

# A Comprehensive Study of After Sales Customer Service Issues in Electronic Equipment Industry

Madanayake MDPT<sup>1</sup>  
Dissanayake KDDN<sup>2</sup>

## ABSTRACT

Today the customer satisfaction is the most important aspect of a business. For any type of business, the final goal is to satisfy the customer and stabilize the business. In satisfying customer, only sales would not be enough. They expect more, such as a good service from the vendor and so on, to fulfil their satisfaction level. From that perspective, this research was carried out to explore the issues in after sales services in electronic equipment industry. For this research, a leading total solution provider for mid range computers and peripherals, who has developed a comprehensive and integrated nationwide service especially to the mid-range computer industry and which tries to concern more about customer satisfaction was used. This research was carried out based on the after sales services that they try to offer to their valued customers in order to fulfil the expectations of them. But there are situations in which the expected level could not be achieved due to various reasons. In this research, the reasons for these were tried to discover and suggest solutions. Some solutions have been proposed for the selected organization to try out them with theoretically and practically proven tests, surveys, beneficial outcomes, discussions and conclusions. As it points out, if this endeavour could save a single penny to the organization, with satisfied customers, then that would obviously be considered as the ultimate obligation of this research.

**KEYWORDS:** After Sales Service, Maintenance, Preventive Maintenance, Warranty

## INTRODUCTION

Customers usually expect a good after sales service as promised or agreed when the product is sold, or service agreement is extended. Most of the time the customer relies on the products and sometimes a failure of a product would be a critical situation to the customer. This becomes a highly critical because most customers of the selected organization are banks and other financial institutions such as credit card, leasing and so on. Sometimes, the customer needs a backup or recovery product to continue their operations without any interruption, when the repair or replacement takes a long time due to some reason. Therefore, provision of a good customer service is a must.

If the organization could not fulfil these requirements then the customer satisfaction would not be in an acceptable level, though it tries to complete the jobs on time. And this may lead customers to choose other competitor when making extended service agreements in next time or making new purchases (Buttle & Burton, 2001).

On the other hand, personnel involved in the jobs handled by the relevant department are not satisfied, as they are busy most of the time. This may discourage them and would lead to less efficient work. Also, sometimes those personnel would leave the organization and then the problem may get worse.

The problems identified in the organization were, not having necessary devices/parts for replacements in the stocks, no enough employees to

send to the customers place to look after the case, busyness of the personnel in the department and inadequate information provided by the customer with their requests.

In this research, the main objectives were to suggest solutions for identified problems in order to minimize after sales issues, discover the hidden causes behind issues in after sales services and provide a background for future researches relating to after sales services.

The benefits that could be obtained from this research findings are, the organization may be able to have an idea about which items/parts should be in the stores and should maintain to offer a good service, continue with the existing number of personnel in the department to fulfil customer requirements, less work load for the personnel involved in jobs of the department, save time when visiting a customer's place by taking necessary parts according to the customers information, identify the causes relating to the failures, and identify actions that need to take in order to avoid or reduce such failures.

## LITERATURE

The literature related to after sales service in electronic equipment industry is hardly published in books and in the Internet too. Therefore to do this, similar activities which were related to work carried out by organizations while doing their business operations to serve customers were considered.

Software industry is such an industry which concerns about what they have delivered to the customers although they have handed over the product i.e. the software. Software maintenance seemed similar to after sales service from several aspects. So, here the topic 'Software Maintenance' was considered as a guide to this research.

<sup>1</sup>Graduate, Department of Industrial Management, Faculty of Applied Sciences, Wayamba University of Sri Lanka.

<sup>2</sup>Senior Lecturer, Department of Industrial Management, Faculty of Applied Sciences, Wayamba University of Sri Lanka.

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Software maintenance in software engineering is the modification of software products when correcting the faults, improving performance or other attributes, or adapting the product to a modified environment. International standard for this is ISO/IEC 14764 (Wikipedia, 2009). Some maintenance processes that would be related to this research are as follows (Out of six processes).

1. The implementation processes contains software preparation and transition activities, such as the conception and creation of the maintenance plan or 'Service Level Agreements' (Wikipedia, 2009) (SLAs) and specialized maintenance contracts negotiated by maintainers, the preparation for handling problems identified during development, and the follow-up on product configuration management.
2. The problem and modification analysis process, which is executed once the application has become the responsibility of the maintenance group. The maintenance programmer must analyze each request, confirm it (by reproducing the situation) and check its validity, investigate it and propose a solution, document the request and the solution proposal, and, finally, obtain all the required authorizations to apply the modifications.
3. The process considering the implementation of the modification itself.
4. The process acceptance of the modification, by checking it with the individual who submitted the request in order to make sure the modification provided a solution.

Categories of Maintenance in ISO/IEC 14764 are as follows;

1. Corrective maintenance: Reactive modification of a software product performed after delivery to correct discovered problems.
2. Adaptive maintenance: Modification of a software product performed after delivery to keep a software product usable in a changed or changing environment.
3. Perfective maintenance: Modification of a software product after delivery to improve performance or maintainability.
4. Preventive maintenance: Modification of software products after the delivery to detect and correct latent faults in the software products, before they become effective faults.

Following are the keywords that are related to the area of study which were used to do this research, (Wikipedia, 2009)

- Customer, sales and marketing
- Customer satisfaction and measuring customer satisfaction
- Customer service
- Customer relationship management
- Customer value proposition
- Consumer protection
- Consumer law
- Service level agreement
- Warranty

- Extended warranty: Extending the warranty period by agreements was considered.
- Service plans, differences from warranties, methods of service and economics
- Preventive maintenance: Preventive maintenance, benefits and how to achieve it were considered in here.

### METHODOLOGY

In this research both primary as well as secondary data were used. The problems existing were discovered by using the primary data, through observations. In here non-purposefully observations were exercised. Because while in the Engineering Department, it was observed that personnel in the department face problems while attending to jobs and it was the major focus in this research too. And based on these observations some basic personal interviews were conducted to identify the problems that are existing. After doing so, secondary data were also referred to get more details on the faults which occurred in previous years. The secondary data included, the data retrieved by the computer based system that the company is maintaining. The data retrieved contained the time and date that a customer informed the organization about the fault over the phone or handed over to the organization, serial number of the part or device, the customer name, if the job is completed the date and time it was done, if not that information as well, the person attended to the job and small description about the fault (this was limited to few words and most of the time it was less than 10 words). By selecting a random sample of 6 months of data, mostly common faulty products were identified and out of those, 4 products were used to do the research. Again by using the above sample, 5 faults were identified for each product that was also mostly common for them. Since the system does not have good detailed records on what the fault was, other methods were also needed to retrieve data. This was also done by mainly focusing on primary data. The facts that should be retrieved as primary data were decided based on the facts available in the secondary data gathered. The methods followed to collect primary data were personnel interviews and a questionnaire. With the available time to this study, second interviews were not so successful, so a questionnaire was used to gather information. The areas for those questions of the second interview and the questionnaire were related to areas such as, the causes for faults i.e. a hardware problem, software problem or wrong usage, whether a repair or replacement should be done for particular part in most cases, time taken to repair the particular part, availability of the part in case of a replacement, if the part is not available then the time taken to order it and receive, whether details given by experienced customers are enough or not to guess the faulty part before attending to the job at customers site (the company asks for some details regarding the fault over the phone at the moment when customer informs about



the fault), possibility of applying preventive maintenance, and finally whether adequate number of employees are there or not, to complete jobs. These were asked for each fault of each product.

**DATA COLLECTION AND ANALYSING**

The products considered were, (1) Finger Tec Attendance Systems, (2) Servers, (3) Terminals and (4) Printers. Data of 2006 and 2007 were retrieved using the system for each product and their faults. Table 1 shows the number of personnel involved for each product & the types of faults chosen. The fault codes that were given as Fault-01, Fault-02... etc. would be used as references for faults in other tables.

	Finger Tec	Servers	Terminals	Printers
Personnel	02	03	04	04
Fault-01	Scanner	Disks	IC's	Heads
Fault-02	Memory	Cards	Logic card	Cables
Fault-03	Main board	RAID/ memory	Printer port	Main board
Fault-04	Key pad	Power	Switches	Logic board
Fault-05	Software	OS	Power	Tractors

**Table 1.No. of Personnel Involved & Faults in Finger Tec, Servers, Terminals & Printers**

Though this research was on after sales service issues, the customer involvement was not considered when collecting data. The reason for not taking their views on this matter was the organizations' policy. Table 2 shows the number of faults for each product for the selected years.

	Finger Tec	Terminals	Servers	Printers
Fault-01	35	221	39	286
Fault-02	35	177	38	264
Fault-03	50	203	48	245
Fault-04	43	186	40	247
Fault-05	40	134	50	226

**Table 2.Number of Faults of Each Product**

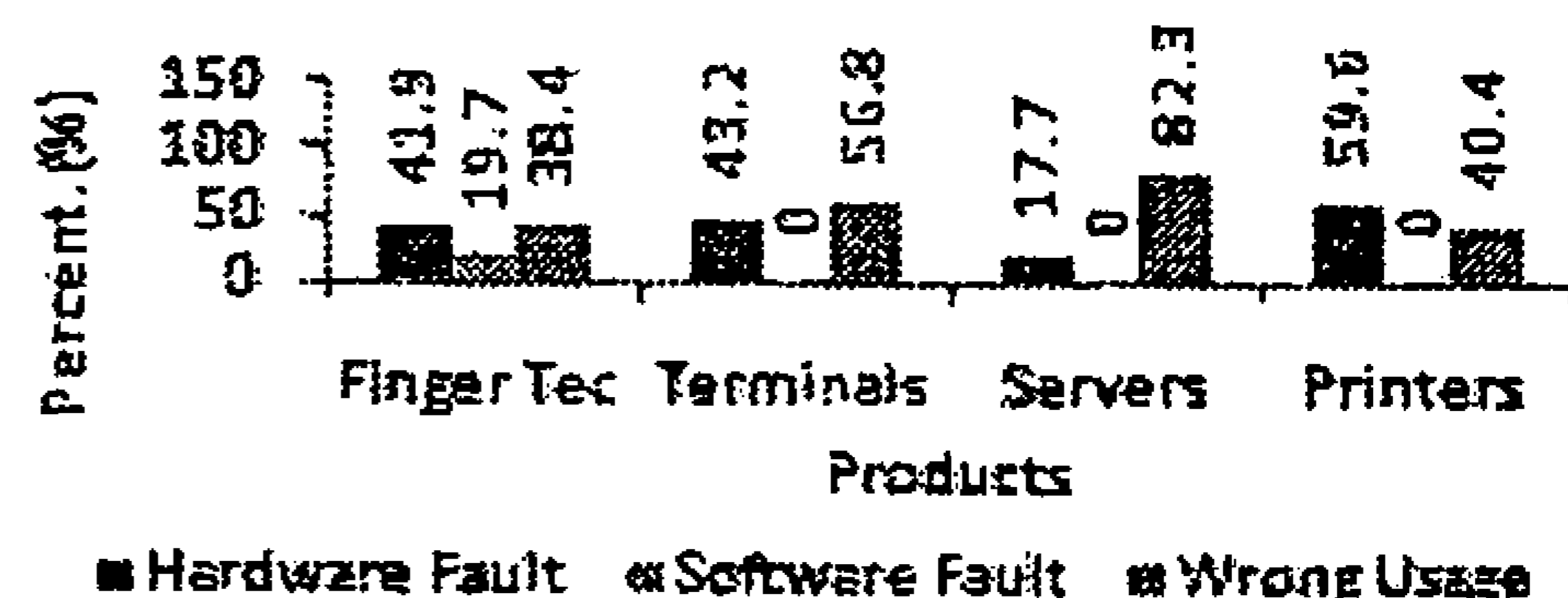
Table 3 shows the areas that were covered in the questionnaire and interviews with possible answers to them.

The figures in Table 2 were combined with answers of the interviews and the questionnaire, which were mentioned in Table 3, and those combined data were used for the analysis. Figures 1 to 8 show those analysed data in percentages.

Question Area	Possible Answers
Cause for the failure	Hardware/ Software/ Usage faults
Reparability of the part	Yes/ No/ Moderate
If repaired, time taken for it	Less than 1 hour/ 2 to 3 hours/ 1 day/ Few days
If replacement needed, availability of parts	Yes/ No/ Moderate
If the part needs to be ordered, the time taken	Within 1 day/ 2 to 4 days/ 1 week
Adequacy of details provided by the customer	Yes/ No/ Moderate
Helpfulness of preventive maintenance	Yes/ No/ Moderate
Adequacy of number of employees	Yes/ No/ Moderate

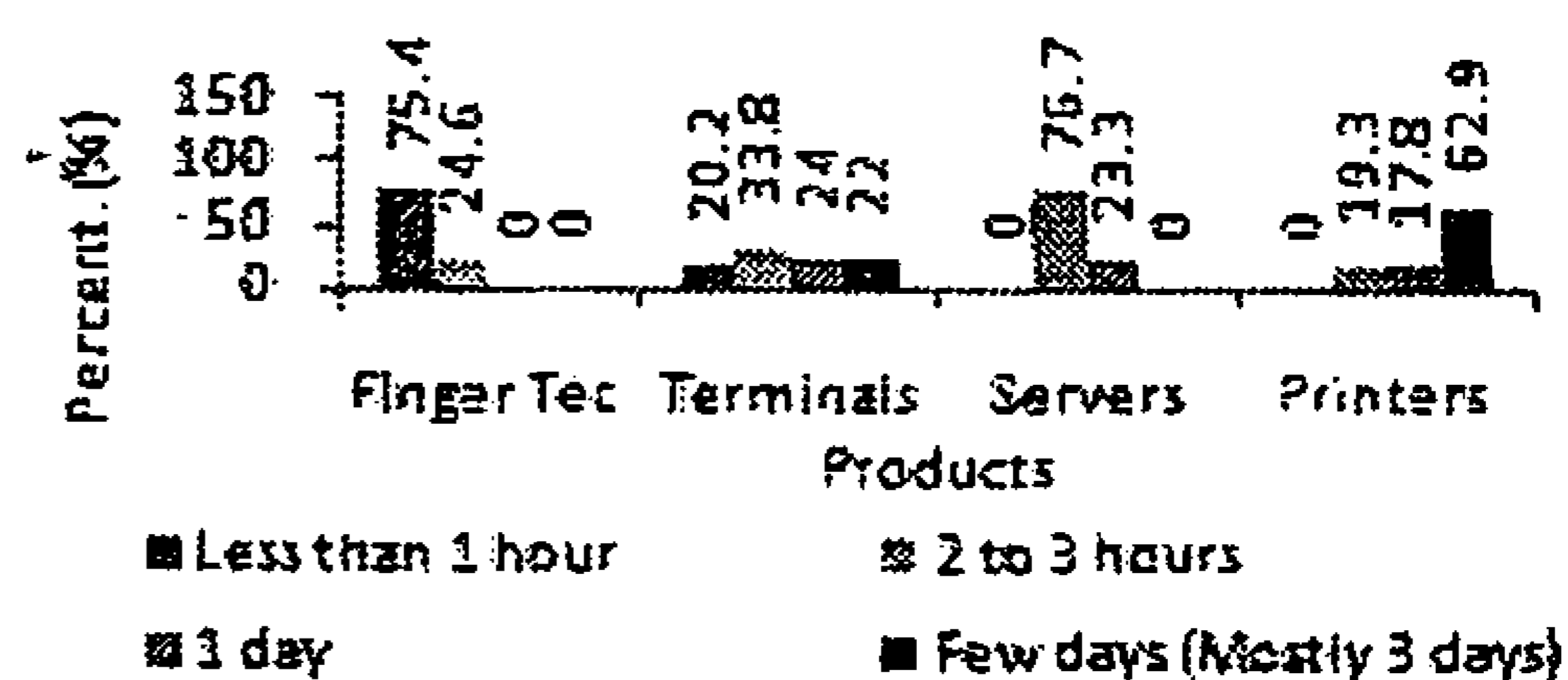
**Table 3.Questioned Areas and Answers**

Following Figure 1 shows the percentages of causes for the failures.



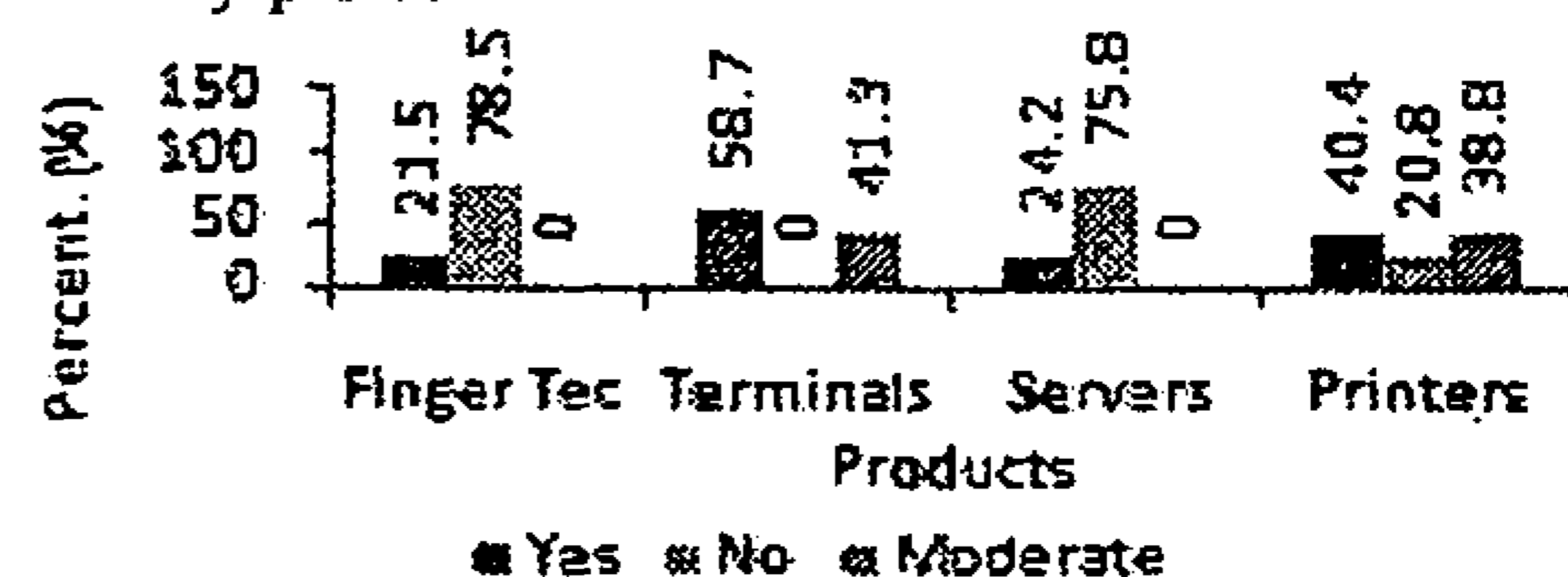
**Figure 1.Causes for the Faults**

The times taken to do repairs are shown in the following Figure 2



**Figure 2.Time Taken to Repair Faulty Parts**

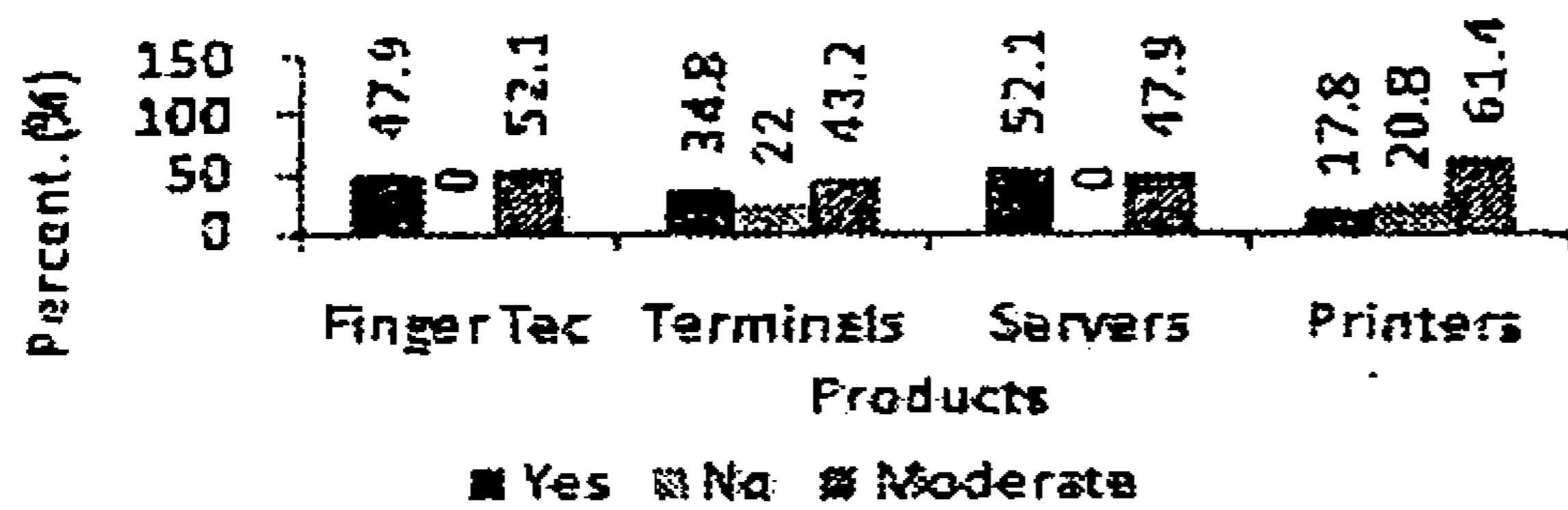
Figure 3 shows the percentages of possibilities to repair the faulty parts.



**Figure 3.Repairability of Faulty Parts**

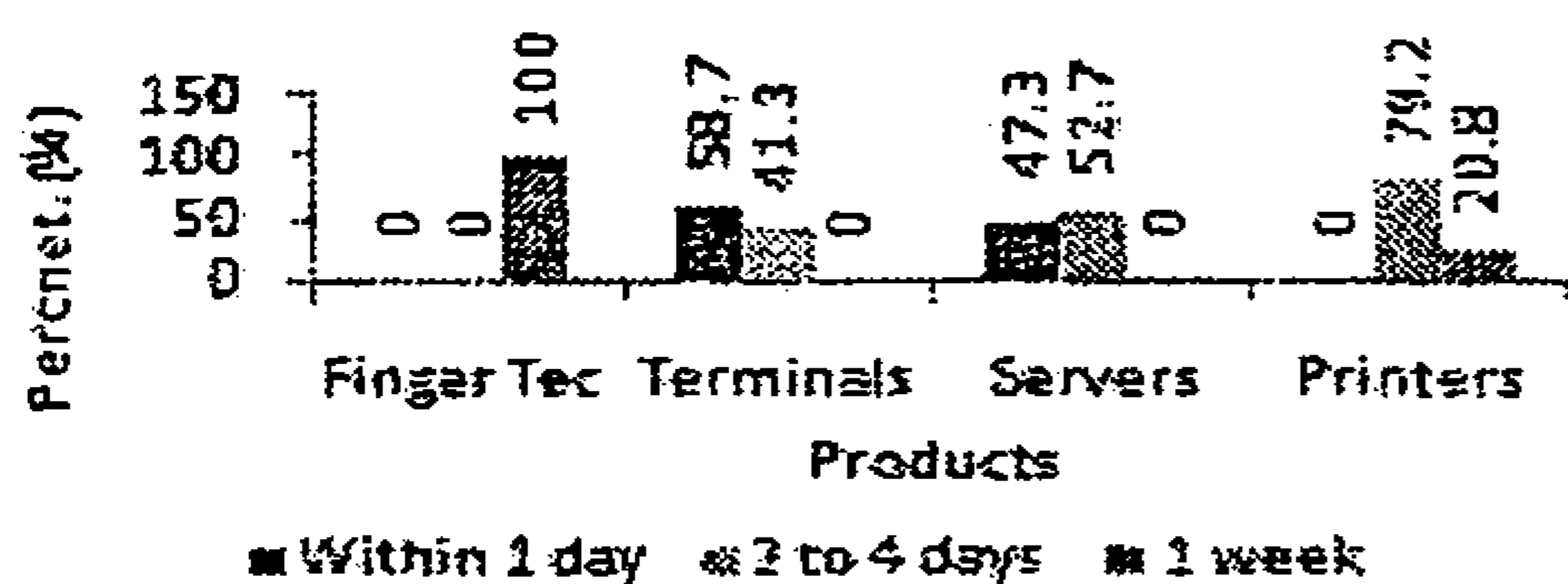
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The following Figure 4 shows the availability of parts when replacements are taken place.



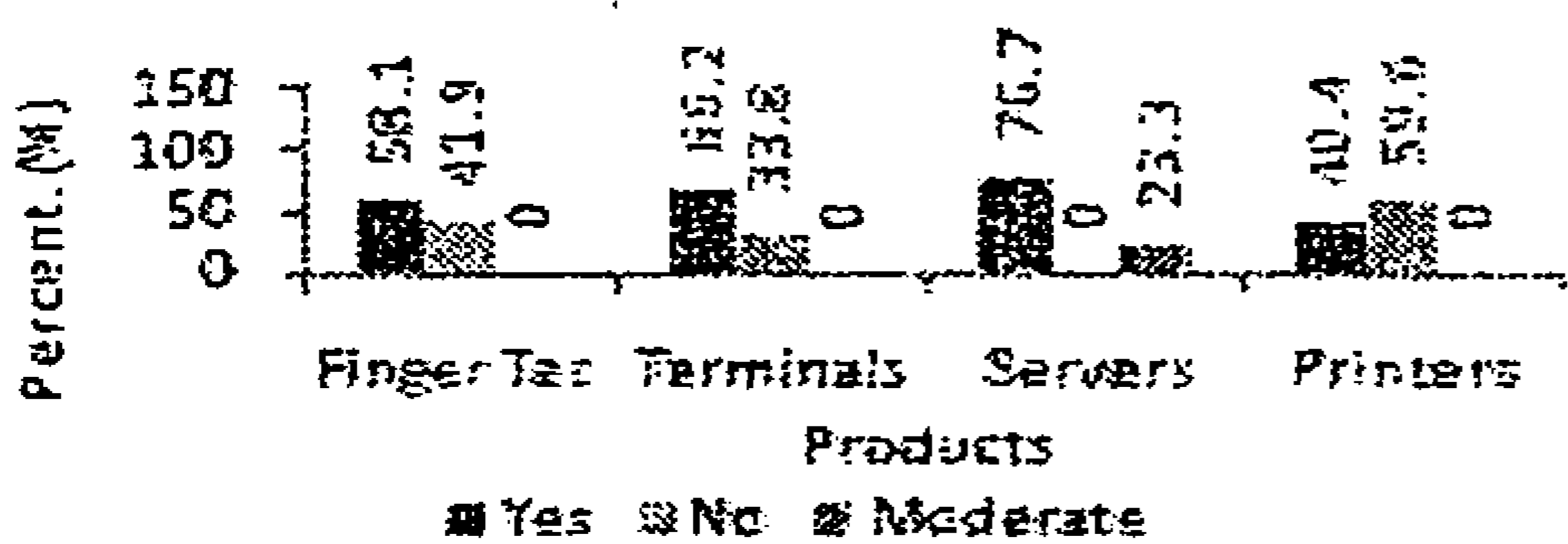
**Figure 4. Availability of Parts to Do Replacements**

The percentages of time taken to receive unavailable parts are shown in Figure 5.



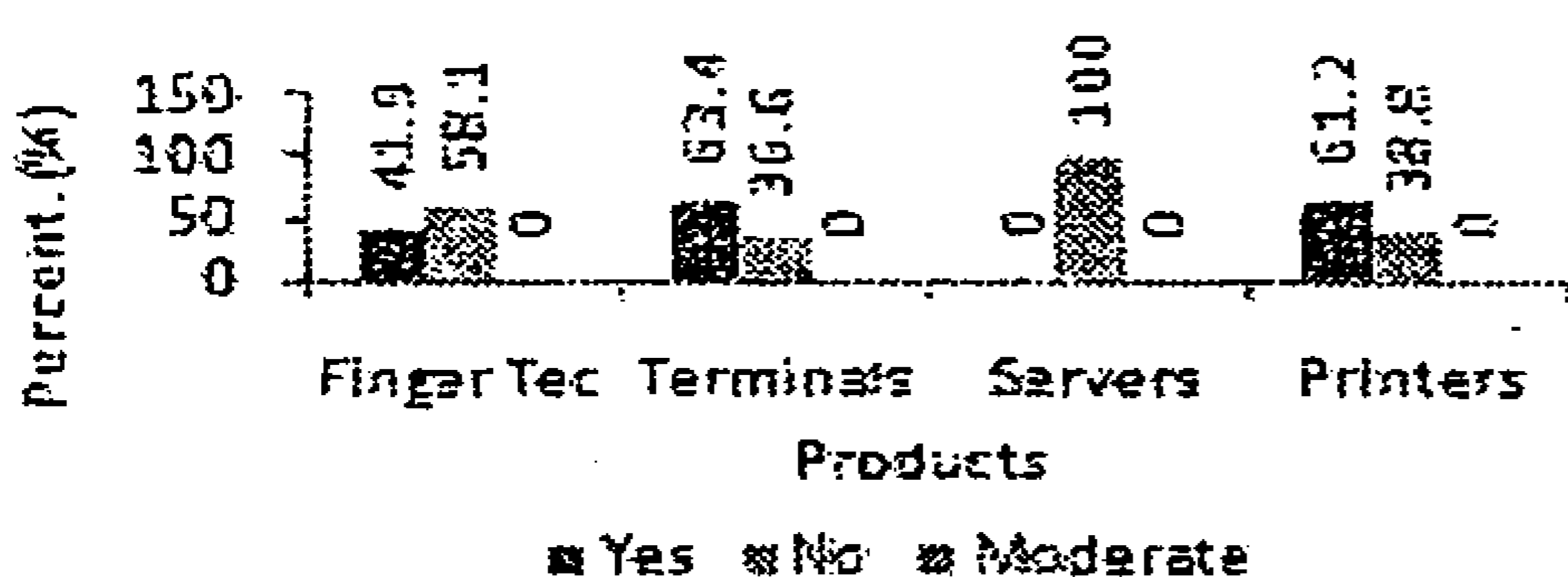
**Figure 5. Time Taken to Order a Part & Receive**

The adequacies of details provided by the customers regarding the faults are mentioned in the following Figure 6.



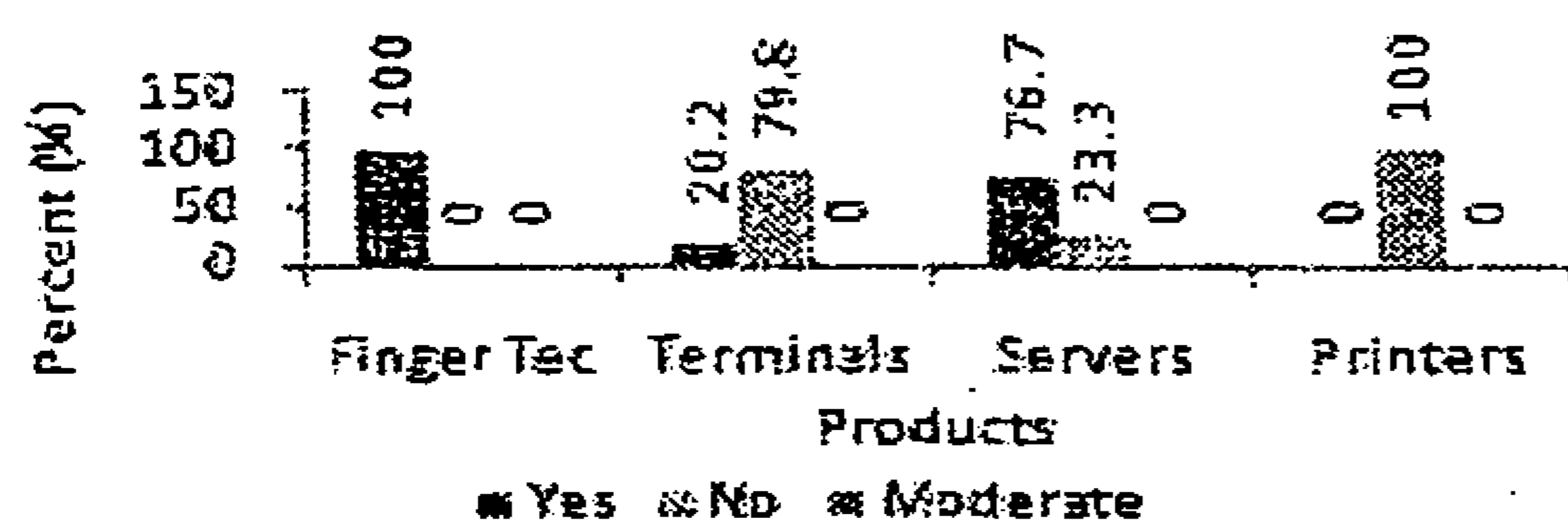
**Figure 6. Adequacy of Details Provided by Customers**

The employees' perspective regarding the helpfulness of preventive maintenance is shown below in Figure 7.



**Figure 7. Helpfulness of Preventive Maintenance**

In Figure 8, it shows the adequacy of number of employees to attend the maintenance work.



**Figure 8. Adequacy of Number of Employees**

## RESULTS AND DISCUSSION

By analysing the data collected as in the previous manner, following are the results that have been derived.

- From Figure 1 it was seen that hardware faults are reasonably high for Finger Tec, Terminals & Printers. Also, wrong usage causes faults in almost all products but, for Terminals & Servers it is higher. Software faults have also contributed in failures of Finger Tec. From this, it can be seen that avoidable causes such as usage & software faults contribute reasonably for failures.

- As shown in Figure 2, repairing for Terminals & Printers take one or more days to complete. Finger Tec & Servers take less time (1 to 3 hours) to be repaired when comparing with others. The reason behind this delay is the complexity of those products in most cases. If the parts are not available in the stores and needs to be ordered, then that process takes a long time too.

- As shown in Figure 3, Finger Tec & Servers have reasonably high faulty parts that are not repairable. Even though all have repairable parts, Terminals have the highest.

- From Figure 4 it was clear that, Server parts are available in most cases. But, for all these products, the situation is moderate or there are no parts in the stores.

- From Figure 5 it was seen that, Finger Tec parts take almost a week to be received after ordering. Terminal parts can be received within a day in most cases. But, Server & Printer parts take 2 to 4 days to be received.

- Figure 6 showed that for Finger Tec, Terminals & Servers, the details provided by the customers regarding the fault were enough before attending to it. But for Printers, it was not so and it has a high possibility of getting inadequate details. Further for Finger Tec & Terminals there is a reasonably high possibility of getting inadequate details.

- As shown in Figure 7, for Terminals & Printers 'Preventive Maintenance' (PM) is effective. But, in case of Servers PM is not helpful in most cases. For Finger Tec also it has a reasonably high chance of being less effective.

- From Figure 8 it was clear that, for Printer repairs, the available number of personnel is not enough, & Terminals also need more personnel. However, Finger Tec repairs do not need additional personnel at all, while for Servers reasonably high requirement is there.

Alternative solutions that were suggested below for these identified results were mainly focused on the potential of the company to implement them.

Solutions for reducing the time taken to complete a job by repairing are;

1. Share jobs, based on the parts. Currently a person who is dealing with a particular part, most of the time does the same job. For example a person may always deal with printer heads, and that job can be practiced by others and later share the same job.



2. Arrange the repair centre in a proper way. Because most of the time faulty product is brought to the repair centre and due to the limited available space, devices are kept together and the space to separate the parts of a device is limited. And where repairs are done and where equipments needed to repair them is kept (in cupboards) have some distance. Therefore by arranging the repair centre, the organization can reduce the time wastage.
3. Recruit new personnel and give appropriate training covering related areas.
4. Train personnel who are dealing with products that have less work load to work with products with excess work load due to repairs. So they can be used when extra work load comes for which takes a long time.
5. Implement PM programs by analysing past data.

The first two are the feasible solutions suggested based on the time taken to start implementation, cost, degree of impact to other operations & skill level required by personnel.

Solutions for unavailability of parts are;

1. Try to implement a forecasting model. By doing so, the organization can forecast parts to be ordered in advance.
2. Allocate appropriate budgets for buying parts in advance. Keeping every part readily available in the store can be done by doing this.
3. Buy products from 3<sup>rd</sup> parties in Sri Lanka.

The first solution is the feasible solution for this organization, based on time taken to implement, cost, quality of products (especially when buying from 3<sup>rd</sup> parties), need of reviews from time to time & complexity of them (when making a forecasting system & allocating budgets, reviews are needed).

Solutions for preventing avoidable causes are;

1. Teach the software fully, as most of the products considered in this relate with software. If not, features that were not covered previously would be new to them and this may lead them to misuse the software by trying to use those features and create software problems.
2. Train customers to use the product correctly. This can be done by arranging training programs. Users should know how to use them correctly, in which environments that they should be used etc.
3. At the point of sales and for existing customers, give the guide lines to use the product correctly as a guide book.

Based on the time taken to be effective, effectiveness, cost, degree of impact to other operations & skill level required for users, the feasible solutions were the first & second points.

Solutions to improve the experienced user support in identifying the problem over the phone, at the initial stage are;

1. Give knowledge of basic technical side of products for experienced users who have been working with the product for long years. So they can make aware the organization about the fault to a considerable extent.
2. Give general basic knowledge to troubleshoot the product, which can be done by users to try out, to see whether the problem can be solved by them. This can minimize the situations that need attending to the place.
3. Give troubleshooting procedures of the product as a guidebook. This would include trouble shooting most common problems that user can solve by themselves.

The feasible solutions for this are the first & second, based on the same criteria mentioned in previous solution.

Solutions for the insufficient number of personnel are;

1. Train personnel dealing with products that have less work load to work with products with excess work load. Because when going through the analysis part of data, it was seen that for some products the possibility of occurring a fault is lower while some get high.
2. Recruit appropriate number of employees and train them for products that have higher number of faults.

Based on the time taken to implement, cost, skill level required for employees & degree of impact to other operations, the feasible solution is the first one.

The feasible solutions out of above mentioned were selected based on criteria such as time, cost, degree of impact to other operations & skill levels required by a particular party etc. And in this case, cost was a major factor that affects the feasible solution as the company concerned more about it.

## CONCLUSION

In this research, the issues of after sales services were tried to discover and suggest solutions. But, here only the vendors' perspective was concerned mainly. As the result, 5 areas of issues were identified covering various aspects of service.

1. Practices of personnel and arrangement of the place where repairs take place which affects the time taken to complete a job.
2. Unavailability of parts for providing a good after sales service.
3. Usage faults and faults due to unawareness, such as software faults of the customers.
4. The unacceptable level of customer support at the initial stage.
5. The human resource issues in the organization regarding repairs and maintenance.

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Most of the solutions suggested are easy to implement and can be easily evaluated. So, an organization can implement most feasible solution, and can evaluate the result. If it is not in an acceptable level then the next feasible solution can be implemented.

This research was carried out using computer related hardware. In some cases they were not purely hardware based and had software relationship with them. So the issues and solutions identified may not be valid or the validity would be less if compared with pure electronic equipments which are not related to computing and software.

While trying to study the feasibility of solutions provided, the organizations' concern had to be considered. As a result, cost had to be considered as a great factor, because the organization needed to minimize the cost as lower as possible in most cases. Therefore, most solutions had to be eliminated. But if the restriction in cost could be limited, several other options could have been implemented in parallel.

The main goal of any organization is customers. If customers are not satisfied, then competitors will come to the arena. Therefore, a company should always target customer satisfaction. Sometimes cost may be a restriction to implement these, but it may play a great role to attract customers by giving an outstanding service. Therefore an organization should balance every aspect when achieving the customer satisfaction.

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