DESIGN AND FABRICATION OF COMPUTER TABLE

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ABSTRACT

Creativity of idea is very important in designation. It is because, idea very important to produce a quality, interesting and unique product. As a new product for customer, this computer table is design followed need characteristic such as easy to handle, multifunction and attractive. In this project, main objective is to create and design a new product based on the existing product in the market. This project are using of various kind of mechanism that have in mechanical laboratory such as aluminum hollow rod, wheel, rivet and sheetmetal. These computer table projects are need multiple method like measurement, marking, cutting, joining and assembly process. This process are important because its involve student skill of using a tool and machine. Beside that, it also can make a student learn something new to increase a creativity of thinking and think to produce interesting product for the future market. This product also must have a characteristic like toughness. It also must be analysis at first to know its strength and what the problem happened on this product. These projects make the student more discipline, punctuality, create a leadership skills and have a good planning in order that can practice it in real situation at the work place.

ABSTRAK

Mereka bentuk sesuatu benda memerlukan idea yang kreatif. Ini adalah kerana idea begitu penting bagi memastikan produk yang dikeluarkan adalah berkualiti, menarik dan mempunyai sesuatu yang unik. Sebagai suatu benda yang baru kepada pengguna, meja komputer yang direka ini hendaklah menepati ciri-ciri yang dikehendaki seperti mesra pengguna, pelbagai fungsi serta menarik. Dalam projek ini objektif utama adalah untuk mencipta serta mereka bentuk suatu benda yang baru berpandukan kepada produk yang sudah wujud di pasaran. Projek ini menggunakan pelbagai jenis bahan yang ada di makmal mekanikal seperti besi aluminium bersegi empat tepat, roda, rivet dan kepingan logam. Projek mencipta meja komputer ini memerlukan banyak kaedah meliputi pengukuran, penandaaan, pemotongan, penyambungan dan pemasangan. Proses ini adalah penting kerana ia melibatkan kemahiran pelajar itu sendiri dalam menggunakan peralatan serta mesin. Selain itu juga, pelajar juga dapat mempelajari sesuatu perkara yang baru serta mengkreatifkan lagi pemikiran dengan memikirkan perkara yang lebih menarik supaya produk yang dihasilkan bakal mendapat tempat di masa akan datang. Produk yang dihasilkan perlu tahan lasak. Ia juga perlu dianalisa terlebih dahulu supaya kita dapat mengetahui kekuatan dan masalah yang timbul pada produk ini. Projek ini juga menumpukan pelajar supaya lebih berdisiplin, menepati masa, mempunyai kemahiran memimipin dan merancang supaya ia dapat dipraktikan apabila berhadapan dengan situasi sebenar di tempat kerja kelak.

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CHAPTER 1

INTRODUCTION

1.1 Project Synopsis

The main purpose for this project is to re-design and fabricate the pc table. The most common form of the computer desk is a variant of the ergonomic desk, having an adjustable keyboard tray and sufficient desktop space for handwriting. Space is provided for a keyboard, mouse, monitor, printer and speakers. This project also to developed an exist product in the market. This project also can create a creative idea and how to make the perfect design for the product and suitable for the costumers. As a Diploma student I must show the skill that I had learn since semester 1 to finish my product. It's including skills of using machine, drawing the products and others else before produce a new product. This final year project also makes me dependent and more responsibility in doing my work. In this project there are specific materials that use such as aluminum rods and sheet metal as a main material for computer table.

1.2 Problem Statement

There are problems are commonly faced by the computer table users. Below the list of problem that occur such as:

1.2.1 Didn't have specific place of each computer accessories.

1.2.2 The table too small and can't receive too much force or weight on it.

1.2.3 Design is beautiful but poor in function.

1.2.4 Also have design for one type of CPU compartment although the CPU have two type, horizontal and vertical

1.3 Project Scope of Work

Project scopes are including:

1.3.1 The limitation of the weight of the each PC part like keyboard, monitor, mouse, CPU, printer and speaker.

1.3.2 All function is inclusive but it doesn't have a specific place for the sub speaker. So this sub speaker can be put together with the monitor. Beside that it also doesn't have compartment to put a paper or personal things.

1.3.3 Design and modification – At the first sketching using free hand before decide to use specific software for the real model such as Solid works and AutoCAD.

1.3.4 Fabricate – Using all the machine and skill that had learn since semester 1 such as bending machine, welding before going to assemble the part.

1.4 Project Objective

1.4.1 Main Objective

a) Design and fabricate a computer table using a machine and other facilities in the Mechanical Lab.
b) To create a PC Table those have a lot of function but easy and comfortable to use.
c) Produce a new features product for the future market.

1.4.2 General Objective

Diploma final year project objective is to train the student to practice the knowledge and skill that have been gathered before in solving problem using academic research, to born an engineer that have enough knowledge and skill. This project also important to train and increase the student capability to get know, research, data gathering, analysis making and then solve a problem by research or scientific research.

The project also will educate the student in communication like in a presentation and educate them to defend their research in the presentation. The project also will generate students that have capability to make a good research report in thesis form or technical writing.

This project also can produce and train student to capable of doing work with minimal supervisory and more independent in searching, detailing and expanding the knowledge and experiences.

1.5 Project Planning

The project begun after get a title at early of semester started. After got the title the first task is to get the information and write a literature review. For the literature review the discussion with supervisor how to find information and model about computer table project. He also explained about the format of the report and how to write the introduction for the final report. Beside that, other alternative are search and find the information in the internet and books. I also search the product in the furniture shops for my references of my design. It took a week to complete the literature review before present to my supervisor.

For the second week, I had prepared a literature review before submit and present to my supervisor, Mr. Mohd. Firdaus. At the same week I do some schedule management for this project which included schedule management. This schedule is purpose to make my work in order based on the schedule. So it can make me more discipline and be punctuality to follow the schedule. I also had doing an introduction of the final report. This introduction is including objective, scope, synopsis and process planning of the project.

After doing a presentation about my literature review, I had made a correction of this chapter based on the supervisor needed. At the week 3, I had doing a sketching for my products. A lot of picture of the PC Table I used for my reference of sketching. It was a hard and messy part in my project. It is because this sketching is showing the products that what we want to make, so it must design nicely to make me satisfied of my design.

The next task is preparation of progress presentation and searching the material needed for this project. For the presentation it has two stages. First stage is in the middle of the semester and another presentation is after the project is done. So for this task I must make a preparation about speech for my presentation. Beside that, I also must practice how to answer the panel questions. For the material, I have searching around the mechanical lab. So I have decided to choose the aluminium rod and the sheet metal as my main material. Before choose the material, I have make a

research about what type of metal is suitable to use for my project. So I think that metal is the best to use for my project.

After decide a material, next stage is fabrication process. My fabrication is including cutting, welding and drilling. I also have to use bending machine for my project. So for my fabrication process I had decided to spend 4 or 5 week for finished that. This stage of the fabrication is main thing for my final year project. it is because, if my fabrication are not complete, it means that my project is also fail. Because of this factor I had spend more time for doing this task. I really hope that I can finished my fabrication followed the schedule.

Finally, my process planning for the finishing are prepare for the last presentation and for complete the final report. Based on my schedule this two task are need 2 week to finish. For the report, I have planning doing it every week and every time if I free. This report must follow the format and guide that have given to us. I must check the report and submit each chapter of my report to the supervisor and waited for his approval before submit to the faculty. This report must be complete before the presentation. So at the week 14, I can focus and prepare for my last presentation.

1.6 Project Schedule

Table 1.1: Gantt chart

	Process planning
	Actual planning

Activities week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Literature review															
Design and sketching															
Finalize Design															
Presentation 1															
Testing and Evaluation															
Fabrication															
Report Preparation															
Presentation 2															
Final Report and submit															

CHAPTER 2

LITERATURE STUDY

2.1 Introduction

The ergonomic desk is a modern desk form which, like the adjustable drawing table or drafting table, offers mechanical adjustments for the placement of its elements in order to maximize user comfort and efficiency. The ergonomic desk is usually a "stand-alone" piece of furniture allowing access to the adjustment mechanisms. Some ergonomic desks have a sufficiently large desktop height adjustment to create either a "sit-down" desk or a standing desk, which allows the user to work while standing. The ergonomic desk is usually a close companion to the ergonomic chair. The ergonomic desk originated with the beginning of the field of human factors or ergonomics after World War II. Legislation stating minimal requirements for furniture used by office workers referred to ergonomic desk standards.

The most common form of the computer desk is a variant of the ergonomic desk, having an adjustable keyboard tray and sufficient desktop space for handwriting. Provisions for a monitor shelf and holes for routing cables are integrated in the design, making it easier to connect the computer components together. Space is provided for a keyboard, mouse, monitor, printer and speakers. The typical armoire desk is usually sold with these features and better cubicle desk designs include holes, trays and shelves for computer systems.

There is a seemingly endless variety of computer desk shapes and forms. Large multi-student computer desks configured in rows are designed to house dozens of computer systems in novel ways while also facilitating wiring, general maintenance, theft prevention and vandalism reduction. Small rolling lectern desks or computer carts with tiny desktops provide just enough room for a laptop computer and a mouse pad. Computer desks are typically mass-produced and require some self-assembly. Local crafts persons can build desks to order or produce unique designs.

The computer itself is normally separate from the desk. The desk is designed generically to hold a typically sized computer, monitor and accessories. Cabling must be carefully routed through the channels and access openings provided by the desk design. A few computers are built within a desk made especially for them, like the British iDesk. The computer is not removable and cannot be separated from the desk. Office of the future proposed other integrated designs.

A rolling computer table configuration offers mobility and improved access in situations where a desk is not convenient. Gyratory computer tables can be used over a bed. Modular computer tables separate user interface elements from the computing and network connection, allowing more placement flexibility. The modules are connected via wireless technology.

2.2 Type of Computer Table

In the market, there are many type and design of the computer table. The famous types of the table are roller and no roller type. This roller computer table is more facilitate to the user. It is because, this table is removable. But certain people also like the no roller type. No roller type is more stable and it can't move when using the computer. So it didn't interrupt the user when used it. About the design, there are many characteristic are provided to attract the costumer to buy it.

2.2.1 Roller Type

2.2.1.1 C LEMPS 24' W Computer Workstation w/ 2 Slidable Shelves

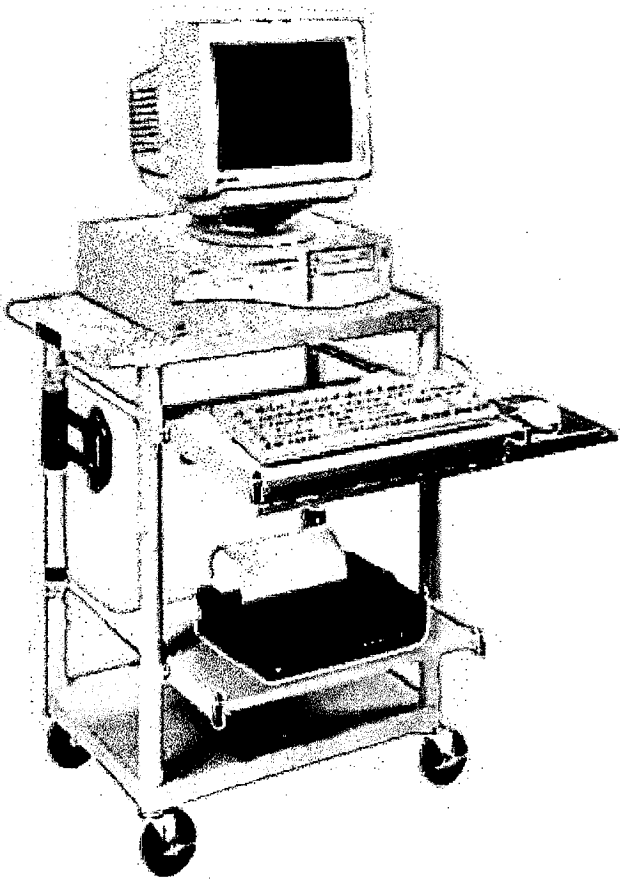

Figure 2.1: C LEMPS 24' W computer workstation

i. Dimensions and Weight :

   a. Dimensions: 24" W X 18" D x 33" H
   b. Pull-out shelves: 19.5" W x 16" D
   c. Colours: putty, black or gray.

ii. Price :

   a. Reg. Price: $521.00
   b. Sales price: $349.00 + $30.00 Shipping (continental US)

iii. Features :

This is a very compact computer desk. This small but practical workstation is a great space saver, at only 24" wide. It is made of molded plastic for assured durability, sturdiness and easy maintenance. This narrow cart includes 4 heavy-duty 4" wheels, the front ones with locks (brakes). It has 4 levels for storage: a bottom shelf, 2 sliding shelves, and the top monitor shelf. It also comes with a handle to facilitate mobility and a surge electric, to simplify cable management. The Mouse Shelf shelf is optional. It slides from under the keyboard shelf.

2.2.1.2 VC01 24" Mobile LCD Monitor Pole Computer Cart

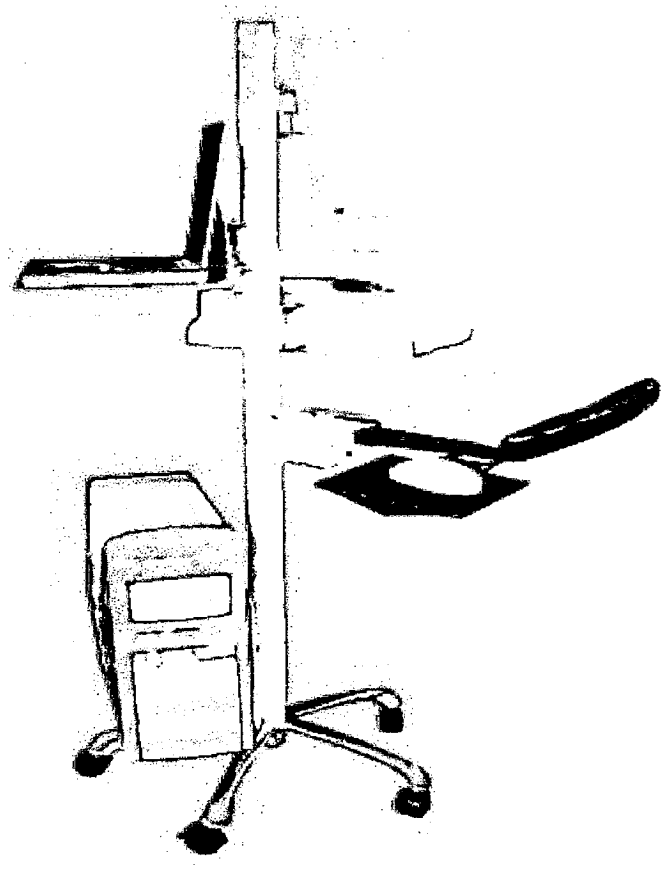

Figure 2.2: VC01 24" Mobile LCD monitor pole computer cart, the new innovation

i. Dimensions and Weight :
   a. Overall: 24 W (footprint) x 60 H
   b. Pole Outer Diameter: 2 3/8" (60mm.)
   c. Load: 100 lbs.

ii. Price :
   a. Regular Price: $780
   b. Sale Price: $650 + Shipping: $65

iii. Key features:

The CUZZI VC-01, a very versatile rolling LCD monitor computer workstation, is heavily used as a point-of-care medical or dental flat panel PC cart. It's ergonomics, portability, space saving attributes and high-tech looks also make it an attractive choice in all types of businesses, trade-shows, mall kiosks, schools, and even at home. All parts are 100% height adjustable.

a. Solid sturdy construction
b. 100% aluminium pole
c. Point-of-care or need operation.
d. Share expensive technology AND space
e. Easy Installation
f. Sit or stand operation
g. All attachments are 100% height adjustable, swivel and tilt
h. Flat Panel mount rotates 360 degrees
i. Panel swivels 180 degrees, left to right
j. Panel Pivots 180 degrees, upwards/downwards
k. Keyboard arm and mouse tray: 100% iron-made
l. Ergo Keyboard platform tilts from +15 to -20 degrees
m. Large CPU / UPS holder w/strap
n. Gel wrist support (reduces fatigue)

2.2.1.3 S-2828 24" Desktop Computer & Laptop Desk

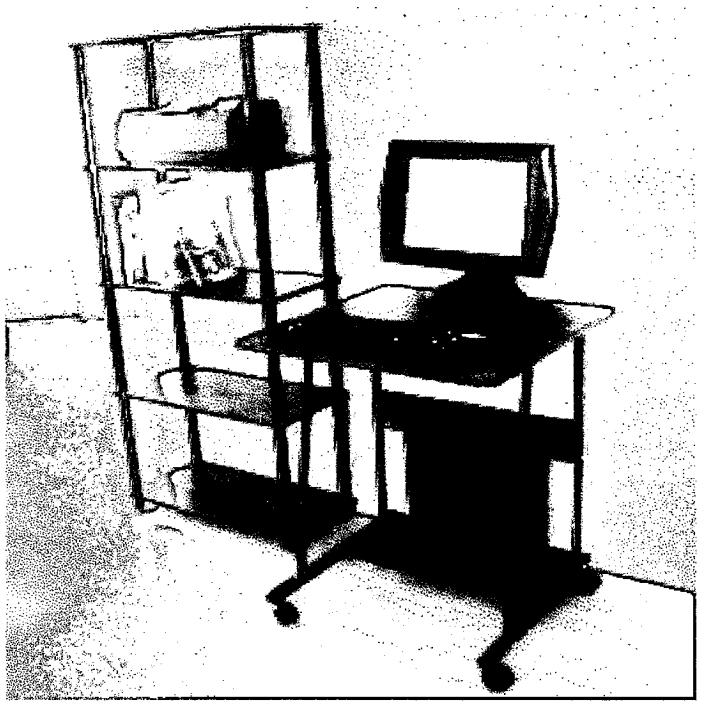

Figure 2.3: S-2828 24" desktop computer & laptop desk

i. Price :

a. List price: $182.00

b. Sale Price: $115.00 + Shipping ($32.00 continental USA)

ii. Features :

This computer table is a simple solution for either a laptop or desktop computer. A minimalist contemporary design that will look elegant in any decor. Its 24 W x 24 D x 30 H (inches) tabletop has been designed at an ideal ergonomic keyboard height, a rare quality among desks that also can be used for laptops. In addition, this desk allows a generous legroom. The bottom shelf can accommodate a printer or a CPU. The 24 x 24" table top design has been calculated to perfectly accommodate desktop computers, including deep boxy CRT monitors. The 24" width is enough to place the CPU tower next to the average sized monitor, with interesting advantages, such as the ability to reach the drives and connections of peripherals very easily, improved ventilation, and even difficult the

reach of the CPU unit for toddlers. The size, simple shape and mobility of this table makes it very versatile, not limiting it's use only as computer furniture, but also as an add-on table for additional writing space, or for adding an extra printer, monitor, audio equipment, scanner, etc. Its light weight, yet study construction, makes it very portable. Just place it in front of a sofa, next to your bed or add it to your work area for extra space. The lack of a keyboard shelf also makes it safer for kids.

2.2.1.4 C LAMC2936 - 27" W Height Adjustable Portable Computer Desk

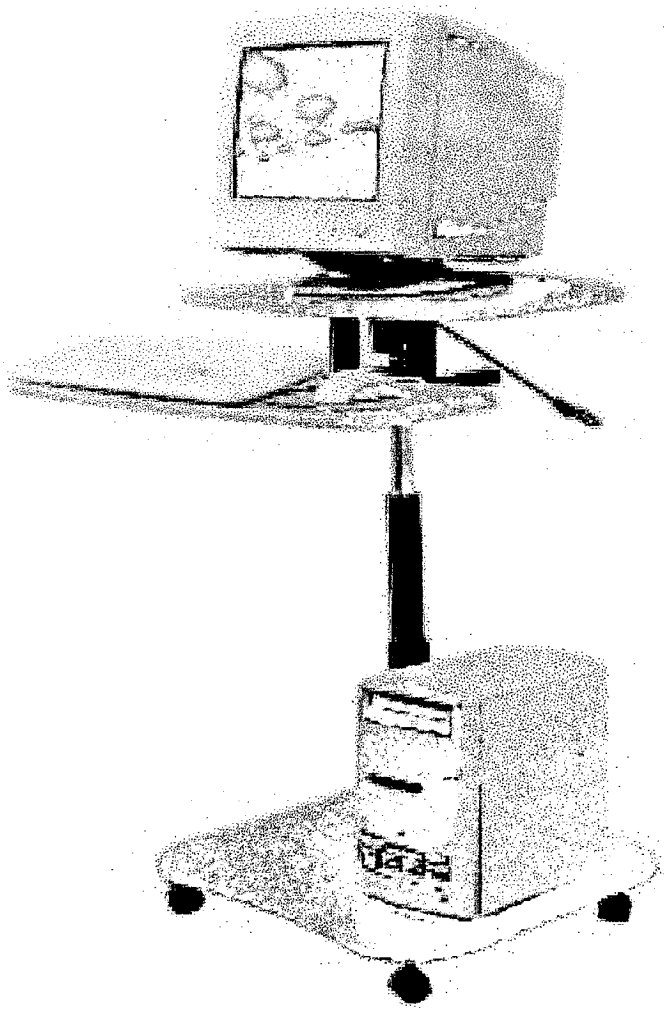

Figure 2.4: C LAMC2936 - 27" W height adjustable portable computer desk