

DISPUTE RESOLUTION AIDED TOOL FOR CONSTRUCTION PROJECTS IN EGYPT

Mohamed Marzouk¹, Lobna El-Mesteckawi², Moheeb El-Said³

^{1,2,3}*Department of Structural Engineering, Faculty of Engineering, Cairo University, Giza, Egypt*
E-mails: ¹*mm_marzouk@yahoo.com (corresponding author)*; ²*lobna_elmesteckawi@hotmail.com*;
³*elsaid1204@yahoo.com*

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Abstract. Contract relationships in construction projects in Egypt have become increasingly strained in recent years. Working relationships, communications, and contractual commitments are often not carried out in good faith. Hence, adversarial approaches to public and private sectors of the construction industry in Egypt generate a substantial increase in the use of binding arbitration and the judicial system for the settlement of contractual disagreements. In this research, a survey questionnaire was designed to obtain the relative weights of the factors that influence the Dispute Resolution Strategy (DRS) Decision. Twenty six combinations of project situations were established based on ten factors, established after studying the causes of disputes with the aid of literature and unstructured interviews, which affect the DRS-Decision. Experts were asked to perform pair-wise comparisons for the ten factors and advise on the recommended resolution methodology for the different status of DRS-Decision's factors. Although negotiation is usually the first attempt to solving any dispute, it sometimes could waste time and consequently money without reaching a satisfying solution. A computer model is proposed to inform the user of whether to quit negotiation and/or any amicable solution to save time and money and resort to arbitration/litigation instead, or to stick to negotiation and/or any amicable solution as it's the only way by which the dispute could be resolved. Results obtained from the survey were utilized in the development of the computer model to provide a simple and an easy to use tool that could advise decision makers on the most appropriate dispute resolution strategy that would mostly succeed; save time and money. A case study is presented to validate the computer model and demonstrate its use.

Keywords: dispute resolution, conflict resolution, computer applications, decision support system, construction management.

1. Introduction

Conflict situations are inherent in construction projects. Unfortunately, such conflicts interfere with the success of projects and create additional costs for all parties (Thompson *et al.* 2000). A construction claim is an assertion of and a demand for compensation by way of evidence produced and arguments advanced by a party in support of its case (Construction Industry Institute 1996). A dispute is originally a claim, but that has been rejected by the defendant. Construction problems and disputes arise due to several factors including; technical, climatic and logistic events, while resolution of construction disputes is influenced by people's motivation, behavioral and cultural implications (McInnis 2001). If disputes are not resolved promptly, they tend to drag on and escalate and can cause project delays, which, lead to claims that require litigation proceedings for resolution, and ultimately destroy business relationships (Cheung *et al.* 2002). Project disputes have become a repetitive phenomenon in the Egyptian construction industry. Such phenomenon, if not managed efficiently, would hinder the success of many construction projects in Egypt and thus slow down the wheel of development. The Cairo Regional Center for International and Commercial Arbitration recorded over 220 law suits raised for arbitration in the last 20 years. Thus, understanding of disputes problem areas as

well as the various resolution methodologies is a step towards its solution. However, understanding of the factors influencing the dispute resolution strategy (DRS) decision and utilizing these factors to determine, using a computer model, the most probable successful strategy to be followed, depending on the dispute case, is a step towards better disputes management and consequently a step towards better performance of construction projects.

Managing construction disputes requires thorough studying of the causes of such disputes and the various resolution methodologies adopted by practitioners in Egypt. Highlighting the most frequent causes of disputes would guide project parties (owners, contractors, and consultants) to put such causes into consideration, i.e. work on preventing them, when starting a new project in order to reduce the probability of disputes occurrence as much as possible. Diekmann and Girard (1995) analyzed the effect of different project characteristics on the occurrence of contract disputes. Three categories of project characteristics were considered: people aspects, process aspects, and project aspects. Certain characteristics were found to be statistically significant indicators of construction disputes. These characteristics were grouped together into seven hybrid variables: owner management and organization, contractor management and organization, project complexity, project size, financial planning, pro-

ject scope definition, and risk allocation. The findings of this work were based on statistical analysis of data on the frequency and severity of disputes in 159 construction projects. The primary results of this study could be summarized by stating that people do not cause disputes, but do affect dispute performance more than any other variable. El-Mestekawi (2008) presented forty-four common causes of construction disputes and seven possible dispute resolution methodologies. Utilizing the results of a questionnaire survey, such causes and methodologies were ranked according to their frequency of occurrence in the construction industry in Egypt. The most frequent causes of disputes which occupied the top five ranks were: i) owner's un-fulfillment of contract obligations, ii) changing needs of owner, iii) contractor's un-fulfillment of contract obligations, iv) contradictory and erroneous information in the mass of documents and v) Inadequate technical plans/specifications. Moreover, arbitration was found to be the most frequently adopted resolution strategy.

A lot of efforts have been made in the area of construction disputes management and advising on the most appropriate dispute resolution strategy (Chan *et al.* 2006; Chan and Suen 2005; Kassab *et al.* 2006; Chan 2003; Cheung 2002; Goldberg *et al.* 1992; Mitropoulos and Howell 2001). Dispute resolution provisions are considered a crucial issue that should be considered. Jenkins and Stebbings (2006) stated that contracts parties spend less time and efforts in writing and negotiating dispute resolution provisions in the contracts compared to the time and efforts spent in commercial and financial clauses. Cheung *et al.* (2002) presented an artificial neural network technique that is used to determine the important factors, affecting the outcome of construction dispute resolution processes in Hong Kong. Spalj (2005) listed several precautions that should be considered to reduce the potential for causing construction claims. These precautions should be taking into account: 1) before bidding or negotiating the contract, 2) before signing the contract, and 3) during project execution, by preparing job documentation. Cheung (2002) presented a framework to select a dispute resolution mechanism for use in different construction contracts. An empirical study was carried out to investigate the framework, considering four types of contracts (main contracts, nominated subcontracts, domestic subcontracts, and labor contracts) and five transaction characteristics (discreteness, presentation, uncertainty, frequency, and identity). Kassab *et al.* (2006) presented a decision support system (named GMCRII) based on the graph model to resolve construction projects' conflicts. GMCRII is capable to investigate strategic interactions that took place between owners and contractors. These interactions are related to the financing of construction projects. Chan *et al.* (2006) developed a decision-making model using the analytical hierarchy process (AHP) and multi-attribute utility technique (MAUT). The model developed consists of five components: Selection factors, dispute resolution methods, utility factors, relative importance weightings, and user's preferred weightings. The purpose of this model is to

identify in a systematic manner an appropriate dispute resolution strategy for a given dispute, rather than relying on subjective decisions.

Studying the causes of disputes and preventing them at an early stage of the project, is a step forward to reducing the probability of disputes occurrence throughout the project life. However, this is not the only criteria in managing disputes in construction projects. It is important as well to be able to deal promptly and efficiently with disputes that already arose in a project. Deciding on the resolution strategy to follow in case a dispute occurred is very critical for all project parties. An unwise decision would lead to numerous losses for one or more parties. Such losses could be financial or personal. The purpose of this paper is mainly to: review the causes of construction disputes; analyze the attributes that influence the dispute resolution strategy (DRS) decision; and design a model that would assist decision makers to make the right decision regarding the resolution strategy to follow in case a dispute occurred.

The skill of dispute resolution cannot be overemphasized. It should be part of the tool kit for practitioners, especially those in a managerial position. Dispute resolution strategies can be classified into two main categories: traditional dispute resolution methodologies or alternative dispute resolution (ADR) methodologies. The formal category includes negotiation and litigation. Whereas, the latter category is defined as "any process or procedure, other than adjudication by a presiding judge, in which a neutral third party participates to assist in the resolution of issues in controversy, through processes such as early neutral evaluation, mediation, mini-trials and arbitration" (Hoogenboom *et al.* 2005). It is further classified into binding (such as arbitration), non-binding (such as mediation, mini-trials) and preventive (such as partnering and dispute review boards). Detailed description of resolution methodologies along with their advantages and disadvantages can be found elsewhere (Gillie 1988; Mix 1997; Phillips 1997; Phillips 1999; Levine 2000; Trantina 2001; Harmon 2003; Chan *et al.* 2004; Cheung *et al.* 2006).

2. Causes of Construction Disputes

Avoiding construction disputes requires understanding of the contractual terms, early non-adversarial communication, and understanding of the causes of disputes (Semple *et al.* 1994). Thus, it is very essential to study the causes of construction disputes in order to manage conflicts among project parties effectively. Forty-four causes of disputes were identified from literature and unstructured interviews, and these form the basis for the survey described later. These forty-four causes were grouped into four categories: contractual matters, cultural matters, management and organization of project parties, and project matters. The participation of different parties in a project is governed by a contract which defines the exchange of construction materials and services for money. That's why contractual problems are of the basic factors that drive the development of disputes. Cultural matters impact parties' relationships, and perceptions of each

other, which subsequently affect the behaviors they will adopt, as well as how effectively they solve problems together. On the other hand, issues involving management and organization of project parties are so important when considering the number of organizations, roles, responsibilities, experience, and the many expectations that affect these parties. Project matters category includes four criteria; project externals, project internals, construction process, and variations. Internal matters are those inherent to the project, whereas, external matters are those associated with the environment where the project is being constructed. The construction process criterion encounters problems that could hinder or delay the construction of the project, whereas, the variations criterion encounters the factors that could impose variations to the project's cost, duration, design and consequently construction methods.

3. Questionnaire Surveys

3.1. Disputes Causes and Resolution Methodologies

To identify the problem areas of construction disputes and dispute resolution practices, a questionnaire survey in a form of face-to-face interview was conducted with thirty-three practitioners, who are experts in the field. The questionnaire, designed for use in the survey, comprised three sections. The first section was meant to gather demographic information about respondents. The second section in the questionnaire contained forty-four possible causes of disputes collected from literature and unstructured interviews. These causes were categorized under four heads; contractual matters, cultural matters, management and organization of project parties, and project matters. Table 1 lists the forty-four causes and their associated codes. Every respondent was requested in this section to rate each cause of dispute on a five point scale based on causes frequency of occurrence. In the last section, the eight dispute resolution methodologies gathered from literature review were encountered and categorized under two heads: Traditional and Alternative Dispute Resolution Processes. Similar to section two, each respondent was asked to rate every methodology, based on its frequency of adoption, on a five-point scale.

The questionnaire was distributed only to the first class of contractors registered in the *Egyptian Federation for Construction and Buildings Contractors*, providing that they have enough experience with construction disputes. The consultants and owners' representatives of big investment projects have been also approached for the questionnaire. A total of 40 practitioners were approached for this questionnaire, however, only 33 responded. All respondents hold senior positions with related working experience. The numbers of respondents are fifteen (i.e., 45.45%), twelve (i.e., 36.36%), and six (i.e., 18.18%) which belong to contractors, consultants, and owners' representatives, respectively. Whereas, the distribution of the respondents' positions at work is 22%, 62%, and 16% from strategic, managerial, and supervisory levels, respectively. The majority of respondents had practiced in the field for 20 to 30 years. Eight respondents

(i.e., 24.24%) have been in the field for more than 30 years. The minimum size of the sample required from the targeted population was determined statistically according to Kish (1995) as per Eqs (1) and (2):

$$n_0 = \frac{p^*q}{V^2}, \quad (1)$$

$$n = \frac{n_0}{1 + \frac{n_0}{N}}, \quad (2)$$

where: n_0 – First estimate of sample size, p – The proportion of the characteristic being measured in the target population, q – Complement of p or $1-p$, V – The maximum standard error allowed, N – The population size, and n – The sample size.

The total number of contractor companies (N), registered in Egyptian Federation for Construction and Building Contractors (EFCBC), in the year 2007 is 58,991, and the first class contractors' companies are 1,716. Hence, p is estimated to be the ratio between the first class of contractors' companies to the total number of contractor companies which is 0.029. To account for possible error in the qualitative answers from the questionnaire, the maximum standard error V was set at 10%. Substituting in Eqs (1) and (2), the minimum sample required was calculated to be 2.816. This means that the minimum sample size is approximately 3.0. Since the number of contractor companies in Egypt is more than the number of consulting companies and owner representatives, therefore, it would be sufficient to target the same sample size, for consultants and owner representatives, as that of contractors. Responses obtained from every category of respondents (contractors, consultants, and owner representatives) were separately collected. The frequencies of all causes are depicted in Fig. 1. According to the survey findings, the most frequent causes of disputes that occupied the top five ranks are (starting from the top): i) owner's un-fulfilment of contract obligations, ii) changing needs of owner, iii) contractor's un-fulfilment of contract obligations, iv) Contradictory and erroneous information in the mass of documents, v) Inadequate technical plans/specifications. Whereas, the least frequent causes of disputes that occupied the last five ranks are (starting from the least): i) technological developments, ii) stringent building regulations, iii) environmental restrictions, iv) weather conditions, and v) changes in environmental regulations. Regarding the resolution methodologies, it was found that arbitration is the most frequent methodology adopted in case a dispute occurred, followed by negotiation and mediation. Whereas, DRB's, partnering, and mini-trials methodologies are the least adopted ones.

3.2. Dispute Resolution Strategy (DRS) Decision Factors

Another questionnaire was designed for the purpose of collecting data that would facilitate the construction of the computer model named Dispute Resolution Strategy (DRS)

Table 1. Causes of construction disputes

	Criterion	Code	Cause
Contractual Matters	NA	CN1	Inadequate technical plans/specifications
		CN2	Inadequate scope definition
		CN3	Inaccurate material estimating
		CN4	Diverse interpretations of contract terms
		CN5	Contradictory and erroneous information in the mass of documents
		CN6	Inadequate risks identification/allocation
		CN7	Lack of dispute resolution process in case a dispute occurred
Cultural Matters	NA	CL1	Little cooperation among project parties
		CL2	Lack of trust among project parties
		CL3	Opportunistic behavior of project parties
		CL4	Adversarial approach in handling disputes
		CL5	Reluctance of project participants to deal promptly with changes
		CL6	Conflicting goals and objectives of project parties
Management and Organization of Project Parties	Contractors	MO1	Contractor's lack of experience in construction law, practices and management
		MO2	Contractor's lack of interpersonal skills
		MO3	Dishonesty of contractor
		MO4	Contractor's un-fulfillment of contract obligations
	Owners	MO5	Owner's lack of experience in construction law, practices and management
		MO6	Unrealistic Owner's expectations
		MO7	Owner's lack of interpersonal skills
		MO8	Dishonesty of owner
		MO9	Owner's un-fulfillment of contract obligations
	Consultants	MO10	Consultants' lack of experience in construction law, practices and management
		MO11	Consultants' lack of interpersonal skills
		MO12	Dishonesty of project consultants
Project Matters	Project Externals	PT1	Site limitations, considering storage, access, etc.
		PT2	Problems with authorities or neighbors affecting progress
		PT3	Stringent building regulations
		PT4	Environmental restrictions
		PT5	Weather conditions
		PT6	Force majeure
		PT7	Lack of capable craftsmen/subcontractors
	Project Internals	PT8	High level of project uncertainty
		PT9	High degree of design complexity
		PT10	High degree of construction complexity
	Construction Process	PT11	Late supply of equipments and materials
		PT12	Poor labor productivity
		PT13	Shortage in resources
		PT14	Insufficient quality control procedures
	Variations	PT15	Changing market conditions
		PT16	Technological developments
		PT17	Changes in environmental regulations
		PT18	Changes in designs, material types and specifications by consultants
		PT19	Changing needs of owner

Decision. Five domain experts were approached for this questionnaire, however, only 3 responded. The three domain experts are holding senior/strategic positions, two of which have participated in the field for more than 30 years and one for about 15 years. The survey questionnaire comprised three sections. Section one was meant to gather demographic information about respondents. Section two contained the ten attributes influencing the dispute resolution strategy decision (see Fig. 2). Studying the causes of construction disputes and ranking them led to establishing the possible factors that might affect the Dispute Resolution Strategy (DRS) Decision with the aid

of literature and unstructured interviews. Respondents, in this section, were asked to perform pair-wise comparisons between the above factors in order to determine their relative weights – the extent to which every factor affects the final decision. The third section in the survey contained twenty-six projects' scenarios. These situations were extracted from the ten factors previously discussed. Respondents were asked to assign a resolution methodology for each situation. The methodologies from which respondents had to choose were: 1) Negotiation, 2) Mediation, and 3) Arbitration/Litigation. Only these three resolution strategies were addressed as they were

found, with reference to the first questionnaire results, to be the most frequently adopted in solving disputes for construction projects in Egypt. The 26 situations and the resolution methodologies assigned for each are listed in Table 2.

The analysis involves the utilization of the Analytic Hierarchy Process (AHP) procedures developed by Saaty (1994) in order to estimate relative weights for the factors. The AHP is a decision making process that drives ratio scales of relative magnitudes of a set of elements by making paired comparisons. The first step is to compare

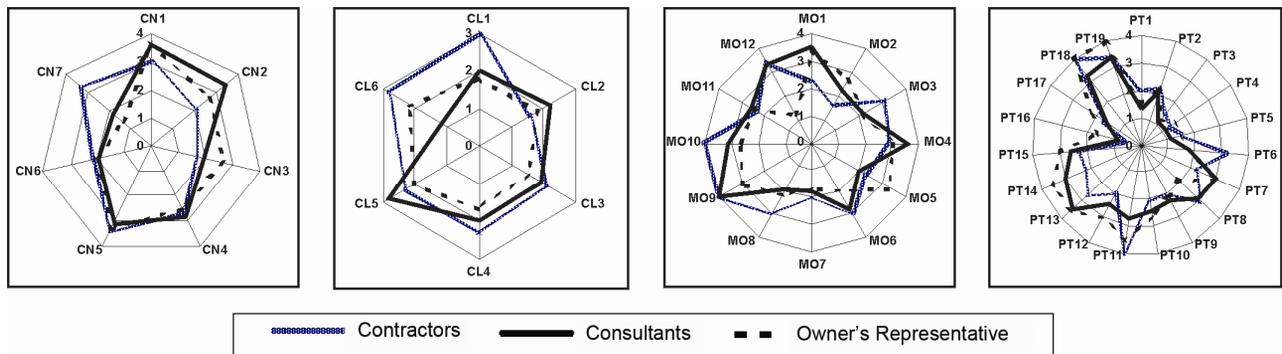


Fig. 1. Frequency of disputes causes

Table 2. Recommended resolution methodologies for projects' scenarios

Attribute	Weight (%)	Scenario	Resolution Methodology
1.1. Behavior	0.8	Parties inside the project are competing.	Arbitration/Litigation
		Parties inside the project are cooperating.	Negotiation
1.2. Project parties' relation	1.4	Relationship between parties is strained.	Arbitration/Litigation
		Relationship between parties is good.	Negotiation
1.3. Type of involvement	4	Parties are involved in long-term relations.	Negotiation
		Parties are involved in short-term relations.	Mediation
1.4. Previous resolution process satisfaction	6.8	Parties are satisfied with previous resolution processes.	Negotiation
		Parties are not satisfied with previous resolution processes.	Arbitration/Litigation
1.5. Dispute responsibility	7	Parties agree on responsibility for the dispute.	Negotiation
		Parties do not agree on responsibility for the dispute.	Mediation
2.1. Liquidity status	28.8	The liquidity status of the claimant is relatively poor (critical).	Mediation
		The claimant has a strong (non-critical) liquidity status.	Arbitration/Litigation
2.2. Time impact	7.2	A long duration resolution process would negatively affect the claimant's company.	Negotiation
		A long duration resolution process would neutrally affect the claimant's company.	Mediation
		A long duration resolution process would positively affect the claimant's company.	Arbitration/Litigation
3. Amount claimed	22	The amount claimed is less than 10% of the original contract amount.	Negotiation
		The amount claimed is 10–25% of the original contract amount.	Negotiation
		The amount claimed is 25–40% of the original contract amount.	Mediation
		The amount claimed is 40–60% of the original contract amount.	Mediation
		The amount claimed is more than 60% of the original contract amount.	Arbitration/Litigation
4. Strength of documents/facts	10	Strength of available facts/documents is weak.	Negotiation
		Facts/documents available are of intermediate strength.	Mediation
		Facts/documents available are reliable (strong).	Arbitration/Litigation
5. Complexity of dispute/defends	12	Level of complexity of the dispute and defenses is low.	Negotiation
		Level of complexity of the dispute and defenses is medium.	Mediation
		Level of complexity of the dispute and defenses is high.	Arbitration/Litigation

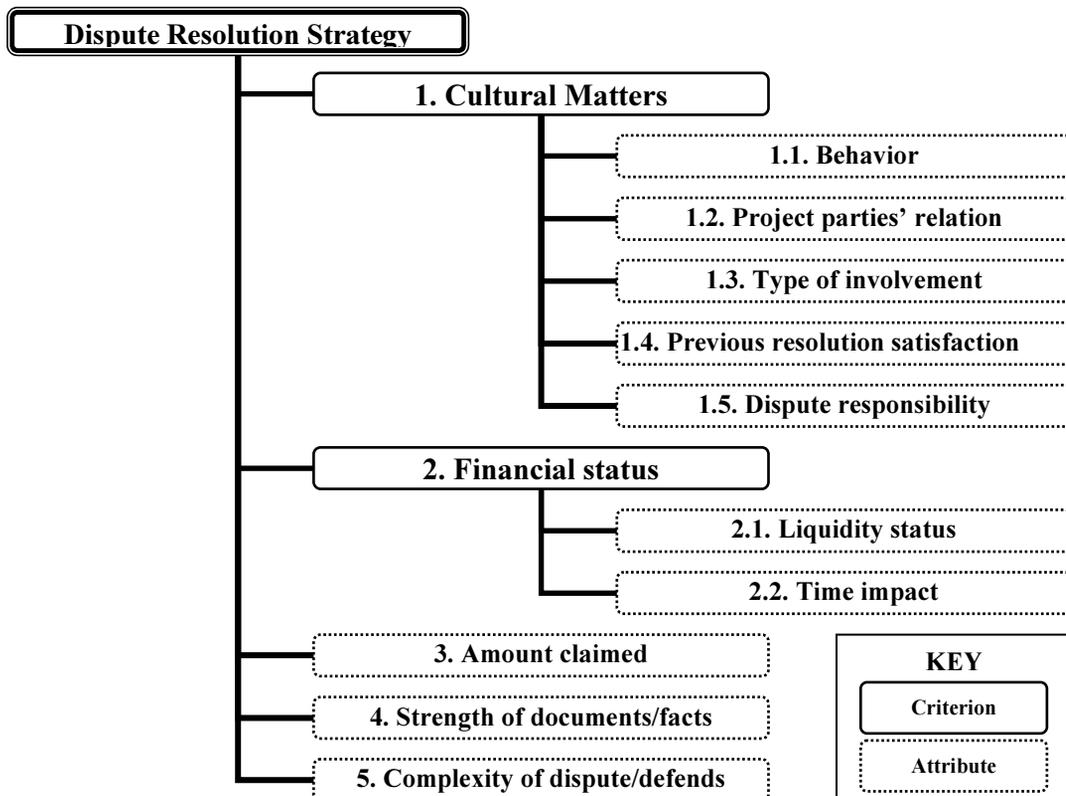


Fig. 2. Dispute resolution strategy decision's attributes

the elements in each level of the hierarchy in pairs. The comparisons are made using judgments based on knowledge and experience to interpret data according to their contribution to the parent node in the level above. Once all the pair-wise comparisons in a group are completed, a scale of relative priorities (weights) is derived from them. This process is repeated for all groups on all levels. The final step is a weighting process that uses these priorities to synthesize the overall importance of the criteria and sub-criteria. Pair-wise comparisons are represented in a square matrix with as many rows and columns as there are elements connected to the parent node in the level above. Respondents' comparisons were collected and an average value was calculated for every pair-wise comparison in order to obtain attributes' weights (see Table 2)

4. Implementation of DRS Aided Tool

A computer model was developed as an aided tool for dispute resolution strategy decision. The tool was developed on three stages: 1) literature review and unstructured interviews; 2) knowledge base development; 3) system implementation. The tool employs all the data collected from the second questionnaire survey (Experts' Knowledge) to form the knowledge base for the model. The knowledge-base is represented as a series of production rules. Visual Basic programming language was utilized to code the tool's IF-THEN rules. The rules entered were simple If-Then rules, each of which takes the weight of the factor it questions. After coding the rules, several user interfaces have been developed to facilitate data entry, as depicted in Fig. 3. The user, decision maker, has

to respond to ten questions in order to reflect the dispute case, and upon his responses, the program assigns a resolution methodology for each of the ten factors influencing the dispute resolution strategy (DRS) decision. Finally, the model calculates a total percentage for each of the three resolution strategies; arbitration, mediation and negotiation. These percentages imply the probability of success of every strategy, if chosen.

5. Model Validation

An actual case study is presented to examine its validity of the proposed tool. The case data is as follows:

1. Project parties are competing.
2. The relationship between the project parties is strained.
3. The project duration was 33 months, which was considered as a long-term commitment.
4. The project parties did not experience any previous disputes, thus it was considered that project parties are not satisfied with previous resolution methodologies as they failed in this case with amicable solutions.
5. Project parties do not agree on responsibility for the dispute.
6. The liquidity status of the claimant (contractor) is strong.
7. A long duration resolution process would negatively affect the claimant.
8. The contract amount was around 66 million dollars, and the amount claimed was around 1.5 million dollars (less than 10% of the original contract amount).

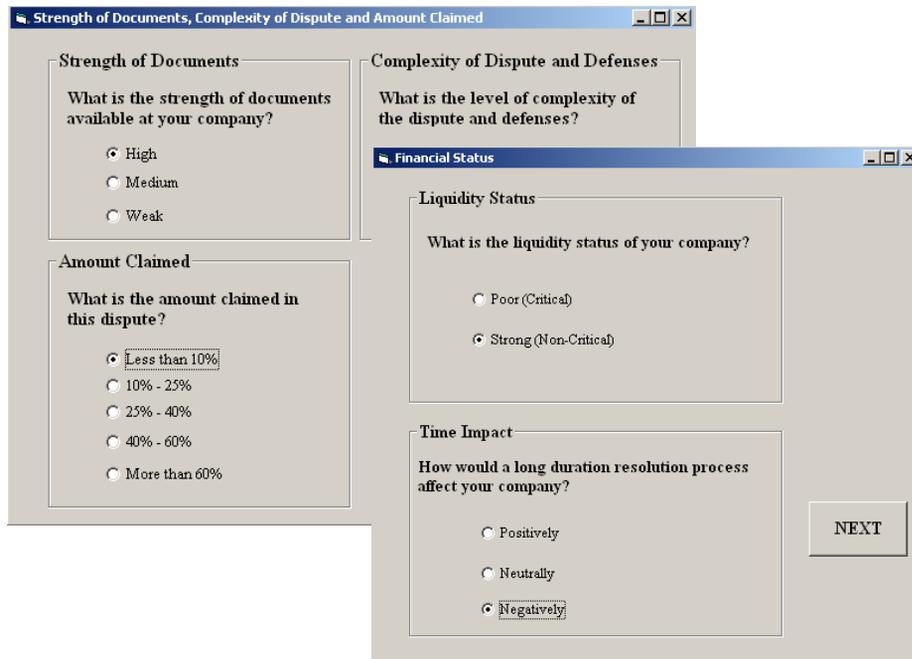


Fig. 3. DRS aided tool screens

9. The strength of facts/documents available at the claimant is strong.

10. The level of complexity of the dispute and defense is high.

The data were fed to the computer model which recommended Arbitration as the most efficient resolution strategy for such case with 59.8% percent of success (see Table 3). This result indicates that the probability of success of negotiation or mediation is very low in comparison to Arbitration. 59.8% of success would direct the claimant in this case to resort to Arbitration through which there is a fair possibility that this dispute will be settled. The computer model’s conclusion proves its truthfulness as it was stated in the case that the project parties resorted at the end to Arbitration to resolve the dispute after failure of amicable solutions.

Table 3. DRS aided tool outputs

Resolution Methodology	Percent of success
Negotiation	33.2
Mediation	7.0
Arbitration	59.8

6. Discussion and Conclusions

In construction disputes, organizations face difficult decisions regarding resolution methodology; whether to negotiate, settle, or pursue other methods of dispute resolution. These decisions involve uncertainty or risk about the possible outcomes and the associated costs. The probability of certain outcomes varies depending on the facts and circumstances of the dispute at hand. The research work reviewed the causes of construction disputes and the various disputes resolution methodologies. It analyzed the attributes that influence the dispute resolution strategy

(DRS) decision in Egypt. The results of this research revealed that the most important criterion influencing the dispute resolution strategy decision is the financial status, followed by the amount claimed, cultural matters, complexity of dispute and defend, and strength of documents/facts. A computer model was designed to compile all the results of the survey and experts’ views in a form of IF–THEN rules. The model is utilized as an aided tool that supports decision makers to the expected resolution strategy that would mostly succeed. Although negotiation is usually the first attempt to solving any dispute, it sometimes could waste time and consequently money without reaching a satisfying solution. Hence, the computer model aims at informing the user of whether to quit negotiation and/or any amicable solution at an early stage of the dispute, to save time and money, and resort to arbitration/litigation instead, or to stick to negotiation and/or any amicable solution as it’s the only way by which the dispute could be resolved, i.e. as the probability of success of arbitration is very low. In general, the model advises the claimant to resort to arbitration if its percentage of success is high, i.e. approximately >60% and to give up negotiation and /or mediation if their percentage of success is low, i.e. approximately <30%.

Incorporating both results of survey I and II, it is recommended for all project parties to prevent as much as possible the causes of disputes that were found to be the most frequent in order to reduce disputes occurrence in a construction project and consequently promote the success of the project. The following recommendations might help accomplishing disputes reduction in a project:

- Owner should present complete and clearly presented designs, as well as clearly and comprehensively prepared contract documents (including drawings and specifications).

- Project parties should undergo detailed and complete site investigation during the tender phase in order to cut down errors and design changes.
- Consultant offices and project management organizations should have an established control system that is to be used to handle, control, and evaluate variations initiated by the owner.
- Owner should allow sufficient time to prepare project briefs and feasibility studies. A comprehensive financial plan and cash flow should also be prepared.
- Owner should make sure that adequate funding is available before the project starts.
- Owner should not impose unrealistic completion dates.
- Contractor should develop a comprehensive financial plan and cash flow.
- Contractor should evaluate his financial capability and volume of works he would be engaged in to make sure that adequate funding is available before he gets involved into the project.
- Contractor should develop monitoring and periodical reporting of critical and long lead items and periodically provide a narrative explaining the causes of any delay experienced.
- Team building should be conducted to develop common project goals and processes, and discuss interests and expectations.
- Project parties should employ preventive resolution strategies; partnering or DRB, at an early stage of the project in order to reduce the probability of disputes occurrence as much as possible.

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GINČŲ SPRENDIMO PAGALBOS PRIEMONĖ STATYBOS PROJEKTAMS EGIPTE

M. Marzouk, L. El-Mesteckawi, M. El-Said

Santrauka

Statybos dalyvių santykiai statybos projektuose pastaruoju metu tampa labai įtempti. Dažnai darbiniai santykiai, komunikacija ir sutartiniai įsipareigojimai nėra vykdomi sąžiningai. Todėl priešiški požiūriai į statybos pramonės viešąjį ir privatajį sektorius Egipte sukelia reikšmingą teisinių ginčų sistemų ir arbitražo taikymo didėjimą. Šiame tyrime, siekiant nustatyti santykinį veiksnių, lemiančių ginčų sprendimo strategijos (GSS) sprendimo santykinį reikšmingumą, buvo sudaryta tyrimo anketa. Remiantis dešimčia veiksnių, kurie daro poveikį GSS sprendimams ir buvo nustatyti remiantis literatūros bei nestruktūrizuotais pokalbiais studijuojant ginčų priežastis, buvo sudaryti dvidešimt šeši projektų situacijų deriniai. Ekspertų buvo prašoma atlikti dešimties veiksnių porinių lyginimą ir pasirinkti ginčo sprendimo metodologiją esant skirtingoms GSS sprendimų veiksnių reikšmėms. Nors derybos, kaip įprasta, yra pirmasis bandymas spręsti bet kokią ginčą, kartais tai gali būti tik laiko ir lėšų švaistymas nepasiekiant norimo rezultato. Pasiūlytas kompiuterinis modelis, kuris gali informuoti naudotoją, ar verta siekiant taupyti laiką ir pinigus nutraukti derybas ir (arba) kitą taikų procesą, vietoj to pradėti teismo arba arbitražo procesą, ar tęsti derybas ir (arba) taikų procesą kaip vienintelį būdą išspręsti ginčą. Remiantis tyrimo rezultatais buvo sukurtas paprastai naudojamas kompiuterinis modelis, kuris sprendimų priėmėjui gali patarti, kokią ginčo sprendimo strategiją reikėtų pasirinkti, kuri iš jų yra sėkmingiausia, taupo laiką ir pinigus. Siekiant parodyti kompiuterinio modelio veikimą pateikta atvejo analizė.

Reikšminiai žodžiai: ginčų sprendimas, konfliktų sprendimas, kompiuterių programos, sprendimų paramos sistema, statybos valdymas.

Mohamed MARZOUK. Associate Professor at Dept of Structural Engineering, Faculty of Engineering, Cairo University. He obtained his BSc and MSc in Civil Engineering from Cairo University in 1995 and 1997, respectively. He obtained his PhD from Concordia University in 2002. He serves as a member for several national committees including Egyptian Code of Practice for Construction Management. His research interests include simulation and optimization of construction processes, O–O simulation, fuzzy logic and its applications in construction, risk analysis, and decision analysis.

Lobna EL-MESTECKAWI. Senior Procurement Engineer at Power Generation Engineering and Services Company (PGESCO), Bechtel's affiliate, and a Ph.D. student at Dept of Structural Engineering, Faculty of Engineering, Cairo University. She obtained her B.Sc. from the American University in Cairo in 2004, Construction Engineering and Management Dept., and her M.Sc. from Cairo University in 2008. Her research interests include construction disputes, decision analysis, and optimization of construction management processes.

Moheeb EL-SAID. Professor of construction engineering and management at Dept of Structural Engineering, Faculty of Engineering, Cairo University. A chairman of Quality control committee, National organisation for civilisation reformation, Ministry of culture. His research interests include productivity, scheduling, risk assessment, life cycle costs, and simulation.