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

¹Yagoub Alavi Matin and ²Kamal Eisapour

¹Department of Industrial Management, Khalkhal Branch, Islamic Azad University, Khalkhal, Iran ²Department of Management, Khalkhal Branch, Islamic Azad University, Khalkhal, Iran

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 α 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.

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.

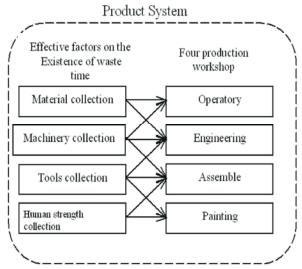


Fig. 1: Frame work of research

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).

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

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 α) 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

ANOVA

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 ± 4105.6 , in Enginearying work shop 921.63 ± 2893.82 , in montaqzh work shop 225.05 ± 468.37 and in painting work shop 151.43 ± 459.62 .

Also on the bases of Table 2. We considered that according to one- way variance analysis test, amount of F=1.44 with meaningful level is 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 ± 197.15 . And on 2009 equal 728.55 ± 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

					95%Confidence			
Descriptive	N	Mean	Std. Deviation	Std. Error	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

	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			

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

Group		

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

	Descrip	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

		Levene's Test f	or Equality of Variances	t-test for E		
Independent Samples Test		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

	Descript	tive				
	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

	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			

Table 10: Pair grouping comparisons LSD

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±5924.05,enginerary 81.01±548.56, montagch 32.99±20.98 and painting 133.28±129.92. 92 is obtained. Also on the bases of Table 5. We considered that according to one way variance analysis test amount of F= 1.71 with meaningful level is 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±532.98 Engineering 94.07±203.65, Assemble 19.45±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 F=10.5, with meaningful level is 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±365.56 and on 2009 = 167.13±349.88 is obtained. According to T=test exam amount of T=0.11 with meaningful level is 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±432.15, Engineering 203. 87±175.04, assemble 351.6±461.01 and painting 93.79±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 $2009\ 251.29 \pm 384.19$. According to testing of dependable a average difference amount of t=0.428 with meaningful level is 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± 7975.26 engineering 5705.14±7038.21, montagtzh 67.68±762.206, painting 805.03±1074.42. Also on the of information on Table 18 considered that according to on way variance analyses testing amount of F=8.25 with the meaningful level is 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

~	α.		
Groun	Sta	fis	fics

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

		Levene's Test f	Levene's Test for Equality of Variances		Equality of Means	
Independe	ent Samples Test	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

					95%Confidence Interval for Mean			
	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

		Levene's Tes	Levene's Test for Equality of Variances t-		for Equality of		
Independent Samples 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
	1N	Ivican	Std. Deviation	Std. Elloi	IVIIII	Iviax
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

Levene's Test for Equality of Varia		or Equality of Variances	t-test for I	Equality of Means		
Independent Samples Test		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±8015. Also on the bases of information on table 21. considered that according to t-test exam amount of t= 0.316 with meaningful level is 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.

ACKNOWLEDGEMENT

Many thanks to Pumpiran Co. Manager.

REFERENCES

- 1. Skoyles, E.R. and J.R. Skoyles, 1987. Waste Prevention on Site, Mitchell Publishing, London.
- 2. Conner, G., 2001. Lean Manufacturing for the Small Shop, Society of Manufacturing Engineers (SME), Dearborn, MI.
- 3. Skoyles, E.R., 2004. Strategic Direction Successful cost reduction methodologies, 20(4): 31-33.
- 4. Flinchbaugh, J., 2001. Beyond lean: building sustainable business and people success through new ways of thinking, Center for Quality of Management J., 10(2): 37-50.
- Emiliani, M.L., 2001. Redefining the focus of investment analysts, The TQM Magazine, 13(1): 34-51.
- Evans, S. And S. Jukes, 2000. Improving codevelopment through process alignment, International J. Operations and Production Management, 20(8): 979-88.
- 7. Faniran, O.O. and G. Caban, 1998. Minimizing waste on construction project sites, Engineering, Construction and Architectural Management, 5(2): 182-8.

- Graham, P. and G. Smithers, 1996. Construction waste minimization for Australian residential development, Asia Pacific J. Building and Construction Management, 2(1): 14-19.
- 9. Teo, M.M. and M. Loosemore, 2001. A theory of waste behavior in the construction industry, Construction Management and Economics, 19(7): 741-751.
- 10. Ramaswamy, N.R., V. Selladurai and A. Gunasekaran, 2002. Just-in-time implementation in small and medium enterprises, Work Study, 51(2): 85-90.
- 11. Rameezden, R., 2006. Attitudes and perceptions of construction workforce on construction waste in Sri Lanka, Management of Environmental Quality: An international J., 17(1): 57-72.
- 12. Lingard, H., P. Graham and G. Smiters, 2000. Employee perceptions of the solid waste management system operating in a large Australian Contracting Organization.
- 13. Svensson, G., 2001. Just-in-time: the reincarnation of past theory and practice, Management Decision, 39(10): 866-79.
- 14. Teo, M.M. and M. Loosemore, 2003. Changing the environmental culture of the construction industry, paper presented at the ASCE Construction Research Congress Conference, University of Hawaii at Manoa, Honolulu, HI, pp: 345-76.
- 15. Implications for company policy implementation, Construction Management and Economics, 18(4): 383-93.
- 16. Alwi, S., K. Hampson and S. Mohamed, 2002. Waste in the Indonesian construction projects, Proceedings of the 1st International Conference on Creating a Sustainable Construction Industry in Developing Countries, November 11-13, Stellenbosch, pp: 305-15.
- Skoyles, E.R. and J.R. Skoyles, 1985. Waste Prevention on Site, Mitchell's Professional Library London.
- 18. Kwan, M.M.C., E.O.W. Wong and R.C.P. Yip, 2003. Cultivating sustainable construction waste management, J. Building and Construction Management, 8(1): 19-23.
- Ekanayake, L.L. and G. Ofori, 2000. Construction material waste source evaluation, Proceedings of Strategies for a Sustainable Built Environment, Pretoria, August 2, available at: www. Sustainable settlement. co. za /event /SSBE/ Proceedings /ekanyake.pdf.

- Formoso, T.C., E.H. Hirota and E.L. Isatto, 1999.
 Method for waste control in the building industry, available at: http:// construction.berkeley.edu/, tommelein/IGLC-PDF/Formoso&Isatto&Hirota.pdf.
- 20. Thomark, C., 2000. Including recycling potential in energy use into the life cycle of buildings, Building Research and Information, 28(3): 176-83.
- 21. Dainty Andrew, R.J. and J. Brooke Richard, 2004. Towards improved construction waste minimization: a need for improved supply chain integration?, Structural Survey, 22(1): 20-29.