

# **Analysis of Persuasive Communication Strategies and Ergonomics Macro in an Effort to Reduce Workplace Accidents in PT. X Batam**

**Dinda Okta Dwiyantri Ridwan Gucci**

Industrial Engineering  
Batam Institute of Technology  
Batam, Indonesia  
[dinda@iteba.ac.id](mailto:dinda@iteba.ac.id)

**Muhammad Adi Sukma Nalendra**

Design and Visual Communication  
Batam Institute of Technology  
Batam, Indonesia  
[adisukma@iteba.ac.id](mailto:adisukma@iteba.ac.id)

## **Abstract**

The Macro Ergonomics Approach looks at the human factor in Occupational safety and health (OSH) or well known as K3 in Indonesia through their interaction with the work area of culture and environment. Considering this, an approach that can support the harmonious implementation of culture and humans is needed through a campaign approach. A persuasive campaign has a homogeneous target audience, seeks to be educated, gives an emotional impression, and looks to change attitudes and change behavior through various appropriate communication media. Macro Ergonomics also tries to persuade the target audience to carry out a healthy and safe work culture by communicating company work rules. Reviewing the science of Design and Visual Communication in terms of persuasive communication has the potential to maximize the OSH discipline enforcement process in Industrial Engineering. This research is aimed to understand the campaign approach in achieving zero accidents. The research identified the potential hazards of the PT X case study in Batam City using Macro Ergonomics. The results of this research are an assessment of the ranking of potential risk that must be addressed in sequence, i.e., in humans, expertise, then technology, namely machines and equipment, and the last one is policy. The result of the persuasive communication strategy analysis is the Facilitator of a Trigger strategy. This strategy positions the OSH work culture as an easy-to-do culture. This strategy needs to be supported by the stakeholders of the as campaign facilitators and initiators.

## **Keywords**

Macro Ergonomics, Safety, Hazard, Campaign, Persuasion

## **6. Introduction**

The potential dangers are often underestimated by most people and companies. Through the identification of potential hazards, accidents can be prevented of the human factors and the environment. Accidents related to the employment relationship, i.e., as a result of work or at the time of carrying out a job, including the accident that befell the labor in the way to or home from work (Wibisono, 2013). Work accidents occurred in various sectors of the industry. Batam is a city with a less 26 industrial area (Indonesia Ministry of Industry, 2020) with about 169.265 workers (Batampos 2020). It is made of Batam became one of the producers of cases of occupational accidents in Indonesia. In 2020, there are at least three accidents triggered by human negligence in the work. Human negligence on the job is one of the signs of low implementation of OSH. The purpose of K3 (OSH), namely the protection of labor in order to survive in the job in the workplace. Control of the production activities with the efforts of the maintenance with the purpose of discharging a safe and efficient (Rawis 2016). Therefore, prevention of accidents at work with more thoroughly in a company or organization might be implement from the most beginning, namely the identification of potential danger. Before an accident occurs then the potential dangers should be eliminated first. Macro Ergonomics approach can identify potential dangers of the overall division in the company.

Macro Ergonomics approach considering human factor in it, especially in the K3 (OSH). Regulation of K3 (OSH) in the company is affected by cultural factors and human. Culture as a system of work must be complied

with by the executor truly tight. Required approach that is able to accommodate the disjointed implementation of the cultural and human that is Campaign approach. The persuasive campaign is an approach in order to achieve a particular effect to be achieved organizations or companies against the subject in a certain period of time. Associated with the K3 (OSH), the campaign has the characteristics of the scope of the target are the same that is human. Macro ergonomics has a scope of the comprehensive review and evaluate the OSH in the company. The approach of persuasive communication companies generally uses the media traditionally have not touched the side of the affective (emotions) of the target audience. Above this, the violation OSH derived from the motives of each worker can be maximized and pushed through the approach of persuasive social campaigns. Persuasive campaign has the characteristics of the scope of the subject of the same design with the method of evaluation of the OSH using the approach of Macro-Ergonomics. Campaign persuasive have a target audience is homogeneous, efforts to educate, to give the impression of emotional and trying to change attitudes and change behavior through a variety of media appropriate communication. Review the science of Visual Communication Design in terms of persuasive communication can potentially maximize the enforcement of discipline OSH in the Engineering Industry it is necessary to do research in case studies of companies that apply the OSH. So, this research is expected to understand the application of the approach to the campaign in an effort to achieve zero accident.

## 1.1 Objectives

The aim of the study is to understand the potential of the campaign approach in an enforcement of discipline OSH (K3) so that the research is expected to understand the application of the campaign approach in an effort to achieve zero accident.

## 2. Literature Review

### 2.1 Potential hazard and Work accident

Potential hazard is something that can lead to workplace accidents until at a loss in an organization (OHSAS 18001: 2007). Work Accident is an accidental thing that can make the injury, the wound until death (Alfatiyah 2017). In the Domino theory, there are five factors that cause sequentially and stand parallel between the factors with one another. The fifth of these factors, among others, namely domino habit, domino mistakes, domino's actions and the conditions are not safe, the domino accident and of domino injury. In preventing the occurrence of accidents is enough to throw one of the dominoes or disconnecting the circuit the chain of dominoes. The cause of loss that occurs due to accidents at work is the following 5 factors namely lack of supervision, the source of the basic causes, causes of contacts, incidents and losses. The main cause of the occurrence of accidents is *unsafe action* (unsafe acts) and *unsafe condition* (unsafe conditions).

### 2.2 Health and safety at work

Health and safety are intended to give protection against any worker where it contains the aspects of safety, health, morale up on the way to maintain treatment of fellow human beings (Tarwaka 2014).

### 2.3 Health and Safety Management system (SMK3)

Health and Safety Management System (SMK3) is a system of regulation in Occupational Safety and Health (K3) in the company with the goal to reduce and even eliminate workplace accidents (Republic of Indonesia Government Regulation No. 50 of 2012).

### 2.4 The macro ergonomics

Macro-Ergonomics is a systems approach socio-technique in *top-down* in analyzing, designing, or repair a working system and the organization of the work then harmonize the design of the elements as a whole (Iridiastadi and Yassierli 2014). Definition of conceptual macro-ergonomics approach is *top-down* in socio-technique applied in the system design of the whole work on the interaction of *human-job*, *human-machine*, and *human- software interface* (Hendrick and Kleiner 2002). Theory socio-technique focuses on the interaction between the demand characteristics of work and social demands of the people who do the work. The elements of the ergonomics of the macro used is human, environment, organization, technology and work (Realyvazques et al. 2018).

### 2.5 Assessment

Assessment is a process to take a decision using information that is obtained through the measurement of learning outcomes by using a test and non-test. Assessment is an activity construe or describe the results of measurements. According to the assessment is the decision about the value (Walimuni et al. 2017).

## 2.6 Campaign

A campaign is a series of communication actions planned with the goal of creating a certain effect to a large number of audiences who carried out continuously at a certain period of time (Roger, S. in Venus 2018). Efforts to improve the enforcement of discipline OSH aligned with the objective methods of the campaign. The purpose of the campaign related to the scientific aspects of cognitive, affective (attitudes) and behaviors (Pfau and Parrot 1993). Susanto (2011) reveals the definition of the cognitive horizon as a process of thinking, the ability of individuals to connect, assess, and consider an event or events. Krathwohl, et al (2001) define affective as behavior that emphasize the feeling, emotion, or a degree of rejection (not agreed) or acceptance (agree) against something. Behavior is response/reaction of an individual to the stimulus that comes from outside and from within himself (Notoatmodjo 2010).

## 2.7 Visual communication and the Psychology of Persuasion

Campaign as a form of communication through the medium of the visual to be a trigger for the achievement of understanding, a change of attitude and behavior change in the running of the discipline OSH. Human factor in a move influenced the motivation and ability of individuals (*ability*) (Fogg 2009). The basis of motivation is: a) *pleasure or pain*; b) *hope or fear*; c) *social acceptance or social rejection*. Not only the motivation, the necessary ability (*ability*) in realizing a behavior. Some of the factors inhibiting the ability of an individual (*ability*) is the Principle of: a) *Time*, the participation of engagement activities are time-consuming target; b) *Money*, the size of the nominal material ejected target; c) *Physical effort*, the size of the business of physical engagement which should be done target; d) *Brain cycle*, how big is the effort to think hard in participating; e) *Social deviance*, conformity of the activities of participation with social norms and grammar rules of the ; f) *Routine*, activity participation is a daily routine. Media as a trigger requires boost system for the quality of motivation and the ability of the audience targeted. A *Trigger* can be divided into three; *the Trigger is Spark* used when the target audience has the motivation and ability are weak at once. *Trigger Spark* displayed on the current situation and the conditions are right. *Trigger Facilitator* used when the target audience has a high motivation but not accompanied by the ability which is great. This strategy is focused on what is it that easy to do assisted with facilitator. *Trigger Signal* used when the target audience has the motivation and ability are high so it is reminiscent.

## 3. Methods

This research conducted in a mixed method where both qualitative and quantitative approach well used. The translation of research conducted with descriptive method. The nature of the quantitative approach is on the assessment of macro-ergonomics and a qualitative approach was on data mining design campaign for the survey, observation, and *Focus Group Discussion* (FGD). The following are the steps in the research, namely:

1. The initial data collection.  
Data collection was conducted at PT X in Batam City with the number of workers 100 workers.
2. Identification of potential danger.  
Exercising is done by identifying the five elements of Macro-Ergonomics, namely: Human, Organizational, Work, Technology and the Environment.
3. Elements of Macro Ergonomics  
At this stage, the identification of hazards will be devoted to each sub-element. The Human element having three sub-elements which need to be identified the potential dangers, namely: Education, experience and expertise. Elements of the Organization has three sub elements, namely: policy of K3 (OHS), Appreciation and Cooperation of the team. Elements of the Technology consists of three sub-elements, namely: the engine, equipment and information systems technology. Elements of the Environment has six sub-elements, namely: noise, temperature, humidity, lighting, station work and *layout of the production floor*. Elements of the work has three sub-elements of the work that requires attention, the target is the production and work schedule. Based on all the elements and sub-elements of this, will be carried out the identification of potential hazards in depth so that the results of the identification of the potential harm this can be used in the assessment of the potential danger to the next stage.
4. Assessment of the Potential Dangers of Using Macro Ergonomics Approach  
At this stage, carried out an assessment of the potential dangers of using sheet assessment of the potential danger IDEACM refer to previous research (Gucci 2019). On the assessment sheet IDEACM elements and sub-elements of the Macro-Ergonomics have weights that will be used as a reference for the assessment of the potential danger.
5. Ranking  
the Value of the potential dangers generate a ranking of the urgency of the danger. The three highest values will be the urgency of the potential danger that must be addressed. The value of the identification of each

of the elements viewed through the elements of the ergonomic macro-Human. A qualitative approach sees the quality of the human role in the value of the potential danger.

6. The Design of *The Campaign*.

The identification of the target audience with the techniques of survey data on demographic, psychographic, and geography. See cognitive, affective and the behavior of the target audience through the method of interview and FGD. Method of analysis the identification of target audiences by descriptive qualitative. The identification of the audience target analyzed with the model of behavioral change (Fogg 2009). A review of the capability of the company in the realization of the communication Strategy of persuasion campaign.

#### 4. Data Collection

PT X chosen research site located in Batam City, Indonesia. PT X is building environment *Jogging track* by utilizing the hill covering an area of 11.3 hectares as the main structure. Project planning has been started from the year 2018 and the realization of the work began in the year 2019-2020 and is still running. The purpose of the design of this hill is to the means of public space, media investment and promotion of the business unit of PT X. the project of making a *Jogging track* planned by dividing the hill into four parts. Part of the first floor as the ground floor, second floor and the third is the jogging track and the fourth floor as the peak of the plateau of the hill. The project involves 20 people working with the assignment of the 2 people excavator operator, 3 people working station mixing cement, 3 people stations for the manufacture of iron, 8 people park workers, 2-person foreman and 2 workers casting the floor jogging track. Workmanship hill involve heavy equipment such as Excavators. Processing time project between Monday – Friday from 08.00–17.00 WIB. There is a schedule Saturday and Sunday with the conditions specified. Here is the data collected in the research is as follows:

1. The employee Data employee Data taken as many as 20 people, consisting of 2 excavator operators. 3 people workers stations stirring cement, 3 people stations for the manufacture of iron, 8 people park workers, 2-person foreman and 2 workers casting the floor jogging track. All employees are graduated from high SCHOOL. There are no workers certified. All workers have less experience over 3 years in the works. Employee Data were taken is a list of employees resume/curriculum vitae.
2. Accident Data Based on the data of occupational accidents has been found accidents lightweight recorded in the form of sand twinkling the eyes while working. There are accidents by operator heavy equipment that is exposed to the rock on the nape of the ear while working on the excavation below the rocky hill.
3. Potential Data hazards Data potential hazards on the get of the results of observation. As for the data of the potential danger is in the form of photographs, layout work stations, measuring temperature, humidity, lighting, noise, data macro ergonomics, namely the data themselves workers, equipment pictures, machine pictures, pictures about the conditions of the work environment, job data that requires attention, the target of workmanship, work schedule, incentives, awards and policy of K3 (OHS).
4. Data measurements of the working environment  
Measurement environment the work done is humidity, noise, lighting and temperature.
5. The Data *layout of the work environment*.  
The Data *layout of the work environment* of the job the work floor to the floor of the trench, the work of digging foundation trenches, the work of casting the floor of the trench, the job of casting sloop outside and in, the construction and installation of stone obliquely, the job of casting the beam between the trenches, the work of the installation of iron wire mesh.
6. Data knowledge of Cognitive and Affective (attitudes) as well as the motivation and *ability* obtained through the method of *Focus Group Discussion* (FGD). FGD participants amounted to 10 workers with the age of 30-45 years with a field that is different. Presented through the FGD known to Most of the workers have been through various kinds of work experience involving the efforts of OSH. The workers have to know the different types and functions of personal protective equipment gained from work experience. Knowledge about the potential danger during work in general has been known. The prevention of occupational accidents pursued through the efforts of the self-based on the experience of work. Such efforts are to use a mask, a long shirt, work shoes and accuracy in work. The workers basically require and needs effort K3 (OHS). During the work in the project *jogging track*, the workers have not received the prevention of accidents of the stakeholders. The attitude of the workers strongly agrees with the prevention K3 (OHS) such as procurement of equipment and directives work better ensure safety, it is because they know the consequences of potential hazards in the work. The workers are aware and agree that use of personal protective equipment in the work can avoid the risk of accidents. The lack of implementation of K3 (OHS) in the work the project by stakeholders due to the lack of understanding of the indirect impacts that can be caused by workplace accidents. The motivation of the workers in the work is to support the needs of the household when the spare time charge time when the pandemic Covid-19. Motivation to work in a state of low protection OSH is because of the lack of a facilitator who is pushing for the creation of a safety working environment. The workers feel a sense of worry (*fear*) while working this case raises the

impetus for the work to be careful. Motivation is the fear of the needs of the economy (*fear*) less fulfilled if it does not work is the main impetus of the permanent workers performing work in conditions that minimal protection OSH. In terms of the ability (*ability*) workers generally have protection efforts work independently but still less evenly between one worker with another worker by reason of convenience of work. The workers agreed that job security is more important than feeling not comfortable when you wear protection tool OSH.

## 5. Results and Discussion

This study results in the form of ranking potential hazards based on the assessment of the potential danger IDEACM (Gucci 2019). The results of the ranking are as follows:

### 5.1 Identification of Potential Hazards

Identification of potential hazards at the 5 elements of macro ergonomics which is divided into 18 sub-element macro-ergonomics. Here is the result of the identification of potential hazards, namely:

1. Human
  - a. Education  
Based on the results of the data collection History of living of workers, all workers are a graduate of the Secondary School Final (SMA).
  - b. Experience  
Based on the results of the data collection curriculum vitae workers and interviews, out of 20 workers, there are 14 people are workers who work for more than 3 years and 6 other workers have work experience less than 3 years.
  - c. Expertise  
Based on the results of the data collection History of living of workers, all workers do not yet have the certification.
2. Technology
  - a. Information system technology  
Information systems technology that is intended in this section is the use of a software-based information system on the project jogging track. One information system that is commonly used is a *warning alarm*, the system information this function when an accident occurs in a large scale so that the work should be stopped if hear a *warning alarm*. *Warning alarm* is to give a sign that there had been accidents at work and all workers have to go into the zone of evacuation. However, at the time of observation, this turns out not applied on this project.
  - b. Equipment  
Based on the results of observation of the following is a list of the potential dangers that are on the equipment used, namely; a) welding machine: less maintenance on the machine, b) wood buffer the brow of the hill: the type of wood used is fragile and weathered.
  - c. Machine  
Based on the results of observation of the following is a list of the potential dangers that are on the machine used, namely; a) excavators: the machine is no longer using a window cover, so often times when the operator becomes unsafe, b) machine cement-mixer: lack of maintenance on the machine.
3. The environment
  - a. Humidity, Noise, Lighting and Temperature  
Measurement of humidity using a Hygrometer. Based on the Decree of the Minister of Health of the Republic of Indonesia NO. 1405 2002 that the threshold humidity of the air in the workplace is 40% - 60%. Table 1 is the result of the measurement of moisture on the project jogging track that shows that the humidity level is above the threshold. This is because the project jogging track is a construction project that the whole is located on the outside of the room (field). Noise measurement using a Sound Level Meter. Table 2 shows the threshold of the noise based on the Decision of the Minister of Health of the Republic of Indonesia NO. 1405 2002. After measurement on the jogging track project, then produced in Table 3. Look back that the project jogging track has exposure daily for 9 hours of work. This means that the project jogging this track belong to a threshold of 85 dB for 8 hours of exposure. However, from the results of the measurement noise, the entire measurement location is at the threshold. Measurement of lighting using a Lux Meter. Table 3 shows the threshold of lighting based on the Decision of the Minister of Health of the Republic of Indonesia NO. 1405 2002. Based on Table 4, then the work on the project jogging track belonging to the rough work and be kept constantly. This means that the threshold is 200 Lux. After measurements lighting then Table 5 shows the results of measurement of the exposure above the threshold at each location of measurement. This is because the project jogging track is a construction project that the whole is located on the outside of the room (field).

So, let's all locations exposed to direct sunlight. Based on the Decree of the Minister of Health of the Republic of Indonesia NO. 1405 2002 that the threshold temperature limit in the workplace that is 18-28°C. After the measurements Table 6 shows that the results of the temperature measurement at each measurement location jogging track is located on above the threshold. This is because the project jogging track is a construction project that the whole is located on the outside of the room (field). So, let's all locations exposed to direct sunlight. All measurement results can be seen in Table 1.

Table 1. Humidity measurement

Measurement Location	Humidity	Noise	Lighting	Temperature
Ground Floor	66 %	62,1 %	81325 Lux	30,5°C
1 <sup>st</sup> Floor	66 %	58,1%	13034 Lux	29,7 °C
2 <sup>nd</sup> Floor	66 %	62,9%	20897 Lux	29 °C
3 <sup>rd</sup> Floor	66 %	59,4 %	11275 Lux	29 °C
4 <sup>th</sup> Floor	66 %	57,8 %	69703 Lux	30 °C

b. Layout

Based on the results of observation and see the workflow on the project jogging track, layouts work experience flow, which is very far from the work-station assembly iron which was on the 4th floor of the jogging track while the station foundry is located on the ground floor. This thing makes a groove back and forth in the casting, making sloop outside, sloop in the installation of stone obliquely, the installation of iron wire mesh, the floor of the trench.

c. Workstation

Based on the results of observation on the project jogging track, then obtained the potential-the potential danger on the workstation can be seen in Table 2. Given this research was conducted on construction projects, then all workers work at all locations that exist in the area jogging track, not just at the station working.

Table 2. Hazard potential on working station

No.	Workstation/ Work Location	Picture of Potential Hazards in the Workstation	Potential Danger
1.	- 1 <sup>st</sup> Floor - 2 <sup>nd</sup> Floor - 3 <sup>rd</sup> Floor - 4 <sup>th</sup> Floor - Ground Floor		- Much of the rest of the material scattered - A lot of wood spiked her work area workers - Transverse irons in the workers area So that can cause accidents punctured and the operator fall. Other potential is the iron-iron that leads out, the wood of the rest of the rest of the construction that is still stuck nails in the wood, cast iron remains the construction of a transverse in the work area workers. This is in contrast with the Regulation-
2.	- 1 <sup>st</sup> Floor - 2 <sup>nd</sup> Floor - 3 <sup>rd</sup> Floor - 4 <sup>th</sup> Floor - Ground Floor		-of the Minister of Manpower and Transmigration of Safety and Health (K3) on the construction of buildings (CHAPTER II, Article 5) that "in Every work place should be equipped with a means for utilities to enter and exit safely" and Article 6 Of the Workplace and working Tools that "Cleanliness and tidiness of the workplace must be maintained so that the materials are scattered building materials, equipment and working tools are not obstruct or cause accidents.

No.	Workstation/ Work Location	Picture of Potential Hazards in the Workstation	Potential Danger
3.	- 1 <sup>st</sup> Floor - 2 <sup>nd</sup> Floor - 3 <sup>rd</sup> Floor		<p>- Much of the rest of the material scattered                      - Iron-iron transverse she re workers                      - The hose-the hose transverse she re workers</p> <p>So that can cause accidents punctured and the operator fall. Other potential is the iron-iron that leads out, the wood of the rest of the rest of the construction that is still stuck nails in the wood, cast iron remains the construction of a transverse in the work area workers. This is in contrast with the Regulation of the Minister of Manpower and Transmigration Of Safety and Health (K3) on the construction of buildings (CHAPTER II, Article 5) that “ in Every work place should be equipped with a means for utilities to enter and exit safely” and Article 6 Of the Workplace and working Tools that “Cleanliness and tidiness of the workplace must be maintained so that the materials are scattered building materials, equipment and working tools are not obstruct or cause accidents.</p>

4. The work

- a. A job that requires attention Overall, the whole work on construction projects is a job that requires attention. It's just a job that really needs attention is on the job using the machine excavator. Because excavators will be redirected to the street dance area jogging track each floor with state of the hills are still made. Moreover, workers who work became the operator of an excavator has not been certified.
- b. Target work Based on the results of interviews with workers working target in the project jogging track no.
- c. Work Schedule Based on the results of observation and interview, work schedule workers on Monday – Friday from 08.00–17.00 WIB. There is a schedule Saturday and Sunday with certain conditions.

5. Organization

- a. Incentives  
Based on the results of interviews on workers that there is no incentive on the project jogging track. This can make the motivation of workers to be low so as to give the impact of a less well on the job.
- b. Awards  
Based on the results of interviews on workers that no system of awards on the project jogging track. This can make the motivation of workers to be low so as to give the impact of a less well on the job.
- c. Policy  
Based on the results of observation and interview that it was indeed on the project jogging track there is no policy OSH. It becomes the thing to note for the future. Because to apply the OSH, the most attention is the policy of the OSH. After the identification of potential hazards then carried out an assessment of the potential dangers of using sheet assessment of the potential danger IDEACM (Gucci, 2019). Table 3 shows the results of the assessment of the potential danger. Based on Table 3 the results obtained 4 ranks, which should be soon overcome, which is on the human element there is a sub-element of skill to rank 1 with the final score of the assessment that is 6,66. Then, on the technological elements of the machine to be rank 2 with a final score that is 1.50, then on the sub-elements of the equipment on rank 3 with a final score that is 1.19 and policy to rank 4 with a final score of 1.10.

Table 3. Sheet assessment of potential hazards IDEACM (Gucci 2019)

<b>Sheet Assessment of Potential Hazards</b>			NO. Doc : 01 NAME : Dinda Okta Dwiyanti Ridwan Gucci ST.,MT Day-DATE/YEAR : Thursday, 27 Mei 2021		
Criteria	Sub criteria	Level of danger (please give √)	Last Score calculation:	Final	Rank

(Weight)	(weight)	Not Dangerous (1)	Dangerous (2)	Very dangerous (3)	Weight Criteria x Weight Sub criteria x Level of Danger = Final Score	Score	
Human (3,44)	Education (0,147)		√		$3,44 \times 0,147 \times 2 = 1,101$	1,01	5
	Experience (0,205)	√			$3,44 \times 0,205 \times 1 = 0,705$	0,70	7
	Skills (0,646)			√	$3,44 \times 0,646 \times 3 = 6,666$	6,66	1
Technology (1,03)	Information and Technology System (0,117)		√		$1,03 \times 0,117 \times 2 = 0,241$	0,24	13
	Equipment (0,386)			√	$1,03 \times 0,386 \times 3 = 1,192$	1,19	3
	Machine (0,486)			√	$1,03 \times 0,486 \times 3 = 1,501$	1,50	2
Environment (0,75)	Humidity (0,050)		√		$0,75 \times 0,050 \times 2 = 0,075$	0,11	18
	Noise (0,057)		√		$0,75 \times 0,057 \times 2 = 0,085$	0,12	17
	Lighting (0,070)		√		$0,75 \times 0,070 \times 2 = 0,105$	0,15	16
	Temperature (0,115)		√		$0,75 \times 0,115 \times 2 = 0,172$	0,25	12
	Layout (0,120)		√		$0,75 \times 0,120 \times 2 = 0,18$	0,27	11
	Workstation (0,128)			√	$0,75 \times 0,128 \times 3 = 0,288$	0,28	10
Job (0,75)	Work that requires attention (0,403)			√	$0,75 \times 0,403 \times 3 = 0,906$	0,90	6
	Target of Work (0,392)		√		$0,75 \times 0,392 \times 2 = 0,588$	0,58	8
	Work schedule		√		$0,75 \times 0,147 \times 2 = 0,220$	0,22	14
Organization (0,67)	Incentive (0,130)		√		$0,67 \times 0,130 \times 2 = 0,174$	0,17	15
	Awards (0,320)		√		$0,67 \times 0,320 \times 2 = 0,428$	0,42	9
	Regulation (0,548)			√	$0,67 \times 0,548 \times 3 = 1,101$	1,10	4

## 5.2 Analysis approach Communication the Psychology of Persuasion

The role of humans in an effort to increase Health and Safety are on the internal factors of the human. If viewed from the side of communication persuasion it is necessary to review the side of the fundamental of the knowledge, attitude and act of an individual. Communication persuasion can have an impact if the message from the communication resonates or ring true so being able to drive behavior.

The design of the campaign as an attempt of persuasion observance of cultural K3 (OHS), need to review the knowledge (cognitive) the importance of OSH to each worker, and the need for alignment between the cognitive with a positive attitude towards such efforts. Communication efforts will have an impact to the behavior with a boost of visual communication media designed. The purpose of the campaign communication persuasive is to create the effect of attitude and behavior that supports the increase in K3 (OHS) with the target participants of the project workers *Jogging track* PT.X conducted on an ongoing basis during the project.

1. Cognitive (*understanding*), through interviews and focus group discussions with workers, has obtained the conclusion that in general the workers know the importance of using protective equipment K3 (OHS) as well as the function of each tool is. Cognitive workers know the basic things to be improved workplace culture K3 (OHS) through the experience of work that has been traversed before. Knowledge of the workplace culture that is safe and healthy is the key in forming a positive attitude towards the persuasion of the implementation of K3 (OHS).
2. Affective (*attitudes*), through interviews and focus group discussions with workers also have been obtained to bring in general workers have a positive attitude towards the implementation of the culture K3 (OHS). Those attitudes are formed due to the encouragement of the basic needs of what they've gone through and naturally during work in the field. Knowledge and experience directly drive the need for protection of the work and the thoroughness of the work. The workers also have the feeling of fear when working with without using equipment and landing culture K3 (OHS).
3. The behavior of the Response or reaction of the workers once you have the knowledge and a positive attitude towards the OSH is seeking OSH equipment independently and limited. The effort is characterized by the use of work shoes, long-sleeved shirt and glasses working. With the efforts of such behavior, then the necessary overview of the motivation and ability even without being driven by stakeholders to implement OSH workers have knowledge and a good attitude to be implanted behavior cultural OSH. Through the analysis, the achievement of the knowledge and attitudes have been formed on the majority of the workers. The purpose of the campaign if the knowledge and attitude have been met is to maximize the efforts of the formation of behavior through the media and facilitator. Media design and facilitators can be a maximum of by knowing the motivation and ability (*abilities*) of the workers. Through FGD obtained some motivation and *ability* of workers as follows:
  - a. Motivation

Motivation is the basic thing that drove the workers to behave. From the results of the FGD, the motivation of the workers keeps their jobs is to reduce fear (*fear*) will be the inadequacy of the necessities of life. The main motivation is to meet the economic needs of the family in the pandemic Covid-19. Next motivation is having trouble finding work in the Covid-19, so as to maintain a job with high risk. That is because the want to deliver the best (*pleasure*) to your family, want to remain a happy family when the pandemic Covid-19. Motivation to keep working and use of personal protective equipment limited, which was initiated by the individual is to remain back home to meet the family safe. It is the urge expectations of each individual to continue to behave thus for the purpose of fulfillment of the integrity of the economic and the social in the family remains adequate.

b. The ability (*Ability*)

Ability in this case are the factors that hinder the behavior despite having a strong motivation. The factors that hinder the enforcement of cultural OSH during the work lies in the magnitude of the value of the material that is incurred in the purchase of equipment OSH (*money*). The next factor is the establishment of norms or rules as well as the value of the work culture OSH work environment (*social deviance*). Those factors is the cause of the normal activity of the violation of cultural OSH work environment. With the absence of reward and punishment if not heed the rules of the OSH, then the enforcement of the rules of the culture of the OSH will not be formed. It is necessary encouragement of stakeholders in the direction of work is more conscious of the importance of culture OSH. The next factor is the Routine (*Routine*). The routine is implementation of culture of K3 (OHS) protocols. The routine of the workers carrying out the work culture K3 (OHS), then the easier it is to maintain the work culture K3 (OHS) work environment.

Through the analysis of motivation and ability (*abilities*) can be inferred qualitatively is the workers have had a strong motivation to run cultural of K3 (OHS). Through the analysis also found that the ability (*ability*) of the workers in carrying out the cultural of K3 (OHS) still need to be supported from the external factors are adequate. Communication strategy as well as countermeasures to avoid various accidents then required the efforts of cooperation between workers and stakeholders. The design of a communication strategy aimed at designing media trigger that is *Facilitator Trigger* is appropriate when the target audience has the motivation high, but not accompanied with the execution capabilities (*ability*) are great. This communications strategy focused emphasis on what are the obstacles for the enforcement of workplace culture of K3 (OHS) it is easy to be implemented. Stakeholders in this case as *the Facilitator* should attempt to strong to realize the needs of the material and high work culture. Through the procurement of material, equipment OSH as well as the work culture that is cultivated in the work environment, then push the media that is *Trigger Facilitator* will also be running as the domino effect of that impact.

## 6. Conclusion

The following are the conclusions of this study are as follows:

1. After the identification of potential hazards then carried out an assessment of the potential dangers of using sheet assessment of the potential danger IDEACM (Gucci 2019). Table 8 shows the results of the assessment of the potential danger. Based on Table 8 the results obtained 4 rank, which should be soon overcome, which is on the human element there is a sub-element of skill to rank 1 with the final score of the assessment that is 6,66. Then, on the Technological elements of the Machine to rank 2 with a final score that is 1.50, then on the sub-elements of the Equipment on rank 3 with a final score that is 1.19 and the Policy element to rank 4 with a score of final 1,10. This means that the urgency of the potential dangers should soon be in the fix is in:
  - a. Human: Skills
  - b. Technology: Machines and equipment
  - c. Organization: Policy OSH
2. Identification using the assessment sheet the potential danger IDEACM (Gucci, 2019) consider three factors, namely the field of human (Skills), Technology (machine and equipment) and the Organization (Policy of K3). Consider the matter as well as evaluate the results of the analysis of FGD then obtained communication efforts persuasive specialized media strategy *Trigger Facilitator*. This communications strategy refers to motivation (*motivation*) is high but not accompanied with the execution capabilities (*ability*) are great. The tone of the communication that will be achieved is by directing that the implementation of the culture of the K3 is an *easy-to-do* and requires facilities in the form of material and the strong rules of the stakeholders' interests.

The technique of identification of the potential dangers of using sheet assessment of the potential danger IDEACM (Gucci 2019) collaborated with the identification of *elements of simplicity* (ability) (Fogg 2009) to

produce an approach that is more relevant from the human side. Designing the campaign messages in the enforcement of culture of K3 (OHS) in the environment of work can be more relevant and impactful.

## References

- Alfatiyah, R., Analisis manajemen risiko keselamatan dan kesehatan kerja dengan menggunakan metode hirarc pada pekerjaan seksi *casting*, *Sintek Jurnal*, vol. 11, no. 2, pp 88-101, 2017.
- Batampos.co.id., Ini 26 kawasan industri di kota batam yang dijadikan sarana investasi, Available: <https://batampos.co.id/2020/07/10/ini-26-kawasan-industri-di-kota-batam-yang-dijadikan-sarana-investasi/>, Accessed on Oktober 28, 2020.
- Fogg, B. J., A behavior model for persuasive design. In *Proceedings of the 4th international Conference on Persuasive Technology*, vol 40, pp 1-7, 2009.
- Gucci, D. O. D. R., Framework penilaian potensi bahaya di industri menggunakan pendekatan ergonomi makro (studi kasus: pt. kunango jantan pekanbaru), *International Journal of Progressive Sciences and Technologies*. vol. 15, no. 2, pp 209-216, 2019.
- Hendrick, H. W., Kleiner, B., *Macroergonomics: Theory, Methods and Applications*. 1<sup>st</sup> edition, London: Lawrence Erlbaum Associates, 2002.
- Iridiastadi, H., and Yassierli, *Ergonomi Suatu Pengantar*. 1<sup>st</sup> edition, Bandung: PT. Remaja Rosda Karya, 2014.
- Krathwohl, D. R., et al., *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*, 1<sup>st</sup> edition, New York: Pearson Education. 2001.
- Notoatmodjo, S., *Ilmu Perilaku Kesehatan*, 1<sup>st</sup> edition, Jakarta: Rineka Cipta. 2010
- OHSAS 18001: 2007. *Occupational Health and Safety Management Systems – Requirements*. UK: BSI. Accessed on October 20, 2020.
- Pfau, M., and Roxanne, P., *Persuasive Communication Campaign*, 1<sup>st</sup> edition, Boston, Massachussets: Allyn and Bacon., 1993.
- Rawis, T. D., Perencanaan biaya keselamatan dan kesehatan kerja (K3) pada proyek konstruksi bangunan (studi kasus: sekolah st.ursula kotamobagu), *Jurnal Sipil Statistik*, vol. 4, no. 4, pp. 243-244, 2016.
- Realyvasquez, A., Macias, A. A. M., Alcaraz, J. L. G., *Macroergonomics for Manufacturing System an Evaluation Aproach*, 1<sup>st</sup> edition, Tijuana: Springer, 2018.
- Setiawati, T., Perancangan iklan layanan masyarakat keselamatan kerja pada kawasan industri di medan, *Jurnal Proporsi*, vol. 2, pp. 187-198, 2017.
- Susanto, A. *Perkembangan Anak Usia Dini*, 1<sup>st</sup> edition, Jakarta: Kencana Prenada Media Group, 2011.
- Tarwaka, *Keselamatan dan Kesehatan Kerja Manajemen dan Implementasi K3 di Tempat Kerja*, 2<sup>nd</sup> edition, Surakarta: Harapan Press, 2014.
- Venus, A., *Manajemen Kampanye: Panduan teoritis dan praktis dalam mengefektifkan kampanye komunikasi publik*, 1<sup>st</sup> edition, Bandung: Simbiosis Rekatama Media, 2018.

## Biographies

**Dinda Okta Dwiyantri Ridwan Gucci, S.T., M.T.** A lecturer in Industrial Engineering. Expertise in Ergonomics and Occupational Health and Safety (K3) at the Batam Indonesia Institute of Technology. The author took a formal undergraduate education at the Sultan Syarif Kasim State Islamic University in Riau (2017) with a major in Industrial Engineering and a Masters in Industrial Engineering at Andalas University, Padang (2019).

**Muhammad Adi Sukma Nalendra, S.Ds., M.Ds.** A lecturer in Visual Communication Design. Expertise in Advertising and Multimedia at the Batam Indonesia Institute of Technology. The author took a formal undergraduate education at DKV ITB (2017) and a Masters in Design Masters ITB (2019)