# Inrestigation and Explanation for the Increase in Production During the Production Process of Manufaturing Systems 

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#### Abstract

The purpose of this research is the examination of effective factors on existence of waste time and the effects of that for company product system. This research is Descriptive-Analysis scientific and measurable. The research of statistic society of all of mangers, bosses and administer or specialists of product affairs and product ported of tested company are 650 (people). The capacity of sample statistic is equal of 40 that, is selected by class accidental sampling. The methods of gathering of information in this research are documentary, observing, interview and questionnaire. Also designed on the basis of 5 selections Likert scale. For admissibility of measurement in application, researcher used the admissibility depend on the content. The Cronbach $\alpha$ was equal $\alpha=0.81$ and it has enough credit. In this research the effective factors on the existence of waste time in collection of material, machinery, tools and human strength are examined on four product system working Shop Company that involve operatory, enginery, assemble and paintining. The hypotheses of this research are analyzed by one way variance analyses of statistic test. The result show that the waste time of collection of material, machinery and human strength does have any effect on product System Company but it has effect on tools collections. Totally Waste times material collection to system Product Company, doesn't have affect; Waste times machinery collection to system Product Company, doesn't have affect; Waste times tools collection to system Product Company, have affect; Waste times human strength collection to system Product Company, doesn't have affect; Between waste times of material collection on 2008 and 2009, there is no difference; Between waste times of machinery collection on 2008 and 2009, there is no difference; Between waste times of tools collection on 2008 and 2009, there is no difference; Between waste times of human strength collection on 2008 and 2009, there is no difference.


Key words: Product • Production process • Production time - Balance of the production process • Manufacturing systems

## INTRODUCTION

As more manufacturers struggle with global markets, competition from low-cost countries and faltering home economies, the attention of many manufacturers has naturally turned to operational costs and waste reduction [1]. The typical approach taken in the past when studying improvement opportunities has been to focus on the manufacturing processes, or the value-added process steps [2]. Ported that when lead-time was examined, the two percentages of 470 all energies are spent trying to improve the value-added component of the lead-time and then the improvement to lead-time would be only 2.5 per cent. Waste can be defined as anything other than the
minimum amount of resources which are absolutely essential to add value to the product. Defined waste as anything other than the minimum amount of equipment, materials, parts, space and workers' time, which are absolutely essential to add value to the product or service. In terms of cost, waste refers to any incurred costs such as inventory, set-up, scrap and rework that do not add to the value of the product [3]. Argued that any goal beyond delivering the right product to the right customer at the right time at the right price is waste [4]. From the perception of end users, waste is internal and external resources that are consumed without adding value to the customers [5]. If a customer is not willing to pay for them, then their existence is considered a waste.

[^0]This means that the different types of wastes threaten many facets of performance of the company that customers may value. A systematic and continuous identification and elimination of waste can lead to increased efficiency, improved productivity and enhanced competitiveness. Generally, companies that work towards the elimination of waste in their manufacturing processes realize the following benefits: lower raw material stock and associated holding cost, reduced work-inprocess and lower finished goods inventories; higher levels of product quality; increased flexibility and ability to meet customer demands; lower overall manufacturing costs; and increased employees' involvement [5]. Reported that, fundamentally, poor competitiveness is caused by the existence of large amounts of waste. Reduction of these non-productive activities (waste) eventually saves time and allows more resources to be allocated to improving throughput and profitability. The principle of continuous improvement by waste elimination has been applied as an approach to improving the performance of a case production system suggested that synchronization in the area of product development can be achieved through the four key steps of process standardization, knowledge sharing, alignment of existing practices and continuous elimination of waste within the joint development cycles [6].

A number of researchers have highlighted the potential benefits in preventing or reducing demolition and construction waste [7-10]. By appreciating the principles of handling and using materials on site, attitudes to prevent waste can be developed and the construction process can be managed more efficiently [11]. Some companies have begun to find that they can gain a competitive advantage from adopting effective waste minimization strategies on site [10]. More recently however, attention has focused on the role that human behavior has to play in waste causation and minimization in the industry $[12,13]$.

Of all supply chain participants, clients arguably have the greatest influence over waste issues as they have the authority to set the environmental standards to which the project team must comply. However, efforts to influence waste management will be of little value if those further down the supply chain do not buy-in to more effective waste management practices [14].

The cost of waste blunts the contractors, making their survival more different in a competitive environment [15]. Estimates that companies that product a higher level of waste are at a 10 percent disadvantages in tendering. Thus [16] argued that construction waste can
significantly affect the performance and productivity of an organization. Moreover, the generation of waste is a loss of profits for the contractors due to extra overhead costs, Delays and extra work in cleaning lower productivity, etc [17]. Construction west even though there is widespread recognition across the world of the importance of moving towards sustainability, the construction industry is notorious for production huge amounts of construction and demolition waste, [18]. As waste impairs the efficiency, effectiveness, value and profitability of construction activities, there is a need to identify the causes of waste generation and control them within reasonable limits [19, 9]. highlighted the inadequate contribution of site manager to the development and implementation of waste management plans. Future, research has shown that the attitudes of construction laborers towards minimization activities are negative [20, 16].

Background: In the title of research "An analysis of factors influencing waste minimization and use of recycled materials for the construction of residential buildings": Residential building construction activities, whether it is new build, repair or maintenance, consumes a large amount of natural resources [21]. This has a negative impact on the environment in the form depleting natural resources, increasing waste production and pollution. Previous research has identified the benefits of preventing or reducing material waste, mainly in terms of the limited available space for waste disposal and escalating costs associated with landfills, waste management and disposal and their impact on building companies profitability. There has however been little development internationally of innovative waste management strategies aimed at reducing the resource requirement of the construction process. The authors contend that embodied energy is a useful indicator of resource value. Using data provided by a regional highvolume residential builder in the State of Victoria, Australia, this paper identifies the various types of waste that are generated from the construction of a typical standard house. It was found that in this particular case, wasted amounts of materials were less than those found previously by others for cases in capital cities (5-10 percent), suggesting that waste minimization strategies are successfully being implemented. Cost and embodied energy savings from using materials with recycled content are potentially more beneficial in terms of embodied energy and resource depletion than waste minimization strategies.

In the title of research "Towards improved construction waste minimization: a need for improved supply chain integration?": In recent years, economic, political and social pressures to adopt sustainable work practices have led to a renewed emphasis on developing effective waste minimization measures for major construction projects [22]. This research explored the efficacy of measures used for minimizing waste in high profile UK-based projects. The case studies revealed a diverse range of waste strategies, the broader applicability of which was then explored via a questionnaire survey of waste minimization specialists. The most effective measures were deemed to be those that fostered "waste minimization partnerships" throughout the supply chain. Questions remain, however, as to whether the industry is culturally prepared for the collaborative relationships necessary to engender radical improvements in waste minimization performance.

In the title of research: "Attitudes and perceptions of construction workforce on construction waste in Sri Lanka": The construction industry consumes large amounts of natural resources, which are not properly utilized owing to the generation of waste [10]. Construction waste has challenged the performance of the industry and its sustainable goals. The majority of the causes underlying material waste are directly or indirectly affected by the behavior of the construction workforce. Waste occurs on site for a number of reasons, most of which can be prevented, particularly by changing the attitudes of the construction workforce. Therefore, the attitudes and perceptions of the construction workforce can influence the generation and implementation of waste management strategies. The research reported in this paper is based on a study aimed at evaluating the attitudes and perceptions of the construction workforce involved during the pre- and post-contract stages towards minimizing waste. A structured questionnaire survey was carried out to understand and evaluate the attitudes and perceptions of the workforce. Four types of questionnaires were prepared for project managers/site managers, supervisors, laborers and estimators. The findings indicate the positive perceptions and attitudes of the construction workforce towards minimizing waste and conserving natural resources. However, a lack of effort in practicing these positive attitudes and perceptions towards waste minimization is identified. The paper further concludes that negative attitudes towards subordinates, attitudinal differences between different working groups and a lack of training to reinforce the importance of waste minimization practices have obstructed proper waste
management practices in the industry. The paper reveals the effect of the attitudes and perceptions of the construction workforce towards waste management applications, which would be of benefit to construction managers in designing and implementing better waste management practices.

According to Figure 1 effective factors on the existence of waste time are originated from 4 variables that involved: Material collection, Machinery, tools and Human strength Product System Company involve, 4 variables on the basis of operatory product work shop, Engineering, Assemble and Paintings. Purpose of this research is examination of effective factor on the existence of waste time for product System Company.

The research hypotheses with the observance of goals and research questions include:

- A waste time collection of material affect to system Product Company;
- A waste time collection of machinery affect to system Product Company;
- A waste time collection of tools affect to system Product Company;
- A waste time collection of human strength affect to system Product Company;
- A waste time collection of material is different in 2008 and 2009;
- A waste time collection of machinery is different in 2008 and 2009;
- A waste time collection of tools are different in 2008 and 2009;
- A waste time collection of human strength is different in 2008 and 2009.


Fig. 1: Frame work of research

## MATERIALS AND METHODS

This research, is descriptive - Analysis scientific and measurable. The intended population for that study was consisted of basses, administer or specialist of product affairs and product protect of tested company are 650 people. The capacity of sample statistic is equal of 40 people that are selected by class accidental sampling. To determine the sample capacity, Table 1 is used. (n: sample statistic, Z: Amount of standard error on $95 \%$ of certainty, P : The relation of special warping on society, N : the capacity of statistic society).

$$
n=\frac{N\left(Z_{\frac{\alpha}{2}}\right)^{2} p q}{e^{2}(N-1)+\left(Z_{\frac{\alpha}{2}}\right)^{2} \cdot p q}=40
$$

The way of gathering of information in this research is documentary, observable and questionnaire able. A research document is gathering from different parts of Archives Company. Also questionnaire involve 19 questions and is designed on the bases of likert 5 selection. For admissibility of measurement in questionnaire, researcher used the admissibility, depend on the canted. A Permanent measurement tool (kronbach $\alpha$ ) is equal $\alpha=0.81$ and it has enough credit.

## RESULTS AND DISCUSSION

After selection and summarization of data's in order of measurement to be easy, dates polishment and increase the amount of certainty in measurement with the use of

SPSS soft ware they analysis. The reasons of waste time event are selected in four collections that is involved: material, machinery, tools and human strength and between product workshops that is involved operatory, Engineering, Assemble and painting, a hosted and tested. After these definitions and reasonably description of waste time details, with refer to companies Arshive, they try to gather data's that is suitable with research principles.

## Tiny Comparison on Waste Time on the Bases of

 Collection Separation in Four Product Workplace Amount of Tiny Comparison of Waste Time Collection Marital in Four Product Workplace: On the bases of information on Table 1. We considered that medium amount of tiny comparison waste time collection material in operatory work shop is equal $1115.62 \pm 4105.6$, in Enginearying work shop $921.63 \pm 2893.82$, in montaqzh work shop $225.05 \pm 468.37$ and in painting work shop $151.43 \pm 459.62$.Also on the bases of Table 2 . We considered that according to one- way variance analysis test, amount of $\mathrm{F}=1.44$ with meaningful level is $\mathrm{P}=0.23$. So the difference of amount of tiny waste time from collection material on four product work shop isn't obtained meaningfully.

Also on the bases of information on Table 3. We considered that medium amount of tiny waste time of collection material on 2008 equal $518.5 \pm 197.15$. And on 2009 equal $728.55 \pm 3027$ is obtained. Since meaning full level is higher $\tan 0.05$, so between tiny waste time and collection material on 2008 and 2009 there isn't any differences.

Table 1: Medium amount of tiny waste time collection material in four product work shop examination

| Descriptive | N | Mean | Std. Deviation | Std. Error | 95\%Confidence Interval for Mean |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | Lower Bound | Upper Bound | Min | Max |
| Operatory work shop | 36 | 1175.6292 | 4105.60795 | 684.26799 | -213.5087 | 2564.7670 | 1.18 | 23750.00 |
| Engineering work shop | 38 | 921.3663 | 2893.82370 | 469.44019 | -29.8099 | 1872.5425 | 2.15 | 15147.40 |
| Assemble work shop | 38 | 225.0582 | 468.37271 | 75.98009 | 71.1079 | 379.0084 | 3.58 | 1975.05 |
| Painting work shop | 34 | 151.4365 | 459.62212 | 78.82454 | -8.9333 | 311.8062 | 1.12 | 2653.00 |
| Total | 146 | 623.5316 | 2549.98326 | 211.03812 | 206.4233 | 1040.6399 | 1.12 | 23750.00 |

Table 2: One- way variance analysis examination difference amount of tiny waste time of collection material in four product work shop
ANOVA

|  | Sum of Squares | df | Mean Square | F | Sig. |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Between Groups | 27955422.489 | 3 | 9318474.163 | 1.446 | 0.232 |
| Within Groups | 914894694.917 | 142 | 6442920.387 |  |  |
| Total | 942850117.406 | 145 |  |  |  |

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Table 3: Medium amount of tiny waste time collection material in four product work shop on 2008 and 2009
Group Statistics

| Year |  | N | Mean | Std. Deviation | Std. Error Mean | t | df | p |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| M101 | 2008 | 73 | 518.5085 | 1976.15805 | 231.29181 | 0.469 | 0.144 | 0.62 |
|  | 2009 | 73 | 728.5548 | 3027.80015 | 354.37720 |  |  |  |

Table 4: Medium amount of tiny waste time in machinery collection

|  | Descriptive |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | N | Mean | Std. Deviation | Std. Error | Min | Max |
| Operatory work shop | 8 | 3319.8750 | 5924.05535 | 2094.46985 | 6.00 | 13251.00 |
| Engineering work shop | 7 | 381.0143 | 548.56285 | 207.33727 | 23.00 | 1540.35 |
| Assemble work shop | 6 | 32.9900 | 20.98536 | 8.56724 | 3.00 | 61.00 |
| Painting work shop | 6 | 133.2833 | 129.92292 | 53.04081 | 50.00 | 387.00 |
| Total | 27 | 1119.3978 | 3413.90057 | 657.00547 | 3.00 | 13251.00 |

Table 5: One-way variance analysis testing and difference on the mount of tiny waste time in machinery collection
ANOVA

|  | Sum of Squares | Df | Mean Square | F | Sig. |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Between Groups | 55469492.657 | 3 | 18489830.886 | 1.718 | 0.191 |
| Within Groups | 247553151.364 | 23 | 10763180.494 |  |  |
| Total | 303022644.020 | 26 |  |  |  |

Table 6: Medium amount of tiny waste time of machinery collection on 2008 and 2009
Group Statistics

| Year |  | N | Mean | Std. Deviation | Std. Error Mean |
| :---: | :---: | :---: | :---: | :---: | :---: |
| A301 | 2008 | 13 | 1194.3915 | 3442.87781 | 954.88250 |
|  | 2009 | 14 | 1049.7607 | 3515.24974 | 939.49001 |

Table 7: Testing of dependable average difference on the amount of tiny waste time machinery collection on 2008 and 2009

| Independent Samples Test |  | Levene's Test for Equality of Variances |  | t-test for Equality of Means |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | F | Sig. | t | df | Sig. (2-tailed) |
| A301 | Equal variances assumed | 0.003 | 0.958 | 0.108 | 25.000 | 0.915 |
|  | Equal variances not assumed |  |  | 0.108 | 24.921 | 0.915 |

Table 8: Medium amount of tiny waste time of tools collection

|  | Descriptive |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | N | Mean | Std. Deviation | Std. Error | Min | Max |
| Operatory work shop | 34 | 420.0141 | 523.98181 | 89.86214 | 14.00 | 2247.40 |
| Engineering work shop | 29 | 94.7093 | 203.65702 | 37.81816 | 1.00 | 1076.00 |
| Assemble work shop | 24 | 19.4583 | 32.05550 | 6.54330 | 1.01 | 133.00 |
| Painting work shop | 20 | 40.5665 | 36.34341 | 8.12663 | 5.25 | 145.00 |
| Total | 107 | 171.0783 | 356.06494 | 34.42210 | 1.00 | 2247.40 |

Table 9: One- way variance analysis testing comparison on the amount tiny of waste time in tools collection
ANOVA

|  | Sum of Squares | df | Mean Square | F | Sig. |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Between Groups | 3168475.201 | 3 | 1056158.400 | 10.592 | 0.000 |
| Within Groups | 10270442.031 | 103 | 99713.029 |  |  |
| Total | 13438917.232 | 106 |  |  |  |

Post Hoc Test Multiple Comparisons Dependent Variable: LSD

| (I) GROUP | (J) GROUP | Mean Difference (I-J) | Std. Error | Sig. |
| :---: | :---: | :---: | :---: | :---: |
| 1.00 | 2.00 | 325.3048(*) | 79.81927 | . 000 |
|  | 3.00 | 400.5558(*) | 84.18697 | . 000 |
|  | 4.00 | 379.4476(*) | 88.98532 | . 000 |
| 2.00 | 1.00 | -325.3048(*) | 79.81927 | . 000 |
|  | 3.00 | 75.2510 | 87.13834 | . 390 |
|  | 4.00 | 54.1428 | 91.78252 | . 557 |
| 3.00 | 1.00 | -400.5558(*) | 84.18697 | . 000 |
|  | 2.00 | -75.2510 | 87.13834 | . 390 |
|  | 4.00 | -21.1082 | 95.60524 | . 826 |
| 4.00 | 1.00 | -379.4476(*) | 88.98532 | . 000 |
|  | 2.00 | -54.1428 | 91.78252 | . 557 |
|  | 3.00 | 21.1082 | 95.60524 | . 826 |

* The mean difference is significant at the .05 level

Comparison of Amount of Tiny Waste Time of Machinery Collection in Four Product Work Shop: On the bases of information on Table 4. We considered that medium amount of tiny waste time of machinery collection in operatory work shop equal $3319.87 \pm 5924.05$, enginerary $81.01 \pm 548.56$, montagch $32.99 \pm 20.98$ and painting $133.28 \pm$ 129.92. 92 is obtained. Also on the bases of Table 5. We considered that according to one way variance analysis test amount of $\mathrm{F}=1.71$ with meaningful level is $\mathrm{P}=0.19$. So the difference of amount of tiny waste time from machinery collection in four product work shop isn't meaningful.

## Comparison of Amount of Tiny Waste Time Tools

 Collection in Four Product Work Shop: On the bases of information on Table 8. Considered that medium amount of waste time tools collection in operatory work shop equal $420.01 \pm 532.98$ Engineering $94.07 \pm 203.65$, Assemble $19.45 \pm 32.05$ and in painting work shop 40.36 .34 is obtained. Also on the bases of Table 9 considered that according to one way variance analyses testing amount $\mathrm{F}=10.5$, with meaningful level is $\mathrm{P}=0.000$ so difference amount of tiny waste time from tools collection in product work shop are obtained meaningful. Also on the bases of Table 10 and according to pair grouping comparisons between work shop considered that highest amount of waste time was in operatory work shop.Also on the bases of information on Table 11 and 12 considered that medium amount of tiny waste time of tools collection on $2008=175.1 \pm 365.56$ and on $2009=$ $167.13 \pm 349.88$ is obtained. According to $\mathrm{T}=$ test exam amount of $\mathrm{T}=0.11$ with meaningful level is $\mathrm{P}=0.9$. So difference amount of tiny waste times from tools collection on 2008 and 2009 isn't obtain meaningful.

Comparison of the Amount of Tiny Waste Time on Human Strength in Four Product Work Shop: On the bases of information on Table 13. Considered that amount of tiny waste times form collection of human strength on operatory work shop is obtain equal with $375.41 \pm 432.15$, Engineering 203. $87 \pm 175.04$, assemble $351.6 \pm 461.01$ and painting $93.79 \pm 106.07$. Also on the of Table 14 considered that difference amount of tiny waste time from human strength collection in product workshop isn't obtain meaningfully.

On the bases of information on Tables 15 and 16 considered that medium amount of tiny waste time of human strength collection is obtained on $2008=200.73 \pm$ 298.77 and on $2009251.29 \pm 384.19$. According to testing of dependable a average difference amount of $\mathrm{t}=0.428$ with meaningful level is $\mathrm{P}=0.671$. So difference amount of tiny waste times from human strength collection isn't meaningfully obtained on 2008 and 2009.

## Comparison of the Amount of Tiny Waste Times with the

 Separation of Product Workshops: On the bases of Table 17. Considered that medium amount of tiny waste times is obtained on is obtained operatory work shop $=12160.28 \pm 7975.26$ engineering $5705.14 \pm 7038.21$, montagtzh $67.68 \pm 762.206$, painting $805.03 \pm 1074.42$. Also on the of information on Table 18 considered that according to on way variance analyses testing amount of $\mathrm{F}=8.25$ with the meaningful level is $\mathrm{P}=0.000$ so difference of the amount of tiny waste times on the bases of product workshop obtained meaningful. Also on the bases of pair grouping comparisons according to information on Table 19. Considered that amount of tiny waste times on operatory workshop was higher than the workshop.Table 11: Medium amount of tiny waste time of tools collection on 2008 and 2009
Group Statistics

| Year |  | N | Mean | Std. Deviation | Std. Error Mean |
| :---: | :---: | :---: | :---: | :---: | :---: |
| M201 | 2008 | 53 | 175.1000 | 365.56277 | 50.21391 |
|  | 2009 | 54 | 167.1311 | 349.88245 | 47.61297 |

Table 12: Testing of dependable average difference on the amount of tiny waste time in tools collection on 2008 and 2009

| Independent Samples Test |  | Levene's Test for Equality of Variances |  | t-test for Equality of Means |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | F | Sig. | t | df | Sig. (2-tailed) |
| A301 | Equal variances assumed | 0.006 | 0.941 | 0.115 | 105.000 | 0.909 |
|  | Equal variances not assumed |  |  | 0.115 | 104.589 | 06.909 |

Table 13: Medium a mound of tiny waste times in human strength collection

|  |  |  |  |  |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
|  |  |  |  |  |  |  |  |  |
|  | N | Mean | Std. Deviation | Std. Error | Lower Bound | Upper Bound | Min | Max |
| Operatory work shop | 6 | 374.4150 | 432.15065 | 176.42476 | -79.0993 | 827.9293 | 3.54 | 1028.00 |
| Engineering work shop | 5 | 203.8760 | 175.04666 | 78.28325 | -13.4731 | 421.2251 | 5.68 | 363.50 |
| Assemble work shop | 7 | 351.0000 | 461.01338 | 174.24668 | -75.3663 | 777.3663 | 3.00 | 1230.00 |
| Painting work shop | 7 | 93.7957 | 106.07108 | 40.09110 | -4.3037 | 191.8951 | 7.02 | 297.00 |
| Total | 25 | 255.1776 | 338.13765 | 67.62753 | 115.6012 | 394.7540 | 3.00 | 1230.00 |

Table 14: One-way variance analyzed testing of difference on the amount of tiny waste times in human strength collection
ANOVA

|  | Sum of Squares | Df | Mean Square | F | Sig. |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Between Groups | 345046.934 | 3 | 115015.645 | 1.007 | 0.409 |
| Within Groups | 2399042.714 | 21 | 114240.129 |  |  |
| Total | 2744089.648 | 24 |  |  |  |

Table 15: Medium amount of tiny waste times of human strength collection on 2008 and 2009
Group Statistics

| Year |  | N | Mean | Std. Deviation | Std. Error Mean |
| :---: | :---: | :---: | :---: | :---: | :---: |
| F201 | 2008 | 17 | 200.7318 | 298.77748 | 72.46418 |
|  | 2009 | 17 | 251.2953 | 384.19267 | 93.18041 |

Table 16: Testing of dependable average difference on the amount of tiny waste times in human strength collection on 2008 and 2009

|  |  |  | arian |  | Equality | eans |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Indep | mples Test | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference |
| F201 | Equal variances assumed | 0.549 | . 464 | -0.428 | 32.000 | . 671 | -50.5635 |
|  | Equal variances not assumed |  |  | -0.428 | 30.170 | 0.671 | -50.5635 |

Table 17: Medium amount of wasting reasons with separation of product workshop
Descriptive

|  | N | Mean | Std. Deviation | Std. Error | Min | Max |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 8 | 12160.2863 | 7975.26406 | 2819.68165 | 4658.00 | 29435.00 |
| 2 | 8 | 5705.1438 | 7038.21627 | 2488.38523 | 757.65 | 18423.90 |
| 3 | 8 | 567.6875 | 762.20615 | 269.48057 | 61.00 | 2060.00 |
| 4 | 8 | 805.0313 | 1074.42686 | 379.86726 | 138.00 | 3426.00 |
| Total | 32 | 4809.5372 | 6990.90785 | 1235.82959 | 61.00 | 29435.00 |

Table 18: One-way variance analysis testing on the amount of difference of wasting reasons with separation in product workshop
ANOVA

|  | Sum of Squares | df | Mean Square | F | Sig. |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Between Groups | 710919835.756 | 3 | 236973278.585 | 8.251 | . 000 |
| Within Groups | 804136734.678 | 28 | 28719169.096 |  |  |
| Total | 1515056570.434 | 31 |  |  |  |

Table 19: Pair grouping comparisons LSD
Post Hoc Test Multiple Comparisons Dependent Variable: LSD

| (I) GROUP | (J) GROUP.TA | Mean Difference (I-J) | Std. Error | Sig. |
| :---: | :---: | :---: | :---: | :---: |
| 1 | 2 | 6455.1425(*) | 2679.51344 | . 023 |
|  | 3 | 11592.5988(*) | 2679.51344 | . 000 |
|  | 4 | 11355.2550(*) | 2679.51344 | . 000 |
| 2 | 1 | -6455.1425(*) | 2679.51344 | . 023 |
|  | 3 | 5137.4563 | 2679.51344 | . 065 |
|  | 4 | 4900.1125 | 2679.51344 | . 078 |
| 3 | 1 | -11592.5988(*) | 2679.51344 | . 000 |
|  | 2 | -5137.4563 | 2679.51344 | . 065 |
|  | 4 | -237.3438 | 2679.51344 | . 930 |
| 4 | 1 | -11355.2550(*) | 2679.51344 | . 000 |
|  | 2 | -4900.1125 | 2679.51344 | . 078 |
|  | 3 | 237.3438 | 2679.51344 | . 930 |

* The mean difference is significant at the .05 level

Table 20: Medium amount of wasting reasons with separation of product work shop on 2008 and 2009
Group Statistics

| Year |  | N | Mean | Std. Deviation | Std. Error Mean |
| :---: | :---: | :---: | :---: | :---: | :---: |
| A.Waste | 2008 | 16 | 4413.7150 | 6034.80881 | 1508.70220 |
|  | 2009 | 16 | 5205.3594 | 8015.64805 | 2003.91201 |

Table 21: Testing of dependable difference on the amount of wasting reasons with separation of product workshops on 2008 and 2009

| Independent Samples Test |  | Levene's Test for Equality of Variances |  | t-test for Equality of Means |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | F | Sig. | t | df | Sig. (2-tailed) |
| A.Waste | Equal variances assumed | 0.171 | . 682 | -. 316 | 30 | 0.754 |
|  | Equal variances not assumed |  |  | -. 316 | 27.870 | . 755 |

## Comparisons of Amount of Tiny Waste Time on 2008 and

 2009: Also on the bases of information on Table 20. Considered that medium amount of tiny waste times is obtained on $2008=4413.71$ and $2009=5205.35 \pm 8015$. Also on the bases of information on table 21. considered that according to t -test exam amount of $\mathrm{t}=0.316$ with meaningful level is $\mathrm{P}=0.75$ so difference amount of tiny waste times on 2008 and 2009 isn't obtained meaningfully.
## The Results of Research It's Including:

- Waste times material collection to system Product Company, doesn't have affect;
- Waste times machinery collection to system Product Company, doesn't have affect;
- Waste times tools collection to system Product Company, have affect;
- Waste times human strength collection to system Product Company, doesn't have affect;
- Between waste times of material collection on 2008 and 2009, there is no difference;
- Between waste times of machinery collection on 2008 and 2009, there is no difference;
- Between waste times of tools collection on 2008 and 2009, there is no difference;
- Between waste times of human strength collection on 2008 and 2009, there is no difference.


## Recommendations:

- For decreasing of waste times arising from the lack of tools on company product chain, offered that specialists should have enough attempt for boating available technology and making insid ness tools and eliminating of order from foreign orders program. For this reason company should have a compiled program about selection, observation, promotion of supplier's skill and they put these on the primary goals of themselves strategic;
- Since the structure of company, was connectedly and the used cost leader ship strategy on his product policies for this reason suggest that in order to providing tools and covering of limitation on finance resource, company on the face of his providers should use from one way channel (controlling and authority of provider about price). On the other hand they should enough attempts about getting attention of business companies, such as banks, business means and for providing cash.


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