

Warehouse Damage Reduction

Project report submitted in partial fulfillment of the requirement for the degree of

BACHELOR OF TECHNOLOGY

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

By

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UNDER THE GUIDANCE OF

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DECLARATION

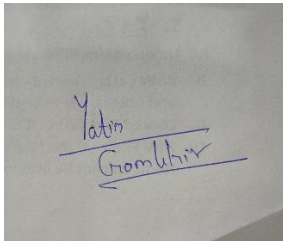
We hereby declare that the work reported in the B.Tech Project Report entitled “Warehouse Damage Reduction” submitted at Jaypee University of Information Technology, Wakhnaghat, India is an authentic record of our work carried out under the supervision of Dr. Alok Kumar. We have not submitted this work elsewhere for any other degree or diploma.



Megham Garg

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This is to certify that the above statement made by the candidates is correct to the best of my knowledge.



Mr. Yatin Gambhir

Date: 21/05/2020

Project Coordinator

Mr. Abhijit Baliga

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I would like to thank every person that has conferred to the development of this project, which is the final stage of our Bachelor Education in Electronics and Communication Engineering at Jaypee University of Information Technology, Wakhnaghat, and Solan. I want to thank my manager and supervisor Mr. Abhijit Baliga, for his advice and supervision during the development of the project. I would also like to thank Mr. Yatin Gambhir for helping me throughout the project in the inventory. And I would also like to thank every Amazon employee who provided us with the necessary information, advice and support throughout the internship.

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Inbound manager intern Amazon

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LIST OF ACRONYMS AND ABBREVIATIONS

WHD: warehouse damage

FC: fulfillment center

RMS: retail market service

CTI: Category/Type/Item

SOP: standard operating procedure

SJI: standard job instructions

AA: associate

PS: problem solver

PA: process assistant

ICQA: inventory control and quality assurance

NYR: not yet received

NYS: not yet stowed

PO: purchase order

TT: trouble ticket

SLP: security and loss prevention

ASIN: Amazon standard identification number

ISS: Inbound support service

ACES: Amazon customer excellence system

OB: outbound

IB: Inbound

C-ret: customer return

LM: last mile

MM: middle mile

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***All of this data, figures and tables are randomly generated numbers to maintain confidentiality of amazon data and are not related to original Amazon data anyhow.**

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Fig 1.3.1 WHD reduction proactive approach

Fig 1.3.1 WHD reduction approach master pack damages

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Abstract

When a seller's unit is damaged in an Amazon fulfillment center, we reimburse the seller if certain conditions are met. We take the damaged unit and replace it with reimbursement in the amount the seller would have received if they sold the unit. In order to maintain the seller's inventory balance at a net zero, a Sellable unit is subtracted and an Unsellable unit is added. On the eleventh day after a unit is flipped into warehouse damaged condition, and as long as the unit is still present in the seller's inventory, a Warehouse Damage Auto RMS will generate. If the value of the RMS is above a certain value, a ticket will automatically be cut to the Warehouse Damage Auto CTI.

In order to reduce these losses there are certain SOPs, SJIs and processes kept in place to ensure that the WHD generation is reduced to the minimum extent possible. But there are still some things that sometimes escapes the current practices and leads to WHD generation this project has the objective to fill these gaps in SJIs, SOPs, and processes.

Introduction

1.1 What is WHD?

An **FC Induced Damage** is an item or unit in a fulfillment center that changes status from sellable to unsellable. **Damage Codes** define **FC Induced Damages**. The following set of **Damage Codes** are used when a unit changes states as described herein:

Code	Description
D	Inventory that is so damaged it is not feasible to return.
E	Sellable inventory was damaged in the FC.
H	Customer damaged inventory was damaged in the FC.
K	Defective inventory was damaged in the FC.
U	Distributor damaged inventory was damaged in the FC.
6	Inventory by the carrier was damaged in the FC.
7	Inventory past expiration date was damaged in the FC.

Table 1.1

1.2 Approach Note:

To complete the project the approach that was adopted included:

- phase 1 where all the information regarding the project available in document format was read i.e. SOP regarding WD, current practices, and type of bins, new plastic free prep and pack SOP for prep recommendation, and current freight refusal guidelines.
- Phase 2 included connecting with stakeholders involved like dock clerk, AAs, PA/PS for feedback and observing the sources of damage at the source itself in the inventory for the breakup of root causes.

- Phase 3 included the understanding and analysis of data of warehouse damage and seller reimbursements to observe trends.
- Phase 4 included making action points based on this analysis and connecting with other FCs to see if other FCs have similar issues and what actions they are taking and agreeing upon.
- Phase 5: See the feasibility of these action points and start implementation for the same if feasible and reject if cost or time inefficient.
- Phase 6: observe the results for these implementations during a certain period.

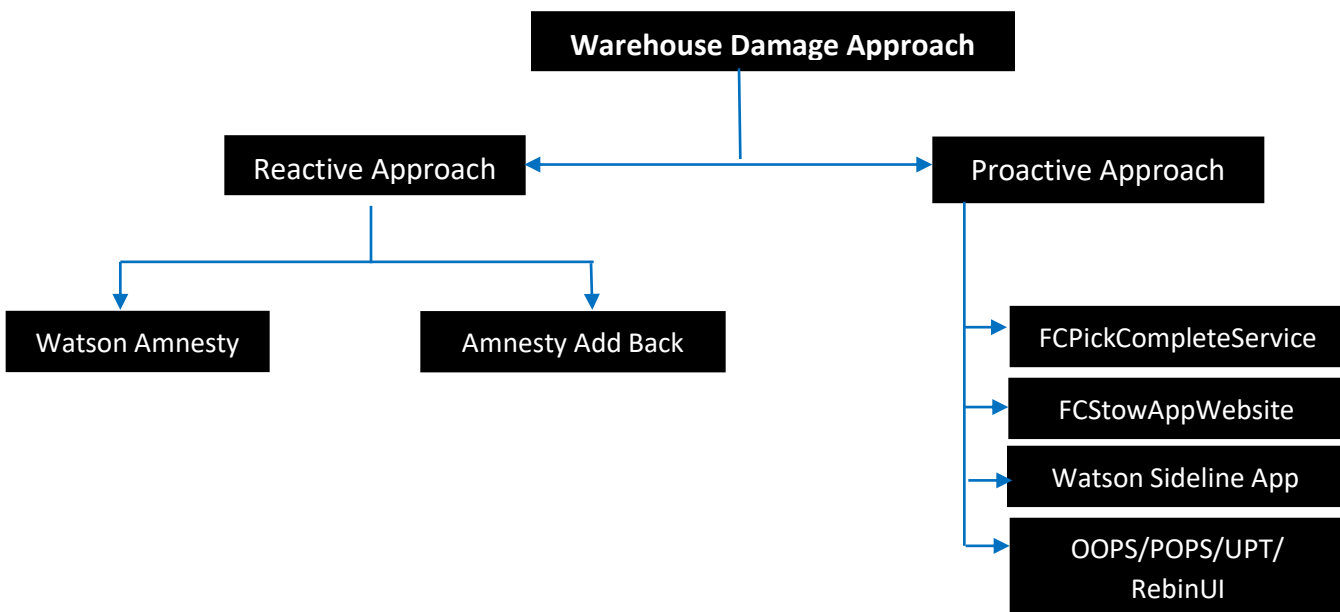
1.3 WD Reduction Approach:

1.3.1 Pro-Active Approach

- Application under this approach are those which pass on through a set of standard process of investigation & research before they are declared as actual Warehouse Damages.

1.3.2 Reactive Approach

- Application under this approach are those which do not pass through a standard process and we act upon it on N-1-day approach.



1.3.2 PROACTIVE APPROACH:

OOPS/POPS/UPT/RebinUI:

Any Item which is marked damage through OOPS tool will straightaway fall under the bucket of Warehouse Damage. As a reactive measure all the Damage tote/carts processed through OOPS should pass through ICQA Damage gatekeeping.

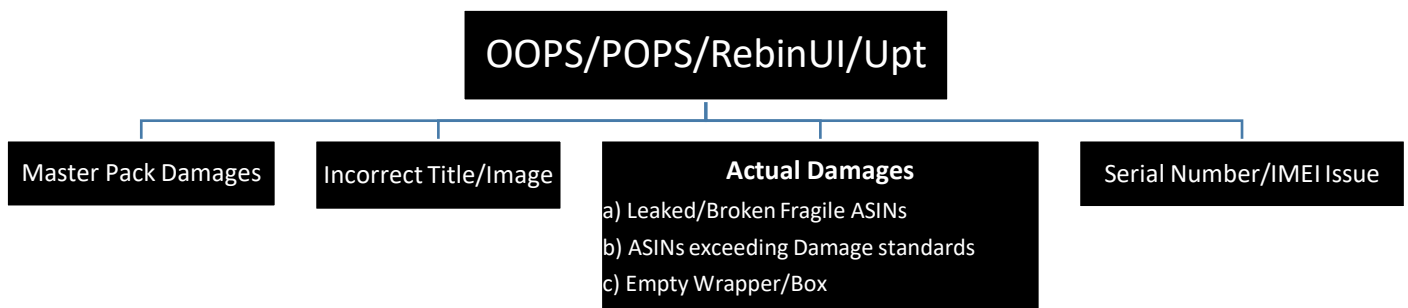


Fig 1.3.2.1

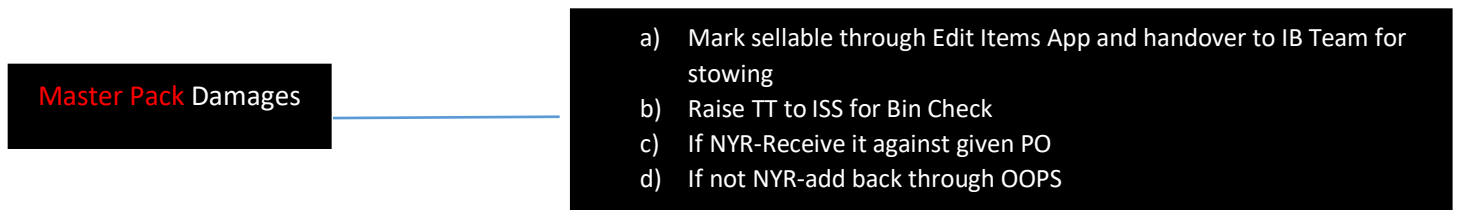
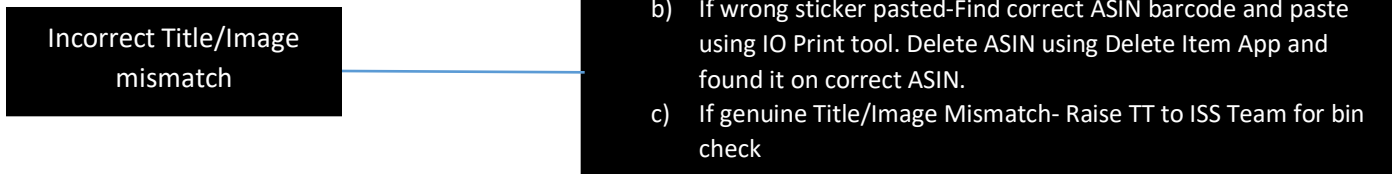


Fig 1.3.2.2

In case of Master Pack

Step 1: Scan item into FC Research and verify if the item in hand is a Master pack or an individual unit.

- If the unit is Master Pack, Using Edit Items App tool, "Mark as Sellable", process the item virtually and physically into another tote and handover to IB Team for stowing. Raise a Trouble Ticket to ISS Team for Bin Check and correcting Inventory. If it is a NYR, then receive it against the given PO and if not then add back through OOPS.



- a) If Title/Image correct- Mark sellable through Edit Items App and handover to IB Team for stowing
- b) If wrong sticker pasted-Find correct ASIN barcode and paste using IO Print tool. Delete ASIN using Delete Item App and found it on correct ASIN.
- c) If genuine Title/Image Mismatch- Raise TT to ISS Team for bin check

Fig 1.3.2.3

Incorrect Title & Image Mismatch

Step 1: Scan item into FC Research and verify if the system title matches the item. Be sure to look for discrepancies in size, color etc.

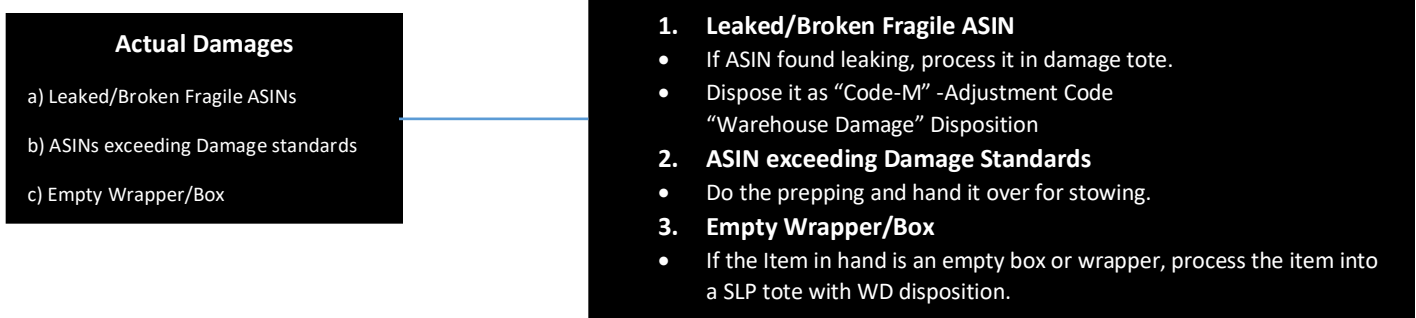
- If the title/Image is correct, Using Edit Items App tool, "Mark as Sellable", process the item virtually and physically into another tote and handover to IB Team for stowing. Else continue with Step 2.

Step 2: Check if the item is simply stickered incorrectly.

- If you are able to locate the correct ASIN:
 - Re-sticker the product using IO Print tool. Delete the ASIN using Delete Item App and found it on correct ASIN.
 - Raise a Trouble Ticket to ISS Team for Bin Check and correcting Inventory.

Step 3: Check if the item is having genuine title mismatch issue on scanning it into FC Research.

1. Raise a Trouble Ticket to ISS Team for Bin Check and correcting Inventory.



Actual Damages

- a) Leaked/Broken Fragile ASINs
- b) ASINs exceeding Damage standards
- c) Empty Wrapper/Box

- 1. Leaked/Broken Fragile ASIN**
 - If ASIN found leaking, process it in damage tote.
 - Dispose it as "Code-M" -Adjustment Code "Warehouse Damage" Disposition
- 2. ASIN exceeding Damage Standards**
 - Do the prepping and hand it over for stowing.
- 3. Empty Wrapper/Box**
 - If the Item in hand is an empty box or wrapper, process the item into a SLP tote with WD disposition.

Fig 1.3.2.4

Actual Damages: a) Leaking/Broken Fragile ASINs

- b) ASINs exceeding Damage standards
- c) Empty Wrapper/Box

a) Leaking/Broken Fragile ASINs

If the Item in hand is broken or leaking, process the item virtually and physically into a Dispose damage tote and dispose it of using "Code-M" as adjustment code and "Warehouse Damage" as disposition.

b) ASINs exceeding Damage standards

If the Item in hand is exceeding Damage standards, do the required prepping/taping and hand it over the tote to IB Team for stowing with "Warehouse Damage" as disposition.

c) Empty Wrapper/Box

If the Item in hand is an empty box or wrapper, process the item virtually and physically into a SLP tote and inform the SLP Team about the same and let the disposition be same as "Warehouse Damage".

Available Data and corresponding Analysis

2.1 What type of data is available in Amazon to analyze the problem of WHD generation and reimbursements?

1. The first type of data reports that are generated and are there for data analysis to observe trends and take action based on these data points.
2. The second type of data that is available on amazon portal is seller reimbursement.
3. The third type of data includes the SOP, SJIs, and amazon wiki that includes all the information related to the standard processes that are followed in Amazon.

The field that are included in the seller reimbursement data, and WHD generation data, and are most useful to analyze trends are:

1. Date of creation of data
2. Warehouse id
3. Damage disposition code
4. Application code
5. Reason code
6. ASIN
7. GL
8. Cost
9. Quantity

2.2 Data Analysis/Research:

On the basis of data gathered from ICQA by data net portal of WHD (warehouse damage) & seller reimbursement for the dates January 2020 to March 2020 following analysis were made top GLs which are contributing to WHD quantity wise and cost wise, top ASINs which are contributing to WHD quantity wise and cost wise, top applications from which the damage is being reported, and top MODs from which this damage is being generated.

Held meetings with Research Analysts of other FCs across INFC, on the basis of this information gathered the below root causes that were identified were validated and a document of best practices related to the deliverables was formed to ensure horizontal deployment across INFC. This document is under progress.

Held meeting with the In Stock Manager of shoe GL for locking a pre prep recommendation of this GL to control damage that was generated and observed in the analysis present in the appendix and a problem statement document was prepared for this prep proposal.

2.3 Insights gained from the Research/Analysis/Deep Dive:

On the basis of this data analysis, performed an ASIN level deep dive in the inventory to see the root causes due to which FC is marking a product damaged. The key insights gained from this ASIN level deep dive were:

- Leakage issues
- Serial number issue
- Fall damages
- Sellable
- Broken combo sets due to improper prep instructions

Images	Remark
	<p>Combo pack issue</p>
	<p>Thin packing issue</p>
	

	Taping on cap issue
	Bubble wrap issue

Table 2.1

On the basis of analysis done on seller reimbursements the top GLs involved cost wise and quantity wise for the dates three months were:

***All the data here are randomly generated numbers assumed to show the approach that was taken during the project, real data cannot be displayed due to confidentiality of the Amazon data.**

GL	cost contribution in 100
beauty	20
drugstore	18
pc	9
electronics	8
kitchen	8
baby product	5
apparel	3
shoes	2
grocery	2
pet products	1

Table 2.2

GL	Qty contribution in 100
beauty	25
drugstore	19
apparel	10
kitchen	8
baby product	7
shoes	6
grocery	5
home	4
pet products	3
automotive	2

Table 2.3

***All the data here are randomly generated numbers assumed to show the approach that was taken during the project, real data cannot be displayed due to confidentiality of the Amazon data.**

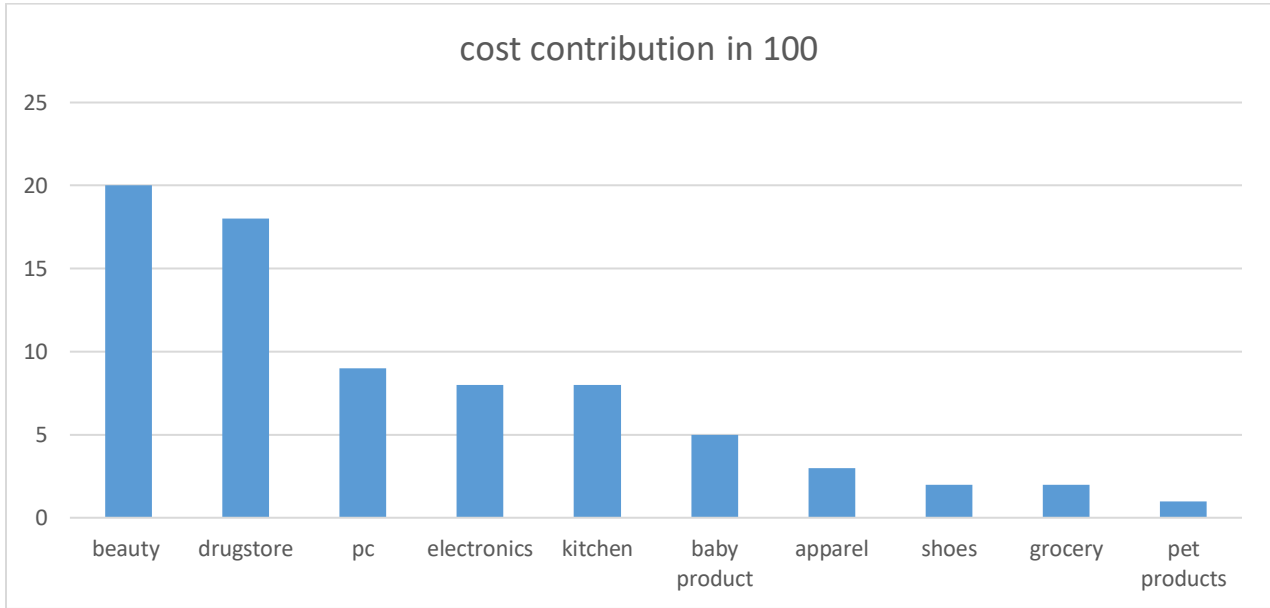


Fig 2.3.1

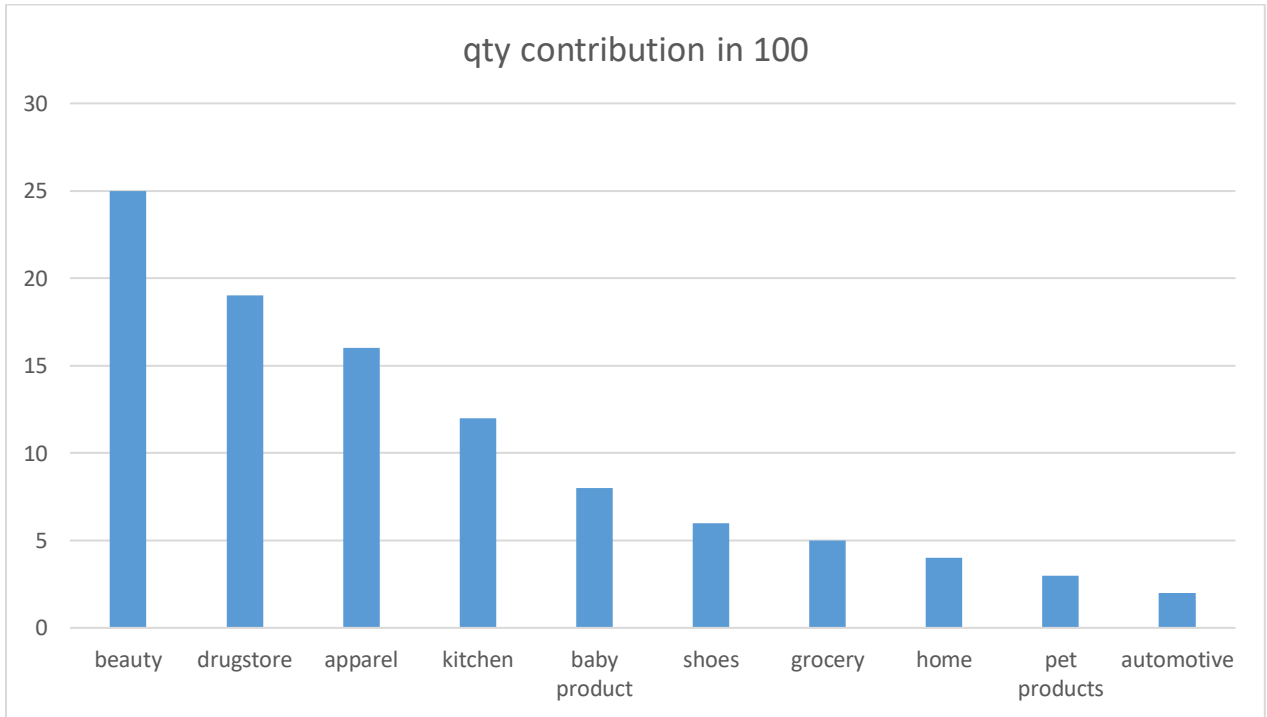


Fig 2.3.2

***All the data here are randomly generated numbers assumed to show the approach that was taken during the project, real data cannot be displayed due to confidentiality of the Amazon data.**

Mapping of each tool that was used to mark damage with the total cost contribution in the WHD.

Application	contribution
Pack	25
Amnesty	21
Pick	17
Stow	13
Edit	12
Customer Return	10
Rebin	2

Table 2.4

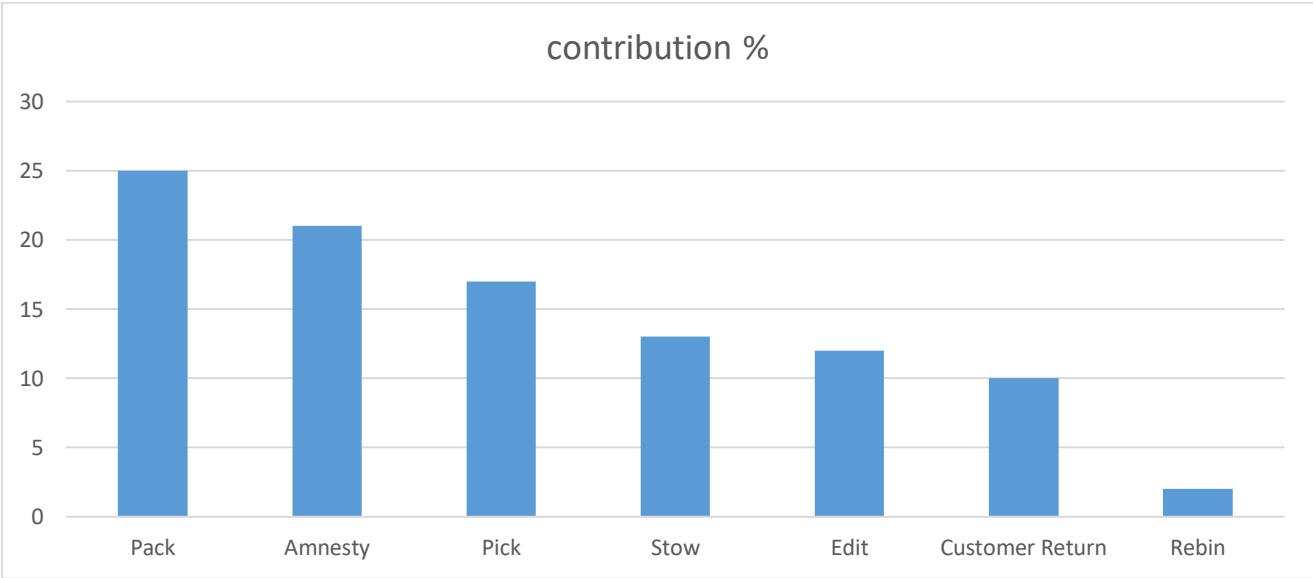


Fig 2.3.3

Analysis shows that the top three tools are pack, amnesty and pick, and contributes approximately 62% to the WHD.

***All the data here are randomly generated numbers assumed to show the approach that was taken during the project, real data cannot be displayed due to confidentiality of the Amazon data.**

Below is the breakup w.r.t process state of the ASIN:

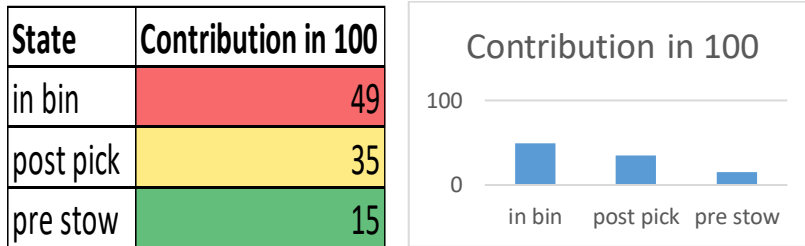


Table 2.5

7.48% of the WHD has been reimbursed to the seller in Jan 2020 – 10th March 2020.

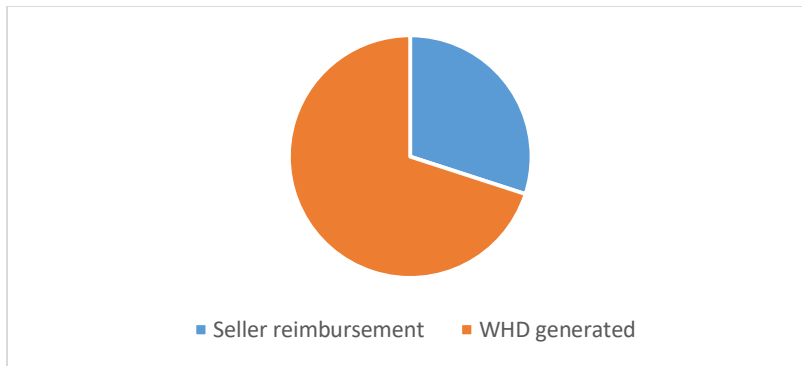


Fig. 2.3.4

Month vs cost analysis

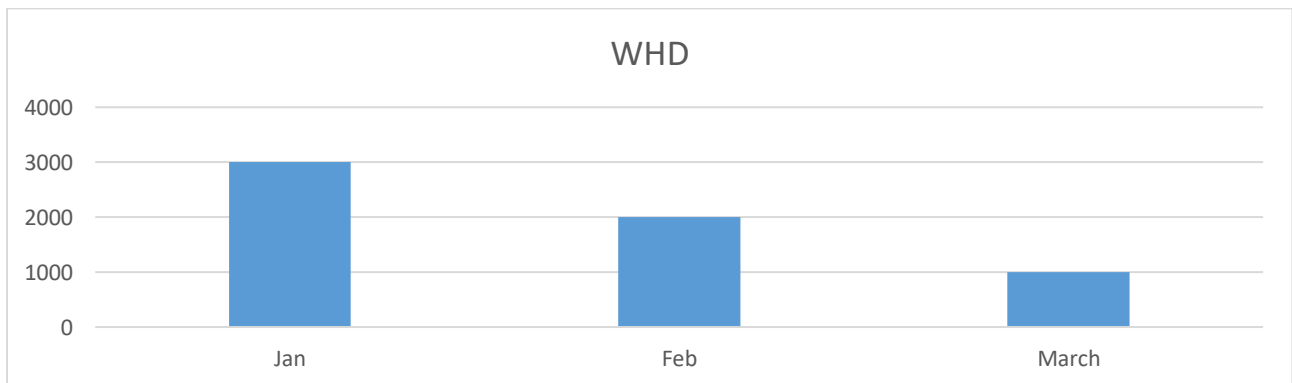


Figure 2.3.5

Actions point analysis

3.1 Potential Action points formed after above analysis:

- Every cardboard box should have taping so that the boxes doesn't get open. We can use paper adhesive tape to go plastic free and this will also leave no stains upon removal.
- Every liquid item needs some type of bagging or seal on the top to avoid spillage which can damage other items. We can use clear bio degradable poly bags.
- Loose cap issues needs to be resolved via paper taping SJI.
- In nail polish bubble wrap needs to be added because they easily get damaged otherwise.
- Combo items should be packed in a clear bio degradable poly bags using Heat Sealing Machine Tool.
- Items that get damaged due to cuts on packaging like lentil packs should be bubble wrapped at the time of receiving.
- Items greater in length than the other boxes present in the bin should be placed separately, and not on top of them, because then they get unstable and fall outside.
- When a new item comes in FC system prompts for a cubiscan for one but receives rest of the quantity, now if we stow those items before the cubiscan of that one item the stower won't know the mode and the chances of wrong sized ASIN in wrong sized bin increases.
- Fragile, delicate and heavy items should be stowed in the lower bins to avoid fall damage to product and injuries to associates.
- There are three types of packing shapes that comes in FC i.e. cylindrical, six-sided, and non-six-sided type. So if we stow these items in a cluster form then we can utilize more space and amnesty will decrease because less items will drop out of the bin.
- We can introduce lid or door on bins with hinges so that it can use gravity to close, this will reduce items from the amnesty by improving the BOOSTA and will also help in reducing bin drift.
- We can add some SJI so that when someone is adding back amnesty item, he/she should be restricted to do so in the damaged land if it's marked in sellable condition.
- We should coach the associates so that they don't paste LPN over serial number of an item.
- Standardize the procedures for INFC through a best practices document to ensure that FCs are ensuring a minimal WHD generation.
- Changes in receive SJI new prep of net bagging for broken combo pack issue

- Changes in stow SJI for addition of new guidelines for stowing to improve inventory health.
- Change in serial number research SOP for unscannable serial number.
- Changes in configuration of damage land, to paste red stickers on damage land bins for a better visual indication than a tape i.e. there at the end of aisle, and fix a certain number of aisles for damage land by taking less than an average number of aisles usually needed.
- Refurbishing of HRV ASINs in warehouse damage disposition.
- Dedicated aisles for stowing liquid ASINs because liquid ASINs that have the potential to damage multiple other units when they leak in bin.
- Tilted bins in L MOD and upper shelves of G MOD.

3.2 Ideas that were not feasible and for what reasons:

- Any idea where plastic prep is included should either be modified or should be dropped since Amazon is now plastic free.
- When we discuss about cluster stowing the allocation of number of aisles that should be dedicated to these shapes is difficult to achieve since the numbers needs to be updated according to demand.
- When we discuss about door bins the implementation cost is very hard to overcome even in 5 years in one FC, and when we are talking about India level it would be very difficult to achieve cost saving.

3.3 Action points in progress:

- Standard document of best practices to be followed across INFC
- Updated stow SJI
- Locking of pre prep recommendation for shoe category

3.4 Probable Impact

- The implementation of shoe prep prep lock will result in saving of lakhs from INFC
- The roll out of standard document for WHD prevention will result in standardization of proactive approach across INFC
- The roll out of updated SJI for stow will result in less fall damages and will lead to reduction in WHD generation and will also save man hour cost for amnesty AA

Plagiarism Report