslavia INTRODUCTION Although fortran Is losing competition with the new languages it Is still very used programming language especially in the technical software production Technical tasks are not to be described by a lot of data usually as in business applications      *Municipal Engineering and the Sanitary Record* ,1924      **Transactions of the American Association of Cost Engineers** American Association of Cost Engineers. National Meeting,1971      The Laws of Scotland ,1987      **Subject Index of Modern Books Acquired** British Library,1922      The Journal of the Engineering Institute of Canada Engineering Institute of Canada,1919      **Engineering & Contracting** ,1921      **The Building News and Engineering Journal** ,1924      **School of Engineering. Professional Courses in Mining, Etc** Columbia University. School of Engineering and Applied Sciences,1930      Announcement Columbia University. Summer Session,1926  
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### **Table of Contents Building Engineering Standard Method Of Measurement 3**

1. Understanding the eBook Building Engineering Standard Method Of Measurement 3
  - The Rise of Digital Reading Building Engineering Standard Method Of Measurement 3
  - Advantages of eBooks Over Traditional Books
2. Identifying Building Engineering Standard Method Of Measurement 3
  - Exploring Different Genres
  - Considering Fiction vs. Non-Fiction
  - Determining Your Reading Goals
3. Choosing the Right eBook Platform
  - Popular eBook Platforms
  - Features to Look for in an Building Engineering Standard Method Of Measurement 3
  - User-Friendly Interface
4. Exploring eBook Recommendations from Building Engineering Standard Method Of Measurement 3

- Personalized Recommendations
  - Building Engineering Standard Method Of Measurement 3 User Reviews and Ratings
  - Building Engineering Standard Method Of Measurement 3 and Bestseller Lists
5. Accessing Building Engineering Standard Method Of Measurement 3 Free and Paid eBooks
    - Building Engineering Standard Method Of Measurement 3 Public Domain eBooks
    - Building Engineering Standard Method Of Measurement 3 eBook Subscription Services
    - Building Engineering Standard Method Of Measurement 3 Budget-Friendly Options
  6. Navigating Building Engineering Standard Method Of Measurement 3 eBook Formats
    - ePub, PDF, MOBI, and More
    - Building Engineering Standard Method Of Measurement 3 Compatibility with Devices
    - Building Engineering Standard Method Of Measurement 3 Enhanced eBook Features
  7. Enhancing Your Reading Experience
    - Adjustable Fonts and Text Sizes of Building Engineering Standard Method Of Measurement 3
    - Highlighting and Note-Taking Building Engineering Standard Method Of Measurement 3
    - Interactive Elements Building Engineering Standard Method Of Measurement 3
  8. Staying Engaged with Building Engineering Standard Method Of Measurement 3
    - Joining Online Reading Communities
    - Participating in Virtual Book Clubs
    - Following Authors and Publishers Building Engineering Standard Method Of Measurement 3
  9. Balancing eBooks and Physical Books Building Engineering Standard Method Of Measurement 3
    - Benefits of a Digital Library
    - Creating a Diverse Reading Collection Building Engineering Standard Method Of Measurement 3
  10. Overcoming Reading Challenges
    - Dealing with Digital Eye Strain
    - Minimizing Distractions
    - Managing Screen Time
  11. Cultivating a Reading Routine Building Engineering Standard Method Of Measurement 3
    - Setting Reading Goals Building Engineering Standard Method Of Measurement 3
    - Carving Out Dedicated Reading Time
  12. Sourcing Reliable Information of Building Engineering Standard Method Of Measurement 3

- Fact-Checking eBook Content of Building Engineering Standard Method Of Measurement 3
  - Distinguishing Credible Sources
13. Promoting Lifelong Learning
- Utilizing eBooks for Skill Development
  - Exploring Educational eBooks
14. Embracing eBook Trends
- Integration of Multimedia Elements
  - Interactive and Gamified eBooks

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