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TRACING SUCCESS

Improving Book Supply Chain through Track and Trace Technology in Cambodia

AGENDA

01 STUDY BACKGROUND

- Overview of Cambodia Textbook Supply Chain
- Emergence of TnT
- Research Questions

02 Methodology

- Research Design
- Data collection and analysis

03 FINDINGS

4 CONCLUSION & RECOMMENDATIONS



1

BACKGROUND OF THE STUDY

ISSUES IN THE CAMBODIA PRIMARY LEVEL TEXTBOOK SUPPLY CHAIN



1

Forecasting & Planning

- Long time taken
- Calculations and entries were done manually
- No account of other reading material

2

Title Development

- Not up-to-date
- No production of other reading materials from the government
- Largely NGOs-based ERMs

3

Publishing & Printing

- Only one main publisher
- Based on former year estimation
- Lack of professional writers, publishers, and printers

4

Procurement & Purchasing

- Long time taken
- Many public bidding processes
- No public funding for other ERMs

5

Distribution Management

- Based on request data two years earlier
- Incorrect amount and title
- Limited capacity of the textbook delivery company
- Poor infrastructure to school

6

Active Use

- Limited understanding of the book market
- Lack of reading culture and understanding of the importance of reading books.

Track and Trace (TnT)

The Core Textbook Supply Management System

DASHBOARD FOR TNT ADMIN



Track and Trace

Production insights

26 %

Month Stats

+1%

\$784.00



Disbursement Creation

Location

Contact

School Years

Total School

9,132

NTTI

23

PoE and DoE

229

National Level

DCD ▲

Confirming

50%

Requesting

70%

Registered schools

90%

Delivery

70%

TELEGRAM CHATBOT FOR USER



October 23

/start 11:18 AM ✓

Thank you for your message. How can I help you today? I have a few commands as follows: 11:18 AM

Message

Inspect Classroom

Confirm Textbook Receipt

Learn How to Use

Report Problems

Check Approved No. of Textbook

Make Textbook Requests

Delete TnT Account

Register for School Director

Register for Class Inspector

RESEARCH QUESTIONS

1

How and under what conditions was TnT **developed and implemented**?

2

What are the **perceived impacts** of TnT?

3

What **challenges** were observed during the process?

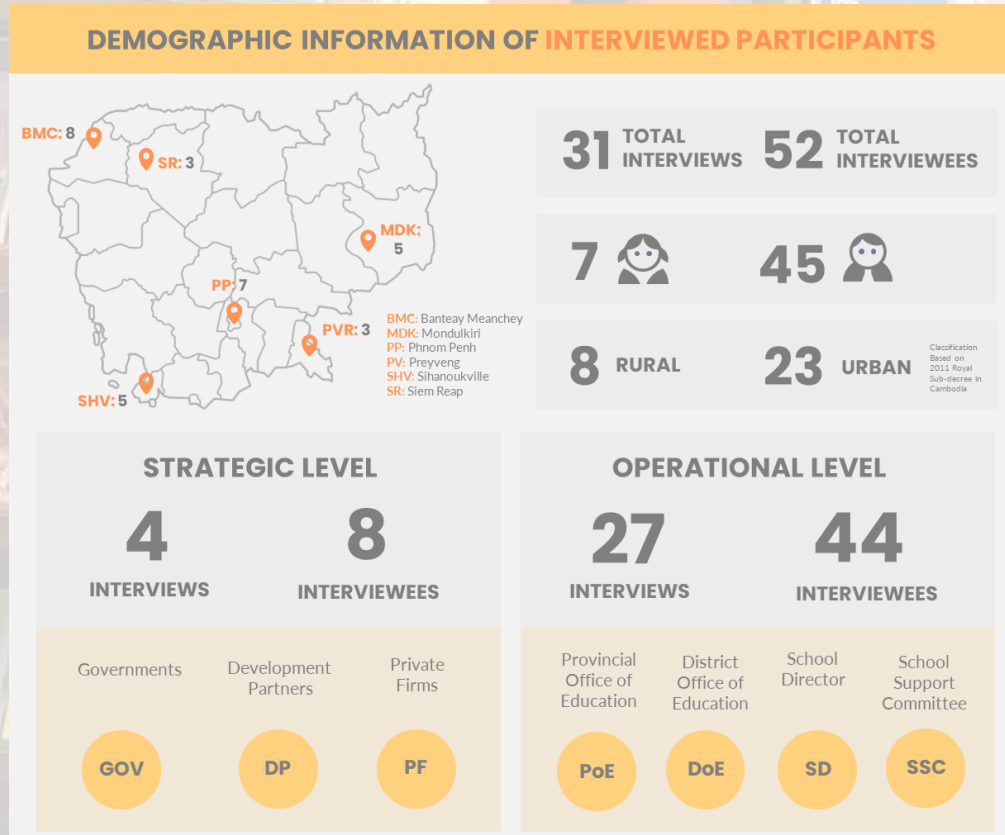


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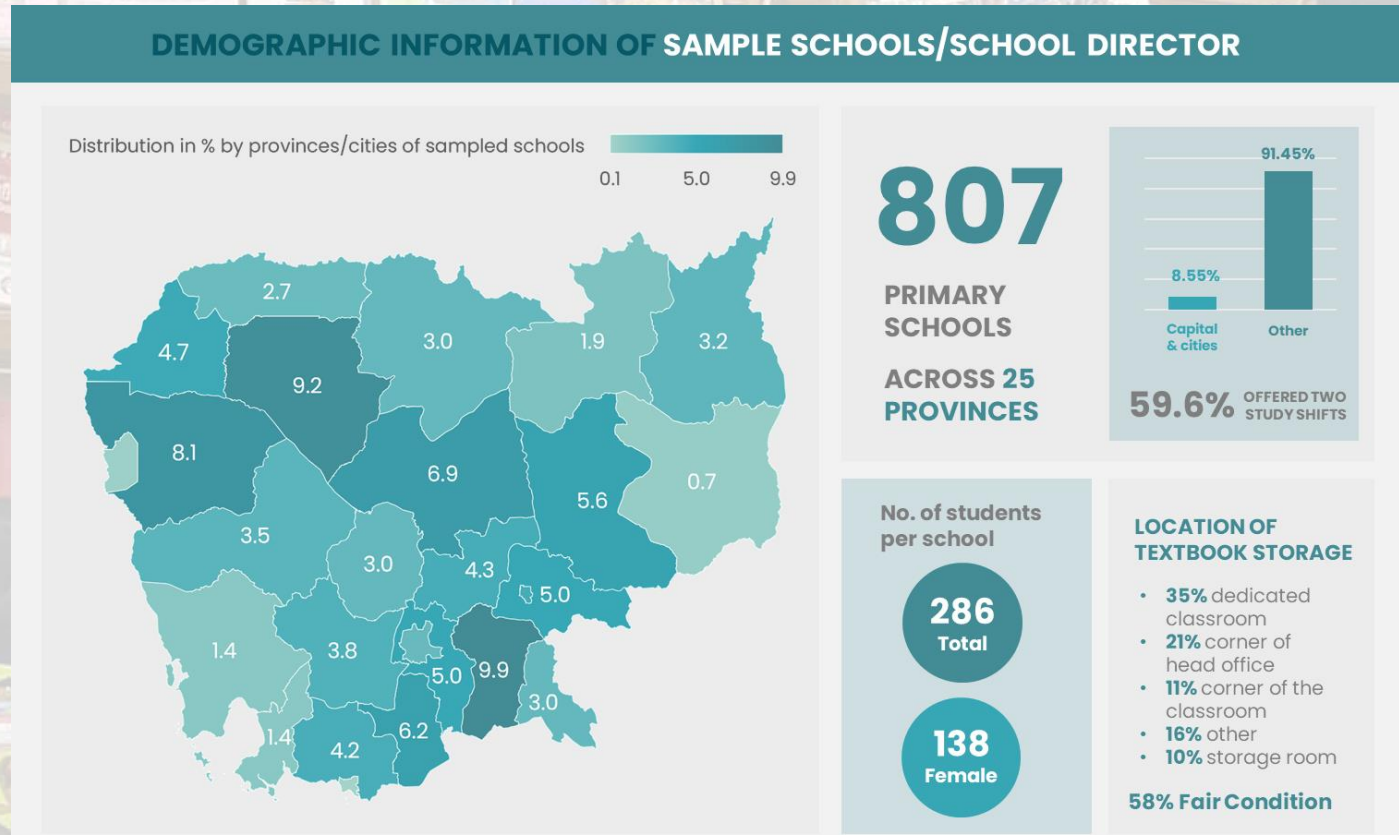
RESEARCH METHODOLOGY

CASE STUDY

Semi-structured Interviews



Online Survey



ANALYTICAL FRAMEWORK

Critical Success Factors Of Effective Supply Chain Performance

Top management support

**A long-term vision or plan
for growth**

Strategic planning

**Strategic
Factors**

Effective
Supply Chain
Performance

**Tactical
Factors**

Skilled staff

**Continued staff training
and capacity building**

**Trusted and collaborative
partnership**

**Effective forecasting of
demand**

**Effective inventory or
procurement management**

Information Technologies

**Communication &
information sharing**

**Resilient infrastructure &
transport facilities**

(Ab Talib et al., 2015;
Drótos & Móricz, 2006;
Fawcett et al., 2009; Kumar
et al., 2015; Syazwan et al.,
2014; Yadav & Barve, 2015)

3 FINDINGS



FACTORS DRIVING THE PERFORMANCE OF TnT



Strategic Factor

Long-Term Vision and Clear Strategic Planning

“TnT is not just something created out of the blue. It emerged from having a **clear mission and vision** since [the minister’s] leadership started in 2014.”

– Ministry Official

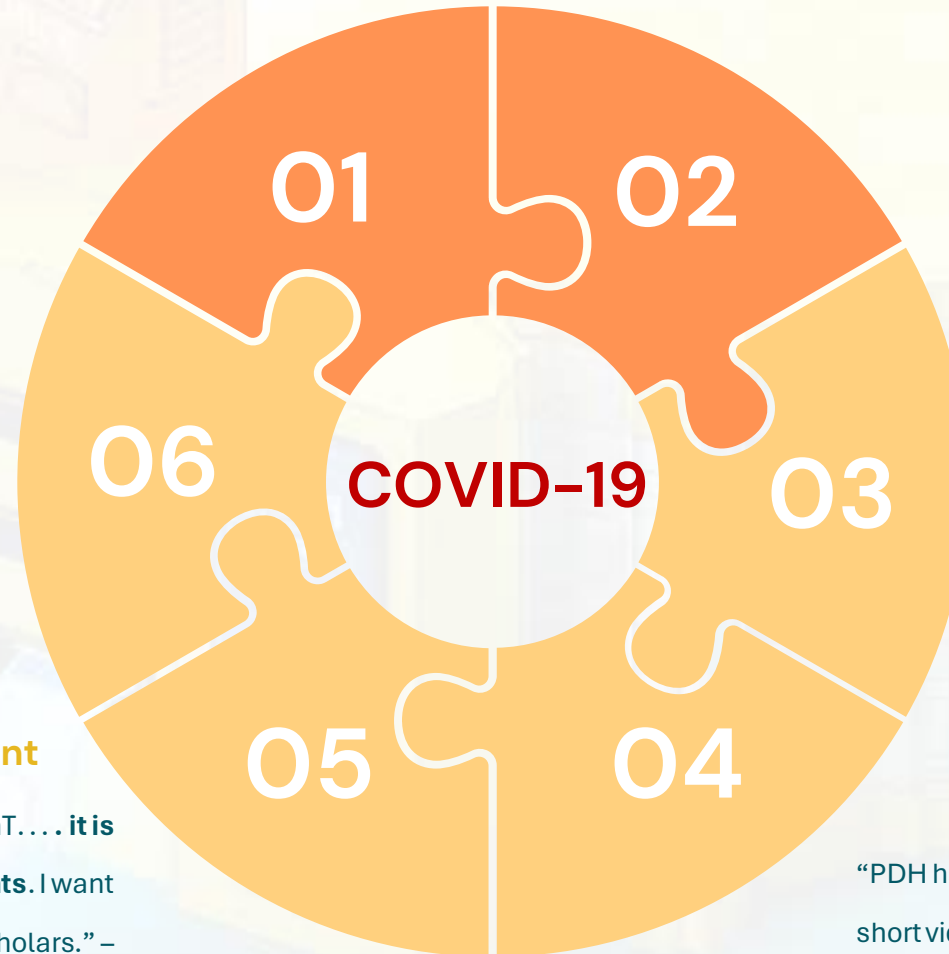
Collaborative Partnership

“I think the enabling factors are **teacher commitment and the involvement from the community, especially the teachers, who know IT, help to assist in it**. I have limited digital competency, but the teachers at school help me in regards to TnT and others.” – School Director

TnT Users’ Commitment

“No, I do not receive any incentive or recognition for using TnT. . . . **it is more of my commitment to the school and the students**. I want improvement for them all and for my nation to have scholars.” –

School Supporting Committee



Tactical Factor



Leadership Commitment and Support

“Besides technology and school directors’ participation factor, **commitment and attention from the management** level are also important factors. They have shown their encouragement and placed a high value on TnT.” – Ministry Official

Information Technologies

“Because we use **electronic devices**, information goes to the ministry faster, and the textbooks also arrive fast.” – School Director

Training and Capacity Building

“PDH has provided **training to PoE, DoE, and school directors** via short videos, face-to-face, and online workshops for about two to three years consecutively.” – Ministry Official

PERCEIVED IMPACTS OF TnT



1

Saving Time



2

**Saving Human
and Financial
Resources**



3

**Improving Textbook
Accessibility to
Students**



4

**Increasing
Transparency &
Accountability**

PERCEIVED IMPACTS OF TnT - #1



1

Saving Time

TnT automates textbook forecasting and requesting; no more manual calculations and hard copy submissions from school directors.

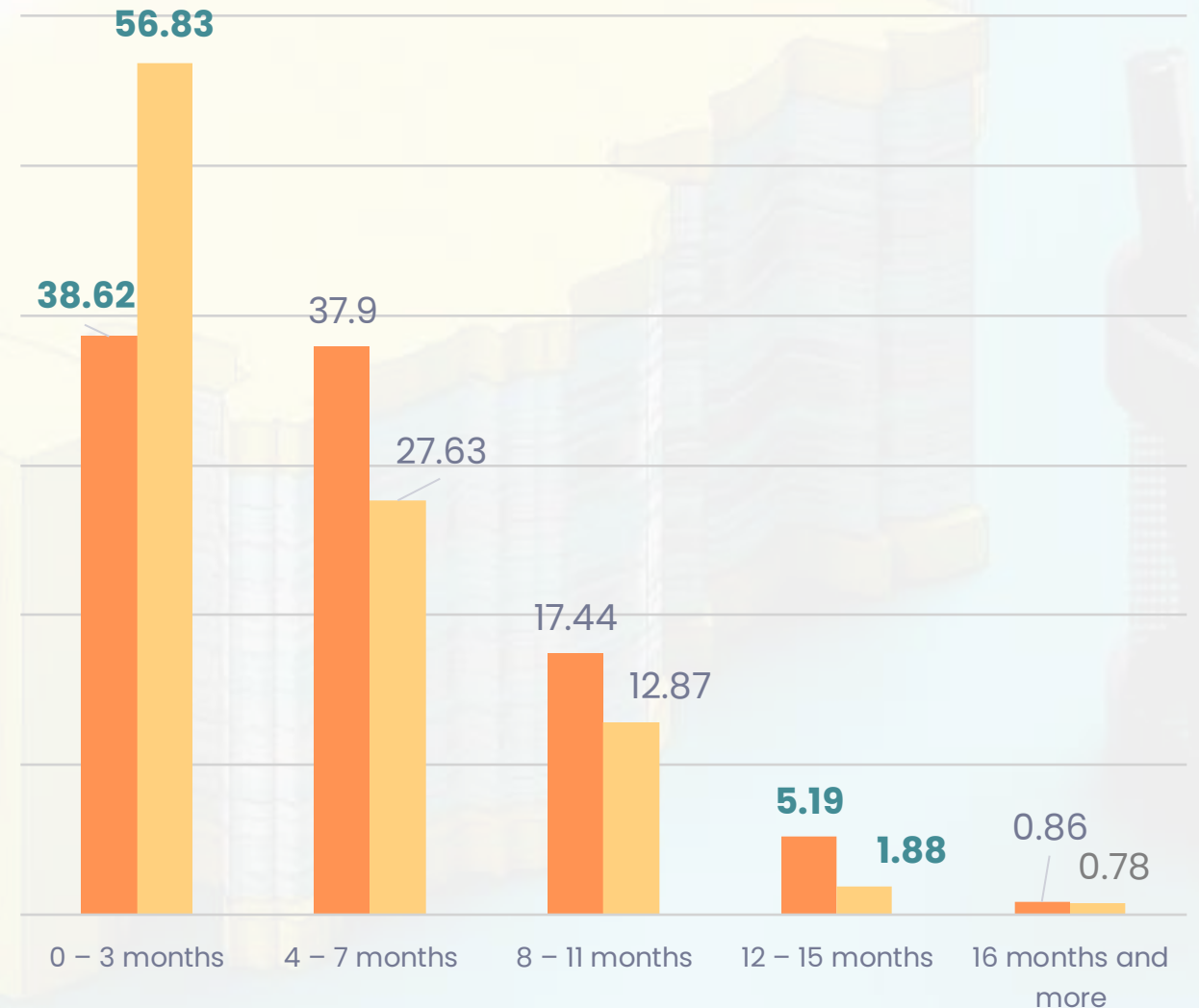
“In the past, we might not have yet finished entering data from about 10,000 schools by this time (2 months). Through TnT,

all data can be collected within a month, and then we can start calculating the total requested number of textbooks.”

– **Ministry Official**

Time taken to receive the requested textbooks

● Pre-TnT ● Post-TnT



PERCEIVED IMPACTS OF TnT-#2



2

Saving Human and Financial Resources

TnT has streamlined textbook management, saving time, money, and resources.

“At DOE, we have one person using TnT. He can also check the dashboard and remind those schools that have not submitted the form, etc. TnT also helps in a way that **he does not have to review the hard copies anymore** since all data will be directed to PDH. **He can focus on other procurement tasks** too.” – **District Education Official**

“In the past, **all of my 12 staff in the department entered the data like crazy and almost always ruined their keyboards.** Now with TnT, I do not need many staff to enter the data. We can just extract the textbook request data right away from TnT. We can also see how many schools confirmed receiving their requested textbooks, where the textbooks were delivered to, lost and damaged textbooks, etc. It is all on the dashboard.” - **Ministry Official**

PERCEIVED IMPACTS OF TnT-#3



3

Improving Textbook Accessibility to Students

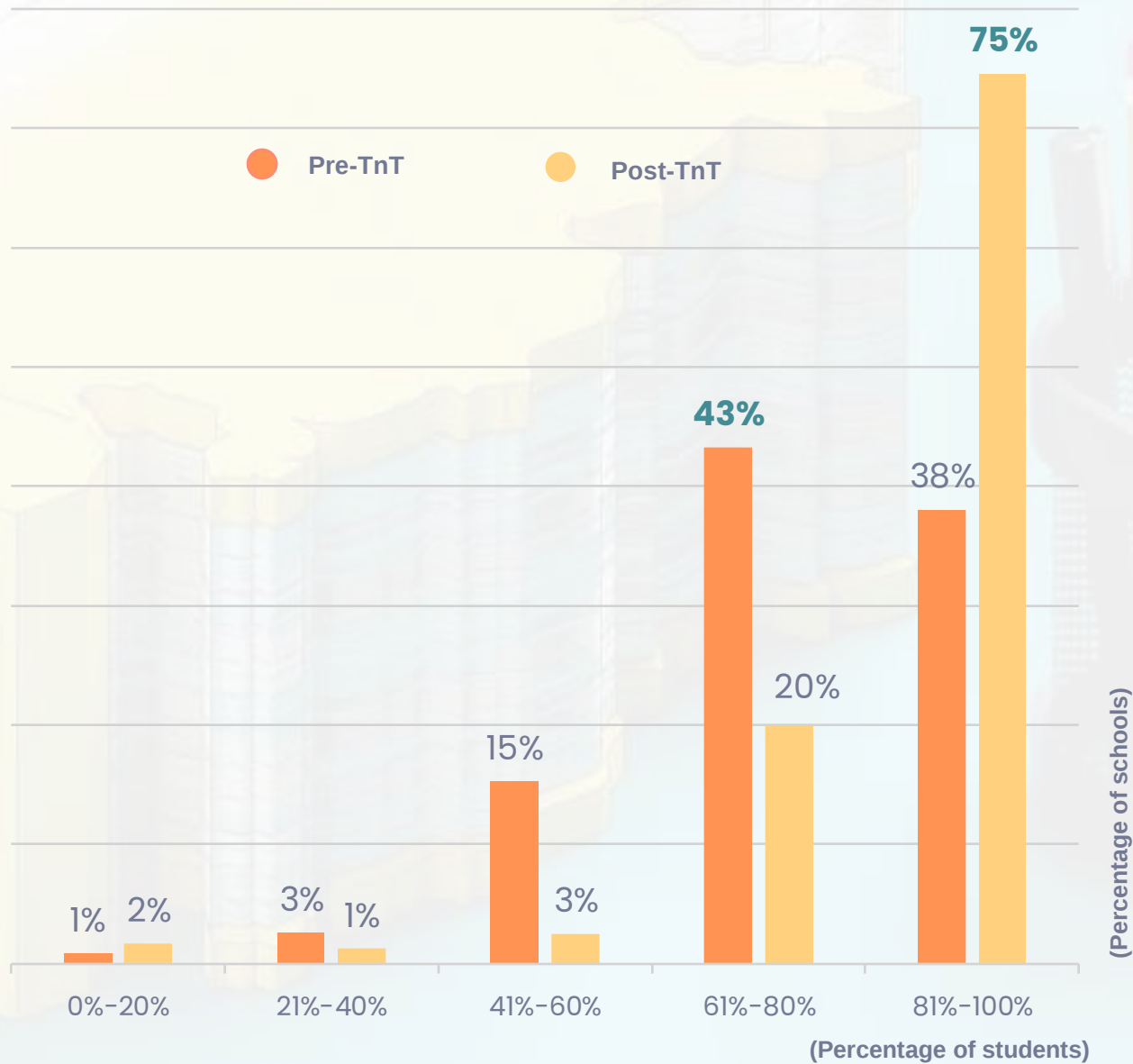
By speeding up the request process, ensuring the right textbooks are delivered, and expediting delivery.

“Since having TnT, textbooks arrived before school started or, at the latest, only two to three days after school

started. It is not a big deal. When the textbooks arrived fast, the students were also happy because they did not have to buy textbooks, and they also take care of the textbooks.” - **School Director**

Director

% of schools have students access to all textbooks



PERCEIVED IMPACTS OF TnT-#4



4

Increasing Transparency & Accountability

TnT digitizes the textbook supply chain and keeps relevant stakeholders informed, making it more transparent and accountable.

From Survey Data

Distribution & Delivery

By using TnT, my school:

- Can easily track textbook shipments.
- Is notified on textbook arrival instantly.
- Is notified on the expected delivery date.
- Is notified on which delivery company will deliver.

Strongly Disagree

0%

Disagree

1%

Neutral

3%

Agree

79%

Strongly Agree

17%

“The top management or related stakeholders also know whether schools have received textbooks or not yet because schools need to send textbook confirmation via TnT. **So, everyone knows instantly, either about requests or confirmation. It seemed like everyone was nearby one another.**”
– School Support Committee

“We can also see how many schools confirmed receiving their requested textbooks, where the textbooks were delivered to, lost and damaged textbooks, etc. **It is all on the (shared) dashboard.**”
– Ministry Official

CHALLENGES

AT THE **IMPLEMENTATION STAGE** OF TnT

WORKING ATTITUDE

Approaching retirement age, less attention until reminded.

INADEQUATE TRAINING

Training is too short. Trainers are sometimes not clear of TnT.

IRRESPONSIVE FUNCTIONS AND COST-BARRIERS

Some functions have been removed or are not responsive to user needs.

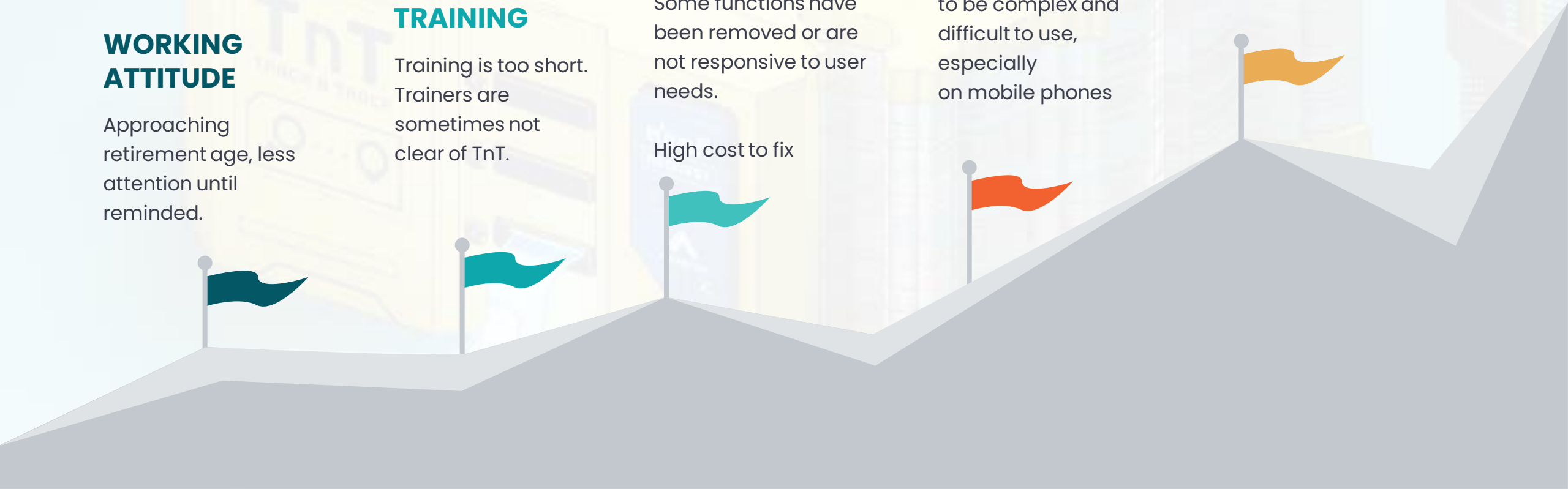
High cost to fix

UNFRIENDLY USER-INTERFACE

Some users of TnT have found the user interface to be complex and difficult to use, especially on mobile phones

DIGITAL DIVIDE

Devices, Access, Competence





CONCLUSION & RECOMMENDATIONS

CONCLUSION

There are **six critical factors** that contributed to the development and implementation of TnT.

- 
1. Long-term vision and clear strategic planning
 2. Top management support and commitment
 3. Information Technologies
 4. Training and capacity building
 5. Commitment of TnT users
 6. Collaboration between stakeholders

Covid-19

TnT has been perceived to bring **four positive impacts** to Cambodia TBSC:

- 
1. Saving time,
 2. Saving human and financial resource
 3. Improving textbook accessibility to students
 4. Increasing transparency and accountability

There are five main **challenges** in implementing TnT.

- 
1. Digital divide
 2. Unfriendly user-interface
 3. Irresponsive functions and cost-barriers
 4. Inadequate training
 5. Working attitude

HIGH-LEVEL RECOMMENDATIONS



FOR BETTER OPERATION OF TnT IN THE FUTURE



Continue communicating the long-term vision among all relevant stakeholders



Establish a system to monitor and ensure equal access to digital resources



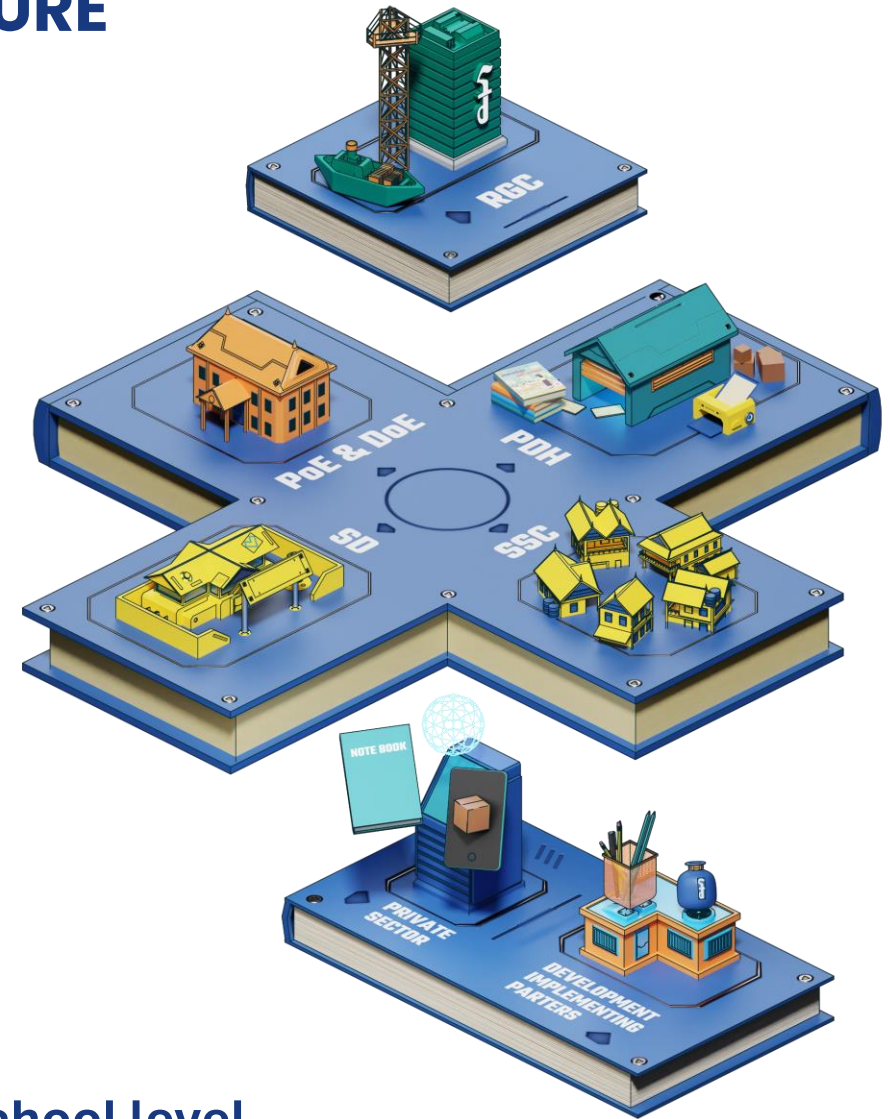
Provide TnT training and updates to all TnT users



Expand access to TnT dashboard to relevant government bodies



Fix the system with local services, enhance its functionality, and enable flexible access at the school level



FOR POTENTIAL APPLICATION IN OTHER LMICS



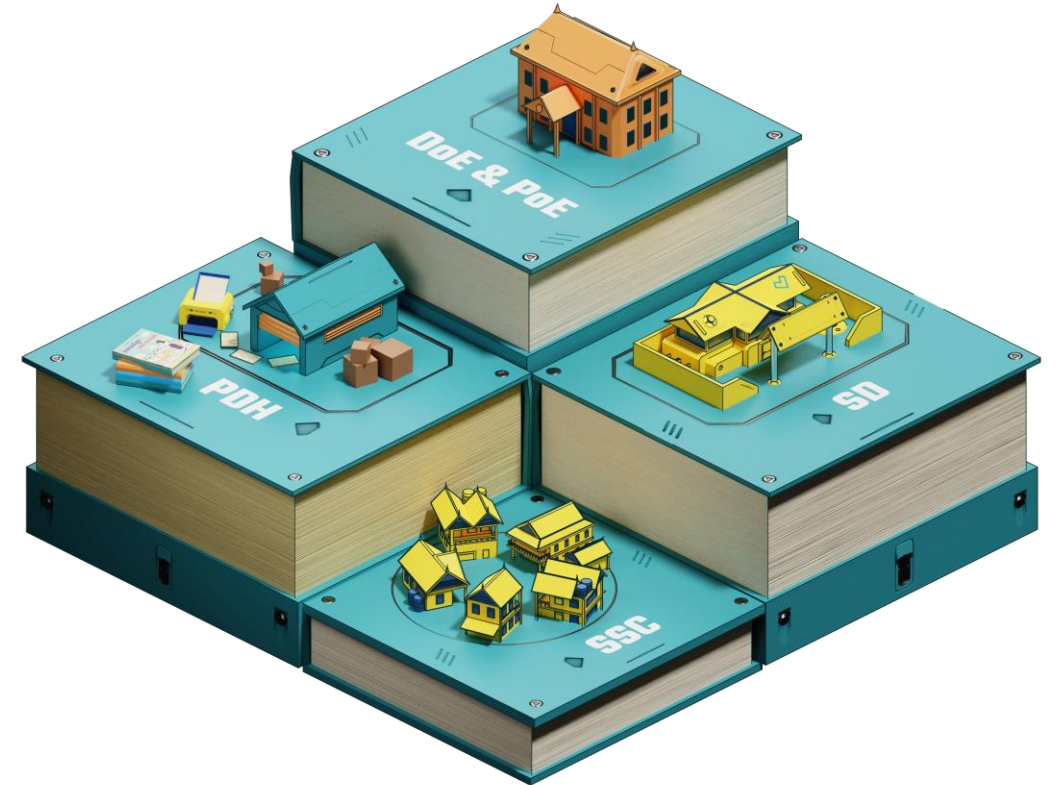
Utilization of widely used digital communication platforms



Contextualization is necessary before scaling up the system nationwide



Importance of training and type of training



**For more info,
please scan**

