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**Book of Abstracts**

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## **IDENTIFICATION OF RESILIENCE DIMENSIONS IN CRITICAL TRANSPORTATION INFRASTRUCTURE NETWORKS**

(LADR-870; Published)

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Incorporating resilience into transportation infrastructure planning and analysis enhances the infrastructure's ability to withstand disruptions and recover rapidly from serious damage. Before it can be incorporated, however, it must be quantified, which requires a basic knowledge of resilience-measuring dimensions, specifically those that relate to transportation. The goal of this study was to develop a comprehensive list of dimensions that can be used to measure such resilience. The literature is rife with information on this subject, and the first step of this research was to extract existing articles (600 of them) and scrutinize them for content. The number of articles was then narrowed down to 372, from which a list of 20 resilience-measuring dimensions was developed. The research revealed that characteristics of roadway networks, such as the length of links, number of intersections, and management and organizational characteristics such as dissemination of information and type of investments, affect its resilience. The findings of this study will help practitioners develop appropriate strategies to enhance the resilience of transportation roadway networks.

## **RANKING AND WEIGHTING OF EFFECTIVE PROJECT BASED COMMUNICATION INDICATORS (EPCIS) FOR PRIMARY AND SECONDARY STAKEHOLDERS IN CONSTRUCTION PROJECTS**

(LADR-883; Published)

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Effective communication can be difficult when construction projects have several stakeholders but is essential to the successful completion of projects. Various studies have identified and analyzed effective project-based communication indicators (EPCIs), yet their impact on the value of internal communication has rarely been studied. Therefore, this paper investigates the impacts of EPCIs on the effectiveness of internal communication within primary (owners, designers, and contractors) and secondary (sub-contractors and suppliers) stakeholders in construction projects. First, a comprehensive study of the previous literature was performed to identify and classify the EPCIs. Data from 40 case study reports involving regional and global construction projects was collected, and a survey questionnaire was designed and disseminated to collect additional data. Then, Cohen's *d* method was employed to weight each of the EPCIs for all the five stakeholders' groups, and the findings revealed that a lack of financial resources, high craft labor turnover, the owner's lack of clarity pertaining to the project goals and objectives,

an enormous number of approvals needed by the primary stakeholders, and the number and depth of additional quality requirements significantly impact the quality of communication within primary and secondary stakeholders respectively. The findings of this research will assist management team in understanding how project parameters impact the quality of communication within stakeholders and will enable them to develop successful strategies to prevent unintended consequences of miscommunications.

## **UNCERTAINTY ANALYSIS OF KEY SCHEDULE PERFORMANCE INDICATORS IN DESIGN, PROCUREMENT, AND CONSTRUCTION PHASES OF HEAVY INDUSTRIAL PROJECTS**

(LADR-884; Published)

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Construction is a dynamic industry because of its evolving technology, resources, and development processes, and project managers have considerable difficulty achieving timely and successful results due to the complexity of the environment. Delays may occur throughout the design, procurement, and construction (DPC) phases of all construction projects, including those involving heavy industry; however, indicators of schedule delays can be identified early in the project's lifecycle and appropriate strategies can be applied. This purpose of this study is to identify the indicators that lead to a project's poor schedule performance during the DPC phases and examines the robustness of each schedule performance indicator. To accomplish this objective, a survey questionnaire was designed and sent to a diverse group of experienced construction professionals. Statistical methods, such as the Chi-squared test, the two-sample t test, and the Kruskal-Wallis test, were employed to evaluate and screen the DPC schedule performance indicators of heavy industrial projects, and a list of schedule delay indicators was developed using the all-possible combination regression analysis approach. The extreme bound analysis (EBA) technique was used to determine the robustness of each indicator's relationship to the model. The results revealed nine robust schedule performance indicators in each of the DPC phases. The findings of this study can be used by the decision-makers of the construction projects, to emphasize on the more reliable factors and minimize the number of revisions required during a project's execution.



## **DISPUTE CLASSIFICATION IN CONSTRUCTION PROJECTS BASED ON LITIGATION CASES**

(LADR-910; In Press)

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Disputes in construction projects arise due to failure of addressing their root causes and for lack of procedures toward dispute avoidance and mitigation. Courts are facing a growing number of construction-related lawsuits that hinder the resolution processes with negative impact on the project completion. This study was an attempt to define major causes of disputes in construction projects from a review of 177 selected litigation cases in the Kuwaiti courts. Dispute sources in construction were classified into four categories as follows: abnormal conditions, financial situation, project delay, and project management. Statistical analysis was conducted to rank the severity of dispute sources. For verification of results, construction experts were interviewed. A regression model was used to predict the disputed claim value. The most severe dispute sources were ranked according to the following: payment delay; contract documents (incomplete information, conflict of interest in both parties, non-compliance, unawareness); main contractor time delay; and owner time delay. It is hoped that results would open avenues toward a clearer understanding of the causes of disputes in contractual agreements in the construction industry, as well as identify areas toward mitigating dispute occurrences. Since the scope of the research was limited to Kuwait, findings of this investigation may lead to a more in-depth investigation of other court scenarios of similar nature from the other parts of the Gulf region.

## **ROLE OF BIM CONTRACT PRACTICES IN STAKEHOLDER BIM IMPLEMENTATION ON AEC PROJECTS**

(LADR-916; In Press)

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The growth of building information modeling (BIM) adoption in the architectural, engineering, and construction (AEC) industry has changed project delivery and contract strategies. While there are numerous BIM contract documents available, how these contract documents are implemented is not well understood. This research investigates how BIM contract practices impact stakeholders' BIM implementation in AEC projects. A mixed methods approach was implemented using a survey and semi-structured interviews. Researchers analyzed survey data using Fisher's exact test and found significant associations between stakeholder BIM use and their respective BIM contractual requirements, as well as BIM execution plan implementation and its respective contractual requirement. Researchers then implemented a

qualitative analysis approach with semi-structured interviews of AEC professionals to identify specific contract requirements impacting BIM implementation and contract-related BIM challenges on current projects. The main categories of contract requirements impacting BIM implementation were contract deliverables, BIM-related meetings, workflow documents, and software requirements. The main categories of contract-related BIM challenges were related to model challenges, reliance on 2D contract documents, the lack of BIM standard practice implementation, and BIM regulatory challenges. These findings can support practitioners when identifying and implementing BIM contract strategies to positively impact BIM adoption in AEC Projects.

## **A PATH TO ESTABLISHING DELAY AND DISRUPTION CLAIMS FOR CONTRACTS ENTERED INTO PRIOR TO THE START OF THE COVID-19 PANDEMIC**

(LADR-918; In Press)

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Since early 2020, Covid-19 has had devastating and ongoing health and economic impacts worldwide. The construction industry has not been immune from these impacts. Although construction was generally deemed essential, in some jurisdictions only certain sectors of the construction industry were deemed essential and therefore allowed to continue with work. Any construction that took place was subject to additional precautions that may have resulted in delay and disruption claims. The methodology of the paper involves a review of primary and secondary legal resources in the United States that are used to derive applicable rules of law. Those rules of law are then applied to force majeure contract language from the American Institute of Architects to outline the criteria for successful delay and disruption claims. For construction contracts entered into prior the onset of the pandemic, delay claims will likely result only in an extension of the contract time, whereas disruption claims may result in additional time and/or money depending on how the contract addresses unforeseen costs. In the absence of express contract terms addressing unforeseen costs in a situation such as Covid-19, principles of equity will dictate whether additional compensation is granted.

## **ANALYSIS OF THE SIX PRELIMINARY INJUNCTIONS GRANTED IN LEGAL CHALLENGES TO COVID-19 VACCINE MANDATES FOR FEDERAL CONTRACTORS**

(LADR-919; Published)

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In September 2021, the Biden Administration issued the Executive Order on Ensuring Adequate COVID Safety Protocols for Federal Contractors, which requires companies that enter into federal contracts to require and verify that their employees are vaccinated against Covid-19. The Executive Order has since been challenged in multiple Federal District Courts. As of the date of submission, six preliminary injunctions have been issued, temporarily ceasing enforcement of the Order. This paper is an analysis and summary of the arguments presented and legal reasoning of the courts, based on the published court opinions. The key issue common among all six cases was whether the Executive Order exceeded the scope of authority granted under the Federal Property and Administrative Services Act. The courts reached slightly different conclusions on this issue and had different reasoning, but all issued temporary injunctions. While most of the injunctions were limited to the plaintiff-states, the most notable preliminary injunction was issued by the Southern District of Georgia and was the only injunction to be issued nationwide. The inclusion of the Associated Builders and Contractors as a plaintiff in that case played a key role in the scope of the injunction being issued on a nationwide scope. Appeals are pending in all cases but given the broad scope of the mandate and the current status of the pandemic, the government faces a difficult appeal.

## **INVESTIGATING THE CRITICAL SUCCESS FACTORS OF CLAIMS MANAGEMENT IN THE CONSTRUCTION CONTRACTS**

(LADR-921; Published)

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Claim management is an essential process aiming to avoid, mitigate, evaluate, and handle the claims that may arise due to various reasons. Claims usually bring up a considerable cost burden and can be disruptive often resulting in myriad issues ranging from delays in project completion to protracted litigation. Claims administration and management can be challenging and time-consuming for all parties; however, the parties can benefit from having an effective claims management program. Therefore, it is of utmost importance to manage claims with respect to contractual items. Considering this troublesome process, there needs to develop effective strategies for the construction firms to best manage claims and their potential impacts on the contract. On the other hand, a comprehensive and up-to-date list of factors is still in need

for many construction companies. To fill this gap, this study proposes a set of critical success factors to best handle the claims, avoid its devastating consequences, and better manage contractual agreements. In this respect, an in-depth literature review is conducted to determine an initial list of variables. The list is refined based on expert opinion to represent the perceptions of the industry practitioners. Then, a questionnaire is administered to construction professionals having broad experience in construction contract management. The variables are ranked by the respondents of the questionnaire based on the importance and success levels. Factor analysis in Statistical Package for the Social Sciences (SPSS) is conducted to categorize the variables. The main factors that arise are human-related, organizational, resource related and project related factors. This study provides a comprehensive, but not exhaustive, list of variables and their categorization to consider as part of an effective claims management process. The study is expected to guide both policymakers and industry practitioners in terms of reviewing their claims management strategies against potentially devastating claims and revisiting their strategies in construction contract Management.

## **PROTEST DENIED: A QUALITATIVE META-ANALYSIS OF FAILED CHALLENGES TO GOVERNMENT CONTRACTING**

(LADR-925; In Press)

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Firms interested in doing business with the U.S. Federal Government, one of the biggest spenders in the world, may have reasons to believe that they have been denied fair opportunities to compete for federal government contracts. The U.S. Government Accountability Office (GAO) provides an expeditious forum where interested parties can challenge government procurement decisions. In this meta- summary, the authors qualitatively analyzed 17 denied bid protests filed against the U.S. Army Corps of Engineers to identify quasi-legal bases that the GAO most frequently took in its denial of bid protests. The findings were abstracted into 12 themes with corresponding frequency effect sizes. Finally, three recent denied bid protests were reviewed in light of the themes to validate the effectiveness of the findings. This study contributes to the growing body of knowledge about one aspect of the U.S. government acquisition practice, i.e., denying bid protests, and presents the findings that can limitedly assist small businesses as defined by the relevant regulations to forestall the validity of their cases in advance.

## **CONTRACT DOCUMENTS DEFECTS: DO CONTRACT DRAFTERS KNOW WHAT THEY WANT AND SAY IT CLEARLY?**

(LADR-927; In Press)

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The construction contract documents describe the scope of the intended work and serve to legally bind the parties to their defined or implied responsibilities, obligations, rights, duties, and liabilities in respect of the executed contract. It is common that contract documents are found to be defective, often leading to change orders, delays, and increased cost, which in turn lead to disagreements and disputes between the parties to the construction contract. Recent literature revealed a set of recommendations for improving the quality of contract documents. These call on project owners to: know what you want, describe it very clearly, not assume that the other party knows what you want, tell them what you want, and not change your mind. The objective of this paper is to assess the validity of these guiding principles through a case law review. The methodology involved analyzing fifty disputes that evolved from deficiencies encountered in contract documents. The scrutiny of the adopted cases allowed the mapping of the underlying categories of defects to the literature- encountered theorized principles, thereby verifying their propositions. The study revealed the following six general categories of impacted documents that, when drafted properly and proactively, will help owners and their contract drafters in minimizing defects in their contract documents: (1) drafting of specifications, (2) drafting of drawings, (3) drafting of conditions of contracts, (4) correctness of rendered design, (5) coordination between specifications and drawings, and (6) coordination of several contracts. These findings call on owners/contract drafters to look for ways and means to identify the measures that should be taken in order to avoid practices that may lead to defective documentation and thus minimize the possibilities of encountering such defects.

## **REVOKING THE EXERCISED TERMINATION OF THE CONSTRUCTION CONTRACT: IMPLICATIONS AND LESSONS LEARNED**

(LADR-928; In the Review Process)

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The decision to terminate the main construction contract by a project owner is a serious task that is normally approached with a great deal of caution and made almost invariably after seeking the appropriate legal advice. However, it is not a rare case that affected contractors find themselves in a position of attempting to have the exercised contract termination amicably revoked and the resumption of work on site reinstated. Whether such attempts eventually fail or succeed, major ramifications are likely to surface in administrating the propagation of the

impacts of both main contract termination and its subsequent revocation on the subcontracts of the lower-tier project participants, i.e., subcontractors. This paper tackles this exact case, which involves the actions taken by the general contractor towards the subcontracts' works, firstly upon the termination of the main contract becoming effective and then upon having this owner's exercised termination successfully revoked. The methodology involved a number of steps. Firstly, an analysis of the legal perspective on how the termination of the construction contract becomes effectively in place is carried out, using (1) a case law review of numerous industry-reported cases involving contract termination, and (2) a review of standard forms of contract conditions. Secondly, an investigation of the viability and requirements for the possible annulment of contract termination, as stipulated under Civil and Common laws, is performed. Lastly, the details of a recent multinational contractor-subcontractor dispute are thoroughly studied, and lessons learned concerning the prevailed irreparable harm are deduced. The outcomes of the work shall be of value to project owners when deciding to revoke their exercised termination and to general contractors when deciding on the effective actions towards the subcontracts' works when such a revoking action becomes effective.

## **EXPERTS INVOLVED IN CLAIMS AND DISPUTES RESOLUTION: MAPPING AND CLASSIFICATION OF ENGAGEMENT POSSIBILITIES**

(LADR-930; In the Review Process)

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The resolution of claims of disputes requires the typical involvement of professionals belonging to the various entities participating in the project construction process, including: owners, contract engineers, project managers, contractors, and subcontractors. Depending on the availability of expertise within such organizations, it is common to see the engagement of outside experts being sought to help throughout the phases of claims and disputes evolution. The objective of this research is to highlight the roles played by such experts and map these roles along to the internationally recognized standard claim and dispute administration timeline by the FIDIC. The followed methodology included (1) reviewing the relevant literature and case law on the subject, (2) highlighting the possible spectrum of expert roles, while being informed by those numerous roles played by the first author on several project cases over three decades, (3) mapping the encountered expert roles onto a standard claim and dispute resolution timeline through conceptualizing the possible engagement scenarios in each of the concerned phases, and (4) synthesizing the classes of such played expert roles. The findings revealed a spectrum of roles that can be asked of experts by way of providing guidance, advice, substantiation, facts assertion, testimony, and/or assessment. The work outcome is of importance both to construction professionals who seek the appointments of experts and to those who acts as experts in the resolution of construction claims and disputes.

## **DEVELOPMENT OF A FRAMEWORK FOR RISK ASSESSMENT IN BUILDING DEMOLITION WORKS**

(LADR-931; In the Review Process)

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The demolition process in construction projects is risky and involves many hazards that may lead to several accidents ranging from minor injury to fatality. These hazardous activities impose risk to contractors, employers/workers, and the public. Nowadays, these demolition operations are rising in every corner of India because of redevelopment policies, new byelaws, outdated design and aging of buildings, and habitation facilities to accommodate the increasing population in the limited land. Still, in most places, demolition operations depend on contractors' knowledge without following any proper standard or framework. Therefore, this study attempts to develop a framework for risk assessment in the demolition of buildings, which involves three phases: identifying, assessing, and giving control measures to potential hazards. In this direction, this study identified 40 potential hazards with the help of existing literature, field survey, and expert interviews; and categorized them into seven categories. For assessment, the 5X5 risk-matrix methodology of British Standard- 8800:2004 (BS-8800:2004) is used, which gives the risk value to each hazard; thereby, categorizing the hazard with respect to the level of acceptance. Relative Importance Index (RII) method is then used for ranking the identified risks. Considering the obtained likelihood and severity of each hazard, 'fall from height' and 'noise pollution' are identified as the most and the least significant hazards respectively. Finally, control measures are suggested. The outcome of this study shows priority order of demolition hazards from major to minor. It will give an idea to demolition practitioners for which hazard has to be eliminated or mitigated primarily with their respective control measures. It will also benefit the policymakers to formulate a policy or law on demolition safety.

## **SYSTEM DYNAMICS AS AN ASSISTIVE TOOL TO DELAY ANALYSIS IN IDENTIFYING PRODUCTIVITY LOSSES**

(LADR-948; In Press)

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It is well-established in the construction literature that change orders have negative impacts on project productivity. Such impacts have been measured through statistical models and data gathered from a large number of projects, which enables drawing conclusions on a broad level. However, there is a gap when it comes to modeling the relationships between change orders and construction productivity on the project level. This paper proposes a novel framework using system dynamics (SD) modeling to complement current delay analysis techniques in quantifying the impacts of owners' change order on project productivity. SD was used as the

modeling tool for its ability in capturing rippled impacts and modeling complex systems. The research methodology is: (1) identifying the exogenous and endogenous parameters; (2) developing dynamic hypothesis that guides model formulation; (3) developing SD model along with its mathematical formulation; (4) running verification tests, and (5) calibrating the model and testing it on a real case study. The developed model captures the typical construction cycle and can quantify the impact of each change order separately. In addition, after calibrating the model to any project, multiple what-if scenarios are conducted to provide further insights on allocating delay responsibilities. This model can identify the delays caused due to change orders that can be helpful for both contractor and owners to resolve the corresponding claims prior to escalation to Disputes.

## **DEVELOPMENT OF EFFECTIVENESS INDEX FOR ELECTRONIC TICKETING IN HIGHWAY CONSTRUCTION**

(LADR-953; In Press)

Karthik Subramanya, Sharareh Kermanshachi, Karthikeyan  
Loganathan, and Apurva Pamidimukkala

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Electronic construction (e-Construction) is gaining popularity in the highway construction industry due to manpower shortages and resource limitations. Adoption of e-Construction technologies can improve the productivity and efficiency of resurfacing operations. Poor performance quality occasionally noticed in highway construction has a detrimental effect on service life and needs urgent attention. Despite the fact that e-Construction technologies, such as e-Ticketing, have helped enhance quality and performance in various other industries, the construction sector largely depends on and inclines toward old and traditional paper-based methods. To increase the use of digital material delivery in highway and bridge construction, stakeholders must have access to complete data and decision-supporting tools. The study considers the critical effectiveness indicators of e-Ticketing implementation and provides a fuzzy- index- based approach to ranking the importance of adopting this new system. An extensive review of the current literature was performed followed by a survey of qualified highway construction professionals in the United States. The findings reveal that the ticketing process, organizational, and technological factors have relatively equivalent impacts on the effectiveness model. The outcomes of the study will provide practitioners with a tool for evaluating the priority levels of e-Ticketing technology implementation. The e- Ticketing Effectiveness Index (EEI) model can provide the state Department of Transportation (DOTs) and general contractors with a decision-making assessment tool which will facilitate in widespread adoption of e-Ticketing technology.



## **CRITICAL FACTORS AFFECTING THE BID COST OF BUILDING CONSTRUCTION PROJECTS**

(LADR-960; In the Review Process)

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A cost database is essential for contractors to estimate accurate bid costs, and most contractors use historical cost databases for this purpose. Factors that influence bid cost should be investigated so that they are accurate. From the existing literature, this study identifies 30 factors that affect bid costs, and a survey was sent to 80 prime and sub-contractors in order to determine the critical factors. The Intra Class Correlation test was conducted to determine the consistency of the responses. Then, the Relative Importance Index (RII) was determined to identify the top critical factors inhibiting the bid cost. In addition, the Mann-Whitney test was performed to determine whether the top critical factors were highly ranked. Using RII and Mann-Whitney tests, the study determined seven critical factors that affect the bid cost of building projects. They are failure to track labor productivity; failure to report site-specific project conditions; failure to report complexity of the project; lacking documentation of union restrictions, regulations, local building code, and safety requirements; failure to report change order impact on labor productivity; failure to incorporate change orders into a cost control program; and failure to report project description. These findings will assist the contractors to accurately bid the building projects.

## **EXPLORING ECONOMIC IMPACTS OF SUSTAINABLE CONSTRUCTION PROJECTS ON STAKEHOLDERS: THE ROLE OF INTEGRATED PROJECT DELIVERY**

(LADR-963; In the Review Process)

Cheng Siew Goh, Feizhen Su, Steve Rowlinson  
Heriot-Watt University Malaysia, Putrajaya, Malaysia

Climate urgency has driven sustainability and the circular economy into the agenda of the construction industry. Despite growing efforts to promote sustainability, there is still a lack of a widespread implementation of sustainability in construction projects. Cost is often viewed as a main barrier to increasing the adoption of sustainable development in construction projects. Seeking cost efficiency appears as one of the central concerns of construction stakeholders in their sustainability moves. This paper presents an assessment of economic impacts of developing sustainability in construction projects. A questionnaire survey was adopted in the study to collect views of professionals on the economic implications of sustainable construction projects. The results reveal that energy cost saving, and green subsidies are the main economic benefits derived from sustainable construction projects. Economic risks such as cost overrun and risks of not meeting the expected rate of return are primary factors hindering the development of

sustainable construction practice. The study however found that, in general, construction stakeholders perceived sustainable construction to bring more positive economic impacts than negative economic impacts for most construction stakeholders. The economic value of sustainable construction project can benefit the construction industry value chain from clients to suppliers and end-users, following an increasing demand for sustainability in the construction sector. This paper offers insights into understanding the economic implications of sustainable construction projects. Thinking around economic impacts that span the entire building life cycle is essential to reveal the true economic value of sustainable construction projects. The authors indicate how construction stakeholders, by taking an integrated project delivery (IPD) perspective, can develop a more holistic view that allows them to gauge the underlying economic value of sustainable construction projects by incorporating long term cost efficiency in the decision making.

## **PUBLICLY APPOINTED AND SWORN EXPERTS IN CIVIL AND STRUCTURAL ENGINEERING – OUTDATED ROLE OR KEY PILLAR OF THE LEGAL SYSTEM**

(LADR-989; In the Review Process)

Ulrike Quapp, Klaus Holschemacher  
HTWK Leipzig University of Applied Sciences Leipzig, Germany

In construction conflicts, disputing parties provide a large number of technical documents to the court. Judges, who are deciding the case, have excellent legal skills but normally only less technical knowledge. In many construction disputes, judges would not be able to render a fair verdict without the expertise of specialized experts. Therefore, qualified experts are a decisive factor for the functionality of the legal system. In Germany, over decades, publicly appointed and sworn experts played the key role in advising German judges in technical issues. Their professional quality has been secured by public law bodies (such as engineering chambers, chambers of commerce and industry, or chambers of crafts) which promoted public trust in the expert's services. In 2009, European legislation obliged Germany to adjust this system. As a result, the exclusive role of chambers in appointing experts expired and independent certification bodies may appoint experts according to DIN EN ISO/IEC 17024. Those experts shall be treated legally equal with publicly appointed and sworn experts. The paper focuses on the importance of civil and structural engineering experts for construction disputes. The authors explain the German court system and analyze the two systems of appointing civil and structural engineering expert, its effects on lawsuits and the public confidence in experts' quality. They use literature review and analysis of relevant jurisdiction. The conclusion is that Germany lost a proved appointing system that, for decades, ensured excellent quality of civil and structural engineering experts as crucial assistance for judges in construction disputes.

# **Schedule of Presentations and Speakers**

## **Friday, March 3**

**9:30 a.m. – 10:30 a.m.** | Moderator: Sharareh Kermanshachi

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**LADR-918** A PATH TO ESTABLISHING DELAY AND DISRUPTION CLAIMS FOR CONTRACTS ENTERED INTO PRIOR TO THE START OF THE COVID-19 PANDEMIC

**Speaker:** Michele Hermann, *Mississippi State University*

**LADR-930** EXPERTS INVOLVED IN CLAIMS AND DISPUTES RESOLUTION: MAPPING AND CLASSIFICATION OF ENGAGEMENT POSSIBILITIES

**Speaker:** Mohamed-Asem Uthman Abdul-Malak, *American University of Beirut*

**LADR-910** DISPUTE CLASSIFICATION IN CONSTRUCTION PROJECTS BASED ON LITIGATION CASES

**Speaker:** Khaled Al-Rasheed, *Kuwait University*

**LADR-884** UNCERTAINTY ANALYSIS OF KEY SCHEDULE PERFORMANCE INDICATORS IN DESIGN, PROCUREMENT, AND CONSTRUCTION PHASES OF HEAVY INDUSTRIAL PROJECTS

**Speaker:** Apurva Pamidimukkala, *University of Texas at Arlington*

**11:00 a.m. – 12:00 p.m.** | Moderator: Brian O'Rourke

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**LADR-916** ROLE OF BIM CONTRACT PRACTICES IN STAKEHOLDER BIM IMPLEMENTATION ON AEC PROJECTS

**Speaker:** Amelia Celozza, *University of Texas at Austin*

**LADR-919** ANALYSIS OF THE SIX PRELIMINARY INJUNCTIONS GRANTED IN LEGAL CHALLENGES TO COVID-19 VACCINE MANDATES FOR FEDERAL CONTRACTORS

**Speaker:** Michele Hermann, *Mississippi State University*

**LADR-883** RANKING AND WEIGHTING OF EFFECTIVE PROJECT-BASED COMMUNICATION INDICATORS (EPCIS) FOR PRIMARY AND SECONDARY STAKEHOLDERS IN CONSTRUCTION PROJECTS

**Speaker:** Apurva Pamidimukkala, *University of Texas at Arlington*

**1:30 p.m. – 2:30 p.m.** | Moderator: Ulrike Quapp

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**LADR-948** SYSTEM DYNAMICS AS AN ASSISTIVE TOOL TO DELAY ANALYSIS IN IDENTIFYING PRODUCTIVITY LOSSES

**Speaker:** Shrouk Garib, *The American University in Cairo*

**LADR-870** IDENTIFICATION OF RESILIENCE DIMENSIONS IN CRITICAL TRANSPORTATION INFRASTRUCTURE NETWORKS

**Speaker:** Apurva Pamidimukkala, *University of Texas at Arlington*

**LADR-931** DEVELOPMENT OF A FRAMEWORK FOR RISK ASSESSMENT IN BUILDING DEMOLITION WORKS

**Speaker:** Dilip A Patel, *Sardar Vallabhbhai National Institute of Technology*

**LADR-921** INVESTIGATING THE CRITICAL SUCCESS FACTORS OF CLAIMS MANAGEMENT IN THE CONSTRUCTION CONTRACTS

**Speaker:** Chengyi Zhang, *University of Wyoming*

**2:45 p.m. – 3:45 p.m.** | Moderator: Wendy Wendrowski

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**LADR-927** CONTRACT DOCUMENTS DEFECTS: DO CONTRACT DRAFTERS KNOW WHAT THEY WANT AND SAY IT CLEARLY?

**Speaker:** Mohamed-Asem Uthman Abdul-Malak, *American University of Beirut*

**LADR-925** PROTEST DENIED: A QUALITATIVE META-ANALYSIS OF FAILED CHALLENGES TO GOVERNMENT CONTRACTING

**Speaker:** Young Joo Kim, *University of Maryland*

**LADR-989** PUBLICLY APPOINTED AND SWORN EXPERTS IN CIVIL AND STRUCTURAL ENGINEERING – OUTDATED ROLE OR KEY PILLAR OF THE LEGAL SYSTEM

**Speaker:** Ulrike Quapp, *HTWK Leipzig, University of Applied Science*

**4:00 p.m. – 5:00 p.m.** | Moderator: Lance VanDemark

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**LADR-953** DEVELOPMENT OF EFFECTIVENESS INDEX FOR ELECTRONIC TICKETING IN HIGHWAY CONSTRUCTION

**Speaker:** Apurva Pamidimukkala, *University of Texas at Arlington*

**LADR-963** EXPLORING ECONOMIC IMPACTS OF SUSTAINABLE CONSTRUCTION PROJECTS ON STAKEHOLDERS: THE ROLE OF INTEGRATED PROJECT DELIVERY

**Speaker:** Cheng Siew Goh, *Heriot-Watt University*

**LADR-928** REVOKING THE EXERCISED TERMINATION OF THE CONSTRUCTION CONTRACT: IMPLICATIONS AND LESSONS LEARNED

**Speaker:** Mohamed-Asem Uthman Abdul-Malak, *American University of Beirut*

**LADR-960** CRITICAL FACTORS AFFECTING THE BID COST OF BUILDING CONSTRUCTION PROJECTS

**Speaker:** Kishor Shreshta, *Washington State University*

## List of Speakers

Amelia Celozza, *University of Texas at Austin*  
Apurva Pamidimukkala, *University of Texas at Arlington*  
Cheng Siew Goh, *Heriot-Watt University*  
Chengyi Zhang, *University of Wyoming*  
Dilip A Patel, *Sardar Vallabhbhai National Institute of Technology*  
Khaled Al-Rasheed, *Kuwait University*  
Kishor Shreshta, *Washington State University*  
Michele Hermann, *Mississippi State University*  
Mohamed-Asem Uthman Abdul-Malak, *American University of Beirut*  
Sharareh Kermanshachi, *University of Texas at Arlington*  
Shrouk Garib, *The American University in Cairo*  
Ulrike Quapp, *HTWK Leipzig, University of Applied Science*  
Young Joo Kim, *University of Maryland*

## List of Moderators

Session 1: Sharareh Kermanshachi, *University of Texas at Arlington*  
Session 2: Brian O'Rourke, *Verrill Dana, LLP*  
Session 3: Ulrike Quapp, *HTWK Leipzig, University of Applied Science*  
Session 4: Wendy Wendrowski, *Seyfarth Shaw, LLP*  
Session 5: Lance VanDemark, *The Vertex Companies, LLC*

