

Effects of Incidental Factors on the Completion Time of Projects in Selected Nigerian Cities

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Abstract: In this study a total of one hundred and fifty questionnaires were given to fifty targeted companies in Lagos, Oyo and Osun states in Nigeria, studying the effects of the six incidental factors. From the results of the responses to the questionnaires, the delays in the completion time due to the incidental factors of inclement weather, force majeure, changes in government policy, market variables, unfavourable site conditions and malfunctioning of plant and equipment were 14, 22, 21, 8, 26 and 9%, respectively. This revealed that unfavourable site conditions and force majeure were the highest and lowest of the incidental factors causing delays to the timely completion of construction projects in the selected states.

Key words: Incidental factor, construction, project, completion time, delay

INTRODUCTION

Delay in completion time occurs in every construction project, but the magnitude varies from project to project. Some projects are delayed a few days behind schedule, while others are delayed for a longer period, resulting in major disputes and claims.

Delays do not always result from a single catastrophic event; they frequently develop slowly during the course of the projects. Minor delays are generally overlooked until their cumulative effects becomes financially apparent. By the time a contractor recognises that there is a problem, many different parties and natural forces would have contributed to the situation. Untimely completion of construction projects has been found to be a major setback in the construction industries in Nigeria.

According to Chan and Kumaraswaswamy^[1], completing projects on time is an indicator of an efficient construction industry, and also that a project completed on time, within budget, and to the specified quality standard is considered successful.

Delay in the completion of construction projects is one of the common causes of troubles encountered during the administration and management of construction projects; this eventually increases the completion cost of projects^[2].

In another study by Odusanmi and Olusanya^[3], delay was described as circumstances, which prevent the contractor from completing the project in accordance with the agreed programme of work. The study of Mansfield *et al.*^[4] stated that changes in government

policies and other incidental factors can cause delay in projects, which therefore requires that adequate considerations be given to the impacts of these delays.

The contributions of Sozen and Giritli^[5] recognised that when delays cannot be attributed to the client, contractor or consultant's act, there should be other factors that exist. These delays that are caused by unforeseen incidents are introduced by Khosrowshahi and Kaka^[6] as delays that are beyond the control of the parties involved in a project.

This study therefore was targeted at the construction industries, by studying the incidental delays in the Nigerian experience that affects the completion time of projects, and therefore provides a guide to the parties involved in other to reduce the problem of delays.

MATERIALS AND METHODS

This research was carried out with the aid of structured questionnaires, addressing the effects of the incidental factors on the completion time of projects. One hundred and fifty questionnaires were administered to fifty construction companies at the rate of 3 per company. A total of one hundred and twenty nine questionnaires were returned.

Therefore;

Administration percentage = $129/150 \times 100 = 86\%$

Three states in Nigeria were selectively covered; these are Lagos, Oyo and Osun states.

The questionnaires were given to the project managers, project engineers and project technical heads. The mode was in the written format, even though personal interviews were also granted. The questionnaires were administered in proportion to the construction activities in the states under study.

RESULTS

The average rating received from the forty-three companies that returned their questionnaires are presented in Table 1.

The effects of the incidental factors on the completion time is rated as follows:

- 1 = Fairly high
- 2 = High
- 3 = Averagely high
- 4 = Very high

Table 1: The rating of the incidental delay factors

| Companies | A | B | C | D | E | F |
|-----------|---|---|---|---|---|---|
| 1 | 3 | 4 | 2 | 2 | 4 | 1 |
| 2 | 4 | 4 | 2 | 1 | 4 | 3 |
| 3 | 3 | 4 | 3 | 1 | 4 | 3 |
| 4 | 4 | 3 | 2 | 4 | 4 | 3 |
| 5 | 3 | 1 | 2 | 4 | 4 | 1 |
| 6 | 4 | 4 | 4 | 3 | 4 | 4 |
| 7 | 1 | 4 | 4 | 1 | 3 | 2 |
| 8 | 4 | 4 | 4 | 1 | 3 | 2 |
| 9 | 4 | 4 | 4 | 3 | 2 | 4 |
| 10 | 1 | 4 | 1 | 2 | 4 | 1 |
| 11 | 1 | 4 | 2 | 4 | 4 | 4 |
| 12 | 3 | 4 | 2 | 3 | 4 | 4 |
| 13 | 4 | 2 | 1 | 4 | 4 | 4 |
| 14 | 4 | 1 | 1 | 3 | 4 | 4 |
| 15 | 1 | 4 | 4 | 2 | 1 | 3 |
| 16 | 3 | 2 | 4 | 1 | 4 | 3 |
| 17 | 1 | 4 | 4 | 2 | 4 | 1 |
| 18 | 2 | 4 | 4 | 2 | 3 | 1 |
| 19 | 3 | 4 | 4 | 1 | 4 | 2 |
| 20 | 3 | 1 | 4 | 2 | 4 | 3 |
| 21 | 4 | 1 | 4 | 2 | 4 | 4 |
| 22 | 4 | 2 | 3 | 4 | 4 | 1 |
| 23 | 4 | 1 | 1 | 2 | 4 | 4 |
| 24 | 4 | 4 | 4 | 2 | 1 | 4 |
| 25 | 3 | 4 | 3 | 4 | 4 | 3 |
| 26 | 3 | 4 | 3 | 2 | 4 | 4 |
| 27 | 1 | 4 | 4 | 1 | 4 | 3 |
| 28 | 4 | 4 | 4 | 1 | 4 | 3 |
| 29 | 2 | 4 | 4 | 2 | 1 | 1 |
| 30 | 2 | 2 | 4 | 4 | 4 | 1 |
| 31 | 4 | 4 | 4 | 3 | 1 | 1 |
| 32 | 1 | 4 | 4 | 3 | 4 | 1 |
| 33 | 3 | 2 | 4 | 3 | 4 | 4 |
| 34 | 4 | 4 | 4 | 2 | 4 | 4 |
| 35 | 4 | 4 | 4 | 2 | 4 | 2 |
| 36 | 4 | 4 | 4 | 1 | 4 | 2 |
| 37 | 3 | 2 | 3 | 3 | 4 | 2 |
| 38 | 1 | 4 | 1 | 4 | 4 | 1 |
| 39 | 4 | 4 | 4 | 3 | 3 | 3 |
| 40 | 4 | 4 | 4 | 2 | 4 | 2 |
| 41 | 3 | 2 | 4 | 2 | 4 | 2 |
| 42 | 3 | 3 | 4 | 4 | 4 | 2 |
| 43 | 1 | 3 | 4 | 4 | 4 | 2 |

- Factor A = Inclement weather
- Factor B = Force majeure
- Factor C = Changes in government policy
- Factor D = Market variables
- Factor E = Unfavorable site conditions
- Factor F = Malfunctioning of plant and equipment

Table 2 gives a summary of the incidental delay factors on the completion time studies. The critical incidental factors rated 4 (very high) in the companies are presented in Table 3. Most of the companies had a

Table 2: Summary of the incidental delay factors

| Rating | A | B | C | D | E | F |
|-------------|----|----|----|----|----|----|
| Fairly high | 9 | 5 | 5 | 9 | 4 | 11 |
| High | 3 | 7 | 6 | 15 | 1 | 10 |
| Ave. high | 13 | 3 | 5 | 9 | 4 | 10 |
| Very high | 18 | 28 | 27 | 10 | 34 | 12 |
| Total | 43 | 43 | 43 | 43 | 43 | 43 |

Table 3: Critical incidental factors of each company

| | |
|----|-----------|
| 1 | B,E |
| 2 | A,B,E |
| 3 | B,E |
| 4 | A,D,E |
| 5 | D,E |
| 6 | A,B,C,E,F |
| 7 | B,C |
| 8 | A,B,C |
| 9 | A,B,C |
| 10 | B,E |
| 11 | B,D,E,F |
| 12 | B,E,F |
| 13 | A,D,E,F |
| 14 | A,E,F |
| 15 | B,C |
| 16 | C,E |
| 17 | B,C,E |
| 18 | B,C |
| 19 | B,C,E |
| 20 | C,E |
| 21 | A,C,E,F |
| 22 | A,D,E |
| 23 | A,E,F |
| 24 | A,B,C,F |
| 25 | B,D,E |
| 26 | B,E,F |
| 27 | B,C,E |
| 28 | A,B,C,E |
| 29 | B,C |
| 30 | C,D,E |
| 31 | A,B,C |
| 32 | B,C,E |
| 33 | A,C,E,F |
| 34 | A,B,C,E,F |
| 35 | A,B,C,E |
| 36 | A,B,C,E |
| 37 | E |
| 38 | B,D,E |
| 39 | A,B,C |
| 40 | A,B,C,E |
| 41 | C,E |
| 42 | C,D,E |
| 43 | C,D,E |

Table 4: Percentage rating of the critical incidental delay factors

| Critical factors | Frequency | Percentage |
|------------------|-----------|------------|
| A | 18 | 14 |
| B | 28 | 22 |
| C | 27 | 21 |
| D | 10 | 8 |
| E | 34 | 26 |
| F | 12 | 9 |
| Total | 129 | 100 |

combination of critical factors, which is an indication that delay in construction project is not usually as a result of one incidental factor.

Table 4 gives a percentage rating of the effects of the incidental factors, as they affect the completion time in the states under study.

DISCUSSION

The questionnaires were distributed in fifty companies in Lagos, Oyo and Osun states in number of 30, 15 and 5, respectively, according to the proportion of construction activities of each states. One hundred and fifty returns were expected at the rate of 3 per company, only One hundred and twenty nine were received.

Table 4 shows the effects of the incident factors.

Factor A = Inclement weather, had a frequency of 18 which is 14%

Factor B = Force majeure, had a frequency of 28 which is 22%

Factor C = Changes in government policy, had a frequency of 27 which is 21%

Factor D = Market variables, had a frequency of 10 which is 8%

Factor E = Unfavourable site conditions, had a frequency of 34 which is 26%

Factor F = Malfunctioning of plant and equipment, had a frequency of 12 which is 9%.

It can then be concluded from these results that the critical incidental factor causing delay in the completion

time of projects in the selected states in Nigeria is factor E (unfavourable site conditions) with 26% followed by factors B, C, A, F and D.

The project engineer will therefore perform better as far as time is concerned in the completion of projects, if adequate provisions could be made to counter the effects of unfavourable site conditions and the other incidental factors.

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