

# INNOVATION SITUATION QUESTIONNAIRE : POST OFFICE

TEAM CHAIRNOBYL

## PRESENTED BY:

- JOE THOMAS
- ISHITA AGARWAL
- SUDHANSU
- PRIYA
- ANUSRI P
- MUDIT CHAND NARAYAN



# BRIEF DESCRIPTION

STUDY

## What is the problem?

- A. Management of in-house dispatch activities (sorting mail by destination and its authentication) in a post office, is cumbersome, archaic, and prone to human error which affects reliability of the postal service.



# EXISTING SYSTEM

STUDY

**Q. Name of the system?**

**A. Mail Dispatch Management System**

**Q. Primary function?**

**A. To scan, sort and seal mails, to identify and authenticate its delivery location**



# EXISTING SYSTEM & ENVIRONMENT

STUDY

**Q. Behaviour?**

**A.** Mental sorting and manual sealing using physical tools, relying on human effort and decision-making

**Q. Structure?**

**A.** Bottom heavy cylindrical instrument for stamp, scanning device, ink well

# EXISTING SYSTEM & ENVIRONMENT

STUDY

**Q.** Interaction with supersystem?

**A.** Sealing - Leave a visible mark on the paper, with a proper indentation

**Q.** Interaction with any other system, in proximity?

**A.** Precise indentation and mark on the envelope

No splotches, the stamp interacts with the paper and ink-well, against the soft support of the table

# EXISTING SYSTEM & ENVIRONMENT

STUDY

**Q.** Natural system surrounding it?

**A.** Clean, dry, well-lit environment, there should be no audible noise between the sealing device and the identification on the envelope

Human that sorts it and the bag it is being sorted into forms the system for sorting

# RESOURCES AVAILABLE TO USE

STUDY

## What are the Materials available

- Paper
- Ink
- Inkwell
- Stamp
- Human resource
- Slate
- Stone
- Information scanner
- Table
- Collection bag
- Computer system

## What are the actions available

- Chemical Energy between Ink and Paper
- Energy use by man to work
- Mechanical displacement
- Electric energy used by the scanners
- Electromagnetic radiations
- Impact force
  - Important consideration for successful imprint
- Friction

## What functions does the workplace allow naturally

- The Ink has a tendency to dry on its own
  - The property can be leveraged to assess when it is okay to stack papers over one another
- The parcels/letters are already labelled.
- Time in hand to complete the tasks: 10PM-3PM
- A space of two work tables
  - Usually the reason of mixup or letter losses

# UNDERSTANDING THE DRAWBACKS

STUDY

## Instantly recognizable drawbacks in current situation

- The scanning equipment, when held for long time causes strain in the wrist.
  - De Quervain's Tenosynovitis and Carpal Tunnel Syndrome are two of the most common effects.
- An instrument to automate the process would decrease the manual effort and increase the efficiency of the post office.
- The bottom heavy stamp requires manual work against gravity, causing strain over the arm
  - Was one thing pointed out directly by the workers

## Reasons for the drawbacks

- The barcode scanners have non-ergonomic handles
- The stamp requires strong impact of the heavy stamp to leave proper indentations to be read by devices.

# INFORMATION ABOUT THE PROBLEM SITUATION

## H I S T O R Y

**Q. History of the development of the problem?**

**A.**

- The metal stamp has been in use since the colonial period.
- It symbolises the prompt delivery routine (same day received and delivered)
- **However, the stamp itself is archaic and requires continuous manual assistance and effort.**
- The sorting of letters has always been seen as a manual job.
- Job positions of sorting assistants and trading is common.
- **However, increased manual activity requiring precise detection leads to chances of human error and discrepancies.**

# INFORMATION ABOUT THE PROBLEM SITUATION

## OTHER PROBLEMS

**Q. Modified direction of development?**

**A.**

- The metal stamp is too heavy and requires a lot of force to leave indentation on paper.
- It also requires manual changing of the dates (everyday activity)
- The activity of stamping could lead to RSI (repetitive stress injury)
- The ink pad required can dry out and get messy.
- The closely knit space makes it difficult for demand of personal space while sorting the letters.
- The scanning device itself is slow and a hand held device requiring extra effort and maneuvering.

# CHANGING THE SYSTEM

STUDY

**Q.** Allowable changes?

**A.**

- Ink not necessary for authentication.
- Behaviour of the authentication tool can be changed
- Processes can be quicker and automated
- Can occupy a fixed/moving location.

# CHANGING THE SYSTEM

STUDY

**Q.** Limitations, what can't be changed?

**A.**

- Mail has to be sorted by destination.
- Mail must be authenticated for delivery to take place.
- Mail has to be delivered on the date of authentication at the last node (Sub-Post Office)
- Date and location must be authenticated.
- Solution cannot occupy too much space.

# CRITERIA FOR SOLUTION SELECTION

STUDY

**Q.** Desired technological characteristics?

**A.**

- **Reduce/Eliminate** operational fatigue of user.
- Increase operational efficiency of process.

**Q.** Expected degree of novelty?

**A.** Solution does not have to be novel, and should be familiar enough to be learned and operated with ease.

# CRITERIA FOR SOLUTION SELECTION

STUDY

**Q.** Desired economic characteristics?

**A.**

- Leverage due to the sheer number of packages, leads to many operational hours saved, hence money saved.
- Material usage can be economical (ink)
- Cost-benefit should make sense for post offices with volume.

# CRITERIA FOR SOLUTION SELECTION

STUDY

**Q.** Desired timetable?

**A.**

- Reduce time taken to sort and seal mail in the morning rush hour by a certain percentage

# COMPETITOR ANALYSIS FOR STAMPING

## H A N D   S T A M P I N G

### **Functionality:**

- The manual process involves using stamps and ink pads.
- It is labor-intensive and requires significant effort.
- Precision is required to ensure accurate stamping.

### **Challenges:**

- Operational fatigue affects worker efficiency.
- Inconsistency in stamping can lead to errors.
- The process is time-consuming and slows down operations.
- There is a high risk of human error in manual stamping.

### **Key Competitor:**

- Manual systems are commonly used in many offices.
- They face high-volume limitations in processing mail.
- There is a need for modern solutions to improve efficiency.



# COMPETITOR ANALYSIS FOR STAMPING

## FRANKING MACHINE

### Functionality:

- Automated postage application speeds up mail processing.
- It is ideal for high-volume mail handling.
- Integrated postage calculation determines the correct postage automatically.
- The process is efficient and saves time.

### Challenges:

- High maintenance costs are a burden for post offices.
- Complexity can lead to downtime and delays.
- Consumable costs can impact the budget.
- Smaller post offices find these systems inaccessible due to high costs.

### Key Competitor:

- Key competitors dominate the franking machine market.
- They offer advanced technology in their systems.
- Cost is a major consideration for businesses choosing franking machines.



Franking a Letter 'Pass Through' Mode

# OPPORTUNITIES FOR IMPROVEMENT

- **Hybrid Solutions:** A semi-automated system could reduce manual labor while keeping costs lower than fully automated systems.
- **Ergonomic Design:** Redesigning manual stamps to reduce wrist strain and improve the efficiency of hand stamping.
- **Cost-Effective Automation:** Developing lower-cost franking machines with simpler maintenance needs could provide an affordable solution for smaller post offices.

# COMPETITOR ANALYSIS FOR SORTING MACHINE

## Siemens Automated Mail Processing System

- Siemens offers cutting-edge sorting machines that use **OCR** (Optical Character Recognition) and **barcode reading** for high-speed automation of letters and parcels.
- machines are capable of **processing large volumes of mail** and parcels (up to **40,000 items per hour**), making them suitable for large postal hubs like those in metro cities.
- Siemens has a **strong global reputation** in postal automation, with **reliable, field-tested solutions** used by national postal systems, including India Post



## Patents:

- Siemens holds **numerous patents** related to automated mail sorting.

## Key patents include:

- **Mail Sorting System with OCR Integration** (Patent No. US6311912B1): Describes the use of OCR and video coding in letter sorting machines.
- **High-Speed Parcel Sorting Conveyor** (Patent No. EP2047822A2): Details a modular parcel sorting system designed for high-speed and high-efficiency sorting.

# WEAKNESSES/SHORTCOMINGS OF COMPETITOR:

- Siemens' machines are technologically advanced but come with a high price tag, making them less accessible to smaller or regional postal hubs in India.
- Advanced systems like these provided by Siemens require specialized technicians and significant maintenance, which can be challenging for postal systems with limited technical support.
- Siemens typically designs its systems for large-scale sorting centers, which may not cater effectively to the needs of small or mid-sized post offices with lower traffic.

## Opportunities for Designing a Novel Product

- Develop a system that requires minimal setup and is easy to maintain.
- Ensure the design is modular and scalable to cater to different postal needs.
- Developing machines that do not require highly specialized skills and can be used with limited technical expertise.



**THANK YOU**