2nd ICETD 2013

The Second International Conference
On Engineering And Technology Development

28 -30 January 2013
Bandar Lampung University (UBL)
Lampung, Indonesia

PROCEEDINGS

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Faculty of Computer Science and Faculty of Engineering
Bandar Lampung University (UBL)
Jl. Zainal Abidin Pagar Alam No.89 Labuhan Ratu, Bandar Lampung, Indonesia
Phone: +62 721 36 666 25, Fax: +62 721 701 467
website :www.ubl.ac.id
PREFACE

The Activities of the International Conference is in line and very appropriate with the vision and mission of Bandar Lampung University (UBL) to promote training and education as well as research in these areas.

On behalf of the Second International Conference on Engineering and Technology Development (2nd ICETD 2013) organizing committee, we are very pleased with the very good response especially from the keynote speaker and from the participants. It is noteworthy to point out that about 80 technical papers were received for this conference.

The participants of the conference come from many well known universities, among others: University Kebangsaan Malaysia – Malaysia, APTIKOM – Indonesia, Institut Teknologi sepuhulh November – Indonesia, Surya Institute – Indonesia, International Islamic University – Malaysia, STMIK Mitra Lampung – lampung, Bandung Institut of Technology – Bandung, Lecture of The Malahayati University, B2TP – BPPT Researcher – lampung, Starch Technology Center – Lampung, Universitas Islam Indonesia – Indonesia, Politeknik Negeri Malang – Malang, University of Kitakyushu – Japan, Gadjah Mada University – Indonesia, Universitas Malahayati – Lampung, Lampung University – lampung, Starch Technology Center – Lampung, Universitas Riau – Riau, Hasanuddin University – Indonesia, Diponegoro University – Indonesia, King Abdulaziz University – Saudi Arabia, Parahyangan Catholic University – Indonesia, National Taiwan University– Taiwan, Surakarta Christian University – Indonesia, Sugijapranata Catholic University – Indonesia, Semarang University – Indonesia, University of Brawijaya – Indonesia, PPKIA Tarakanita Rahmawati – Indonesia, Kyushu University, Fukuoka – Japan, Science and Technology Beijing – China, Institut Teknologi Sepuluh Nopember – Surabaya, Researcher of Starch Technology Center, Universitas Muhammadiyah Metro – Metro, National University of Malaysia – Malaysia.

I would like to express my deepest gratitude to the International Advisory Board members, sponsor and also to all keynote speakers and all participants. I am also grateful to all organizing committee and all of the reviewers who contribute to the high standard of the conference. Also I would like to express my deepest gratitude to the Rector of Bandar Lampung University (UBL) who give us endless support to these activities, so that the conference can be administrated on time.

Bandar Lampung, 29 August 2013-08-26

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QUALITY CONTROL ANALYSIS INTO DECREASE THE LEVEL DEFECTS ON COFFEE PRODUCT

Heri Wibowo, Sulastri and Emy Khikmawati
Industrial Engineering Department University of Malahayati
Jl. Pramuka No 27 Kemiling Bandar Lampung 35153 Indonesia
Email: heriwibowo_ti@yahoo.co.id, lastri.1208@yahoo.co.id, emy_khikmawati@yahoo.com

Abstract—Many local companies were that engaged in the manufacturing of coffee beans into semi-finished carelessly ready for export. To maintain the product to fit customer demand, it is very necessary quality control. The problems are the following: (1) The destruction of coffee still within the limits of control or not. (2) Any type of damage that occurs in coffee product were produced. (3) The factors that cause damage to the coffee product. (4) Application of statistical tools in controlling product quality coffee and pressing the occurrence of damage to the product. This study aims to determine how the implementation of quality control using statistical tools useful in efforts to control the level of damage to the product in the company. P control chart analysis results indicate that the process is in a state of uncontrolled or still experiencing irregularities. Based on Pareto diagram, priority repairs that need to be done is for the dominant type of damage that the black seed (25.68%), broken seeds (19.23%), brown seeds (17.60%) and more than a hollow seeds (15.99%), the causal diagram analysis can be seen from the factors that cause damage to human factors/workers, machine production, work methods, materials/raw materials and the work environment, so the company can take precautions and repair the damage.

Keywords: Quality, Coffee, P Control Chart

1. Introduction
Quality product company based on character of parameters. Good quality product will give value added the product, and low quality will give the loss that caused incapability competitive the company with the others. Focus in quality will gives positive impact to business tough cost production impact and revenues impact (Gasparz, 2005 in Juita Alisjahbana, 2005). Quality control activity can help the company defend and improve the quality product though controlling the level product defect until zero defects.

2. Methodology
The steps in research are:
1. Early research to get the comprehensive problem, like data or information and observation.
2. Data process, where the data collected is processing. These steps are check sheet diagram, histogram and p control chart. The steps make p control chart are:
   a. Calculate the defect percentage
      \[ P = \frac{np}{n} \]
      (Montgomery, Douglas C. 2001)
      Where : np = Total defect in sub-group
      \[ n = \text{Total checked in sub-group (day to-i)} \]
   b. Calculate Central Line (CL)
      Central line is defect product average (p)
      \[ CL = \bar{P} = \frac{\sum np}{\sum n} \]
      (Montgomery, Douglas C. 2001)
      Where : \( \sum np = \text{Total defect} \)
      \[ \sum n = \text{Total checked} \]
c. Calculate Upper Control Limit (UCL)

\[ UCL = \bar{P} + 3 \sqrt{\frac{P (1-P)}{n}} \]

(Montgomery, Douglas C. 2001)

Where: \( P = \) Defect product average
\( n = \) Total production

d. Calculate Lower Control Limit (LCL)

\[ LCL = \bar{P} - 3 \sqrt{\frac{P (1-P)}{n}} \]

(Montgomery, Douglas C. 2001)

Where: \( P = \) Defect product average
\( n = \) Total production

Note: If LCL < 0, so LCL assumed the same with zero (LCL = 0)

3. Problems analysis is Paretto diagram and Cause-Effect diagram.

4. Result

Table 1. Data of Defect Coffee Product

<table>
<thead>
<tr>
<th>Sample</th>
<th>Black Beans (g)</th>
<th>Red Beans (g)</th>
<th>Brown Beans (g)</th>
<th>Broken Beans (g)</th>
<th>Holey Beans (g)</th>
<th>More Than 110 (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample</td>
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<td>4</td>
<td>4</td>
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</table>

Table 2. Calculation of p Control Chart

Picture 2. Histogram of Defect Coffee Product
Based on p control chart that quality control product needs improvement, because there are deviation points and irregularly that it shows the product had still deviation after it tested the sample. The p control chart is seemed some deviation points UCL and LCL out, after that it needs the new control limit to get the data uniforms. This thing is eliminating data reject lower than LCL or higher than UCL. There are three deviation datas (number 2, 5 and 19).

Table 3. Calculation of p Control Chart After Revision
5. Conclusion
1. Using statistical p control chart tools in quality control can identify that quality of coffees out of control, it shows that production still had deviation. And after revision shows the sample data has been controlled or no deviation.
2. Based on Paretto diagram, improvement priority to press or decrease total defect of product can be done on four dominant kinds of defect, they are black seeds (25.68%), broken seeds (19.23%), brown seeds (17.60%) and more than a hollow seeds (15.99%).
3. Based on Cause-Effect diagram (fishbone diagram), can be seen the influence of factors and become the cause of defect the product, they are man, material, machine, methods and environment.

References
