

STUDY ON CAUSES OF DELAY AND COST OVERRUNS IN HERITAGE RENOVATION OF BHAKTAPUR

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Abstract

A fresh and present look at the performance and delivery of heritage projects is required because few studies have been conducted to explore the specific project management and participant issues that contributed failed elements (time and cost) in heritage projects. The major contribution of this research is in the guidance for improvement to help avoid delays and cost overruns in future heritage renovation projects. Bhaktapur municipality is rich in heritage; here the tourism market is one of the source of economy. Bhaktapur municipality has been selected for this study because many of the heritage renovation projects have been completed each year. Most of heritage renovations have been done with the help of users committee and *amanat*. Tourism has become an important economic factor for the region. So the heritage renovation is studied with the impact of the delay in the works. The research design for this study is more qualitative than quantitative. The main causes of delay have been found as difficulties in financing projects and poor managerial skills. Similarly, the causes of the cost overruns have been found as material cost increased due to inflation.

Keywords: Heritage renovation, Delay analysis, Cost overruns, Bhaktapur municipality

1. Introduction

The step to protect ancient properties, that are regarded as forming part of a country's national heritage, has grown immensely since the World Heritage Centre and the World Heritage list were both established in 1972 (UNESCO, 1972). The importance of old heritage sites has been recognized worldwide and analyzed by many researchers (Araoz, 2011); (Brand, 1995); (Forster and Kayan, 2009); (Orbagli, 2008); (Rypkema, 2003). Different heritage organizations have since been founded with the goal of protecting and managing cultural heritage, and different studies have explained the importance of preserving and protecting old heritage architecture. The necessity to preserve the aesthetic quality of heritage buildings and their outstanding universal value is emerging as a task of high importance for governments and the professional

discipline that runs heritage projects. (Mason, 2005; Provins, 2008 and Roders, 2011).

Managing heritage projects has been seen as a complex issue, sometimes facing significant criticism (Reyers, 2001). Today, there is growing reception that heritage conservation provides cultural, economic and social benefits to urban communities. Moreover, heritage buildings are seen as an important element of Bhaktapur's social capital (Bullen, 2011). Bhaktapur municipality highlighted the importance of taking actions to protect heritage places from further developmental activities in order to retain their values. Heritage projects management is necessary to execute meeting time and cost obligations; this drags towards the need for investigation of current project management systems to obtain better outcomes in heritage projects.

The present study attempts to address certain critical activities in the current management of the planning or design phase of the project lifecycle of heritage

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renovation, which is considered necessary in the successive construction phases, and thereby, it contributes significantly to control project cost overruns and time delays. Although supporting principles, policies and guidance to improve heritage renovation project outcomes have been developed. Many problems still occur to seriously affect the management of heritage renovation projects.

A new and fresh look at the project performance and delivery of heritage projects is necessary, as few studies have been conducted to explore the specific project management and the role of active stakeholders that contributed to delays and cost overruns.

Despite the results from previous research that have been utilized to provide solutions to improve the delivery of heritage renovation projects, many such projects are in fact still running time overrun and cost overrun. Meeting the time and cost limits is often found even in the well-managed projects that are run by experienced managers and supported by highly regarded organizations. After fifteen years of collecting data, (Shenhar, 2007) came up with the surprising result that 85 percent of all construction projects have failed to meet time and budget goals. A main task of the research is to identify the major causes of delays and cost overruns in heritage renovation and to identify causes of how current processes and procedures can be improved to better fit the heritage project to ensure the completion on time and within budget.

Researcher mainly focused on major causes of delay as Client related factors that include finance management and payments of completed work and delay in decision making; Contractors related factors include the site management, improper planning, adequate construction experience, and correct execution during construction, proper construction methods followed and subcontracting the work system. Consultants related factors include contracts management, preparation and approval of drawings, quality assurance control and timely approval of tests and inspections; materials factors include quality and availability; labour and equipment factor include labour supply, labour productivity and equipment availability and

maintenance; contractual relationships factors include major disputes resolution and negotiations during construction, appropriate and functional organizational structure linking all parties involved in the project and effective communication between these parties; external factors include weather conditions, changes in regulations, problems with neighbors and site conditions.

Tourism plays an important role in the economy of Bhaktapur municipality. This study finds that cultural tourism in Bhaktapur has contributed to local government's tax revenue particularly through tourist entry fee which in turn contribute in the conservation of the world heritage properties.

People are always captivated by newness and wants of the new thing in a normal case. So, with the changing lifestyle the house owners also want a modern lifestyle with cables, solar panels, underground water tanks, roof-top tanks and as such which World Heritage Site rules do not allow. With these conflicting interests and noncompliance of rules and regulations take place leading to loss of the uniqueness of its heritage.

All the three Durbar Squares in Bhaktapur are in good condition. Local people of Bhaktapur are aware of the knowledge of conservation of heritages. During the study, it was found that the site manager had more contact with the locals. People also have realized the importance of conservation, but they wish for incentives. The locals of Bhaktapur Dubar Square have decided not to sell their houses to outsiders. This also may be the reason for the intactness of urban space as every resident is the people born and brought up with the Newari tradition and the surroundings.

2. Methodology

2.1. Study Area

The Bhaktapur municipality has population about 77,000 inhabitants and is located at a distance of 16 km east of Kathmandu. Besides Kathmandu and Lalitpur, it is the only ancient Newari town, and is one of the three old royal cities in the valley.

Its location on the main caravan route between Tibet and India had made the city prosperous and brought

a certain impulse to the development of cultural life. Nowadays, relics of this multifaceted cultural and architectural history are the main reasons for domestic and foreign tourists to visit the city.

Tourism has become an important economic factor for this municipality. Another important economic sector in Bhaktapur municipality is agriculture. About 60 % of the city's population are members of the Jyapu caste and working mainly as farmers (many of them in subsistence), although Bhaktapur is a medium size city (Taraschewski, 2007).

In Bhaktapur, the renovation works of heritage by the users' committee was started on 049/50 fiscal year. Data from the Bhaktapur magazine, 208 renovation works were studied which were renovated from year of 2055 B.S to till date which shows the renovation works of about 71 percentage of the renovation projects are within the budget and time. The study is conducted for further improvement in renovation works within budget and time.

2.2. Current Management Practices of Old Heritage Renovation Projects:

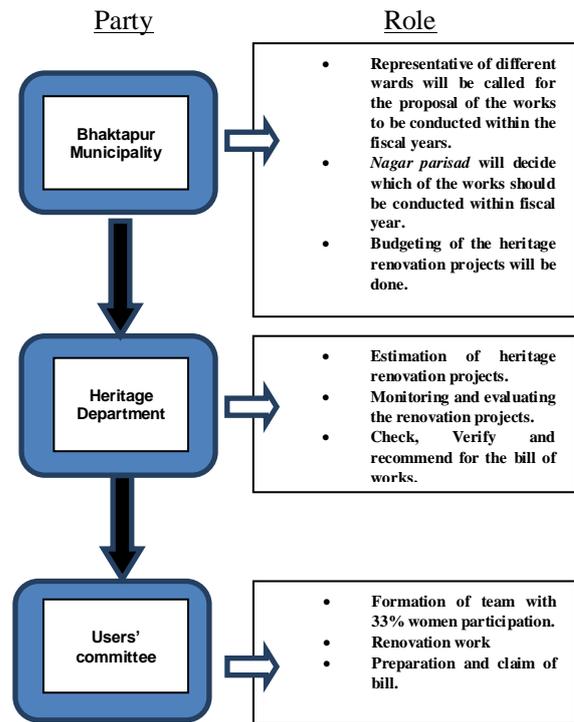


Fig 2 Current management practices of old heritage renovation projects

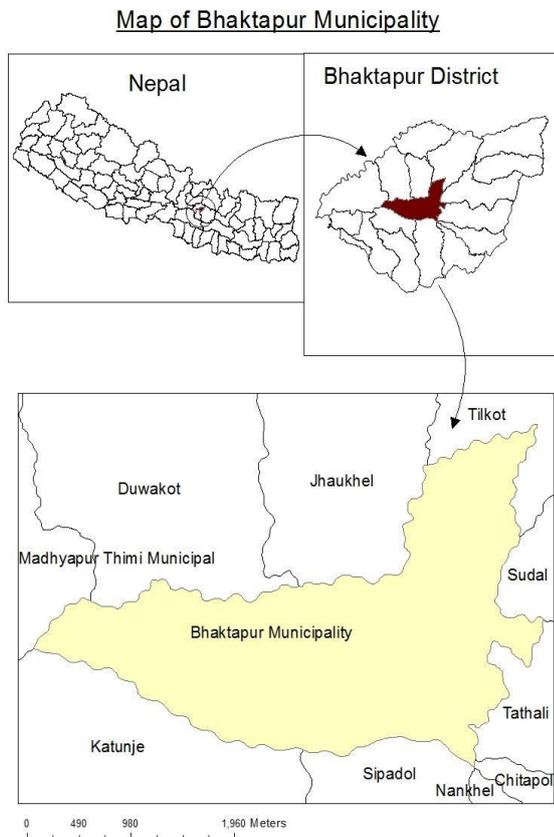


Fig 1 Location of Bhaktapur municipality

Sampling for Interview with Key-role Personnel

For sampling for interview with key-role personnel, officials from various projects were interviewed as per questionnaire developed. The officials are either chairpersons of the renovation project or individuals assigned by chairperson. The sampling in this case was purposive or judgmental sampling, done on researcher's intuition and subjective and relevance basis.

Sampling for Interview with Archaeology Department Officials, Bhaktapur Municipality

Sub overseers and Architects from Archaeology department officials in Bhaktapur Municipality were selected for interview and discussion. For the study, the researcher conducted interviews with Mr. Surya Bhakta Kharbuja, Technical Advisor, Archeology Department, Bhaktapur Municipality, who was involved in all the renovation projects.

For research, Mr. Kharbuja acts as a member of Bhaktapur Municipality.

Sampling for Questionnaires with Individuals (end members)

For questionnaire to respond, the researcher met individuals, and interviewed individuals from different walks of life as per questionnaire developed. Random sampling technique was used in this case for selecting the samples. Although the number of samples is too small compared to the entire population, the number has been restricted due to similarity of responses from all individuals involved and also due to limitation of time.

2.4. Data collection techniques

For the purpose of this study, the various types of data to be collected includes primary data through observations and questionnaires and interviews with key members of concerned heritage renovation projects, and direct and indirect beneficiaries of projects were conducted. Municipality members, representatives of political parties, intellectuals, local people etc. were the beneficiaries. Secondary data from existing laws, rules and regulations, literature review, existing cases, previous relevant studies in Bhaktapur municipality, etc. were considered.

2.5. Data Analysis Techniques

In the present study, the collected data was analyzed by using SPSS tools and Qualitative Data Analysis Technique. The study involves Qualitative Data in the form of information gathered in a non-numerical form like people and their activities and views, signs, symbols, interview transcript, field notes, images and documents (report, meeting minutes etc.). The most common forms of qualitative data were what people have said or done.

Using Qualitative Data Analysis technique, the raw data is collected in some form of explanation, understanding or interpretation of the people under investigation. Qualitative Data Analysis then the meaningful and symbolic content of qualitative data was evaluated and interpretation was developed to categorization and analytical understanding to draw the conclusions.

3. Result and Discussion

3.1. Correlation Analysis

In this study, the Pearson Correlation coefficient was used to test the presence of association between the variables. Values between 0 and 0.3 (0 and -0.3) indicate no correlation (variables not associated), 0.3 and 0.5 (-0.3 and -0.5) a weak positive (negative) linear association, Values between 0.5 and 0.7 (-0.5 and -0.7) indicate a moderate positive (negative) linear association and Values between 0.7 and 1.0 (-0.7 and -1.0) indicate a strong positive (negative) linear association. The significance of the relationship is tested at 95% level with a 2-tailed test where a statistically significant 33 correlation is indicated by a probability value of less than 0.025. This means that the probability of obtaining such a correlation coefficient by chance is less than 2.5 times out of 100, so the result indicates the presence of an association.

3.2. Most Important Delaying Parameters:

From the respondents, SPSS analysis was done taking the very high linear association with correlation value greater than 0.9 to 1.0 are taken. There is $25 \times 2 = 50$ number of very high correlation data. And it indicates following variables as a major parameter of delay analysis.

Table 1 Important cost overruns parameters

S.No.	Correlation between		Correlation value	Level of significance
1	Increase environmental restriction	poor relationship with sub-contractor	0.922	0.009
2	Poor cost control of site management	Cost of accident: damages, injury and death	0.944	0.005
3	Lack of resource planning	Material cost increased by inflation	0.905	0.013
4	Lack of resource planning	Increase in labor cost	0.944	0.005
5	Claims and dispute with clients	poor team work relation	0.976	0.001
6	Material cost increased by inflation	poor team work relation	0.937	0.006

Table 2 Correlation between important delaying parameters

S.No.	Correlation between		Correlation value	Level of significance
1	Difficulties in financing project	Wind damages	0.913	0.014
2	Difficulties in financing project	Hot weather effect on construction activities	0.903	0.014
3	Difficulties in financing project	Delay in performing final inspection and certification	-0.953	0.003
4	Difficulties in financing project	Delay in obtaining permits for construction	0.943	0.005
5	Delay in producing design documents	Ineffective planning and scheduling of project	0.932	0.007
6	Delay in producing design documents	Delay in obtaining permits for construction	0.943	0.005
7	Unclear and inadequate details in drawings Design	Poor site management	1.000	0.000
8	Unclear and inadequate details in drawings Design	Poor Managerial Skills	0.921	0.009
9	Unclear and inadequate details in drawings Design	Poor Subcontractor Performance	0.932	0.007
10	Misunderstanding of municipality requirements	Delay in performing final inspection and certification	0.913	0.011
11	Inadequate design-team experience	Ineffective planning and scheduling of project	09.55	.0003
12	Inadequate design-team experience	Late in selection of finishing materials due to availability of many types in market	0.968	0.002
13	Un-use of advanced engineering design software	Conflicts between parties	0.922	0.009
14	Change Order	Late in selection of finishing materials due to availability of many types in market	0.922	0.009
15	Wind Damage	Hot weather effect on construction activities	1.000	0.000
16	Rain effect on construction activities	Poor Managerial Skills	09.52	0.003
17	Fire	Changes in material types and specifications during construction	0.955	0.003
18	Poor communication and coordination on site	Poor Subcontractor Performance	0.919	0.010
19	Poor site management	Poor Managerial Skills	0.929	0.009
20	Poor site supervision	Poor Managerial Skills	0.932	0.007
21	Slowness in decision making	Late procurement of materials	1.000	0.000
22	Rework due to errors during construction	Changes in material types and specifications during construction	0.958	0.003
23	Improper construction methods implemented	Poor Managerial Skills	0.952	0.003
24	Changes in government regulations and laws	Seasonal employment	-1.000	0.000
25	Shortage of labors	Personal conflicts among labours	0.931	0.007

From the above analysis of data, it was found that the numbers of variables affecting the delaying in the renovation projects are repeated numbers of times. Among them these three variables repeated the most are given in the Table no. 3 below.

Table 3 Most affecting parameters for Delay

S.No	Variables	No. of repetition
1	Poor Managerial Skills	10
2	Difficulties in financing project	8
3	Unclear and inadequate details in drawings	6

From the above analysis, it is clearly seen that the renovation is affected by Poor Managerial skills, Difficulties in financing projects and Unclear and Inadequate details in drawings.

3.3. Most Important Cost Overruns Parameters:

From the respondent, SPSS analysis was done taking the very high linear association with correlation value greater than 0.9 to 1.0. There is 6*2=12 number of very high correlation data. And it indicates variables as the most important cost overruns parameters as shown in table 1.

From the above analysis data, it was found that the numbers of variables affecting the cost overruns in the renovation projects are repeated numbers of times. Among them these three variables repeated the most, they are:

Table 4 Most important cost overruns parameters

S.No	Variables	No. of repetition
1	Lack of resource planning	4
2	Material cost increased by inflation	4
3	Poor team work relation	4

From the above analysis, it is clearly seen that

the renovation is affected by lack of resource planning, material cost increased by inflation and poor team work relation.

3.4. Impacts of Cost Overruns:

From the respondent, SPSS analysis was done taking the very high linear association with correlation value greater than 0.9 to 1.0 are taken. From analysis, it is seen that there is a very correlation between surplus amount and claim with correlation value of 0.953 and level of significance of .0003. That means it is clearly seen that there is a high impact of cost overruns in surplus amount and the claim for this renovation project.

3.5. Chance of Occurrence of Delay in Heritage Renovation Projects:

Table 5 Chance of occurrence of delay in heritage renovation projects

	No.	Percentage
Always	2	28.57
Sometimes	5	71.43
Never	0	0.00

From the respondents it is seen that 28.57% of the projects contains always the delay in heritage renovation projects and 71.43% of the projects contain sometimes in delay in heritage renovation projects.

3.6. Main Causes of Cost Overruns:

Table 6 Main causes of cost overruns

	No.	Percentage
Materials	6	40.00
Labour	6	40.00
Sub contractor cost	2	13.33
Job overhead	1	6.67
Total	15	100

From the respondents, it is seen that the major causes of delay in heritage renovation projects are due to materials and shortage of labor as 40% each.

3.7 Anticipation or Prediction of Price Escalation

From the respondents, it is clearly seen that there is very less percentage of 28.57%, that they tried to anticipate or predict price escalation. It is the worst condition, in which engaged people are not aware of prediction of the price escalation.

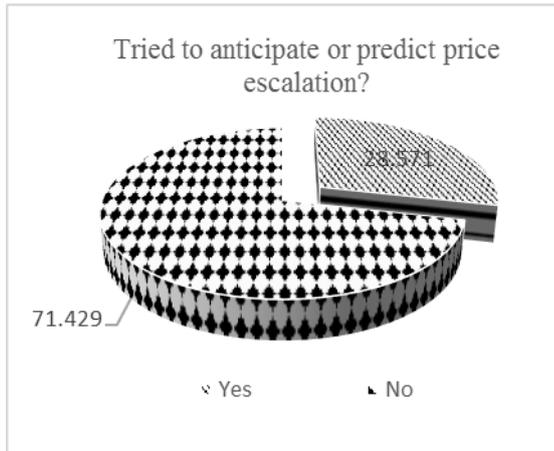


Fig 3 Tried to anticipate or predict price escalation in renovation

3.8 Parties Affected by Price Escalations:

From the above Fig. 4, it can be explained that the price escalation will be affected to client and

regularity bodies as heritage department and Bhaktapur municipality.

4. Conclusion

1. In conclusion, it is found that in the heritage renovation projects, the main delaying factor is difficulties in financing project. And other major factors can be taken as poor managerial skills, conflicts between parties, personal conflicts among labours, and lack of productivity due to ritual festivals & works.
2. The main causes of the cost overruns is analysed as a material cost increased by inflation. And another major important factor causing the cost overruns is due to the increase in labour cost, lack of resource planning and poor team work relation.
3. The Bhaktapur municipality is affected by the delay and cost overruns of the heritage renovation projects. As Bhaktapur is rich in cultural and rituals works, tourism is one of the source of the Bhaktapur municipality. So, the municipality should maintain its property in time.

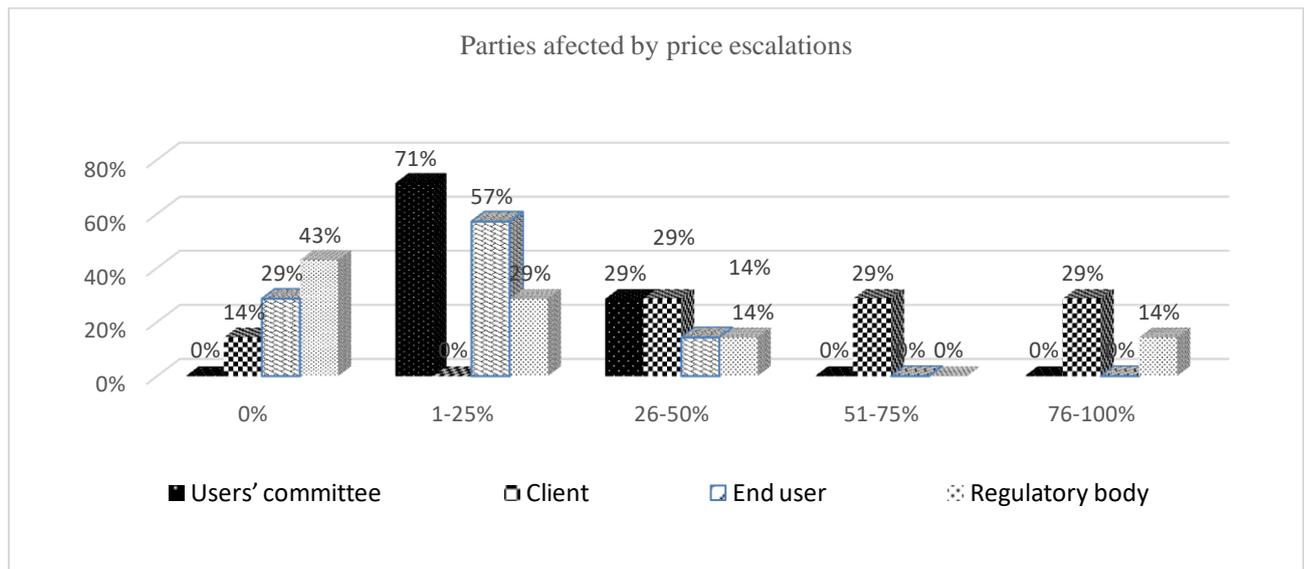


Fig 4 Parties affected by price escalations

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