Reverse Logistics for Bidvest Panalpina Logistics

Project BPJ 420

Final Report

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Executive Summary

Reverse logistics (RL) is often not treated with much importance as forward Logistics, but the fact is that it forms a major part of the supply chain management in any business from manufacturing to warehousing.

A lack of an official RL system at Bidvest Panalpina logistics has caused a lot of unhappiness to the customers. The number of complaints have increased over the months due to long waiting times on goods that where returned to the warehouse for various reasons. The absence of a well-structured RL system has set BPL a step behind its competition as this has proven a slack in Customer services.

The Report strictly focuses on Returns Management (RM) which is a fraction of Reverse Logistics. RM focuses on management of goods as soon as they enter the warehouse.

Customer complaints have raised concerns as to what may be missing in the current RM process. Satisfying the customer is one of the main goals of BPL as it is a service providing business, hence identifying the gaps in the De-group RM process and making improvements to the system may yield less complaints and better Customer Services.

In this Report literature on various continuous improvement tools are discussed and Quality functional Deployment is used to identify a suitable improvement tool, to meet the requirements and goal of improving the RM process.

Business Process Engineering is the methodology that is used to improve the entire RM process at BPL.

A dashboard to maintain the performance of the RM performance is designed. This dashboard will show the percentages of goods returned back to the customer on time and those that are not returned to the customer on time.
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List of Acronyms

BPL: Bidvest Panalpina Logistics
RL: Reverse Logistics
RM: Returns management
BPR: Business Process Re-engineering
HAWB: House Airway bill number/House bill number
BPMS: Business Process Management System
BPMN: Business Process Mapping Notations
TQM: Total quality management
QFD: Quality functional deployment
Chapter 1:

1.1 Introduction and Background

1.1.1 Company Background

Bidvest Panalpina Logistics (BPL) previously known as Safcor Panalpina Logistics is a supply chain management company that has been offering warehousing and Logistics services to customers in South Africa and around the world for over a century. The company has 25 facilities in South Africa. The project covered in this report was conducted at Bidvest Panalpina Unit 2 warehouse (Unit 2), which is situated right behind OR Tambo international airport. Unit 2 warehouse is approximately 20000 square metres in size.

Unit 2 Operations are divided into The De-group operations and the Contract Logistics Operations. This report only focuses on the De-group Operations.

De-group Operation is continuous process where most of the goods that are arrive are consolidated. These goods are taken apart and grouped according to their House Bill (HAWB) number and case number (Identification number). The process is explained further (refer to 1.1.3)

1.1.2 Introduction

In the De-group Operations there has been a huge concern on the increasing number of customer complaints on returned goods not being attended to on time. According to BPL rules, returned goods are not supposed to stay in the warehouse for more than three days, but questions arise on what may be the problem since goods actually stay in the warehouse for more than three days. This is a huge concern for BPL as a service provider, as one of their goals is to give the customer best value for their money.

The current Information system that is used in the De-group Operations is Cargowise Software. Cargowise software is the system software that is used to update the returned goods. Information from this software can be extracted into excel or access.

When goods are returned one can only add a small comment as a reason for return, this is not readily visible when one searches for a specific cargo. For one to be able to see that it is a returned cargo one should go into more details on the cargo.
There is no set standard documented procedure at BPL managing returns which also raises questions as to whether the process is meeting the international standards of RM. Various tools are researched in this report in order to identify the gaps that may exist in the RM system and to improve the RM system at BPL.

1.13 The De-group flow of goods

De-group Operations is a forward flow of goods and information. Whatever goes through entrance gates (receiving) should not exit (dispatch) the warehouse through the same gate but a different gate that is only allocated for goods that are leaving the warehouse. In the De-group Operations goods come in singles or in consolidated batches. The whole de-group operations is explained in detail below.

![De-group Operations Sub-processes Diagram]

**Receiving**

This is a cross docking area where goods are received, pre-inspected for damages or shortages. Receipt documents are signed and the goods are unloaded from the truck and then transported to the De-bulking area using a forklift or a pallet jack. The goods are entered into the Cargowise system using their case numbers and HAWB numbers. If there are any damages or shortages, a comment is also added in Cargowise under the specific good’s HAWB.

**De-bulking**

This is where goods are taken apart (if they are consolidated) by the warehouse personnel and then grouped according to House Bill numbers (Identification Numbers), forklifts and pallet jacks are used to transport the goods during this process.

For goods that are not consolidated, the goods are just grouped according to HAWB numbers by the warehouse personnel. Once the goods are grouped according to their specific HAWB numbers they are transferred to Allocations.

**Allocations**
In this process, goods are allocated a specific storage space in the warehouse using the HAWB by the warehouse personnel and then transferred to the cages using forklifts and pallet jacks.

**Picking**

This process is triggered by a customer. The customer sends a request to the Channel controller (Person in charge of the release documents) for a parcel to be retrieved. The Channel controller then sends physical release documents to Allocations personnel. The personnel at Allocations then search for the customers parcel and retrieve it from the cages or floor and send it to the Dispatch area using a forklift or pallet jack.

**Dispatch**

This is where goods are prepared for shipment. The goods are inspected for damages or shortages. Documents are compared to the goods for similarities in the identification codes. Once everything is on point, a Runsheet is created on Cargowise and printed an handed over to the truck driver. The goods are loaded onto the truck using a pallet jack or forklift and the truck is released.

1.1.4 **Problem Statement**

Customers have raised complaints about the delay in feedback of goods that are returned to the warehouse. Goods are allowed to stay in the warehouse for at most three days, but records show they have been stored in the warehouse for more than two days. Records show that goods have been kept in the warehouse for as long as 20 days.

At times the returned goods could not be located when a release documents are received from the channel controller (Person in charge of the releasing the goods) due do personnel not processing the returned goods on time. The delay is seen as poor service by the customer.

1.2 **Project Aim**

The main aim of the project is to develop an improved RM process for the De-group Operations. The new RM process should be able to track the flow of returned goods and decrease the average time that items spend in the warehouse.

A few more aims of the project are:

- To investigate the current RM system and perform a gap analysis of the process.
• To increase the visibility of the returned goods in the RM system, that is the system should be able to track the flow of the returned goods in the de-group Operations of the warehouse.
• The as-is and to-be processes will then be compared and simulation will be used as a validation tool to show the level of improvement.

1.3 Project Scope and Deliverables

1.3.1 Project Scope
The first part of the project was to investigate the current RL process being used at BPL De-group Operations and design a flow process chart. The next step of the project was to investigate the appropriate tool that would be used to design a new RM process.

The second part was to develop an improved RM process was designed using Business Process Re-engineering (BPR) process improvement tool.

The solution was then validated by means of simulation model. The simulation model is a scaled down simulation model that was used as a validation tool for process improvement.

Lastly a dashboard that will be used to maintain the performance of the new RM system was designed. A set of performance indicators suitable for the new RM were also be selected

1.3.2 Deliverables
The main deliverable was to design new RL process using BPR methods that will be explored in the literature review.

The deliverables can be further broken down as follows:

• A flow chart of the current RM system using a process analysis tool ,BPR
• A Flow chart of the new RM system
• Develop a dashboard depicting the status of the new re-engineered RM process
• A simulation model that will compare the current and new RM process
Chapter 2: Literature Review

2.1 Business Process Reengineering

2.1.1 Introduction

In this literature review various methods are explored and one is ultimately selected to be used to solve the problem. This literature review serves as a motivation as to define and analyse various methods.

Business Process Re-engineering (BPR) dates back to the 1800’s. It was used by management in order to “make their processes the best-in-class” (Weicher, 1995, p2). One of the ideas behind BPR is Fredric Taylor who suggested in the 1880’s that managers use process reengineering methods to discover the best processes for performing work, and that these processes be re-engineered to optimize productivity. (Weicher, 1995)

Although it dates back to the 1800’s it said that the beginning of BPR was in the mid 1980’s and the person behind it is Peat Marwick Mckinsey. (Kittithreeapronchai, 2012)

The most popular definition of Business process Re-engineering is adapted from M.Hammer and J.Champy and states that, “Re-engineering is the fundamental Re-thinking and radial redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed” (M.Hammer and J.Champy, 1993).

Business Process Re-engineering has been used in a variety of organisations from manufacturing to service industries. Not only has it be used for process improvements but it has also been used to measure the performance of a process. It has been proven to be successful by companies such as The South African Post Office, Price Waterhouse Coopers the South Africa Post Office (SAPO) and British Airways

The emerging best practice in the world is to use Business Processes to unlock economic value add within the organisation via information technology by means of:

a) Increasing the productivity and customer satisfaction

b) Exploitation of current markets

c) Creation of new markets
2.1.2 Business Process Re-engineering Principles

There are seven BPR principles. More emphasis is put on reconstructing the process and not the tasks. In BPR a lot of focus is placed on process improvement in order to accomplish the outcomes and not on the tasks. This brings our attention on the seven principles of BPR which are universal and have been used as re-engineering guidelines or codes rather of re-engineering a process.

These are the seven principles of BPR that are adopted from M. Hammer and J. Champy:

1. Organise around outcomes, not tasks.
2. Have those who use the output of the process perform the process.
3. Merge information-processing work into the real work that produces the information.
4. Treat geographically dispersed resources as though they were centralised
5. Link parallel activities instead of integrating their results.
6. Put the decision point where the work is performed, and build control into the process.
7. Capture information once and at the source.

2.1.3 The BPM Lifecycle

It is important to be able to understand the life cycle of BPM as it familiarises one with the terminology of BPM and helps one to monitor the performance or quality of the process.

The aim of the method is to identify the quality of the process models and the adequacy of the execution Environment (Weske, 2007)

The life cycle is shown in the figure below.
2.1.3.1 Van der Aalst et al's BPM Life Cycle

The life cycle model begins in the process Design phase. This is where process is electronically designed using the Business Process Management System (BPMS) and verified.

Once the process has been designed, the process is implemented and it is linked to the underlying system. The employee, the Information system and the System are configured according to the business environment. The next Phase is the enactment phase which is triggered by the configuration of the system. The Enactment Phase is where information or data of the performance is captured in order to maintain and monitor the process. The information is then evaluated, this occurs at the Evaluation phase. The information from the enactment phase is analysed and improved, if necessary.

2.1.4 BPR steps

The following figure shows all the steps and activities that need to be adhered to in order for one to execute the BPR process. Not only does it link the activities but it also shows the interactions of the business environment and the actors (Cross functional Team defined under the Prepare for BPR step, below) that lie within that environment and the system.
2.1.4.1 Prepare For BPR

This is regarded and the most important stage as it helps management answer to all the questions that show the importance of the method. It is important for one to get this stage right the first time in order to avoid failure and unnecessary loss of money. This stage entails all the planning and preparation of the project. In this stage cross functional teams are formed, they are the role players in the re-designing of the process as they are involved right from the beginning until the execution of BPR in the end. Management should also be involved to supervise the entire project. The customer driven objectives should be identified as the goal of the company is to satisfy the customer requirements.

2.1.4.2 Map and analyse the as-is process

This is the second stage of implementing BPR. The AS-Is process is mapped in this stage. This stage is used to identify the gaps or disconnections rather in the process. Modelling methods such as BPMN are used to create and document the activities of the process. The processes that need to be re-engineered are then identified. Other analyses tools such as simulation can also be used in this stage to see the duration of each activity.

2.1.4.3 Design the to-be process

This is the third stage of BPR implementation. Alternative solutions to the problems identified and developed at this stage are. The main objectives are used as guidelines to develop this alternative solutions. Usually a company will compare the current process to that of the expertise and its competition. Once the areas of improvement are identified, a New To-be processes is developed and designed. The duration of each activity utilises is identified and

Figure 3: BPR steps and Respective activities (Muthu, Whitman & Cheraghi, 1999)
analysed. The to-be processes are validated and and trade-off analysis is performed in order to select the best alternative suitable for the enterprise.

2.1.4.4 Implement Re-engineered Process

This is the fourth stage of BPR implementation. It is regarded as the most difficult stage because this is where the re-engineering efforts meets the most resistance. It is wiser to run the culture change program simultaneously with the planning and preparation of the to-be processes as most of the time was taken by analysing the current process.

A transition plan for implementing the to-be process is prepared for at this stage. The plan must align the organisational structure, Information system and business policies as well as the business procedures with the re-designed processes. An information system to support the process should be developed. The as-is and the to-be mapped process will be used to compile a list for changes.

2.1.4.5 Improve continuously

Re-engineering and achieving a best in class process is a long term procedure and thus it require continuous improvement to maintain and improve the process. The first step of continuous improvement is to monitor the activities and measure the performance of each activity and analyse the results. This can be done through constant attitude surveys and discrete meetings with those that were not directly involved from the beginning of the project. Customer satisfaction, supplier responsiveness and employee attitudes could be measured to monitor the results of the continuous improvement.

2.1.4.6 Conclusion

BPL is looking for a long term solution to improve customer satisfaction. This would be a good method as it creates a strong foundation for expressing knowledge and ideas (to identify and solve problems) amongst employees through formation of a functional team in uts (BPR) early stages. The responsibilities of each team member are clearly defined. BPR utilises benchmarking and which is a good tool to identify the loop holes of the current process including the ones that the BPL might not have noted on their own.
2.2  Total Quality Management

2.2.1  Introduction

“Quality does not only refer to goods and services, but it also includes the quality of time, place, equipment, tools, and processes people, the environment, information and measurement “(Dale 2003:5).

“It is an on-going process in an organisation; hence all the departments in a company should be involved in serving their customers with better quality, lower costs, quicker response and great flexibility.” (Schonberger 1990:11)

The definition of quality depends on the role and people defining it as there is no uniform definition even amongst the well-known authors.

There seem to be two levels of quality (Hoyer and Hoyer 2004:54) namely:

- By producing goods and delivering services whose measurable characteristics satisfy a fixed set of specifications
- Products and services that satisfy customer expectations for their use and consumption.

From the above two levels it is quite clear that quality highlights two factors, i.e. conformance to specification and customer satisfaction. This brings us to the definition of quality that is used by the International Standards organisation which states that Quality is meeting the performance standards.

This definition is known as the Universal definition. According to ISO 9001:2008 document that was established by the International Standards Organisation, there are certain International standards that need to be considered and met in order for one to be able to say that they are producing quality products or services. The roots of TQM can be traced back to the 1920’s when statistical theory was first applied to product quality control. This concept was further developed in Japan in the 40s led various people such as Deming. The focus switched from quality of products to the quality of all issues within the organisation, Total Quality Management(TQM).

Total quality management can be designed according to the customer needs hence this creates rooms for an organisation to do what is best for the company and their customer. There is no set procedure when it comes to Total Quality management so an organisation can design one that is suitable for its needs and that of their customer.

According to the ISO 9001:2008 document the design and implementation of the organisation’s quality management system is influenced by
a) Its organisational environment, changes in the environment, and the risks associated with that environment.

b) Its very needs

c) Its particular objectives

d) The products it provides

e) The processes it employs

f) Its size and organisational structure

TQM is a tool that improves a company’s competitiveness, effectiveness and flexibility for the benefit of its stakeholders. It is also a way of planning, organising and understanding each activity and removing of all wasted effort and energy that is routinely spent in an organisation.

2.2.2 The principles of Total Quality Management

According to Demining who is one of the greatest early pioneers of Quality, there are 14 principles in Quality. According to Dale (2003:53) the 14 can be applied anywhere, to small institutions as well as the large ones, to the service industry as well as the manufacturing industry.

2.2.2.1 Deming 14 points of Quality

1. Create constancy of the purpose for improving products and services.

2. Adopt the new philosophy

3. Cease dependence on inspection to achieve quality.

4. End the practice of awarding business on price alone; instead, minimize total cost by working with a single supplier.

5. Improve constantly and forever every process for planning, production and service.

6. Institute training on the job.

7. Adopt and institute leadership.

8. Drive out fear.

9. Break down barriers between staff areas.

10. Eliminate slogans, exhortations and targets for the workforce.

11. Eliminate numerical quotas for the workforce and numerical goals for management.

12. Remove barriers that rob people of pride of workmanship, and eliminate the annual rating or merit system.
13. Institute a vigorous program of education and self-improvement for everyone.

14. Put everybody in the company to work to accomplish the transformation

By looking at the 14 principles one is able to see that this is a long term method as the entire company is involved in establishing a good quality product the principles also promote team work and everyone in the company should have the same attitudes and goals as members of the company.

2.2.3 TQM Implementation elements

According to J. Collet and B. King there are ten elements for Implementing TQM in company (1990:5)

**Ten Elements of Total Quality Management**

**Implementation Model**
2.2.3.1 Explanation of the Elements in Figure 4.

1. The first element is where the management makes the decision to introduce TQM in the Company.
2. In the second element the customer needs are identified and an establishment of how these needs will be met is made.
3. The next element is where management do a review of the critical processes that drive the organisation to meet the customer needs.

4. At this stage a project team is established, this team will be involved in the entire TQM process from the beginning till the end. It also helps management to access the level of resource, time and management involvement required by the TQM process on a small scale.

5. Assessment and Breakthrough Plan, the organisation. The organisation sets a plan for strategic breakthrough based on the assessment of its vision, its customer demands, its critical processes and the requirements for improvement.

6. The organisation manages TQM momentum, this is done through continued customer assessment, on-going selection of improvement projects and the increasing involvement of all levels of management.

7. This element focuses on Individual management breakthrough Contributions

8. Daily process management is the monitoring as supervision of activities in the process and the process itself.

9. This element is done concurrently with element 7 and 8, this element discusses the establishment of a new functional and cross functional team. All three elements together capture and integrate the benefits of individual and cross functional team.

10. The final element focuses on the review of the process and incorporates the improvements and "lessons learned" in the plan for future improvements. These elements may take more than two years to be implemented.

2.3 Selection Of the most Appropriate Method

The information that was used to produce the weights is the number of returns that took longer than seven days to be fabricated. It is assumed that if goods are in the system for more than four days then it is taken as a customer complaint as there is no customer service system that records such complaints

2.3.1 Quality Functional Deployment. (QFD)

This is an Industrial engineering tool that is used to determine the most suitable method amongst two or more methods, to be applied in solving a problem according to certain specifications. In this project QFD is utilised to choose which methods will best meet the company’s requirements between TQM and BPR.
The following is an explanation of the QFD figure. Appendix C

2.3.1.1 Importance Weighting

The different customer requirements are given, this customer requirements are from BPL. Once they are given they are allocated weights according to the importance by the customer.

The rankings that are used are 5-highest and for the 1-lowest

The different customer requirements that are addressed in the QFD are:

1. Quick response time - Customers require a service that is fast, they need their returned goods to be processed and dealt with on time.
2. Information - The customer should always have an update of what is happening to the goods that they have returned.
3. Affordable services – The services should have a reasonable fee and this fee should not be exaggerated or too high for the customers.
4. Efficiency – Customers should be given service that is better than what they expected in order to keep them happy

2.3.1.2 Quality characteristics

These are the characteristics that the company should possess in order to meet the customer requirements that are mentioned above. These characteristics are given in the QFD figure (see Appendix C).

2.3.1.3 Direction of improvement

Here one chooses the option of maximising, minimising or just reaching the target for the quality characteristics. This is up to the company and what its priorities are.

2.3.1.4 Interrelationships

The link interrelation between the Quality characteristics and the Customer Requirements are is established this is done by selecting three criteria; Strong relationship (9), moderate relationship (3) and weak relationship (1)

2.3.1.5 Competitive Analysis

The importance of each Customer requirement is given a weight. The weight of the BPR and TQM methods are then given. Once these weights have been established the total of each method is calculated and a graph appears to show the results of the QFD.
2.3.1.6 Conclusion

From the calculation of the total that is done in the competitive Analysis it is clear that the “winner is BPR”.

2.3.2 The Criterion Matrix

This is a criterion method of selecting the most suitable method to solve BPL’s problem. Each criterion is given a ranking with 4 as the highest ranking and 1 as the lowest ranking. The ranking is depended on whether the method addresses the criterion. The table below shows the criterion weights for each method.

Table 1: Criterion Table

<table>
<thead>
<tr>
<th>Criteria</th>
<th>BPR</th>
<th>TQM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptability and Flexibility</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Execution Time</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Ease of Conversion to electronic process</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Step-By-Step procedure</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Enables continuous improvement</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Identification for opportunity for improvement</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Supports Gap analysis</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Drastic Change</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Eliminate non-value adding activities</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30</strong></td>
<td><strong>24</strong></td>
</tr>
</tbody>
</table>
2.3.2.1 Conclusion

From the above criterion matrix the BPR is the most suitable method to solve BPL’s problem.

2.4 More Tools used in the Project

2.4.1 Simio Simulation Software

2.4.1.1 Description:

Simio is a powerful simulation tool that can be used to simulate business scenarios with the purpose of evaluating defined performance metrics such as resource utilisation, throughput time, event occurrences etc.

2.1.4.2 Purpose:

The simulation tool can be used to measure defined performance metrics, change processes for the current business model to evaluate proposed process changes at minimal costs.

The following is an illustration of a Simio software simulation model.

![Simio simulation model](image)

**Figure 5: Simio simulation model**

After Simulation a report that contains the Resource utilisation, time that an entity stays in the system and many more factors is generated. This report contains all that data that is utilised for measuring the performance of the system.
2.4.2 Microsoft Visio

2.4.2.1 Description:

This Microsoft tool was used for modelling business processes for the BPL de-group operations.

2.4.2.2 Purpose:

It is used to design business processes and the relationships between processes in the company. It utilises Business Process Modelling Notations (BPMN) to design a process modelling for universal understanding in all functions of the organisation.

2.4.2.3 BPMN Notation Symbols

Diagram Elements

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**Figure 6: BPMN Notations**
Chapter 3: Development of Conceptual Design

This Chapter entails the application of the selected methods in an attempted to develop a solution to BPL’s current problem of taking long to process customer returns and returning them to the customer. BPR along with other engineering tools have been used to identify problems in the de-group operations and solve the problems through process improvement.

3.1 BPR Implementation

3.1.1 Prepare for BPR

3.1.1.1 Cross Functional Team

For the preparation stage to begin a cross functional team was established, This team is responsible for the planning and execution of the project. It is important that management must be involved in order to give a more strategic direction.

The selected Team for the Project:

- Tshepiso Makoe (BPL Continuous Improvement Manager)
- Willem Bekker (BPL Continuous Improvement Manager)
- Patricia Ngomane (Project Leader)
- Lufuno Tshiswaise (Engineering Student)

3.1.1.2 Customer Driven Objectives

The following are identified customer objectives that will be considered to develop the solution:

- Reduce response time for queries
- Increase availability of information
- Decrease processing time of returned goods

3.1.1.3 Strategic Purpose

The main purpose for the improvement of the process is to minimise processing time for returned goods in the de-group operations.
3.1.2 Map and Analyse the AS-IS process

3.1.2.1 Mapping (See Appendix A)

The As-Is process was mapped using the BPMN notation. Once the process was mapped time studies were conducted in order to use Simio (simulation software) to analyse the process.

3.1.2.2 Analysis

Simio simulation model was used to analyse the current process. The Simio model (see figure 7) has one source, three servers and two dispatch stations.

![Simio model](image)

Figure 7: Simulated modelled

3.1.2.2.1 The simulation model

The following are explanations of each station on the simulation model

a) Receiving:

The different tasks that are covered under the receiving are, the unloading of the cargo and transfer time to the de-group station.

b) De-bulking:

The following station covers the de-grouping of goods, inspection, photographing cargo and the transfer to the allocations area

c) Allocations:
In the allocations area the time taken to allocate a boxes to a specific area is the only task.

   d) Storage Cages:

This station only has one task, the time taken to store the goods in the cages.

   e) Dispatch

The tasks that are covered in the Dispatch are the processing of the returned goods, updating the goods information on the system (Cargowise), scanning, printing the Runsheet and loading the truck.

A runsheet is a list with all the goods that need to be delivered. This sheet has the driver details, the deliveries that the driver needs to make in order of delivery, the vehicle number and the addresses of the places where the deliveries should be made.

3.1.2.2.2 Input Data:

The processing times for single boxes and multiple boxes differs, the following table gives the input data of each of the model entities that represent the number of boxes. Sequence tables where created under data tables in Simio in order to create different processing times for each model entity.

Note: Single boxes are dispatched through dispatch1 and multiple boxes are dispatched through dispatch 2

Table 2: processing times for single and multiple boxes

<table>
<thead>
<tr>
<th>Processing time</th>
<th>Single (In minutes)</th>
<th>Multiple (In minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving</td>
<td>Uniform(480,7220)</td>
<td>Uniform(480,7220)</td>
</tr>
<tr>
<td>De-bulking</td>
<td>Uniform(1,2)</td>
<td>Uniform(45,60,120)</td>
</tr>
<tr>
<td>Allocations</td>
<td>Uniform(5,10)</td>
<td>Uniform(45,120)</td>
</tr>
<tr>
<td>Storage cages</td>
<td>Triangular(1440,2880,7220)</td>
<td>Triangular(1440,2880,7220)</td>
</tr>
<tr>
<td>Dispatch(1-singles,2-multiples)</td>
<td>Triangular(15,20,30)</td>
<td>Triangular(45,60,90)</td>
</tr>
</tbody>
</table>
Assumptions
The number of returns does not exceed twenty in a month
Everything that enters the system should leave the system

Analysis of the Data:

Please find the results of the model in appendix C

The model was run over a period of a month. Analysis was done on the throughput times, the number of goods that entered each station and exited the station:

- According to the data the storage station has the highest throughput time, this is the bottleneck of the process.
- Not all entities (boxes) that enter this station leave the station.

3.1.3 Design the TO-BE process

3.1.3.1 New Cage for Returns

The TO-Be process is mapped using the BPMN notation *(See Appendix C)*

In the TO-BE process the following important part of the process was incorporated:

a) Have a reserved area for returns (cage 15)

All the returned goods will go directly to this cage 15. They will be processed the same day that they arrived. This will be done so that whatever comes in first should leave the system first

b) Sending all returns to cage 15 will improve the following:
   i. All returns will be attended to as soon as they reach the warehouse
   ii. It will be easy to track the location of the goods
   iii. Personnel in cage 15 will focus only on the returned goods; hence the time taken to attend to returns will be reduced.

3.1.3.2 Design the to be process

The TO-Be process is mapped using the BPMN notation *(See Appendix B)*

3.1.3.2 Validation of the new Process
A simulation model is used to validate the new process and to show the difference between the TO-BE and the AS-IS processes.

The processing times for single boxes and multiple boxes differs, the following table gives the input data of each of the model entities that represent the number of boxes. Sequence tables were created under data tables in Simio in order to create different processing times for each model entity.

<table>
<thead>
<tr>
<th>Processing time</th>
<th>Single (In minutes)</th>
<th>Multiple (In minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving</td>
<td>Uniform(480,7220)</td>
<td>Uniform(480,7220)</td>
</tr>
<tr>
<td>Returns cage</td>
<td>Triangular(5,15,30)</td>
<td>Triangular(14,60,90)</td>
</tr>
<tr>
<td>Storage cages</td>
<td>Triangular(300,1440,2880)</td>
<td>Triangular(300,1440,2880)</td>
</tr>
<tr>
<td>Dispatch(1-singles,2-multiples)</td>
<td>Triangular(15,20,30)</td>
<td>Triangular(45,60,90)</td>
</tr>
</tbody>
</table>

From the Results (see Appendix C) it is clear that the TO-BE process takes less time due to the fact that there is a designated cage that deals with returns only and the returns are processed as soon as they arrive

**Note:** Single boxes are dispatched through dispatch1 and multiple boxes are dispatched through dispatch 2

### 3.1.4 Implement Re-engineering Method

Implementation plan is still to be developed. This plan will have a step by step procedure on how the new re-engineered process will be implemented

### 3.1.4.1 Implement Transition Plans

This is one of the most difficult stages as people are not always open and comfortable with change. Once people have developed a way to do things and are comfortable, they would rather stay in their comfort zones than try new thing
A well-structured transition plan is developed and will be placed in the final report

3.1.5 Improve Continuously

3.1.5.1 Initiate on-going measurements

Measurements can be taken by conducting surveys; the participants of these surveys are the people that will be involved in the daily operations of the returns process. This will be done in order to get opinions about the process and criticism which will help in improving the process.

3.1.5.2 Review Performance against the targets

A dashboard was designed this dashboard I used to show the performance of BPL’s returns process. The dashboard uses time as its keep performance indicator. The dashboard shows how many goods where received and how many are returned before three days lapses and how many take longer. The goods are identified buy HAWB numbers.

The following is the graph from the dashboard. This graph shows the record for the third of September.

![Age of HAWB per bucket for store check of 3 SEP 12](image)

**Figure 8: Performance measurement for the third of September**

3.1.5.3 Improve Continuously

Continuous improvement is important in every company because it ensures that a process is well maintained and it also helps one in identifying the problems that lie within the process.
One should constantly review ones performance and find thing to improve to strive towards having the best in class products or services.

**Conclusion**

The designed Model will help BPL achieve its goal of reducing the storage time of returned goods in the warehouse. Treating Returns Management with a lot of importance like forward logistics and having a designated area for returns will help the company to improve their attitudes and maintain good customer services since this will force them to give enough attention to the returns. The process is aimed at attending to the returns as soon as they hit the doorstep of the company. This gives the company enough time to do the job right and do away with the system of dealing with problems under pressure. The final Process enables the company to also measure its performance and make room for continuous improvement. This will give them a competitive advantage since customers do not only pay for things to be done but for good service too. The To-be model is economical because there is no need for one to get new resources to accommodate this new process. The same personnel will be used and no special facility needs
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Appendices

Appendix A: AS-IS Flow Process

1. **Receiving**
   - Start: Incoming Shipment
   - Notification Email
   - No of pallets & Waybill
   - Cargo Arrives
   - Transfer sheet, Manifest 
   - & RIB
   - Cargo inspection
   - Manifest
   - No. of pieces
   - Waybill
   - No.
   - Sealed Bulk cargo?
   - Yes
   - No
   - Sealed Cargo?
   - (All 4 sides)
   - Photograph
   - Uncover the cargo 
   - & Photograph Cargo
   - (All 4 sides)
   - De-group Cargo
   - According to
   - HWBN/MWBN
   - Cargo Transferred
   - to De-group
   - Pallet jack/UDL
   - Unload cargo
   - Sign delivery papers
   - Cargo Transferred
   - to De-group
   - Pallet jack/UDL

2. **De-Bulking 
   & Allocation**
   - Cargo inspection
   - Photograph & 
   - record
   - Warehouse Floor 
   & Wait for clearance
   - Damages?
   - Yes
   - No
   - Report Supervisor 
   & Record Shortages
   - Information System?
   - Yes
   - No
   - Photograph 
   & record
   - Pallet &Cargo
   - condition sheet
   - Allocate cargo
   - Warehouse Floor 
   & Wait for clearance

3. **Picking & 
   Dispatch**
   - Release Truck
   - Driver signature
   - RUnsheet
   - Load truck with 
   - cargo
   - Print Shipment 
   details
   - RUnsheet
   - Update shipment
   - CargoWise
   - Print Shipment 
   details
   - RUnsheet
   - Load truck with 
   - cargo
   - Driver signature
   - RUnsheet
   - Release Truck
   - End
   - Fixable
   - Yes
   - No
   - Process the return 
   and fix
   - Send to dispatch
   - Receive custom 
   clearance
   - Email and manifest
   - Pick cargo
   - Factory floor
   - Fixable
   - No
   - Reimburse 
   Customer
   - Yes
   - No
   - Shortages?
   - Yes
   - No
   - Longages?
   - Yes
   - No
   - Shortages?
   - Yes
   - No
   - Damages?
   - Yes
   - No
   - Longages?
   - Yes
   - No
   - Shortages?
   - Yes
   - No
   - Damages?
   - Yes
   - No
   - Longages?
   - Yes
   - No
   - Shortages?
   - Yes
   - No
   - Damages?
   - Yes
   - No
   - Longages?
   - Yes
   - No
   - Shortages?
   - Yes
   - No
   - Damages?
Appendix B: TO-BE Flow Process

RECEIVING

- Start: Incoming Shipment Notification Email
  - No of pallets & Waybill
- Cargo Arrives
  - Transfer sheet, Manifest & RIB
- Unload cargo
  - Sign delivery papers
- Cargo Transferred to De-group
  - Pallet jack/UDL

ALLOCATIONS AND PICKING

- Cargo inspection
  - Manifest
  - No. of pieces, Waybill no.
- Process The cargo & Make decision
- Report to Supervisor Email
- Photograph & record Pallet & Cargo condition sheet
- Inspect Cargo
- Reimburse Client
  - Fixable
  - Yes
  - No

DISPATCH

- Send to Cage 15
- Receive Release Notification Email
- Send to Returns Store Room/Cage
  - No
  - Return Box Immediately
  - Yes
  - No
- Release Truck
  - Driver signature Runsheet
- Load truck with cargo
- Print Shipment details Runsheet
- Update shipment CargoWise

End
### Appendix C: Simulation Model results

#### AS-IS

<table>
<thead>
<tr>
<th>Stations</th>
<th>Number entered and exited</th>
<th>Processing times-average (hours)</th>
<th>Time in station-Average (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving</td>
<td>3</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>De-bulking</td>
<td>3</td>
<td>0.92422</td>
<td>0.92422</td>
</tr>
<tr>
<td>Allocations</td>
<td>3</td>
<td>0.92597</td>
<td>0.92597</td>
</tr>
<tr>
<td>Storage cages</td>
<td>3</td>
<td>1.5712989</td>
<td>84.45245</td>
</tr>
<tr>
<td><strong>Total processing Time</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### TO-BE

<table>
<thead>
<tr>
<th>Stations</th>
<th>Number entered and exited</th>
<th>Processing times-average (hours)</th>
<th>Time in station-Average (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving</td>
<td>3</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Returns Cage</td>
<td>3</td>
<td>1.0796</td>
<td>1.0796</td>
</tr>
<tr>
<td>Storage cages</td>
<td>3</td>
<td>1.0121</td>
<td>1.0121</td>
</tr>
</tbody>
</table>
Appendix D: QFD