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# Requirements analysis for the disaster logistics inventory information system to improve the effectiveness and efficiency of handling emergency response periods

Handayani N.U. ; Sari D.P.; Widharto Y.; Basyir G.

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The exact specifications of system requirements are very important factors in the system development process. Any deficiency at this stage will affect the quality of the output of the information system developed. Therefore, system analysts must focus on how requirements are defined and modeled. Building a new information system is a complex process that consists of many steps that must be done before the final product is prepared for the customer. It is important to meet the needs and expectations of customers to maintain project sustainability in the future. There are several approaches to develop new information systems in which different strategies, methodology, modeling techniques or life cycles can be used. This study aims to analyze the need for the development of a website-based disaster logistics inventory information system. This research produces an analysis of information

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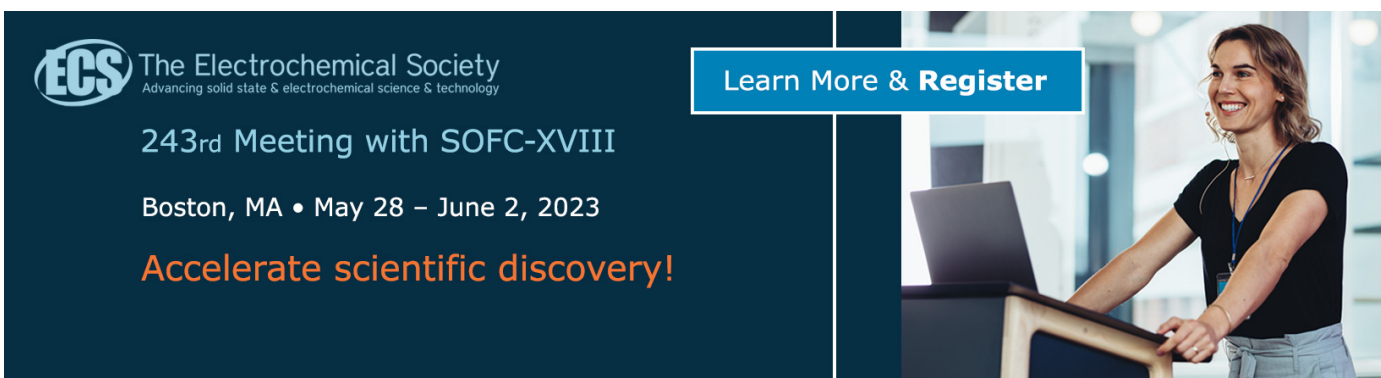
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## The Role of IT in Innovation Enhancement

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# Requirements analysis for the disaster logistics inventory information system to improve the effectiveness and efficiency of handling emergency response periods

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**Abstract.** The exact specifications of system requirements are very important factors in the system development process. Any deficiency at this stage will affect the quality of the output of the information system developed. Therefore, system analysts must focus on how requirements are defined and modeled. Building a new information system is a complex process that consists of many steps that must be done before the final product is prepared for the customer. It is important to meet the needs and expectations of customers to maintain project sustainability in the future. There are several approaches to develop new information systems in which different strategies, methodology, modeling techniques or life cycles can be used. This study aims to analyze the need for the development of a website-based disaster logistics inventory information system. This research produces an analysis of information system requirements both from functional and non functional aspects. Based on functional analysis obtained the minimum specifications that must be owned by information systems, while the non-functional analysis obtained the minimum data needs to run a website-based disaster logistics inventory information system.

## 1. Introduction

Mount Merapi is one the most active mountain in the world for its relative short periodic and high intensity of eruption around 3 - 7 years [1]. The biggest eruption of Mount Merapi occurred in 2010 with 3 times bigger eruption power than the previous one with the launch of a glowing cloud with the radius of 14.5 km. According to the *Badan Nasional Penanggulangan Bencana (BNPB)* - National Emergency Response - Mount Merapi eruption occurred lasted for 14 days since October 26, 2010. Based on the data of *BNPB* on the eruption of Mount Merapi in 2010, it recorded 277 deaths and missing, 186 injured and 159.977 people were evacuated.

According to *Pusat Vulkanologi dan Mitigasi Bencana Geologi (PVMBG)*, the type of Mount Merapi eruption was cyclical and it would reoccur in a certain period of time, so that Mount Merapi has a periodic potential disaster. Therefore, the local government must be ready in handling the eruption [2, 3, 4, 5, 6]. The local emergency response (BPBD) Sleman area, Special Region of Yogyakarta is a government institution that has the duty to deal with the disasters occur within the province of The Special Region of Yogyakarta.

Management of relief items for disaster victims from the start of procurement or shelter assistance, inventory, and distribution is part of Humanitarian Logistics (HL) [7]. There are four things that must be considered in handling HL, namely a) the uncertainty of distribution routes (road conditions),



## The effects of electroculture on shoot proliferation of garlic (*Allium sativum* L.)

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**Abstract.** The Philippines is an archipelago that always experiences yearly devastating typhoons which hinders continuous agricultural crop production. Using an old horticulture technique called electroculture, supplied electric voltage can stimulate plant growth, improve crop quality, and increase crop yields as long as the contributing factors are present – dormancy and essential nutrients. Using garlic (*Allium sativum* L.), three set-ups were prepared: control, 6 V, and 12 V electrocuted systems. Then, the effects of the supplied voltage in terms of plant height were visualized. The reaction of the garlic (*A. sativum* L.) to the application of voltage gave unfavorable results – the average height is relatively higher for the controlled system having 78.2 cm compared to the 6 V and 12 V set-ups of 55.7 cm and 57.1 cm, respectively. However, from the data of the 12<sup>th</sup>, 17<sup>th</sup>, 18<sup>th</sup>, 19<sup>th</sup>, 20<sup>th</sup>, 21<sup>st</sup>, 25<sup>th</sup>, and 26<sup>th</sup> day of the experimental period, the electricity applied somehow assisted the plant's growth. Drying and decrease in height were also visible during the 29<sup>th</sup> day of the experiment. Further experimentation and optimization can be done to substantiate the results of this present study.

### 1. Introduction

The Philippines is a tropical country where farming is the staple source of food with principal crops growing such as rice (*Oryza sativa*), corn (*Zea mays*), coconut (*Cocos nucifera*), banana (*Musa*), pineapple (*Ananas comosus*), coffee (*Coffea*), and mango (*Mangifera indica*) [1,2]. As one of the major exporters of agricultural products, the rate of production of each crop must be continuous. However, the country always experiences yearly devastating typhoons and natural calamities that hinders ceaseless production [3].

In order to compensate for this loss, electroculture, an overlooked planting method, can be a promising technique to use. Electroculture is a method of applying electric currents to a plant to assist its seed germination process [4]. The earliest experiments on the subject recorded appear to be those of Dr. Maimbray of Edinburgh in 1746 where he electrified two myrtle plants which in turn gave a positive result [5]. Based on the observations of Palafox (2013) [6], plants that grew beside power lines are healthy. In this context they concluded that the plants utilize the electric current produced by the power lines to speed up its growing process. They also considered the contribution of thunderstorm to the plant's germination and growth process, hence, gave a favorable result. Though, some



## The surface roughness analysis using sound signal in turning of mild steel

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**Abstract.** Among every other parameters of production process, surface roughness holds its ground as one of the most crucial factors for the quality analysis. Good surface finish is a major criterion in almost every machining process. If the surfaces aren't smooth, many kinds of mechanical, thermal, frictional, vibrational problems may occur. So minimizing the surface roughness should be the top priority. Surface roughness depends on many factors. But it has a direct relation with the tool conditions and overhang length of the tool. With the variations of tool conditions and overhang length the machining sound level also varies. In this present study, an analysis has been made based on captured sound signal to correlate the surface roughness parameters with sound level at different tool and overhang length conditions. As the cutting tool wears out due to continuous usage, surface roughness also develops on the tool surface. It has been observed that with the increase of overhang length the sound generated level within the cutting zone varied and surface roughness in the job also varied due to the effect of vibration and friction. A correlation factor has been investigated with the sound level variation to analyze the surface roughness condition with different tool wear and overhang length.

### 1. Introduction

Lathe machines are one of the most widely used metal shaping machines for cylindrical job pieces. For effective and multipurpose uses they are being used in almost every workshop. Many research works has already been conducted to improve the surface roughness of machined work-piece in turning operations using different types of process parameters, coolant, hot machining, cryogenic machining etc. G.M. Sayeed Ahmed et al [1] conducted an experiment using AISI 1050 material of different diameters of 20, 30, and 40 mm in which the surface roughness of the work piece was determined through experiments using constant cutting speed and feed rates with different depth of cuts (DOCs) and tool overhang lengths. Safeen Y. Kassab et al. [2] experimented to find relation between surface roughness and cutting tool vibration in lathe dry turning of medium carbon steel. They found that vibration of cutting tool depends strongly on cutting tool overhang length and with the increasing feed rate the surface roughness of work piece increase. H.H. Habeeb et al. [3] conducted machining of nickel based alloys 242 included using four different cutting tool materials under wet condition. Flank wear modes are noticed as acceptable results at lowest cutting depth with high cutting speed and moderate feed rate. Optimum surface roughness results were also recorded with decreasing of cutting depth. In a similar type of experiment by Anayet U. Patwari et al. [4] investigated the effects of overhang length on surface roughness, chip morphology to determine the suitability of over-hang

# A review of a machine design of chocolate extrusion based co-rotating twin screw extruder

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**Abstract.** Based on innovation and competitive market for food industry, there are several food products which have been designed to attract customer. Since there is USD 39,431 millions of chocolate sales in 2018, USA [1], chocolate product shapes have been developed based on manufacturing process. This paper presents a review process of a machine design of chocolate extrusion based co-rotating twin screw extruder. A property of suitable chocolate for extruder was established. The pros and cons of machine extruder for food processing including, a screw extruder design were exposed. Since there were problems in the chocolate extruder, the process parameters such as barrel temperatures, feed rate, screw speed, motor load and melt pressure were established. These parameters would be applied to design screw extruder for chocolate processing.

## 1. Introduction

Several new technologies or innovations have been introduced in order to increase productivity while reducing production cost. There are several areas in food industry that have high competition, such as, the chocolate market which has market of USD 39,431 millions of chocolate sales in 2018 in USA with consumers ranging from children to adults [1]. Therefore, many technologies have been applied to increase productivity of chocolate production while enraging flavors and various shapes. Since the properties of chocolate are melted in normal temperature, flowed in a container and changed viscosity depending on the temperature, chocolate is processed via many production processes such as extrusion, printing, and so on. However, there are several problems during extrusion process such as low productivity rates, product waste and improper extrusion temperature affect to increase production costs. Therefore, the chocolate extrusion is processed with the screw extruder in order to reduce those problems, and the screw extruder has been applied to control various factors including high flexibility. This paper presented a review process of a machine design of chocolate extrusion based co-rotating twin screw extruder.

## 2. Chocolate

Chocolate is composed of nonfat particles (sugar, cocoa solids, and milk powder particles) dispersed in cocoa butter as a continuous phase [2]. The flow properties to control the quality of chocolate product of a chocolate flow is an important parameter since too low viscosity will cause the weight of the chocolate over the enrobed candy will also be too low. However, if it is too high, then bubbles may be formed and put chocolate. Moreover, the different chocolate viscosity provides distinguished

