Construction Contractors' Claim Process Framework

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Abstract: The management of construction claims is the greatest challenge that is facing contractors in today's vacillating business environment. Construction projects are becoming increasingly susceptible to a variety of factors that give rise to time extension and cost recovery. Although the construction business environment has moved toward partnering arrangements in recent years, the number of contractual difficulties continue to rise. Thus, the construction industry needs to develop methodologies for construction claim management that should overcome their current problems. While some practitioners have been using some kind of a procedure for claim management process framework measuring tool, a written exposition of such an instrument is not widely available in the literature. This paper presents the principles that underly construction claim process and gives a generic framework that aims at facilitating measurement of construction claim process as one of the strategies for improving construction business processes. It also presents a survey of Malawian construction contractors' performance on the construction claim process framework. The results show a low awareness of such a construction claim process-measuring instrument.

INTRODUCTION

The concept of a construction claim is not new, but what has been lacking is the methodology that can help construction managers to assess the level of effectiveness for their construction claim process. The need for such a structured instrument for auditing construction contractors' claim process cannot be overemphasized for the purpose of reducing time and cost increases. The construction industry is widely perceived as being slow to innovate and has trailed many manufacturing industries in process innovation (Veshosky 1998). One of the characteristics that has significantly contributed to business processes improvement within manufacturing organizations is the methodology of mapping and measuring their business processes (Garvin 1991). This is also the level where the implementation of total quality management plan is achieved. Further, Voehl (1992) pointed out that the purpose of process-based improvement schemes is to ensure that all key processes work in harmony to maximize organizational effectiveness. Thus, the objective of modeling and developing a claim process framework was to provide an instrument that construction managers can employ to audit their organizations' construction claim process capabilities. Such a construction claim process framework assessment should provide a rational basis for addressing improvement from the challenges of their evolving construction business environment. The Egan (1998) report has equally advocated the development of such management-measuring instruments that should help assessment of construction organizations' capabilities as one of the means toward modernizing business processes of companies in construction industry. The present paper presents a framework for measuring construction claim process. It sets a methodology for assessing whether construction claim processes are in place and the degree to which the best practices are achieved, and provides the basis for a detailed audit of the current practice that characterizes successful approaches to construction claim management. This paper outlines how a construction contractor can self- or third party-audit its construction claim process. It also presents a survey of Malawian construction contractors' performance on the construction claim process framework. The results show a low awareness of such a construction claim process-measuring instrument.

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BACKGROUND

A construction claim arises when a party to a construction contract believes that in some way, by act or omission, the other party has not fulfilled its part of the bargain (Levin 1998; Kartam 1999). To put it in other words, a claim arises when one party to the contract has suffered a detriment for which that party should be compensated by the other party. Therefore, 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 claims originate from a variety of causes both direct and indirect (Institute 1986). A number of major disputes can be largely traced to four basic sources: (1) the contract documents due to errors, defects, and omissions; (2) failure to appreciate the real cost of a project in the beginning; (3) changed conditions; and (4) stakeholders involved in a project. However, the researchers were concerned with the construction claim process and focused on the variables that form the construction claim process. Based on a literature review, the researchers modeled and developed the construction claim process based on the following variables (Easton 1989; European 1996; Kartam 1999):

- Claim identification
- Claim notification
- Claim examination
- Claim documentation
- Claim presentation
- Claim negotiation
- Use of total quality management tools to prevent claims

Construction Claim Identification

Construction claim identification involves ''timely'' and ''accurate'' detection of a construction claim. This is the first and critically important ingredient of the claim process. For example, some construction claims of excellent merit are lost solely due to failure of identifying them (Easton 1989). Thus, an awareness of job factors, which give rise to construction claims, is a skill that generally has to be specially acquired. Such learning not only sensitizes construction managers to po-

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tential construction claims, but also exposes company-wide problems to contract management.

Construction Claim Notification

Construction claim notification involves alerting the other party of a potential problem in a manner that is nonadversarial. Time limit requirements are very crucial and critical. For example, a typical contract provision such as ''shall be confirmed in writing as soon as practicable and no later than twenty days'' means exactly that (Sawyer and Gillot 1990). An initial letter of a claim notice to the other party should be short, clear, simple, conciliatory, and cooperative. It should indicate the problem and alert the other party of the potential increase in time or cost. It is very hard to argue with someone who appears polite and sincere, helpful, and cooperative.

Construction Claim Examination

Claim examination involves establishing the legal and factual grounds on which the claim is to be based. This should also involve the estimate of the potential recovery. Such issues may have to be investigated by interviewing staff who worked on the project. The primary sources for claim examination could deal with project files, video footage, memos, etc., that must be used to prove the time and cost elements of the claim.

Construction Claim Documentation

Claim documentation is the collection of the hard facts that give the actual history of a construction claim. A well-prepared defendant quickly demolishes evidence and claim costs that are not supported by accurate records. For example, minute inaccuracies can be seized upon to cast doubt on the entire claim. The documented facts are the glue that holds the legal framework together. If these are insufficient the claim will not stick.

Construction Claim Presentation

A claim presentation should be logically built up, well organized, and factually convincing. Thus, a claim should be written in a format that emphasizes the fact that a contract requirement was breached. A contractor must then demonstrate the resulting harm was caused by the owner's acts. Atkinson (1985) has fittingly said that presentation is best separated into two, the entitlement and the quantum. The former section should have the legal and factual basis while the latter should provide the estimated recovery of the claim.

Construction Claim Negotiation

According to Easton (1989) a structured and proper negotiation preparation includes (1) ascertaining that all information is current and complete; (2) minimizing the scope of negotiation beforehand so that insignificant points should not precipitate a violent argument and disrupt progress; (3) knowing one's weaknesses and trying to utilize weak points by conceding them in return from the other party; (4) foreseeing problems; and (5) anticipating the opposition's next move. To benefit from this stage, a construction contractor needs experts that have skills for negotiation. There is a saying that ''it is more important to be prepared than it is to be right.'' For example, in construction disputes, ''right'' is often difficult to determine and it is preparation for negotiation that really counts.

Use of Total Quality Management Tools to Prevent Construction Claims

The factors that lead to loss of time, cost increases, and other determinants of underperformance can be linked to specific management weaknesses. Such factors are often associated with lack of application of total quality management tools. By implication the natural use of total quality management tools at every stage of a construction project should result in substantial time and cost reduction of a construction project. For example, the European Construction Institute (European 1996) and the Construction Round Table (*A route* 1996) have noted that ''improvement teams'' within construction organizations on project reviews, project knowledge capture, construction process, project planning, project communication, benchmarking, reengineering, relationship with internal and external stakeholders, project quality control and circles; and project measurement and feedback positively contribute to project performance.

RESEARCH METHODOLOGY

Measuring Instrument Development

There has been a proliferation of measuring frameworks in the field of management especially in the manufacturing industry (Chiesa et al. 1996; Kululanga 1999). Such business process-measuring frameworks have just begun to emerge within the construction business environment (European 1996). A business process measurement is far superior to a performance-based measurement (Garvin 1991). It is because the former reveals the reasons why problems exist and can provide construction managers with potential solutions to address the root causes of the underperformance. The latter merely highlights the problems without giving hints to the root causes of underperformance. Chiesa et al. (1996) and European (1996) provided the contingent theory that was employed for developing an instrument for measuring contractors' construction claim process. In developing such process-based measuring instruments Crossan (1995) has distinguished the concept of capturing ''practice'' and ''awareness'' as principal elements for addressing improvement. The former involves the ''understanding'' of an issue that prompts an organization to take an action. The latter simply relates to ''behavior'' or what an organization does in addressing improvement. Thus, the two antecedents need to be understood when developing process framework for ascertaining the effectiveness of an organizational process. To this end, ''behavior and awareness'' specific statement indicators were developed in an attempt to measure the construction claim process. Such indicators were linked to scores. The process-measuring framework focused on such questions as whether the individual processes necessary for addressing improvement—for example, construction claim processes of a construction contractor—were in place and the degree to which the best practice could be implemented and achieved effectively. Table 1 presents a construction claim process-measuring framework that was modeled and developed by the researchers based on the aforementioned theory of capturing behavior and awareness in order to measure the effectiveness of an organizational process.

Construction Contractor Sample Design

A simple random sample of construction contractors was estimated by Tull and Hawkins's (1993) formula, which is presented below

$$n = [\sigma^2]\left[\frac{e^2}{Z^2} + \frac{\sigma^2}{N}\right]^{-1}$$

where 95% was the confidence coefficient, 10% of the mean was the specified error, and a value of 2 for the variance where a five-point scale is used (Churchill 1995). The National Construction Industry Council (*Construction* 2000) constructors' population was 300 for the southern part of Malawi. Using the formula, a sample size of 93 was required. The construc-

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TABLE 1. Framework for Construction Contractors' Claim Process

Scale	Construction claim identification	Construction claim notice	Construction claim examination	Construction claim documentation	Construction claim presentation	Construction claim negotiations to avoid cost and time increase	Use of TQM tools to prevent claims arising from management weaknesses
4	A contractor always accurately identifies construction claims.	A contractor always gives timely notice of an identifiable construction claim.	A contractor always establishes the legal grounds on which the claim is based with an estimate of potential recovery.	A contractor elicits facts that record the actual history of the construction claim.	A contractor always logically builds up a well organized and factual claim.	A contractor is always committed to an organized claim negotiations process.	A contractor's use of TQM tools and techniques always comes out naturally to all employees.
3	A contractor once in a while accurately identifies construction claims.	A contractor once in a while gives a timely notice of an identifiable construction claim.	A contractor once in a while establishes the legal grounds on which the claim is based with an estimate of potential recovery.	A contractor partially gives facts of the actual history of a construction claim.	A contractor once in a while logically builds up, a well organized and factual claim.	A contractor once in a while is committed to an organized claim negotiations process.	A contractor's use of TQM tools and techniques sometimes comes out naturally to all employees.
2	Construction claim identification process is under consideration.	The culture of timely giving notice of a construction claim is under consideration.	Construction claim examination process is under consideration.	Construction documentation that provides facts of the actual claim history is under consideration.	Construction claim presentation that gives a logical, organized, and factual claim is under consideration.	A contractor is considering developing construction claim negotiating skills.	TQM tools and techniques are used by employees when reminded.
1	The importance of identifying construction claims is known but not done.	The importance of giving a timely notice of an identified construction claim is known but not done.	The importance of establishing legal grounds for a construction claim is known but not done.	The importance of providing the facts of the actual history of a construction claim is known but not done.	The importance of giving a logically, well organized, and factual claim is known but not done.	The importance of having skills in claim negotiations is known but employees are untrained.	The importance of TQM tools and techniques are recognized but not applied.
0	A contractor is completely unable to identify construction claims.	A contractor gives notice of a construction claim very late.	A contractor is unable to establish legal grounds on which a claim is based.	A contractor is unable to give the facts that provide the actual history of a construction claim.	A contractor has an illogical, disorganized, and nonfactual construction claim presentation.	A contractor has no claim negotiations skills and often his claims consume excessive time and cost.	All employees are unaware of TQM tools and techniques.

Note: TQM = total quality management.

tion claim process-measuring framework (Table 1) was sent to construction managers to check the level of their practice. In addition, four organizational attributes were used to characterize the sample, namely (1) financial turnover; (2) experience of a construction company in terms of number of years in construction business; and (3) average number of employees. Fifty-three responses were obtained from construction contractors that operated in Malawi, one of the southern Africa development cooperation countries. A confidence level of 91% was reached from this level of response rate.

ANALYSIS OF RESULTS

The main statistics used in data analysis were mean scores, Spearman correlation coefficient, and one-way analysis of variance. To compute the mean score, a numerical scale of the construction claim process-measuring framework as shown in Table 1 was used. The equation presented below shows how the common practice of the surveyed construction contractors was calculated

$$R = \frac{4(x_5) + 3(x_4) + 2(x_3) + 1(x_2) + 0(x_1)}{(x_5 + x_4 + x_3 + x_2 + x_1)}$$

The mean score values were further interpreted to reflect the responding rating. Such a procedure helps conversion of a continuous index (mean score) into discrete categories. In this case, the categories were classified as follows:

$$3.50 < \text{mean score} \le 4.00 \quad \text{Level 4}$$

$$2.50 < \text{mean score} \le 3.50 \quad \text{Level 3}$$

$$1.50 < \text{mean score} \le 2.50 \quad \text{Level 2}$$

$$0.50 < \text{mean score} \le 1.50 \quad \text{Level 1}$$

$$0.00 \le \text{mean score} \le 0.50 \quad \text{Level 0}$$

Krustal-Wallis one-way analysis of variance by a formula shown below was used to detect any difference in practice of the construction contractors in terms of their groupings by average number of employees, financial turnover, and number of years in business. The test is appropriate for detecting variation within a sample (Siegel and Castellan 1988)

$$KW = \left\{\left[\frac{12}{N(N+1)} \sum_{j=1}^{k} n_j \overline{R_{j=1}^2}\right] - 3(N+1)\right\} \cdot \left\{\left[1 - \frac{\sum_{i=1}^{g} (t_i^3 - t_i)}{N^3 - N}\right]\right\}^{-1}$$

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The evaluation of the degree of association between attributes of construction contractors and the variables of construction claim process was achieved by application of Spearman's correlation coefficient. Rank correlation is one of the means that is suggested to evaluate the associations where ordinal scales are used (Howitt and Cramer 1997). The equations for calculating the Spearman's correlation coefficient where ties in ranks are involved are shown below

$$r_s = \frac{(N^3 - N) - 6\sum_{i=1}^{N} d_i^2 - \frac{1}{2}(a + l)}{\sqrt{(N^3 - N) - (a + l)(N^3 - N) + al}}$$

$$a = \sum_{i=1}^{g} (t_i^3 - t_i); \quad l = \sum_{i=1}^{q} (s_i^3 - s_i)$$

RESULTS AND DISCUSSION

Fig. 1 presents plots of distribution of the attributes of construction contractors surveyed. Only Fig. 1(a) is biomodal, the rest of the distributions are negatively skewed. The majority of contractors are in categories 1–5 representing 73 and 58% by size of construction contractors in terms of number of average employees and number of years in a construction business, respectively.

Fig. 2 shows the distribution of the responses by ''level'' as also depicted in Table 1 of the construction claim process-measuring framework. It is evident that Levels 1 and 2 characterized the unweighted responses to the various variables of the construction claim process. It can also be observed that Level 4 of the construction claim process-measuring framework was below 5% as per results of the surveyed construction contractors. Although ''Level 1'' stands out in the responses of construction contractors, it only relates to being aware of the ''importance of a variable of a construction claim process'' but ''not benefiting from its implementation'' in a construction firm.

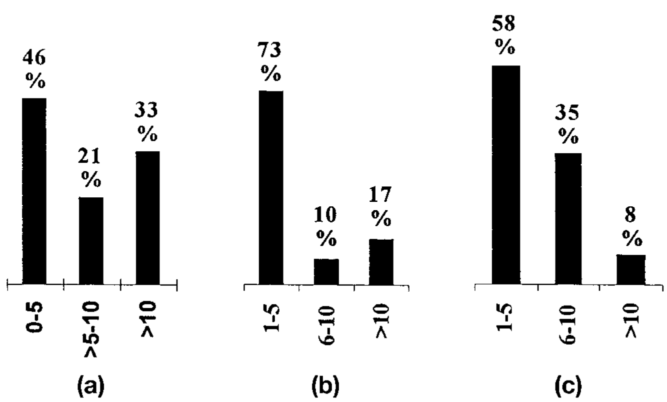

FIG. 1. Distribution of Responses by Construction Attributes: (a) Financial Turnover (MK 10^5); (b) Size by Number of Employees; (c) Period in Business in Year

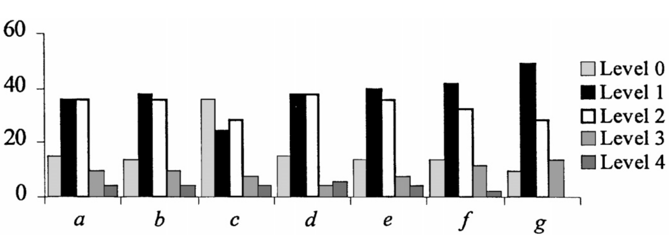

FIG. 2. Percentage Distribution of Claim Process Variables and Level of Achievement: (a) Claim Identification; (b) Claim Notice; (c) Claim Examination; (d) Claim Documentation; (e) Claim Presentation; (f) Claim Negotiations; (g) Natural Use of Total Quality Tools

The application of total quality management tools (such as improvement teams in construction process, construction planning, communication, benchmarking, reengineering, relationships with internal and external stakeholders, quality control and circles, and measurement and feedback) by construction contractors correlated significantly with all the variables of construction claim process depicted in the framework as shown in Table 2. Thus, the natural use of total quality tools positively influenced the sound practice of claim processes by construction contractors. According to Alhozaimy and Al-Negheimish (1999) the conditions in developing countries with respect to quality improvement are less favorable as most developing countries face problems with regard to product and service quality. The nature of problems may also differ depending on the phase of industrial development.

Age in terms of number of years in the construction business was not significantly correlated to the variables of construction claim process at the $p < 0.05$ level. Thus, experience of construction contractors in business gave no bearing to the level of practice on the construction claim process. Generally, it is expected that age should influence capability. However, the construction industries of developing nations are characterized by a very high staff turnover (Misra 1991). Such a characteristic may plague a contractor with low levels of experience due to brain drain despite being in business for a long time.

Size in terms of financial turnover and average number of employees was significantly correlated to the variables of the construction claim process at the $p < 0.01$ level. As construction organizations grow in size they tend to become more formalized in their structures, operations, and organizations (Harris and McCaffer 1995). Such an organizational behavior may in turn contribute to strategies employed for addressing improvement in their construction claim process.

Table 3 shows that the practice of the surveyed construction contractors differed significantly by their category sizes in terms of average number of employees at the $p < 0.01$ level. Such unique differences are not uncommon in the construction industry (Harvey and Ashworth 1997). However, the practice of construction contractors was not significantly different by size in terms of financial turnover except for ''construction claim preparation.'' Similarly, construction contractors, practice of construction claim process did not differ significantly by age of a contractor in terms of number of years that a company has been in business.

Table 4 shows further correlation analysis by groupings of

TABLE 2. Spearman Correlation of Claim Variables to TQM Tools, Year in Business, and Size of Firm (r_s)

Variable	Construction claim identification	Construction claim notice	Construction claim examination	Construction claim documentation	Construction claim preparation	Construction claim negotiation
Total quality management	0.880[a]	0.880[a]	0.870[a]	0.830[a]	0.860[a]	0.910[a]
Years in business	0.200	0.180	0.100	0.190	0.180	0.210
Financial turnover	0.620[a]	0.650[a]	0.550[a]	0.640[a]	0.600[a]	0.670[a]
Number of employees	0.590[a]	0.600[a]	0.530[a]	0.570[a]	0.620[a]	0.550[a]

[a] $p < 0.01$.

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TABLE 3. One-Way Analysis of Variance for Various Groupings of Variables (*P*)

Construction claim identification	Construction claim notice	Construction claim examination	Construction claim documentation	Construction claim preparation	Construction claim negotiation	Natural use of TQM tools
(a) Experience by Number of Years in Business by a Construction Contractor for Categories 0–5, >5–10 and >10						
0.197	0.182	0.098	0.187	0.180	0.209	0.236
(b) Size by Financial Turnover of Construction Contractor for Categories 1–5, 6–10, and >10						
0.230	0.280	0.060	0.070	0.020[a]	0.070	0.340
(c) Size by Average Number of Employees for a Construction Contractor for Categories 1–5, 6–10 and >10						
0.004[b]	0.002[b]	0.006[b]	0.005[b]	0.002[b]	0.002[b]	0.001[b]

[a]$p < 0.05$.
[b]$p < 0.01$.

TABLE 4. Spearman Correlation of Claim Variables of Various Groupings (r_s)

Grouping category	Construction claim identification	Construction claim notice	Construction claim examination	Construction claim documentation	Construction claim preparation	Construction claim negotiation	Natural use of TQM tools
(a) Size by Financial Turnover of a Construction Contractor							
0–5	0.979[a]	0.862[a]	0.881[a]	0.923[a]	0.901[a]	0.882[a]	0.457[a]
>5–10	0.671	0.707	0.707	0.000	0.707	0.000	0.000
>10	0.364	0.370[b]	0.333	0.385[b]	0.352	0.390[b]	0.343
(b) Size by Average Number of Employees for a Construction Contractor							
1–5	0.465[a]	0.449[a]	0.411[a]	0.471[a]	0.450[a]	0.390[a]	0.265
6–10	−0.365	−0.033	0.317	0.111	0.000	0.283	0.283
>10	0.288	0.288	0.222	0.527	0.228	0.000	0.000
(c) Experience by Number of Years in Business by a Construction Contractor							
1–5	0.320	0.330	0.290	0.400[a]	0.380[a]	0.470[a]	0.270
6–10	−0.060	−0.060	−0.060	−0.061	−0.060	−0.060	0.230
>10	0.890[b]	0.890[b]	0.890[b]	0.890[b]	0.890[b]	0.920[b]	0.890[b]

[a]$p < 0.05$.
[b]$p < 0.01$.

construction contractors. Such an analysis was carried out to unravel issues that could easily be masked if the sample was not segregated. The size categories of >5–10 and 6 to >10 by financial turnover and average number of employees, respectively, were insignificantly correlated to the claim process variables at the $p < 0.05$ level. Similarly, experience expressed as the number of years in business for a construction company in categories 6–10 and >10 years was insignificantly correlated to construction claim process at the $p < 0.05$ level.

Fig. 3 shows that by the mean score *R* the common practice of the construction contractors on the variables of construction claim process was 1.5. According to a procedure that helps converting a continuous mean score into discrete categories, the practice of the surveyed construction contractors falls under Level 1, i.e., $0.50 < \text{mean score} \leq 1.50$. The implication of this result is that the majority of the construction contractors were aware of the importance of the various processes required for a sound construction claims process but they simply did not carry them out.

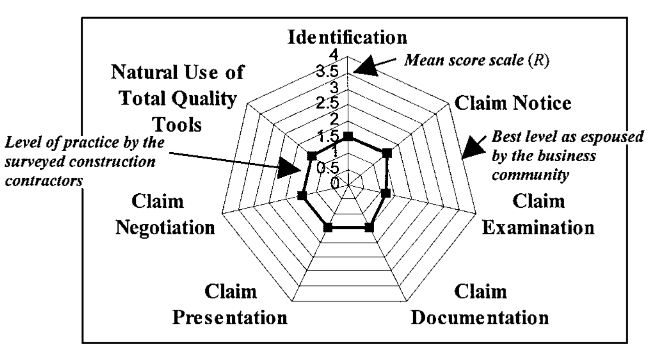

FIG. 3. Mapping Chart on Construction Claim Process

CONCLUSIONS

This paper has presented the principle that underlies the construction claim process and contributed toward the development of a construction claim-measuring framework that is severely lacking in the literature. It has also established that the majority of construction contractors were not aware of a structured methodology for construction claim process by way of their practice on the framework. The developed construction claim process framework has the potential to influence the way construction contractors manage their construction claims. The results in this study may be used to assist contractors in adjusting to a business environment that demands measuring business processes to form a basis for continuous improvement. The study also forms the basis for further research, construction claim process in a dynamic process, and new constructs that will emerge as the current construction business environment changes. Benchmarking construction contractors' practices with the developed construction claim process framework in other regions could improve the development of this framework for measuring construction claim process. Recommendations for further study include increasing the size of the sample of the data set to address the limitation in this study.

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NOTATION

The following symbols are used in this paper:

d_i = difference in ranks between attribute and claim variable;
e = specified error;
g = number of groupings of different tied ranks;
I = integer;
KW = chi-square distribution for;
k = number of conditions by attribute groups;
LE = level;
N = population size;
n = number of cases;
n_j = number of cases in jth attribute;
n_s = sample size;
p = probability;
R = mean core;
$\bar{R}$ = average of ranks in jth attribute group;
R_j = sum of ranks in jth attribute group;
r_s = Spearman correlation coefficient;
s_i = numbers of different tied ranks in ith grouping for claim variable;
sign = significance;
t_i = numbers of different tied ranks in ith grouping for attribute;
x_0 = frequency Level 0 of claim process;
x_1 = frequency Level 1 of claim process;
x_2 = frequency Level 2 of claim process;
x_3 = frequency Level 3 of claim process;
x_4 = frequency Level 4 of claim process;
Z = 95% was confidence coefficient; and
σ^2 = variance.

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