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# ANALYZING THE IMPACT OF QUALITY CONTROL CIRCLE AND SEVEN TOOLS METHODS ON ENHANCING PRODUCTIVITY

**Ramlah P[1], Maffudnurnajamuddin[2] Serlin Serang [3]**

[1]Universitas Teknologi Akba Makasar
[2,3]Universitas Muslim Indonesia
*Email: *ramlah@unitama.ac.id*

***ABSTRACT***

*The primary objective of companies involved in the production process is profitability, achieved through optimizing labor, raw materials, and resources. This continual improvement results in a robust production system geared towards generating significant profits. A prevalent method for ongoing refinement is the application of Quality Control Circles (QCC). This research focuses on assessing productivity improvements in the K84 Line Steering Handle following the implementation of QCC methodologies. It aims to understand the factors affecting productivity and applies QCC techniques to enhance efficiency. The research reveals promising findings, indicating that QCC-driven enhancements have substantially reduced cycle times across workstations. This reduction directly contributes to increased production output for the K84 Line Steering Handle. The utilization of QCC methods has proven remarkably effective, elevating efficiency levels from 65% to an impressive 92% and concurrently reducing manpower requirements by 3. In summary, this research emphasizes the transformative impact of QCC practices on productivity, highlighting substantial gains in output efficiency and resource optimization for the K84 Line Steering Handle. The integration of QCC-driven improvements has proven instrumental in achieving these positive outcomes.*

***Keywords: Quality Control Circle, Seven Tools and Productivity***

## INTRODUCTION

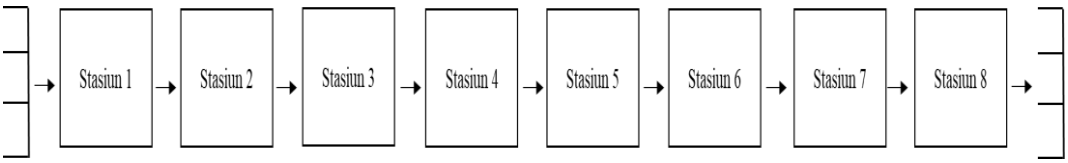
The economy relies on production and distribution of goods. Production stands as a fundamental function in any organization, encompassing activities responsible for creating additional value in products, which constitute the output of industrial organizations.

Workforce stands as a crucial production factor alongside others like raw materials, capital, machinery, and technology. Managing and monitoring these production factors collectively is essential for effective operations. Production machinery supports and enhances work productivity, amplifying the quantity of product output. Time plays a pivotal role in determining the achieved level of work productivity. When a company produces goods within set or calculated standard time frames, the production process is expected to operate effectively and efficiently (Haryanto, 2018).

The primary objective of companies engaging in production processes is profitability. Various methods, such as saving on labor, raw materials, and other resources, exemplify the types of improvements made by these companies. Continuous improvements are consistently pursued to establish a robust production system that ensures substantial profits.

One of the automotive industries engaged in manufacturing produces and assembles parts for both two-wheeled and four-wheeled vehicles. Fierce competition has prompted the management to devise a strategic plan to confront future challenges. The increased customer demand in 2021 has driven the management to enhance production capacity to meet these growing needs. Equally crucial is the continuous focus on cost reduction across all processes to sustain competitiveness in the global market.

Within this diverse production landscape, various production lines yield different products. The focal point of this research is the K84 Line Steering Handle, a component in two-wheeled vehicles functioning as a steering control mechanism.




Figuer 1. Layout Line Steering Handle K84

Currently, the production capacity of the K84 Line Steering Handle is 300 pcs/shift. To meet the increased customer demand in 2021, efforts are being made to increase the output to 400 pcs per shift. Additionally, the line's efficiency stands at only 65%, whereas the management standard is set at 90%. Furthermore, the Man Hour per Unit is 0.2, whereas the standard is 0.15 (where High is Bad). What steps is the management taking to enhance the productivity of the K84 Line Steering Handle

Achieving set targets and objectives is crucial in today's market where consumers, empowered by current information and technology, have heightened sensitivity towards product quality and pricing. Consequently, companies are compelled to elevate the quality of their products continually and refine strategies (Napitupulu & Hati, 2018). The quality of products and services hinges on customer satisfaction and the efficiency and effectiveness of the processes that create and support them. Quality is an evolving category influenced by changing customer expectations and needs due to the abundance of information. This drives an increased demand for product and service quality, compelling manufacturers to consistently and continuously ensure the quality of their products (Simanova, 2015). Quality constitutes the factors within a product or result that align it with the intended purpose for which it is needed (Assauri in Sirine & Kurniawati, 2017).

In reference to quality aspects for consumers and producers, quality is interpreted as the producer's endeavor to meet customer satisfaction by delivering what meets the needs, expectations, and even the hopes of customers. This effort is observable and measurable in the final outcome of the produced product.

**Quality**

The quality of a product is influenced by several factors commonly known as the 6Ms (Machine, Material, Manpower, Method, Money, Motivation) (Napitulu & Hati, 2018). These factors shape the quality of a product and service, consequently impacting the productivity of a process. Productivity stands as a crucial point in industrial existence, serving as a parameter for organizations to measure the performance of their resources, including both human resources and business units within the organization.

There's a correlation between efforts to improve quality and productivity. Quality improvements yield two significant outcomes: increased sales and reduced costs. Improved quality inevitably fosters a positive perception of the offered products and services, thus boosting sales. Enhanced quality minimizes the need for reworking items or discarding them due to irreparability, consequently reducing labor hours wasted on rework. The time saved from rework can be redirected towards generating new products, thereby enhancing productivity and, naturally, reducing costs (Tannady, 2015).

**Quality Control**

According to Assauri in Ekawati and Rachman (2017), quality control and supervision are activities aimed at ensuring that production and operational activities proceed as planned. When deviations occur, corrective steps are taken to ensure the achievement of the desired goals. Control involves monitoring outputs, comparing them against established standards, interpreting differences, and taking corrective actions to align the entire process with the set standards (Sirine & Kurniawati, 2017).

Meanwhile, as per Gaspersz in Ekawati and Rachman (2017), quality encompasses the entirety of a product's characteristics that support its ability to meet specified specifications or applied needs. Therefore, quality control can be defined as an effort to maintain the standard or quality of produced goods in line with the product specifications established based on the company's management policies (Assauri in Ekawati & Rachman, 2017).

**Productivity**

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**Quality Control Circle**

According to Sritomo Wignjosoebroto (2003, p. 297), a Quality Control Circle is a small group of frontline employees, sometimes led by a supervisor, who voluntarily seek ways and means

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to enhance quality and reduce production costs wherever this group operates within the production system.

## RESEARCH METHODS

The study regards production as its population, specifically focusing on a segment within the production process. Primary data originates from Quality Control Circle (QCC) activities associated with the Line Steering Handle K84, complemented by daily logs pertaining to this product. Data collection encompasses interviews, observations, and documentation. Qualitative research necessitates in-depth interactions through interviews and observations within the setting of interest to grasp phenomena comprehensively. Interviews serve the purpose of constructing insights into various facets like individuals, events, organizational dynamics, motivations, and more. The methodology employs in-depth interviews to deeply explore issues relevant to the research focus. The researcher utilizes Purposive Sampling to select key informants, including the Improvement Manager, Production Manager, and members of the Line Steering Handle K84 Production Team.

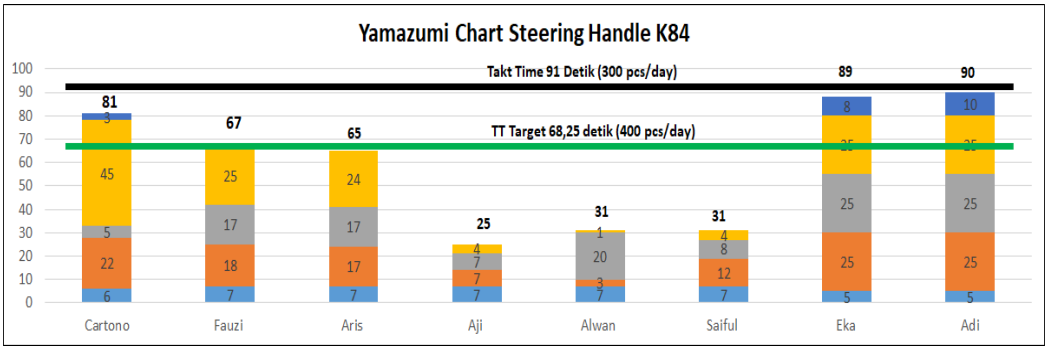
Observation within qualitative research varies, and in this study, the observer participates openly within the observed setting. Documentation is instrumental in collecting non-human data, inclusive of documents and records. Post-data collection, the process proceeds to data processing and analysis. This involves systematically organizing and synthesizing data from interviews, field notes, and documentation, rendering it comprehensible for both the researcher and others.

Spradley's model shapes the qualitative data analysis, tailored to different research stages. This includes selecting Line Steering Handle K84 activities as the data source, entering the field through key informant identification, focusing on observing Line Steering Handle K84's production performance, selecting observations across production lines, and eventually identifying Improvement themes based on the research findings.

## RESULTS AND DISCUSSION

**Tabel 1. Cycle Time Line Steering Handle K84**

| No | Name | Process | Element Work | Cycle Time | Takt Time |
|---|---|---|---|---|---|
| **1** | Cartono | Bending dan Knurling | 5 | 81 | 91 |
| **2** | Fauzi | Brazing 1 | 4 | 67 | 91 |
| **3** | Aris | Brazing 2 | 4 | 65 | 91 |
| **4** | Aji | Correcting | 4 | 25 | 91 |
| **5** | Alwan | Auto drill | 4 | 31 | 91 |
| **6** | Saiful | Inspection | 4 | 31 | 91 |
| **7** | Eka | Buffing 1 | 5 | 89 | 91 |
| **8** | Adi | Buffing 2 | 5 | 90 | 91 |




**Figuer 2 Yamazumi Chart Line Steering Handle K84**

After collecting data on cycle time, the writer proceeded to generate data on man-hours. This data was derived from the number of workers, effective working hours, and production capacity per shift or per line. Both sets of data serve as crucial reference points during result evaluations. Comparing the cycle time and man-hour data

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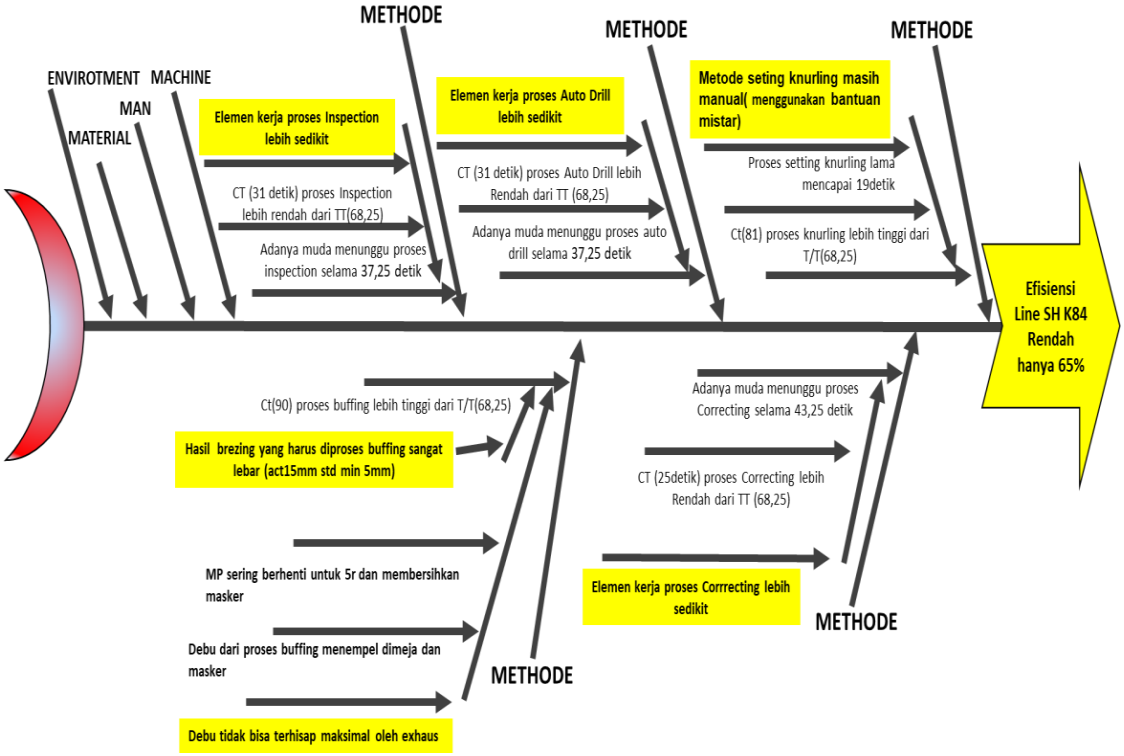
allows researchers to evaluate the efficiency and productivity of the observed process.




After conducting a root cause analysis, the subsequent step, Step 5, involves implementing improvement measures. Within the improvement plan table, this encompasses the root cause, improvement plan, causal factors, improvement activities, responsible parties, location, time frame, costs, and the targeted outcomes.

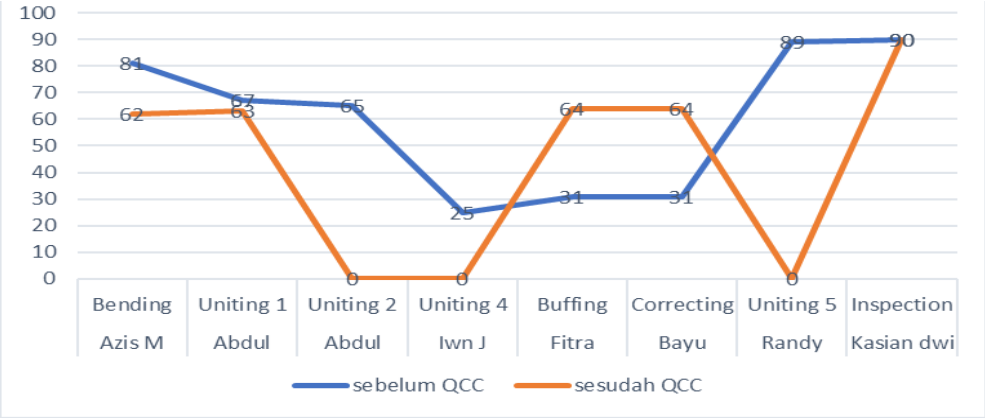



**Figure Cycle Time before and after QCC**

| Factor | Before QCC | After QCC |
|---|---|---|
| Q | - No influence | - No influence |
| C | Cost Overtime | |

Increase in forecast from 5200 to 8100 = (increase by 2900 pcs) required 73.3 hours
For additional cost overtime
= number of manpower x overtime hours x rate per hour
= 8 x 73.3 x Rp. 26,958 = Rp. 15,808,171
Overtime Cost = 0 Pipe trial = 0 Saving MP = 3 MP
Sacing Area = 3M x 7M
Consumable Costs more efficient

D A/R only 75% if the capacity is only 300/day A/R line 100% because capacity is 400/day

S Potential illness due to the Buffing process Potential Sick/Fatigued MP due to Daily Overtime
Potential illness due to work in the buffing process does not exist
M Team members' fatigue and motivation decrease due to overtime
. Fatigue factor due to overtime did not occur

## CONCLUSION

Based on the research conducted on Quality Control Circle (QCC) and seven tools to enhance Line Steering Handle K84 productivity at PT. Dharma Polimetal Cikarang, several key findings emerged. The analysis revealed that the primary cause of low productivity in Line Steering Handle K84 was time wastage across various stations: Bending and Knurling, Brazing 1, 2, 4, Buffing, Correcting, Brazing 5, and Final Inspection. Efficiency stood at 65%, well below the company's target of 90%. To address this, the proposed solution was to increase capacity from 300 pcs/shift/line to 400 pcs/shift/line using QCC implementation. Specific improvement actions included consolidating inspection with Correcting and Auto processes, establishing minimal sample limits for brazing, merging Brazing processes, optimizing exhaust systems, and introducing assisting tools. These enhancements effectively reduced cycle times at workstations, ensuring a notable increase in Line Steering Handle K84 production output. Implementing the QCC method resulted in a substantial productivity boost, elevating efficiency from 65% to an impressive 92%, while also reducing manpower by 3 individuals.

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