Enhanced Medication Safety and Improved Workflow Efficiency at NCCS Medication Service @ Clinics

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Problem Statement

Verification of drugs was hindered at NCCS Medication Service @ Clinics (MSCs) due to limited IT infrastructure, staff shortage, and incompatible or absence of barcodes. As such, an alternative workflow was used for verification, which is depicted below.

Pharmacist takes a picture of the drug and script → Pharmacist sends picture into TigerText → Any available pharmacist verifies that the drug is correct

Reduced efficiency

The absence of real-time verification compromised patient safety, and the additional steps needed for verification reduced workflow efficiency.

Project Aim

The project aimed to **enhance medication safety and workflow efficiency** at MSCs within 4 weeks by reducing the time taken and steps required for drug verification (at least 50%) and achieving 100% accuracy in drug verification.

Additional measures (i.e., user-friendliness, trust, integration, overall satisfaction) were used to assess the project's success.

Lessons Learnt

#1 *Absence of unique barcode*
We learnt that by **concatenating** two codes, we could create a new barcode input for each drug, enabling accurate drug verification.

#2 *Manual & Repetitive formatting*
We learnt that we could **automate** the formatting task using the **Mail Merge** function in Microsoft Word, which enabled us to format all our labels at once. We recommend professionals to use Mail Merge for repetitive formatting tasks to save time and labor.

«ItemName» → Standard format of labels

Final label ← PIPERACILLIN AND TAZOBACTAM INJ

Potential Solutions

1. Plan
- Identify workflow and process inefficiencies that compromise safety
- Gather pain points of staff

2. Do
- Generate and label barcodes
- Integrate barcode scanning process into workflow

3. Study
- Gather staff feedback
- Track (1) time savings and (2) efficiency improvements post implementation
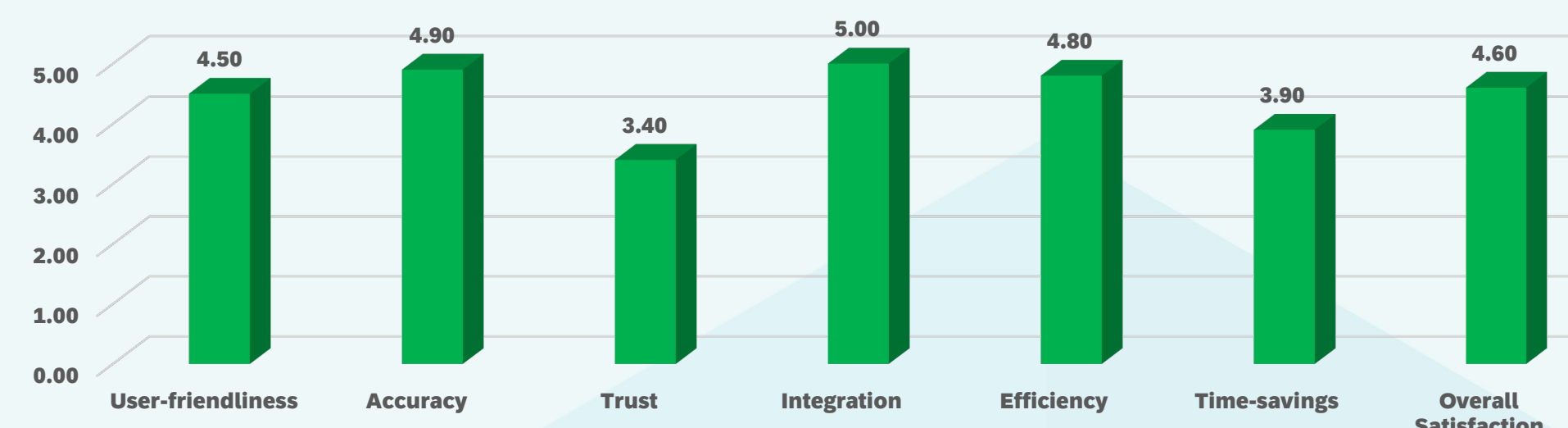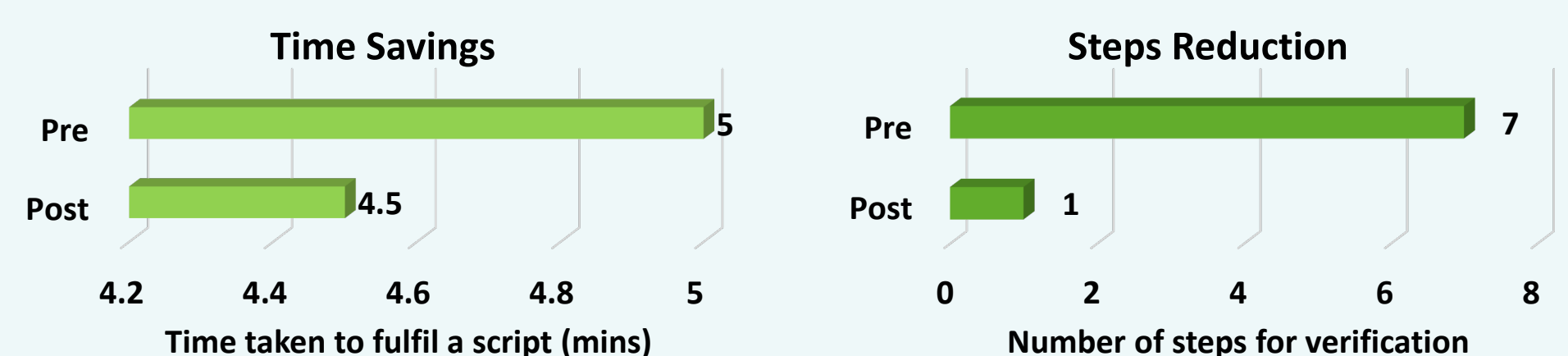
4. Act
- Implement new verification process at MSCs for relevant drugs

Using Microsoft's '3 of 9 barcode' font, we created unique barcode inputs for unlabeled drugs by combining the (1) drug code and (2) brand code of each drug. Below is an image of the barcode input and the corresponding barcode.

(1) Drug code (2) Brand code → Barcode

VB12I01A29

Outcomes & Impacts

Time savings (30 seconds per script) and **steps reduction** (six steps per drug) were observed post-implementation.

Time Savings — Time taken to fulfil a script (mins): Pre 5, Post 4.5

Steps Reduction — Number of steps for verification: Pre 7, Post 1

User-friendliness 4.50, Accuracy 4.90, Trust 3.40, Integration 5.00, Efficiency 4.80, Time-savings 3.90, Overall Satisfaction 4.60

Feedback from pharmacists (N = 10/10) revealed a **high level of satisfaction** for the new verification process.

What's Next? Continuous engagement with stakeholders to improve work process and patient safety when infrastructure (i.e., systems, vendors) are unable to support. Despite widespread use of automation, pharmacists remain vigilant against its potential pitfalls (low in trust).