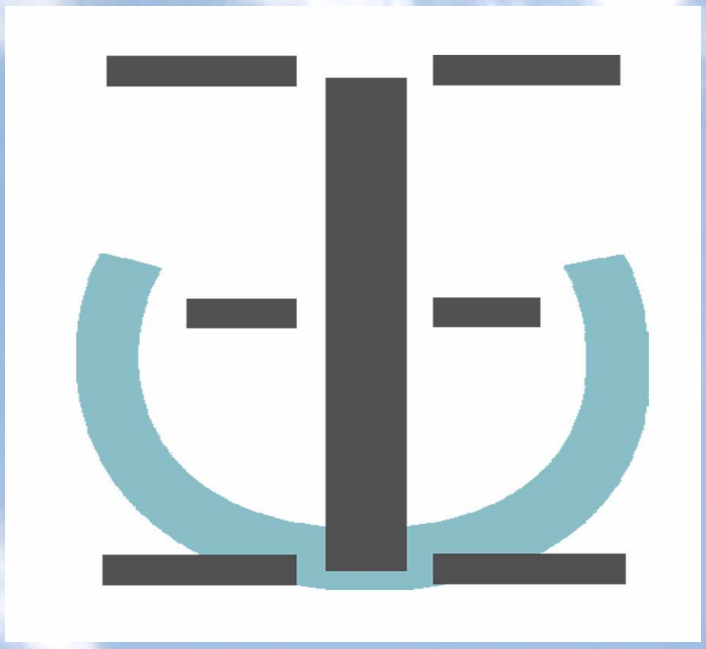
I-CEE INC.

Final Report



Vibro-I

I-CEE INC.

Bilkent University

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1 EXECUTIVE SUMMARY

I-CEE is a company that was founded in September 2007 with issued capital of 218,500.00 $.This Business Plan sets our strategic, operating, marketing and financial objectives.

1.1 The Product

VIBRO-I enables visually impaired to view the world as if they do not have a vision defect by vanishing the cane! VIBRO-I consists of two wrist bands which both have vibrator devices on them and an attachment accessory. Vibrator devices on one band denote all directions according to signals received from the image processing device (a micro camera) fixed on the attachment accessory. Devices on the other band vibrate according to signals received from sensors when obstacles encountered which are undetected by the camera.

VIBRO-I is fantastic for providing earlier warning of obstacles than the cane can provide, waist-level objects are much more visible with VIBRO-I, gives object recognition, gives object distance, gives object direction, gives independence, makes a difference!

1.2 Business Strategy

1.2.1 Marketing and Sales Department Strategies

1.2.1.1 Product Strategy

Vibro-I has low cost, it allows low price for its customers. The product technology will increase by the development of the technology so we cannot say that the product has high technology at the moment. Since the product consists of a belt and a wrist band, special designs can be made according to orders. When GPS technology starts to be fully used in the country, we can have a competition with GPS Trekker, the only competitor in the world.

1.2.1.2 Price Strategy

The product price is as low as we can hold due to the facts stated below:

- The customers are visually impaired people, so their income levels are much lower than the income levels of others.

- The company uses market-pull strategy that means we offer the product to the consumers, before their demand.
- 371.00 $ price

1.2.1.3 Distribution Strategies

The company I-CEE is going to make agreements with two types of costumers. The first target costumers have middle income levels. Secondly we will focus on upper and higher income leveled visually impaired people, who will have a chance of using the more technological item.

1.2.1.4 Promotion Strategy

The product is firstly going to be introduced to communities. These communities contain Altı Nokta Korler Dernegi and Ophthalmology Association. We are planning to reach to our final consumers by these communities. We are also planning to make advertisements in health magazines.

1.2.2 Financial Strategies

Financial and Accounting Department suggests financial strategies in order to run the business. The department is therefore responsible of balance flow of payments and cash flows, while doing marketing jobs. The first important thing to achieve is to pay the loans back. Then solutions for financing company operations are going to be found. Later on, cost reducing is going to be done since it is essential to make analysis for all activities, profitable or not. Also, it is going to be found out whether the company may have a lower level cost or not by cost reducing. All above stated analysis are going to be reported and the reports are going to be submitted to the related ranks.

1.2.3 Administration Strategies

The department deals with personnel hiring newcomers. Also, it provides education programs for both newcomer personal and current working personnel. The program allows personnel to increase employment power in order to increase productivity. It is also responsible of increasing motivation of the employees. Finally, finding out better strategies in order to increase productivity, recovering delivering problems and minimizing distribution costs are the duties of this department.

1.2.4 Software Strategies

The software department controls the hiring of software engineers in order to hire enough experienced engineers in related programs. The engineers are then going to be transferred to R&D department, since the product maintenance is going to be mostly done on the hardware system. The improvements of the current product are going to be done by the R&D department. Related researches are going to be made. It is also going to work on the up coming projects of the company.

1.2.5 Production Strategies

Our factory's capacity has been decided based on the market research. First year's (2007) market share is thought as 4000 units. Therefore, the capacity will be 333.3 units/month or in other words 16 units/day. This amount can be met by only one shift per day (eight hours). Moreover, two assemble lines will be sufficient at the beginning stages of production. These lines will assemble camera and sensors to belt, and vibration devices to wrist band. Capability of the machines to produce both types of products makes the process flexible. Schedule will be made with respect to the total amount that we want to produce. Since our plan is to produce 4000 products first year, the assemble line must produce products for 20 days in a month. The sequence may be changed with respect to the unexpected events or demand. Our

workforce includes 5 workers per line and all the workers must be skilled and experienced since our tasks are all about electronics.

Quality Control Department is one of the most important departments of the firm. The quality of the product has to be as high as possible due to the fact that it is a product for the safety of our customers. The required tests are going to be done on the test machines by employees who have gained enough skills on their jobs. There are two test passing requirements. The first one is for the products to meet the design requirements. The second one is whether the product has enough performance. Samples from specific amounts of finished products are going to be taken and tests are going to be applied on these samples.

The products are going to be manufactured on our own, which means we are not going to use outsourcing. There is not going to be a complex layout, and all the process is going to be done in the same building.

Inventory levels will be low for both raw materials and finished goods. They will be stored in a room inside the building. Providing sufficient supplier linkages and implementing just-in-time techniques will be helpful to decrease the number of work-in-process inventory, set up time, holding and set-up costs, and increase the efficiency of the line.

1.3 Enterprise Structure

Our enterprise is I-CEE company which in short has the following merits and regulations:

Vision:

- I-CEE primarily aims to help the blind to move about independently,
- I-CEE values human psychology: VIBRO-I is specially designed to provide a new vision experience without the cane for the blind.

Mission:

- I-CEE aims to maximize the costumer satisfaction by providing high quality and low prices,

- aims to fulfil responsibilities to humanity and environment.

I-CEE:

- cares for costumer rights,
- highly values public trust and customer feedback,
- is open to new ideas throughout the development,
- operates within strict legal and ethical rules,
- relies on human resources,
- provides a democratic arena where employees share ideas,
- improves teamwork within the organization.

1.3.1 Production Planning Department

The Production Planning Department is headed by Oğuzhan Aras Bulut. He is responsable of calculating the amount of production, he estimates forecast. He is bounded to COO.

1.3.2 Production Department

Head of Production Department is İlker Kanatlı and he is bounded to COO. He has two sections under his organization; hardware and software parts of the product. These parts need to be improved separately but also they need to be connected each other. Therefore the duty of him is to check the software and hardware productions step by step, and make them not to loose the connection. In other words he will be the bridge between these works.

1.3.3 Research and Development Department

The Research and Development Department of our company is headed by Berk Korkut. He is the one who searches about the developing technologies about both software and hardware to check whether they can be applicable or not for the product to make it better if possible. Therefore he is also responsible of following the whole project in every step. His department is bounded to COO.

1.3.4 Design Department

Ceren Hasançebi is the vice president of Design Department and she is bounded to COO as well. She is responsible of the design of both hardware and software parts of the Project. As a computer engineer she is the heart of the software design, also she checks the hardware design that is going to be done by electrical and electronics engineers.

1.3.5 Quality and Assurances Department

Head of the Quality and Assurances Department is Esra Dokuzoğlu. She has the responsibility of providing the quality management system. She necessarily checks the whole system in every step because the important thing is to be sure about the quality from the supplying materials till the final product. She is bounded to CFO.

1.3.6 Marketing and Sales Department

İlker Kanatlı is in charge as vice president of Marketing& Sales Department which is bounded to CFO. His department's general duty is to reach present and potential consumers, make new market researches, recognize new tends and take feedback to make essential changes in products, combine these studies with sales operations and promotions, create new market strategies to increase the market ratio and profit. There are two sections in this department; marketing and after sale services in which has two more sections; software services and hardware services. Vice President of this department establishes coordination between these sections and checks all studies out.

1.3.7 Finance and Accounting Department

Our Finance and Accounting department is headed by Ekin Kartal. She has two sections under her organization. One of these sections is Financial Section which is responsible for financial studies; analysis, reports, feedbacks of projects and investment analysis. The other section is accounting. Accounting section prepares legitimate reports for Capital Markets

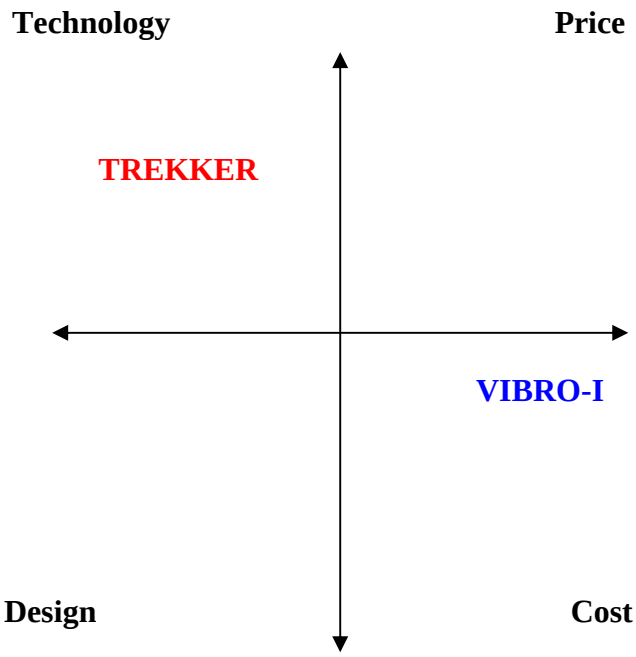
Board of Turkey related ministries and other related institutions. She is bounded to CFO as well.

1.4 Business Plan in a Nutshell

1.4.1 Market and Competitive Analysis

1.4.1.1 Industry Classification:

The market is composed of four dimensions. The products can be classified as being low pricey, well designed, technological and costly advantage. As a product Vibro-I has low prices and low cost. Instead of having high cost and high price due to high technology, we give importance to the cost differentiation.



The product class is in the electric and electronic sector. This sector is divided into some subtitles, which contain medical electronic sector that our product belongs to. Furthermore, according to the agreements with 6 Nokta Körler Derneği, Ophthalmology Association and health magazines will be source of advertisement. By installing the advertisement of the firms to the receivers, the investors will make money out this. Therefore, it will make advantage according to the other competitor.

1.4.1.2 Product Classification:

Technology, price, cost and design are the four basic units that make up the market. The property of I-CEE products is to have less manufacturing cost and less price for the customers.

1.4.1.3 Market Segmentation:

There are about 412.000 blind people in Turkey. As a company, for the first segment in which cables are used to combine the belt and the wristband, our aim is to address to the customers, who have middle, upper and higher income levels. We have assumed that middle income blinds may also be willing to get our product since it has a positive psychological effect due to the fact that this item prevents the blind people to be able to be free of canes and do not allow others to understand the blindness. It is an important issue since everybody would feel sorry for blind people however they do not need any kind of pity.

For the second segment, the customer income levels change a little bit; we address only for the upper and higher income level customers because the price increases much more than the product of the first segment, due to the increase of the cost of the item to our company. The main issue of the second segment is that the cable is going to disappear, whenever the wireless system takes place of it. The advantage of this is to make the customers more comfortable since they will not have to carry the cable, and doing motions with a cable that connects a belt and a wristband may not be so easy; at least wireless technology will be much easier. Also, wireless system simplifies the data flow much more than a cable. Finally, for the cameras, 75 objects can be defined by using Matlab or C++ . By this way, the camera can identify the specific objects and transfers them to the headphones. The person is going to hear it on the headphone. If we consider it with an example, the blind person will know that there is a specific object in a specific distance by hearing from the headphone.

1.4.1.4 Participants in Industry:

Our product is going to be sold in below stated participants:

- Medical shops
- Hypermarkets (such as Real)
- Drugstores

1.4.1.5 Distribution Partners:

The product is for the use of blind people in order to save them from the cane and let them be aware of the objects around. Consequently, blind people are the customers of our product. In order to reach them, we will use the foundations as distribution partners. These foundations such as Alti Nokta Korler Dernegi will help us reach customers and help customers reach us.

1.4.1.6 Competitors:

According to our research about existing competition in the world about blinds, we have only one competitor which is GPS Trekker. It integrates off-the-shelf hardware for GPS input with voice output to provide instructions and optional voice input for entering notes. However, the real advantages of Trekker are its software features and adaptation to meet the needs of the visually impaired.

Main features of Trekker (http://www.nanopac.com/GPS%20Trekker.htm) are voice-information control features, user-defined location marks, route planning and recording, access to GPS status information, flexibility in information presentation and guidance to allow for various levels of users (beginner, normal, advanced) and familiarity with a given environment.

1.4.2 Sales Forecast

Turkish population has an average growth rate of %2.26. Its reflections can be seen in population of visually impaired people. Researches that were made by Republic of Turkey, Prime Ministry, management of impaired people by the end of May, 2006, total amount visually impaired people is 412.312. Our target costumer is middle, upper and higher income

leveled visually handicapping people. Again, according to same research, the number of visually impaired people and their social status are given below:

Social Status	Number of Visually Impaired People
Student	21864
Housewife	103845
Retired	65252
Have Income	16734
Not Able to Work	41211
Not Have a Job	12041
Expected to Work	513
Other	150851
Total	412312

16.9% of the visually impaired people are retired, 2.5% have income, 0.2% are expected to work; which approximately makes 19.6% that makes 80.000 people. According to our estimations, we are going to reach to 4000, approximately 1% of the market potential. Our company plans to grow at the same rate of population growth rate, which is approximately 2.3% per year. Also, 63.7% of these people have registered to Social Security Foundation. Two years after the sales, we are planning to deal with this foundation to increase our sale quantity.

1.4.2.1 Cost Calculation:

The investment analysis includes both variable and fixed costs for production sections. Wages, salaries and other costs are added to these numbers in order to find cost function of Vibro-I.

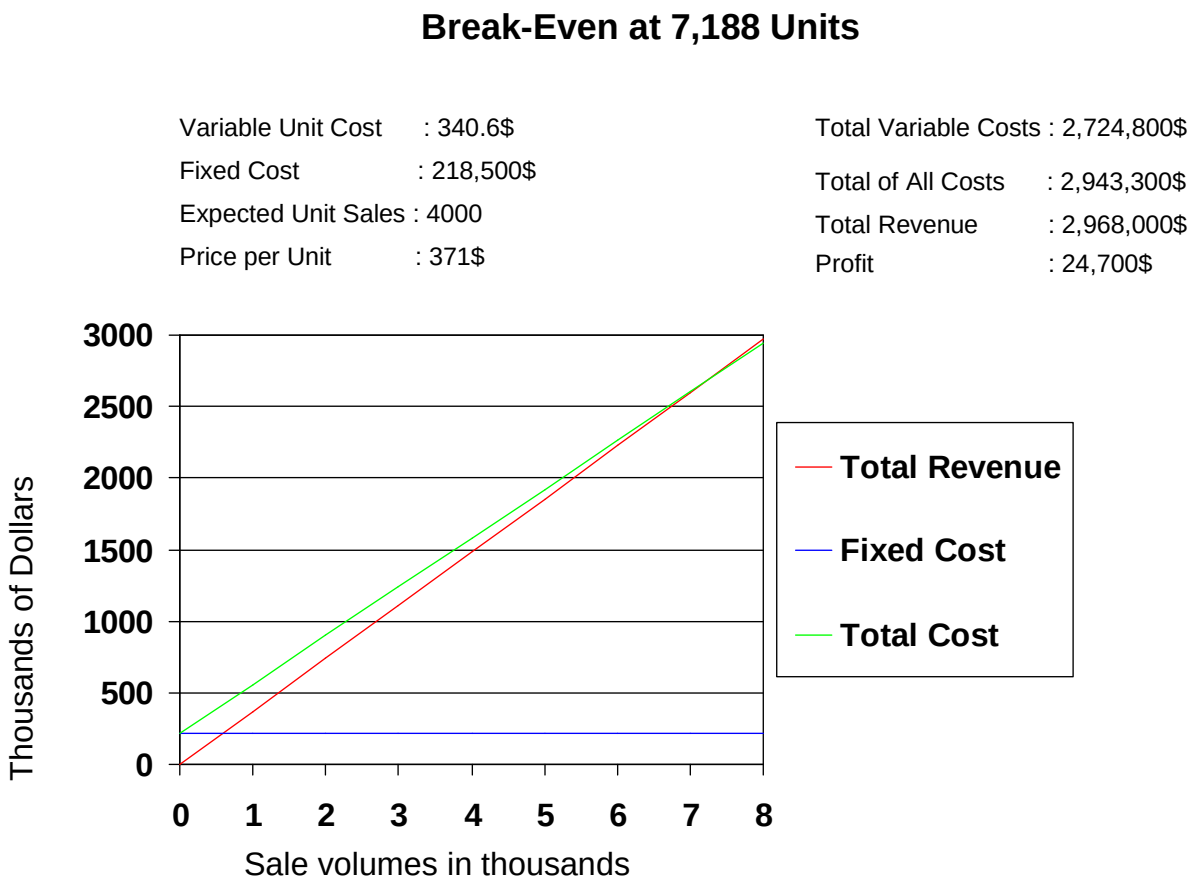
[2] http://www.ozurluler.gov.tr/arastirma/troailerianaliz.htm

Marginal cost and after marginality calculations are done. The total cost calculations are calculated with respect to the estimated production capacity numbers and the price is determined according to the total cost calculations.

1.4.3 Financial Analysis

1.4.3.1 Break Even Analysis:

The break even point is passed by 7188 units, which is given in Break Even Analysis Table. Our variable unit cost is $340.6, which contains production variable cost, maintenance cost, waged and salaries. Our total fixed cost is $218.500, which contains production fixed cost, facility and equipment costs.



1.4.3.2 Capital Spending:

We will minimize the capital outlays by using the second hand machines. On the other hand the 280-meter square factory building will be owned in order to decrease the total cost.

The company will run 10 employees at the beginning. Our major operating costs relate to the staffing are at the Table of Staff Cost (full details are in Annex A).

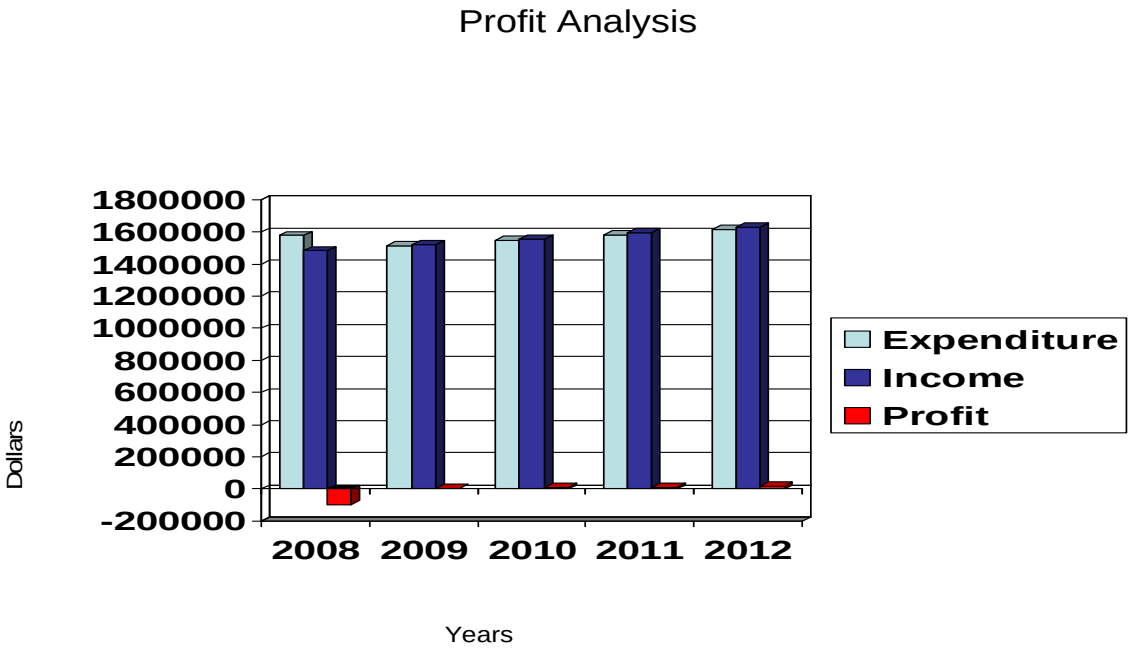
Other Operating Costs:

Table of Operating Expenses Shows the detailed analysis of Operating Expenses. (full details are in Annex A). It includes the total occupancy expenses, total office expenses, total commission expenses, total computer expenses, total marketing and sales expenses, total professional expenses and at last insurance expenses.

1.4.3.3 Profit and Loss Account:

The table below describes the expenditures, incomes and profits annually. However, there is a detailed table explaining can be found in Annex A. Our estimated sales show that the net profit at year 1 will turn out to be a lost, which is $96,900.00. However it turns out to be positive by the second year. The following profits are 5100, 8340, 11580 and 14820 respectively.

	2007	2008	2009	2010	2011
Expenditure	$1,580,900.00	$1,516,000.00	$1,549,860.00	$1,583,720.00	$1,617,580.00
Income	$1,484,000.00	$1,521,100.00	$1,558,200.00	$1,595,300.00	$1,632,400.00
Profit	($96,900.00)	$5100.00	$8,340.00	$11,580.00	$14,820.00



1.4.4 Risk Analysis

1.4.4.1 SWOT ANALYSIS

Strengths:

In Turkey, there is no firm that deals with visually impaired people by preventing them to use canes. So, we are going to be strong in the market. Both of the facts that it is against a handicap and it has a low cost determine that the purchasing ratio would be high. The Head Office in Ankara simplifies the distribution among the whole country, whereas the other offices in Izmir and Istanbul simplify the distribution among other countries. Consequently, location is strength by the help of the offices.

Weaknesses:

It is hard to determine the market volume, and so the forecast calculations, due to the fact that our consumers have handicaps, whose exact values are hard to be found. The certain values about these people are not found and the existing values are resulted only by the registered ones. Consequently, our weakest point is forecast calculations.

Opportunities:

The technology is improving day by day. Turkey also is not so far from the technology, by which we are waiting for the GPS technology to arrive to our country. We mean map of Turkey is not fully recorded in GPS navigation system (except map of Istanbul city) when we refer to GPS technology. This technology provides us to load certain maps in the system. So, whenever the GPS technology is reached, we can use it in order to let our customers reach maps of locations and find locations more easily.

Threats:

The easy imitation of the technology is the most important threat of our company. Because of the fact that we are going to use pull system in our production system, we need to have good advertising processes in order for our product to be sold.

2 COMPANY ORGANIZATION

2.1 Positions of the Company Staff

All staff in the company along with their responsibilities are listed as below:

- İlker D. Kanatlı (CEO & head of Production Dept.)
- Oğuzhan A. Bulut (CFO & head of Production Planning Dept.)
- Esra Dokuzoğlu (COO & head of Quality & Assurances Dept.)
- Berk Korkut (head of R&D Dept.)
- Ekin Kartal (head of Finance& Accounting Dept.)
- Ceren Hasançebi (head of Design Dept.)

2.1.1 Chief Executive Officer:

Chief Executive Officer is responsible for all operations that are made in the company. He checks all stages of production and marketing. İlker Kanatlı rules the company as the chief. He is the last man who authorizes to confirm any operations or decisions. He is also eligible

to confirm interior decisions. Chief Executive Officer is also charged to be the president of board of directors. This is the top stage of the company and this job has a vital importance.

2.1.2 Chief Operations Officer:

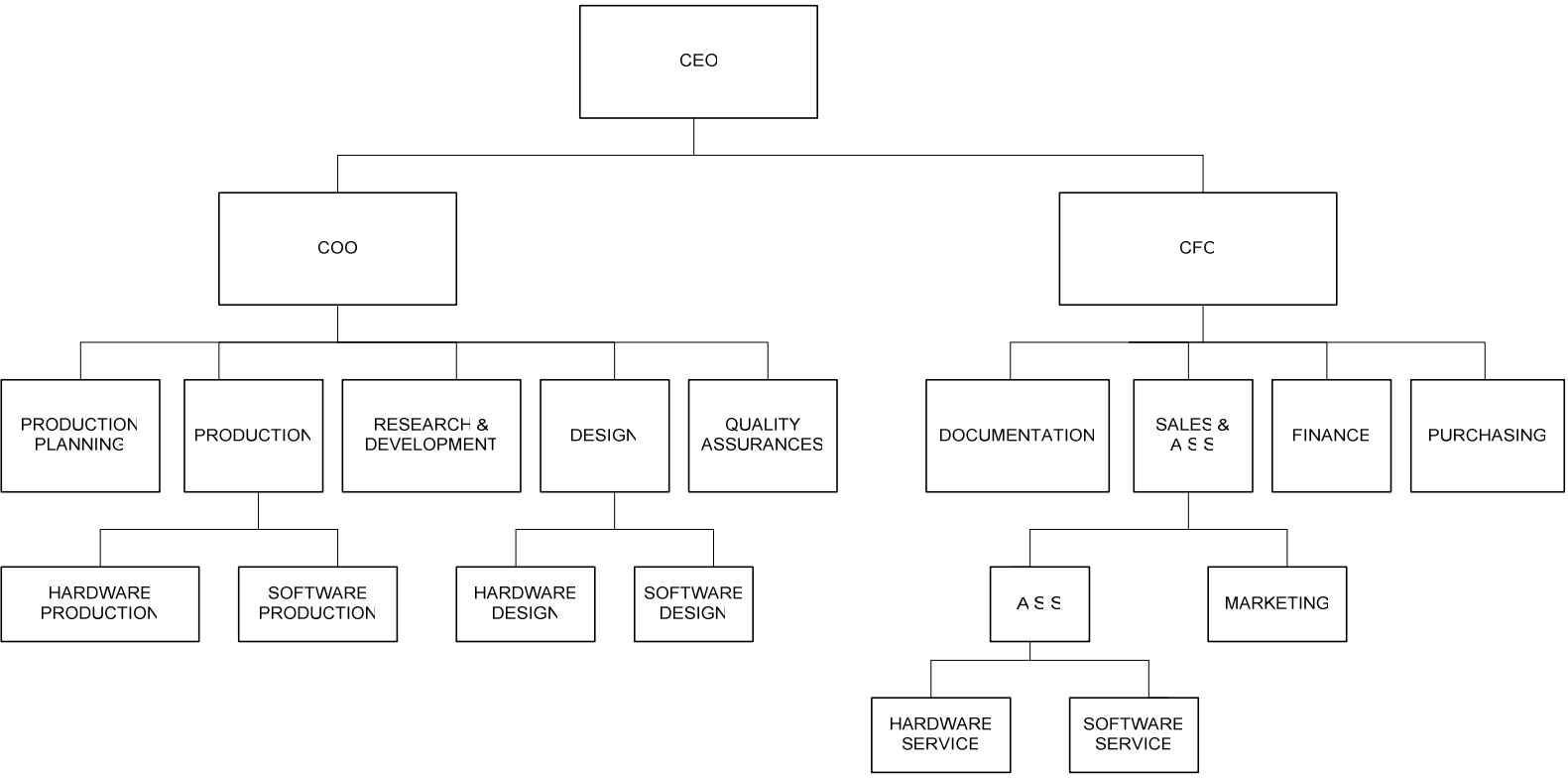
The chief operations officer is responsible for the production planning, production, research-development and design departments. In our company Esra Dokuzoğlu is the chief operations officer so she is the bridge between these departments and the chief executive officer.

2.1.3 Chief Financial Officer

Oğuzhan Aras Bulut is the chief financial officer of our company and he is bounded to the CEO as well. He has the responsibility of the quality and assurances, marketing and sales and finance and accounting departments.

2.2 Organization Chart

I – CEE
ORGANIZATION CHART



3 DEVELOPMENTS IN THE PROJECT

Our first design included three motion detection sensors on a belt and two vibration devices on two wristbands. The design was planned that three sensors would detect the objects around the user and the vibration devices would vibrate with the range information which comes from the sensors.

While the project progressed, we realized that we would also need a camera to detect the shapes of the objects and with the basic shapes which we capture from the camera, we would have a chance to give the details of the objects to user and we realized that if we can give the "name" of the obstacle to the user, it would help the blind person to sense the environment much easier. Therefore we added a camera to the system.

Another problem during the improvement was the connection between the sensors, vibration devices and the processor. We had to make the design with light-weight components and also the product must not limit the user's movements. Therefore we had to make a decision to use a wireless connection or standard cable connection. Cables can limit the movement of the user, but on the other hand wireless system is heavier than a standard cable system. Last development includes a portable camera. In the first design, we planned to put the camera on the belt. We choose a belt because this part of the body is much more stable than the other parts of the body. On the other hand the place of the camera can be a problem for the user. A fixed camera on a belt may cause user to always wear a belt even if he/she goes outside, or live inside the home etc. Therefore a portable camera which can be fixed on a belt or on a cap (head is another stationary part of the body) was considered. But finally we have decided to include either the camera or the sensors (dependent on the implementation version to be done) in a special fabrication coverage which will be produced as if it would be attached like an accessory over any part of the clothing worn (this compact coverage can be resembled to mobile phone holders attached to pants or the belt but just for the purpose of making a

metaphor ours will be able to be attached to any clothing worn actually). But this attachment accessory should be attached to the outermost clothing since camera should see the outside in order to detect the surrounding environment.

So, we considered suggestions and comments we have received during the preliminary presentation. Most critical ones among those suggestions were basically like the following:

- Possible difficulty when wearing / taking off the product and maintaining it during usage.
- Possibility of the camera component being affected from weather conditions
- How recognization of the visually impaired will be assured (like cane and the yellow arm band as international conventions)

Here are our own suggestions for those:

- Design of the product is renewed. Cables still exist but they will be less of concern because major component of the product (the camera or the sensors) is now encapsulated in a special coverage which also includes a generic attachment unit allowing attachment over any part of the clothing,
- Weather conditions do no more cause any problems with the special coverage,
- Major difference VIBRO-I offers is to save the visually impaired from disability psychology: basically VIBRO-I has a huge claim such that changing the way people approach to the visually impaired.

4 CONCLUSIONS

Here are the results we obtained:

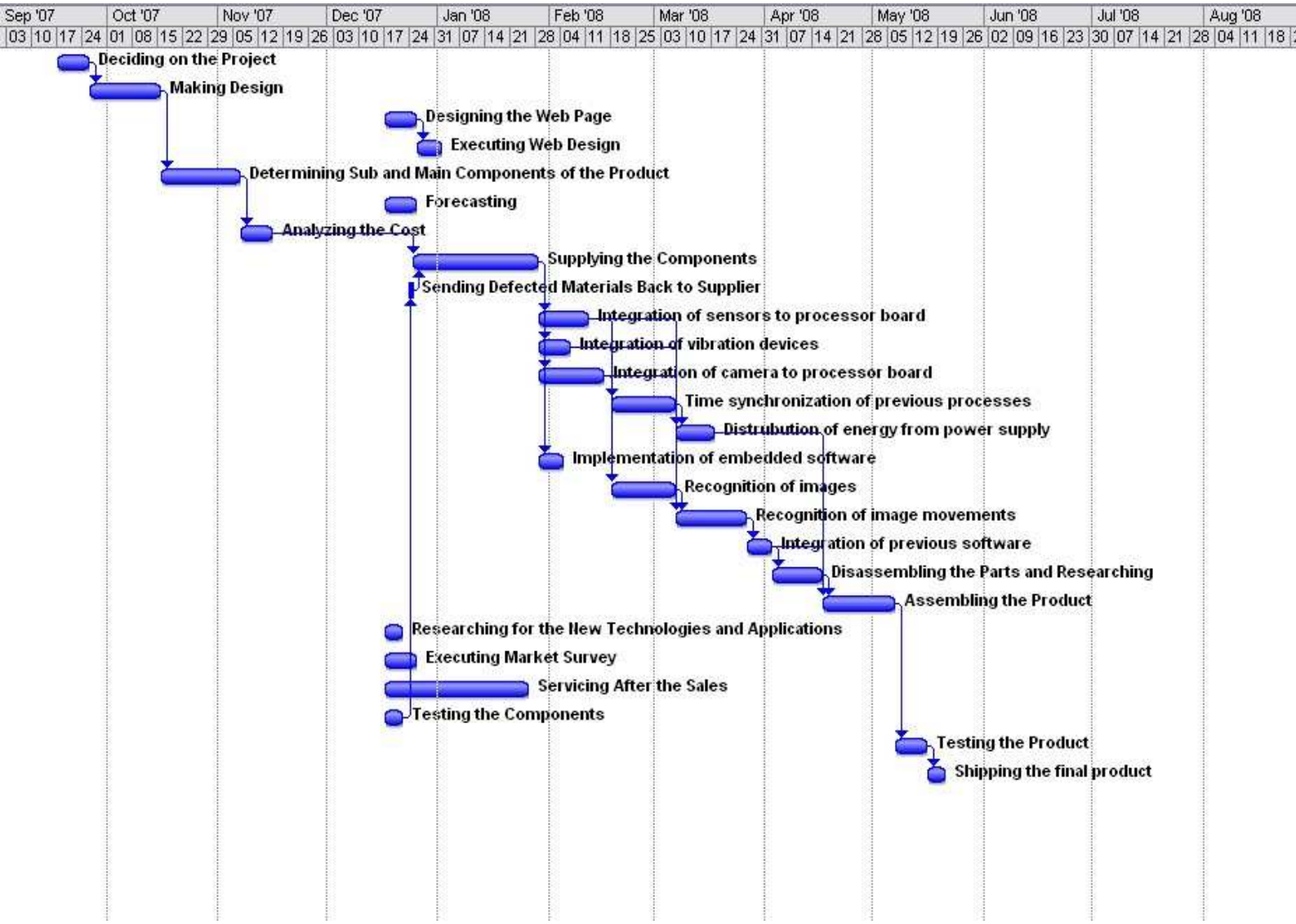
- After our research, there is a few image processing software which suits our case but we could not decide yet which one totally meets our needs,
- Previous design did not offer ergonomical solutions in order to be efficient to use (for the visually impaired).

Here are the conclusions we have drawn from the previous results:

- We developed a partially new design which is explained in the previous 'Developments in the Project' section.
- Our renewed design does not offer a complete solution to the recognition problem because we value psychology of the visually impaired. We did not even consider a recognizable solution since it contradicts with the vision of VIBRO-I.
- We decided to first implement the sensor version of the product, than we will implement the camera version later when we decided on the image processing software,
- We see that our Business Plan and the preliminary technical design are being accompanying our development well throughout the whole semester!

5 APPENDICES

5.1 MS Project Development Plan



5.2 Flow Chart done at the very Beginning of the Project