



Association of Schools of Construction of Southern Africa

The Sixteenth Built Environment Conference

*Construction in 5D: Deconstruction, Digitalization, Disruption,
Disaster & Development: A Second Look*

26 - 27 September 2022, Lanseria, South Africa

Book of Abstracts



**International Council
for Research and Innovation
in Building and Construction**

BUILT ENVIRONMENT CONFERENCE – 2022

16th Built Environment Conference – Construction in 5D: Deconstruction, Digitalization, Disruption, Disaster & Development: A Second Look

26 – 27 September 2022
Lanseria, South Africa

EDITORS

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[September 2022](#)

PREFACE

The Association of Schools of Construction of Southern Africa (ASOCSA) Built Environment conference series in its 17th year of existence continues to be one of the major cutting-edge built environment conferences on the African continent. Since its inception in 2006, the blind peer reviewed conference proceedings have been referred to by both private and public sector policy and decision makers. The series produces a post-conference edition of the Journal of Construction, which is on the list of journals approved by the South African Department of Higher Education and Training (DHET) for subsidy. The conference series continues to be endorsed by the International Council for Research and Innovation in Building and Construction (CIB), one of the largest global built environment research organizations and recognized by the Australian Institute of Building (AIB). The conference provides an interactive international forum and networking opportunities among researchers, academics, administrators and practitioners, representing institutions of higher learning, government agencies, contracting organisations, consulting enterprises, financial institutions, and other construction-related organisations.

The past two conferences had been severely impacted by the effects of the COVID-19 pandemic, and the academic world across the globe either cancelling conferences or converting them to virtual events. However, true to its vision and commitment to continue being a premier African built environment conference, ASOCSA and the organizers persevered under difficult and challenging circumstances to present the previous version in the long-standing Built Environment series as a virtual conference.

It is with great excitement and relief that life has returned to some level of normalcy, and following the removal of travel and other restrictions, the 16th Built Environment Conference is again for the first time since 2021 an in-person event. Delivering a world-class conference is not novel for ASOCSA. The conference proceedings will be published by ASOCSA within a reasonable time after the conference once all audits and verifications have been completed. The authors of a selection of the best ten to twelve conference papers will be invited to rework their papers into book chapters that will be published in a Scopus, Compendex and Web of Science indexed edited book post-conference and titled, Construction in 5D: Deconstruction, Digitalization, Disruption, Disaster, Development: A Second Look.

OBJECTIVES

The 16th Built Environment Conference with its theme of Construction in 5D: Deconstruction, Digitalization, Disruption, Disaster & Development has a range of interesting and cutting-edge peer-reviewed research papers addressing topical issues that affect the built environment not only in South Africa but in the regions beyond. Notwithstanding the ever-increasing challenging global economic environment with shrinking sponsorship budgets, the conference continues in the tradition of previous conferences in the series and provided an international forum with clear industry development and sustainability focus. This focus provides the opportunity for researchers and practitioners from developed and developing nations to deliberate topical current issues that impact the Built Environment.

The broad objectives of the conference are:

- To provide a forum for multi-disciplinary interaction between academics and industry practitioners.
- To disseminate innovative and cutting-edge practices that respond to the conference theme and outcomes, namely Construction in 5D: Deconstruction, Digitalization, Disruption, Disaster & Development: A Second Look.
- To provide a world class leading internationally recognized, accredited and SCOPUS-indexed conference for the built environment; and
- To contribute to the existing built environment body of knowledge (BEBOK) and practice.

The conference organizers bring together in a single forum, a group of researchers and academics from the wide range of built environment disciplines that include engineers, architects, quantity surveyors, construction, and project managers. 'Delegates' and participants are drawn not only from South African institutions of higher education, government agencies, and other construction-related organizations but also from across the African continent and the United Kingdom.

CONFERENCE THEME AND OUTCOMES

CONSTRUCTION IN 5D: DECONSTRUCTION, DIGITALIZATION, DISRUPTION, DISASTER & DEVELOPMENT: A SECOND LOOK

There is little doubt that the construction industry has experienced exponential change and development in recent years. The 16th Built Environment Conference will examine five of these cutting-edge concepts to determine their state of the art in the construction sector both in practice and academic research. This conference therefore seeks responses to questions related to current conversations, debates, and empirical research on:

- Deconstruction – the dismantling or ‘unbuilding’ of buildings to maximise reusing and preserving the demolished fragments and involves taking a building apart piece by piece, essentially reversing the order of its construction.
- Digitalization – the conversion and transformation of construction business processes to use digital technologies and embrace the ability of digital technology to collect data, establish trends and make better business decisions.
- Disruption – displacement of well-established construction technologies, techniques, or products to disruptively affect the normal operation or function of the construction industry while potentially creating a new industry or market. Artificial intelligence, virtual/ augmented reality, internet of things, blockchain technology, and e-commerce are some of the disruptive technologies that are significantly influencing the future of the construction industry
- Disaster – an occurrence that disrupts the normal conditions of existence and operation causing a level of suffering and challenge that exceeds the capacity of adjustment of the affected community and the construction industry
- Development – in the context of construction refers to an industry that possesses the vision, leadership and capacity to bring about a positive transformation of itself within a condensed period of time

The conference includes papers that address, inter alia,

- Current trends and developments
- Policies
- Legislation and regulations
- Practices
- Case studies.

The internationally peer reviewed, and edited conference proceedings that contains the full papers is aimed at contributing significantly to the body of knowledge relative to the science and practice of construction not only in South Africa but everywhere where the products of construction are produced even in these new challenging times of fear and uncertainty.

Prof Theo C. Haupt
Conference Academic Chair (2022)
Durban, South Africa
September 21, 2022

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ACKNOWLEDGEMENTS

The organizing committee of the 16th Built Environment conference, held in Lanseria, South Africa, is grateful to the Council of the Association of Schools of Construction of Southern Africa and member universities and individuals for supporting this conference through their valued contributions. Special thanks are also extended to our conference partners for supporting the conference. Without the support received, this conference and the further development and growth of the Association of Schools of Construction of Southern Africa (ASOCSA) with respect to its mission in the region would not be possible. Additionally, this support demonstrates the commitment to the further development of the body of knowledge relative to the science and practice of construction. This commitment is deeply valued and acknowledged. Additionally, this support demonstrates the commitment to the further development of the body of knowledge relative to the science and practice of construction. This commitment is deeply valued and acknowledged.

Further thanks are extended to Dr. Progress Chigangacha (Nelson Mandela University) and Dr. Mariam Akinlolu (Mangosuthu University of Technology) who worked tirelessly especially in the co-ordination of paper reviews. The organizing committee also wishes to acknowledge the selfless contributions of the Scientific and Technical Committee and panel of reviewers who ensured that each paper was rigorously refereed for inclusion in the conference proceedings and possible selection for inclusion in the published SCOPUS-indexed post-conference publication of the highest standard that satisfies the criteria for subsidy by the South African Department of Higher Education and Training (DHET).

The excellent support of our webmaster, Tamar Ellis in setting up and supporting the conference website and technical support during the conference itself is appreciated. The sterling contributions of Ferial Lombardo in the co-ordination and organization of the conference are acknowledged.

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PEER REVIEW PROCESS

To maintain and ensure the highest quality in the conference proceedings and comply with the requirements for subsidy of the South African Department of Higher Education and Training (DHET), a rigorous two-stage system of peer review by no less than two acknowledged experts in the field has been followed. In terms of this process, each abstract received was twice blind reviewed in terms of:

- Relevance to overall conference theme and objectives;
- Relevance to selected sub-theme;
- Originality of material;

- Academic rigour;
- Contribution to knowledge; and
- Research methodology.

Authors whose abstracts were accepted after a blind peer review process was completed were provided with anonymous reviewers' comments and requested to submit their full papers noting and addressing these comments. Evidence was required relative to the actions taken by authors regarding the comments received. These resubmitted papers were twice blind reviewed again in terms of:

- Relevance to overall conference theme and objectives;
- Relevance to selected sub-theme;
- Originality of material;
- Academic rigour;
- Contribution to knowledge;
- Research methodology and robustness of analysis of findings;
- Empirical research findings; and
- Critical current literature review.

Authors whose papers were accepted after the second review were provided with additional anonymous reviewers' comments and requested to submit their revised full papers. These final papers were only included in both the conference presentation schedule and the conference proceedings after evidence was provided that all comments were appropriately responded to, having been multiple peer-reviewed for publication. At no stage was any member of the Scientific and Technical Committee or the editor of the proceedings involved in the review process relative to their own authored or co-authored papers. The role of the editors was to ensure that the final papers incorporated the reviewers' comments and arrange the papers into the final sequence based on the conference presentation schedule as captured on the conference proceedings and Table of Contents. Of the 62 abstracts originally received, only 48 papers were finally accepted for presentation at the conference and inclusion in the conference proceedings, representing an acceptance rate of 77%. To be eligible for inclusion these papers were required to receive one of three recommendations from at least two reviewers, namely:

- Accepted for publication or
- Provisional acceptance provided minor changes / corrections are made or
- To re-submit for publication provided author/s reconsider/s the areas of concern
-

Regards,

**Theo C. Haupt
Conference Academic Chair 2022
Nelson Mandela University**

TAX BENEFIT

ASOCSA is a registered Public Benefit Organization as defined in Section 30 of the Income Tax Act and a registered Section 21 Company as defined in the Companies Act. Therefore, all donations made to ASOCSA will be fully deductible for income tax purposes and a section 18A certificate, for proof of deductibility will be issued to the donor upon receipt of the donation. The deductible donation is limited to 10% of the donors' taxable income before providing for Section 18A and Section 18 deductions.



History

ASOCSA is not the first attempt to form a body that addresses, inter alia, matters of construction education and training. In the days of the Building Industries Federation South Africa and the National Development Fund there were regular annual meetings of the Heads of Departments that offered construction-related programs. Recognizing the two-tiered higher education sector in South Africa, there were separate meetings for universities and the former technikons. In the more recent past, the Chartered Institute of Building - Africa initially convened annual educators' forums that did not quite fulfill the same function as the previous forums. However, during 2005 the very first meeting of University Heads of Departments drawn from all higher education institutions in South Africa met for the very first time since the re-landscaping of the sector in the same venue to discuss matters affecting construction, and particularly construction education in the country. This meeting was repeated in 2006 where the need was expressed for the establishment of a formal forum / association of universities to engage in discussion / debate / collaboration / promotion of matters of mutual interest and so ASOCSA was born.

Broad Aims

ASOCSA aims to be the professional association for the development and advancement of construction education in Southern Africa, where the sharing of ideas and knowledge inspires, guides and promotes excellence in curriculums, teaching, research and service. To achieve this aim ASOCSA is partnering with the construction industry to find ways to effectively represent the interests of both construction academic and industry practitioners. ASOCSA will offer a variety of programs and services designed to help its members serve their customers more effectively and succeed in an increasingly challenging environment of construction information management and technology. To this end ASOCSA provides a forum for the debate and discussion of issues of mutual interest to all industry stakeholders. For example, one of the tasks of ASOCSA will be supporting the development of curriculums that address the needs of the construction sector in the Southern African region. ASOCSA convenes an annual conference that is one of only two construction-related conferences previously accredited by the Department of Higher Education and Training (DHET) where construction academics and practitioners can interact relative to practical experience and the findings of relevant research. This conference series is endorsed and underwritten by the International Council for Research and Innovation in Building and Construction (CIB) as well as several major industry stakeholders.

The Journal of Construction which is accredited by the Department of Higher Education presently published electronically four times per year is the official journal of ASOCSA and in the past more than 5,000 complimentary copies were distributed to all industry stakeholders in the Southern African region. The production and distribution of practice notes and technical papers is a further endeavor to grow the partnership between academia and industry.

With respect to the Southern African region, ASOCSA is committed to the following:

Vision

To drive innovative construction related higher education

Mission Statement

To promote, facilitate, develop, and monitor the relevance and quality of construction related curricula, research, and graduates in conjunction with higher education institutions, industry and government.

Strategic objectives

The objectives of the Association are:

- to promote and facilitate the development of curricula for construction related programmes
- to assist with the accreditation of construction related programmes
- to hold an annual conference that acts as a forum for multi-disciplinary interaction between academics and practitioners

- to publish an accredited research-based journal and contribute to the built environment body of knowledge (BEBOK)
- to disseminate information dealing with construction education and related matters
- to develop and maintain closer links with industry and government
- to represent the collective views of its members
- to liaise with other organisations and persons to promote the interests of its members
- to promote and support relevant postgraduate research
- to provide bursaries to postgraduate students in accordance with set criteria

ASOCSA continues to seek opportunities to promote both academic and industry employment opportunities. Finally, ASOCSA intends to play a significant and supportive role in the accreditation of construction-related academic programs.

Heads Forum meetings

ASOCSA believes that meetings of the Heads of School and Departments of Construction in Southern Africa is a vital component of its functions and holds both formal and informal discussions with Heads during each conference. The annual Construction Education Summit series commenced in 2021 (CES21) is planned from 2023 to become a formal platform for engagement with all construction higher education stakeholders.

International Affiliation

ASOCSA has commenced discussions about closer collaboration with similar institutions such as the Associated Schools of Construction (ASC) in the United States, the Royal Institute of Chartered Surveyors (RICS), the Chartered Institute of Building (CIOB), Australian Institute of Building (AIB) and Council of the Heads of the Built Environment (CHOBE) in the United Kingdom. ASOCSA has entered a Memorandum of Understanding with the International Council for Research and Innovation in Building and Construction (CIB).

In summary, benefits of membership of ASOCSA which are self-evident include participation in meetings of the Heads and the CES series throughout the region, access to the Journal of Construction with reduced paper processing fees, reduced rates at all ASOCSA, MBA and CIB events, involvement at regional level with industry-academia forums, interaction and networking opportunities relative to, for example, collaborative research, curriculum development, external moderation of courses, and external examination.

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For more information on ASOCSA and its activities visit www.asocsa.org

Dear Author

PEER REVIEW PROCESS CONFIRMATION: 16TH BUILT ENVIRONMENT CONFERENCE: LANSERIA, SOUTH AFRICA 2022

This serves to confirm that the following blind peer review process was strictly followed relative to this conference.

To ensure the highest quality in the conference proceedings and comply with the requirements for subsidy of the South African Department of Higher Education and Training (DHET), a rigorous two-stage system of peer review by no less than two acknowledged experts in the field has been followed. In terms of this process, each abstract received was twice blind reviewed in terms of:

- Relevance to overall conference theme and objectives;
- Relevance to selected sub-theme;
- Originality of material;
- Academic rigour;
- Contribution to knowledge; and
- Research methodology.

Authors whose abstracts were accepted after the blind review process was completed, were provided with anonymous reviewers' comments, and requested to submit their full papers addressing these comments. Evidence was required relative to the action taken by authors regarding the comments received. These resubmitted papers were twice blind reviewed again in terms of:

- Relevance to overall conference theme and objectives;
- Relevance to selected sub-theme;
- Originality of material;
- Academic rigour;
- Contribution to knowledge;
- Research methodology and robustness of analysis of findings;
- Empirical research findings; and
- Critical current literature review.

Authors whose papers were accepted after this second review were provided with additional anonymous reviewers' comments and requested to submit their revised full papers. These final papers were only included into both the conference presentation schedule and the conference proceedings after evidence was provided that all comments were appropriately responded to. At no stage was any member of the Scientific and Technical Committee or the editor of the proceedings involved in the review process relative to their own authored or co-authored papers. The role of the editors was to ensure that the final papers incorporated the reviewers' comments and arrange the papers into the final sequence based on the conference presentation schedule as captured on the conference proceedings and Table of Contents. Of the 65 abstracts originally received, 46 papers were finally accepted for presentation at the conference and inclusion in the conference SCOPUS-indexed proceedings, representing an acceptance rate of 71%. To be eligible for inclusion these papers were required to receive one of three recommendations from at least two reviewers, namely:

- Accepted for publication or
- Provisional acceptance provided minor changes / corrections are made or
- Re-submit for publication provided author/s reconsider/s the areas of concern

The conference proceedings will be published by ASOCSA within a reasonable time after the conference once all audits and verification have been completed. The authors of a selection of the best ten to twelve conference papers will be invited to rework their papers into book chapters that will be published in a Scopus, Compendex and Web of Science indexed edited book post-conference and titled, Construction in 5D: Deconstruction, Digitalization, Disruption, Disaster, Development: A Second Look.

Sincerely,



Dr. Progress Chigangacha (Conference Co-Chair)

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SUB-THEME: DEVELOPMENT

An exploration into the perceptions of social sustainability in the built environment amongst project managers

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ABSTRACT AND KEYWORDS

Purpose of this paper

Sustainability is a word that has gained prominence and popularity over the past few decades. The term “sustainability” comprises environmental, economic and social sustainability. Environmental sustainability has been the main aspect that has been focused on, followed by economic sustainability, however social sustainability has received little attention at all especially within the built environment. The aim of this research is to understand why the built environment treats social sustainability as the least important pillar, despite having improved on environmental and economic sustainability.

Design/methodology/approach

This research follows a concurrent embedded mixed-method approach within a pragmatic paradigm. A mixed-method approach was used for this research and semi-structured interviews were carried out. Project managers in South Africa were interviewed on social sustainability and were requested to answer questions about social sustainability within the built environment. This study also conducted a secondary data analysis of similar research by Ohene, Nani and Tetteh (2019).

Findings

The key findings are that social sustainability is treated as the least important pillar of sustainability due to the lack of a universal definition and understanding, the competitive nature of the built environment, the fact that it cannot easily be numerically or monetarily valued or measured, the socio-economic and sociocultural climate, and because there are no industry assessment bodies or tools for it.

Research limitations/implications

The study concludes that the concept of social sustainability is currently very broad, vague and subjective within the industry. This lack of clarity of what exactly social sustainability means and encompasses in the context of the built environment is a huge barrier in its implementation in the industry. It is recommended that more research be done on the subject matter, thereby resulting in the development of a definition, guideline or standard practices being established in the industry for there to be a universally understood meaning of what social sustainability means and looks like in the built environment. Furthermore, the establishment of an industry body which can advocate for social sustainability and can make assessment tools is also recommended.

What is original/value of paper

Social problems within and due to the built environment have been neglected and left unattended to. This paper attempts to understand why social sustainability is treated as the least important pillar within the built environment.

Keywords: Project managers, social sustainability, Construction projects, Property development, Sustainability

Impact of Covid-19 on construction businesses and their associated business survival practices in Zambia

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ABSTRACT AND KEYWORDS

Purpose of this paper

The purpose of this study was to investigate the impact of the Covid-19 pandemic on construction business in Zambia and the business survival practices adopted by the companies in responding to the effects of the pandemic on business.

Design/methodology/approach

The study uses an ex-post facto design which is descriptive in nature. The study sample was conveniently drawn from construction professionals and contractors operating in the Zambian construction industry. The data was analysed using the relative importance index (RII) after an exploratory factor analysis (EFA) was performed to assess the factor structure of the study variable. Scale reliability was assessed using Cronbach alpha, item-total correlations, composite reliability and average variance extracted.

Findings

The results show that the Covid-19 pandemic led to project distress, a poor business environment, and financial distress for companies in the Zambian construction industry. In order to cope the effects of the pandemic, construction businesses resorted to reducing their operational costs, reduction of profit margins on bids, business development, strategic business management, exercising financial discipline, waste minimisation and financial prudence. Government assistance was the least used survival strategy.

Research limitations/implications

The study was exploratory in nature and so used scales which are not widely validated. Some of the study scales exhibited poor reliability. Also, the study used a small sample of 30 respondents. Therefore, the results need to be interpreted with caution and further studies are required to valid the findings from this study.

Keywords: Covid-19 impact, business survival practices, Zambian construction industry.

Identifying Key Barriers Impeding Circular Built Environment Transition in Africa: An Exploratory Factor Analysis

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ABSTRACT

Purpose of this paper

This paper seeks to identify the key barriers hindering circular built environment (CBE) transition in Africa.

Design/methodology/approach

An exploratory factor analysis (EFA) was performed to reveal the factor structure underlying what the construction stakeholders and circular economy (CE) experts consider as the key impediments towards CBE transition. Assumptions of sample adequacy (KMO = 0.885) and sphericity (Bartlett's test of sphericity = $p < 0.001$) were fulfilled. The principal axis factoring extraction method coupled with the varimax rotation was employed. The number of key barriers were extracted using both the eigenvalues above 1 and visual inspection of the Scree plot.

Findings

The results of a pilot study (which included 14 countries) show that the key barriers include: implementation and regulations, client demand, supply chain, environmental, technological, and knowledge and information. Moreover, the CE initiatives are still immature in Africa, as evidenced by the prevalence of implementation related barriers.

Research limitations/implications

Data was obtained from a pilot study that consisted of 14 African countries, out of a total of 54 involved in the survey. Therefore, the barriers identified should be treated as indicative and not prescriptive.

What is original/value of paper

The paper highlights the key barriers impeding the Circular Built Environment transition in Africa. The outcomes of this paper can be used by policymakers, academics and industry practitioners to facilitate a CBE transition within Africa.

Keywords: Barriers, Circular Built Environment, Circular Economy, Africa, Exploratory Factor Analysis.

Construction Project Finance for Success: SMEs Perspective

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ABSTRACT

Purpose

Small and medium enterprises (SMEs)" successful execution of construction projects hinges on several factors. When clients' financing is delayed, SMEs face uncertainty in securing construction project funding. Project finance is key to successful project execution among SME contractors. Therefore, this study aimed to investigate construction project financing strategies for successful project completion from a SMEs perspective.

Design/methodology

A qualitative research approach was used based on interviews with 28 SME contractors, and consultants working with the SMEs in Gauteng province. Content analysis with the assistance of an Excel spreadsheet was used to analyse the data.

Findings

The findings indicate that construction SMEs heavily rely on various sources to finance the projects successfully. These financing strategies include Self-funded, Client upfront payment, Friends & Family, Government assistance, and Bank loan. Overall, there was a general agreement among SME contractors that bank financing is the least used source of funding. The prominent finances are sourced from personal income and immediate family and friends.

Research limitations/implications

The interviewees were managers of SME contractors working in the construction industry in Gauteng province, South Africa.

Practical implications

For SMEs to successfully finance their project, they should have self-acquired financial muscles or financial support from close acquaintances but not rely on bank loans and other sources of project finance.

Original/value

The knowledge advanced in this study will inform owners of small and medium-sized contractors of strategies necessary for sourcing finances for successful project delivery.

KEYWORDS: Access, Challenges, Construction SMEs, Project Finance Strategies, South Africa.

Model for Effective Public Procurement for Small, Medium and Micro Enterprises in South African Construction Industry

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ABSTRACT & KEYWORDS

Purpose of the Study

Although several reforms made to the South African public procurement system and application of supply chain management as a strategic policy strategic instrument, the South African public procurement system has still been strongly criticised for not encouraging the participation of small and medium enterprises. Hence, this study aimed to develop an effective public procurement model to encourage the participation of small, medium and micro enterprises in public procurement process. The effective public procurement model was measured by adopting five pillars of South African public system: openness, value for money, accountability, transparency and competitiveness.

Design/Methodology/Approach

The quantitative research method was employed to generate knowledge of the subject matter. The target population is approximately 400, including employees, managers, directors, business owners, procurement experts and professionals from Public Works Sector, Construction Industry Development Board, Business Chamber, Business Council, Procurement Institute, Built Environment Council and Progressive Professionals Forum. To determine the sample size, the 95% confidence level was chosen, with the margin of error at 5%. The stratified sampling method was used to select a sample size of 250 respondents. A questionnaire was used to collect data from 229 respondents. The data was analysed using the Statistical Package for the Social Sciences and Analysis of Moment Structure.

Findings

The findings revealed that openness, value for money, accountability and transparency made the strongest contribution to effective public procurement model, except competitiveness.

Research Limitations/Implications

The scope of the study was limited to the public procurement system in the South African context

Practical Implications

The study enhances efficiency in the South African public procurement system.

What Is Original/Value of Paper.

This study is unique as it contributes to expanding the body of knowledge on the public procurement system in South Africa.

Keywords: Accountability, Openness, Public Procurement, Small and Medium Enterprises, Value for money

An investigation and comparison of the mental health of the construction industry workforce prior to and during the pandemic in UK

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ABSTRACT AND KEYWORDS

Purpose of this paper

This research investigated and compared the mental health of those working within the construction industry prior to and during the COVID-19 pandemic. There had been research exploring this topic prior to the pandemic. However, there had been limited exploration into how the pandemic period effected mental health, despite the speculation that the pandemic caused the mental health of those working in the construction industry in the UK to decline.

Design/methodology/approach

The research was carried out using a mixed methodology, including primary, secondary, qualitative, and quantitative data. Due to the complex nature of the topic, but also the need to explore past and current events, the research question required a mixed methodology.

Findings

There were high rates of poor mental health and suicides within the construction industry in the UK. This had been well documented for some years, the pandemic was expected to exacerbate these issues due to restrictions and changed stressors. However, this research showed that the mental health of construction workers did not necessarily worsen, in addition to there being a lower level of suicides in 2020 compared to 2019. However, the rates had been still alarmingly high, and the construction industry had reached crisis point. Further research needed to be carried out in the years following the pandemic.

Original value

The mental health of construction workers in the UK had been consistently poor over at least the last decade. Additionally, there were high rates of suicides within the construction industry. However, the speculation that statistics would show declining mental health in the industry during the pandemic, was proved to be incorrect by the primary and secondary research. The research provided data and discussions on the mental health of construction employees prior and amid the global pandemic in UK. It shaded light on the post-pandemic era on how to improve the mental wellbeing of employees for all stakeholders in the construction industry.

Keywords: Mental health; Construction workforce; Pandemic; Suicide; Wellbeing

The growth and performance of construction firms in South Africa: does leadership style make a difference?

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ABSTRACT AND KEYWORDS

Purpose of this paper

The purpose of this paper is to examine whether there is a significant relationship between leadership styles and organisational growth and performance of construction firms in South Africa. The rationale for this paper originates from the notable failure of prominent construction firms in South Africa. This decline in the performance of construction firms brings about the need to investigate the relationship between leadership styles and the growth and performance of construction firms.

Design/methodology/approach

The study employed mixed-method research approach involving the use of a case study and survey research design. Structured interviews were used to elicit primary qualitative data while an online questionnaire was used in generating quantitative data over five years for construction companies listed in Grade2-9 on the Construction Industry Development Board (cidb) Register of Contractor (RoC). The data collected was analysed using descriptive and inferential statistics. The descriptive analysis was based on the responses of 31 contractors in the Western Cape. Pearson correlation analysis was conducted to examine the effect of leadership styles on the company's growth and performance. Interviews were analysed using thematic analysis.

Findings

The study found that the relationship between six leadership styles and organisational performance were significant at the 5% level of confidence, while three were significant at the 1% level. The relationship between leadership styles and organisational growth and performance was found to be positive but moderately weak.

What is original/value of paper

The outcomes of the research are useful to current construction company leaders and practitioners entering the industry as they will be aware of the correct and most effective leadership style that benefits construction companies. This will bring about overall firm growth, improved company performance and reduced failures of contractors in the South African construction.

Keywords: Construction Industry, Democratic Leadership, Growth, Laizzez-Faire Leadership, Organisational Performance, South Africa, Transformational Leadership

Affordable Housing Development by the Private Sector—A Conceptual Framework

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ABSTRACT & KEYWORDS

Purpose of this paper

There is an increasing need for housing supply globally, and the advocacy for private sector participation to address housing backlogs has been on the rise for many years now. This is however challenged by stiff regulatory restrictions that threaten private sectors' involvement. Affordable housing development as a tool for housing delivery is rife with many challenges globally. Even when calls are made for a more active private sector engagement to effectively manage housing crises, the legislative structures which should encourage their participation rather create barriers for them. This literature review-based paper slightly differs from empirical studies and aims to develop a conceptual framework linking regulation to housing affordability. The objective is therefore to develop a framework for the analyses of affordable housing by the private sector.

Design/methodology/approach

The objective is achieved through a critical review of existing literature and analysing various methodologies. The conceptual framework is achieved using the theoretical tools of Institutional Analysis and Development.

Findings

The conceptual framework becomes the result of the study which will be useful for future research and can guide developers and policy makers in their decision making on affordable housing supply.

Research limitations/implications

This conceptual paper does not have empirical data. The study recommends how the conceptual framework can be employed to guide researchers for further studies, as well as guide developers, and policymakers in making informed decisions and interventions. The framework will help them in identifying the main planning and building regulations are, that affect the private sector in affordable housing development.

What is the original/value of paper?

The IAD framework is introduced into affordable housing studies here. It is commonly used for policy studies regarding common pool resources research.

Keywords: Regulations, Developers, Affordable Housing, Private sector, Framework

Built Environment Students and Enterprise Education: Attitudes and Perceptions

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ABSTRACT AND KEYWORDS

Purpose of this paper

The purpose of this study was to explore a broad array of attitudes toward and outcomes of entrepreneurship education on construction students in order to understand and the characteristics of students participating in related programs and activities, the nature and extent of their involvement, entrepreneurship's role in their career plans, and its impact on entrepreneurial self-efficacy.

Design/methodology/approach

Survey data were collected from 190 first to third year construction management, civil engineering and quantity surveying students at a University of Technology in South Africa.

Findings

Results revealed that while 75% of the students intended to pursue jobs in industry upon graduation, a majority of them perceived that enterprise education could increase their chances of getting a job as well as broaden their career choices and prospects. Of all the students, 12% perceived that enterprise and entrepreneurship was being incorporated in their programs. Further, students who had participated in the newly developed enterprise module displayed statistically significant higher self-efficacy on a number of enterprise competencies.

Practical implications

Findings from this study provides a model which is useful in curriculum development and evaluation.

Keywords: construction education; curriculum development; enterprise education; entrepreneurship

Assessing the Mental Well-being of the Construction Workforce in South Africa using the World Health Organisation (WHO-5) Wellness Index Measure

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ABSTRACT AND KEYWORDS

Purpose

The purpose of this study is to assess the psychological wellbeing of the construction workforce in South Africa using the validated WHO-5 Wellbeing Index Measure.

Design/methodology/approach

In this cross-sectional study, data were collected from contractors working in the Kwa-Zulu Natal province in South Africa. The sample were conveniently selected based on proximity and familiarity to the researcher. A quantitative research approach was used, and data were analysed using IBM SPSS v25. Furthermore, descriptive statistics was used to analyse data and further interpreted using the prescribed WHO-5 scoring system.

Findings

The findings of the study revealed the mean responses ranging from 3.31 for 'I have felt cheerful and in good spirit'; 3.00 for 'I have felt active and vigorous' and 'I have felt calm and relaxed'; 2.63 for 'I woke up feeling fresh and rested' and the lowest ranking of 2.37 for 'My daily life has been filled with things that interest me'. The overall WHO-5 score was calculated as 57.24 which is slightly above the cut-off score determined as ≤ 50.00 . Cronbach's Alpha was further used to measure the internal consistency and reliability was accepted as good at 0.893 across all the scales used, and further analysis of the results was conducted

Research limitations/ implications

The study is only limited to assessing the psychological wellbeing on a conveniently sampled population using self-report questionnaire. Therefore, may suffer from limitations associated with self-reporting such as response bias, social desirability, introspective ability, understanding and limitations with rating scales.

Value of paper

It is hoped for that the findings of this study will reveal the state of mental wellbeing among the construction workforces. Several limitations are acknowledged. This is a snap survey and forms part of an ongoing empirical research.

Keywords: Construction Industry, Construction Workforce, Mental Well-being, Mental Health, WHO-5

Emerging Black Businesses Participation in the South African Public Sector Property Management Portfolio

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ABSTRACT & KEYWORDS

Purpose

Owning property does not only provide shelter but is also a potential source of income. However, there are limited Emerging Black Business property owners in South Africa participating in the Public Sector Property Management Portfolio. Therefore, this study aims to examine the participation of emerging black business owners in the public sector property portfolio with a view to improving property management practice.

Design/methodology

The study employed a qualitative research design using semi-structured interviews with 18 registered property owners and government officials in the Free State province. Data was analysed using a mixed method of thematic and content analyses.

Findings

Findings indicate ineffective legislative frameworks and low participation of emerging black-owned businesses in public sector property management portfolios. This was found primarily due to poor implementation, a lack of public and private sector co-operation, and a lack of information sharing on best practices.

Research limitations/implications

The research study was limited to emerging black business owners in the Free State province, South Africa.

Practical implications

There is a need to develop property incubator programmes for mentoring and educating emerging black business property owners. Investment and participation in property development incubators and information sharing will enhance emerging black business owners' participation in the public property management portfolio.

Original/value

The findings will inform Emerging Black Business owners and the government on strategies necessary for enhanced participation in the South African Public Sector Property Management Portfolio.

Keywords: Emerging Black Businesses, Property-owners, Public Sector, Property Management Portfolio.

The potential of Industry 4.0 to enhance project delivery in the Zimbabwean construction industry

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ABSTRACT & KEYWORDS

Purpose of this paper

The aim of this research was to investigate the potential of Industry 4.0 technologies to improve project delivery in the construction industry in Zimbabwe.

Design/methodology/approach

The data was collected through the distribution of structured questionnaires to general contractors, architects, and engineering firms in Bulawayo, Zimbabwe. The data was analysed using MS Excel to generate descriptive statistics in the form of frequencies and mean scores (MSs).

Findings

The results show that there is limited use of Industry 4.0 technologies. Nonetheless, Industry 4.0 is perceived to have the potential to enhance timely delivery of projects through enhanced visualisation of projects before construction, improved connectivity of project team, improved building design, provision of accurate data, and improved planning and decision making. Nonetheless, the lack of funds, lack of resources, lack of knowledge, and the lack of skilled labour are the major barriers constraining the use of the technologies.

Research limitations/implications

The study is based on a small sample, which may affect the generalisation of the findings to other regions.

Practical implications

The perceived importance of Industry 4.0 on project delivery calls upon the creation of an enabling framework to support the adoption of these technologies to improve performance. The integration of Industry 4.0 into the built environment curriculum is important to impart knowledge and skills to the graduates.

What is original/value of paper?

The study makes an important contribution to an emerging body of knowledge in Zimbabwe.

Keywords: Barriers, Construction, Industry 4.0 technologies, Project time delivery

Leadership style and its influence on job satisfaction of South African quantity surveyors

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ABSTRACT AND KEYWORDS

Purpose

Insight into the most appropriate leadership style in quantity surveying firms could play a significant role in employee job satisfaction. Therefore, this research aims to establish if there is a relationship between the leadership styles used in quantity surveying firms and the level of job satisfaction experienced by employees.

Design/methodology/approach

The research used a positivist research philosophy, deductive reasoning, and a mono-method (quantitative) survey approach. Candidate and registered quantity surveying members of the Association of South African Quantity Surveyors (ASAQS) were approached to complete the online questionnaire.

Findings

The results revealed that 64.5% of all the variance in job satisfaction in South African quantity surveyors could be explained by the leadership style that the leaders implement in the organisation. The prevailing leadership style used is transformational leadership, which is positively correlated to employee job satisfaction.

Practical implications

Transformational leadership should be implemented in the quantity surveying industry in South Africa to increase the job satisfaction of the quantity surveyors

What is original/value of paper

The study findings are valuable to many role players in the quantity surveying industry in South Africa. When transformational leadership is implemented in the quantity surveying industry, the job satisfaction of quantity surveyors is increased.

Keywords: Job satisfaction; Leadership styles, Transformational leadership

Challenges of the Supply Chain Management in The Construction Industry: An Analytical Study

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ABSTRACT AND KEY WORDS

Purpose of this paper

This research aims to investigate the challenges of Supply Chain Management (SCM) in the construction industry.

Design/methodology/approach

To achieve the abovementioned aim, the research adopted an analytical qualitative research approach. Comparative analysis of intensive literature review was conducted to build a comprehensive knowledge about the research topic through investigating the nature and characteristics of supply chain and SCM, dimensions of supply chain performance and challenges of SCM.

Finding:

Construction industry is a productive process that has numerous and complex interfaces between participants and many problems originated by the lack of coordination of these participants. SCM provides several principles to address this fragmentation and eliminate it. Some of the major benefits that construction organizations can achieve by applying SCM principles are: reduced actual costs, increase competitive advantages, on time delivery, productivity improvement, value creation, greater confidence in longer-term planning and better relationships between parties. The research identified many causes of challenges to apply SCM application in construction industry are and covered the different views, approaches and efforts conducted to adopt the concept of SCM in the construction industry. In addition, it discussed the different roles of SCM, dimensions and characteristics of SCM and stakeholders involved in construction supply chain.

Limitation:

The concept of supply chain (SC), and supply chain management (SCM) are relatively new to the construction industry, and the construction industry is limited to apply SCM technique and principles.

Practical Implication:

The research work presented in this paper enable governmental authorities, design and construction firms as well as other supply chain members to work collaboratively to overcome these challenges as an approach for enhancing the performance of the construction industry.

Keywords: Challenges of Supply Chain Management, Construction Industry, Supply Chain Management.

Construction Infrastructure Project Cost Overrun and Cost Control/Management Techniques.

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ABSTRACT AND KEYWORDS

Purpose of this paper

The construction industry is distinct and different from other industries due to its multifaceted nature and the unpredictability it meets. Despite advancements in construction project management throughout the decades, cost overrun as proved to be a significant challenge for the industry with most of the construction and infrastructure projects encounter cost and schedule overruns due to challenges caused by inadequate cost management during the design and implementation stages. Hence, this research is set to identify and rate the elements that influence cost overruns and evaluate the cost management techniques in the UK construction sector.

Design/methodology/approach

The research was carried out using primary research, which takes the form of quantitative data collected through a questionnaire. This provides the required data for analysing cost overruns and determining the most effective cost management strategy. The Relative Importance Index (RII) rated the components.

Findings

Findings from the research show that erroneous estimating, unsuitable planned design standards, and information are the main militating factors influencing cost overruns in construction infrastructure projects (CIPs) with a relative important index (RII) of 0.938462 whilst budgeting ranked highest for all participants as a cost-control approach.

Original/value of paper

This is to gauge the position of middle management on the various challenges posed by cost overrun and delays. It was deduced from the research outcome that an experience professional should oversee complex or mega project and innovative design technology can be used to enhance design consideration right from the outline design stages.

Keywords: Cost overrun, Cost management, Cost control, Construction, and Infrastructure projects

Barriers Facing Retrofitting of Existing Building in Developing Countries: A Review of Literature

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ABSTRACT AND KEYWORDS

Purpose

The retrofitting of existing buildings has gained recent recognition in the built environment as an acceptable alternative to the construction of new buildings. New retrofitting technologies have become a means of achieving sustainability through efficient and effective practices in the construction industry. Therefore, this paper seeks to identify the barriers facing retrofitting buildings in the construction industry of developing countries.

Findings

The study found that various barriers to building retrofitting include a lack of technical expertise, a lack of capital investment, a lack of awareness, a lack of operation and maintenance support, limited financial support such as subsidies, low-interest rates as well as tax reductions, and a long payback period

Design/Methodology/Approach

This study utilized a systematic examination of literature to identify the barriers to building retrofitting in developing countries. A literature search was conducted using the Scopus search engine.

Originality/Value

This study has contributed to the field of building retrofitting by identifying the barriers facing the practices of building retrofitting in developing countries. The finding of this study will facilitate the professionals and house owners to understand the barriers facing building retrofitting in their regions.

Implication

The paper provides significant findings from an economic, energy, and environmental point of view. To address the barriers to building retrofitting in the construction industry, it should inspire professionals to consider the barriers to retrofitting when designing the project to avoid delays.

Keywords: Retrofitting, Existing building, Sustainability, Developing countries, Barrier

Supply chain management practices and factors affecting project quality in Zambia

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ABSTRACT AND KEYWORDS

Purpose of this paper

The purpose of this study was to assess the supply chain management practices used in the Zambian construction industry and identify factors which affect project quality in the supply chain practices.

Design/methodology/approach

The study used a quantitative research approach with a survey questionnaire administered to contractors and consultants in the construction industry. Convenience sampling was used because the study was exploratory in nature and to avoid the difficulties associated with probability sampling methods. The data was first subjected to exploratory factor analysis to assess the dimensionality of the study scales. Reliability and validity were assessed using Cronbach's' alpha, item-total correlations, composite reliability, and average variance extracted. The relative importance index was then used to rank the predominant supply chain management practices and the factors which affect project quality.

Findings

The results show that the supply chain management practices factors into two broad categories relating to the internal practices of the contractors and to external supply chain management practices in relation to suppliers. Practices which affect project quality factored into contractor factors and project management supply chain related factors. Contractor supply chain factors ranked higher than project management related factors.

Research limitations/implications

The results are limited by the small sample size (55) and the exploratory nature of the study which relied on scales which are not widely validated. As a result, some of the reliability and validity statistics for some scales fell below the acceptable threshold. Therefore, the results should be interpreted with caution.

Keywords: Supply chain management, project quality, Zambian construction industry.

The implementation of Building Information Modelling in the quantity surveying profession

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ABSTRACT AND KEYWORDS

Purpose of this paper

The aim of the research study was to determine the reasons why quantity surveying professional in South Africa being reluctant to implement Building Information Modelling (BIM).

Design/methodology /approach

To explore the problem identified and to achieve the purpose of the study, a quantitative study was executed. A structured questionnaire was used to facilitate the data collection. The research specifically targeted registered quantity surveyors in South Africa. The data was analysed by making use of descriptive statistics, which allowed for the arithmetically analysis of the data.

Findings

BIM knowledge possessed by quantity surveyors is insufficient and the collective efforts from the entire profession to increase the knowledge is slightly evident, however, these efforts are identified as important to improve their knowledge. Initial capital investment is identified as the main barrier for the implementation of BIM in the quantity surveying profession, within sufficient education and training as the second largest barrier followed by cultural resistance.

Research limitations/implications

There is a limited number of quantity surveyors in South Africa with BIM experience and therefore participation in the research was below average.

Practical implications

The results identify factors effecting the implementation of BIM and therefore identifying aspects which must be targeted through the development and implementation of strategies and programmes, which could reduce barriers and improve the knowledge possessed.

What is original/value of paper

The research study identifies the reasons behind the quantity surveying profession being opposed to implementing BIM.

Keywords: Quantity surveyor, Building Information Modelling, barriers, knowledge.

Quantity surveyors' level of knowledge relating to sustainable building principles

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ABSTRACT AND KEYWORDS

Purpose of this paper

This study aimed to identify the level of knowledge of quantity surveyors relating to green building principles and the level of involvement of the quantity surveyor in the selection process of green building projects. The study further investigated if and how the quantity surveyor is involved in the selection process of green building materials and products on projects.

Design/methodology/approach

A quantitative research approach was used with an online survey placed on the Association of South African Quantity Surveyors' (ASAQS) Weekend Property and Construction Newsletter. The target population included registered professional quantity surveyors and candidate quantity surveyors. The data was analysed through descriptive statistics, which allowed for the arithmetically analysis of the data.

Findings

The green building principles which were mostly notified from the data includes: "the high-cost premium"; "benefits of reduced operating costs"; "green building products"; "benefit of return on investment on green buildings"; and "green buildings achieve higher market values". The results further revealed that quantity surveyor provides cost advice on alternative green building materials and products to the design team even though the architect is primarily responsible for the selection process of green building products and materials.

Practical implications

The results identified areas where quantity surveyors' knowledge is lacking which should be addressed.

What is original/value of paper

This study will add important information on the involvement of the quantity surveyor in the selection process of green building materials and products on sustainable building projects.

Keywords: Knowledge level, sustainable building principles, quantity surveyor, green building principles

Utilization of corn cob ash as partial replacement of cement in concrete: a review

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ABSTRACT & KEYWORDS

Purpose of this paper

This paper aims to review the extant and current literature on the utilization of corncob ash (CCA) as a partial replacement for cement in concrete and to investigate its properties as a cement replacement material in concrete production.

Design/methodology/approach

This study systematically reviewed published articles in scientific databases; Scopus and Google scholar to acquire data on the utilization of CCA as a partial replacement of cement in concrete.

Findings

CCA was found as a suitable cement replacement material with good pozzolanic characteristics. Also, the optimum cement replacement with CCA ranges from 5%-10% without sacrificing the concrete strength.

Practical implications (if applicable)

The findings of this study will help promote CCA adoption as a sustainable cement replacement material in the construction industry.

What is original/value of paper

The review findings revealed the current trend of CCA applications in concrete and properties and the gaps that are yet to be covered, as this will serve as a guide to researchers for further research in the field. It will also inform the construction industry on the applications of CCA in concrete production towards enhancing greener and sustainable construction materials.

Keywords: Pozzolan, Chemical property, Physical property, Sustainability, Compressive strength

Effects of COVID-19 on employees in the construction and consulting engineering companies in the small and medium sector, South Africa

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ABSTRACT AND KEYWORDS

Purpose of this paper

The study aimed to establish the effect of the COVID-19 pandemic on employees within the construction and consulting engineering companies in South Africa.

Design/methodology/approach

This is a literature review paper which analyses empirical research carried on COVID-19 and its implications on employees within the small and medium enterprise sector. The literature review was limited to only the studies conducted between the periods of the COVID-19 pandemic (2019- 2022).

Findings

The result of this study demonstrate that although the pandemic has impacted both large firms and small and medium enterprises, its effects are more significant on small and medium enterprises. It was found that compared with large firms, employees within the small and medium enterprises are more vulnerable to the COVID-19 pandemic, having been laid off or having reduced work hours and pay.

Original/value of paper

This study is significant because it contributes to the existing knowledge of the COVID-19 pandemic and its consequences on employees in small and medium enterprises. Moreover, the study serves as a valuable tool for organisations, especially small and medium enterprises, on how to respond to a pandemic of this nature. Additionally, the study will help promote the sustainability of small and medium enterprises by adopting different strategies to respond to the COVID-19 pandemic

Keywords: COVID-19 pandemic, small and medium enterprises, South Africa.

Investigation of Simplicity principle as a solution for Complexity within architectural design process

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ABSTRACT AND KEY WORDS

Purpose

This research aims to investigate the role of the simplicity principle towards overcoming the complexity of the architectural design as an approach for developing sustainable construction projects.

Design/methodology/approach

In order to achieve the above-mentioned aim, a scientometric analysis was conducted to identify the needed literature to be reviewed. This was followed by an investigative approach that determine the different factors that lead to complexity in the architectural domain. Moreover, different simplicity techniques that were used to reduce the complexity in architecture was revised. Finally, a deductive relationship matrix was developed to portray the relationship between Simplicity approaches and Complexity aspects.

Findings

The research identified the five core aspects of scientometric analysis for papers that relate to the scope of the study. Then through literature review, the research identified the main concept of complexity, its types and aspects as well as the simplicity concept and its use in the Architecture/Engineering/Construction industries concluding with a relationship matrix that propose simplicity techniques as a solution to the complexity aspects

Originality/value

The research is studying a relatively novel topic that has not been previously explored enough in the architecture domain. This can be due to the way of precision of the design process where to relate it to the complexity science. However, this research aims to isolate those research that focus on architecture and highlight the outcome in the literature section.

Keywords: Architecture Design Process; Design Sustainability; Complexity Theory; Simplicity Approaches

Impact of Ethics and Professional Conduct on the Quality of Services Rendered by Construction Project Managers.

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ABSTRACT & KEYWORDS

Purpose

Construction and infrastructure development plays a significant role in improving the lives and the economy of South Africa. The construction project managers (CPM) are appointed to ensure that the project runs accordingly by offering required activities on time and within the allocated budget. The aim of the research was to determine whether stakeholders and project sponsors are being exploited in terms of unethical and unprofessional conduct by the CPMs. The objective of the research was to determine whether there is a collusion between the CPMs have any impact on the quality of work in the construction sector. The South African government has professional councils in place that regulates and monitor the professional behaviour in the construction sector.

Methodology

A qualitative research method was used as a primary method to collect data from the eight respective participants. Publications from academic and government sources were used as secondary method to supplement the primary data.

Findings

The findings in the study have indicated that corruption is one of the contributing factors towards unethical behaviour and poor workmanship in the sector. There is still a significant gap between the professionals where skills transfer becomes a concern. Private sector relies primarily on experience as opposed to public sector which relies on professional registration.

Value

Relevant authorities such as the South African Council for the Project and Construction Management Professionals and law enforcement officers should strengthen the legislation that would enforce harsher penalties on parties that conduct unethical practices. The SACPCMP should regulate the profession in a manner that there is a separation of power where professionals operate as both principal agent and the CPM.

Keywords: Ethical Behaviour, Corruption, Registered Construction Project Manager, The Construction Sector

A Critical Review of the Cost Implications of Sustainable Construction

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ABSTRACT & KEY WORDS

Purpose of this paper

This proposed study aims to evaluate the cost and socio-economic influence of sustainable construction on the realities of South African construction. The construction industry influences the environment as well as individual health and well-being. Sustainable construction contributes to the mitigation of problems associated with pollution, waste, and inactivity and presents alternative options subconsciously leading to healthier choices. This literature-based paper from the early stages of a doctoral study argues that the implementation of sustainable construction practices will increase if the knowledge gap among construction professionals is closed by advancing the benefits of life cycle costing of all immovable assets in the built environment.

Design/methodology/approach

The critical review methodology will be used to compile this paper.

Findings

The findings of this study will be based on the critical review of relevant literature.

Research limitation/implications

The study's limitations include implementation barriers and little knowledge of sustainable construction practices and LCC in the QS profession. Further limitations will be investigated through the critical review of relevant literature.

Practical implications

Practical implications and key findings will be based on the critical review of relevant literature.

Originality/value of paper

The combination of sustainable construction knowledge combined with core QS skills provides an opportunity to promote the implementation of sustainability practices in the construction industry. The concept of life cycle costing as cost management tool in sustainable construction equips the QS profession with relevant data to ensure the best value from a whole life per

spective

Keywords: Construction, Cost Management, Sustainability, South Africa

Sustainable Infrastructure Development Approaches in Sub Sahara Africa – the Case of Zambia

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ABSTRACT & KEYWORDS

Purpose

This paper reviews the approaches and nature of sustainable infrastructure development that have emerged as a matter of interest for economies in high, medium, and low-income countries.

Methodology

The paper adopted a systematic literature review of the identified related studies that targeted various physical information sources and online peer-reviewed academic databases to solicit literature published in English on infrastructure development models using search keywords including state-led approach community led approach, infrastructure development, and mixed development method.

Findings

Literature suggests that state-led-development models have worked in Asia and in other countries where it has been replicated. However, little or no evidence exists to vividly propose either state-led or community-led development trajectory as ideal for Sub-Saharan Africa and Zambia in particular. Thus, it must be pointed out that the 2 precondition for an ideal development agenda for any given economy must be premised on developing diverse and contextual local capacities that engage local challenges within a global development landscape.

Originality

This work is limited to assessing the approaches and nature of sustainable infrastructure development. It will contribute to the planning, design, and implementation of infrastructural engineering project solutions, especially in low and medium economies that are essential to establishing infrastructure development approaches that directly support sustainable development within communities and sharing knowledge in the built environment. It is also believed that such a comprehensive understanding is warranted in order to build a narrative on remedial options for developing and managing infrastructure to promote sustained economic and human development in Zambia.

Keywords: Infrastructure development, economic development, human development, sustainability, communities.

Structural efficiency and energy: A consideration for sustainable construction in South Africa

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ABSTRACT AND KEYWORDS

Purpose of this paper

In South Africa, the environmental impact of inefficient construction methods is becoming unsustainable. To some extent, the impact can be mitigated through sustainable design and construction methods. With building demand expected to increase significantly over the next few decades, this will result in an intolerably high level of negative overall impact unless basic principles of sustainable building construction are incorporated into standards and then enforced. This paper examined inefficient construction methods by contrasting a specific unfavourable standard SANS 204 with a specific actual condition.

Design/methodology/approach

A review of SANS 204 conducted by other authors identifies areas for improvement and indicates that shortcomings may be overcome through a more rigorous examination of energy efficiency in order to achieve sustainable construction methods. Assessing the environmental impact of buildings necessitates the development of a building environmental assessment system, which requires, (1) an understanding of the various ways in which a process affects the environment; (2) a quantification of the magnitude of each of the process's effects; and (3) a yardstick for determining the extent of environmental degradation.

Findings

The potential of an integrated paradigm to direct builders toward sustainable buildings is presented.

What is original/value of paper

This study contributes to the growing body of knowledge regarding the relationship between structural efficiency and energy consumption, and how they can contribute to the overall efficiency and sustainability of buildings.

Keywords: sustainable construction, structural efficiency, energy efficiency.

Sustainable construction developments for low-income housing projects: lessons for South Africa in local governments

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ABSTRACT & KEYWORDS

Purpose of this paper

Low-income housing remains one of the most pressing infrastructure deficiencies in South African local governments. This study aim is to presents the factors that would enhance sustainable low-income housing developments and performance of contractors during the construction process.

Design/methodology/approach

The study was descriptive and exploratory in nature using a quantitative design. Data was gathered through structured questionnaires using stratified random technique to ensure that medium to large scale construction companies are well represented in the selection relating to low-income housing within Polokwane Municipality.

Findings

Findings suggest that causes of poor quality in low-cost houses is perceived to be related to the use of inexperienced contractors who are presumably not tested enough, and to the untrained workers by the contractors. The finding of this study also provides a platform for improving quality of housing design, construction projects, sustainability and an opportunity for local and international design and construction professionals to rethink design in the context of low-income housing project.

Research limitations/implications

Managers in low-income housing projects and contractors may also use the results of this study as a benchmark for competitive advantage. The results alos provide a guideline for sustainable construction developments for low-income housing projects for South Africa in local governments.

Value of paper

This study is of value to designers/consultants and managers in the local governments as it helps to establish the factors affecting the sustainable construction developments for low-income housing projects.

Keywords: Low-income housing, contractors, building construction, quality design

The Potential Benefits of Using E-Tendering in South African Construction Projects

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ABSTRACT & KEYWORDS

Purpose

The South African Construction Industry (SACI) in its broadest sense had to change from the normal and ancient way in order to meet the global sustainability objective. However, there are challenges encountered in adopting and implementing sustainable technological construction practices. This study aims to fill the knowledge gap through investigating the Potential benefits of e-tendering in the south African construction Projects.

Design

A Questionnaire was prepared and distributed electronically to Professionals in the South African Construction Industry and out of the 110 sent out only 91 responses were received. The SPSS Package, descriptive analysis (mean item score) and exploratory factor analysis (EFA) were used to analyze the data obtained.

Findings

The findings of the study show that the top three potential benefits of e-tendering are: increased distribution speed of tenders, increased efficiency and effectiveness, and improved tender management.

Value

The effective deployment of an electronic tendering (e-tendering) systems, according to various authors, is one of the tactics that may be used to increase transparency, accountability, and eliminate corruption.

Keywords: e-Tendering, innovation adoption, South African construction industry.

Decentralized Treatment for Wastewater: Practices Towards Sustainability in Wastewater Management: A Bibliometric Review

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ABSTRACT & KEYWORDS

Purpose of the paper

Limitations of the centralized wastewater treatment systems and the rapid increase in urbanization have increased the need for sustainable efficient alternatives. The purpose of the study was to identify the research trends in publications on decentralized wastewater treatment practices for sustainable wastewater management.

Methodology

A bibliometric methodology was adopted in the study. The bibliometric analysis was conducted using the VOSviewer software. A total of 93 peer-reviewed journal articles from Scopus were quantitatively reviewed using a variety of methods such as co-occurrence analysis, co-authorship analysis, and citation analysis.

Findings

The identified research clusters revealed that there is a strong linkage between decentralized technologies and wastewater reclamation, resource conservation, and water conservation. However, the lack of extensive collaboration among researchers is concerning especially, for the growth and refinement of ideas in the research area.

Research Limitations

The study only used the Scopus database. Further investigations are therefore needed to understand the operation and processes of decentralized wastewater technologies drawing information from other databases.

Value of paper

The identified research trends can help push for the adoption of decentralized wastewater systems for sustainable wastewater management in the wastewater sector.

Keywords: Decentralized wastewater systems, Onsite wastewater treatment, Sustainable sanitation

An Integrated Framework for Catalysing Development and Sustainability of Small and Medium sized Contractors: A case of Namibia

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ABSTRACT AND KEYWORDS

Purpose of this paper

This study sought to develop a framework that catalyses development and sustainability of small and medium-sized contractors (SMCs) in Namibia.

Design/methodology/approach

The study employed a multi-method qualitative approach to validate the conceptualised framework. Data were collected in two phases using purposive sampling. Phase 1 entailed semi-structured interviews with twenty-two (22) industry stakeholders, while Phase 2 involved structured interviews with five (5) experts and a semi-structured interview with a director of an established indigenous construction company. Data were analysed using thematic analysis.

Findings

The findings validated the conceptualised framework, culminating in the development of the final integrated framework for catalysing development and sustainability of SMCs in Namibia.

Research limitations/implications

The developed framework needs to be adapted to other settings with caution.

Practical implications

The developed integrated framework could aid government, policymakers, and other relevant stakeholders to enhance development and sustainability of SMCs in Namibia and similar settings.

Originality/value of paper

The study argues that the adoption of the proposed integrated framework would stimulate development and sustainability of SMCs in the Namibian and similar contexts since there is paucity of literature regarding a framework focusing on Namibia.

Keywords: Integrated framework, SMC development and sustainability, Namibia

An Investigation into the Factors Influencing the Uptake of Electronic Tendering (e-Tendering) in South African Construction Projects

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ABSTRACT & KEYWORDS

Purpose

Against the backdrop of increasing use of e-tendering in construction management, there is a need for adequate knowledge of the factors that influence the decision by organizations in the construction industry to use e-tendering. This study aims to fill the knowledge gap through investigating the factors influencing the uptake of e-tendering.

Design

A well-structured questionnaire was used to gather data and on the data sourced in a questionnaire survey involving 91 professionals in the South African construction industry. Using the SPSS Package, descriptive analysis (mean item score) and exploratory factor analysis (EFA) were used to analyze the data obtained.

Findings

It was observed that out of the 8 identified factors investigated in the study, three most important factors influencing the uptake of e-tendering in South African construction projects, in order of importance, were: price reduction in tendering process, client and user satisfaction / improvement in communication between parties, and corruption reduction / enhanced decision making.

Value

The study concludes by identifying strategies that should be engaged in increasing the uptake and maximizing the benefits of e-tendering in the South African construction industry.

Keywords: e-Tendering, innovation adoption, South African construction industry.

SUB-THEME: DIGITALIZATION

An overview of the use of Building Information Modelling (BIM) by general contractors and the potential benefits for emerging contractors

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ABSTRACT AND KEYWORDS

Purpose

The purpose of this paper is to identify Building Information Modelling (BIM) uses and benefits for General Contractors (GCs) and then to explore the extent to which Emerging Contractors (ECs) can also benefit from this novel innovation.

Design

In exploring the comprehensive benefits derived by GCs from using BIM during the project execution phases, this paper explores the extent to which the specific challenges experienced by ECs in project execution can be addressed by BIM technology. The benefits investigated include management of project scope, schedule control, cost management, and quality of workmanship.

Findings

The findings suggest that GCs can use BIM for various associated beneficial functions. ECs can also benefit from BIM. The use of BIM can benefit and assist ECs to overcome challenges during the project execution phase. This study proposes that the challenges experienced by ECs can be addressed by introducing a lean approach to the BIM concepts.

Value

This paper addresses two research gaps, it holistically reviews and synthesizes extant studies and identifies extensive BIM project use opportunities for GCs and proposes potential BIM project uses to benefit ECs and lay the foundation for further studies.

Keywords: Emerging Contractors (ECs), General Contractor (GCs), Building Information Modelling (BIM), Developing Country, Project Manager (PM)

An Overview of BIM as a Material Management Tool in the Construction Industry

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ABSTRACT

Purpose of this paper

For decades building materials management has solely relied on manual managing and recording. These usually resulted in increased construction costs and waste of materials. These challenges have raised a great concern for the construction manager (CM). The CM is now looking for an innovative way of managing building materials. Based on documented findings, this study aims to check the extent to which innovative management technology such as Building Information Modelling (BIM) functions as a material management tool.

Design/methodology/approach

To achieve the objective, published articles focusing on BIM-Material management were extensively reviewed, supported by trends check and visualisation network mapping. VOSviewer bibliometric analytical software was used to map the network connection for co-occurrence keywords, contributing country, and the most cited author.

Findings

The findings of this study disclose that there are few BIM-based material management models, if adopted, can help minimise rebar waste and effectively manage material handling and supply during construction.

Practical implications

This study has documented the various contribution of BIM as a material management tool. The result of this study will create more awareness of BIM capability. These will alert the construction managers and BIM experts to consider BIM adoption in managing building materials. Also, add to the knowledge on building material management. Subsequently, it will increase the adoption and wider use of BIM in the construction stage.

Keywords: BIM, Material Management, On-site, Construction Manager, Innovative technology.

Progressing Production Performance on Projects through the adoption of Building Information Modelling

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ABSTRACT AND KEYWORDS

Purpose of this paper

In recent years, new technologies and project delivery methods have emerged that promise efficiency, cost savings, and productivity increases to the commercial construction industry. BIM and integrated project delivery (IPD) are technologies and project delivery methods. This study aims to ascertain how the adoption of Building Information Modelling (BIM) has affected construction projects' production performance (time, cost, quality).

Design/methodology/approach

The study used a literature review and a qualitative research approach that employs personal interviews in collecting primary data to address the research objective.

Findings

The study found that the general adoption of BIM on construction projects was very low in South Africa. This is due to a lack of awareness of BIM and a lack of understanding of BIM by the professionals who know about it. Most of the research samples utilized a BIM platform, but none used a full suite of platforms and could not optimally use the software. It was also found that in some cases, using a BIM platform has negatively impacted project performance.

What is original/value of paper

This study's findings add considerably to the body of information about BIM in South Africa. The conclusion is crucial for the adoption of BIM in the built environment of South Africa, resulting in increased efficiency, cost savings, and productivity in the commercial construction sector.

Keywords: Building Information Modelling, Costs, Performance, Quality, Skills, Time

A bibliometric review on application of digital technologies in green building

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ABSTRACT AND KEYWORDS

Purpose

Green buildings (GB) have been identified as a feasible solution to the ecological problem emanating from the construction industry, while the use of advanced digital technologies such as artificial intelligence, internet of things, blockchain, 4D printing, and whatnot in GB is regarded as an excellent approach to boost the sector's efficiency, resilience, and sustainability. While extant studies have considered the application of one or more of these digital technologies, a complete examination of their integrated applications in GB spectrum is still sparse. To this end, this study seeks to fill this gap.

Design/methodology/approach

To attain the study's objectives, a data-mining technique in form of bibliometric analysis of research articles within the context of green buildings and relevant digital technologies was conducted using the Web of Science core collection as database. Retrieved articles were screened for eligibility while the relevant studies were synthesized using the VOS viewer bibliometric analysis tool.

Findings

Application of digital technologies came into inception about three decades after green building evolution. Most of these technologies were mainly deployed in developed economies and top-tier academic institutions primarily from Asia, North America and Europe. Synthesis of keywords and critical analysis of retrieved articles revealed that BIM has been the major tool incorporated into green building development. Most of these tools focus more on design and construction phase of green building projects. Moreover, their concentration is veered towards energy efficiency and environmental aspects of sustainability.

Original/Value

This paper contributes to the knowledge corpus on the nexus between green buildings and cutting-edge digital technologies of the present era while grey areas where some of the technologies are still nascent were pinpointed. More so, it encourages researchers and stakeholders, particularly in developing climes like sub-Saharan Africa, to fully explore these auspicious technologies to promote a resilient and viable built environment.

Keywords: Sustainable building; Digital technologies, Building information modelling, Artificial intelligence, Review.

Adoption of Building Information Modelling (BIM) by Small and Medium UK Construction Enterprises (SMEs)

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ABSTRACT & KEYWORDS

Purpose of this paper

There is no unanimous agreement on a sole gain for adopting and implementing BIM (Building Information Modelling) will provide SMEs, which employed less than 250 people and perceptions of rewards have been seen to be impacted by the context of the individual. However, a general benefits can be inherent in its adoption except that all are focused predominantly on larger firms working on larger projects. There is less research conducted to establish a body of knowledge which allows SMEs to decide with greater certainty whether the adoption of BIM is suitable for their organisation due to the lack of current clarity on the issue.

Design/methodology/approach

This research investigates how BIM can be adopted by small and medium UK construction enterprise. It adopt an online-based questionnaire with both closed and open questions completed to fulfil the research objectives. The sample consists of 52 participants, working for SMEs within the construction industry.

Findings

The research demonstrates that occupation, experience, sector type, typical project size and organisation type all influenced perceptions of BIM, however these distinctions cause minor variances and the highest-ranked gain/benefit remain consistent throughout. The perceive challenges for BIM adoption for SMEs include: Lack of awareness, cultural resistance to change, the initial need for upskilling, training and recruitment, lack of organisational structure to support BIM, interoperability issues and concerns relating to return on investment.

What is original/value of paper

The research concludes that BIM would improve most SMEs and it should be implemented in the long-term. However, in the current environment it has not achieve its potential benefits except where multiple stakeholders are willing and able to use the technology, it is evident the construction industry has not matured to this stage, particularly for SMEs.

Keyword: Building Information, Small and Medium Enterprise, Construction Industry.

A systematic review of the adoption of wearable sensing devices for monitoring the health of construction workers

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ABSTRACT & KEYWORDS

Purpose

This study aimed at exploring the use of wearable sensing devices (WSD) for health monitoring construction workers.

Research Methods

This study conducted a systematic review for data collection. Relevant databases were searched using keywords such as wearable sensing devices (WSDs), construction health and safety, and health monitoring in construction.

Findings

The results show that WSDs can help to identify several conditions that contribute to poor health, including heart disease, stroke, heat exhaustion, insomnia, blood pressure, pulse, and heatstroke. WSDs could help to reduce injuries and fatalities by monitoring workers' health while they are performing physically de-manding tasks. The most widely used WSDs in the construction industry are smartwatches, wristbands, smart hard hats, and smart safety vests.

Research limitations

This study is based on a systematic literature review that will serve as a foundation for further research.

Practical implications

This study makes recommendations for using WSDs to monitor construction workers' health more effectively.

Value of paper

WSDs are one piece of digital technology that can help to monitor workers' health in the construction industry.

Keywords Construction Health and Safety, Construction Industry, Construction Workers, Health Monitoring, Wearable Sensing Devices.

SUB-THEME: DISRUPTION / DISASTER

Hand-arm Vibration Syndrome (HAVS) in Developing Countries. A Bibliometric Analysis

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ABSTRACT & KEYWORDS

Purpose of this paper

While vibratory equipment is an inevitable input in the operational requirements of many domains, the construction industry included, it goes without saying that these are a constant occupational hazard and a threat to the health and well-being of specific work groups. Evidence abounds that exposure to vibration has debilitating effects on the human body, which depending on the extent of exposure and individual susceptibility, could lead to HAVS.

Design/methodology/approach

This study explored literature on HAVS in developing countries through examining 91 articles published between 2002 and 2022 from the Scopus database. VOSviewer version 1.6.18 was used to develop a co-occurrence network based on the bibliographic data obtained.

Findings

The study concluded that research on HAVS in developing countries is in its infancy, demonstrated through the scant data available. In fact, the disease is underdiagnosed and underreported. Notwithstanding from the above, in recent years the number of academic studies on HAVS in developing countries is on the rise.

Research limitations/implications

This study was focused on the prevalence of HAVS within the developing countries context, over the past twenty years.

Original/value of paper

This paper contributes to the knowledge corpus of HAVS in developing countries.

Key words: Hand-arm vibration syndrome (HAVS), vibration exposure, occupational health, bibliometric analysis, developing countries

E-Learning Challenges Faced by Construction Management Students in South African institutions during Covid-19 Pandemic

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ABSTRACT AND KEYWORDS

Purpose of this paper

E-learning has become necessary in education because it substituted physical contact-based teaching and became a learning tool during the Covid-19 pandemic. The education sector has emphasised the benefits of e-learning on student performance and given less attention to the challenges e-learning students face. These e-learning challenges must be well-addressed to have a minor influence on South African institutions' student performance. Therefore, this study aims to evaluate the e-learning challenges faced by students during covid-19 and possible solutions that higher education institutions can implement to minimise these challenges.

Design/methodology/approach

This study seeks to adopt a scoping review method for reviewing published Journal articles in this study context. The authors used the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) guidelines to report the findings of this scoping review paper.

Findings

Despite providing ease and flexibility for lecturers and students, the online teaching and learning approach has drawbacks, especially for students. The key findings of this study are that students struggle with technical and technological issues and lack motivation and pedagogical skills. According to the paper's conclusion, the shift to online learning has created a chance to learn from unusual circumstances and could be advantageous for most students in conjunction with technological advancements.

Research limitations/implications

The study was limited to students in South African higher education institutions.

What is the original/value of paper?

This study will add to the knowledge of innovative education in South African institutions for lecturers and construction students while positively impacting the construction industry.

KEYWORDS: e-learning, students challenges, higher education, covid-19, performance

The Utilization of Implementing Agents in Providing Infrastructure Management Capabilities in South African Municipalities: Emerging Lessons

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ABSTRACT & KEYWORDS

Purpose of this paper

The purpose of the study is to investigate the utilization of IA to provide IM capabilities in South African municipalities. This study aims to fill this research gap and explicit agreement design and explore some lessons from the perspective of maximizing the municipalities' net benefits, to minimize asymmetric information on either of the GCC prescripts and MFMA and reduce its negative impacts.

Design/methodology/approach

This study employs principal agent economic theory and has adopted a case study method of investigation. The official representatives of the IA and the managers entrusted with infrastructure projects in the three case study municipalities, are at the forefront of the investigation. This ongoing study will further obtain qualitative data from the interviews with the stakeholders in the infrastructure delivery departments and enterprise programme management offices (EPMO) of the selected case study municipalities. The information gathered from interviews will be carefully documented. The study employs principal agent economic theory to evaluate and synchronize the prescripts that regulate the relationship between principals and agents, allowing them to make day-to-day decisions while guaranteeing that the agent operates in the principals' best interests. The fundamental issue in an agency partnership is constructing a contract that directs the engagement because neither party's efforts are always evident.

Findings The information gathered from interviews will be carefully documented. Thematic analysis of interview results and critical variations between the General Conditions of Contract (GCC) and the Municipal Finance Management Act (MFMA) will be undertaken. Several studies (Páez-Pérez, and Sánchez-Silva, 2019; Glas, 2017, Khatleli, 2018; Patrucco, et al, 2019; Gong et. al., 2019) have indicated that quality can indeed be sacrificed, if the providers of infrastructure services are for-profit, and government departments lack comprehensive knowledge of General Conditions of Contract (GCC) for construction works to enable quality monitoring capabilities. The contract takes the center stage on construction projects as the most significant tool for guiding and influencing the behavior of the agent and contractor. According to (National Treasury, 2018; Mazele and Amoah, 2021) the perfect contract must create a precise balance between the incentives and sanctions imposed on the agent in order to ensure mutually beneficial optimal performance. Both the municipalities (principal) and the agent seem to understand value for money, avoiding cost overruns, and exercising due diligence in handling variation. On the contrary, there were no synergies about whose legislative prescripts, whether GCC or MFMA, took precedence in administering infrastructure projects in municipalities.

Research limitations/implications (if applicable)

The limitation of this case study is the generalization of the findings.

Practical implications

The outcomes of this study have important consequences for the specific implementing agent contract design in terms of limiting asymmetric information and reducing its negative effects to meet all parties' value for money aim. There is a growing interest to utilise implementing agents in the local government sector, and the related practical implications towards increasing the IM capabilities in low-capacity municipalities. Therefore, it is recommended that there has to be an explicit agreement that synchronizes both GCC prescripts and MFMA legislative requirements.

Keywords: Implementing Agents, service delivery, engineering skills, GCC, MFMA, low-capacity municipalities

Eliciting Key Enablers of Development and Sustainability of Small and Medium-sized Contractors: A case of Namibia

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ABSTRACT AND KEYWORDS

Purpose of this paper

This study sought to establish the key enablers of development and sustainability of small and medium-sized contractors (SMCs) in Namibia.

Design/methodology/approach

The study adopted industrywide semi-structured interviews with twenty-two (22) construction stakeholders who were purposively selected. Data were analysed using thematic and frequency analysis.

Findings

The findings revealed five (5) key enablers of SMC development and sustainability which include an enabling construction business environment, training of SMCs, provision of adequate and affordable capital finance, consistent work opportunities and collaborative support of public and private institutions.

Research limitations/implications

The small sample size employed precludes the study from being generalised to other settings without caution.

Practical implications

The findings of the current study could assist policymakers and other relevant stakeholders to formulate and implement apt policies and programmes that adequately respond to the developmental needs of SMCs in Namibia and similar contexts.

Originality/value of paper

The study findings could be adapted to re-engineer policies and contractor development programmes (CDPs) that enhance development and sustainability of SMCs in Namibia. Further, there is dearth of literature on key enablers of development and sustainability of SMCs in the Namibian context.

Keywords: Key enablers, SMC development and sustainability, Namibia

Digital technologies for enabling Construction 4.0 in the South African context

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ABSTRACT AND KEYWORDS

Purpose of this paper

The paper reports the preliminary results from a study on how to leverage digital technologies to enable Construction 4.0, which is inherently tied to improved construction project performance.

Design/methodology/approach

A scoping review methodology was used to compile the paper. Scoping review was chosen because the researchers are identifying knowledge gaps and to clarify concepts on a subject matter. Relevant Construction 4.0 literature was extracted from Google Scholar, EBSCO, Science Direct and Emerald.

Findings

There is evidence of improved construction project performance in the construction sector by leveraging on digital technologies. These findings thus reinforced the need to empirically test the available digital technologies in South Africa on whether they are best suited to enable a transformation, which will promote favourable project delivery outcomes.

Research limitations/implications (if applicable)

The findings of a preliminary review of the related literature showed a lack of case studies to authenticate, how digital technologies can enable Construction 4.0, especially for small contractors busy with small projects.

Practical implications (if applicable)

The changes recommended from practice as a result of this paper are that 3D Printing can be used as a key driver of enabling Construction 4.0 in South Africa. The research will serve as a basis for other studies on the subject.

Originality/value of paper

3D Printing is proposed as the primary physical digital technology identified from the existing Construction 4.0 models to drive change in South Africa. The use of Construction 4.0 leads to positive project performance related to cost, the environment and time.

Keywords: Construction 4.0, Digitisation, Transformation, Project Delivery

The influence of different personality types relating to the Quantity Surveyor within a design team to facilitate effective communication in the Construction Industry

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ABSTRACT AND KEYWORDS

Purpose of this paper

To manage a construction project efficiently, the entire project team must overcome communication barriers by communicating effectively and accurately. The aim of this study is to investigate the communication methods, forms, channels, and personality type indicators used by the quantity surveyor as part of a design team to achieve the shared project objective. These objectives are achieved through communicating their interactions and collaboration, resulting in the team enhancing its innovation, problem-solving, decision making, support, and work performance.

Design/methodology/approach

A literature review was conducted to identify the communication methods and barriers that exist within a construction design team, because all aspects of work are affected to some extent by communication in the construction industry. Qualitative and quantitative data were obtained through web-based questionnaires undertaken by thirty-two industry professionals in South Africa. The findings indicate that the communication barriers relate to consistency, timeliness, accuracy, frequency, length, and exclusion of communication by the other design team members.

Findings

The study concludes that the communication barriers include the lack of questioning, expression, listening skills, perception differences, as well as jumping to conclusions, and having a general lack of knowledge when communicating with other design team members. Therefore, writing, listening, reading, response time, tone, risk response strategy, method, channels, timeliness, and format accuracy of communication should be addressed among the design team members and the quantity surveyor to ensure effective communication.

Research limitations/implications

It is recommended to undertake a case study to investigate the communication barriers of a small design team, in contrast to a large design team. The communication channels, format, and methods could then be researched and compared comprehensively.

What is original/value of paper

This study identified key barriers design team members face when communicating. Furthermore, the process to determine the personality type of the stakeholders within the design team is discussed by explaining the process and purpose of a personality assessment.

Keywords: Quantity surveyor, design team, communication, personality assessment.

Leveraging IoT to Mitigate Information Management & Communication Lapses on Construction Sites

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ABSTRACT & KEYWORDS

Purpose of this paper

This paper explores IoT leveraging by construction project management professionals for information management and communication lapses mitigation.

Design/methodology/approach

An integrative review of a purposive sample of literature exploring implications around leveraging IoT for enhanced information management and communication for construction project management professionals in South Africa.

Findings

Findings indicates the capacity and pervasiveness of IoT in the global and local construction industry extends to the enhancement in capturing, management, and communication of ubiquitous construction site data in real-time. Literature also shows that CSM shortcomings related to information management & communication can be improved through innovative exploitation of available IoT technologies as supposed to reinvention of technologies from other sectors.

Research limitations/implications

The current study is a theoretical study, limited to relevant extant literature and therefore needing subsequent empirical studies, as a next step.

Practical implications

Inherent limitations to this first theoretical study provide a basis for evaluating the current conjectures. The findings obviously paint an initial picture in a relevant gap area highlighting the need for empirical studies.

What is original/value of paper

The study explored a nascent technology that is at the forefront of digital innovation in construction project management. The study offers a comprehensive view on IoT leveraging for information management and communication enhancement during construction project execution. Furthermore, the study identifies the need for a framework to explore areas of CSM where IoT can also be leveraged beyond health & safety.

Keywords: IoT, Construction site, Information Management and Communication, Limitations, Construction Digitisation

An audience analysis on financial feasibility studies in construction

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ABSTRACT AND KEYWORDS

Purpose of this paper

The aim of this study is to understand the needs and priorities of real estate developers in terms of financial feasibility studies.

Design/methodology/approach

An interpretivist view lends the opportunity to investigate the issue through a qualitative methodology. Semi-structured, in-depth interviews with 23 real estate developers were conducted, followed by the audience analysis to better understand the needs and priorities of the real estate developers in terms of financial feasibility studies.

Findings

From the analysis simplicity is key. The formatting of the report is vital, and the audience is not necessarily financially inclined. The audience has very specific aspects that they would like to look at that should always form part of the summary page.

Research limitations/implications

The sample size of this study is small and limited to South Africa. Thus, a greater sample size that stretches cross borders could provide more clarity and allow generalisability.

Practical implications

Understanding the audience better in terms of what their needs and priorities are, can lead to better compiled and communicated financial feasibility studies in the industry. This in turn may improve the readability of these reports and the understandability of it that leads to better investment decisions. This also grants the opportunity for quantity surveyors to produce improved and more professional reports.

What is original/value of paper.

An audience analysis was done on the audience (real estate developers) on financial feasibility studies, giving a clear indication on how the report should be formatted and what information it should display.

Keywords: Audience analysis; Communication; Construction industry; Real estate developers; Quantity Surveyors

Deconstructing Female Recruitment and Retention Insufficiencies

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ABSTRACT & KEYWORDS

Purpose of this paper

This paper is a critical review of the solutions to increase female recruitment and retention despite existing gender equity-oriented policies.

Design/methodology/approach

The Social exchange theory (SET) and Job embeddedness theory (JET) are used to contextualise plausible solutions to female recruitment and retention in construction. A systematic literature review was used to identify relevant articles discussing the underrepresentation of females in the construction industry.

Findings

The results from the review identified intrinsic and extrinsic job satisfaction as key drivers for mitigating female underrepresentation in Construction Management related fields.

Research limitations/implications (if applicable)

From the lenses of JET and SET, the construction sector must prioritise overall employee job satisfaction for females. Various factors of job satisfaction, including remuneration and leave models, health and safety issues, and other gender equality issues must be achieved by organisations.

What is original/value of paper

The paper introduces the application of relevant theories to the less explored aspects of the feminine footprint of the construction industry, thereby providing a sound basis for deeper empirical research.

Keywords: Recruitment; Retention; Social Innovation; Job embeddedness; Job satisfaction