ABSTRACTS OF PUBLISHED PAPERS

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PREFACE

It is my pleasure to write this introductory note for the eighteenth volume of the Abstracts of Published Papers 2023. The Abstracts of Published Papers is an annual publication of East West University Center for Research and Training (EWUCRT) with an objective to keep an official log of academic publications of the faculty members of East West University. It includes the abstract of published research articles, book chapters, books, and conference papers of our colleagues.

It is indeed a matter of great satisfaction for East West University Center for Research and Training (EWUCRT) to publish the eighteenth volume of the Abstracts of Published Papers, which contains abstracts of the academic publication published in 2023. This publication is a collective effort of the faculty members of the university. Our scholars have enthusiastically and immensely contributed in areas of business, economics, social sciences, engineering, telecommunications, liberal arts and literature, population health, computer science, pharmacy, and technology. This volume contains abstracts of 193 research articles. Among them, 133 articles were published in international and two in national journals, sixteen book chapters were published abroad, as well as 42 papers were published in international conference proceedings. Considering their academic achievements, we sincerely congratulate all the research scholars.

The Center expresses its sincere thanks to Dr. Rafiqul Huda Chaudhury, Chairperson of EWUCRT and Member, Board of Trustees, and all the members of the Research Committee (RC) for their support and encouragement. Furthermore, thanks are also due to all the personnel of EWUCRT involved in this publication.

M. S. Haque

Professor Muhammed Shahriar Haque, PhD
Executive Director
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Readymade Garment Industry in Bangladesh: Can It Retain the Lead in the Global Market?

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ABSTRACT

The readymade garment (RMG) industry remained at the heart of Bangladesh's economy since it not only contributed to 84% in the total export earnings in 2020—2021 but also remained as the largest employer in the country employing a workforce of 5 million. Bangladesh had the comparative advantage of cheap labour. In a four-decade long journey the industry grew from an export value of $31 million to $35.8 billion and was ranked second after China in the global apparel market. The journey was marked by steady growth. However, it was also interrupted by a series of tragic accidents with the deadliest incident claiming more than 1,100 lives in 2013. As a consequence, the RMG industry faced a serious image crisis. Through the collaborative efforts of all the stakeholders, there was significant improvement in workplace safety by 2018. In 2020, the industry was hit by the COVID-19 global pandemic that caused a loss of $5.6 billion in exports. Within two years, the industry was back on track with the assistance of financial package from the government and the resilience of the Work- force. The global market for readymade garments had many supplier countries apart from Bangladesh, namely China, Vietnam, Cambodia, India, Myanmar, and Turkey — Vietnam being the closest competitor. Vietnam enjoyed a number of comparative advantages, like skilled labour, backward linkage, free trade agreement, infrastructure, and FDI, the areas where Bangladesh lagged. It remains to be seen if Bangladesh would be able to transform itself, keep up with the global trends, and maintain its position in the global RMG market.

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Rahmania Hotel: Keep on Tradition or Invite Innovation?

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ABSTRACT

Rahmania Hotel, a family-run business turned 76 year old in 2022 in the hands of third generation. Rajshahi, a large metropolis, a commercial and educational hub, situated at the northern part of Bangladesh, has been home to this family-run hotel. Anisur Rahman established Rahmania Hotel in 1946. He migrated to Rajshahi from Bihar, India. No other hotel was in operation in Rajshahi during the 1950s. Reasons for this business's longevity include providing affordable, high-quality cuisine, prioritizing customer satisfaction, and strong family ties. This hotel is committed to its traditions and works hard to keep it. Since 1950, they have been selling Phirni (a traditional dessert) during the month of Ramadan. Nonetheless, they continued to sell meet and roti, which they began selling in 1965. The hotel opens daily at 7 in the morning, serves traditional breakfast, lunch, afternoon snacks and dinner, and closes at midnight. The new wave of consumerism in cosmopolitan Rajshahi city has caused consumers to shift food preferences. In recent years, the city's food business has expanded into new areas, such as coffee shops, cake and pastry shops, fusion restaurants, fast food, pizza shops, Chinese and continental restaurants. This research aims to find out whether this family-owned business incorporates new ideas or relies on tradition for its continued success. Research. The research question is whether Rahmania will adapt to the new trend and extend or keep the tradition or amalgamate both to create a new identity. This case study focuses on the survival of family businesses through branding. How family businesses achieve business longevity through consideration of new industry trends and societal context. The case: firm. The theoretical framework of this case study is built based on small family business branding and family business longevity. This is a case study of one of Rajshahi's oldest and most successful family businesses, the Rahmania Hotel. The framework of this case study is based on three variables: family business branding, family business longevity, and connection, or dealing with industry innovation and changing social context. Branding strategies for a successful family business and how to continue its longevity through the third generation and how to confront the changing scenario of industry and society are the context of this case study. The owner, customers, and food bloggers. Data Analysis: Narrative analysis. The results show that family unity is the key to the link between a business's longevity and its brand. Family businesses need to adapt to new industry and social changes that family businesses have not looked at in enough depth before. This case study highlighted the issues of branding, longevity, and innovation in a 6-year-old family business. This case study gives insight on how a long-lasting family business manages the dilemma between tradition and innovation to keep branding on the move.

Keywords: Rahmania Hotel, Family Business, Branding, Rajshahi, Longevity

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Unmad#: Can Leadership Help Survive the Satirical Magazine? A Case from Bangladesh

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ABSTRACT

Unmad, the first satirical magazine in Bangladesh turned 45-year-old in 2022. The magazine, the brainchild of Ahsan Habib and few other friends, was launched in 1978, at a time when they were at their late teens. The market of satirical magazine in Bangladesh is niche in nature with few players. While it is observed that many of the satirical magazines are short-lived, Unmad is a clear exception. There were a few direct competitors who extinct out; such as: Cartoon, BanGo, Angul, Lokjon. There were a few other indirect competitors, who were circulated as supplements with daily newspapers; such as: Rosalo, GhorarDim — got extinct as well. The man who is credited for this lone surviving satirical magazine in Bangladesh, is Ahsan Habib- who is given the title 'Dad of cartoons in Bangladesh'. While surviving for as long as 45 years owes to its leader, the marketing report card of Unmad looks grim. The market potentials remained under-utilized with the peak circulation of monthly 30,000 in the mid-1990s that experienced a continuous decline to nearly half in 2020. Revenue through ad sponsors dwindled as well. In the age of digital transformation, the magazine still remained merely in print version. This research aims to look into the matter whether leadership strength is sufficient to help Unmad survive in the everchanging digital landscape. The research question is can Unmad survive in the long run amidst its weakness in marketing strategy? Phenomenon: This case study focuses on challenges of survival faced by a satirical magazine in the digital world. The theoretical framework of this case study is built on the premises of leadership and marketing. Context: This is a case study of 45-year-old satirical magazine of Bangladesh, namely Unmad. The framework of this case study follows a blend of leadership and marketing strategies for survival in the wave of digital consumerism. The founder cum owner, readers. Data Analysis: Narrative analysis. The case reveals that the leadership style of the protagonist, a blend of genius and humility, pulled on the production of humor and hence survival of Unmad up to this point. Yet it lacks market fit and needs to adapt to the changing patterns of digital consumerism to fully capitalize its brand potentials. This case study highlighted on the unique features of leadership who created a culture enabling to continue to produce the product 'humor' for as long as four and half decades. Furthermore, this case study offered insight on how Unmad faces dilemma of market growth and hence survival.

Keywords: Unmad, Leadership, Survival, Marketing Strategy, Satirical Magazine

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Is Chatgpt a Menace for Creative Writing Ability? An Experiment

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ABSTRACT

The increasing prevalence of Artificial Intelligence (AI) language models, exemplified by ChatGPT, has sparked inquiries into their influence on creative writing skills in educational contexts. This study aims to quantitatively investigate whether ChatGPT's use negatively affects university students' creative writing abilities, focusing on originality, content presentation, accuracy, and elaboration in essays. The research adopts an experimental approach to shed light on this concern. This study aims to quantitatively investigate whether the utilization of ChatGPT, an AI chatbot, adversely affects specific dimensions of creative writing skills among university students, with an emphasis on originality, content presentation, accuracy, and elaboration. The experimental study involves 600 students from 10 universities, divided into a control and an experimental group (EGp). The EGp incorporates ChatGPT in their creative writing process as an intervention. The study evaluates originality, content presentation, accuracy, and elaboration, utilizing the Wilcoxon Signed-Rank Test for analysis. Results and The findings reveal a detrimental association between ChatGPT use and university students' creative writing abilities. Analysing both machine-based and human-based assessments substantiates earlier qualitative observations regarding ChatGPT's adverse impact on creative writing. This study highlights the necessity of approaching AI integration, particularly in creative writing disciplines, with caution. While AI tools have merits, their integration should be thoughtful, considering the potential drawbacks. These insights inform future research and educational practices, guiding the effective incorporation of AI while nurturing students' writing skills.

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Rivalry Between Traditional Market and Social Commerce Market and Brief Study of Consumer Tendency: An Empirical Evidence

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ABSTRACT

This study empirically investigates the competition between the traditional market (TM) and the social commerce market (SCM) based on customer tendency towards product price, quality, availability, design, time convenient, place convenient, comfortable to purchase, show off tendency on social commerce market and recommendations. According to the study, there are several notable differences between TM and SCM, and the tendency to flaunt affects whether or not people buy products from SCM. Even though social commerce markets tend to have higher prices, many still prefer them over traditional markets. This research is the first to examine the conflict between TM and SCM, and its conclusions diverge from those of Singh & Bhatia (2022); when making purchases, SCM customers are more likely to have gotten affected by advertisements or boasting. This study will help policymakers, marketers, and consumers infer the SCM and TM situation.

Keywords: Traditional Market/Local Market/Physical Market, Social Commerce Market/ Online Market, Customer Satisfaction, Customer Loyalty, Show-Off Tendency
JEL classification: C12, M31, M10

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Adaptation of Telemedicine during the COVID-19: Evaluating Perceived Quality and Acceptance

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ABSTRACT

While telemedicine has grown in popularity during the COVID-19 epidemic, less research in Bangladesh has investigated how it affects patients' acceptability, perception, and purchasing intent. As a result, this study will evaluate patients' perceptions of the quality and acceptability of telemedicine services. This will determine ultimate purchase intention during the pandemic and how it will affect future decision-making in a developing country like Bangladesh. The eSERVQUAL scale was utilized in this study, and its impact on the patients' purchase intent was explored. We asked 300-plus people who used telemedicine services at least once during the pandemic to participate in an online survey. During the data collection period of June 1st to July 25th, 2022, we collected 251 responses online. This research proposed five hypotheses, all tested using Structural Equation Modeling (SEM). The findings show that telemedicine services' 'e-tangibles,' 'assurance,' and 'empathy' directly impact patients' perceptions and readiness to repurchase the services. Furthermore, according to the study, there is no significant evidence that the 'reliability' and 'responsiveness' of these services significantly influence patients' perceptions in the same way. This original research applied the five-dimensional eSERVQUAL model and assessed the perceived value of newly adapted telemedicine service quality by utilizing 22 factors. This will definitely add value to the application of contemporary and established statistical techniques to measure the service quality perception among service users. The findings of this study will motivate Asian healthcare institutions, professionals in this field, and academic programs to establish effective tangibility and provide assurance, and empathy to patients to increase their purchase intent. Key study limitations include convenient sampling, 300 questionnaires were distributed but only received 251 responses which are limited in size, and access to the actual patients who used telemedicine.

Keywords: Telemedicine, COVID-19 Pandemic, Patients' Acceptance, SERVQUAL Model, eHealth
JEL Classification: I11, M31, O33

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Governance as an Interplay between Corruption and Polity: Conceptualizing from a National Perspective

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ABSTRACT

This study examines the notion of governance while corruption and polity act in a negotiated approach. It adopts a theory synthesis approach to design the research paradigm and brings renewed attention to governance from a national perspective. This study argues that corruption and polity collectively define the state of governance in a particular country, which might offer some new insights to the remaining parts of the world. The principal aim of the study is to bring relevant evidence from the literature to develop a solid foundation on governance from a macro perspective. Deploying a qualitative approach, this study highlights available literature on corruption, polity, and their connections to define the state of governance. From this specific target, we have initiated this study deploying a conceptual fashion in exploring governance which is shaped by the interplay between two loosely connected themes: polity and corruption. The outcome of this synthesis is to renew our understanding on governance to strengthen the governance mechanism whereby corruption could be checked through sound polity in action. The arguments presented in the paper are expected to be useful for regulators and policymakers as they prepare governance-related rules, acts, or directives in their respective countries.

Keywords: Corruption, Governance, Polity
JEL Classification: D73, G18, G30, G38, K10

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Management Control Systems in the Business Sector: Understanding Trends from Selected Literature in an International Setting

Anup Chowdhury[*] and **Nikhil Chandra Shil**[†]

ABSTRACT

In a business organisation management control systems are found in the design of organisational structures and the policies and procedures used for planning and evaluation. Many authors have defined management control systems in many ways and as a result different typologies of management control have evolved to define management behavior. Management control systems must be expanded to managerial practices that cultivate employee cooperation and creativity in the discovery and exploitation of new business opportunities. This study is an attempt to explore the trends of management control systems applied in different country's business sector based on selected published literatures worldwide.

Keywords: Management Control Systems, Business Sector, Literature Review, International Setting

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Public Policy Issues in the Context of Public Sector Reforms: A Qualitative Storytelling of a Former Government Department in the Asia-Pacific Region

Anup Chowdhury[*] and **Nikhil Chandra Shil**[†]

ABSTRACT

Predominantly public policy is a set of guidelines initiated by the government of a country to work in favour of mass people or the public. We showcase and represent public policy materials against the backdrop of being involved in the process of accountability, transparency, and efficient and effective administration and program delivery. In addition, the selected government department used private-sector management control technologies to deal with the public-sector reform initiatives. These elements are considered part of the modern approach to public administration also. The study may be useful to policymakers formulating new public sector policies. Moreover, the findings reported in this study would be useful to public sector managers in their daily decision-making process.

Keywords: Public Policy, Public Sector Reforms, Government Department, Qualitative Storytelling, Australia

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A Qualitative Narrative on the Practices of Transparency and Accountability at Local Government Institutions: The Case of a Union Parishad in Bangladesh

Nikhil Chandra Shil[*] and **Anup Chowdhury**[†]

ABSTRACT

This study presents the current practices of transparency and accountability of local government institutions in Bangladesh taking a union parishad as a case. The research approach follows the style of a qualitative narrative based on selective interviews, focus group discussion, observation and analysis of archival records and documents. Different secondary sources are also consulted to provide a thick description of the key themes of the study. Research triangulation is reached through analyzing interviews, archival records, and observations. The study found that local government institutions in Bangladesh still suffer from a very weak structure in providing basic services to the citizens, including lack of revenue, low level of human capital in the local government bodies. The study also found that participation in decision making, and the budget preparation process is grossly absent, along with a weak monitoring mechanism which lacks accountability and transparency. Continuation of an inherited colonial structure fueled with political instability and a power-playing attitude are collectively responsible for weak local government structure. Though Bangladesh has witnessed significant reform initiatives in organizations responsible for public service delivery, local government institutions have not benefitted enough from these initiatives due to their remote positioning and servicing a large beneficiary population, most of whom are unaware about their public rights. However, the study highlights some visible changes whereby transparency and an accountability framework of local government units is improving. Digitalized technology has been widely used in public service delivery. The use of a database system, sharing information, awareness programs and inclusion of digital centers in local government agencies make the local government units more transparent.

Keywords: Transparency, Accountability, Local Government, Union Parishad, Bangladesh

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Public Administration Agendas in the Light of New Public Management: A Written Testimony of Reform Initiatives of an Asian Country

Nikhil Chandra Shil[*] and **Anup Chowdhury**[†]

ABSTRACT

This paper presents a conceptual discussion of New Public Management (NPM) driven reform initiatives in public administration. NPM is a management philosophy used since the 1980s by many governments, particularly developed countries, namely the US, UK, Australia and New Zealand, to modernize the way the public sector works. Developing countries have also embarked on the path of transformation since the 1990s. Bangladesh has also witnessed various public administration reform initiatives since independence but is gaining momentum after 1990s with significant use of NPM modalities to make the public sector more responsive and results oriented. This paper brings the success stories from the global market and critiques the case of Bangladesh in its administrative reform initiatives through the lens of the NPM. The analysis is based on various secondary sources such as policy papers, research articles, archive material, etc. Based on the discussions, the paper concludes with some recommendations.

Keywords: Bangladesh, Bureaucracy, New Public Management, Public Administration, Reforms

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Understanding Mentoring in the Context of Bangladesh

Samina M. Saifuddin**, Laila Zaman**[*] and **Md. Sajjad Hossain**[†]

ABSTRACT

While mentoring research has drawn considerable attention from researchers and practitioners, most of this research is situated in Western or developed countries' contexts. Bangladesh is a non-Western, under-researched context. The present study aims to understand how individuals working in Bangladeshi organizations perceive the meaning of mentoring and mentoring support as a career strategy. We conducted 42 in-depth interviews. Findings from the study suggest mentoring is not well-understood as a career strategy, and the conceptualization and understanding vary with the management levels. Junior-level employees aligned mentoring with receiving training or assistance from a supervisor or manager to carry out their job duties and tasks. In comparison, the mid-level employees highlighted receiving task assistance and some career assistance. The senior level was the only group that adequately described the meaning and highlighted mentoring provided them with career assistance and psycho-social support. Mentoring is associated with protégés instrumental and psycho-social career benefits and is a vital human resource management (HRM) tool for talent development. Thus, inadequate understanding and practice can affect employees' career outcomes and a talent-driven approach. Theoretically, the research contributes to a better conception of mentoring in an under-researched context. Ragins and Kram (2007b) emphasized that contextualized comprehension of mentoring allows scholars and practitioners to build better bridges. From a career and HRM perspective, a richer understanding of how mentoring is perceived can help design and implement context-appropriate mentoring models in organizations that accrue the most benefit to mentors and protégés careers. Finally, the study contributes to context-based scholarship.

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The Impact of Technological and Social Factors on Student's Engagement in Online Learning: Evidence Based in Self-Determination Theory

Rumana Afroze[*] and Sujana Shafi[†]

ABSTRACT

This study addresses and investigates university students' engagement and perspectives on utilising online learning in Bangladesh. The goal of this study is to pinpoint the variables that affect students' engagement technologically and socially and to understand the level of students' engagement in an online learning environment. This research used the quantitative method. The respondents to this research were undergraduate and postgraduate students from both private and public universities in Bangladesh, located in different locations. The number of respondents was 201. A structured questionnaire obtained via Google Form was used to determine the level of engagement and understanding of using online learning. SPSS was used to analyse the data that had been gathered. Outcome has demonstrated that the technological factor influences students' engagement, such as the necessity of a device or gadget. Also, social factors like engagement in classes and mental health issues positively influence students' engagement in online learning. Overall engagement in online classes is low because there is less communication and assistance from classmates, and students' engagement during online learning is influenced by mental health issues. The self-determination theory has been adopted to represent this study's variables and also to understand students' engagement in online learning. This research's recommendations, based on the findings, include the necessity for serious measures to support students' psychological wellbeing and their personal and financial concerns, and that more engagement with classmates should be ensured and improved by the academicians and university authority.

Keywords: Online Learning, Self-Determination Theory, Students' Engagement

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MOOC-based Learning for Human Resource Organizations during the Post-pandemic and War Crisis: A Study from a Developing Country Perspective

Shamsul Huq Bin Shahriar[*], **Silvia Akter**[†], Nayeema Sultana[‡], Sayed Arafat[§] and Md. Mahfuzur Rahman Khan[**]

ABSTRACT

Human resources (HR) management has encountered unforeseen obstacles and issues in recruiting, retaining, training and developing workforces under the "new normal" due to pandemic circumstances followed by the Russo–Ukrainian War and global economic turmoil. As the world is now well-equipped with technological advancements and internet-based connectivity, many pandemic disruptions have been avoided through rapid adaptation of technological systems. Despite the constructive outcomes of this contemporary approach to learning and development (L&D), this study explores the further depths of massive open online courses (MOOC) platform adoption in human resource development initiatives during pandemic times. A qualitative research approach was adopted to understand the employee and HR perspective on the changes in L&D approaches in organizations. To gather the primary data, respondents were divided into two clusters; different sets of questionnaires were developed for interview sessions. Results suggest that employee L&D was much more improvised with distance or online learning, including organizational e-learning systems and MOOC platforms. To accomplish their HR development goals, organizations went through significant transformations during the Coronavirus pandemic; organizational attempts to initiate online training and MOOC-based learning fostered positive results in employee capacity development, process improvement, employee engagement and motivation. This research will assist organizations in developing interactive training methods as an effective replacement for traditional training. Additionally, it will assist readers, practitioners and HR specialists in understanding how MOOCs are changing the L&D ecosystem.

Keywords: MOOCs, Russo–Ukrainian War, COVID-19, Economic Turmoil, Self-directed Learning, Future of Work

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Green Finance and Renewable Energy: A Worldwide Evidence

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ABSTRACT

Using a large sample of 44 countries for 2007–2020, we provide evidence that green finance (green bonds) significantly fosters renewable energy production. Our results are robust to addressing cross-sectional dependence concerns, allowing structural breaks, and using several alternative specifications and estimation methods. Compared to our baseline findings, the effect is higher for green bonds issued to finance alternative energy. We also find that the existing stock of technological capacity significantly fosters the impact of green finance on renewable energy production, particularly in the long run. The long-run impact of green finance is significant in countries with higher emissions per dollar GDP, higher levels of climate change exposure to the economy and human life, and better-developed credit markets. The effect is more pronounced in countries with low or net zero emission targets and following the post-Paris 2015 agreements.

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Determinants of Students' Satisfaction with Digital Classroom Services: Moderating Effect of Students' Level of Study

Md Abdul Momen[*], Seyama Sultana[†], **Md. Anamul Hoque**[‡], Shamsul Huq Bin Shahriar[§] and **Abu Sadat Muhammad Ashif**[**]

ABSTRACT

Like every other sector, educational institutions have also been suffering immensely due to COVID-19 pandemic. Many educational institutions are now adopting digital classroom services. However, an online platform with the need for appropriate technology and infrastructure from the students' perspective poses a severe challenge to developing countries like Bangladesh. The paper aims to figure out the relevant factors that affect the extent of student satisfaction with digital classroom services at the school and tertiary levels. It is a quantitative study of 450 students from Bangladesh who encountered online classes during the pandemic of COVID-19. An equal number of students from all levels, including schools, colleges and tertiary stages, participated in the survey. Exploratory and confirmatory factor analyses are used to interpret the data. Structural equation modeling using AMOS graphic software is incorporated to test the study's hypothesis. Among all the four determinants of student satisfaction during this critical era, all levels look satisfied with the three underlying influences: technological, convenience and resource-related factors. However, school-level students found the digital classroom services abrasive with Internet connectivity and technical structures during online classes and exams. A comprehensive study can assess the difference between private and public university students in this regard. In addition, the impact of gender and/or location (rural/urban area) can be assessed by using the same model of the study. Having the experience of the students' satisfaction level during this pandemic, the government, educational institutions and other stakeholders can take away the findings of the results to have a better plan for Internet-based education at every level. The study is unique to see the readiness of developing nations such as Bangladesh to focus on the sudden uncertainty like a pandemic in introducing the digital education platform. The study can add value to achieving the country's sustainable development goal of becoming a digitally enabled regional education hub.

Keywords: Digital Classroom, Structural Equation, Educational Institutions, Bangladesh

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Transition to Siblinghood Challenges: Consumer Attitude Towards E-Consultation

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ABSTRACT

When a family welcomes a new baby and the existing children become older siblings, the family must make considerable adjustments. They could require support from E-consultation. To address issues associated with the transition to siblinghood, this study attempts to ascertain consumers' (parents') attitudes toward e-consultation. Young parents with nuclear families and two or more children who reside in Dhaka City made up the respondents. There were 220 participants in the survey. The study demonstrates that four of the five constructs—service cost, ease of use, assurance, and barriers to users- proved to significantly influence consumer (parents) attitude towards e-consultation and, ultimately, e-consultation sales. Healthcare organizations should create cloud services so that distant customers can handle the consultation on their own. The e-consultation will give firms from the healthcare business and other industries an opportunity to capture new markets.

Keywords: Transition to Siblinghood (TTS) Challenges, Electronic Consultation (e-consultation), Service Cost, Service Time, Ease of Use, Assurance, Barriers to Users, Technophobia

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How to Achieve Financial Flexibility: The Role of Corporate Governance

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ABSTRACT

Financial flexibility can have a profound influence on an organization as well as the global economy. Accordingly, corporate managers, academic scholars, business practitioners, and the government have extensively studied the sources and importance of financial flexibility and how to achieve it. Therefore, the principal objective of this study is to propose a useful approach by focusing on the effects of corporate governance on achieving financial flexibility. To this end, this study considered unbalanced panel data from the years 2007 to 2020, yielding 14,088 firm-year observations. The data is obtained from China Stock Market and the Accounting Research Database (CSMAR). The researcher primarily used fixed-effect ordinary least squares (OLS) and system GMM regression for analysis. This study also detects endogeneity by applying the Durbin–Wu–Hausman test. Furthermore, it controls endogeneity by applying lag financial flexibility as an instrumental variable and by employing the system GMM estimation technique as well as the change and reverse change tests. The empirical findings confirm that the corporate governance index has a significant positive effect on financial flexibility, and considering the individual attributes of corporate governance, the results indicate that internal ownership concentration has a significant positive relationship with financial flexibility, confirming the shareholders monitoring hypothesis of agency costs. However, external ownership concentration shows a significant negative relationship with financial flexibility.

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Behavioural Phenomena of Family Firm Control Diversity and R&D Investment with Moderating Role CEO Compensation

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ABSTRACT

The novel study describes the behXavioural phenomena of family firm types and explores the relationship between the family firm types of control diversity and Research and Development (R&D) investments. Acquiring controlling rights is a psychological phenomenon for family firm owners. The moderating effect of CEO compensations on R&D investments is investigated. We collected data of listed A-share family firms in China from 2011 to 2020 in the China Stock Market and Accounting Research database. We used Tobit regression for data analysis. The study concludes that lone-controller family firms (LCFFs) are less willing to invest in R&D and multi-controller family firms (MCFFs) have positive behaviour towards R&D. The moderating role of CEO compensation deviates the willingness and behaviour to invest in R&D. To the best of our knowledge, this study is the first to outline the paradoxical empirical evidence on family firms and R&D investments by analysing control diversity and how the moderating role of CEO compensation nexus can alter willingness towards R&D. The study is a novel attempt following De Massis et al's framework to test the willingness and ability of LCFFs and MCFFs. Previous studies based on agency theory have tacitly assumed that ability and willingness exist in family-controlled firms. However, this study challenges this implicit assumption.

Keywords: Family Firms, Control Diversity, R&D Investment, CEO Compensation, Behavioural Agency Model

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The Impact of Crowdsourcing in Organizations: A Systematic Literature Review (SLR) and Future Research Directions

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ABSTRACT

Crowdsourcing is a very popular term in the management and business world in the 21St centu:y. This study engages in the Systematic Literature Review (SLR) methodology to investigate the impacts of crowdsourcing in formal organizations while undertaking their businesses. In conducting the SLR process this study carried out the Text Analyses on the existing literature related to business and management fields. Then, Data Visualization tools were employed to understand how the ideas in the literature were connected. The Visualization tools show how the condensed principles in the literature relate to the growth of the organization, produce the desired outcomes in implementations and influence the use of crowdsourcing according to peculiar situations of the organizations. Finally, the Text Analyses of current literature and the findings of this paper pave the focus of future fillitful research directions.

Keywords: Crowdsourcing, Systematic Literature Review (SLR), Organization, Management

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The Influence of Board Size and Board Independence on Triple Bottom Line Reporting

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ABSTRACT

The purpose of this study is to examine the associations between board size, board independence and triple bottom line (TBL) reporting. The TBL report consists of three components, namely, environmental, social and economic indices. This study's sample consists of top 50 listed companies from the year 2017 to 2019 on Tadawul Stock Exchange. Ordinary least squares, quantile least squares and robust least squares are used to investigate the associations between board characteristics and TBL reporting, including its separate components. The authors find a significant negative association between TBL reporting and board independence. Social bottom line is significantly and negatively related to board size and board independence. Results indicate that board independence negatively influences the TBL disclosure of companies. Therefore, companies are encouraged to embrace TBL reporting. This suggests that businesses should improve the quality of their reporting while ensuring that voluntary disclosures reflect an accurate and fair view in order to preserve a positive relationship with stakeholders. The present study explains the evidence for the determinants of the TBL in Saudi Arabia.

Keywords: Board Size, Board Independence, Triple Bottom Line, Saudi Arabia Listed Companies

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The Trade-off between Outreach and Sustainability of Microfinance Institutions: Does Loan Delinquency Play a Mediating Role?

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ABSTRACT

The outreach-sustainability trade-off in microfinance is often attributed to the high transaction cost of small loans. But does loan delinquency play any role? Is there any relationship between delinquency and poverty level of borrowers? In microfinance, loan delinquency is a key concern, as poor borrowers lack collateral and microfinance institutions (MFIs) face information asymmetry which may lead to problems of adverse selection and moral hazard. This paper empirically examines the relationship between microfinance outreach and sustainability, and the role of loan delinquency in that relationship. Through a rigorous quantitative analysis of a global dataset of microfinance firms, the study confirms that MFI sustainability comes at the expense of outreach and there is a trade-off between the two goals. It demonstrates the mediating role of loan delinquency in the outreach-sustainability relationship and indicates that poor clients, compared to not-so-poor, have high delinquency rates that negatively affect the financial performance of MFIs.

Keywords: Microfinance, Outreach, Sustainability, Loan Delinquency, Portfolio at Risk, Information Asymmetry

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Some Recent Trends and Implications of Foreign Direct Investment in Bangladesh

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ABSTRACT

This study was carried out to evaluate the recent trends and implications of foreign direct investment (FDI) in Bangladesh. Due to its cost-effective workforce, potential market, rapidly growing economy, advantageous geographical location, and other pertinent factors Bangladesh has become one of the most enticing developing countries for foreign direct investment (FDI). Both quantitative and qualitative analyses were used. The trends and implication of FDI was assessed through different variables such as Net FDI inflow in Bangladesh, FDI inflows as percentage of GDP of Bangladesh, sectoral FDI inflow in Bangladesh, net FDI inflows from top 10 countries and by sectors, net FDI flow by EPZ and non-EPZ areas, no. of employment by FDI, FDI inflow by components, GDP, export, import, balance of payment, foreign exchange rate, inflation and corporate tax rate, which were then analyzed using different statistical measures, such as growth percentage, trend equations, the square of the correlation coefficient and correlation matrix. Thirteen trend equations and R-squared were tested for different relevant variables of FDI. To estimate the implication of FDI in Bangladesh, seven hypotheses has also been tested. Among them, the trend values were positive for eleven variables. The square of correlation coefficient (R-squared) of most of the equations is more than 0.7, indicating well fitted trend equations. According to the results of this analysis, FDI has positive correlation between GDP growth, exports, imports, employment in EPZs, and exchange rates. However, there is a significant negative correlation between corporate tax rate and inflation rate. By introducing beneficial FDI policies, providing substantial investment incentives, streamlining pertinent regulations, minimizing bureaucratic procedures, and through better infrastructure Bangladesh must act swiftly to entice more foreign investors. Despite adopting lenient FDI regulations, the government musthave to ensure facilities like more export processing zones, easy access to IT facilities, maintaining stable foreign exchange rates, encourage FDI from leading nations, an attracting new foreign investment source. By implementing these policies into practice, Bangladesh can boost up economic growth and may attract more FDI. This study proves that there is room for FDI to increase in the future and supporting economic growth of Bangladesh.

Keywords: FDI, Economic Development, Export Processing Zone, GDP, Bangladesh
JEL Classifications: F21, F23, F24, F31

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Performance Appraisal of Selected First-generation Private Commercial Banks in Bangladesh

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ABSTRACT

The motive of this study is to appraise the performance of selected first-generation private commercial banks in Bangladesh. Both quantitative and qualitative analyses were used. The performance of the banks wastested through several variables, such as Deposits, Investments, Loan-to-Deposit ratio, Imports, Exports, Return on Assets (ROA), Return on Equity (ROE), Net income, Earnings per Share (EPS), etc. These variables were then examined using statistical measures, such as growth percentage, trend equations, the square of the correlation coefficient, and a correlation matrix. Sixty trend equations and R-squared were tested for twelve different banks' activities. From the study, it has been found that banks are facing some challengesdue to ongoing economic crisis and liquidity crisis. However, all the banks are trying to recover from the economic crisis, and some banks are doing very well, while some banks are facing hardships to cope with the situation. The findings of the trend analysis and correlation matrix of the study are expected to direct the first-generation commercial banks of Bangladesh to improve their performance. We are quite optimistic that if the selected banks tried to overcome the identified problems, then their performance will improve, and they may give riseto accelerated development of Bangladesh's economy.

Keywords: Bangladesh, Deposit, EPS, First Generation, Investment, Private Banks

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The Collaborative Effort and Efficiency of Inquiry-Based Learning: Effect on the Teacher Performance–The Role of Student Performance

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ABSTRACT

This study investigates the effect on the teacher's performance of collaborative effort and efficiency of inquiry-based learning. It also determines the impact of the mediating role of student performance. The research framework was constructed based on the unified technology acceptance and use of technology theory. A quantitative analysis was done with surveys to collect primary data from the teacher and lecturers of Malaysia. The researcher used a Likert scale of 7 to evaluate elements of the building. This study focuses on the top 10 public university students in Malaysia. The universities are University Malaya (UM), University Kembangan Malaysia, University Putra Malaysia (UPM), University Since Malaysia (USM), University Technology Malaysia (UTM), Universiti Utara Malaysia (UUM), International Islamic University Malaysia (IIUM), University Technology Mara (UiTM), University Malaysia Perlis (UniMap), and University Tun Hossain (UTHM). Finally, researchers selected the total number of students, 368,881, which is the population of this study. Using systematic random sampling with an interval, researchers sent students an electronic link to respond to a Google Doc questionnaire. This is a unique study in the field of teacher performance that used a diverse and necessary variable known as teaching pedagogy. Therefore, it uniquely integrates leading pedagogy variables into teacher performance. The result of this study helps to meet the education qualification requirement (EQR), and the newly acquired knowledge from this study may help spur the development of the education sector. In addition, it may provide an extensive understanding of making government policies for educational institutions.

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Funding Dreams, Fueling Causes: Individuals' Behavioral Intentions Toward Donation-Based Crowdfunding

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ABSTRACT

This study aims to analyze the factors impacting individuals' behavioral intention to participate in donation-based crowdfunding through the lens of self-determination theory. Using a deductive approach, a structured questionnaire was used to collect data from 297 respondents through the convenience sampling method. PLS-SEM was performed using a quantitative method, and findings showed that face concern, altruism, personal innovativeness, and internal locus of control significantly impacted an individual's self-identity, which in turn impacted their behavioral intention to participate in donation-based crowdfunding. This study contributes by adding to the body of the existing literature by highlighting the impact of self-identity, which catalyzes an individual's decision to participate in donation-based crowdfunding. The findings provide robust insights for fundraisers, marketers, and policymakers on understanding the key drivers of individuals' intention to participate in donation-based crowdfunding and how to adopt innovation to make crowdfunding platforms more reliable and accessible through policy reformations.

Keywords: Crowdfunding, Self-identity, Social Identity, Behavioral Intention, Personal Innovativeness, Self-determination Theory

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Okay Google, Good to Talk to Usersâ€™ Examining the Determinants Affecting Usersâ€™ Behavioral Intention for Adopting Voice Assistants: Does Technology Self-Efficacy Matter?

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ABSTRACT

This study investigates the impact of attitude and trust on the behavioral intention of adopting artificial intelligence (AI)-based voice-assistant services through the integration of parasocial relationship theory (PSR) and humanâ€“computer interaction (HCI) theory. Employing a deductive approach, partial least squares structural equation modeling (PLS-SEM) was performed to assess the proposed model based on 295 participants by using a purposive sampling method. Findings revealed that the functional components significantly impacted usersâ€™ attitudes, while social attributes, such as social cognition and electronic word of mouth (e-WOM), were revealed to be critical constituents in driving usersâ€™ trust. Moreover, technology self-efficacy (TSE) showed a moderating impact on the relationship between trust and behavioral intention to use voice-assistant services. Based on the findings, the study provides robust and meaningful insights for managers and designers to foster trust and form a positive attitude among the users. Additionally, the outcome of the study adds to the body of research on AI-based technology adoption and interactions by investigating the antecedents of trust and attitudes towards voice-assistant services.

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Determining the Intention to Use App-based Medicine Service in an Emerging Economy

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Muhammad Khalilur Rahman[**] and Muhammad Mohiuddin[††]

ABSTRACT

The study investigates the customers' intention to use app-based medicine services in an emerging economy. This study explores the indirect effects of perceived usefulness, perceived ease of use, perceived security and perceived delivery with the intention to use app-based medicine services through the mediating effect of perceived trust. The present study developed a self-administered survey questionnaire to collect data from 336 respondents who were using app-based medicine services in Bangladesh. The data was collected between March 2022 and May 2022. The collected data were analysed using SmartPLS-4 to determine the reliability and validity of the constructs. The study's findings indicate that perceived usefulness, perceived ease of use, perceived security, and perceived delivery positively and significantly ($t > 1.96$; $P < 0.05$) influence the perceived trust in app-based medicine services. The research findings also indicate that perceived ease of use, perceived delivery, and perceived trust significantly ($t > 1.96$; $P < 0.05$) impact the intention to use app-based medicine services. This study highlights to explore the success factors such as consumer perceived usefulness, perceived ease of use, perceived security, and perceived delivery that can increase customers' trust to use app-based medicine services in the developing economy.

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Mediating Role of Lean Management on the Effects of Workforce Management and Value-added Time in Private Hospitals

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ABSTRACT

This study aims to investigate the mediating role of lean management on the relationship etween workforce management and value-added time in private hospitals. This study also investigates the direct influences of workforce management and lean management on the value-added time of the hospitals. This study applied a quantitative approach to obtain data from the private hospitals' staff in Peninsular Malaysia. A self-administered survey questionnaire was used to collect data from 287 hospital staff using a stratified random sampling method. The partial least squares structural equation modeling (PLS-SEM) approach was used to determine the internal consistency, reliability, validity of the constructs. The PLS-SEM method was also used to test the hypothesised research model via SmartPLS 3.3.4 version. The findings of the study indicate that lean management has a direct and significant effect on the value-added time of private hospitals. The findings also revealed that lean management significantly mediates the relationship between workforce management and value-added time in private hospitals. The analysis of the results indicates that both workforce and lean management have a significant impact on the value-added time of the hospitals. This study provides empirical contributions to enhance the quality of workforce management, lean management and value-added time. The findings of this study provide valuable insights into how effectively managing the workforce and providing guidelines to augment the lean management practices can ensure value-added time in Malaysian hospitals and the overall health-care industry. The lean management framework provides useful insights for the policymakers to understand the significance of workforce management, lean management on ensuring value-added time through reducing waiting times, unnecessary delays, generating a higher degree of patient safety, satisfaction and loyalty. The research findings provide some essential indications for the health-care service providers to understand how the lean management approach can be implemented to enhance value-added time and how lean management can play a mediating role in creating a link between workforce management and value-added time in hospitals. This study also contributes to the theoretical and practical perspectives. The present study contributes to a better understanding of workforce management and lean management in health-care sectors from theoretical and practical perspectives.

Keywords: Lean Management , Workforce Management, Value-Added Time, Quality Improvement, Hospitals

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Buy or Die: An Investigation of Consumers' Intention to Engage in Unusual Purchasing Behavior Through the Lens of Stimulus-Organism-Response Approach

Ismail Alam[*], **Dewan Mehrab Ashraf**[†] and Mohammad Rokibul Kabir[‡]

ABSTRACT

The existing dearth of knowledge concerning consumers' tendency to engage in unusual purchasing behavior has sparked a scholarly appeal for comprehensive research in this area. This study investigated consumers' intention to engage in unusual purchasing when people received information on the global supply chain disruption from multiple online information sources and explored how consumers behave in such unique situations. This study employed the stimulus-organism-response approach and tested the impact of exposure to online information sources on voluntary self-isolation and unusual purchase behavior. Data were collected from 292 bank employees through an online survey using Google Forms. Partial least squares structural equation modeling was performed to assess the data using SMART PLS 3.3.4. Research findings indicated that the intention to self-isolate was linked with the intention to engage in unusual purchasing. Results also showed that exposure to online information sources leads to perceived severity and information overload. Findings also indicated that perceived severity had a significant impact on the respondent's intention to engage in unusual purchasing. This study leads to the development of a comprehensive understanding of the underlying reasons behind consumers' unusual purchasing behavior in the consumer and retail markets during the COVID-19 pandemic.

Keywords: Stimulus-organism-response, Consumer Behavior, Information Overload, Cyberchondria

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The Role of Innovation Resistance and Technology Readiness in the Adoption of QR Code Payments Among Digital Natives: A Serial Moderated Mediation Model

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ABSTRACT

Recent literature on the QR code payment system has called for further research on the adoption of QR codes as a payment tool among digital natives. In response to this call, this study investigates the influence of perceived value on digital natives' attitudes and trust in fostering their intention to adopt QR code payments through the integration of prospect theory and perceived value theory. Following a purposive sampling technique, a quantitative approach was employed and PLS-SEM was performed to evaluate the study hypotheses. A structured questionnaire was used to collect survey data from 387 digital natives. Findings showed that digital natives' behavioural intention to adopt QR code payments was positively influenced by perceived value and trust but not by attitude. Furthermore, the findings demonstrated that attitude and trust serially mediated the relationship between digital natives' perception of value and their propensity to accept QR code payments. Nevertheless, this study also highlighted the moderating effects of technology readiness and innovation resistance and showed how they strengthen and weaken the relationships amongst perceived value, attitude, trust, and behavioural intention. The study offers valuable insights for marketing managers and policy makers in understanding digital natives' perceptions towards adopting QR codes with regard to making payments and advances the theoretical depth by contributing to the literature related to the adoption of QR codes while making payments.

Keywords: QR Code Payment, Innovation Resistance, Technology Readiness, Digital Natives

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Effects of Lean and Six Sigma Initiatives on Continuous Quality Improvement of the Accredited Hospitals

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ABSTRACT

The main purpose of this study is to investigate the role of Lean and Six Sigma initiatives on continuous quality improvement in the Malaysian Society for Quality in Health (MSQH) accredited hospitals. In particular, it investigates the relationship between top management support and teamwork. It also examines the influence of teamwork on Lean and Six Sigma initiatives. In this study, 450 survey questionnaires were distributed to twelve MSQH-accredited hospitals' staff using the Stratified Random Sampling method and received 251 useable responses constituting a 55.78 per cent response rate. The reliability and validity of the research variables were tested based on internal consistency, construct validity and discriminant validity by applying the SmartPLS 3.3.4 software. The relationships among various variables in the model were tested using Partial Least Squares Structural Equation Modeling (PLS-SEM). Overall, the study's findings reveal that Lean and Six Sigma initiatives positively and significantly impact the continuous quality improvement of MSQH-accredited hospitals. The findings also indicate that top management support has a positive and significant relationship with teamwork and vice versa, i.e. teamwork significantly affects Lean and Six Sigma initiatives.

Keywords: Top Management Support, Teamwork, Lean Initiatives, Six Sigma Initiatives, Continuous Quality Improvement, Hospitals

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Human or AI? Understanding The Key Drivers of Customers' Adoption of Financial Robo-Advisory Services: The Role of Innovation Resilience

Dewan Mehrab Ashraf* and Mohammad Rokibul Kabir

ABSTRACT

The extant literature on fintech indicates a requirement for additional investigation into the adoption patterns of financial robo-advisory services. Our study aims to investigate the determinants that impact users' propensity to adopt financial robo-advisory services. The study employed a deductive approach, utilizing a quantitative method and purposive sampling to obtain a sample size of 272. PLS-SEM was used to evaluate the data. The findings indicated that perceived value is influenced by perceived enjoyment, anthropomorphism, and perceived performance, whereas perceived risk is affected by complexity, trust, and perceived security. Perceived value and perceived risk revealed a significant impact on users' behavioral intentions. The findings indicate that innovation resilience played a significant role in moderating the association between perceived value and users' behavioral intention to adopt robo-advisory services. The present study adds to the extant body of literature by emphasizing the significance of perceived value, perceived risk, and innovation resilience in the acceptance of roboadvisory services among consumers. The study's findings provide valuable insights for financial institutions and policymakers in the development and positioning of robo-advisory services.

Keywords: Robo-advisors, Innovation Resilience, Perceived Value, Perceived Risk, Fintech

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The Intricate Relationship of Employee Engagement and Lean Approach toward Quality Improvement of the Public Hospitals

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ABSTRACT

The lean approach is a value-added system that reduces cost and waste to continuously improve the quality performance of the healthcare organization. The present study investigates the relationships of the lean approach with top management team and employee engagement toward quality improvement of the public hospitals in Malaysia. This study used stratified random sampling to collect data from the public hospitals' staff who were directly involved with patient services. In this study, PLS-SEM 3.3.4 was applied to measure the research constructs and hypotheses. The research findings indicate that the lean approach has a significant relationship with the top management team and employee engagement to positively impact the quality improvement of the public hospital. However, research findings also indicate that the top management team has no significant influence on quality improvement in public hospitals, but it has an indirect effect through the lean approach and employee engagement. The findings of the study will provide guidelines on how the lean approach contributes to the body of knowledge and practical implications to continuously improve the quality performance of public healthcare system.

Keywords: Lean Approach, Employee Engagement, Top Management Team, Quality Improvement, Public Hospital

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Managing Consumers' Adoption of Artificial Intelligence-Based Financial Robo-Advisory Services: A Moderated Mediation Model

Dewan Mehrab Ashraf*

ABSTRACT

This study investigates the determinants of willingness to use financial robo-advisory services. The study aims to identify the intertwined roles of perceived value, perceived risk, and perceived financial knowledge in consumers' acceptance of financial robo-advisory services. Fintech and AI-based applications have opened up new prospects for financial management, but studies into the adoption and implementation of robo-advisors are limited and scant. The study offers novel insights by exploring the direct and indirect effects of perceived value and risk on consumer decisions around adopting robo-advisory services. The study also identifies other major drivers of robo-advisory service adoption and formulates a comprehensive model. A quantitative method using a deductive approach was applied, with PLS-SEM performed on a sample of 285 respondents from Bangladesh. The sample was gathered using a purposive sampling method. Findings revealed that while relative advantage and perceived innovativeness positively affected perceived value and adoption intention, complexity negatively impacted perceived value and adoption intention. The findings also highlighted that attitude had a negative effect on perceived risk and intention to adopt robo-advisory services. The mediating impact of perceived value and risk in predicting the relationship between relative advantage, attitude and behavioral intention to adopt robo-advisory services was also identified. Moreover, the study revealed that perceived financial knowledge moderated the relationship between perceived value and behavioral intention. This study contributes to the existing body of literature by showing the intertwined roles of perceived value, perceived risk, and perceived financial knowledge in consumer acceptance of robo-advisory services. The study provides meaningful insights for financial institutions, and policymakers seeking to make robo-advisory services more reliable and acceptable to consumers through innovative service design and positioning.

Keywords: Robo-advisory Services, Perceived Value, Perceived Risk, Financial Knowledge, Artificial Intelligence
JEL Code: M15, O33, L86, D83

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Employer Branding, Job Satisfaction, Organisational Commitment, Organizational Citizenship Behaviour: A Moderated-Mediation Approach

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ABSTRACT

The purpose of this study is to investigate the mediating role of job satisfaction in tandem with the moderating role of organisational commitment and income in employer branding and organizational citizenship behaviour relationship in the context of Bangladesh banking sector. Data were collected from surveying 211 employees of private banks in Bangladesh through a structured questionnaire. The findings of the study demonstrate that employer branding is positive in organizational citizenship behaviour. Additionally, job satisfaction partially mediates the employer branding and organizational citizenship behaviour relationship. Lastly, both organisational commitment and income significantly moderate the job satisfaction and organizational citizenship behaviour relationship. The outcomes of the study incorporate considerable amount of knowledge into employer branding, job satisfaction, organizational commitment, and organizational citizenship behaviour literature. More precisely, the moderating role of organizational commitment and income between job satisfaction and organizational citizenship behaviour is a unique contribution of the present study which will believably enrich the literature of the existing organizational citizenship behaviour predominantly used in the Bangladeshi banking sector.

Keywords: Employer Branding, Job Satisfaction, Organizational Citizenship Behaviour, Organisational Commitment, Social Exchange Theory

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An Investigation into the Spatial Rice Market Integration in Bangladesh: Application of Vector Error Correction Approach

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ABSTRACT

Market integration is a metric for market efficiency, notably pricing efficiency. This paper examined the type and degree of market integration in Bangladesh using latest available weekly rice market price data from the six district markets in Bangladesh from January 2014 to December 2018. The findings demonstrated that the wholesale price series of rice are stationary at first difference, but non-stationary at levels. The vector error correction model is then implemented after the Johansen-Juselius approach has been used to examine the co-integrating relationship between the various district markets. The negative and statistically significant coefficients of error correction term for the rice markets in Barishal, Chattogram, and Sylhet districts show that short-run dynamics are convergent with long-term equilibrium. According to the estimated results of the error correction model, there is an equilibrium relationship between the rice markets in Dhaka with rice markets in Barishal, Chattogram, Dinajpur, and Khulna over the long run. In the short run, the calculated co-efficient values, however, indicate that there is only a weak transmission of price changes from one district market to another within the same week.

Keywords: Market Integration, Spatial Price Transmission, Agricultural Trade, Error Correction Model, Bangladeshi Rice Market, Agricultural Market Integration
JEL Classification: Q11, Q13, Q14, Q18, Q19

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Response Strategies Used during COVID- Abstract 19: Restaurants in Dhaka City

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ABSTRACT

COVID-19 jeopardized the survival of the worldwide restaurant business. The purpose of this article is to evaluate the effectiveness of restaurant response strategies to the COVID-19 crisis during more than two months of lockdown in 2020 in Bangladesh. A two-stage approach was used to collect the data. The restaurants were chosen from eight Dhaka City clusters that were selected judgmentally. A standardized questionnaire was utilized to collect data from 221 restaurant owners selected through simple random sampling. The findings show that during COVID-19, all three strategies online reliance, cost reduction, and resilience- influenced restaurant profitability. Restaurants may replicate some of these successful response strategies developed during COVID-19 in the future. To increase profitability, restaurants should develop good relationships with online food delivery companies.

Keywords: Online Ordering, Resilience, Cost Reduction, Temporary Laying Off Employee, Delivery Service, Restaurants, Response Strategy

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Factors Influencing Users' Perspective on Adopting Cloud Computing Framework in Higher Educational Institutions of Bangladesh

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ABSTRACT

To date, various studies on cloud computing adoption have highlighted the advantages of using cloud computing in HEIs around the world. However, there has been a dearth of research in finding out the factors that affect cloud computing adoption in the HEIs of a developing country, Bangladesh. This sequential mixed method study involves interviews and a questionnaire survey among 481 students and faculty members in Bangladeshi HEIs. It has used the Statistical Package for Social Sciences (SPSS v.22) and SmartPLS (v3.2.7) software for the analysis of the questionnaire responses. The researchers have designed the conceptual model of the study based on UTAUT model. The findings reveal that perceived benefits (t-value=5.681) and social influences (t-value =2.094) have significant positive influence on the intention to use of cloud computing. In contrast, technophobia (t-value=2.123) and the quality of Internet infrastructure (t-value=3.752) have significant negative effects on the intention behind the actual use of cloud computing. On the other hand, perceived risk, the lack of knowle dge and awareness of cloud computing, facilitating conditions, complexities and skills transferability have non-significant influence on the intention of actual use of cloud computing. The results of this study will help policymakers of Bangladeshi HEIs to ensure the effective adoption of services provided by cloud computing application by the faculty members and students. Moreover, the study sets an example for other developing countries in the world by highlighting the factors that affect cloud computing adoption among faculty members and students in HEIs.

Keywords: Cloud Computing, Higher Educational Institution, UTAUT, SmartPLS

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[†] Department of English and Humanities, School of Humanities and SoThis is a single case study on a beauty-care start-up, namely ‘Shajgoj’. The start- up is a pioneer to implement omni-channel model in Bangladesh. In last 10 years, since 2013 till 2022, Shajgoj bagged in name, fame and Daily Start ICT award; acquired $ 6 million fund, expanded business from one brick and mortar store to nine. Can Shajgoj sustain this smooth sailing in future? We explored the case for the clues of sustainability. We found too broad and diversified product range as a weakness. Having a wide range of products- from personal care to home care, from women’s care to men’s care, from clothing to appliances- their prime positioning on content-based commerce, and empathy for community may digress. High-paced growth with five new brick and mortar stores in April 2023 alongside promotional extravaganza further intensifies tension on liquidity per se sustainability. Objective: Our objective is to understand the prospect of sustainability at Shajgoj. Functional area: Strategic Management & entrepreneurship Keywords: Start-up, Sustainability, Omni-channel Marketing, Shajgojcial Sciences, Brac University, Dhaka, Bangladesh. Email: sabreena.a@bracu.ac.bd

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Mastering Cloud Kitchen Dynamics: Pizza.us Basabo's Path to Prominence

Salma Akter* and Azizur Rahaman

ABSTRACT

The investigation of "Pizza.us Basabo," a prominent cloud restaurant located in the dynamic metropolis of Dhaka, Bangladesh, is at the centre of this case study. Mr Yasin Ahmed, a visionary, founded the enterprise in 2020 in response to the tremendous problems posed by the COVID-19 epidemic. Yasin's life-changing adventure from job loss to successful entrepreneurship fueled the creation of Pizza.us Basabo. Beginning as a simple home-based venture, it quickly extended its boundaries to include a physical presence by 2022. The investigation delves into the deep network of problems and strategic tactics that have followed Pizza.us Basabo's journey through the ever-changing global landscape. It shines a light on the artistic balance that the establishment works tirelessly to achieve—balancing the necessity of cost-efficiency with an uncompromising dedication to excellent quality standards. Furthermore, it solves the primary problem of nurturing and sustaining a loyal client base in the competitive world of cloud kitchens. A key and multidimensional challenge, symbolic of the current cloud kitchen arena, is embedded inside the story of Pizza.us Basabo. The complicated dance involving cost-efficiency and an unswerving commitment to enhanced quality norms lies at its heart. Pizza.us Basabo, as a cloudbased kitchen, simplifies its processes to save expenses, which is critical to its success. Nonetheless, the unwavering quest for the highest standards in meal preparation, delivery, and customer service remains a pillar. The current discriminating customers as well as the powerful influence of internet reviews heighten the importance of this difficulty, altering the perception of brands and loyalty. This intricacy is complemented by the challenge of establishing a niche and cultivating loyalty in the fiercely competitive cloud kitchen industry. While cloud kitchens provide convenience and a wide range of culinary options, creating engagement, commitment, and unforgettable dining experiences emerged as the heartbeat of success. The Case: Single. A comprehensive interview with Yasin Ahmed served as the major source of information for this case. The interview was conducted straightforwardly, with explicit clarification of the study's aims, and was led by a questionnaire that was somewhat structured. This study is in line with the current "Technology Acceptance Model" (TAM), which is relevant to the cloud kitchen scenario in Bangladesh. The TAM provides a theoretical structure that illustrates the operational complexities and constraints that cloud kitchens face. The path of Pizza.us Basabo is better understood through the lens of this paradigm. The TAM, which was developed to assess the acceptability of technological advancements, provides a prism through which the institution's policies, difficulties, and achievements may be understood. The TAM is based on customer feedback and adoption and provides significant knowledge of how Pizza.us Basabo leverages digital technology and navigates the volatile terrain of cloud kitchens. Type of the Case: Explanatory. Protagonist: Present.

Keywords: Cloud Kitchen, Quality Standards, Customer Engagement, Entrepreneurship, Technology Acceptance Model (TAM)

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Staying Afloat in F-commerce Platform in an Emerging Economy: A Case Study on Fashion Tunnel

Jannatul Ferdous Shetu, **Salma Akter*** and Fariza Binte Mahbub

ABSTRACT

The enormity of the global F-Commerce sector is ever-expanding as it gains popularity thanks to the advantages it provides consumers with. The local online business owners from the emerging markets have immense potential to reign over the global F-Commerce platform but the challenges they face are numerous in number as well. This case study explored the experience of an F-Commerce venture named 'Fashion Tunnel' and investigated the factors contributing to hindering the entrepreneurs' progress. This case study is qualitative in rigor and an in-depth interview was conducted for data collection using a semi-structured questionnaire. We clarified the purpose of the case study before the initial interview. We focused on the solutions to resolve the challenges as well. The protagonist was present. Being a business venture capitalizing on art, design, crafting, and creativity; the owners of Fashion Tunnel faced violation of intellectual property rights (designs, prints, and motifs) along with the challenges triggered by the contemporary economic conditions. Global inflation caused their production cost to increase, the price of raw materials to increase, and the nominal wage of their craftsmen to increase but their customers' expenditure in jewelry was on the decline. This effect is identified as the Cost-Push Inflation in the Keynesian economic model. Moreover, COVID-19 and its repercussions caused them to lose customer dollars before and after the pandemic, and impacted their growth and investment decisions throughout. Along with that, as two women entrepreneurs, their experiences and struggles were unique and exemplary. We chose Fashion Tunnel as this venture started its journey 15 years ago, right around when F-Commerce had only started flourishing in an emerging economy like Bangladesh. Therefore, we received information on a wide range of factors from their long journey which enabled us to portray an appropriate scenario close to reality. Thus, we could address the challenges appropriately in our study which also led us to the proper identification of necessary solutions.

Keywords: F-commerce, Copyright Law, Online Business Entrepreneur, Entrepreneurship, Covid- 19, Case, Bangladesh

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Move with Tradition or Embrace Change? A Case Study of Dhaka's 60-Year-Old Abul Hotel

M. Sayeed Alam[*], Salma Akter Moushumi[†] and **Sarah Akter Sarwar**[‡]

ABSTRACT

Interview with the protagonist. internet sources. Understand the knowledge of segmentation, targeting and positioning and apply the same in real context of a restaurant business, • Explain the role of customer satisfaction in brand building, Draw connections between and among customer engagement, customer-generated marketing, product development, and market development. This is a single case study on Abul Hotel from Dhaka, a restaurant that turned 60-year in 2022. Abul Hotel is a successful brand as testified by the fact that this has become a landmark in the locality. The business flourished further when descended into the hands of the second generation. Abul Hotel earlier focused on traditional Bangladeshi cuisine, lately diversified into Abul Hotel Cafe with fast food, Chinese, and Thai cuisine. Against the backdrop of the restaurant industry where the rate of failure is as high as 30% during the first year of business, the case of Abul Hotel is indeed an outlier. Now, the business faces a dilemma due to the fact that the hotel needs to relocate for MRT (Mass Rapid Transit) project. At this crossroad, the protagonist has to choose between the options of staying with tradition or embracing change. This case involves a 60-year-old hotel in Dhaka. This example teaches students how to apply book marketing knowledge to our local context. Students in the class can ask (i) to list a few hotels in their districts or neighbourhoods that have lasted at least 10 years, and (ii) How do these brands last longer. This case is relevant broadly to the theory of marketing that can connect specifically to the theories of market segmentation, targeting, positioning, and branding.

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The Role of Marketing and Innovation in Small Family Enterprises A Case Study of Casio Metal

M. Sayeed Alam[*] and **Tanzim Ara Mim**[†]

ABSTRACT

Casio Metal has been in operation for 37 years. Badsha Mia, the proprietor of Casio Metal, was raised in a low-income family with no formal schooling. It has been a fantastic journey as an entrepreneur from this terrible deficiency in life to being the first elected president of the Bangladesh Bathroom Fittings Manufacturing Association. He began his adventure at the age of 24 with only 4-5 goods; presently, his Casio metal can make more over 70 items and employs approximately 70 employees. As a proactive entrepreneur, Badsha Mia had to close his business a few times because of problems, but he kept going because he was willing to take risk his own money and image to run his business full-time. He is still in business to this day. The market now has over 300 manufacturers, indicating the level of competition and ease of market entry for this firm. Casio Metal primarily serves the wholesale sector and exclusively the Dhaka-based market. Casio's youthful competitors grew their firms quicker than he did. Even though the firm is neither good nor terrible, this case study argues that this small family business can use innovation and marketing to build an organization for future growth and market development to compete and deliver value to its target market.

Keywords: Casio Metal, Family Business, Entrepreneurship, Marketing, Innovation

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Investigating the Performance of Delay-Tolerant Routing Protocols Using Trace-Based Mobility Models

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ABSTRACT

The mobility patterns of nodes significantly influence the performance of delay-tolerant network (DTN) routing protocols. Trace-based mobility is a class representing such movement patterns of nodes in DTN. This research analyzes the performance of DTN routing techniques on trace-based mobility regarding delivery ratio, average latency, and overhead ratio. Three real traces: MIT Reality, INFOCOM, and Cambridge Imotes are implemented on five DTN routing techniques: Epidemic, Spray and Wait, PRoPHET, MaxProp, and RAPID. For more explicit realization, Shortest Path Map-Based Movement from synthetic mobility model has also experimented with the traces. The Opportunistic Network Environment (ONE) simulator is used to simulate the considered protocols with these mobility models. Finally, this research presents a realistic study regarding the performance analysis of these DTN routing techniques on trace-based mobility along with Shortest Path Map-Based Movement by considering the variation of message generation intervals, message Time-To-Live (TTL), and buffer size, respectively.

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Remote Health Monitoring System Using Microcontroller—Suitable for Rural and Elderly Patients

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ABSTRACT

Amid and post-COVID-19 pandemic, the matter of being in touch with patients to monitor their health matrices became somewhat challenging, especially in the rural areas of countries like Bangladesh and for elderlies. To address this issue, a patient health monitoring system is developed using a Programmable Intelligent Computer (PIC) microcontroller and Global System for Mobile Communications (GSM) protocol with the help of a pulse sensor, IR sensor, photodiodes, temperature sensor, etc., to measure 3 (three) crucial health matrices such as heartbeat/pulse, oxygen saturation level, and body temperature from a fingertip of the patient in 20 s remotely. Whenever the system measures the health matrices, it sends a short message service (SMS) report to a personal caretaker over GSM automatically. If the system finds any anomaly based on predefined threshold levels for each health parameter, it sends a SMS alert report to the designated doctor automatically as well. A prototype of the developed system is made, verified, and tested to be working perfectly as designed and programmed. In the experiment with the developed system, heart rate ranged from 61 to 105 bmp, body temperature ranged from 95.3 to 99.1 °F, and oxygen saturation was minimum at 97%. According to the set threshold levels, which led to an automatic SMS alert to the caretaker's mobile phone.

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Arduino and NodeMCU-Based Smart Soil Moisture Balancer with IoT Integration

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ABSTRACT

Without proper moisture in the soil, the process of agriculture can fall in danger, which can lead to even an economic collapse for a country. However, over-irrigation, under irrigation, or improper water distribution can result in crop damage and reduced productivity, which leads to waste of valuable resources including water. To contribute to addressing this issue, a smart soil moisture balancer is developed based on Internet of Things (IoT), with the help of a soil moisture sensor, water pump control, water flow meter, water level indicator, Arduino Uno, and NodeMCU with built-in Wi-Fi (IEEE 802.11b Direct Sequence) module. The developed system intelligently controls the irrigation pump's switching based on the data collected from a soil moisture sensor. The water level indicator provides data on water availability in the storage, and the water flow meter provides data on water flow rate, which gets transmitted to the ThingSpeak IoT server that stores the data and generates graphs to help with the analysis and making future decisions. A prototype of the developed system is made, verified, and tested to be working perfectly as designed and programmed. In the experiment with the prototype, it is found that the system saves 36.17% of water in case of sandy soil, 37.08% and 32.90% in case of clay soil and loamy soil, respectively. On average, the system saves 35.38% of the water, which in turn can save other intertwined resources like time and energy, keeping the efficiency of the irrigation system.

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Autoencoder and Deep Convolutional Generative Adversarial Network in Improving the Performance of Bangla Handwritten Character Recognition

Tanzina Akter Tani[*]**,** Mir Moynuddin Ahmed Shibly[†]**, Md. Shoumique Hasan**[‡]**,** Nilofa Yeasmin[§] and **Shamim Ripon**[**]

ABSTRACT

Outliers and class imbalances in datasets can be great adversaries to the classifier performance. The task of recognizing Bangla handwritten characters is also no different than that. This chapter has addressed these two aspects of a large Bangla handwritten characters dataset. An Autoencoder-based model has been proposed to perform outlier detection. After removing the outliers, the deep convolutional generative adversarial network (DCGAN) has been employed for the imbalanced classes. ResNet-50 classifiers have been trained on the dataset after removing the outliers as well as after adding generated images. In both cases, the classifiers have demonstrated better test accuracy than that of the original dataset. On the outlier removed and the balanced datasets, ResNet-50 has yielded 97.95% and 97.92% test accuracy, respectively whereas the test accuracy on the original dataset has been 97.63%. These methods can help us to obtain a robust Bangla handwritten classifier.

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Convolutional Neural Networks and Stacked Generalization Ensemble Method in Breast Cancer Prognosis

Tahmina Akter Tisha[*]**,** Mir Moynuddin Ahmed Shibly[†]**, Kowshik Ahmed**[‡] and **Shamim H. Ripon**[§]

ABSTRACT

Among women, one of the main reasons for death is breast cancer. Two types of breast tumors or lumps can be found—benign and malignant. Malignant tumors have a higher chance of transforming into cancer. Therefore, recognizing breast tumors as malignant is the first step toward the treatment of breast cancer patients. Early malignancy detection can play a major role in curing breast cancer, which can save many lives. This study aims at developing appropriate deep-learning models that detect breast cancer from breast histopathology images of the BreakHis dataset. To build such deep-learning models, seven popular convolutional neural networks have been used. Those networks are DenseNet, ResNetV2, Inception, InceptionResNetV2, VGG16, VGG19, and Xception. These seven models have been trained on the magnification factor-based subdatasets from the BreakHis dataset. Among them, InceptionResNetV2 model has better performance than the others with test accuracies of 99.70%, 98.60%, 98.27%, and 97.5% for 40 ×, 100 ×, 200 ×, and 400 × magnification factor datasets, respectively. To improve the performance, the stacked generalization ensemble method has been employed. The ensemble model has outperformed InceptionResNetV2 in 100 × and 200 × datasets with test accuracies of 98.88% and 99.42%, respectively, and for the 400 × dataset, it has the same test accuracy as InceptionResNetV2. The portability of these models is then verified by testing them with images from a different dataset. The overall results of this study have beaten the majority of the state-of-the-art works on the BreakHis dataset. Thus, the developed models from this study can be a great help to detect breast cancer.

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Emerging Memories and Their Applications in Neuromorphic Computing

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ABSTRACT

In the current era of big data, translating brain-like functionalities into hardware systems is the key to realizing artificial intelligence on a chip in a power-efficient and scalable manner. The neuromorphic computing paradigm offers intelligent systems that can be trained efficiently on unstructured big data through spiking or oscillatory neural networks. While spiking neural networks (SNN) utilize leaky integrator-and-fire neurons and spike-time-dependent synaptic plasticity to perform the training and inference on spatiotemporal data, oscillatory neural network (ONN) models neurons as coupled oscillators to solve combinatorial and computationally hard problems. An efficient implementation of SNN requires novel device concepts to process spatiotemporal data in-memory to overcome the von Neumann bottleneck. In this regard, emerging memory devices, such as ferroelectric field effect transistor (FeFET) and Resistive Random Access Memory (RRAM), come to the rescue. Here, we discuss the unique device properties of FeFET and RRAM and their applications as neurons and synapses to implement power-efficient neuromorphic computing systems. The application of FeFET as coupled oscillators for the implementation of ONN is also discussed.

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KOH/NaOH-Activated Carbon, Biomass-Based Supercapacitors

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ABSTRACT

Activated carbons (ACs) are porous carbonaceous materials with high surface-to-volume ratios and improved chemical functionality. The physical and chemical properties of ACs and their performance in various technologies such as energy storage, solar cells, catalysis, and gas adsorption/separation is highly dependent on the carbon precursors and the activation/carbonization methods. Among the carbon precursors, biomass has become the essential precursor for producing ACs because it is renewable, low-cost, and readily available. The carbonization and activation of biomass precursors are usually performed via physical, chemical, mechanical, and electrochemical approaches. So far, many chemical activating agents (acidic, basic, and neutral) have been reported to synthesize ACs from biomass. This is because chemical activation offers the advantages of kinetic-controlled chemical reactions, low-activation temperature, and low cost. In particular, basic KOH and NaOH are widely used for synthesizing biomass-derived ACs, which are used in electrochemical supercapacitors (ESCs) and other potential applications. This chapter comprehensively discusses the general characteristics, methods, advantages, and imitations of ACs prepared from biomass and activated with KOH and NaOH activators by highlighting the fundamentals of ACs. Finally, the application and the performance of ACs produced by KOH and NaOH activation for ESCs application are discussed.

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Mangrove Endophytes and their Natural Metabolites: Role in Promoting Plant Health

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ABSTRACT

Mangroves are forests commonly found in tropical and subtropical countries at the interface between the aquatic and the terrestrial environment. In this unique environment, plants have adapted to thrive in extreme conditions such as high salinity, strong light intensity, regular tidal floodings, and low oxygen levels. Mangrove plants harbor a rich diversity of microbial symbionts, called endophytes, that produce a wide range of natural metabolites. Mangrove endophytes and their metabolites have been reported to enhance plant fitness by promoting growth and increasing resistance to abiotic and biotic stress. This chapter will focus on mangrove endophytes, the metabolites they produce, and their role in stimulating plant development and strengthening plant defenses against pathogens and pests. A special emphasis will be placed on Avicennia endophytes and their metabolites, as Avicennia has been described as the only mangrove genus occurring all over the world.

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Modeling the Impacts of Best Management Practices (BMPs) on Pollution Reduction in the Yarra River Catchment, Australia

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ABSTRACT

Pollution of a watershed by different land uses and agricultural practices is becoming a major challenging factor that results in deterioration of water quality affecting human health and ecosystems. Sustainable use of available water resources warrants reduction of Non-Point Source (NPS) pollutants from receiving water bodies through best management practices (BMPs). A hydrologic model such as the Soil and Water Assessment Tool (SWAT) can be used for analyzing the impacts of various BMPs and implementing of different management plans for water quality improvement, which will help decision makers to determine the best combination of BMPs to maximize benefits. The objective of this study is to assess the potential reductions of sediments and nutrient loads by utilizing different BMPs on the Yarra River watershed using the SWAT model. The watershed is subdivided into 51 sub-watersheds where seven different BMPs were implemented. A SWAT model was developed and calibrated against a baseline period of 1998–2008. For calibration and validation of the model simulations for both the monthly and annual nutrients and sediments were assessed by using the Nash–Sutcliffe efficiency (NSE) statistical index. The values of the NSE were found more than 0.50 which indicates satisfactory model predictions. By utilizing different BMPs, the highest pollution reduction with minimal costs can be done by 32% targeted mixed-crop area. Furthermore, the combined effect of five BMPs imparts most sediments and nutrient reductions in the watershed. Overall, the selection of a BMP or combinations of BMPs should be set based on the goals set in a BMP application project.

Keywords: BMPs, SWAT, Yarra River, Sediment, Nutrients

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Potentiality of Far Surface-mounted Reinforcement for Flexural Strengthening of Reinforced Concrete Beam

Md. Naimul Haque[*] and **Mohammad Kamruzzaman Talukder**[†]

ABSTRACT

This paper explores the potentiality of a proposed strengthening technique named as Far Surface Mounted (FSM) reinforcement for flexural strengthening of RC beam. In this technique the reinforcement is mounted in the tension face of the beam away from the existing beam surface and cast new concrete to increase the flexural capacity of the beam. Results of total 14 tested beams are analysed and presented here in this paper. To evaluate the performance of the new strengthening technique, the load-deflection behaviours of the beams strengthened with new technique are compared with the results of control beam and another beam strengthened with Near Surface Mounted (NSM) reinforcement method. It was found that the beam strengthened with new technique has higher flexural capacity than the control beam and beam strengthened with NSM technique. The influence of shear key spacing and inter-surface locking behaviour are also explored. In most of the cases, it found that the final failure modes are the shear and deboning of the added layer of concrete for the beams strengthened with new technique.

Keywords: Strengthening, Far Surface Mounted Rebar, RC Beam, Flexure Experimental Load-deflection

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Experimental Investigation of Flexural Capacity and Deflection of Low Strength RCC Beam Strengthened with Flexural Steels and Steel Shear Key

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ABSTRACT

Poor quality of construction materials and ineffective design of structural members are primary reasons for fast deterioration of flexural capacity of existing steel reinforced cement concrete (RCC) beam. Beam strengthening methods are applied to prevent further distress in the existing structural element. This article presents the results of an experimental study on the performance of strengthened simply supported 1200 mm long rectangular low strength (low ultimate compressive strength) RCC beams tested in flexure under 4-point bending. The unstrengthened RCC beam (control beam, CB) has been strengthened in this study by attaching additional concrete layer at underside (tension side) of the existing CB. The additional cement concrete layer (FSM layer) is bonded to the existing bottom surface of the CB using epoxy adhesive and steel shear keys. The FSM concrete layer is longitudinally reinforced using steel rebar (FSM steel) to withstand bending stress. This method is regarded as far surface mounted (FSM) reinforcement for flexural strengthening of the existing RCC beam (Strengthened beam, SB). This research investigates the effectiveness of using the FSM technique by performing laboratory tests to observe the expected change in the flexural capacity, deflection and failure mode of the SB relative to the unstrengthened CB. This research also investigates the expected shear transfer between the CB bottom and the FSM concrete layer with consideration for the use of shear keys of different diameters as fasteners, and application of epoxy as a bonding material. The effect of using a 1200 mm long (equal to the length of CB) FSM steel of Ø12 mm in the 62.5 mm thick FSM concrete layer was examined in case A tests. Steel shear key of Ø10 mm and length of 150 mm was used in case A tests for increasing the bond between the CB bottom concrete and the FSM concrete layer. The length of steel shear keys used in the subsequent tests was kept the same. Epoxy and surface roughness at the interface of the CB bottom—FSM layer were used. The mid-span deflection and peak bending moment observed in the SB is compared with those observed in the CB. It is noted that the ratio of the measured deflections SB/CB when beam fails in case A is in the range of 0.4–0.6 and the ratio of peak bending moments SB/CB is in the range of 2.7–3.1. The effect of using a 1200 mm long FSM steel of Ø12 mm (greater than the FSM steel diameter in case A) was investigated in case B tests. Thickness of the FSM concrete layer was of 62.5 mm that is the same as the thickness of the FSM layer in case A. A steel shear key of Ø12 mm (greater than case A tests) and epoxy adhesive were used in case B tests. The ratio of the two deflections SB/CB for case B is 0.5 when beam fails. The ratio of peak bending moments SB/CB for case B is in the range of 2.9–3. The effect of position of the FSM steel in the FSM concrete layer was investigated in case C tests by first decreasing the thickness of the FSM layer from 62.5 mm (the same thickness as in case A) to 37.5 mm. In the next case D tests of the SB specimens, the thickness of the FSM concrete layer was increased from 62.5 mm (case A) to 82.5 mm. For both case C and D tests, the steel shear key of Ø8 mm (smaller diameter than case A, and case B) was used. Epoxy adhesive and the surface roughness were used in both cases. For case C, the ratio of the two observed deflections SB/CB is close to 0.6 when beam fails. The ratio of peak bending moments SB/CB in case C is in the range of 2.4–2.6. The ratio of the observed deflections SB/CB in case D is close to 0.5 when beam fails. The ratio of peak bending moments SB/CB in case D is in the range of 2.8–3.1. The effect of length of the FSM layer was investigated in case E and F tests using a reduced length of the FSM concrete layer. Like case A to D tests, no adhesives were used in case E and case F tests to investigate the variation in deflection and peak bending moment capacity values. For case F tests, the steel shear key of Ø12 mm was used. This diameter of steel shear key is the same as the diameter of shear key used in case B but higher than the diameter of shear key used in case E tests. In case E tests, length of the FSM concrete layer was 700 mm that is shorter than the 1200 mm long CB used in case A to D tests. In the next case F tests, length of the FSM concrete layer was further reduced to 350 mm. This length of the FSM layer is shorter than the 700 mm long FSM layer used in case E. In case F tests, diameter of the FSM steel was 10 mm. The FSM steel was placed in the 62.5 mm thick FSM concrete layer (the same thickness as in case A and case B). The observed SB/CB ratio for deflection in case E tests is in the range of 0.4–0.50. The maximum calculated SB/CB ratio for bending moment capacity in case E is 2.5 when peak moment arises. Debonding of FSM layer in case E was observed when the load carrying capacity of SB specimen was almost zero. The ratio of the two deflections SB/CB for case F is in the range of 0.5–0.6 when beam fails. The ratio of bending moments SB/CB in case F is in the range of 1.8–2.2 when the peak bending moment arises. The experimental results provide evidence that flexural capacity of the SB specimens in comparison with the control beams have increased while mid-span deflection of the SB specimens have decreased due to the increased initial stiffness of the SB specimens. Owing to the ease of the FSM method, and smaller deflection ratio with higher peak moment ratio the FSM method yields, the FSM method is preferred for strengthening the control beams.

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An In-Depth Econometric Analysis of Pavement Performance and Service Life by Pavement Rehabilitation Treatment Type and Delivery Method

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ABSTRACT

This paper delivers a detailed statistical assessment of pavement rehabilitation treatments by delivery methods via studying their performance in terms of pavement indicators (international roughness index, rutting depth, and pavement condition rating) and in terms of their pavement service lives. The data include 812 pavement segments that were rehabilitated under six commonly implemented treatments and through six commonly used delivery methods [with a focus on public–private partnerships (PPP)], which were let or completed in the United States between 1996 and 2011. The treatments include a two-course hot-mix asphalt (HMA) overlay with or without surface milling, concrete pavement restoration; three-course HMA overlay with or without surface milling; three-course HMA overlay with crack and seat of portland cement concrete pavement; 3R (resurfacing, restoration, and rehabilitation) and 4R (resurfacing, restoration, rehabilitation and reconstruction) overlay treatments; and 3R/4R pavement replacement treatments. The delivery methods/PPP types include performance-based contracting, cost-plus-time, incentives/disincentives, design-build and their derivatives, warranties, and lane rentals. To model and forecast pavement performance, a three-stage least-squares approach is employed. For the pavement service life analysis, the elapsed time until the pavement crosses a threshold is investigated, using random parameter hazard-based duration models. Separate models are estimated for each combination of delivery method/PPP type and rehabilitation type. The model estimation results show that several influential factors, such as traffic, weather, and pavement characteristics along with drainage condition affect pavement performance and pavement service life; these factors differ among pavement rehabilitation treatments and delivery methods/PPP types.

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Bivariate-Logit-Based Severity Analysis for Motorcycle Crashes in Texas, 2017–2021

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ABSTRACT

Due to the number of severe traffic collisions involving motorcycles, a comprehensive investigation is required to determine their causes. This study analyzed Texas crash data from 2017 to 2021 to determine who was at fault and how various factors affect the frequency and severity of motorcycle collisions. Moreover, the study tried to identify high-risk sites for motorcycle crashes. Utilizing bivariate analysis and logistic regression models, the study investigated the individual and combined effects of several variables. Heat maps and hotspot analyses were used to identify locations with a high incidence of both minor and severe motorcycle crashes. The survey showed that dangerous speed, inattention, lane departure, and failing to surrender the right-of-way at a stop sign or during a left turn were the leading causes of motorcycle crashes. When a motorcyclist was at fault, the likelihood of severe collisions was much higher. The study revealed numerous elements as strong predictors of catastrophic motorcycle crashes, including higher speed limits, poor illumination, darkness during the weekend, dividers or designated lanes as the principal road traffic control, an increased age of the primary crash victim, and the lack of a helmet. The concentration of motorcycle collisions was found to be relatively high in city cores, whereas clusters of severe motorcycle collisions were detected on road segments beyond city limits. This study recommends implementing reduced speed limits on high-risk segments, mandating helmet use, prioritizing resource allocation to high-risk locations, launching educational campaigns to promote safer driving practices and the use of protective gear, and inspecting existing conditions as well as the road geometry of high-risk locations to reduce the incidence and severity of motorcycle crashes.

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A Review on Semiconductor Photocathode in Bioelectrochemical Systems: Mechanism, Limitation and Environmental Application

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ABSTRACT

Bio-electrochemical system (BES), a promising green treatment and resource recovery technique, suffers mainly from the cathodic limitation towards practical application. An emerging way to avoid this limitation is to apply novel or semiconductor catalysts on the cathode. Semiconductor photocatalysts are very promising that can combine the photoexcited and bio-generated electrons in BES. The possibilities of photocatalysts (bio and abiotic) for BES anode and cathode were jointly discussed in several review articles. However, comprehensive discussion on the semiconductor photocatalysts for BES cathodic application is limited. Therefore, this review aimed to explore the semiconductor photocatalysts for cathodic improvement in BES. An in-depth examination on their selection criteria, technical factors for catalyst layer fabrication, photocathodic reactions under visible light spectrum are highlighted. The review found that, photocathodic reactions in BES were promisingly applied for i) oxygen evolution and reduction, (ii) hydrogen evolution, and (iii) pollutant removal. However, there is a lack of studies on the recently developed visible light heterojunctions/composites for the cathodic enhancement in BES. Tunable bandgap with highly efficient semiconductors should be considered for Type II and z-scheme heterojunctions preparation. Graphitic carbon nitride, bismuth oxi-halides, earth-abundant metal-based oxides are the new generation photocatalyst choices for BES cathode. Bio-electrochemical desalination using semiconductor photocatalyst cathodes is still an unexplored field. Emphasis should be given more on efficient cathode catalyst layer preparation for better interactions among the electrolyte, light, and electron acceptors. Highly efficient photocatalytic air cathode can be a promising step towards a self-sustaining BES for future solution.

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A New Treatment Step of Bio Electrochemically Treated Leachate Using Natural Clay Adsorption towards Sustainable Leachate Treatment

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ABSTRACT

Standalone and combined leachate treatment mechanisms suffer from low treatment efficiencies due to leachate's complex, toxic, and recalcitrant nature. Bioelectrochemical system (BES) was used for the first time to investigate the treatment of leachate mixed wastewater (WW) (i.e., diluted leachate, DL) (DL ≈ L:WW = 1:4) to minimize these complexities. A natural clay (palygorskite) was used as adsorbent material for further treatment on the BES effluent (EBES) while using two different masses and sizes (i.e., 3 g and 6 g of raw crushed clay (RCC) and 75 µ of sieved clay (75 µSC)). According to bioelectrochemical performance, BES, when operated with low external resistance (Rext = 1 Ω) (BES 1), showed a high removal of COD and NH3-N with 28% and 36%, respectively. On the other hand, a high Rext (100 Ω, BES 100) resulted in low removal of NH3-N with 10% but revealed high COD removal by 78.26%. Moreover, the 6 g doses of 75 µSC and RCC showed the maximum COD removals of 62% and 38% and showed the maximum removal of NH3-N with an average range of 40% for both sizes. After efficient desorption, both clay sizes resulted in regeneration performance which was observed with high COD (75%) and NH3-N (34%) on EBES. Therefore, when BES and clay adsorption technique sequentially treated and achieved with combined removal of ~ 98% for COD and ~ 80% of NH3-N, it demonstrated an efficient treatment method for DL treatment.

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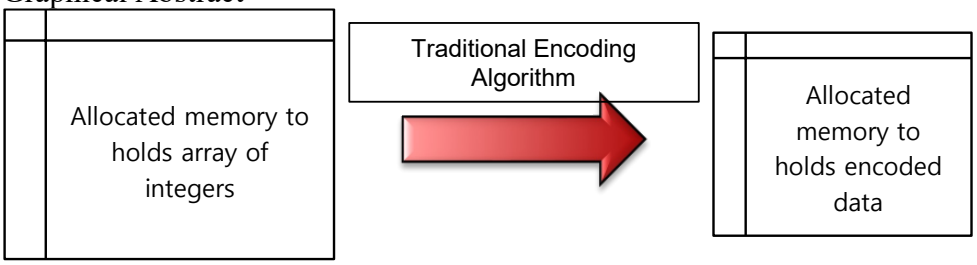
FAW: Flag Aligned Word-Based Encoding for In-Place Integers Compression

Mostofa Kamal Rasel*

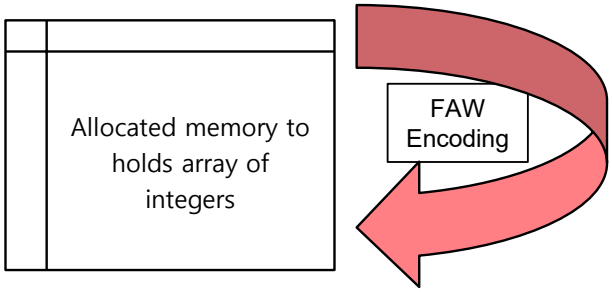
ABSTRACT

FAW-encoding is an open-source C library that facilitates a memory efficient compression of an array of integers. An integer in an array either lags behind or never exceeds its original place in that array after encoded by FAW-encoding. Therefore, FAW-encoding causes in-place compression of an array of integers that never needs memory allocation to store the encoded data. Due to these special properties, FAW-encoding optimizes algorithms, such as, graph mining and joining, that generally produce large intermediate results. Besides encoding, the open-source C library comprises with methods for decoding or searching an encoded array and intersecting and merging encoded arrays.

Graphical Abstract



(a) Traditional encoding algorithms allocate new memory for holding encoded data



(b) FAW-encoding stores encoded data in-place of input array

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The Performance Analysis of Digital Filters and ANN in De-noising of Speech and Biomedical Signal

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ABSTRACT

A huge number of algorithms are found in recent literature to de-noise a signal or enhancement of signal. In this paper we use: static filters, digital adaptive filters, discrete wavelet transform (DWT), backpropagation, Hopfield neural network (NN) and convolutional neural network (CNN) to de-noise both speech and biomedical signals. The relative performance of ten de-noising methods of the paper is measured using signal to noise ratio (SNR) in dB shown in tabular form. The objective of this paper is to select the best algorithm in de-noising of speech and biomedical signals separately. In this paper we experimentally found that, the backpropagation NN is the best for de-noising of biomedical signal and CNN is found as the best for de-noising of speech signal, where the processing time of CNN is found three times higher than that of backpropagation.

Index Terms: LMS, Process Time, Error Histogram, DWT and SNR

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An Advanced Decision Tree-Based Deep Neural Network in Nonlinear Data Classification

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ABSTRACT

Deep neural networks (DNNs), the integration of neural networks (NNs) and deep learning (DL), have proven highly efficient in executing numerous complex tasks, such as data and image classification. Because the multilayer in a nonlinearly separable data structure is not transparent, it is critical to develop a specific data classification model from a new and unexpected dataset. In this paper, we propose a novel approach using the concepts of DNN and decision tree (DT) for classifying nonlinear data. We first developed a decision tree-based neural network (DTBNN) model. Next, we extend our model to a decision tree-based deep neural network (DTBDNN), in which the multiple hidden layers in DNN are utilized. Using DNN, the DTBDNN model achieved higher accuracy compared to the related and relevant approaches. Our proposal achieves the optimal trainable weights and bias to build an efficient model for nonlinear data classification by combining the benefits of DT and NN. By conducting in-depth performance evaluations, we demonstrate the effectiveness and feasibility of the proposal by achieving good accuracy over different datasets.

Keywords: Neural Network, Deep Neural Network, Decision Tree, Nonlinear Data Classification, Back Propagation, Gradient Descent

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Analysis on Intrusion Detection System Using Machine Learning & Deep Learning Models

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ABSTRACT

In recent years, the number of networked devices has increased since the internet is so widely used, which leads to a data flow among those connected network devices. Due to the server's flaws allow hackers can get infiltrated system by cyber-attacks such as network intrusion is one type which is sometimes difficult to detect. One of the most common defenses against these assaults in networked devices is the Intrusion Detection System (IDS), which is deployed in the network. IDS in the previous works are trained many times by using a traditional machine learning (ML) based model and pre-collected dataset to classify attacks. In this paper, we proposed two deep learning (DL) based model, i.e., LSTM and FNN with five ML based model, i.e., RF, SVM, LR, NB and KNN, these algorithms indicate a considerable improvement in intrusion detection performance. Our results indicate that using an LSTM model yielded a maximum accuracy of 99.91%, surpassing the performance of other ML and DL algorithms. After preprocessing the dataset CSE-CIC-IDS2018, we worked with seven days of data and from every day's data we have taken 0.3 million data in different ranges. After that, we merged all data which was total 2.1 million. Due to the limitation of our hardware specification and greater computing time, we have taken limited data. Future work can be done by using more data for the IDS model's training and testing, and trying other deep learning architectures such as CNN and GRU to improve the performance.

Keywords: CSE-CIC-IDS2018, Machine Learning, Preprocessing Phases, Deep Learning

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MangoLeafBD: A Comprehensive Image Dataset to Classify Diseased and Healthy Mango Leaves

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ABSTRACT

Agriculture is one of the few remaining sectors that is yet to receive proper attention from the machine learning community. The importance of datasets in the machine learning discipline cannot be overemphasized. The lack of standard and publicly available datasets related to agriculture impedes practitioners of this discipline to harness the full benefit of these powerful computational predictive tools and techniques. To improve this scenario, we develop, to the best of our knowledge, the first-ever standard, ready-to-use, and publicly available dataset of mango leaves. The images are collected from four mango orchards of Bangladesh, one of the top mango-growing countries of the world. The dataset contains 4000 images of about 1800 distinct leaves covering seven diseases. Although the dataset is developed using mango leaves of Bangladesh only, since we deal with diseases that are common across many countries, this dataset is likely to be applicable to identify mango diseases in other countries as well, thereby boosting mango yield. This dataset is expected to draw wide attention from machine learning researchers and practitioners in the field of automated agriculture.

Keywords: Image Classification, Plant Disease Detection, Machine Learning, Precision Agriculture, Image Dataset

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Net-metering and Feed-in-Tariff Policies for the Optimum Billing Scheme for Future Industrial PV Systems in Bangladesh

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ABSTRACT

In this paper, the economic sustainability of net billing and feed-in-tariff (all energy buy/sell) method is analyzed in comparison with the current net-metering for the industrial PV systems in Bangladesh. Three billing methods are compared according to plant capacity factor, excess energy transfer, levelized cost of energy (LCOE), net present value (NPV), payback period, and profitability index (PI) for the analysis of optimum billing scheme. The highest plant capacity factor and minimum LCOE are found for the large PV system in Chattogram. Out of three methods, all energy buy/sell exhibits the NPV which is USD 5.85 million and PI of 2.54 at the minimum 4.9 years discounted payback time for the large PV system in Chattogram. The sensitivity analysis of solar irradiation at six other regional areas, bill escalation rate, and discount factor is performed to observe the impact on annual energy production and NPV. For both systems, all three assessed methods are found economically feasible, but the net metering is attained as the least profitable in comparison with net billing and all energy buy/sell schemes. From various analyses, it is found that the adaption of these two schemes in the present guideline can enhance industrial PV production in Bangladesh.

Keywords: Bangladesh, Feed-in-tariff, Industrial PV, Net Energy Metering, NPV, Payback Time

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A CNN-Based Strategy to Classify MRI-Based Brain Tumors Using Deep Convolutional Network

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ABSTRACT

Brain tumor is a severe health condition that kills many lives every year, and several of those casualties are from rural areas. However, the technology to diagnose brain tumors at an early stage is not as efficient as expected. Therefore, we sought to create a reliable system that can help medical professionals to identify brain tumors. Although several studies are being conducted on this issue, we attempted to establish a much more efficient and error-free classification method, which is trained with a comparatively substantial number of real datasets rather than augmented data. Using a modified VGG-16 (Visual Geometry Group) architecture on 10,153 MRI (Magnetic Resonance Imaging) images with 3 different classes (Glioma, Meningioma, and Pituitary), the network performs significantly well. It achieved a precision of 99.4% for Glioma, 96.7% for Meningioma, and 100% for Pituitary, with an overall accuracy of 99.5%. It also attained better results than several other existing CNN architectures and state-of-the-art work.

Keywords: Brain Tumor, MRI, Multiclass Classification, Deep Learning, VGG, CNN

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Sickle Cell Disease Classification Using Deep Learning

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ABSTRACT

This paper presents a transfer and deep learning based approach to the classification of Sickle Cell Disease (SCD). Five transfer learning models such as ResNet-50, AlexNet, MobileNet, VGG-16 and VGG-19, and a sequential convolutional neural network (CNN) have been implemented for SCD classification. ErythrocytesIDB dataset has been used for training and testing the models. In order to make up for the data insufficiency of the erythrocytesIDB dataset, advanced image augmentation techniques are employed to ensure the robustness of the dataset, enhance dataset diversity and improve the accuracy of the models. An ablation experiment using Random Forest and Support Vector Machine (SVM) classifiers along with various hyperparameter tweaking was carried out to determine the contribution of different model elements on their predicted accuracy. A rigorous statistical analysis was carried out for evaluation and to further evaluate the model's robustness, an adversarial attack test was conducted. The experimental results demonstrate compelling performance across all models. After performing the statistical tests, it was observed that MobileNet showed a significant improvement ($p = 0.0229$), while other models (ResNet-50, AlexNet, VGG-16, VGG-19) did not ($p > 0.05$). Notably, the ResNet-50 model achieves remarkable precision, recall, and F1-score values of 100 % for circular, elongated, and other cell shapes when experimented with a smaller dataset. The AlexNet model achieves a balanced precision (98 %) and recall (99 %) for circular and elongated shapes. Meanwhile, the other models showcase competitive performance.

Keywords: Ablation Experiment, Classification, Deep Learning Model, Machine Learning Classifier, Sickle Cell Disease

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A Comprehensive Review of Green Computing: Past, Present, and Future Research

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ABSTRACT

Green computing, also called sustainable computing, is the process of developing and optimizing computer chips, systems, networks, and software in such a manner that can maximize efficiency by utilizing energy more efficiently and minimizing the negative environmental influence on the surrounding. The term "green computing" refers to practices that lessen the negative effects of technology on the environment. Due to the improvements in modern technology, various devices, mechanisms, and software have been developed, and lots of studies have been conducted to optimize and increase those technologies' green computing abilities. Thus, review and summarization of green computing-based studies are required to identify the current advancements, challenges, and future research opportunities. This study reviewed and summarized green computing each area studies, by exploring green computing's twelve areas. Current research trends, datasets or testing mechanisms, and the construction or implementation of various technologies to accomplish green computing and sustainable development have been discussed. This study, after conducting thorough comparison and analysis, provides responses to the proposed state-of-the-art research questions. Furthermore, this study presents the current challenges and future research opportunities with respect to each green computing area. This study will provide organizations, researchers, and institutions conducting research on green computing with insights and ideas. Furthermore, environmental organizations, companies, and government agencies concerned with reducing carbon emissions and energy consumption will also benefit from this review study.

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Combating Covid-19 Using Machine Learning and Deep Learning: Applications, Challenges, and Future Perspectives

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ABSTRACT

COVID-19, a worldwide pandemic that has affected many people and thousands of individuals have died due to COVID-19, during the last two years. Due to the benefits of Artificial Intelligence (AI) in X-ray image interpretation, sound analysis, diagnosis, patient monitoring, and CT image identification, it has been further researched in the area of medical science during the period of COVID-19. This study has assessed the performance and investigated different machine learning (ML), deep learning (DL), and combinations of various ML, DL, and AI approaches that have been employed in recent studies with diverse data formats to combat the problems that have arisen due to the COVID-19 pandemic. Finally, this study shows the comparison among the stand-alone ML and DL-based research works regarding the COVID-19 issues with the combinations of ML, DL, and AI-based research works. After in-depth analysis and comparison, this study responds to the proposed research questions and presents the future research directions in this context. This review work will guide different research groups to develop viable applications based on ML, DL, and AI models, and will also guide healthcare institutes, researchers, and governments by showing them how these techniques can ease the process of tackling the COVID-19.

Keywords: Artificial Intelligence, COVID-19, Deep Learning, Machine Learning, Pandemic

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Modeling and Classification of Departmental Business Processes of a Bangladeshi University

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ABSTRACT

Business process modeling (BPM) is a field of computer science that can be used by every organization to maintain its workflow pattern. Adopting this can significantly improve the workflow and can identify problems with the workflow in terms of resource optimization. In this article, the idea of representing the business processes of a Bangladeshi Educational Institute using the business process model and Notation 2.0 has been presented. In this case study, a business process model for the information system at the departmental level of East West University (EWU) has been designed after analyzing 15 key business processes by interviewing stakeholders. After classifying the created as-is business process models based on two criteria-order of actor participation and participation of external entities/departments, two areas of optimization in the workflow pattern have been proposed, load optimization and online automation. This documented model of the business processes has multi-purpose uses. It can be used for resource management, as a guide for stakeholders to better understand a business process, and as a guideline for new employees. This study has shown that by adopting business process modeling, an educational institution could march toward a better and enhanced workflow pattern by identifying problems in it.

Keywords: As-is Model, BPMN2.0, Business Process Model, Business Process Optimization, Workflow Pattern

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Comprehensive Dataset of Annotated Rice Panicle Image from Bangladesh

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ABSTRACT

Bangladesh's economy is primarily driven by the agriculture sector. Rice is one of the staple food of Bangladesh. The count of panicles per unit area serves as a widely used indicator for estimating rice yield, facilitating breeding efforts, and conducting phenotypic analysis. By calculating the number of panicles within a given area, researchers and farmers can assess crop density, plant health, and prospective production. The conventional method of estimating rice yields in Bangladesh is time-consuming, inaccurate, and inefficient. To address the challenge of detecting rice panicles, this article provides a comprehensive dataset of annotated rice panicle images from Bangladesh. Data collection was done by a drone equipped with a 4 K resolution camera, and it took place on April 25, 2023, in Bonkhoria Gazipur, Bangladesh. During the day, the drone captured the rice field from various heights and perspectives. After employing various image processing techniques for curation and annotation, the dataset was generated using images extracted from drone video clips, which were then annotated with information regarding rice panicles. The dataset is the largest publicly accessible collection of rice panicle images from Bangladesh, consisting of 2193 original images and 5701 augmented images.

Keywords: Object Detection, Rice Panicle, Annotated Image, Crop Yield Estimation, Computer Vision

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A Comprehensive Dataset for Sentiment and Emotion Classification from Bangladesh E-commerce Reviews

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ABSTRACT

In the rapidly evolving domain of e-commerce, analyzing customer feedback through reviews is crucial, particularly for understanding and enhancing consumer experience in the Bangladeshi market. Our comprehensive dataset, derived from two Bangladeshi e-commerce platforms, Daraz and Pickaboo, features a diverse collection of reviews in both Bengali and English, covering a broad range of products. These reviews are not only rich in linguistic variety but also encapsulate a spectrum of emotions, some even conveyed through emojis, offering a deep dive into consumer sentiment. Expert annotators have meticulously examined and categorized each review, classifying emotions into five distinct types - Happiness, Sadness, Fear, Anger, and Love - and sentiments into Positive (Happiness, Love) and Negative (Sadness, Anger, Fear) categories. This level of detailed annotation enables precise assessments of customer emotions and preferences, which are essential for evaluating and improving existing product offerings. Moreover, the insights gleaned from this dataset are invaluable for guiding future product development and uncovering new opportunities in the dynamic Bangladeshi market. Ultimately, this dataset not only serves as a significant resource for sentiment analysis using natural language processing (NLP) techniques but also contributes valuable insights into the unique consumer behavior patterns in Bangladesh, enriching the NLP community's understanding of diverse market dynamics.

Keywords: Sentiment, Emotion, Manual Annotation, Dataset, Multilabel, Multiclass, All Categories Review, Bangladesh

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LeafNet: A Proficient Convolutional Neural Network for Detecting Seven Prominent Mango Leaf Diseases

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ABSTRACT

Fruit production plays a significant role in meeting nutritional needs and contributing to the lessening of the global food crisis. Plant diseases are quite a common phenomenon that hampers gross production and causes huge losses for farmers in tropical South Asian weather conditions. In context, early-stage detection of plant disease is essential for healthy production. This research develops LeafNet, a Convolutional Neural network (CNN)-based approach to detect seven of the most common diseases of mango using their images of leaves. This model is trained specially for the pattern of mango diseases in Bangladesh using a novel dataset of region-specific images and is classified for almost all highly available mango diseases. The performance of LeafNet is evaluated with an average accuracy, precision, recall, F-score, and specificity of 98.55%, 99.508%, 99.45%, 99.47%, and 99.878%, respectively, in a 5-fold cross-validation that is higher than the state-of-the-art models like AlexNet and VGG16. LeafNet can be helpful in the detection of early symptoms of diseases, ultimately leading to a higher production of mangoes and contributing to the national economy.

Keywords: CNN, Mango Leaf, Deep Learning, LeafNet, Agriculture

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Current-matching Erases the Anticipated Performance Gain of Next-Generation Two-Terminal Perovskite-Si Tandem Solar Farms

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ABSTRACT

The bifacial gain of various optimally-tilted, and tracking bifacial farms based on single-junction PERC and HIT technologies are well established. The solar module technology is, however, evolving rapidly with the commercial development of two, three, and four-terminal mono and bifacial HIT-Perovskite tandem cells underway. Given the complexity of current-matching in two-terminal tandem cells and significant variation of the weather conditions across the world, one wonders if the benefits of fixed-tilt and tracking cells obtained for single-junction solar cells would remain for tandem solar cells. In this paper, we use a detailed illumination and temperature-dependent bifacial solar farm model (supported by a detailed physical model for bifacial HIT-Perovskite tandem cells) to show that (a) row-to-row shading in solar arrays significantly suppresses the effective albedo collection and thereby the two-terminal (2T) tandem cell efficiency and relative gain compared to an optimal bifacial HIT cell, (b) the global energy yield potential of fixed-tilted and solar-tracking topologies would improve by adopting a 2T tandem design at optimal albedo, with maximum gain arising for tracking farms, (c) the 2T tandem cell/modules (subcell bandgaps, thickness) must be optimized for maximum benefit, and (d) even a relatively small deviation from the optimum will negate all benefits. Our results will broaden the scope and understanding of the emerging tandem bifacial technology by demonstrating global trends in energy gain for worldwide deployment and the need for location-specific tailoring of the module design.

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DC and RF Performance of an N-channel Monolayer Black Phosphorus Nanoribbon Transistor

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ABSTRACT

Two-dimensional black phosphorus is a relatively new discovery. There are numerous studies on black phosphorus two-dimensional transistors that focus on analog and RF performance. However, the RF performance of black phosphorus nanoribbon transistors is yet to be explored. We use a four-band tight binding Hamiltonian in conjunction with a non-equilibrium Green's function quantum transport simulator to investigate both the DC and RF performance of a monolayer black phosphorus nanoribbon transistor. We found that electron intra-band tunneling is responsible for current flow in the off-state, while in the on-state, the electrons flow over the top of the channel barrier potential. With a VDD of 0.4 volt and a gate length of 5 nm, our black phosphorus nanoribbon transistor has DC performance metrics of 510 μA/μm on-state current, 105 on/off current ratio, and 65 mV/dec inverse subthreshold slope. The device's RF performance characteristics are as follows: cut-off (unity current gain) frequency of 772.84 GHz, maximum oscillation (unity power gain) frequency of 1.15 THz, and open circuit voltage gain of 26.7 dB with transistor operating in the on-state. The RF performance of the device is found to be significantly impacted by the source and drain contact resistances. With source and drain resistances set to zero, the cut-off frequency increases to 995.23 GHz and the unity power gain frequency increases to 4.16 THz. The device shows unconditional stability above 893 GHz and it is conditionally stable below this frequency.

Keywords: DC Performance, RF Performance, Black Phosphorus, Nanoribbon Transistor, NEGF, Tight Binding

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Facial Expression Database of Autism Spectrum Disorder Children

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ABSTRACT

The processing of face information relies on the quality of data resources and therefore the dataset is crucial for image processing. While considering behavioural investigations of facial expression recognition (FER) in autism spectrum disorders (ASD) provide conflicting findings due to its difficulty in processing real-world application domains. Also, the significant intra-class heterogeneity makes the FER a challenging task. Hence, this research introduces a novel facial expression database of ASD children. The database is gathered from ASD children aged 6 to 14 with various levels of disease severity, wherein 45% of the children have severe ASD, 35% have moderate, and 20% have low severity of ASD. A total of 81 Male and 32 female children participated in taking the images of facial expressions. Four expressions are considered when generating the dataset: Happy, Sorrow, Neutral, Angry or Disgusted. The generated dataset is validated by analyzing the facial expression recognition using the deep convolutional neural network (DeepCNN). The accuracy accomplished by the DeepCNN using the proposed ASD facial expression recognition database is 96.14%.

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Hybrid Multi-modal Emotion Recognition Framework based on InceptionV3DenseNet

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ABSTRACT

Emotion recognition is one of the most complex research areas as individuals express emotional cues based on several modalities such as audio, facial expressions, and language. The recognition of emotion from one of the modalities is not always feasible as the single modalities are disturbed by several factors. The existing models cannot attain the maximum accuracy in exactly identifying the expressions of individuals. In this paper, a novel hybrid multi-modal emotion recognition framework InceptionV3DenseNet is proposed for improving the recognition accuracy. Initially contextual features are extracted from different modalities such as video, audio and text. From the video modality, the features such as shot length, lighting key, motion and color are extracted. Zero-crossing rate, Mel frequency cepstral coefficient (MFCC), energy and pitch are extracted from the audio modality and the unigram, bigram and TF-IDF are extracted from the textual modality. In feature extraction, high level features are extracted with better generalization capability. The extracted features are fused using the multi-set integrated canonical correlation analysis (MICCA) and are provided as the input to the proposed hybrid network model. It detects the correlation between multimodal features to provide better performance with single learning phase. Then the proposed hybrid deep learning model is utilized to classify emotional states by considering the accuracy and reliability. The work simulations are conducted in the MATLAB platform and evaluated using the MELD and RAVDESS datasets. The outcomes proved that the proposed model is more efficient and accurate than the compared models and attained an overall accuracy rate of 74.87% in MELD and 95.25% in RAVDESS.

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Computational and Experimental Analysis of a Triode Microfuse with a WO3 Heater

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ABSTRACT

In this study, high-current-protecting multilayered thin film microfuses are designed and simulated using the MEMS-based tool of COMSOL multiphysics software and then fabricated and tested in the laboratory. Portable electronic devices are comprised of a secondary battery or DC charge source, and due to short circuit overcurrent, fire, and explosions can ensue. A protecting device should steadily cater to phenomena like overcurrent situations to avoid hazardous circumstances. The primary purpose of this investigation is to design a heater resistor with a negative temperature coefficient (NTC) to function as a low melting point-based alloy for the fuse element. A lead-tin (90Pb:10Sn wt.%) alloy has been employed as the low melting point-based fuse element, and tungsten oxide (WO3) is integrated with the layer as a heater resistor due to its negative temperature coefficient of resistance characteristics. The electro-thermo-mechanical behavior is assessed, and a three-dimensional structural modeling and simulation technique has been performed in both steady-state and transient conditions with varying physical and electrical parameters. The heat required to melt the fuse depends on heater geometry, and when we applied 2 A current to the 1 : 30 length and width ratio-based device, the heater achieved 600 K. Experimentally, nearly at 1 A current and above 4 V, the microfuse reached melting temperature and thus has been blown which provides a scope of controlling nearly 4 W of power electronic devices.

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Finite Element Method-Based Electro-Thermo-Mechanical Analysis of Unimorph Actuator for Microrobots Application

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ABSTRACT

This research presents modeling and simulation findings of a unimorph that can enhance displacement and temperature for rising applied current. In MEMS (Micro-Electro-Mechanical Systems) the development of analytical models to describe the motion of unimorph actuators is hampered by their significant nonlinearities and intricate geometries. This problem can be solved successfully using finite element modeling, which also enables performance prediction and soft actuator design optimization. Investigating the deformation in unimorph actuators for various applied currents is the major goal of this work. With an increase in actuator applied current, deformation rises. The microstructure is transformed into a unimorph actuator as a result of current-induced thermal strain and thermally induced deformation. The actuator was designed for high force-displacement and modeled with a 20 μm width and 110 μm length U-shaped microstructure and has been tested using currents up to 20 mA, thus observing temperature rise upto 310 °C with deformation of maximum 3.6 μm along the axis. This article's presentation of modeling techniques, material characteristics, and design principles can be used as a springboard for designing soft robotic actuators.

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Deep Learning Networks for Handwritten Bangla Character Recognition

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ABSTRACT

In recent years, deep convolutional networks (DCNN) have gained popularity for different classification (or recognition) tasks. In this paper, three well known DCNN structures were used, i.e., AlexNet, SqueezeNet and GoogLeNet, and their classification performances in recognizing handwritten Bangla isolated characters were compared. These networks have simpler structures compared to the recent DCNNs. Experiments on a standard Bangla database revealed that the overall performance of GoogLeNet is slightly better than the other two networks. Further analysis using saliency maps of the test samples revealed the important features that are learned by the networks for classifying characters. This information led us to understand why classification of some samples fail and how to rectify these.

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Molecular Characterization of Streptococcus Agalactiae and Streptococcus Dysgalactiae Causing Bovine Mastitis in the Southern Region of Bangladesh

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ABSTRACT

This study was conducted to validate polymerase chain reaction (PCR) as a confirmatory diagnostic tool to find out the presence and frequency of Streptococcus agalactiae (S. agalactiae) and Streptococcus dysgalactiae (S. dysgalactiae) in mastitic milk samples obtained from dairy cows in the southern region of Bangladesh. A total of 196 samples of bovine milk were collected from various dairy farms in the Chattogram metropolitan area of the southern part of Bangladesh. DNA extracted from isolates obtained by culturing California mastitis test (CMT)-positive mastitic milk samples (n = 146) on 5% sheep blood agar was used as a template for PCR. Two sets of specific primers based on the 16S rRNA gene were used to discriminate between S. agalactiae and S. dysgalactiae. Four PCR products were subjected to sequencing, followed by phylogenetic analysis. The PCR analyses revealed that out of the 146 CMT-positive milk samples tested, 29 samples were positive for S. agalactiae (19.86%), while 26 samples were positive for S. dysgalactiae (17.81%). Further sequence analysis of the corresponding PCR products and bioinformatics analysis verified the results. The study proves the efficiency of PCR as a useful diagnostic approach to determine the presence and prevalence of S. agalactiae and S. dysgalactiae in mastitic milk samples obtained from dairy cows.

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Complete Genome Sequence of the Pandrug-resistant Vibrio Cholerae Strain KBR06 Isolated from a Cholera Patient in Bangladesh

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ABSTRACT

Vibrio cholerae poses a serious hazard to global health and causes cholera disease in humans. Here, we present the full-genome sequence of a pandrug-resistant V. cholerae strain KBR06 isolated from a cholera patient in Bangladesh that exhibited intermediate resistance to only two antibiotics out of 39 among 14 antibiotic categories.

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Synthesis and Cloning of Long Repeat Sequences Using Single-stranded Circular DNA

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ABSTRACT

Non-coding repeat expansion causes several neurodegenerative diseases, such as fragile X syndrome, amyotrophic lateral sclerosis/frontotemporal dementia, and spinocerebellar ataxia (SCA31). Such repetitive sequences must be investigated to understand disease mechanisms and prevent them, using novel approaches. However, synthesizing repeat sequences from synthetic oligonucleotides is challenging as they are unstable, lack unique sequences, and exhibit propensity to make secondary structures. Synthesizing long repeat sequence using polymerase chain reaction is often difficult due to lack of unique sequence. Here, we employed a rolling circle amplification technique to obtain seamless long repeat sequences using tiny synthetic single-stranded circular DNA as template. We obtained 2.5-3 kbp uninterrupted TGGAA repeats, which is observed in SCA31, and confirmed it using restriction digestion, Sanger and Nanopore sequencing. This cell-free, in vitro cloning method may be applicable for other repeat expansion diseases and be used to produce animal and cell culture models to study repeat expansion diseases in *vivo and in vitro*.

Keywords: Benign Adult Familial Myoclonic Epilepsy (BAFME), Cell-free synthetic Biology, In Vitro Cloning; Neurodegenerative Diseasaes, Repeat Sequence, Spinocerebellar Ataxia (SCA) 31.

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Social Demographics Determinants for Resistome and Microbiome Variation of a Multiethnic Community in Southern Malaysia

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ABSTRACT

The prevalence of antibiotic-resistant bacteria in Southeast Asia is a significant concern, yet there is limited research on the gut resistome and its correlation with lifestyle and environmental factors in the region. This study aimed to profile the gut resistome of 200 individuals in Malaysia using shotgun metagenomic sequencing and investigate its association with questionnaire data comprising demographic and lifestyle variables. A total of 1038 antibiotic resistance genes from 26 classes were detected with a mean carriage rate of 1.74 ± 1.18 gene copies per cell per person. Correlation analysis identified 14 environmental factors, including hygiene habits, health parameters, and intestinal colonization, that were significantly associated with the resistome (adjusted multivariate PERMANOVA, $p < 0.05$). Notably, individuals with positive yeast cultures exhibited a reduced copy number of 15 antibiotic resistance genes. Network analysis highlighted Escherichia coli as a major resistome network hub, with a positive correlation to 36 antibiotic-resistance genes. Our findings suggest that E. coli may play a pivotal role in shaping the resistome dynamics in Segamat, Malaysia, and its abundance is strongly associated with the community's health and lifestyle habits. Furthermore, the presence of yeast appears to be associated with the suppression of antibiotic-resistance genes.

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Genomic and Phenotypic Characterization of Acinetobacter Colistiniresistens Isolated from The Feces of a Healthy Member of The Community

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ABSTRACT

Acinetobacter species are widely known opportunistic pathogens causing severe community and healthcare-associated infections. One such emerging pathogen, Acinetobacter colistiniresistens, is known to exhibit intrinsic resistance to colistin. We investigated the molecular characteristics of A. colistiniresistens strain C-214, isolated from the fecal sample of a healthy community member, as part of a cohort study being conducted in Segamat, Malaysia. Comparison of the whole genome sequence of C-214 with other A. colistiniresistens sequences retrieved from the NCBI database showed 95% sequence identity or more with many of the genome sequences representing that species. Use of the Galleria mellonella killing assay showed that C-214 was pathogenic in this model infection system. The strain C-214 had a colistin and polymyxin B MIC of 32 and 16 mg/L, respectively. Besides, it was resistant to cefotaxime, amikacin, and tetracycline and showed moderate biofilm-producing ability. Different genes associated with virulence or resistance to major classes of antibiotics were detected. We observed mutations in lpxA/C/D in C-214 and other A. colistiniresistens strains as probable causes of colistin resistance, but the biological effects of these mutations require further investigation. This study provides genomic insights into A. colistiniresistens, a potentially pathogenic bacterium isolated from a community member and notes the public health threat it may pose.

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Molecular Characterization and Comparative Genomic Analysis of Acinetobacter Baumannii Isolated from the Community and the Hospital: An Epidemiological Study in Segamat, Malaysia

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ABSTRACT

Acinetobacter baumannii is a common cause of multidrug-resistant (MDR) nosocomial infections around the world. However, little is known about the persistence and dynamics of A. baumannii in a healthy community. This study investigated the role of the community as a prospective reservoir for A. baumannii and explored possible links between hospital and community isolates. A total of 12 independent A. baumannii strains were isolated from human faecal samples from the community in Segamat, Malaysia, in 2018 and 2019. Another 15 were obtained in 2020 from patients at the co-located tertiary public hospital. The antimicrobial resistance profile and biofilm formation ability were analysed, and the relatedness of community and hospital isolates was determined using whole-genome sequencing (WGS). Antibiotic profile analysis revealed that 12 out of 15 hospital isolates were MDR, but none of the community isolates were MDR. However, phylogenetic analysis based on single-nucleotide polymorphisms (SNPs) and a pangenome analysis of core genes showed clustering between four community and two hospital strains. Such clustering of strains from two different settings based on their genomes suggests that these strains could persist in both. WGS revealed 41 potential resistance genes on average in the hospital strains, but fewer (n=32) were detected in the community strains. In contrast, 68 virulence genes were commonly seen in strains from both sources. This study highlights the possible transmission threat to public health posed by virulent A. baumannii present in the gut of asymptomatic individuals in the community.

Keywords: Acinetobacter Baumannii, CRISPR–Cas, Malaysia, Antimicrobial Resistance, Community, Comparative Genomics, Faecal, Hospital, Virulence

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Generalized Moment Method for Smoluchowski Coagulation Equation and Mass Conservation Property

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ABSTRACT

In this paper, we develop a generalized moment method with a continuous weight function for the Smoluchowski coagulation equation in its continuous form to study the mass conservation property of this equation. We first establish some basic inequalities for the generalized moment and prove the mass conservation property under a sufficient condition on the kernel and an initial condition, utilizing these inequalities. Additionally, we provide some concrete examples of coagulation kernels that exhibit mass conservation properties and show that these kernels exhibit either polynomial or exponential growth along specific particular curves.

Keywords: Smoluchowski Coagulation Equation, Mass Conservation, Generalized Moment

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Rotational Effect of a Cylinder on Hydro-Thermal Characteristics in a Partially Heated Square Enclosure Using CNT-Water Nanofluid

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ABSTRACT

Rotating cylinder movement in a cavity flow is an exciting field of study in heat transfer. Considerable research has been carried out on rotating cylinders under MHD mixed convection in various types of enclosures. However, considering partially heated square enclosure and magnetic field using CNT-water nanofluid is very limited. This study's goal is to assess the hydrothermal phenomena in a square enclosure with a rotating cylinder. Simulation has been conducted for different rotational speeds (Ω) and dimensionless times (τ) to observe the thermal and fluid flow behaviour. The Galerkin Residual based finite element method has been used to conduct numerical calculations. The results are shown as isotherms, streamlines, and average Nusselt number at the cylinder wall. Moreover, the drag force at the moving wall, and the fluid properties such as the root mean square (rms) of velocity, the temperature, the vorticity functions, and the average fluid temperature are also presented. The heat transfer rate, drag force, rms velocity, and temperature increase with the rise of rotational speed and dimensionless time rise. Maximum vorticity occurs at Ω = 8 and τ = 1. The maximum vorticity function increases 12 times with the increasing rotational speed. Higher rotational speed leads to increased average fluid temperature. The case of Ω = 8, τ = 1 shows the most temperature variance, while Ω = 1, τ = 0.1 has the least. Increasing rotational speed results in higher drag force on the cylinder's surface. At Ω = 4, the drag force is 2.8 times greater than at Ω = 2. Overall, the fluid flow and thermal performance boost up while the rotating speed of the cylinder is higher.

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Wave Profile Analysis of the (2+1)-dimensional Konopelchenko-Dubrovsky Model Mathematical Physics

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ABSTRACT

The (2 + 1)-dimensional Konopelchenko-Dubrovsky (KD) model and the modified version of the new Kudryashov (MVNK) technique are chosen in the current research to obtain the traveling wave solutions (TWSs). The obtained solutions represent the rich range of explicit solutions to the studied model. As a result, TWSs to the stated model are expressed as the different types of wave profiles such as the kink shape, bell shape, anti-bell shape, and W-shape wave profiles. The Hamiltonian function is found from the stated model and shown it as three dimensional, contour and phase plane in this manuscript. The effects of wave velocity and other parameters on the wave profile are also discussed. The obtained wave profiles are typically useful in applications how waves interact with high-dimensional systems in new, specialized structures. Additionally, the direction and position of solitons for changing other parameters can offer a clear-cut explanation of all the different features of wind and water waves. It is seen that the mentioned scheme is effective, potential and easy in mathematical physics. Finally, this study may be opened up brand-new avenues for further study and application in the fields of mathematical physics.

Keywords: (2 + 1) dimensional Konopelchenko–Dubrovsky (KD) Model, Modified Version of the New Kudryashov (MVNK) Technique, Bifurcation Analysis, Solitons, Travelling Wave

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Generalized Linear Regression Model to Determine the Threshold Effects of Climate Variables on Dengue Fever: A Case Study on Bangladesh

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ABSTRACT

One of the leading causes of the increase in the intensity of dengue fever transmission is thought to be climate change. Examining panel data from January 2000 to December 2021, this study discovered the nonlinear relationship between climate variables and dengue fever cases in Bangladesh. To determine this relationship, in this study, the monthly total rainfall in different years has been divided into two thresholds: (90 to 360 mm) and (<90 or >360 mm), and the daily average temperature in different months of the different years has been divided into four thresholds: (16°C to ≤20°C), (>20°C to ≤25°C), (>25°C to ≤28°C), and (>28°C to ≤30°C). Then, quasi-Poisson and zero-inflated Poisson regression models were applied to assess the relationship. This study found a positive correlation between temperature and dengue incidence and furthermore discovered that, among those four average temperature thresholds, the total number of dengue cases is maximum if the average temperature falls into the threshold (>28°C to ≤30°C) and minimum if the average temperature falls into the threshold (16°C to ≤20°C). This study also discovered that between the two thresholds of monthly total rainfall, the risk of a dengue fever outbreak is approximately two times higher when the monthly total rainfall falls into the thresholds (90 mm to 360 mm) compared to the other threshold. This study concluded that dengue fever incidence rates would be significantly more affected by climate change in regions with warmer temperatures. The number of dengue cases rises rapidly when the temperature rises in the context of moderate to low rainfall. This study highlights the significance of establishing potential temperature and rainfall thresholds for using risk prediction and public health programs to prevent and control dengue fever.

Keywords: (2 + 1) dimensional Konopelchenko–Dubrovsky (KD) Model, Modified Version of the New Kudryashov (MVNK) Technique, Bifurcation Analysis, Solitons, Travelling Wave

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The Study of Slow Manifolds in the Lorenz-Haken Model Using Differential Geometry

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ABSTRACT

In order to explore the Lorenz-Haken model, we will concentrate on the flow curvature technique, a recently created method based on differential geometry. This approach treats a dynamical system's trajectory curve or flow as a curve in Euclidean space. Analytical calculations may be used to determine the flow curvature, which is the trajectory curve's curvature. The flow curvature manifold, which is related to the dynamical system of any dimension, is defined by the locations where the flow curvature is null. For the slow invariant manifold of the same dynamical system, the flow curvature manifold offers an analytical equation. The slow invariant manifold equation may be discovered using the flow curvature technique without the need of any asymptotic expansions. In this study, we compute the analytical equation of the slow invariant manifold for the three-dimensional Lorenz-Haken model using the flow curvature approach for the first time. This analytical equation, together with its visual representation in phase space, makes it possible to distinguish between the slow development of trajectory curves and the rapid one, which advances our knowledge of this slow-fast domain. This study also advances the field relative to earlier similar work. Aside from that, we utilize the Darboux theorem to demonstrate the slow manifold's invariance characteristic.

Index Terms: L-H Equations, Slow-Fast Model, Analytical Equation, Darboux Theory, Flow Curvature Method

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Spiral Patterns and Numerical Bifurcation Analysis in a Three-Component Brusselator Model for Chemical Reactions

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ABSTRACT

Pattern formation is a natural phenomenon that can be modeled by reaction–diffusion systems. Regular rotating spiral pattern formation and the instability of the spiral dynamics are very closely related to morphogenesis processes, cardiac arrhythmias, and chemical reactions. Since regular rotating spirals can emit periodic traveling waves from their core, hence the analysis of periodic traveling wave solutions of an oscillatory dynamical system is crucial to understand the instability of spiral patterns. To investigate the spiral patterns for chemical reactions, we consider a three-component Brusselator model. We first examine the local behavior of solutions of the model. Then we analyze the occurrence of periodic traveling wave solutions in a two-dimensional parameter plane. Next, we explore the stability outcome of periodic traveling wave solutions. It is observed that periodic traveling wave solutions change their stability, which is the Eckhaus type. The results are justified by a direct numerical simulation in one and two space dimensions. The regular and oscillatory periodic traveling wave solutions are revealed in the one-dimensional space dimension of the model by considering an Eckhaus bifurcation point. Moreover, we illustrate regular rotating spiral waves and the phenomenon for far-field breakup from the spiral waves in the two-dimensional space.

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Microwave-assisted Rapid Synthesis of Nanosized SSZ-13 Zeolites for Effective Conversion of Ethylene to Propylene

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ABSTRACT

SSZ-13 is an attractive zeolite with chabazite topology composed of small pores with 8-membered rings. In this work, we report a highly effective method to synthesize SSZ-13s with microwave (MW) heating. Compared with conventional electric (CE) heating, MW heating accelerates both the nucleation and crystal growth rates of the synthesis by 6 and 18 times, respectively. Importantly, MW-assisted rapid synthesis produces the SSZ-13 with the smallest particles (<50 nm). However, the CE-assisted synthesis produces large/inhomogeneous particles (size: 0.4–1 μm). The obtained SSZ-13s were employed in acid catalysis or ethylene-to-propylene (ETP) reactions. The record-small SSZ-13s were more efficient in the ETP reactions, with more stable ethylene conversion/propylene yield (at the same time on stream) and higher propylene selectivity (at the same ethylene conversion), than large SSZ-13s. Finally, the maximum propylene yield (62%) is competitive or better than any SSZ-13s obtained via direct synthesis from precursors like silica and alumina. Moreover, we illustrate regular rotating spiral waves and the phenomenon for far-field breakup from the spiral waves in the two-dimensional space.

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Highly Porous Polyaniline- or Polypyrrole-Derived Carbons: Preparation, Characterization, and Applications in Adsorption

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ABSTRACT

Nitrogen-doped porous carbons are one of the most fascinating materials with noticeable applications in adsorption/separations, catalysis, supercapacitors, and batteries. Polyaniline (pANI)- or polypyrrole (pPYR)-derived carbons (pADCs or pPDCs, respectively) exhibit very remarkable performances in the liquid- and gas-phase adsorptions because of some unique characteristics including nitrogen- and oxygen-functionalities, very high specific surface area, and tailored porosity. In this report, we reviewed the recent advances in the preparation and characterization of pADC- and pPDC-type materials and their applications in the adsorptive removal/separation of various chemicals from water, liquid fuel, and air. The preparation procedures and the surface properties of the reported pADC or pPDC adsorbents were explained, with adequate tables. The adsorption results were discussed in terms of the following points: (i) maximum adsorption capacities of the pADCs or pPDCs for a specific adsorbate, (ii) possible adsorbate-adsorbent interactions to understand the adsorption mechanisms, (iii) regeneration of pADC or pPDC adsorbents for recyclability. We believe that this review will provide new scientific perceptions to design/optimize highly porous carbons, especially pADCs or pPDCs, for various applications including adsorption.

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Advances and Key Considerations of Liquid Chromatography–mass Spectrometry for Porcine Authentication in Halal Analysis

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ABSTRACT

The halal food industries are rapidly expanding to fulfill global halal demands. Non-halal substances such as porcine proteins are often added intentionally or unintentionally to products. The development of highly selective and sensitive analytical tools is necessary, and liquid chromatography–mass spectrometry is a powerful tool that can cope with the challenge. The LC–MS method has great potential for halal authentication, because it has high sensitivity and low detection limit and detects several species markers and different tissue origins at once within one species. This article provides an understanding of recent advances in the application of LC–MS for the improvement of porcine authentication. Sample preparation, marker selection, separation and mass spectrometry conditions, quantitative assessment, and data processing for protein identification were all covered in detail to choose the most suitable method for the analytical needs.

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Coping with the COVID-19 Pandemic by Strengthening Immunity as a Nonpharmaceutical Intervention: A Major Public Health Challenge

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ABSTRACT

The global Coronavirus-2 outbreak has emerged as a significant threat to majority of individuals around the world. The most effective solution for addressing this viral outbreak is through vaccination. Simultaneously, the virus's mutation capabilities pose a potential risk to the effectiveness of both vaccines and, in certain instances, newly developed drugs. Conversely, the human body's immune system exhibits a robust ability to combat viral outbreaks with substantial confidence, as evidenced by the ratio of fatalities to affected individuals worldwide. Hence, an alternative strategy to mitigate this pandemic could involve enhancing the immune system's resilience. The research objective of the review is to acquire a comprehensive understanding of the role of inflammation and immunity in COVID-19. The pertinent literature concerning immune system functions, the impact of inflammation against viruses like SARS-CoV-2, and the connection between nutritional interventions, inflammation, and immunity was systematically explored. Enhancing immune function involves mitigating the impact of key factors that negatively influence the immune response. Strengthening the immune system against emerging diseases can be achieved through nonpharmaceutical measures such as maintaining a balanced nutrition, engaging in regular exercise, ensuring adequate sleep, and managing stress. This review aims to convey the significance of and provide recommendations for immune-strengthening strategies amidst the ongoing COVID-19 pandemic.

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Excited-State Intramolecular Proton Transfer in 10-Hydroxybenzoquinoline, 1-Hydroxyanthraquinone, Methyl Salicylate and 4-Methyl-2,6-Diformyl Phenol: A Qm/Mm–Md Study

Md Al Mamunur Rashid[*], **Thamina Acter**[†] and Nizam Uddin[‡]

ABSTRACT

The reaction dynamics of excited-state intramolecular proton transfer (ESIPT) tautomerism in 10-hydroxybenzoquinoline (HBQ), 1-hydroxyanthraquinone (HAQ), methyl salicylate (MS) and 4-methyl-2,6-diformyl phenol (MFOH) has been investigated by quantum mechanics/molecular mechanics–molecular dynamics (QM/MM–MD) simulation with four different solvents H2O, CH3OH, CH2Cl2 and CHCl3. The ESIPT of HBQ proceeds 20 ± 8 fs in water and methanol solvents; whereas, for other two solvents, CH2Cl2 and CHCl3, proton transfer (PT) occurs within 62 ± 6 fs and 76 ± 6 fs, respectively. Similarly, the ESIPT of HAQ proceeds 21 ± 6 fs in H2O, 33 ± 6 fs in CH3OH, 51 ± 6 fs in CH2Cl2 and 61 ± 6 fs in CHCl3. The ESIPT of MS proceeds in 23 ± 6 fs in H2O, 38 ± 6 fs in CH3OH, 60 ± 6 fs in CH2Cl2 and 73 ± 6 fs in CHCl3. The ESIPT of MFOH proceeds 20 ± 6, 22 ± 6, 35 ± 6 and 58 ± 6 fs in H2O, CH3OH, CH2Cl2 and CHCl3 solvent, respectively. Our QM/MM–MD simulations show that the rate of PT is inversely proportional to the polarity of the solvents. In addition, intramolecular hydrogen bonding capacity between the hydroxyl oxygen (proton donor) and the benzoquinolinic nitrogen (proton acceptor) plays an important role for the ESIPT reaction.

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The Solvation Dynamics of CO2 by Quantum Mechanical Molecular Dynamics

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ABSTRACT

The solvation dynamics of CO2 in an aqueous solution were investigated using quantum mechanical molecular mechanical molecular dynamics (QM/MM-MD) simulations. It is demonstrated that the formation of H2CO3 occurs through direct reactions between CO2 and nH2O, with extremely high activation barriers in the gas phase. However, in a solution, the activation energy decreases as the number of H2O molecules increases. Specifically, for the CO2 − H2O system, the activation energy is about 32 kcal/mol, while for the CO2 − 2H2O and CO2 − 3H2O systems, it decreases to 28 kcal/mol and 15 kcal/mol, respectively. These findings suggest that the solvation of CO2 in a solution favors a step-wise mechanism.

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Environmental Petroleomics – Application of Ultrahigh-Resolution Mass Spectrometry for Molecular-Level Understanding of the Fate of Spilled Oils

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ABSTRACT

Molecular-level investigation of crude oil has become an essential part of oil spill research, It facilitates the assessment of oil behavior, fate, impacts, as well as the evaluation of oil spill origins, toxic substances, and the effect of such incidents. Notable oil spill incidents, such as the Deepwater Horizon, have emphasized the need for molecular-level information on spilled oil to evaluate and monitor environmental damage. In this study, the term 'Environmental Petroleomics' is defined. During the weathering of spilled oil, various effects can alter the oil's chemical composition, including evaporation, dispersion, photo-oxidation, and microbial degradation. The major toxic compounds in the spilled oil are aromatic compounds, followed by polar oxygenated aromatic compounds. Although gas chromatography-mass spectrometry (GC-MS) is an effective approach for compositional analysis of crude oil, it falls short in its ability to separate individual compounds in the weathered oil. This is particularly challenging when dealing with weathered oil enriched with polar oxygen- and sulfur-containing compounds that emerge during the weathering process . Ultra-high-resolution mass spectrometry (UHR-MS) has played a key role in the development of Environmental Petroleomics, proving effective in characterizing various polar species. This review explores the application of ultra-high-resolution mass spectrometry for oil spill research. The study concludes that the toxicity of weathered crude oils results from the photo-oxidation of crude oil molecules into highly oxygenated, water-soluble species. Prospective research in environmental petroleomics concerning the analysis of oil spills may direct its attention towards innovating novel methodologies. These could encompass high-resolution imaging of oil spills, time-resolved analysis of spill dynamics, integration of ultra-high-resolution mass spectrometry (UHR-MS) with complementary techniques, and the utilization of UHR-MS for biomarker analysis.

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Far Field Tsunami Simulation Using an Open Boundary Condition from An Extended Domain

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ABSTRACT

This study assesses the simulation of far field tsunami from an extended domain along the coastal belt of Southern Thailand and the west coast of Peninsular Malaysia using a formulated open boundary condition. The vertically integrated depth averaged shallow water equations are solved numerically in two different model domains. Along with the original domain (OD) an extended domain (ED) is considered during the simulation process. Using the method of lines technique, linear shallow water equations (SWE) are solved in the original domain and the extended domain all together to simulate the response of the tsunami source in the western side of the open boundary of the original model domain. A tsunami source similar to 2004 Indian Ocean Tsunami is considered as an initial condition for this boundary value problem. The ED is extended up to 2000 km from the coast. The non-linear shallow water equations are solved in the original domain where the tsunami source was omitted. In the original domain, a boundary condition is used which was formulated by the amplitude of the source in the extended domain and the formulated boundary condition was imposed at west boundary of the OD to compute tsunami response in absence of original tsunami source. Finally, the effect of the formulated boundary condition was simulated in the coastal belt of the south part of Thailand and the west coast of the Peninsular Malaysia. Tsunami travelled time and water elevation for different coastal location are stimulated by the two models. The outputs of this study are compared with the available data in the USGS website, and a very reasonable agreement is observed.

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Outliers as a Source of Overdispersion in Poisson Regression Modelling: Evidence from Simulation and Real Data

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ABSTRACT

The Poisson regression model is a well-known technique for modelling count data. However, it is necessary to satisfy the overdispersion assumption in order to fit the Poisson regression model. Due to the overdispersion problem in the Poisson regression model, standard errors might be underestimated, which may lead to a highly misleading inference. There are several tests in the literature to check the presence of overdispersion in the Poisson model. In this study, we apply a regression-based t test to identify the overdispersion. The simulation study and real data example clearly show that the overdispersion in the Poisson model is caused by the existence of outliers.

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In Vitro Anticancer Properties of Novel Bis-Triazoles

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ABSTRACT

Here, we describe the anticancer activity of our novel bis-triazoles MS47 and MS49, developed previously as G-quadruplex stabilizers, focusing specifically upon the human melanoma MDA-MB-435 cell line. At the National Cancer Institute (NCI), USA, bis-triazole MS47 (NCS 778438) was evaluated against a panel of sixty human cancer cell lines, and showed selective, distinct multi-log differential patterns of activity, with GI_{50} and LC_{50} values in the sub-micromolar range against human cancer cells. MS47 showed highly selective cytotoxicity towards human melanoma, ovarian, CNS and colon cancer cell lines; in contrast, the leukemia cell lines interestingly showed resistance to MS47 cytotoxic activity. Further studies revealed the potent cell growth inhibiting properties of MS47 and MS49 against the human melanoma MDA-MB-435 cell line, as verified by MTT assays; both ligands were more potent against cancer cells than MRC-5 fetal lung fibroblasts (SI > 9). Melanoma colony formation was significantly suppressed by MS47 and MS49, and time- and dose-dependent apoptosis induction was also observed. Furthermore, MS47 significantly arrested melanoma cells at the G0/G1 cell cycle phase. While the expression levels of Hsp90 protein in melanoma cells were significantly decreased by MS49, corroborating its binding to the G4-DNA promoter of the Hsp90 gene. Both ligands failed to induce senescence in the human melanoma cells after 72 h of treatment, corroborating their weak stabilization of the telomeric G4-DNA.

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Burnout Risks in Bangladeshi Physicians: A Multicenter, Cross-Sectional Study

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ABSTRACT

Physician burnout is a global concern that can lead to exhaustion, ineffectiveness, and poor health outcomes. Burnout has been linked to a variety of societal and professional variables worldwide. This cross-sectional, multi-centered study was conducted by face-to-face interviews between April 2019 and December 2021 at sixty-two (62) tertiary level hospitals to identify potential risk factors for burnout among Bangladeshi physicians, which is essential for preventing adverse impact on their well-being, improving overall quality of life, and facilitating measures to manage stress and maintain a healthy work-life balance. A simple random sampling technique in conjunction with a structured questionnaire was used to collect a total of 1434 responses, assuming 20 % of the sample as non-responsive. Univariate, bivariate, and multinomial logistic regression statistical analyses were performed to determine the risk factors and associate the level of severity. The distribution of burnout status differs significantly at distinct covariate levels, such as working place, working hour, prevalence of potential interpersonal conflicts (subsequent increase of adjusted odds ratios i.e.; 6.52, 8.82, 11.41, and 37.07 is observed for physicians having interpersonal conflicts with both co-workers & family members), job dissatisfaction, annoyed feeling while dealing with patients (adjusted odds ratios are 529.68, 518.26,983.87 and 849.57 respectively) and some other significant factors of the physicians. This study also reveals that the female physicians, physicians with age 40–49, physicians with additional liabilities, physicians with job dissatisfaction, less salary compared to the workload, less flexibility and security at the job sector as well as obese physicians are at high risk of burnout. These results are statistically significant with a p value ≤ 0.05. To reduce burnout of Bangladeshi physicians, it is necessary to address the risk factors, create supportive workplaces, maintain a healthy work-life balance, provide opportunities for self-care, and promote mental health.

Keywords: Burnout, Bangladeshi Physicians, Workplace, Burnout Measure

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Potential Drug-Drug Interactions and Prescription Errors in COVID-19 Infected Patients

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ABSTRACT

Prescription errors can cause havoc during the pandemic, especially for comorbid patients with diabetes and hypertension identified as a risky population group for COVID-19. Therefore, the present study was designed to evaluate the prescription errors, including drug-drug interactions, among outpatients infected with COVID-19. This study was carried out at the outpatient departments of different hospitals in Dhaka, Bangladesh, through a random sampling method between May and August 2021. Eighty prescriptions from COVID-19 patients were collected, among whom 44 had comorbidities. The Microsoft Excel 2016 program analyzed the prescriptions and online aiding tools, such as Drug Interaction Checker (Drugs.com), were used to identify potential drug-drug interactions. Among those 80 prescriptions, 44 cases (55%) contained moderate drug-drug interactions; Moxifloxacin and Remdesivir, the highest observed combination, were detected in 10 prescriptions (12.5%). A total of 7 prescriptions (8.75%) contained significant drug-drug interactions. The dose was not mentioned in 37 cases (46.25%), while the patient's history was not found in 21 cases (26%). Moreover, 6–10 drugs were found in 54 prescriptions (67.50%), while 11–15 drugs were prescribed in 19 prescriptions (23.75%). Prescription error and drug-drug interaction may implicate the disastrous situations more profoundly, especially for the comorbid patients. Prescription errors, an avoidable occurrence, may be eradicated by awareness and tools with preventive measures.

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Effect of SMAD4 Gene Polymorphism on Breast Cancer Risk in Bangladeshi Women

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ABSTRACT

Breast cancer, one of the most prevalent cancer types among women worldwide as well as in Bangladesh, is the leading cause of cancer death in women throughout the globe. The risk of breast cancer development was found to be associated with genetic polymorphism according to several studies. As a convenient prognostic marker, a biomarker helps to identify disease progression, can lead to an effective therapeutic strategy, development of prognostic marker is very important for any cancer to initiate treatment strategy early to increase the possibility of the success rate of the treatment along with reduction of the treatment cost. This study aims to establish the correlation between polymorphism of SMAD4 rs10502913 and risk of breast cancer development in Bangladeshi women. This study was conducted on 70 breast cancer patients and 60 healthy volunteers through blood sample collection followed by DNA separation between the intervals of August 2019–October 2019. The collected DNA sample was arranged for the RFLP analysis of a PCR amplified fragments followed by gel electrophoresis. The obtained data was analyzed by structured multinomial logistic regression model. Obtained different fragment size after gel electrophoresis indicated different genotypes in this experiment. Our findings demonstrated that mutant homozygous A/A genotype, plays a significant role in breast cancer development among Bangladeshi women (P = 0.006, OR = 4.9626, 95% CI = 1.9980–12.3261) compared to the reference homozygous G/G genotype. Moreover, heterozygous G/A genotype was also found to be significantly associated with the risk of breast cancer development (P = 0.0252, OR = 2.6574, CI = 1.1295–6.2525). Considering the A/A genotype and G/A genotype combined, it also indicates a strong association of breast cancer development in Bangladeshi women (P = 0.008, OR = 3.5630, CI = 1.6907–7.5068). Our study indicated a novel association between SMAD4 (rs10502913) polymorphism and increased risk of breast cancer development in Bangladeshi women.

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Common Approaches of Cytochrome P450 (CYP) Induction Assays

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ABSTRACT

The induction of enzymes is a defensive mechanism for some xenobiotics, but it may alter the drug's safety and efficacy by altering the activity of metabolic enzymes. One of the major families of enzymes involved in phase I metabolism is Cytochrome P450 (CYP) enzymes which may get induced by certain drugs. Concomitant administration of drugs due to chronic disease or polypharmacy, inducers among them may cause toxicity or reduce the plasma concentration at a sub-therapeutic level. This is one of the dangerous types of drug-drug interactions, but predictable & preventable. The CYPs get induced by three nuclear receptors, including the aryl hydrocarbon receptor (AhR); constitutive androstane receptor (CAR); the pregnane X receptor (PXR). Without identification during drug development, enzyme induction phenomenon of a new drug molecule may get noticed only during pharmacovigilance. Though, this CYP induction may not be a barrier for drug development, it may cause possible DDI and treatment failure. According to FDA guidelines, pharmaceutical industries adopted In-vitro, Ex-vivo and In-vivo techniques based on different developmental stages. The results are also interpreted based on regulatory bodies guidelines. For In-vitro assay best accepted method is using primary hepatocytes either fresh or cryopreserved, for Ex-vivo liver slices of different species and in-vivo, clinical investigations are the extreme option. This paper reviews current industry approaches of CYP induction assays to evaluate potentiality for a new drug molecule as an inducer.

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siRNA: A Comprehensive Review of Marketed Products till August 2022

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ABSTRACT

Small interference RNA (siRNA) is a double-stranded RNA of 21~25 nucleotides. siRNA functions using a natural phenomenon known as RNA interference (RNAi), a gene silencing mechanism. Hypothetically, siRNA can target and regulate the expression of any disease-related gene in a sequence-specific manner. In 1993, this mechanism was noticed in a nematode Caenorhabditis elegans, later discovered in humans. After two decades, in 2018, the first siRNA therapeutics (Patisiran) were developed successfully and got approval from USFDA. Followed by three more siRNA drugs (Givosiran, Lumasiran, and Inclisiran) approved in consecutive years to treat rare, inherited genetic disorders. Recently approved one is Vutisiran with a similar indication of patisiran. Limitation of conventional therapies, this new & standard pharmacotherapy opens a new era of changing the treatment options of human diseases. Six siRNA candidates are in phase III clinical trials and are hoped to enter the pharmaceutical market soon. Challenges faced during the development of these novel therapies were off-target effects, target-specific delivery, cellular uptake, recognition by the innate immune system, limited efficacy, and others. However, chemical modification of the siRNA nucleotides in sugar, base, and phosphate moiety makes it successful in overcoming obstacles. In addition, a non-viral delivery carrier also helped in many aspects during formulation. This study is a narrative review and will summarize pharmacokinetic, pharmacodynamic, design approaches, and other attributes faced during the development of marketed siRNA products.

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Prevalence of Perceived Anxiety in General People, Students and Healthcare Professionals during COVID-19 Pandemic

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ABSTRACT

The global severity of COVID-19 remains high which results anxiety and other mental health problems, also it altered people's everyday lives, affected human connections and economic operations. The goal of this comprehensive review was to identify the effects of the linkage COVID-19 pandemic on the mental health of different groups and communities. This study compiled evidence of a link between anxiety rates and the COVID-19 pandemic. The evaluation period started in June' 2022 and ended on August'2022, during this time, total four databases such as PubMed, Science Direct, Tailor & Francis Online, and Springer were used to search scientific literatures. A total 616 studies were identified from all four databases and 63 scientific literatures were selected based of predetermined criteria for review which were published in between 2020 to 2022. Three groups of population such as general population, students and healthcare professionals were taken for review the findings from the selected literatures. Gender, physical disorders, psychiatric disorders, COVID infection, infection rates in colleagues or family members, experience of frontline work & non-frontline work, close contact with infected patients, high exposure risk, quarantine experience, etc. were highly considered as factors associated with increased prevalence of anxiety among all three groups. During the COVID-19 pandemic, the general population, healthcare professionals, and students experienced an increase in the prevalence of mental diseases, whereas infected individuals had a decrease. Females were highly prevalent to anxiety than male. Our comprehensive review concluded significant co-relation between anxiety and COVID-19 but long-term study is needed to better understand which may define the population's mental condition in future.

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Exploring Patient Response towards Hotline-based Telemedicine Service in Bangladesh

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ABSTRACT

Telemedicine system enables doctors and patients to communicate while staying afar which can be helpful for areas with lesser health facilities and at times of natural or health disasters. In developing countries like Bangladesh, telemedicine service offers the potential for wider health access and equity if effectively implemented. Therefore, the response and acceptance of care receivers who are the main beneficiaries of the service should be explored. As Dhaka University Telemedicine Programme (DUTP) is a non-profit University project-induced successful telemedicine service in Bangladesh, our study was conducted on the DUTP hotline-based telemedicine programme aimed to explore patients' prior knowledge and response (experience, satisfaction and acceptance) about the service. The cross-sectional study was conducted by interviewing 200 participants over the phone with a structured questionnaire to analyze their knowledge and response. Participants were selected by randomization from the patient pool of hotline-based DUTP telemedicine service. The data was analyzed using SPSSv20. Among the participants, 41% of total participants knew about telemedicine services before COVID-19. Average patient satisfaction was well above moderate level (p-value< 0.01; mean 3.88). 16.5% respondents mentioned about having any problem while availing the service where 'treatment or service related problem' was the most common. Significant association was found between people's 'occupation' and 'knowledge before COVID-19' (p = 0.002) indicating to the probable role of profession or occupation in molding people's health-service related knowledge. Patient-doctor communication ['perception about doctor's adequate evaluation (Q3)' and 'understanding doctor's advice properly (Q4)'] was found to be significantly associated with 'age' and 'location (division)' while most respondents (around 90%) perceived the communication as effective. 'Age' had also an association with 'treatment or service related problem'. 80.5% were willing to take the service in the future even by paying fees. All participants appreciated telemedicine service in general when they were asked about its possible inclusion in mainstream primary healthcare. The overall response of patients toward DUTP hotline-based telemedicine, in general, came out to be positive. Concerned authorities and policymakers may exploit this accepting attitude of people toward developing effective telemedicine services in order to ensure wider health and well-being of population.

Keywords: Hotline-based Telemedicine, Telemedicine, Patient Response, Patient Satisfaction, Patient-Doctor Communication, Primary Healthcare

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Compounds from the Petroleum Ether Extract of Wedelia chinensis with Cytotoxic, Anticholinesterase, Antioxidant, and Antimicrobial Activities

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ABSTRACT

Wedelia chinensis is a folk medicine used in many Asian countries to treat various ailments. Earlier investigations reported that the petroleum ether extract of the plant has potential biological activity, but the compounds responsible for activity are not yet completely known. Therefore, the current work was designed to isolate and characterize the compounds from the petroleum ether extract and to study their bioactivities. Four compounds including two diterepenes (-) kaur-16α-hydroxy-19-oic acid (1) and (-) kaur-16-en-19-oic acid (2), and two steroids β-sitosterol (3), and cholesta-5,23-dien-3-ol (4) were isolated and characterized. Among the compounds, the diterpenes were found to have more biological activities than the steroidal compounds. Compound 1 showed the highest cytotoxicity with LC50 of 12.42 ± 0.87 μg/mL. Likewise, it possesses good antioxidant activity in terms of reducing power. On the contrary, compound 2 exerted the highest antiacetylcholinesterase and antibutyrylcholinesterase activity. Both the diterpenes showed almost similar antibacterial and antifungal activity. The identification of diterpenoid and steroid compounds with multifunctional activities suggests that W. chinensis may serve as an important source of bioactive compounds which should be further investigated in animal model for therapeutic potential in the treatment of different chronic diseases.

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Bioactive Compounds from Curcuma Aeruginosa and The Effect of Comosone II on The Migration and Invasion of Breast Cancer Cells

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ABSTRACT

Bioassay-guided separation afforded furanodienone 1,10-epoxide (9) as the new compound, curcolone (10) as partially described compound and ten known compounds; germacrone (1), furanodienone (2), curzerenone (3), curcumenol (4), zederone (5), comosone II (6), (1E,4E,8R)-8-hydroxygermacra-1(10),4,7(11)-trieno-12,8-lactone (7), 13-hydroxygermacrone (8), curcuzederone (11) and demethoxycurcumin (12). The study showed that germacrone, furanodienone, curzerenone, comosone II, 13-hydroxygermacrone, curcuzederone and demethoxycurcumin are the bioactive compounds of C. aeruginosa rhizomes. Comosone II significantly inhibited MDA-MB-231 cell migration and invasion through the inhibition of MMP-9 enzyme. The present study may lead to further anticancer studies of comosone II and supports the traditional uses of C. aeruginosa rhizomes.

Keywords: Curcuma Aeruginosa Rhizomes, Zingiberaceae, Cell Migration and Invasion, Comosone II, Matrix Metalloproteinases, Triple-Negative Breast Cancer Cells MDA-MB-231

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Study of COVID-19 Case with Multiple Comorbidities: Severe to Survival

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ABSTRACT

Elderly COVID-19 patients with comorbidities suffer from severe complications and mostly didn't survive. We report management of a 80-year-old patient with several comorbidities. Due to the fast deterioration of the condition, physicians treated her with Tocilizumab along with medications for other underlying diseases. She recovered completely after therapy with Actemra.

Keywords: COVID-19, Co-morbidities, High-resolution Computed Tomography, Anticoagulant, Actemra

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Antimicrobial, Antioxidant, and Cytotoxic Properties of Endophytic Fungi Isolated from Thysanolaena Maxima Roxb., Dracaena Spicata Roxb. and Aglaonema Hookerianum Schott

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ABSTRACT

Endophytic fungi have recently been recognized as an impressive source of natural biomolecules. The primary objective of the research was to isolate fungal endophytes from Thysanolaena maxima Roxb., Dracaena spicata Roxb. and Aglaonema hookerianum Schott. of Bangladesh and assess their pharmacological potentialities focusing on antimicrobial, antioxidant, and cytotoxic properties. The fungal isolates were identified up to the genus level by analyzing their macroscopic and microscopic characteristics. Ethyl acetate extracts of all the fungal isolates were screened for different bioactivities, including antimicrobial (disc diffusion method), antioxidant (DPPH scavenging assay), and cytotoxic (brine shrimp lethality bioassay) activities. Among the thirteen isolates, Fusarium sp. was the most recognized genus, while the others belonged to Colletotrichum sp. and Pestalotia sp. Comparing the bioactivity of all the extracts, Fusarium sp. was shown to be the most effective endophyte, followed by Colletotrichum sp. and Pestalotia sp. In the antimicrobial study, two isolates of Fusarium sp. (internal strain nos. DSLE-1 and AHPE-4) showed inhibitory activity against all the tested bacteria and the highest zone of inhibition (15.5 ± 0.4 mm) was exerted by AHPE-4 against Bacillus subtillis. All the fungal isolates produced mild to moderate free radical scavenging activity, where the highest antioxidant activity was revealed by one isolate of Fusarium sp. (internal strain no. AHPE-3) with an IC50 value of 84.94 ± 0.41 µg/mL. The majority of Fusarium sp. isolates exhibited notable cytotoxic activity, where AHPE-4 exhibited the highest cytotoxicity, having the LC50 value of 14.33 ± 4.5 µg/mL.The findings of the study endorsed that the fungal endophytes isolated from T. maxima, D. spicata, and A. hookerianum hold potential as valuable origins of bioactive substances. Nevertheless, more comprehensive research is warranted, which could develop novel natural compounds from these endophytes to treat various infectious and cancerous diseases.

Keywords: Antimicrobial, Antioxidant, Cytotoxic Properties, Endophytic Fungi, Morphology

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Evaluation of The Potential Associated Factors Contributing to Various Side Effects of Covid-19 Vaccines in Bangladesh

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ABSTRACT

Due to questions about the safety and possible side effects of COVID-19 vaccines, initially, most individuals with chronic comorbid conditions showed unwillingness to vaccination. Though COVID-19 vaccines were found safe in clinical trials, real-world results still need to be explored to generate and further analyze the safety and efficacy profile of these vaccines. Our study aimed to evaluate and associate the various side effects of COVID-19 vaccines at different covariate levels along with comorbid conditions. This cross-sectional study aimed to evaluate the side effects of COVID-19 vaccines in Bangladesh using data collected from a sample of vaccinated individuals through a structured questionnaire. The data were analyzed using descriptive statistics, bivariate analysis with a chi-square test, and multiple logistic regression model to identify the frequency, severity, and duration of side effects, as well as the associations between side effects and potential predictors. Our study investigated the side effects of four prominent approved COVID-19 vaccines in Bangladesh. The findings revealed that Sinopharm was the most administered vaccine, accounting for 55% of the respondents. The majority of participants (38%) reported experiencing mild side effects, such as pain at the injection site, fatigue, and headache, while only 13% required hospitalization due to severe side effects. Significant associations were observed between vaccine type and variables such as gender, age group, concomitant health complications, prior COVID-19 history, physician's recommendation, and adverse consequences. Logistic regression analysis identified significant associations between the presence of side effects and variables such as concomitant health complications (OR=3.2 p-value: 0.011) and concomitant medications (OR=0.38, p-value: 0.039). These results provide valuable insights to help guide vaccination strategies and ensure vaccine safety in Bangladesh. Further investigation into these aspects in larger and more diverse groups is necessary, taking longitudinal follow-up and the objective evaluation of side effects into consideration.

Keywords: Covid-19 Vaccine, Vaccine’s Side Effects, Comorbidity, Vaccine Comparison, Public Health

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The Effect of Lactic Acid Fermented Sake Lees in a NASH-HCC Mouse Model

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ABSTRACT

Nonalcoholic steatohepatitis (NASH) is a liver disease characterized by fatty liver and cirrhosis that van lead to hepatocellular carcinoma. Although NASH prevalence is increasing worldwide, no cure has yet been established. Sake-lees, which are a by-product of sake refinement, have liver-protecting properties. Lactic acid fermented sake lees (FSL) is a food made by lactic acid fermentation of lees, which are then dealcoholized. Although FSL is regarded as a pro-health supplement, whether it has hepatoprotective effects remains unclear. To address this, we used a murine model of NASH to determine whether FSL could suppress progression of the disease. FSL supplementation significantly suppressed the increase in blood glucose impeded the progression of NASH. Protein analysis revealed that FSL also attenuated the increased expression of inflammatory markers. We infer that dietary FSL has anti-inflammatory and anti-hyperglycemic effects that contribute to the inhibition of NASH progression. Disclosure H. Suzuki: None. K. Watanabe: None. S. Arumugam: None. M. Afrin: None. Y. Matsubayashi: None. H. Sone: Research Support; Novo Nordisk, Astellas Pharma Inc., Kyowa Kirin Co., Ltd., Taisho Pharmaceutical Holdings Co., Ltd., Ono Pharmaceutical Co., Ltd., Eisai Co., Ltd., Takeda Pharmaceutical Co., Ltd. Funding Japan Society for the Promotion of Science (22K17772).

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Arjunolic Acid Modulate Pancreatic Dysfunction by Ameliorating Pattern Recognition Receptor and Canonical Wnt Pathway Activation in Type 2 Diabetic Rats

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ABSTRACT

Arjunolic acid (AA) is a potent phytochemical with multiple therapeutics effects. In this study, AA is evaluated on type 2 diabetic (T2DM) rats to understand the mechanism of β-cell linkage with Toll-like receptor 4 (TLR-4) and canonical Wnt signaling. However, its role in modulating TLR-4 and canonical Wnt/β-catenin crosstalk on insulin signaling remains unclear during T2DM. The current study is aimed to examine the potential role of AA on insulin signaling and TLR-4-Wnt crosstalk in the pancreas of type 2 diabetic rats. Multiple methods were used to determine molecular cognizance of AA in T2DM rats, when treated with different dosage levels. Histopathological and histomorphometry analysis was conducted using masson trichrome and H&E stains. While, protein and mRNA expressions of TLR-4/Wnt and insulin signaling were assessed using automated Western blotting (jess), immunohistochemistry, and RT-PCR. Histopathological findings revealed that AA had reversed back the T2DM-induced apoptosis and necrosis caused to rats pancreas. Molecular findings exhibited prominent effects of AA in downregulating the elevated level of TLR-4, MyD88, NF-κB, p-JNK, and Wnt/β-catenin by blocking TLR-4/MyD88 and canonical Wnt signaling in diabetic pancreas, while IRS-1, PI3K, and pAkt were all upregulated by altering the NF-κB and β-catenin crosstalk during T2DM. Overall results, indicate that AA has potential to develop as an effective therapeutic in the treatment of T2DM associated meta-inflammation. However, future preclinical research at multiple dose level in a long-term chronic T2DM disease model is warranted to understand its clinical relevance in cardiometabolic disease.

Keywords: Arjunolic Acid, Type 2 Diabetes Mellitus, TLR-4, Wnt, Insulin Signaling

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Paneth Cells Disruption and Intestinal Dysbiosis Contribute to the Development of Hirschsprung-Associated Enterocolitis in a Benzalkonium Chloride-Induced Hirschsprung's Disease Rat Model

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ABSTRACT

Hirschsprung-associated enterocolitis (HAEC) is a life-threatening complication of Hirschsprung's disease (HSCR). This study investigated the role of Paneth cells (PCs) and gut microbiota in HAEC development. Male Sprague-Dawley rats with HSCR were established by exposure of 0.1% (n = 30) benzalkonium chloride (BAC) to rectosigmoid serosa and sacrificed at 1-, 3-, 5-, 8-, and 12-weeks postintervention. The sham group was included and sacrificed on Week 12. Hematoxylin-Eosin staining was conducted to count the number of ganglionic cells and analyze the degree of enterocolitis. Intestinal barrier function was assessed for the ratio of anti-peripherin, occludin and acetylcholinesterase (AChE)/butyrylcholinesterase (BChE). PCs antimicrobial peptide (AMP) was evaluated by cryptdins, secretory Phospholipase A2, and lysozyme levels by qRT-PCR, respectively. 16S rRNA high throughput sequencing on faecal samples was used to analyze the changes in intestinal microbiota diversity in each group. Compared with sham groups, 0.1% BAC group rats had fewer ganglion cells after 1-week postintervention. Occludin and peripherin were decreased, and AChE/BChE ratio was increased, respectively. Sigmoid colon tissues from BAC-treated rats showed increased α-defensins positive PCs on Week 5 postintervention. Conversely, PCs-produced AMP tended to decrease from Week 5 to Week 12. Rats in the sham group demonstrated increased Lactobacillus and decreased Bacteroides, while rats in the 0.1% BAC exhibited reciprocal changes. Enterocolitis occurred from Week 1 postintervention onwards. Disruption of PCs in the Week 5 postintervention and dysbiosis exacerbate the occurrence of HAEC. This research sheds new light on the cellular mechanisms of HAEC development.

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Durability of Rice Husk Ash Concrete in Chloride Environment

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ABSTRACT

The increasing use of supplementary cementitious materials (SCM's) has not only reduced the cost of concrete but also improved its long-term performance in adverse environments. Rice husk ash (RHA) produced after burning of rice husk (RH), being a SCM, has high pozzollani reactivity as it contains silica in amorphous and highly cellular form and form secondary gel in presence of cement in concrete. This paper highlights the durability performance of RHA blended cement concrete in NaCl environments. Cubical test specimens (100 mm) were cast from M28 grade concrete with cement replacement levels of 0, 10, 15, 20 and 25% by RHA. The test specimens were precured for 7 days in plain water (PW) and then exposed to NaCl solution of 5% concentrations for the curing period of 14,28,60 and 180 days. After specific curing period, the test specimens were subjected to different tests including visual examination, compressive and tensile strength, chloride content and PH at different depth levels. RHA concrete showed significant resistance in strength loss and chloride penetration. Moreover, 10 % to 15% cement replacement level in concrete was found effective from strength and durability point of view.

Keywords: Rice Husk Ash (RHA), Compressive Strength, Split Tensile Strength, NaCl environment, Durability

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Drivers and Barriers to Going Paperless in Tertiary Educational Institute

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ABSTRACT

Tertiary educational institutes especially universities have become one of the major consumers of paper. Since paper uses natural resources and energy, universities are being encouraged to turn processes paperless. However, there are certain barriers along with drivers which lead to turning processes paperless. Although some work has been done on similar work, most of these works are not from Bangladesh's perspective and do not show as-is or to-be models of processes. This paper presents the current scenario of paperless initiatives, the impact of going paperless, and the driving forces and barriers to making processes paperless. Due to limitations in time and resources, only personnel working at East West University were interviewed for this qualitative study. To analyze the data from the interviews, the 'Gap Analysis' method. The interview data was then used to build as-is and to-be models for two processes at East West University which are not yet paperless. The drivers and barriers to these processes turning paperless were also explored. Going paperless not only reduces paper usage, but also reduces manpower, physical storage space, and time needed to maintain the processes. However, barriers specific to different processes still remain which include but are not limited to fear of data center failure and transparency maintenance.

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A Deep Reinforcement Learning Framework for Reducing Energy Consumption of Server Cooling System

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ABSTRACT

Data Centers consume a tremendous amount of energy for cooling the servers. The cooling system of a data center consumes around 40–55% of the total energy consumption. Thus, it is required to reduce the energy consumption of the server cooling system to minimize the electricity cost. In this experiment, a general framework for reinforcement learning agent integrated cooling systems has been proposed to reduce the cooling cost. The proposed model has been trained and evaluated in a simulated environment. A traditional threshold-based cooling system was also evaluated in the same environment to determine the efficiency of the proposed framework. The proposed framework was able to reduce energy consumption by 21% for 36 months compared to the threshold-based cooling system. To develop the proposed model, the Deep Q-Learning algorithm has been used in this experiment.

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A Comparative Analysis of the Impacts of Traditional and Digital Billing Methods

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ABSTRACT

Bisphenol A or BPS is frequently used in thermal paper for POS machines to give receipts. Compared with many studies, this chemical substance impacts both the environment and human health. With current technology, this primitive system can easily be replaced. However, every change faces some obstacles. To overcome this, the main target is to identify its impacts and the benefits and problems of the alternate method. Mostly these findings will be done through the previous record and people's opinions. After analysis, several harmful effects of thermal paper are detected. Moreover, opinions are collected for the alternative to paper billing, digital billing. Furthermore, most of the opinions were biased due to the mindset of people. In Bangladesh, thermal paper is being used in POS machines almost everywhere. Millions of trees are getting cut off to produce thermal paper. Also, it causes a threat to human life. So, digitalizing it is essential. From the study, these subjects are thoroughly explored. Also, the debates between paper billing and digital billing are being analyzed. Because of the traditional mindset, people are hesitant to move from a paper-based billing process to a digital one, though it has positive practical impacts. The outcome of this study could benefit those who want to switch to digital billing in the future.

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Multiclass Classification of Malicious URL Detection Using Machine Learning and Deep Learning

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ABSTRACT

Because of the rapid growth in internet usage, cyber risks have increased, especially in the form of malicious URLs. These malicious URLs are used as a means to deceive and exploit unsuspecting users, resulting in severe consequences such as data breaches, financial loss, and system compromise. The research paper presents an analysis of various techniques for malicious URL detection. The paper provides an overview on the impacts of malicious URLs on cyber attacks, phishing attempts, and malware infections, Introduces the various types of malicious URLs, and also discusses their characteristics and common strategies used by attackers to distract the malicious intent. The paper aims to detect the various malicious URLs for which URLs will be safe, risky, or too risky. Experimental results show that the random forest classifier and Feed feed-forward neural Network algorithms give better performance which is 91.44% and 95.98% respectively. The experimental results also show that the suggested URL features and behaviors can significantly improve the ability to recognize malicious URLs. This implies that the suggested methodology might be regarded as an effective method of identifying malicious URLs.

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Mangoes Taste Detection System Using Deep Learning

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ABSTRACT

Machines have evolved significantly in recent years due to incorporating new technology. As a result, advanced machine learning and image processing have become hot issues for scholars. This study provides a deep learning-based enhanced approach for detecting mango tastes (sweet and sour) from mango photos. A total of 3132 mango image data were used for training and validation. This system employs a modified YOLO v3 algorithm. On sour mango data, this system received 0.84 for average precision (AP), 0.75 for precision, 0.94 for recall (true positive rate), and 0.83 for F1-score (combination of precision and recall), whereas, on sweet mango data, this system received 0.97 for AP, 0.98 for precision, 0.97 for recall, and 0.98 for F1-score.

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Automatic Multi-document Summarization for Bangla News Text Using a Novel Unsupervised Approach

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ABSTRACT

Digitalization made the world remarkably agile; therefore, plenty of news is published on a related topic in different newspapers. An automatic text summarizer can contain all the primary information on a particular topic to understand the main essence of news or an article quickly and efficiently. We have developed a novel extractive-based multi-document summarizer for Bengali news. A very few summarizers have been introduced for the Bangla language. To the best of our knowledge, the word embedding technique has not been used in any of the prior summarizers. The selected sentences of the summaries' semantic and syntactic relationship are maintained through the utility of word embedding. In this paper, we have used predictive-based embedding, which is continuous bag-of-words-based word2vec algorithm. Since it is a multi-document summarizer, redundant sentences are present in the dataset and are removed by a clustering technique. The proposed model gives a statistically significant result in terms of ROUGE-L F1-measure, which outperforms the baseline system on the same scale. The proposed model achieves state-of-the-art performance and can do a better readable and informative synopsis, which might help the reader gain vital information reliably fast.

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Deep Learning-assisted Fracture Diagnosis: Real-time Femur Fracture Diagnosis and Categorization

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ABSTRACT

Fractures necessitate accurate and timely diagnosis to enable proper medical treatment, and are a frequent occurrence in the human body. X-ray image-based fracture detection through manual means is prone to human error and is a time-intensive process. This study proposes a new method for fracture diagnosis using AI-assisted techniques, particularly deep learning. The goal is to allay worries regarding fracture detection. A DNN model was created in order to quickly identify and classify femur fractures. For improving model accuracy and preventing overfitting when working with tiny datasets, data augmentation techniques are essential. Three trials were used in the study to assess the model's effectiveness utilizing the Adam optimizer and softmax activation. Fivefold cross-validation was used to assess the proposed model's capability to distinguish between healthy and fractured femurs. A 92.44% accuracy percentage was attained. On numerous subsets, the data accuracy was examined, and it was discovered to be greater than 95% on 10% of the data and 93% on 20% of the data. The model is more effective than currently used methods. The study examines how quickly and precisely artificial intelligence (AI) and deep learning can diagnose femur fractures. The study suggests an AI system that might revolutionize the identification of femur fractures. To improve speed and detection accuracy, the technique incorporates real-time analysis and classification of femur fractures.

Keywords: Training, Deep Learning, Ultrasonic Imaging, Bones, Real-time Systems, Object Recognition, Artificial Intelligence

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Traffic Sign Recognition and Classification Using Machine Learning and Deep Learning

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ABSTRACT

The recognition and classification of traffic signs hold significant significance within intelligent transportation systems and autonomous vehicles. This task entails the precise and real-time identification and categorization of diverse traffic signs through the There are many different types of neural networks that can be used for traffic sign recognition and classification, including convolutional neural networks (CNNs), recurrent neural networks (RNNs), and deep belief networks (DBNs). The choice of which network to use depends on the specific requirements and constraints of the task. The field continues to evolve and advance, with new techniques and approaches being developed to address the challenges and limitations of this task.

Keywords: Models CNN, Detection, Prediction, Parameters, Inception V3, Inception-Resnet, Mobile net, Renet50, Xception, Overfitting

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A Deep Learning-Based Technique to Determine Various Stages of Alzheimer's Disease From 3D Brain MRI Images

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ABSTRACT

Alzheimer's disease is a kind of dementia which leads in progressive loss of memory usually in elderly persons. Since there is not any cure for this condition it is vital to discover it as soon as possible. Machine learning algorithms are being used to detect various stages of Alzheimer's disease. ADNI, the most comprehensive dataset has been collected and used to conduct the experiments. The dataset comprises three classifications that include Alzheimer's Disease, Mild Cognitive Impairment and Cognitive Normal. The proposed approach illustrates multiple preprocessing methods to transform 3-D images into 2D images and employs various CNN models to achieve the best performing ones. Preprocessing approaches include brain segmentation, conversion to MNI space etc. VGG19 model has the overall best performance among all other models with an accuracy of 94.25% outperforming many other similar works.

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Deep Learning Based Emotion Recognition Using EEG Signal

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ABSTRACT

Human-machine interface technology has shown success in recognizing emotions based on physiological data such as EEG signals, rather than facial expressions as facial expressions may not always provide accurate results. The paper proposes a deep learning method for recognizing emotions like arousal, valence, dominance, and liking from EEG signals. The proposed method use FFT for feature extraction, PCA for feature reduction, and deep learning models, namely, LSTM, ANN and CNN are employed. After conducting several experiments a novel combination of channels, number of channels and bandwidths has been identified. By adopting these combinations, the experimental results outperform the majority of the compared works. All research and comparisons were conducted by utilizing the DEAP dataset.

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Contextual Bangla Next Word Prediction and Sentence Generation Using Bi-directional RNN With Attention

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ABSTRACT

In recent years, there has been a demand for natural language processing techniques that accurately predict the following word in a phrase. Existing Bangla next word prediction systems have significant draw- backs, including the inability to predict outside of their library and lengthy training cycles. To address these limitations, we present a Bi-directional Long Short-Term Memory (Bi-LSTM) with a Self-Attention method for developing language models that can anticipate the next word from a given input. Our models beat existing state-of-the-art systems. Our models obtain high testing accuracy for several n-gram language models, including 97.98% for the 7-gram, 97.97% for the 6- gram, and 97.91% for the 5-gram. Furthermore, the training time and number of epochs required to reach the desired accuracy are greatly reduced by our suggested system. While other works utilized 1000s of epochs to reach desired precision, we employed the Self-Attention method to achieve the same degree of accuracy in only 200 epochs. Our goal is to contribute to the advancement of natural language processing technology for use in a variety of industries such as healthcare, education, and finance. We hope to assist industry in developing sustainable technology by delivering accurate and efficient language models.

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Utilizing GloVe Embeddings for Deep Learning Based Analysis of Research Paper Abstracts

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ABSTRACT

Researchers are finding it harder and harder to locate relevant articles as the body of scientific literature expands at an exponential rate. Due to the sheer volume of publications, manual classification and categorization of these articles is no longer possible. By addressing the task of accurately classifying research papers based on their abstracts, the purpose of this paper is to address the task of improving the proposal and search procedures for efficient academic information retrieval. While ordering papers in computer science, mathematics, physics, and statistics, the models accomplish high precision, accuracy, recall, and F1-score by using profound learning calculations (LSTM, GRU, Bi-LSTM, and Bi-GRU) and GloVe word embeddings to catch semantic data. The LSTM, Bi-LSTM, GRU and Bi-GRU models were used to accurately classify the abstracts of research papers into computer science, mathematics, physics, and statistics. These models performed well concerning accuracy, recall, and F1-score, as well as accomplishing high precision. Automatic categorization of research papers was made possible by combining GloVe word embeddings with deep learning algorithms, which sped up information search and knowledge discovery. These models can help academic researchers and practitioners streamline the process of categorizing research papers and boost their research efforts.

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Enhancing Performance of Abstractive Multi-Document Update Summarization on TAC Dataset

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ABSTRACT

In this paper, we investigate the efficacy of various cutting-edge models for update summarization on the TAC 2009 dataset. To construct abstractive and extractive summaries of news items, we use the T5 Transformer model and Textrank + Pegasus model. Our goal is to assess how well these models capture key information from updates and generate coherent and useful summaries. Here we use conventional assessment measures such as ROUGE to assess the performance of the models. We analyze the fluency, coherence, and informativeness of generated summaries from the T5 Transformer model, Textrank + Pegasus, and TensorFlow models against human-authored gold summaries.

Keywords: Summary, Update, Automatic, Transformer, Abstractive, Tensorflow

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Implementation of Bangla Extractive Update Summarization Task On BUSUM-BNLP-Dataset: A Multi-Document Update Summarization Corpus

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M. Saddam Hossain Khan* and **Rashedul Amin Tuhin†**

ABSTRACT

The research inspires automated multi-document update summarization to perform a more complete linguistic (semantic) assessment of Bangla newspaper articles, research articles, or multiple texts by selecting the most essential ideas. Automated update summarizer methods are critical in identifying relevant information and up-to-date material for the user, minimizing the amount of time and effort necessary to read an entire article or many articles on a similar topic. Many updated summary approaches have been developed and implemented in the English language, while updated summarization in Bengali remains restricted. Keeping this in mind, we want to devise a straightforward method for developing a Bengali automatic updated summary task. To collaborate on this research, we proposed BUSUM-BNLP, a multi-document updated summarization Bangla dataset that is divided into six categories: international, sports, politics, entertainment, Bangladesh, and business. Each article has been divided into two groups, A and B. Essentially, every pair of A and B has five news article files, each with a title, date-time, and pertinent news content. Similarly, for each set of documents, we developed three human-written summaries. To generate a quality dataset, we reviewed 1,000 Bangla news articles from major newspaper e-platforms (Prothom Alo, Jugantor, Kaler Kantho, BBC Bangla) and researched certain Bangla language and summarizing norms. Since there are two kinds of summarization methods: extractive and abstractive. In this paper, we created a TF-IDF-based model and used a pre-trained SentenceRank to obtain an updated Bengali summarization model. We tested these two models using our BUSUM-BNLP dataset, and the experienced TF-IDF model outperformed the pre-trained SenteneRank model.

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BilinBot: A Bilingual Chatbot using Deep Learning

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ABSTRACT

Chatbots are widely famous all over the world. Businesses of all scales, web services, customer supports and various others are integrating chatbots. However, most of them work in the English language. Our research aims to create a bilingual chatbot that can be used by people from different regions and converse in both Bangla and English. It will not just enable seamless communication in both languages, but enhance user experience for people of all fields and regions in Bangladesh. We named our chatbot "BilinBot" which comes from the idea of creating a "Bilingual Chatbot", Our BilinBot can take questions as user input in English and Bangla language, predict the answer and respond accordingly as it has been trained. Natural language processing approaches are used to process the data. We performed ROUGE-1, ROUGE-2 and ROUGE-L evaluations to assess BilinBot. Our experimentation indicated that Google BERT is the best feature engineering approach for processing natural language, and for the training phase, LSTM and GRU performed best. We compared BilinBot with the state-of-art works and achieved better performances.

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Detecting Pneumonia from X-Ray Images of Chest using Deep Convolutional Neural Network

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ABSTRACT

Coughing, chest pain, and exhaustion are symptoms of the common respiratory infection known as pneumonia. It is harmful to young children, the elderly, and anyone with compromised immune systems. The diagnosis process includes physical examination, a review of medical history, imaging testing, and treatment with antibiotics, antiviral drugs, and supportive care. This study proposes using three models—VGG19, DenseNet201, and CheXNet—of convolutional neural networks (CNN) for the identification of pneumonia. The goal is to evaluate the effectiveness of different models and determine which one is most reliable for detecting pneumonia. On a sizable dataset of chest X-ray pictures, the VGG19 and DenseNet201 models were trained and assessed. The best training and tuning accuracy were achieved by our proposed model, which received a score of 98.22%. Numerous patterns and irregularities in chest X-ray images associated with pneumonia were successfully identified using the improved CheXNet model. These results highlight the enormous potential of convolutional neural networks for automating the diagnosis of pneumonia. More research and validation are needed to demonstrate its stability and generalizability across different patient populations and imaging types.

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On Cognitive Level Classification of Assessment-items Using Pre-trained BERT-based Model

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ABSTRACT

Outcome based education (OBE) is gaining popularity nowadays due to its effectiveness in preparing learners for their future roles as active participants. Bloom's taxonomy is a well-known educational model as it helps implement the OBE. It offers teachers a tool to encourage progressive thinking and intellectual development in students. Bloom's Taxonomy helps categorize cognitive skills and learning objectives, while the cognitive level classification of assessment items determines the complexity needed to complete the assessment. By using both the cognitive level classification and Bloom's Taxonomy, educators can create assessments that accurately measure students' abilities and target specific learning outcomes. This paper proposes a model that can accurately categorize assessment items according to their cognitive complexity. The paper utilizes the cognitive domains of Bloom's Taxonomy and focuses specifically on the first four levels: remembering, understanding, applying, and analysing. Some previous attempts have been made in this field but, to our best knowledge, this is the first time the Bidirectional architecture of Deep Learning (DL) algorithms and BERT-based Transformer model have been used. By comparing several machine learning (ML) algorithms, DL algorithms with Bidirectional layers and pre-trained BERT-based Transformer model, it has been found that the BERT model scores the highest among all the other ML and DL algorithms. The performance is evaluated based on accuracy, precision, recall, and F1-score. The BERT-based Transformer model has an accuracy of 89%, where some of the other algorithms performed considerably well (BiLSTM: 84%, LSTM: 83%, BiGRU: 83%, RF: 83%). Also, compared to the state-of-the-art model, the transformer model scored higher. This suggests that the model can be used to deploy as the classification model. The developed model will help educators with the exact assessment items to implement OBE. Overall, this research contributes to the field of NLP and educational assessment by demonstrating the potential of ML and DL approaches in accurately classifying assessment items.

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Bangladeshi Food Classification Using Transfer Learning and Ensemble Model

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ABSTRACT

Automated food intake monitoring has been deemed an imperative pursuit. Despite the introduction of various datasets and deep learning techniques, there has been a growing demand for such systems, giving rise to challenges in keeping up with the multitude of food types across different countries. To tackle this issue, the authors developed the Bangladeshi Food Dataset (BFD-58), encompassing 58 distinct food items from Bangladeshi local cuisine. This contribution plays a role in the ongoing endeavor to enhance food recognition capabilities. By employing transfer learning techniques, the dataset underwent classification testing by the authors. An accuracy of 86% was achieved through single-network transfer learning, which, while noteworthy, was identified as having room for improvement. To elicit further performance enhancements, an ensemble approach involving two networks was employed, resulting in a remarkable accuracy boost of 97%. Moreover, to validate the authors' approach, comparative assessments were conducted on a benchmark dataset. The outcomes were aligned with their achievements, yielding single-network and ensemble accuracies of 86% and 94%, respectively. The dataset can be found on github.

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Android Malware Categorization and Characterization Using Machine Learning

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ABSTRACT

Among all the current mobile operating systems, Android has the most market share with more than three billion active users. As android is open-source, it possesses many challenges of malicious cyberattacks. Most of the android applications are now online or somehow connected to internet and for this availability of connectivity with internet, hackers can push malware into the system easily without any concern of the user, although the application was safe and secure while installing for the first time. As a result, it is becoming difficult to identify their behavior and categorize to implement protection inside android operating system. In this research, we proposed a system to categorize and characterize various types of malware based on their network traffic pattern using K-means and Decision Tree algorithm, and also proposed a diagram demonstrating how android developers can implement this system in android OS.

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Mood Classification of Bangla Songs Based on Lyrics

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ABSTRACT

Music can evoke various emotions, and with the advancement of technology, it has become more accessible to people. Bangla music, which portrays different human emotions, lacks sufficient research. The authors of this article aim to analyze Bangla songs and classify their moods based on the lyrics. To achieve this, this research has compiled a dataset of 4000 Bangla song lyrics, genres, and used Natural Language Processing and the Bert Algorithm to analyze the data. Among the 4000 songs, 1513 songs are represented for the sad mood, 1362 for the romantic mood, 886 for happiness, and the rest 239 are classified as relaxation. By embedding the lyrics of the songs, the authors have classified the songs into four moods: Happy, Sad, Romantic, and Relaxed. This research is crucial as it enables a multi-class classification of songs' moods, making the music more relatable to people's emotions. The article presents the automated result of the four moods accurately derived from the song lyrics.

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DeepTestDroid A Platform for Automated Application Testing Using Deep Learning

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ABSTRACT

Black and white box testing is used to measure an application. Testing can be complex and costly. Various testing techniques can measure multiple parts of an application. DeepTestDroid performs UI performance testing, which is black box testing. It can predict the density of an application's page from its wireframe picture. Higher density means a longer load time. UI performance testing can only be performed with human interaction. However, DeepTestDroid makes it automatic. To detect density, DeepTestDroid uses mobilenetV3Large. MobileNetV3Large was selected after an experimental analysis alongside other image processing models. This project can reduce the cost and step of UI performance testing. It will also make it easier to complete the testing phase of SDLC.

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Unmasking Ovary Tumors: Real-Time Detection with YOLOv5

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ABSTRACT

Ovary tumor is an unexpected growth of a women's ovary. For successful treatment planning and identification, ovary tumor detection is critical. The present medical method to detect ovary tumors is dependent on ultrasonic imaging, which can be constrained by its high cost, time-intensive nature, and dependence on specialized equipment and proficient personnel. With and advanced object detection algorithm Our system proposes a approach for the real-time diagnosis of ovarian tumors by utilizing YOLOv5. The proposed methodology obviates the need for ultrasound imaging by leveraging a machine learning model trained on a dataset comprising images of both healthy and malignant ovaries. Our system is able to precisely identify ovarian tumors through the analysis of real-time photos or video, using it as an alternative to ultrasound imaging. Our system can be easily used in a variety of medical applications. Consistent with the contemporary practice of remote patient care, our state-of-the-art technology for detecting ovarian tumors in real-time enables medical practitioners to diagnose such tumors from a distance, thereby facilitating prompt intervention and treatment. In addition, the integration of our approach into the increasing prevalence of robotic-assisted surgery may facilitate the autonomous detection of ovarian tumors during surgical procedures, thereby improving surgical accuracy and patient outcomes. In addition, the proposed methodology offers a cost-effective means of identifying ovarian neoplasms, particularly advantageous for socioeconomically disadvantaged populations that encounter challenges in obtaining costly ultrasound apparatus and remote medical evaluations. Our approach decreases patients' financial burden by removing the need for costly ultrasound scans and permitting remote medical consultations. Our study proposes a unique approach for detecting ovarian tumors in real time using YOLOv5. The system's capacity to detect ovarian tumor using real-time photos or video, as well as its application in remote medical settings and cost, making it a promising diagnostic tool for ovarian tumors. This study paves the path for better ovarian tumor identification, accessibility, and treatment results.

Keywords: Real-time Ovary Tumor Detection, YOLOv5, Ultrasound Alternative, Remote Ovary Tumor Detection, Robotic Surgery, Affordable Ovary Tumor Detection, Marginalized Populations, Cost-effective Diagnosis

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A Machine Learning and Deep Learning Integrated Model to Detect Criminal Activities

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ABSTRACT

Crime is considered an intended execution of an act that is harmful to society and punishable under criminal law. Bangladesh as a developing country has experienced severe crime-related issues in recent years due to the constantly growing criminal activities. The law enforcement sector of Bangladesh is dedicated to implementing the law and reducing fear of offense to make Bangladesh a secure place to live. Despite this, the traditional ways of detecting crimes in Bangladesh are currently slow and less effective because they are not getting enough technological support. As a result, most of the time the crimes get reported after the occurrence. So to attain efficiency in policing activities it has become significant to develop such a system that can notify the police department before the occurrence of a crime. In our proposed model, we develop a system that can prevent crime by detecting and notifying real-time criminal activities beforehand. To carry out this concept, we build a central system consisting of three modules i.e. criminal activity identification module, weapon detection module, and criminal detection module. Each of the modules is centrally connected and can give an alert when any type of abnormality occurs. We use Deep Learning and Machine Learning algorithms to perform criminal activity detection and face recognition of criminals. For each of the modules, we collect and prepare our own data set. We perform various experiments to investigate the effectiveness of the method. The evaluation result shows that our proposed method performs impressively in identifying criminal activities and criminals.

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Comprehensive Analysis of Feature Extraction Techniques and Runtime Performance Evaluation for Phishing Detection

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ABSTRACT

The digital landscape is continually evolving, bringing with it numerous cybersecurity challenges, notably the rise of phishing websites targeting unsuspecting users. These deceptive websites jeopardize digital identities, emphasizing the critical need for precise detection mechanisms. This research provides a deep analysis of feature extraction nuances and critically evaluates the runtime performance of detection models. Through intensive refinement of Random Forest classification models, an integrative approach is adopted, which encompasses feature selection, outlier mitigation, and hyperparameter optimization using advanced data mining techniques. Leveraging a pre-established dataset with 87 distinct features from 11,430 URLs, this research narrows down the features to a pivotal set of 56. The outcome is a robust model that achieves an accuracy of 97.069% and a precision rate of 97.326%. A noteworthy aspect of this study is the incorporation of ensemble models, which amplify prediction accuracy by harnessing the capabilities of multiple algorithms. By employing the ensemble approach, the research ensures the model's heightened accuracy and adaptability, making it resilient against ever-changing phishing strategies. The findings underscore the symbiotic relationship between comprehensive feature extraction techniques and the paramount importance of runtime efficiency, laying the groundwork for a fortified digital landscape.

Keywords: Data Mining, Random Forest Classifier, Randomized Search CV, Grid Search CV

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An Application of Decentralized Product Authentication System for Supply Chain Management Using Blockchain Technology

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ABSTRACT

The supply chain management sector faces a significant challenge: the lack of adequate technological resources for authenticating product authenticity. Given the increasing interest in Bitcoin and its impact on the financial industry, Blockchain Technology (BCT) has garnered considerable attention across various sectors. Both academic studies and corporate practices have shown a growing interest in exploring the applications of BCT in Supply Chain Management (SCM). By harnessing the power of Blockchain Technology and smart contracts, it becomes possible to overcome traditional constraints and authenticate products in a simple, cost-effective, and secure manner. Decentralized and immutable blockchain systems allow for tracking products back to their original source, enabling a robust verification process. In this work, we developed and implemented a system that leverages blockchain technology, specifically the Ethereum platform, and smart contracts for product authentication. Through a comprehensive analysis, we have identified the requirements for transitioning from the existing centralized system to a decentralized and distributed blockchain-based ledger technology. By providing complete access to the product's history, from its inception to packaging and delivery, the integration of distributed ledger technology into supply chain systems has greatly simplified the product authentication process.

Keywords: Blockchain, Supply-chain, Authentication, Smart Contract, Decentralization

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Smart Gloves for People with Speech Disability

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ABSTRACT

People with speech disabilities face difficulties to interact and communicate effectively. They mostly rely on sign language, which is not understood by the general people. To help the speech disabled community to get better employment opportunities and most importantly to help them lead a normal life, we have proposed a system to convert Bangla sign language to spoken Bangla words. The signs (i.e., gestures) made by a speech disabled person will be captured through different sensors positioned on a glove, and the gestures are then processed to produce the corresponding Bangla words. This paper describes the design methodology of the system and the performance of the implemented prototype. The performance analysis indicates that our prototype can identify Bangla signs with 88.97% accuracy.

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Evaluation and Correlation of the Various Side Effects along with Comorbid Conditions, Following the Administration of Covid-19 Vaccines, in Bangladesh

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ABSTRACT

COVID-19, caused by the novel coronavirus SARS-CoV-2 was declared a pandemic after its massive outbreak. Though COVID-19 vaccines were found safe in clinical trials, real-world results still need to be explored. Our study aimed to evaluate and correlate the various side effects of COVID-19 vaccines in Bangladesh at different covariate levels along with their concomitant illness of the vaccine recipients. This prospective cross-sectional study was conducted on individuals who had administered either the first or both doses of the COVID-19 vaccine. Data were organized and analyzed by using Microsoft Excel 365 and the statistical tool R. Chi-square tests were conducted to examine whether the different candidates of vaccines have an association with the various covariates and to determine the adjusted contribution of the related variables on the severity level of side effects, a multinomial logistic regression model was fitted. Adjusted odds ratios, standard errors, and p-values are reported. The most reported side effects after vaccination are headache, body and joint pains, and injection site swelling. Most of the respondents faced mild side effects requiring no hospitalization. People who suffered for more than 5 days of side effects, were mostly administered Moderna (36%, p=0.04). The most frequent side effects were likewise experienced by the participants after receiving the Moderna vaccine (p=0.03). However, no statistically significant evidence was found of the recurrence of covid infection following the administration of the Moderna Vaccine. Statistically significant associations have been observed between the concomitant health complications and severity of side effects. This study showed that all administered vaccine candidates caused mild to moderate levels of side effects, thus implicating the safety of these vaccinations in Bangladesh. However, it is pertinent to generate extensive real-world evidence to support ongoing pharmacovigilance process to ensure safety.

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Behavioral Alterations Caused by Pain and Inflammation in Rodent Models

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ABSTRACT

Cytokine induced sickness behavior has been associated with several effects on the nervous system which is characterized by fatigue, lack of activity, depression etc that holds similarities with the symptoms of depression. Local inflammation and pain result in the release of cytokines at the periphery which in turn is capable of affecting CNS behavior or more specifically cognition. The objective of the preliminary study is to examine the extent to which acute pain and inflammation impact CNS behavior in rodent model. 20 mice were taken which were subdivided into a control group (n=4) and two test groups, group 1 (n=8) and group 2 (n=8). Pain induction was done in group 1 using 0.7 mL acetic acid per mice whereas inflammation was induced in group 2 using 0.2 mL carrageenan per mice. Behavioral tests including hole board test, tail suspension test and elevated plus maze test were performed. The findings showed, after the induction of pain, the average writhing of the test group was 36 times compared to no writhing in control group, indicating successful pain induction in test group. The average paw volume after 30 minutes of carrageenan injection in test and control group was 0.245 mL and 0.17 mL respectively. 57% and 59% lower head dippings than control group were observed in test groups 1 and 2 respectively. Results from tail suspension test indicated that test group 1 and 2 had 28% and 23% less mobility time than the control group. Moreover, the results of the elevated plus maze test showed that test group 1 and 2 explored the open end at rates that were 40% and 55% lower than those of the control group. All these results of behavioral tests suggested that both test groups had reduced CNS activity which may be related to the release of cytokines.

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Revisiting Manhattan Music in the Time of COVID-19: Body Politics, Anti-Asian Racism and Negotiation of Ethnic Identity

Farzana Akhter*

ABSTRACT

The rise in COVID-19 cases has not only generated anxiety and uncertainty but has also caused an upsurge in anti-Asian racism all over the world. The racially motivated attacks have forced us to rethink the concept of migration, integration, and racism in a global context. In this paper, I look back at Meena Alexander's Manhattan Music and relying on Arjun Appadurai's critical theory in Fear of Small Numbers: An Essay on the Geography of Anger I investigate the dynamics that go into making the dominant culture hostile towards immigrants and ethnic populations. Drawing a connection between my reading of the novel and the COVID-fueled racism, I debunk the myth of assimilation as a means of integration and attest that race and ethnicity still play crucial role in the politics of power. That is, despite the ethnic protagonists' negotiation of their subjectivity, their ethnic body will continue to be victims of racial politics and used as scapegoats as long as white supremacy prevails and is considered normative. Revisiting Manhattan Music and rendering the connection between race, ethnicity and racism opens up avenues for critical rethinking and compels us to ever more consider the intersection of ethnic identity and race today in an era of global pandemic that has targeted Asian migrants in and beyond America.

Keywords: COVID-19, Anti-Asian Racism, Scapegoat, Ethnic Subjectivity, Body Politics, White Supremacy

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Translanguaging as Trans-Identity Insights from Ethnic Minority Students in Bangladesh

Mili Saha and **Akhter Jahan***

ABSTRACT

The ethnic minority students of Bangladesh need to use the dominant language, Bangla, to interact with other communities where their indigenous languages remain unrecognised. Hence there is a necessity of investigating the indigenous students' beliefs and perceptions about their languages and negotiation of identity and understanding how they maintain their languages and construct their identities through linguistic and cultural resources from their L1 (ethnic language), L2 (Bangla), and L3 (the priority foreign language, English) in the perceived monolingual context of Bangladesh. This case study adopts a critical ethnographic approach and probes questions to explore ten tertiary-level ethnic (Chakma) learners' cognitions and practices of translanguaging and trans-identity. A qualitative analysis of the data revealed that the participants' identities were highly influenced by their instrumental needs to accommodate mainstream Bengali society, resulting in the endangerment of their L1 and the marginalisation of their indigenous identities. Possible policy interventions, including the implementation of transformative pedagogy, to ensure inclusive academic and social integration have been suggested.

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Female Frontline Health Workers in High-risk Workplaces: Legal Protection in Bangladesh amid the Covid-19 Pandemic

Nabila Farhin*

ABSTRACT

Despite the feminisation of the global health force, women health workers (HWs) are primarily nurses, midwives and community health workers (CHWs), and surgeons, doctors, and specialists are generally male-dominated. It is also prominent in Bangladesh, where the health workforce has a gender imbalance, and females comprise a minority group. The COVID-19 pandemic put unsurmountable pressure on HWs as they had to serve in high-risk workplaces as frontliners. The female HWs shouldered the same burden, were overworked without adequate occupational safety and health (OSH) measures, and risked their lives. Their right to decent work in a safe workplace was severely compromised, and the World Health Organization and International Labour Organization (ILO) circulated a few specialised guidelines to safeguard their decent work conditions amid the pandemic. Bangladesh tried to adhere to international guidelines while formulating national pandemic management strategies. However, in reality, the already weak and understaffed health sector collapsed with the patient influx, many HWs got infected without adequate personal protective equipment (PPE), and some died in the line of duty. This qualitative research investigates whether the existing legislation of Bangladesh is adequate to safeguard the OSH for female frontline HWs, especially doctors and nurses, amid the COVID-19 pandemic. The paper explores international legislation for decent work and OSH rights, especially safeguarding female HWs. It also analyses the COVID-19 specialised guidelines protecting their rights. Finally, the research investigates the compliance of Bangladesh with international guidance during the pandemic. In doing so, it explores domestic laws, professional guidelines for HWs, and national pandemic response strategies. The chapter critically examines a range of primary sources, including international and national legislation, conventions, pandemic management guidelines and relevant judicial decisions. Secondary sources, such as journal articles, books, newspaper articles, and reports, are contextually analysed in line with the objective of the paper. Bangladesh has no specialised health legislation, resulting in ambiguity regarding the definition and classification of HWs. The Bangladesh Labour Act 2006 (BLA), the only employment legislation securing decent work and OSH, is not applicable to public hospitals. Moreover, the scope of the BLA for private hospitals is not clear, which leads to confusion regarding the extent of legal protection rendered to female HWs at private hospitals in high-risk situations. Unfortunately, Bangladesh has no specialised legislation safeguarding OSH rights for HWs in high-risk workplaces, and professional guidelines also remain inadequate. Explicit protective guidelines for female frontline HWs, except for pregnant workers, are also absent in the national pandemic management strategies. Therefore, the laws are insufficient and have failed to render adequate legal protection to the OSH rights of female frontline HWs during the pandemic in Bangladesh.

Keywords: Health Workers, Occupational Safety and Health, COVID-19, Bangladesh

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Gendered Vulnerability and Role of Women in Landslide Preparedness: A Case Study of an Urban Periphery of Cox's Bazar, Bangladesh

Mumita Tanjeela*

ABSTRACT

Landslides have been a recent addition to the list of natural hazards in the south-eastern part of Bangladesh particularly in some districts of the Chattagram division. Although Bangladesh is primarily characterized by flat topography, this part is hilly and mountainous, featuring numerous terraces and these hilly districts have experienced severe landslide incidents in recent years. Landslides are mostly triggered by heavy rainfall usually during the monsoon period in these areas. However, the underlying causes of landslides include deforestation, hill cutting, and unregulated and unplanned development work. Moreover, rapid urbanization has spurred hill-cutting activities, deforestation, and construction in the Chottogram Division, leading to an increasing number and impact of landslides. In particular, the influx of Rohingya refuge in Cox's Bazar is contributing to deforestation and hill cutting at an alarming rate and the risk is increasing. Poverty and landlessness also compel poor people to reside on precarious hill slopes. The nexus between climate-induced migration, poverty, urbanization, and the emergence of a new type of hazards is yet to be studied with due concern. In this context, the paper explores the landslide vulnerability and preparedness practices of the at risk community and underscores the importance of women's involvement in disaster preparedness activities. The study was conducted using a qualitative research method, adopting a case study approach of a Community-based landslide preparedness programme in Cox's Bazar district of Chottogram division, Bangladesh. Data and information were collected through focus group discussions, in-depth interviews of women living in the studied community, key informant interviews of project officials, and participant observation of their community activities. The findings clearly indicate that gender is a critical factor for shaping women's vulnerability to any hazard. The study also reveals that despite gender-differentiated vulnerabilities, women's agency and their involvement in disaster preparedness activities have a positive impact on community resilience. Thus, women's roles in emergency preparedness and responses as well as in disaster risk reduction, are equally significant as those of their male counterparts.

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Cultural Perspectives of Suicide in Bangladesh

Anisur Rahman Khan*

ABSTRACT

The French classical sociologist, Émile Durkheim, in his ground-breaking research Le Suicide (1897/2002) drew our attention to the role of socio-cultural perspectives to meaningfully understand the study of suicide. Since then, there has been a growing scholarly interest to tap the diverse association between suicide and culture. The case for Bangladesh, however, proves otherwise. This chapter tries to extricate the cultural perspective of suicide in Bangladesh. Drawing predominantly on the existing literature, it attempts to synthesise the prevailing manifestations of the cultural elements affecting suicide and captures the deep relationships between the cultural indexes (e.g., religion, gender, legal status, methods, demographic characteristics, intervention, and research) and suicide. Unfortunately, as a country, Bangladesh has not been able to develop a positive culture of help-seeking in the event of suicidality due to the strong sense of collective stigma and shame. Considering the grievous situation of suicide, Bangladesh must approach to adopt culturally sensitive interventions to appropriately address the problem.

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Relocating a Torn Identity and Asserting the Right of the Oppressed to be Heard and Liberated in Mohja Kahf's The Girl in the Tangerine Scarf

Md Abu Shahid Abdullah*

ABSTRACT

Recently, there has been a rapid increase in the production of literary works written in English by female Arab writers who have brought more appreciation for the Arab women who are often perceived by the Western reader as exotic, eccentric and complex. The article deals with the 2006 novel The Girl in the Tangerine Scarf by Mohja Kahf, a Syrian-American poet and novelist, which presents the reader with a new borderland area occupied by young Arab-American Muslim women. The novel condemns distorted images of Muslims in America by local media and US foreign policy. The article aims to show the way the protagonist Khadra attempts to relocate an identity which has been lost between home and abroad and between a radical Islam and discerning secularism. Kahf offers the Western reader a unique portrayal of Muslim women, having developed a subjectivity of their own. The article also aims to show that by disclosing the journeyâ€"searching for the identityâ€"of Khadra, Kahf enables her to come to terms with both her Arab and American identities where she creates a new identity for herself in order to be accepted and established in America. The new attitude of Muslim-American women resonates with the authorâ€™s assertion of the right of the oppressed to be heard and liberated.

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Post-Nuclear Explosion Crisis and Survival in Do Androids Dream of Electric Sheep?

Md Abu Shahid Abdullah*

ABSTRACT

The article deals with the novel *Do Androids Dream of Electric Sheep*? and aims to show that although the colonisation program to the Mars or other colony planets saves the humans from extinction after World War Terminus (WWT), the remaining human population on earth suffers from alienation and class conflict in the aftermath of the nuclear fallout. On the one hand, the colonisation program classifies the humans clinging on to earth to be biologically acceptable and a threat to the race, and on the other hand, the earth's populace who were physiologically and psychologically affected by the dust are rejected from the normal society. The article also shows that in order to cope with the loneliness and silence, humans resort to technological aids and entertainment devices which ultimately make them even more isolated from each other and tend to infuse them with certain egocentric ideologies. The article further shows that in order to survive and reclaim their shattered identities, humans pick up and try to mend the fragments of ideas and objects which they consider to be indispensable to their existences. Additionally, they tend to transmit their memories, ideas and experiences to the next generation to ensure that the things they believe in and fight for would survive even after their physical demise.

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Forever Displaced: Religion, Nationalism and Problematized Belonging of Biharis in Ruby Zaman's Invisible Lines

Farzana Akhter*

ABSTRACT

Abstract Nationalism and religion have always been at the centre of political contestation in Southeast Asia. In fact, religion was the determinative factor in the 1947 Partition of the Indian subcontinent, where India was for the Hindus and East and West Pakistan for the Muslims. The emergence of a national identity based on religion let loose unanticipated violence and bloodshed, which led to massive migration as religious minorities—Muslims from India, and Hindus from both sides of Pakistan—crossed borders to be with co-religionists. However, the Urdu-speaking Muslims known as "Biharis," who migrated to East Pakistan from India during and after the 1947 partition, faced a perilous situation in the wake of the Liberation War of Bangladesh. The rise of the Bengali nationalistic movement and the war resulted in the formation of a new nation-state, but it left the Biharis without a nation or national identity. This paper, highlighting the plight of the half-Bihari protagonist in Ruby Zaman's Invisible Lines (2011), brings to the surface the ambivalent existence of the Biharis. Applying the theoretical framework of Benedict Anderson, Partha Chatterjee, and Ashis Nandy, the paper further demonstrates how the convoluted ties between religion, nationalism, and national identity problematize the inclusion of the Biharis, thereby displacing them forever, first from their homeland and then from Bangladesh. Even after they were granted citizenship in Bangladesh in 2008, the precarity of their national identity and belongingness still pervades as the country continues to eye them with suspicion and contempt for varied reasons.

Keywords: Bangladesh Liberation War, Bihari integration, Nationalism, National identity, Partition, Pluralistic nationalism

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Embracing Otherness: The Role of Nostalgia in Bicultural Identity Formation in How the García Girls Lost their Accents, Dreaming in Cuban, and an American Brat

Farzana Akhter*

ABSTRACT

Although nostalgia is an intrinsic part of immigrant literature, it has been consistently portrayed negatively as a painful and romantic sentiment surrounding the loss of home that impairs a person from living in the present. It is viewed as a sickness that makes adjustment or assimilation in the adopted land difficult. However, dissenting from the critics who have downplayed nostalgia, I attest that immigrant nostalgia is a complex response to numerous social, political, economic, and cultural phenomena that intermingle in the experience of immigrant relocation and social integration. Hence, concurring with Stuart Tannock, Fred Davis, and Andreea Deciu Ritivoi I claim that rather than creating a hindrance in functioning in the present life, nostalgia facilitates continuity of the immigrant self. Analyzing the nostalgic tendency of the central characters of Julia Alvarez's How the Garcia Girls Lost their Accents, Cristina Garcia's Dreaming in Cuban, and Bapsi Sidhwa's An American Brat: A Novel, I demonstrate the correlation between immigrant nostalgia and identity formation arguing that, instead of being the exclusive product of emotional predisposition or self-indulgence, their nostalgia and the journey back home assist them in reevaluating their self and position in the adopted land and initiate the formation of bicultural identity.

Keywords: Nostalgia, Immigrant Literature, Displacement, Continuity of Identity, Discrimination, Bicultural Identity

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American Ethnic and Immigrant Novels: A Mere Commodity or a Discourse of Resistance and Reformation?

Farzana Akhter*

ABSTRACT

Over the years critics and scholars have not only accused ethnic and immigrant literature of being hackneyed and apolitical but also of becoming a commodity for the consumption of cultural fetishists. The increase in the publication of literary works produced by ethnic and immigrant American writers in the recent times has yet again sparked the longstanding debate over the commodification of ethnic and immigrant narratives. This paper is an attempt to contend such allegation and make a case for this genre. Centering the discussion on some of the salient literary works of Latino/a American and South Asian American writers and relying on Fredric Jameson's theory of "political unconscious" and Ramón Saldívar's theoretical perspective expressed in Chicano Narratives: The Dialectics of Difference, I demonstrate that ethnic and immigrant narratives have ideological subtexts and political and cultural implications. Concurrently, I attest that by experimenting with various writing styles and techniques the writers of this genre successfully navigate between authentic political engagement and commercial success.

Keywords: American Ethnic and Immigrant Literature, Apolitical, Commodification, Political Unconscious, Resistance, Cultural Fetishism

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'Beyond the Waking World': The Significance of Dreams in H.P. Lovecraft's Works

Maria Mollah*

ABSTRACT

The horror genre as a whole is often overlooked in research and even less attention is paid to its various subgenres. One such subgenre is cosmic horror or Lovecraftian horror which focuses on the horror of all that is unknowable and incomprehensible. Dreams have been an integral part of folklore and are associated with the unknown. It is, thus, no surprise that they feature heavily in Lovecraft's short stories, novellas, and poems. This article will utilise textual analysis and a psychoanalytic approach to explore the role that dreams play in the works of H.P. Lovecraft and, by extension, the genre of cosmic horror. A close reading of the short stories "Beyond the Wall of Sleep" (1919), "The Dreams in the Witch House" (1933), and the novella The Dream-Quest of Unknown Kadath (1943) show that dreams in Lovecraft's works stem from the repressed memories and the collective unconscious of the human race and also act as a passage into other worlds and alternate dimensions of a vast, multidimensional cosmos. The findings show that Lovecraft uses these dreams as a device to explore themes and ideas like absurdism, nihilism, alienation and fragmentation which, together with his unique style, puts Lovecraft's cosmic horror in the ranks of early twentieth-century texts that are considered quintessential modernist works.

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Reconstructing Feminist Ecocriticism: A Critical Study of Amitav Ghosh's Selected Novels

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ABSTRACT

This paper explores selected fiction of Amitav Ghosh from an ecofeminist perspective in order to show how the author delineates the interconnections between women and environment. The ecofeminist lens will be used to explore different dynamics of human-nature relations and the consequences of them. The connection between women and nature is still viewed as something established only through women writers. It is understandable that as long as only women writers are associated with ecofeminist philosophy, the full potential of this notion cannot be explored. Though many authors have been focusing on the environmental issues and problems by reflecting on them in their works, it is hard to find authors (especially male) who believe in the ecofeminist solutions of these concerns. To respond to this complication, this study takes selected novels of Amitav Ghosh: *The Hungry Tide, Sea of Poppies, and Gun Island* to find out the ecofeminist essence in them. Ghosh's works generally have nature as their centerpiece, but the connection between woman and nature in his oeuvre and its efficacy in solving environmental problems have scarcely been investigated. Therefore, this study aims to address this gap present in the scholarly discussion of Amitav Ghosh's literary work.

Keywords: Ecofeminism, Amitav Ghosh, Reproductive Power, Harmony, Climate Change, Natural Disaster

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Students' Perception Regarding the Enrolment in the LIS Program

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ABSTRACT

The purpose of the study is to identify the students' perception regarding their enrollment in the Library and Information Science (LS) program at a private university in Bangladesh. Specifically, it's aimed to identify the motivation factor for choosing the LIS program at the undergraduate level, the students' expectations, their perceptions of career opportunities, and their overall satisfaction with the program. The research takes a qualitative approach, employing interviews as the primary data collection method. A semi-structured questionnaire was developed based on the existing literature for collecting the data from the respondents. A total of twelve (12) students from a reputed private university were interviewed from different level i.e., fresher, last year students, and alumni. The interview was conducted from 25 September to 20 October 2023. The findings of the study indicated that students enrolled in the LIS program due to including its multidisciplinary and technical nature, its emphasis on technology, the comprehensiveness of the course curriculum, and the potential for further studies in the field. However, some students initially lacked awareness of the range of career opportunities available within the LIS field when enrolling. On the other hand, some of the students knew the scope of future career opportunities from different sources. The study also clearly identified that students express a high level of satisfaction with the LIS program. The study is one of the first attempts in Bangladesh to identify the students' perception regarding their enrollment in LIS program in detailed manner. This study can be a great tool for educational institutions offering LIS programs, enabling them to gain a deeper understanding of the diverse motivations, expectations, and experiences of their students.

Keywords: LIS Program, Satisfaction, Career Opportunities, Expectations, Future Outlooks, Motivation Factors, Bangladesh

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Assessing Information Quality of Bangladesh E-government Websites

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ABSTRACT

The purpose of this paper is to assess the information quality of e-government websites by university-education citizens of Bangladesh. It also investigated citizens' demographic and Internet related variables associated with perceived information quality ratings and the validity of the underlying factor structure of information quality dimensions. An online survey was conducted to assess information quality of e-government websites among a sample of university-educated citizens in Bangladesh. Descriptive statistics were obtained to examine respondents' ratings on information quality of these websites on a five-point Likert scale. A multiple linear regression model was applied to determine the effect of demographic and Internet use variables associated with information quality ratings on e-government websites. Finally, a confirmatory factor analysis (CFA) was performed to determine the underlying factor structure of information quality dimensions. The findings revealed that the ratings on most information quality items were close to 4.00 on a five-point scale, indicating a generally high information quality of Bangladesh e-government websites. Out of 20 information quality dimensions, value-added and authority were the two top-rated information quality dimensions while security, completeness, reliability, advertisement, relevance and ease of use were the least rated dimensions. The results of multiple regression suggested that gender, age and the device used for accessing the Internet were significantly associated with information quality of e-government websites. The CFA results indicated that information quality dimensions corroborate the factor structure of information quality dimensions used in earlier studies, although the model fit statistics were not fully validated. The focus of this study was confined to university-educated citizens in Bangladesh. Therefore, the results of this study may not be generalized to other demographic groups in Bangladesh or elsewhere. This paper can provide guidelines for developing high-quality, informative and citizen-centric e-government websites and suggest ways on how these websites can be evaluated for information quality. This study is the first to examine the information quality of e-government websites from the citizens' perspective in Bangladesh. The findings of this paper can assist responsible government agencies in making the websites more informative and useful for a diverse group of users.

Keywords: E-government Websites, Information Quality, University-educated Citizens, Demographic and Internet Use Variables, Information Quality Indicators, Bangladesh

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Gen Z, Metrics, and Academic Libraries: The Use of Metrics in Shaping Academic Libraries for Gen Z

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ABSTRACT

The term "Gen Z" refers to the group of people who were born between 1996 and 2010 and who are thought to have grown up on social media, digital technology, and the internet. Gen Zers are often very online, having been the first generation of true digital natives. In Asia, Gen Zers spend six or more hours a day on their phones; they are recognized for working, shopping, and forming friendships online. The primary objective of the study is to explore the characteristics of Gen Z and their pattern of using information. This study will also highlight the importance of quantitative metrics in identifying the needs of the Gen Z for developing plans to meet their diverse information needs. This study is conceptual in nature and will follow a qualitative approach. The authors will extensively review relevant articles on the topic and articulate the concept of Gen Z and their features, importance of metrics in developing plans for academic libraries. To deal with the diverse needs of Gen Z, the authors will use their insights and experiences. This study will highlight the areas where metrics can be applied to understand the existing nature of Gen Z in academic libraries. The academic libraries need to develop plans or strategies based on the collected data from the Gen Z. The metrics should be applied on a regular basis to explore the changing needs of Gen Z. Without proper analysis of metrics, it is not possible to meet the diverse needs of Gen Z. It is also important to understand that a single plan or strategy will not be applicable for a long period of time. The behavior of Gen Z will change radically with change in technology. AI-based (Artificial intelligence) tools are now predominantly used by Gen Z. Therefore, academic libraries particularly need to develop strategies for an existing situation rather than a long-term plan. This study will help information professionals of academic libraries to understand the need of metrics in shaping academic libraries based on the demand of Gen Z.

Keywords: Gen Z, Metrics, Academic Libraries, Developing Country

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The Role of Fact-checking Sites during the Israel-Palestine Conflict

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ABSTRACT

As a result of the information explosion, a great amount of data has been created, including stuff that is deceptive, ethically problematic, tolerant, and hateful. The rapid and extensive circulation of false news, on the other hand, appears to show that many people either do not comprehend the concept of" fake news" or, if they do, share it nonetheless. False news has increased in Palestine in concert with the expansion of social media, maybe more than in other countries due to the ongoing Israeli occupation and the broader Arab-Israeli conflict. This research studied 147 news items from three important fact-checking websites—AP Fact Check, Reuters Fact Check, and AFP Fact Check—to detect trends in misinformation on the Israeli-Palestinian conflict. The results are going to help in understanding the influence of media coverage on peace initiatives and conflict settlement, and they have significant implications for the study of interpersonal disputes, past recollections, and political inaccuracies.

Keywords: Misinformation, Israel-Palestine Conflict, AFP Fact Check, AP Fact Check, Reuters Fact Check

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Media Coverage of DeepFake Disinformation: An analysis of three South-Asian countries

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ABSTRACT

A lot of people are concerned about Deepfakes in modern society. Despite its wide range of uses, Deepfakes has gotten little public recognition. The main goal of this research is to analyze Deepfakes and their originators, as well as their potential and risks. We analyzed 203 news articles from 16 media outlets in Bangladesh, India, and Pakistan to achieve our goal. The extracted news had been categorized under threat, prevention, and entertainment centric news. It has been revealed after analyzing Deep Fake-related news from the leading English daily of these countries that more than 50% news of Pakistani newspapers related to Deep Fake was on the threat of this heinous technology. On the other hand, one-third news of Indian and Bangladeshi newspapers was in this regard. The widespread broadcast of misleading information through media outlets might boost their legitimacy and reception for a short time but slowly and steadily smear their good name. This study also highlights the significant role media professionals have in spreading disinformation about the people and topics they cover.

Keywords: Deep Fake, News Media, Deep Fake Detection, Disinformation, News Credibility

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Information Seeking Behavior of University Students during 2023 Dengue Outbreak: A Developing Country Perspective

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ABSTRACT

Dengue outbreak has become a regular phenomenon Bangladesh. It has created a panic among people from all walks of life. The study was conducted to gain insights about the dengue related information seeking behavior of university students of Bangladesh during 2023 dengue outbreak. In this study, a survey was conducted with an online questionnaire here. 532 students from different universities of Bangladesh have participated Mann Whitney and Kruskal Wallis test was applied to determine the relationships between different demographic variables and the choice of information sources, purpose of seeking information. In this study majority of students Majority of the students use social media platforms as their primary source of information regarding dengue virus. Most of the students seek information to mainly know about the disease and the safety products related to the virus. There was a significant difference between the residence of the respondents and their choice of information sources. The respondents also have identified several barriers to dengue related information. They mostly regarded the lack of medical terminologies and lack of necessary steps by the educational institutions as the primary barriers. Dengue outbreak has become regular phenomenon in Bangladesh. It imperative for studen5tts to seek necessary information regarding the dengue virus. The authorities must take care of the preference of the students regarding the choice information source while giving them proper information.

Keywords: Dengue, Information Seeking, Students, University Students, Bangladesh

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Students' Perception of Wikipedia as an Academic Information Source

Ahmed Shafkat Sunvy[*] and **Raiyan Bin Reza**[†]

ABSTRACT

Wikipedia has become an integral part of education in recent times. But its credibility and its ability to serve as an efficient academic resource is still a matter of concern. This study aims to evaluate Bangladeshi students' perception of Wikipedia as an information resource. For this quantitative research, the authors used structured questionnaires with close ended questions to collect data. A total of 336 students from several Bangladeshi institutions chosen using random sampling method were the population for this study. The collected data were analyzed using IBM SPSS Statistics 25. Kruskal Wallis and Mann-Whitney U tests were used to test the hypothesis. The study found that students regularly used Wikipedia for their academic work and classroom assignments. A majority of the students (N=296, 88.1%) deemed it appropriate to use Wikipedia in the context of university studies. This study is the first attempt in Bangladesh to investigate how frequently and why university students use Wikipedia in their academic work and whether they deem Wikipedia credible, accurate and relevant to their education. Extensive research by the authors has shown that there are many aspects of Wikipedia that make it suitable for the learning-teaching process, which makes it a fruitful topic for further study.

Keywords: Wikipedia, Bangladesh, Students, Academic

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The Un-peopling of Peoples: A Critical Study on the Justifiability of the Non-Recognition of the Indigenous Peoples of the Chittagong Hill Tracts

Adity Rahman Shah*

ABSTRACT

Despite being a religiously pluralist and parliamentary democratic country, Bangladesh does not recognise the indigenous groups of the Chittagong Hill Tracts (CHT) area as indigenous peoples, the residence of the majority of ethnic communities on its territory. Historically, various ethnic groups in CHT have always enjoyed local autonomy and special status. However, after Bangladesh was liberated in 1971, it did not recognise any special/separate status of the CHT ethnic communities in its attempt to enforce nationalism. Consequently, the indigenous peoples of CHT lost their right to autonomy, land rights and even cultural identity. Promisingly in 2014, in Wagachara Tea Estate Ltd. Case, the Appellate Division of Bangladesh has expressly admitted the existence of "indigenous peoples" in the CHT region. But, in the 2016 Universal Periodic Review, the Government of Bangladesh outwardly denied the existence of indigenous peoples in the territory. Further, in 2019, a new government order came to remove the word "indigenous" from the title of every registered organisation in Bangladesh. Against such a background, this paper attempts to explore the legal and factual basis of the CHT indigenous community's claim to be recognised as "indigenous peoples" and examines the justification of Bangladesh's current approach of non-recognition of the CHT indigenous peoples under relevant IHRL. The paper also sheds light on the possible domestic legal strategy to address the situation.

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Assessing the International Criminal Court's Response to Genocide: A Reference to the Case of Al-Bashir

Mohammad Pizuar Hossain*

ABSTRACT

On the 75th anniversary of the Genocide Convention, the role of the International Criminal Court (ICC), as constituted under the Rome Statute, in responding to genocide is worth evaluating. This article assesses the effectiveness of the ICC in addressing genocide, with a focus on the Al-Bashir Case (case concerning genocide, crimes against humanity, and war crimes in Darfur, Sudan) - the first ICC proceeding against a sitting Head of State charged with genocide. It first singles out the ICC's role in promoting international solidarity to prevent genocide, break cycles of violence, and enhance the likelihood of prosecution. It also discusses the legal obligation to strengthen international cooperation for the Al-Bashir Case, under the Genocide Convention, and considers the relevant contexts of the International Criminal Tribunals for the Former Yugoslavia and Rwanda. The analysis has incorporated legal and criminological literature, alongside scholarship of international relations from voluminous resources. This article emphasises the ongoing necessity for international cooperation within the ICC to effectively implement its mechanisms: investigation, prosecution, principle of complementarity, and deterrence. It suggests that this aim can be attained through encouraging Member States of both the Rome Statute and the Genocide Convention to actively participate in responding to genocide.

Keywords: Genocide prosecution, international harmony, International Court of Justice, Al-Bashir case, complementarity principle

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Criminology of Atrocity Crimes: Analysing the Aetiology of the Rohingya Persecution in Myanmar

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ABSTRACT

The current paper examines the aetiology of persecution committed against the Rohingya in Myanmar from a criminological perspective. Criminological theories focusing on one level of analysis may not fully explain the incidents concerning the systematic implementation of policies of persecution against the Rohingya for decades. Thus, the author scrutinizes the factors which are involved in the aetiology of persecution at three different levels: macro (national), meso (organizational) and micro (local community and individual) within four dynamics – namely, motivation, opportunity, control and constraint. This paper employs the case study method and collects data through focus group discussions with the Rohingya in the Kutupalong refugee camp in the Cox's Bazar region of Bangladesh. It limits its analysis to the data that covers the events of persecution against the Rohingya in Myanmar, such as revocation of their citizenship, deprivation of their fundamental rights, and different forms of atrocity crimes, from 1962 to 2019. It reveals that, despite the heterogeneity of the actions that led to atrocity crimes against the Rohingya, the military leaders in charge of Myanmar (and somewhat Myanmar's civilian government), military personnel and other security force members, paramilitaries and vigilantes played various roles in the perpetration of such crimes.

Keywords: criminology, international crimes, Rohingya community, authoritarianism, military perpetrators

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The Rohingya Refugee Crisis: Analysing the International Law Implications of Its Environmental Impacts on Bangladesh

Mohammad Pizuar Hossain*

ABSTRACT

Bangladesh is hosting many Rohingya refugees, who were forced in different periods starting from the late '70s to leave the Rakhine state (formerly Arakan state) of Myanmar (formerly Burma). The most significant number of them fled to the Cox's Bazar region of Bangladesh in 2017. This article thus examines the international law implications of the environmental impact of the unprecedented and unanticipated 2017 Rohingya mass influx on the ecological resources of the Cox's Bazar region of Bangladesh. It argues that Myanmar's implementation of atrocious and discriminatory policies through its militia's violent acts forcing the Rohingya to leave Myanmar and take shelter in Cox's Bazar caused environmental damage in Bangladesh. The core argument is that Myanmar should be held liable based on customary international law and treaty obligations. Hence, this article explores selected international law avenues offering only a preliminary overview of Myanmar's potential state responsibility for paying compensation to Bangladesh and undertaking steps to prevent further environmental harm and restore biodiversity in the areas where the Rohingya refugees are settled.

Keywords: Myanmar, Bangladesh, Rohingya refugee crisis, transboundary environmental harm, state responsibility, customary international law

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Fifty Years of Human Rights Enforcement in Legal and Political Systems in Bangladesh: Past Controversies and Future Challenges

Ali Mashraf [*]

ABSTRACT

This paper provides a synopsis of the human rights enforcement in Bangladesh, which marks its 50 years in 2021 since its independence. After a theoretical background on how human rights are perceived as legal and political instruments, it critically discusses human rights provisions and explores the legal and institutional frameworks on human rights enforcement in Bangladesh—(re)construed in 50 years (1971–2021). Finally, it divulges the controversies in human rights enforcement and a roadmap to address them by making some suggestions: multiple legislative, administrative, and judicial reforms are required to tackle human rights abuses to ensure punishment for the abusers and restitution for the victims. The paper concludes with the notion that the positive will of the relevant stakeholders (legislature, executive, and judiciary) is the key to upholding and protecting the human rights of Bangladeshi citizens. The significance of this paper lies in exploring the complexities associated with the laws and insular national politics, which often debars the enforcement of human rights and crucially compromises Bangladesh's ability to empower its citizens.

Keywords: Myanmar, Bangladesh, Rohingya refugee crisis, transboundary environmental harm, state responsibility, customary international law

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Public Interest Litigation and the Constitution of Bangladesh: Past, Present, and Future

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ABSTRACT

The autochthonous architecture of the Constitution of Bangladesh provides a foundational back up to an activist legal fraternity. At the beginning of its journey, the idea of public interest litigation (PIL) started developing with Kazi Mukhlesur Rahman case in 1974, even before India started its social interest litigation. After a long hiatus, the Supreme Court (SC) of Bangladesh finally expanded the ambit of locus standi of PIL. Such a socially motivated gateway to the court has been abused to the extent that the court had to intervene to differentiate between PIL and private interest litigation. Finally, in 2016, the SC came up with a framework for narrowing the ambit of locus standi in PIL. This chapter critically evaluates the journey of PIL in Bangladesh and lays a roadmap for the future.

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Undergraduate Student's Stress, Anxiety, Depression and their Coping Styles during Covid-19

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ABSTRACT

Introduction: COVID-19 was responsible for widespread disturbance throughout the educational system and was harmful in a variety of ways. In particular with regard to the state of a student's psychological health. Purpose: This study examines the relationship between psychological distress (depression, anxiety, and stress) and coping strategies among the students of a private university in Bangladesh during the COVID-19 pandemic. Methodology: A cross-sectional web-based survey was conducted from September 2020 to December 2021 on 951 respondents using the DASS-21 and Brief-COPE questionnaires. Results: The majority of students were experiencing mild to extremely severe depression (75.8%), anxiety (88.5%), and stress (79.1%). The level of stress ($p<.001$), anxiety ($p<.001$), and depression ($p=.23$) was significantly higher among the female students compared with male students. This study also highlights the coping strategies of students. However, sex differences were not profound in adopting coping strategies. The results also showed significant correlation between some Brief-COPE measures, such as acceptance and self-blame ($r=.708$, $p<.001$); use of informational support and emotional support ($r=.599$, $p<.001$). Conclusion: As the prevalence of mental health disorders was found to be higher among private university students, university authorities should seek necessary assistance from mental health professionals to support their students in overcoming psychological distress not only related to the pandemic but also related to their day-to-day life activities.

Keywords: Bangladeshi university students, Covid-19, Stress, Depression, Anxiety, Coping

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Evidence for Environment Hypothesis: Cross-Cultural Measurement Invariance of the Composite Scale of Morningness Across Bangladesh and Spain

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ABSTRACT

Morningness-eveningness reflects individual differences in circadian functioning and is related to health and well-being. Cross-cultural comparison could facilitate understanding of the environmental factors affecting morningness-eveningness, which requires establishing cross-cultural validity of the relevant assessment tools. In this study, we applied the Composite Scale of Morningness (CSM) to Bangladeshi (n = 1015; 37.9% women) and Spanish (n = 1054; 73.2% women) university students (aged 18–27 years) to evaluate alternative factorial models of the CSM and to test its measurement invariance across cultures. Moreover, this study tested environment hypothesis, suggesting that higher average temperatures and lower latitudes would be related to greater morningness. From nine competing factorial models, a bifactor model with two specific factors (morning preference and morning affect) showed the best fit for both cultures. The two-factor bifactor model had full metric invariance with partial scalar and strict invariance across cultures. The Bangladesh–Spain comparison of the CSM scores revealed higher morningness in Bangladeshi students which supports the environment hypothesis. Overall, this research confirms that morningness-eveningness construct is perceived and interpreted similarly by the Bangladeshi and Spanish students. Importantly, this study highlights the effects of environmental factors including latitude and temperature on morningness-eveningness, and thus facilitates further cross-cultural morningness-eveningness research.

Keywords: Morningness-eveningnessenvironment, hypothesis, measurement invariance, bifactor model, composite scale of morningness

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Validation and Psychometric Properties of the Bangla Version of Positive Mental Health Scale (PMH-scale)

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ABSTRACT

Positive mental health is crucial to individuals' total well-being and especially to their emotional, psychological, and social functioning. To assess the positive aspects of mental health, the Positive Mental Health Scale (PMH-scale) is being used as one of the most significant and practical short unidimensional psychological tools. However, the PMH-scale has not yet been validated for the Bangladeshi population nor has it been translated into Bangla. Therefore, the purpose of this study was to investigate the psychometric properties of the Bangla version of PMH-scale and validate it with the Brief Aggression Questionnaire (BAQ) and Brunel Mood Scale (BRUMS). The sample of the study consisted of 3145 university students (61.8% men) aged from 17 to 27 (M = 22.07, SD = 1.74) and 298 general population (53.4% men) aged from 30 to 65 (M = 41.05, SD = 7.88) of Bangladesh. The factor structure of the PMH-scale as well as measurement invariance for sex and age (age ≤30 years; age >30 years) were tested, using the confirmatory factor analysis (CFA). The CFA revealed that the originally proposed unidimensional model of PMH-scale had a good fit in the current sample which confirms factorial validity of the Bangla version of PMH-scale. The value of Cronbach's alpha (for both groups combined α = 0.85; for the student sample α = .85; and for the general sample α = .73) ensured the high internal consistency of the items. Concurrent validity of the PMH-scale was confirmed through the expected correlation with aggression (BAQ) and mood (BRUMS). The PMH-scale was also partially invariant over groups (student, general, men and women) indicating that the PMH-scale is equally applicable to student, general, men and women population. Therefore, this study tells us that the Bangla version of PMH-scale is a quick and easy-to-administer tool for assessing positive mental health in different groups of people in Bangladeshi culture. This work will also be useful for mental health studies in Bangladesh.

Keywords: Bangla PMH-Scale Positive mental health, Aggression, Mood, Measurement invariance

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SARS-CoV-2 Infection after Vaccination: A Comparative Profile between Dose 1 and Dose 2

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ABSTRACT

Since the initial shipment of vaccination campaign against SARS-CoV-2 infection, it was a major concern all over the world regarding appropriate gapping between the first and second dose and also the necessity of booster dose after being vaccinated with the second dose. This cross-sectional type of comparative study was conducted at Kuwait Bangladesh Friendship Government Hospital, from the period of March 01 2021 to August 31 2021, on 148 hospitalized patients who were vaccinated with Astra Zeneca. They were divided into two groups on the background of 1st dose and 2nd dose. Collected data were entered into SPSS-26 version and after data cleaning, descriptive analysis was done with frequency distribution. To find out the significant difference between the two groups considering clinico-demographic information, disease severity, and duration of the last dose of vaccine; the Pearson Chi-square test was done with a significance level ≤0.05. The patients from both groups were mostly male and above 60 years. There were no significant age or sex variations between the two groups. SARS-CoV-2 infection was common after 38 days of dose 1 and after 63 days of dose 2. Fever, cough, running nose, shortness of breath, fatigue, nausea, vomiting, lower oxygen saturation, radiological involvement were comparatively more in patients who got only a single dose. Mild pneumonia (70.7%) was the commonest presentation in both doses of vaccinated patients and single dose vaccinated patients mostly (45.5%) presented with severe pneumonia. Elderly clinically risks group patients were mostly hospitalized with infection after 1 month of the 1st dose and on the other hand after 2 months of completing the 2nd dose. Symptomatic infection and disease severity were more in 1st dose vaccine recipients in comparison to 2nd dose.

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Novel Messenger RNA Coronavirus Vaccination: A Study of Adverse Skin Reactions

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ABSTRACT

Since the initial shipment of vaccination campaign against SARS-CoV-2 infection, it was a major concern all over the world regarding appropriate gapping between the first and second dose and also the necessity of booster dose after being vaccinated with the second dose. This cross-sectional type of comparative study was conducted at Kuwait Bangladesh Friendship Government Hospital, from the period of March 01 2021 to August 31 2021, on 148 hospitalized patients who were vaccinated with Astra Zeneca. They were divided into two groups on the background of 1st dose and 2nd dose. Collected data were entered into SPSS-26 version and after data cleaning, descriptive analysis was done with frequency distribution. To find out the significant difference between the two groups considering clinico-demographic information, disease severity, and duration of the last dose of vaccine; the Pearson Chi-square test was done with a significance level ≤0.05. The patients from both groups were mostly male and above 60 years. There were no significant age or sex variations between the two groups. SARS-CoV-2 infection was common after 38 days of dose 1 and after 63 days of dose 2. Fever, cough, running nose, shortness of breath, fatigue, nausea, vomiting, lower oxygen saturation, radiological involvement were comparatively more in patients who got only a single dose. Mild pneumonia (70.7%) was the commonest presentation in both doses of vaccinated patients and single dose vaccinated patients mostly (45.5%) presented with severe pneumonia. Elderly clinically risks group patients were mostly hospitalized with infection after 1 month of the 1st dose and on the other hand after 2 months of completing the 2nd dose. Symptomatic infection and disease severity were more in 1st dose vaccine recipients in comparison to 2nd dose.

Keywords: Corona virus, vaccination, mRNA vaccine, skin reactions.

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Exploring Mental Health Challenges and Coping Strategies in University Students During the COVID-19 Pandemic: A Case Study in Dhaka City, Bangladesh

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ABSTRACT

Background: Mental health challenges have emerged worldwide during the COVID-19 pandemic. University students experienced changes in their lifestyles, academic life, family relationships, earning capacity, and support systems. This study explores the common mental health challenges in university students and their coping strategies using social support in the first wave of lockdowns in Dhaka city in 2020. By learning from young people's impacts and coping responses, we can help build an improved strategy for future events of this magnitude. Methods: A qualitative study design was employed to conduct 20 in-depth interviews and two focus group discussions with students from purposively selected three public and three private universities in Dhaka city and five key informant interviews with different stakeholders. We used inductive reflexive thematic analysis and applied six phases of the thematic analysis. Codes retrieved from two differently prepared codebooks were merged and compared to identify themes for a fair interpretation of the underlying data. Data were manually indexed, summarized, and interpreted to categorize codes into sub-themes leading to themes. Results: Financial constraints, academic pressure, learning resources shortages, losing confidence, relationship breakup, excessive internet dependency, and traumatic experiences challenged the mental health conditions of the students unevenly across universities during the COVID-19 pandemic. Expressed mental health well-being impacts ranged from anxiety, stress, and depression to self-harm and suicidal ideation. Family bonding and social networking appeared as robust social support mechanisms to allow students to cope with anxiety, stress, and depression. Partial financial subsidies, soft loans to purchase electronic resources, faculty members' counseling, and sessional health counseling contributed to minimizing the mental health impacts of COVID-19. Conclusion: Mental health is still not a resourced area of health and well-being in Bangladesh. Concentration on developing strong social support and improving increased financial subsidies, including learning resources, can be effective in assisting students in coping with the common mental health burdens during pandemic periods. A national intervention plan should be immediately designed and implemented by engaging different stakeholders including healthcare professionals and establishing effective mental healthcare support centers at universities to avoid immediate and prolonged negative mental health impacts.

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Women Migrant Workers and their Transition Across State Boundaries: Labour Exporting Policies of Bangladesh and the Reality

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ABSTRACT

Women's labor migration from Bangladesh gained traction in 2013. According to the Bureau of Manpower, Employment, and Training, a total of 2,91,098 Bangladeshi women moved for employment between 2015 and 2019. However, the most difficult challenge Bangladesh has is the repatriation of the majority of them from Middle Eastern nations owing to violence at the destination, which includes overwork, forced imprisonment, non-payment of salaries, malnutrition, and emotional, physical, and sexual assault. The death toll is also rising, expressing concern about migration policy. As a result, the study seeks to determine the extent to which the structure of Bangladesh's female labor exporting policy has the ability to safeguard such women in destination countries. This qualitative study seeks answers by conducting a careful content analysis of accessible secondary data and policy papers on the breadth and limitations of Bangladesh's women's labor exporting laws.

Keywords: Women migrants, Bangladesh, Empowerment, Alienation, Poverty, Migration policy

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Psychological Perspective of Suicidal Behaviour in South Africa

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ABSTRACT

Background and Objectives: Suicidal behaviour is a complex and wide-reaching concern which brings far-reaching social, psychological, emotional, and economic consequences. Suicidal behaviour can be explained by several theoretical models. Amongst them, the psychological perspective has long been involved as an important academic orientation to analyse suicidal behaviour. This critical review examines the status of South African studies that were found compatible with the psychological perspective of suicidal behaviour. It aims to provide some directives to enrich the works on suicidal behaviour in the context of South Africa. Methods: This review includes South African scholarly literature on suicidal behaviour published between 2008 and 2018. Scholarly works were searched through PubMed, EBSCO and Google Scholar. Thirteen relevant studies were included in this analysis. Results: Although several South African studies have apparently been conducted from the standpoint of the psychological aspects of suicide, they eventually do not maintain very sharp relevance to the key theoretical and methodological prescriptions embedded in the broader domain of the psychology of suicide. For example, only a very few South African studies have used scales developed from the major psychological theories of suicidal behaviour. At the same time, the overreliance on measurement scales has made South African studies more positivist in methodological orientations. Conclusion: The psychological perspective requires robust attention to appropriately tap the complex dynamics of suicidal behaviour in the context of South Africa. Researchers in South Africa must strive to make a meaningful methodological and epistemic development by using the key theoretical and methodological advances in the field of psychology. It is also equally important to integrate multidisciplinary models to investigate suicidal behaviour in South Africa.

Keywords: Literature review, Psychology of suicide, South Africa, Suicidal behaviour

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Male Suicide Cases in Bangladesh: Lensing through Durkheim's Sociological Typology

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ABSTRACT

Durkheim's classic Le Suicide provides the most astounding perspective in the sociological analysis of suicide. Using macro-level statistical data, he analyzed the suicide patterns of different populations and groups with reference to socio-cultural factors and social structures. His model comes with a four-fold typology of suicide: anomic, egoistic, altruistic, and fatalistic. This classification of suicide provides a means for analyzing the structural conditions in society with regard to the causes of suicide and the pathways for meaningful empirical research in sociology Moreover, suicide as a topic gradually waned from the mainstream sociological focus. Nonetheless, we attempted to understand the individual cases of suicide by explicating the essence form Durkheim's four-fold schema. In doing so, we contextualized 20 male suicide cases from Bangladesh through qualitative semi-structured research interviews with persons close to deceased males and characterized their relevance to Durkheim's typology. We conclude that explicating Durkheim's model at the individual level has potential for rejuvenating the sociology of suicide in the field of suicide research.

Keywords: Durkheim, males, macro-micro, sociology of suicide, Bangladesh

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ChatGPT's Performance Before and After Teaching in Mass Casualty Incident Triage

Rick Kye Gan[*] and **Helal Uddin**[†]

ABSTRACT

Since its initial launching, ChatGPT has gained significant attention from the media, with many claiming that ChatGPT's arrival is a transformative milestone in the advancement of the AI revolution. Our aim was to assess the performance of ChatGPT before and after teaching the triage of mass casualty incidents by utilizing a validated questionnaire specifically designed for such scenarios. In addition, we compared the triage performance between ChatGPT and medical students. Our cross-sectional study employed a mixed-methods analysis to assess the performance of ChatGPT in mass casualty incident triage, pre- and post-teaching of Simple Triage and Rapid Treatment (START) triage. After teaching the START triage algorithm, ChatGPT scored an overall triage accuracy of 80%, with only 20% of cases being over-triaged. The mean accuracy of medical students on the same questionnaire yielded 64.3%. Qualitative analysis on pre-determined themes on 'walking-wounded', 'respiration', 'perfusion', and 'mental status' on ChatGPT showed similar performance in pre- and post-teaching of START triage. Additional themes on 'disclaimer', 'prediction', 'management plan', and 'assumption' were identified during the thematic analysis. ChatGPT exhibited promising results in effectively responding to mass casualty incident questionnaires. Nevertheless, additional research is necessary to ensure its safety and efficacy before clinical implementation.

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Effects of Mass Casualty Incidents on Anxiety, Depression and PTSD Among Doctors and Nurses: A Systematic Review Protocol

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ABSTRACT

Introduction: Both doctors and nurses showed a greater risk of being exposed to different mental health conditions following mass casualties. This systematic review aims to synthesise the existing evidence on the prevalence of anxiety, depression and post-traumatic stress disorder and their associated risk factors among doctors and nurses following mass casualty incidents. Methods and analysis: Seven electronic databases (PubMed, PsycINFO, MEDLINE Ovid, Embase, CINAHL, Web of Science and Nursing & Allied Health database) will be searched from 2010 to 2022 with peer-reviewed articles in English language using the predefined keywords. Two reviewers will independently screen the titles and abstracts, as well as review the full texts using the eligibility criteria, then extract data independently. The National Institutes of Health Quality Assessment Tools (NIH-QAT) for quantitative studies, the Critical Appraisal Skills Programme (CASP) Checklist for qualitative studies and the Mixed-Methods Appraisal Tool (MMAT) for mixed-method studies will be used to measure the quality appraisal of eligible studies. A third reviewer will resolve the discrepancies when the two reviewers cannot reach an agreement in any step. The result from the eligible studies will be described following narrative synthesis with the key characteristics and findings of the included studies, and meta-analysis will be performed, if applicable. Ethics and dissemination: This systematic review deals with existing published studies without any personally identifiable information of participants. Therefore, ethical approval from the research committee is not required. Findings from this review will be disseminated in peer-reviewed journals and presented at relevant international conferences.

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Socioeconomic Disparities in Diabetes-Concordant Comorbidity: National Health Interview Survey, 1997–2018

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ABSTRACT

Objective: Although social disparities in morbidity and mortality are well-documented, little is known how socioeconomic status (SES) shapes diabetes-concordant comorbidity (DCC). This study examines socioeconomic inequalities in DCC among adults with diabetes in the United States. Study design: The study incorporated a cross-sectional nationally representative household health survey. Methods: This study used data from the National Health Interview Survey, 1997–2018. The analysis included 56,192 adults aged 30 or above with diabetes. Multinomial logistic regression was used to obtain relative risk ratios in gender-stratified models after adjusting for sociodemographic covariates. Results: The multivariable-adjusted analyses suggest that across all SES indicators and in both men and women, individuals with lower SES had greater odds of DCC than individuals with higher SES. The associations of SES indicators with DCC were larger in magnitude among women than in men. For example, compared to individuals with a college or higher degree, men with less than a high school degree were 2.06 times (95% confidence interval = 1.76–2.41) and women with less than a high school degree were 3.19 times (95% confidence interval = 2.67–3.82) more likely to have 3 or more DCCs. Similar associations were observed for other indicators of SES. Conclusion: Study findings suggest strong social status and gender-based patterns in DCC. Identifying population groups with poor social status may be useful for informing interventions aiming to improve healthcare services of diabetes-related complications.

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Prevalence of Truancy Among School-Going Adolescents in Three South Asian Countries: Association with Potential Risk and Protective Factors

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ABSTRACT

We examined the prevalence and evaluated the associated risk and protective factors of adolescent school truancy through sex-stratified models by analysing 7562 adolescent data from the Global School-based Student Health Survey (GSHS) of three South Asian countries: Afghanistan, Bangladesh, and Pakistan. The prevalence of school truancy was 26.6%. The highest truancy was found in Bangladesh (37%), followed by Pakistan (24.7%) and Afghanistan (14.7%). Male adolescents had a 2.05 times higher relative risk ratio (RRR) [95% CI: 1.29, 3.28] of having truancy of ≥ 3 days (last month) than the female respondents. Respondents of older age, bullied, and injured had significantly higher RRR of truancy of ≥ 3 days than their counterparts. Household food insecurity also significantly increased male and female students' RRR of school truancy. However, peer and high parental support significantly reduced the RRR of 1–2 days and ≥ 3 days of truancy of male and female students.

Keywords: Truancy, Bangladesh, Afghanistan, Pakistan, Adolescents, Global School-based Student Health Survey (GSHS)

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Family Resilience and Neighborhood Factors Affect the Association Between Digital Media Use and Mental Health Among Children: Does Sleep Mediate the Association?

Md. Khalid Hasan[*] and **Helal Uddin**[†]

ABSTRACT

The associations between digital media use and mental well-being among children and adolescents have been inconclusive. We examined (i) the associations between digital media use and mental health outcomes, anxiety, depression, and ADHD, (ii) whether family resilience and neighborhood factors attenuate the associations, and (iii) whether sleep mediates these associations. We used the National Survey of Children's Health data from 2019 to 2020. A total of 45,989 children's (6–17 years) data were analyzed in this study. Multivariate logistic regression was used to assess the associations between digital media use and anxiety, depression, and ADHD. Path models and Paramed command in STATA were used to test the role of sleep as a mediator of these associations. The prevalence of heavy digital media users (who spent 4 or more hours per day) among the analytic sample was 30.52%, whereas anxiety was 13.81%, depression was 5.93%, and ADHD was 12.41%. Children in the heavy media user group had 63% increased odds of anxiety (95% CI: 1.32–2.01) and 99% increased odds of depression (95% CI: 1.35–2.94) after adjusting for sociodemographic factors, compared to the children in light media user group (who spent < 2 h per day), and these relations were significant at 0.01 level. However, family resilience and community factors significantly attenuated the effect of digital media use on anxiety and depression. Sleep did not mediate the associations between digital media use and anxiety or depression. Conclusions: Family resilience and neighborhood factors protect against the harmful effects of digital media use. Further research is needed to examine the relationships of media contents, the presence of electronic devices in bedrooms, and sleep quality with mental health.

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Effects of Covid-19 on Bangladesh's School Dropouts and Child Marriage Rates: A Threat to Achieving Sustainable Development Goals and Promotion of Intergenerational Poverty

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ABSTRACT

The 2030 deadline for eradicating child marriage set forth in SDG is made challenging by COVID-19. According to UNICEF, Covid-19 increased the likelihood of child marriage for 10 million more girls. The negative effects of the epidemic have increased the probability of child marriage and school dropouts worldwide. After 543 days of closed educational facilities in Bangladesh, particularly schools and colleges, the number of unfilled seats in classrooms revealed a heightened worry about dropouts. Following a qualitative study and review of the literature from Bangladesh, this study explored the trends and impact of covid-19 on the growing number of child marriages and school dropouts, as well as the repercussions of how it jeopardizes the accomplishment of relevant sustainable development objectives. According to this study, child marriage and school dropout rates will in the near future increase the intergenerational poverty rate nationwide.

Keywords: Covid-19, Child Marriage, School dropout, Sustainable development, Bangladesh

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Decolonizing the Biocolonial Mind: Rebooting Resistance against Ecopolitics and Biocoloniality in Select Indigenous Female Poets' Poetry in Bangladesh

Ariful Islam*

ABSTRACT

Struggle and transformation maintain a cause-and-effect relationship, regardless of its time and context. This paper is in fact an attempt to explore how Indigenous women in Bangladesh are responding to the act of both installing the sense of collective struggle among the mountain people and mobilizing it as a collective resistance. The fundamental gap between the flatlanders and the mountain people in Bangladesh is due in large part to both their different viewpoint apropos of the evaluation of human-nature relationship and their prejudiced understanding of majority-minority issue. Thereby, their struggle has always been concerned about decolonizing the biocolonial mind of the flatlanders and the hegemonized spirit of the mountain people. Their struggle highlights their active role in fighting against the question of identity and capitalist mindset of the people in power and authority. Through rereading some select Indigenous female poets' poetry in the light of development conspiracy (Trijinad Chakma 2013), ecopolitics (Eric R. Wolf 1973), biocolonialism (Debra Harry 2014, Hannah Butt 2012, Laurelyn Whitt 2009, Gayatri Spivak 2000), and biopiracy (Ashleigh Breske 2018, Vandana Shiva 1997), this paper will investigate Indigenous communities' different forms of resistance against both ecopolitics and biocoloniality. Explaining the root reasons in this regard, this paper will also elucidate different layers of transformation they are experiencing and expecting. Finally, the concluding remarks regarding Indigenous female poets' "struggle and/as transformation" will throw light on both their great expectations and their ambiguous decolonizing mission against ecopolitics and biocoloniality.

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I'm Going to Do My Duolingo, Got to Keep My Owl Happy: Using Duolingo in Bangladesh

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ABSTRACT

Language education is key to unlocking many of the advantages of globalization. At the same time, technology can attract and direct the attention of students (Degirmencia, 2021). Modern trends lead to innovative technologies in education, including the birth of digital, mobile, and gamified learning or gamification (Yaccob et al., 2022; Yu & Trainin, 2022). Now, students are more in control of their learning paths, for example, various language activities and games (Yaccob et al., 2022), and have more control in advancing at their own pace (Perry, 2021). In English language classrooms, meaningful teaching and learning are significant to developing students' English proficiency, focusing on linguistics and communicative competence (Yaccob et al., 2022). This study aims to uncover the role of gamification in self-regulated language learning. Duolingo is used here as a platform for self-regulated language learning. Duolingo is one of the most gamified Mobile Aided Language Learning (MALL) applications (Shortt, Tilak, Kuznetcova, Martens, & Akinkuolie, 2021). We found that students quickly took to the gamified elements and grew in their confidence and frequency of language learning as a result of the interaction.

Keywords: Ecofeminism, Amitav Ghosh, Reproductive Power, Harmony, Climate Change, Natural Disaster

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Exploring the Fancy World: CNN'S Coverage of AI Generated Content

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ABSTRACT

The main aim of the study is to explore the CNN" s Coverage of AI generated content. In this study, content analysis method was applied. All the news items were collected from the CNN website (https://edition.cnn.com/). The search box in the CNN website was used and the keyword 'Generative AI "was used to collect news items for this study 151 news items were gathered covering Ai generated content. Out of 151 news items 74 news items were selected which were more representative of the topic 'Generative AI". Then the news items were categorized into 3 broad groups like Ethics, Potential & Regulation. Then, the news items were sub grouped into subgroups like business, art and misinformation when it was necessary. The media coverage of AI generated content had various aspects. Most of the cases, the coverage focused on ethical issues that AI created for society. The Ethical issues mainly focused on the AI's role in spreading disinformation, Deepfakes, copyright issues related to AI generated art etc. Many news items also highlighted the huge potentials AI generated contents. Several reports were made to focus on the impact of AI in education, art, business and life as a whole. Many reports also emphasized the need of regulation AI generated contents. Already many social networking sites are working to regulate AI generated fake news and senators are continuously calling for better regulations and many social media companies are taking actions to address the risks. This study mainly focused on news items of a single media. In future studies, other news items of other media outlets can be analyzed.

Keywords: AI, AI Content, Ethics, Misinformation, CNN

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Impact of Religious Information on Political Beliefs and Personal Morality Among Bangladeshi People

Md. Liton Ali, Md.Rifat Mahmud and **Raiyan Bin Reza***

ABSTRACT

Religion has been an integral part of this world since ancient times. Bangladesh is a South Asian country with a population of over 170 million people. Like most of the South Asian countries, religion plays a very crucial role in the society and politics of Bangladesh. The use of religion in politics is not so uncommon in Bangladesh. Religion has been an important debate issue in many political and social trends. Many religious groups in Bangladesh have drawn the attraction of a wide section of the country's population in recent years. The policymakers are also influenced by the impact of religious factors while making policies. Religion still shapes the moral beliefs of the people in the country. It is also evident from social and political tensions. The main objective of this study is to explore the impact of religious information on Bangladeshi citizens' personal morality and political beliefs. An online survey was conducted to collect the viewpoints of Bangladeshi citizens regarding the impact of religious information on their personal morality and political beliefs. A total of 210 respondents participated in the survey selected through convenience sampling. In addition to demographic and general information, a five-point Likert scale was used to measure the impact of religious information on morality and political beliefs. Additionally, nonparametric Mann–Whitney U and Kruskal– Wallis tests were conducted to know the significance of differences in respondents' assessment of personal morality and political beliefs in terms of their demographic characteristics. The current study reveals that religious information has an impact on the citizens of Bangladesh. The respondents have differences in their opinions by different demographic groups. Respondents' educational level, current residency, and information literacy have significant differences in their opinions. This paper will help us to get a brief scenario of the impact of religious information on morality and political beliefs. Although the result of this study cannot be generalized, this study will help future studies on this issue.

Keywords: Religious Information, Political Beliefs, Personal Morality, Bangladesh

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Adapting to Change: How Dr. S. R. Lasker Library Meets Evolving User Needs Through Technological Innovations?

Md. Abdul Latif[*], **Jarin Anjum Mim**[†] and **Dilara Begum**[‡]

ABSTRACT

It is evident that libraries are increasingly incorporating Internet information technology, innovating service models, and focusing on user needs and information construction (Xu, Guo, & Wu, 2022). The library's approach includes embracing mobile services, focusing on community empowerment, and evolving from traditional librarianship to information science roles (Caperon, 2015; Arévalo & González, 2016). Moreover, the integration of knowledge management and service, and the development of staff skills for electronic environments are crucial (Li-hong, 2016; Nabil & Bilel, 2018). In an era where technological advancements and digital innovations are reshaping the landscape of information access and dissemination, academic libraries in Bangladesh are at the forefront of embracing change to meet the evolving needs of their users. This paper explores the dynamic role of Dr. S. R. Lasker Library of East West University in adapting to these shifts, with a focus on technological innovations and its impact on user engagement and service delivery. Through a detailed case study of this leading academic library in Bangladesh, including the strategies and implementations, this study sheds light on the transformative role of digital technologies in library environments. From the integration of online subscribed and open access databases to the adoption of innovative services and technologies, the paper delves into how this library is revolutionizing its services to enhance user experience and accessibility.

Keywords: Technological Innovations, Information Access, Service Delivery, Academic Libraries, Dr. S. R. Lasker Library

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The Role of Library and Information Professionals in Promoting Digital Fluency: Emerging Challenges and Opportunities

Dilara Begum[*] and Kazi Mostak Gausul Hoq[†]

ABSTRACT

Today's information landscape is characterized by massive proliferation of digital technologies and contents, which has created innumerable opportunities as well as challenges for library and information science (LIS) professionals worldwide. With the increasing diversification of users' information needs, the sources and volume of information are also increasing at a breakneck speed. In order to successfully cope with this situation, LIS professionals require digital fluency, i.e., the ability to skillfully and ethically adopt, use and evaluate information and technology. The cyberspace is rapidly becoming an unsafe place for people who have limited digital knowledge and skills. Misinformation, online bullying, racism and terrorism, unethical online marketing etc. are posing severe risks for common people, especially the young generation. The absence of quality control and gatekeeping has worsened the situation further. By highlighting the risks and opportunities offered by the digital revolution, the paper discusses the ways LIS professionals could contribute in promoting digital literacy among the library users in particular and the society in general. Through structured interviews and the review of secondary sources, possible roles of LIS professionals in promoting digital fluency in the context of Bangladesh are discussed. The discussion ascertains that LIS professionals have dynamic roles to play in this regard in the forms of mentors, educators, gatekeepers, content evaluators and so on. The paper concludes with a deliberation on the requisite skills to be possessed by LIS professionals in this regard and puts forward concrete recommendations to help them do so.

Keywords: Digital Fluency, LIS Professionals, Cyberspace, Bangladesh

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Interreligious Dialogue to Unite Youth against Religious Extremism in Bangladesh: Role of Academic Libraries

Dilara Begum[*] and **Md. Hasinul Elahi**[†]

ABSTRACT

Few years back, in Bangladesh, a brutal, inhuman attack took place at the Holy Artisan Bakery where 29 people were killed, including hostages, police officers, gunmen, and bakery staff. Most of the attackers were from well-off families and had English medium backgrounds (The Daily Star, 2016). Still, they involved with terrorist activities. They had been misguided by the religious extremist groups. It is the high time to take initiatives by the academic libraries to promote interreligious dialogue to aware people about the main theme of different religion and as well as to eradicate religious misconceptions. Interreligious dialogue will enable youth to understand religion in a better manner. The noble message from different religion should be shared with them. Traditionally, academic libraries were responsible for user education. But, in today's context it is inevitable for academic libraries to address the global issues. Since in academic libraries, most of the users represent youth it is important to educate them in different aspects of life. Academic libraries should include interreligious dialogue in their information literacy service as well. This paper will provide a detailed outline of a proposed plan to promote interreligious dialogue among universities through their academic libraries. Academic libraries through this interreligious dialogue can remove fanatic ideas and extremism from the mind of students. This interreligious dialogue in universities will work as a prevention to religious extremism rather than cure.

Keywords: Interreligious Dialogue, Religious Extremism, Youth, Academic Libraries, Bangladesh

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Effectiveness of Fact Checking Websites: A Webometrics Analysis

Abdullah AL Imran and **Raiyan Bin Reza***

ABSTRACT

Purpose: The aim of this study is to determine the effectiveness of the top fact checking websites of various countries around the world. Methodology: A number Different web links had been extracted for each website using Yahoo search engine. The searches were performed generating globally recognized webometrics searching string. The collected data had been analyzed through Microsoft Excel by dividing the number of webpages by the number of in links and the number of out links. Findings: A total of 35 websites have been analyzed from 32 different countries. After conducting a webometric analysis, it has been observed that the website named 'Observatory' from Portugal holds 1st rank in terms of total number of webpages having 3760 webpages and Austrian website named 'Mimikama' holds 2nd position with 2400 webpages. 'Japan Center of Education for Journalists (JCEJ)' a Japanese website has 13 webpages which is least in this criterion. In case of self-link per page, Brazilian website named 'Agencies Lupa' holds first position with 264.12 links per page and Bangladeshi website named 'Fact Watch' with .4 weblinks per page holds the last position. Portuguese website named 'Observatory' has the highest number of external links per webpage which is 6.75 and the Australian 'RMIT ABC Fact Check' has the lowest (0) external link per page. It has been seen from the study that despite having a large number of webpages, many websites obtained very low scores because of a smaller number of external and self-link per page. Originality: Different types of webometrics study had been conducted in Bangladesh. But this is the attempt which attempted to extract the web metrics performance of different fact checking websites from various countries. Implications: The websites mentioned in this study can realize the level of their performance and determine the acts to be taken to enhance overall activities.

Keywords: Webometrics, Self-link, External Links, Web Impact Factor.

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East West University Center for Research and Training (EWUCRT) promotes academic and applied research for creation and dissemination of new knowledge. With this goal the Center is dedicated to developing the research potentialities of faculty members of the East West University. In this effort, EWUCRT provides generous financial grants to support faculty research and training on research methodology, publications of research reports and journals and sharing of research results with academia researchers and policy makers. To facilitate dissemination and exchange of knowledge EWUCRT organizes seminars and symposiums.

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