CHAPTER 2

STATE OF THE ART

2.1. Previous Research

Ganis et.al (2005), in their research paper describe the ergonomic and work safety problems between machine and operator. It use position marking on work method analysis that concern on static and dynamic position. The result of those methods was productivities optimalization and reduced work accident.

Dewa et.al (2005), identified the problems based on monitoring with the observation and analyse it. The analysis done on continues process of machining to reduce the deviation that result on process. This is an introduction of quality control aspect in term of reducing rejected goods. It analyzes the characteristic of data pattern and identifies the problems by Pareto diagram, Histogram, Control Chart, Cause and Effect diagram. It found problems of common and special cause, for example of machine rotation setting, cutting speed, (human error), dull of cutting tool.

Dewi et.al (2005), analysed the Ergonomic aspect based on Biomechanics analysis of Yogyakarta traditional plough. By using Mannequin Pro 7 software, this methods developed human body posture of farmer to reduce work load and risk of body injury.

2.2. Present Research

Present research combine among three previous papers as the pre analysis method of study. The purpose is to analysed nonconformity problem relation among aspect of quality control and ergonomic. By using Mannequin Pro 7 it generate the analysis of Biomechanics graph and Energy expenditure. Furthermore, it analysed based on human limitation on workload, energy expenditure, posture and physiology aspect, and so human disorder and injury analysis.

Table 2.1. Differences of previous research with present research

Researcher	Purpose	Data that used	Research Object	Method
Ganis Et.al (2005)	Equipment support design which effective ,comfort, safe, and health, supporting Indonesian anthropometry.	Anthropometry data ,working posture and position frequency on operator, *Jig* dimension Of Boom ZX-30 Toshiba CNC machine.	*Jig* Boom ZX-30 Toshiba CNC machine.	Designing based on Anthropometry and static & dynamic position activities, frequency position marking.
Dewa Et.al (2005)	Problem Identification based on monitoring and observation to analyzed problems.	Quality control data on machining process 40 mm Boom ZX -30 Excavator product	Variation result of 40 mm diameter of hole in Boom ZX - 30 product	Statistical Process Control (with X bar chart and R chart) and Cause-Effect Diagram
Dewi, Et.al (2005)	Equipment design based on ergonomic and biomechanics with support with Mannequin Pro 7 software.	Anthropometry data, working posture, dimension of bajak and garu.	Yogyakarta traditional Bajak and Garu.	Biomechanical analysis with Mannequin Pro 7 software.

Present research	Analysing the relationship and potential causes of quality control and ergonomic aspect on Biomechanics, human posture analysis, & physiology (human disorder & injured) that influenced on existing nonconformity problem.	Anthropometry data, working posture, dimension of working place, variation data.	Variation result of 40 mm diameter of hole in Boom ZX - 30 product (as quality control aspect that being analyzed) Biomechanics on operator posture at Jig Boom ZX-30 Toshiba (as Ergonomics aspect that being analyzed)	SPC analysis (using WinQS software) and Cause-effect diagram, position marking analysis, Biomechanics analysis with Mannequin Pro 7 software, biomechanics graph and Energy expenditure analysis, Human disorder and injured analysis, over flexion analysis.