

# Solid Waste Management as a Tool in Happy Workplace

Charuvan Kasemsap

**Abstract**—The purpose of this study was to implement the happy workplace activities through the employee engagement in the small and medium-sized enterprises (SMEs) located in the industrial estate around Bangkok, Thailand. Information obtained from participants, comprising of semi-structured interviews and happiness questionnaire surveys were analysed to evaluate the appropriate happy workplace activities, which were conducted as during May 2013-May 2014. The improvement of solid waste management and “5S” system of Cornel Polymer Co. Ltd., Pop System and Service Co. Ltd., and Siam Integration System Co. Ltd. approximately 80, 20, and 30 percent, respectively led to the increasing of happy workplace score of happy body about 40 percentages of each case study.

**Index Terms**—Industry, happy workplace, safety performance, solid waste management.

## I. INTRODUCTION

Company’s ability to compete and gain market share in its industry is related to the quality value of a product or service fitted to customer needs. The happiness of employees leads to the customer satisfaction [1], especially the workplace satisfaction [2] to increase organization productivity [3]. A workplace management can enhance performance and reduce organization losses resulting from cognitive decline [4], illness [5], accidents, high absenteeism, and high labour turnover [6]. Therefore, employee should empower the employees to increase their knowledge and skill in activity engagement of employees to stimulate happy workplace on a sustainable basis [7].

Happy workplace activities are happy body, happy heart, happy society, happy brain, happy money, happy relax, happy soul, and happy family as shown in Table I [8]. Owing to the happy body related to the physically and mentally health employees, less sickness will help the company to save a lot of their budget on health expense.

TABLE I: HAPPY WORKPLACE ACTIVITIES

Happy workplace	activities
happy body	Appropriate working area, sport
happy heart	Friendly working cooperation
happy society	Communication o employee
happy brain	Training courses
happy money	Welfare
happy relax	Recreation
happy soul	Voluntary club
happy family	Family vocational training

Employee of happy workplace will do energetic and active

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at work and also be harmony to cooperate at work. Sport is a highly effective tool for enhancing overall physical fitness, engaging and empowering individuals and company to take action to improve their efficiency [9]. Two-way communication not only verbal communication (sounds, language [10], and tone of voice) but also nonverbal signals (facial expressions, body language, and posture) can have a positive impact on improving mood and productivity in the working environment [11]. A greater collaboration, participation is needed, and teamwork among workers in different functional groups leads to an effective management of production processes.

According to the employee safety performance regulated by the occupational safety and health act (OSHA) [12], each employer has a general duty to furnish each employee a place of employment free from recognized hazards that cause or are likely to cause death or serious physical harm. Work environment may be divided into three broad components: physical environment (ventilation & temperature; noise; infrastructure & interior, amenities), mental environment (fatigue, boredom, monotony, attitude & behavior of supervisor & colleagues), and social environment. Effective work environment encourage the happier employee with their job that ultimately influence the growth of an organization as well as growth of an economics [13]. Safety performance can be continuous improved by the “5S” system in workplace to reduce waste and solid waste management.

The “5S” system comprised of five steps of sort, set in order, shine, standardize, and sustain as shown in Table II [14]. The “5S” team should define the area’s geographic boundaries on area map, take photos, and use workplace scan checklist to assess the improvement of “5S” state. The 5S Audit was checked for working table, file cabinet, shelf, electrical machine, and surrounding area as score of 1 (very poor) to 5 (very good). Employee participation in 5S systems has become widely challenged as a critical component of environmental management in industry.

TABLE II: 5S SYSTEM

Category	Meaning
Sort	Effective space by removing unused items.
Set in order	Less searching time by labeling items.
Shine	Keep ready-used thing by cleaning.
Standardize	Integration into standardization.
Sustain	Keeping as a habit of procedures.

Solid waste is the unwanted or useless solid materials generated from combined residential, industrial and commercial activities in a given area. Management of solid waste reduces or eliminates adverse impacts on the environment and human health and supports economic development and improved quality of life. An effectively managing waste includes monitoring, collection, transport,

processing, recycling and disposal. Methods of waste reduction, waste reuse and recycling are the preferred options when managing waste [15]. They eliminate the production of waste at the source of usual generation and reduce the demands for large scale treatment and disposal facilities. The generators need a suitable container and must store the waste on their property until it is collected. Waste generators have to categorize their solid industrial waste based on the hazard posed by the prescribed industrial wastes (PIWs) that come from manufacturing sources prior to disposal. Relevant information may also be obtained through Material safety data sheets (MSDS), and industry association. The specific hazard characteristics of Environmental Protection Agency are described in Table III [16]. Their environmental benefit is the reduction of greenhouse gas emission, and the contamination of pollutants [17].

TABLE III: SPECIFIC HAZARD CHARACTERISTICS

Hazard characteristic	Definition
Explosive wastes	a solid waste which is in itself capable, by chemical reaction, of producing gas at a temperature, pressure.
Flammable solid wastes	Readily combustible, contribute to fire through friction under conditions encountered in transport or containment.
Wastes liable to spontaneous combustion	Spontaneous heating under normal conditions encountered in transport, or contact with air and liable to catch fire.
Wastes which, in contact with water, emit flammable gases	Interaction with water, are liable to become spontaneously flammable or flammable gases.
Oxidising wastes	Yielding oxygen, contribute to combustion of other materials.
Organic peroxide wastes	Thermally unstable and may undergo exothermic self-accelerating decomposition.
Infectious wastes	Containing viable microorganisms or their toxins to cause disease.
Corrosive wastes	By chemical action can cause severe damage when in contact with living tissue.
Wastes that liberate toxic gases in contact with air or water	Liberation with air or water, are liable to give off toxic gases in dangerous quantities.
Wastes capable of yielding another material which possesses any of the characteristics above	Leachate, which possesses any of the characteristics listed above and/or is a flammable liquid.

II. PROCEDURE FOR PAPER SUBMISSION

The purpose of this study was to implement the happy workplace activities through the employee engagement in the small and medium-sized enterprises (SMEs) located in the industrial estate around Bangkok, Thailand. Three different workplace environments were collected from SME factories which are Cornel Polymer Co. Ltd., Pop System and Service Co. Ltd., and Siam Integration System Co. Ltd. Their products are powder color, furniture, and testing machine, respectively. The Happinometer was used to systematically measure and evaluate the employees' happiness. The happinometer score of questionnaire surveys (Appendix) are calculated (1).

$$Happinometer = \left( \sum_{i=1}^n n_i \times w_i \right) \div 5 \tag{1}$$

The  $n_i$  is number of score whereas the unit weight ( $w_i$ ) of score 1, 2, 3, 4, and 5 are 0, 25, 50, 75, and 100, respectively. The definition of its score expressed as very unhappy (0-25), unhappy (25-50), happy (51-75), and very happy (75-100). The Information obtained from happinometer score and semi-structured interviews were analyses to evaluate the appropriate happy workplace activity, which were conducted during May 2013-May 2014.

III. RESULT

The happy workplace happinometer of Cornel Polymer Co. Ltd., Pop System and Service Co. Ltd., and Siam Integration System Co. Ltd. are shown in Table IV. The lowest happinometer score were found in happy body index.

TABLE IV: HAPPY WORKPLACE HAPPINOMETER

Happinometer	Cornel Polymer	Pop System and Service	Siam Integration System
Happy Body	52 ± 12	49 ± 18	47 ± 14
Happy Relax	51 ± 11	57 ± 17	49 ± 14
Happy Heart	67 ± 10	69 ± 21	66 ± 13
Happy Soul	53 ± 15	56 ± 17	54 ± 15
Happy Family	65 ± 24	72 ± 26	62 ± 19
Happy Society	58 ± 15	59 ± 21	51 ± 19
Happy Brain	62 ± 16	66 ± 18	56 ± 19
Happy Money	58 ± 18	58 ± 13	49 ± 20

This happinometer score were evaluated together with the semi-structured interviews, focus groups and survey in the issues of technique, safety, economic and happiness as shown in Table V. The score rating of 5 equals easy to done, 100 percentage of hazard reduction, low cost, and 100 percentage of happiness enhancement whereas 1 equals hard to done, 0 percentage of hazard reduction, High cost, and 0 percentage of happiness enhancement by team of employee happy workplace activity and employer of case study. It was found that the overall score of Cornel Polymer Co. Ltd., Pop System and Service Co. Ltd., and Siam Integration System Co. Ltd. were 575, 300 and 675, respectively (Table V).

TABLE V: EVALUATION OF HAPPY WORKPLACE ACTIVITY

Issue	Cornel Polymer	Pop System and Service	Siam Integration System
Technical			
- Employee	5	2	5
- Employer	5	2	5
Safety			
- Employee	5	5	5
- Employer	1	5	5
Economic			
- Employee	4	3	3
- Employer	5	3	5
Happiness			
- Employee	5	5	4
- Employer	3	5	3
Score			
- Employee	500	150	300
- Employer	75	150	375

The Happy Workplace activity as solid waste management was done by employee of Cornel Polymer Co. Ltd., (Fig. 1). The productions of hazardous waste, which can be harmful or even fatal for human health, were prevented through waste

minimization and the reuse of waste materials through recycling. However, the key development in waste management is the focus on the procurement issues, where careful selection of materials and process redesign.



(a) Before.



(b) After.

Fig. 1. Solid waste management of Cornel Polymer Co. Ltd.

The “5S” systems were established by employee of Pop System and Service Co. Ltd., (Fig. 2) and that of Siam Integration System Co. Ltd (Fig. 3). 5S is a process designed to organize the workplace, keep it clean, maintain effective and standard conditions as productive, safe workplace [18].



(a) Before.



(b) After.

Fig. 2. The 5S of Pop System and Service Co. Ltd.

Furthermore, time for searching tools, materials and document is minimized. Waste management is an important part of the protection of the environment and of human health. The most important challenge for the industry is the prevention of waste. Workplace features and good communication network at workplace have effect on worker’s productivity [19].



(a) Before.



(b) After.

Fig. 3. The 5S of Siam Integration System Co. Ltd.

#### IV. DISCUSSION

The “5S” score of Cornel Polymer Co. Ltd., as solid waste management, Pop System and Service Co. Ltd., and Siam Integration System Co. Ltd. enhance approximately 80, 20, and 30 percent, respectively. The benefits of workplace activities led to the higher score of happy body about 40 percentages of each case study. Furthermore, they can reclaim solid waste as reuse process about 462 US \$, 231 US \$, and 277 US \$ per month for Cornel Polymer Co. Ltd., Pop System and Service Co. Ltd., and Siam Integration System Co. Ltd., respectively. In addition, the solid waste management of Cornel Polymer Co. Ltd. can reduce curing cost 30.8 US \$ per month as well as the 5S system of Pop System and Service Co. Ltd., and Siam Integration System Co. Ltd. can reduce searching time of 15 percentage, which equals to the wage 1,039 US \$ and 2,911 US \$ per month, respectively (Table VI).

Cost reductions can be achieved by taking particular measures at different stages in the management of wastes especially reduction and reuse process. It is important that a company reassesses its housekeeping practices regularly because much money and resources are wasted due to lack of care or ignorance. Good housekeeping practices can require

no capital cost and usually entails implementing simple changes that results in reduced emissions, wastes, operational costs and increased productivity as well as increased workplace safety.

TABLE VI: HAPPY WORKPLACE VALUE OF CASE STUDIES

Activity	Value (Indirect cost)
Solid waste management of Cornel Polymer Co. Ltd.	- reclamation of solid waste 30 % equal 1,000 kg/month value 462.14 US \$/month - reduction of curing 30.80 US \$/month
5S of Pop System and Service Co. Ltd.	- reclamation of solid waste 10 % equal 500 kg/month value 231.06 US \$/month - reduction of searching time 15 % (25 man- day and wage 9.24\$/day) value 1,039.80 US \$/month
5S of Siam Integration System Co. Ltd.	- reclamation of solid waste 10 % equal 600 kg/month value 277.28 US \$/month - reduction of searching time 15 % (70 man-day and wage 9.24\$/day) value 2,911.45 US \$/month

## V. CONCLUSION

Sustainable organization performance refers to the maintenance of an organization's high performance levels in respect of environment and societal contribution over the long term. In order to implement these activities effectively in the workplaces, both the employers and employees should get fully involve, and the activities should be done regularly and continuously throughout the year.

## APPENDIX

### Happinometer Questionnaire

#### A. Happy Body

- 1) How often do you usually have breakfast per week?
- 2) How often do you usually have exercise day per week?
- 3) Are you have smoked the cigarette?
- 4) Are you have drunk alcoholic beverage such as alcohol, beer and so on?
- 5) Overall, are you happy in your body?

#### B. Happy Relax

- 1) Overall, do you have enough relax?
- 2) Overall, do you have hobby such as see movie, listen to music, shopping etc?
- 3) Overall, do you have stress from working, family, and so on?
- 4) Overall, do you have successful life?
- 5) Overall, can you solve the problem in your life?

#### C. Happy Heart

- 1) Overall, do you concern about your friend?
- 2) Overall, do you support your friend?
- 3) Overall, do you concentrate on the importance of teamwork?
- 4) Overall, do you have closed relationship in your workplace?
- 5) Overall, do you have closed communication with your colleague?
- 6) Overall, do you have work instruction with your colleague?
- 7) Overall, do you happy to make benefit to public?

- 8) Overall, do you attend beneficial activity in social public?
- 9) Overall, do you yourself attend beneficial activity in social public such as plastic bag reduction?

#### D. Happy Soul

- 1) Overall, do you maintain the culture, religion and also donation ?
- 2) Overall, do you do as religion practices to calm your mind?
- 3) Overall, do you stay in peacefully country?
- 4) Overall, do you happy in your country?

#### E. Happy Family

- 1) Overall, do you have enough time to stay with your family?
- 2) Overall, do you have activity together with your family such as exercise, shopping, and have a merit?
- 3) Overall, do you happy with your family?

#### F. Happy Society

- 1) Overall, do you have good relationship with your neighbor?
- 2) Overall, do you respect on social regulation?
- 3) Overall, do you feel safety in your life?
- 4) Overall, can you receive assistance from community when you have some problems?
- 5) Overall, do you think that your country is peaceful?
- 6) Overall, do you have happy life in your country?

#### G. Happy Brain

- 1) Overall, do you interested in seeking for innovative knowledge ?
- 2) Overall, do you have progressive opportunity in your career path?
- 3) Overall, do you have opportunity to develop your skill and competency?
- 4) Overall, do you have suitable knowledge, competency with your working position?

#### H. Happy Money

- 1) Overall, do you have to significantly pay by installment?
- 2) Overall, can you punctually pay by installment?
- 3) Overall, do you have saving deposit monthly?
- 4) Overall, do you have enough wages, compared with the total expenses monthly?

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