

# **Operation Health**

## **E-Commerce Analysis focused on Logistics Stages**

- To analyse data of orders made from 28 May to 27 June across the country
- The dataset contains order value, delivery destination, time of purchase, preparation, picking up, packaging, out-stock, and delivery, etc.

**Data Analyst: Harry Truong**

# Overview of Order Quantity

629064

Total orders

503,118

complete

80%

% complete

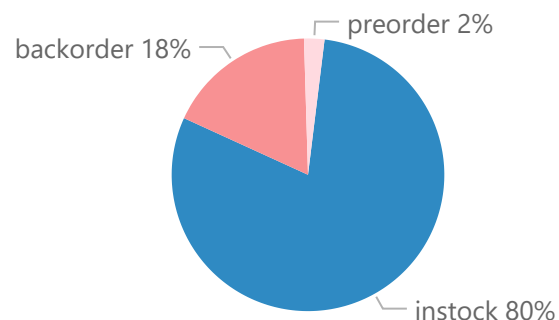
123,719

cancelled (not fail)

19.7%

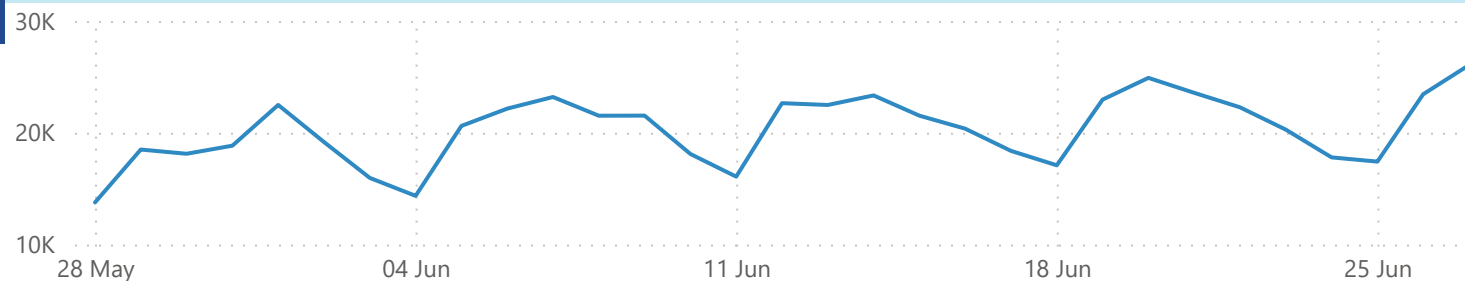
%cancelled

## By order type

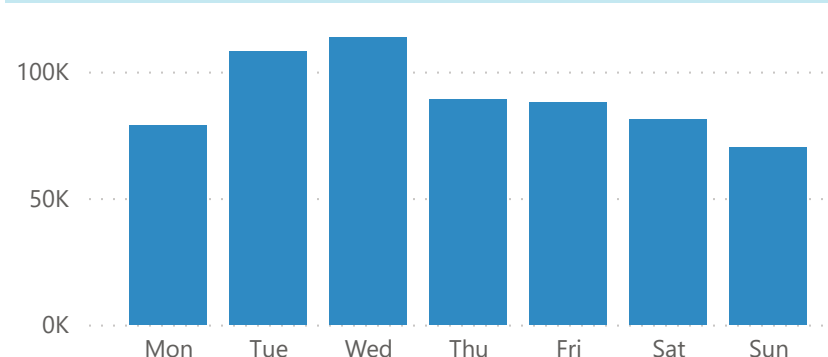


- Majority of orders contain in-stock items (80%), while only 2% of total must be pre-ordered

## By purchase date

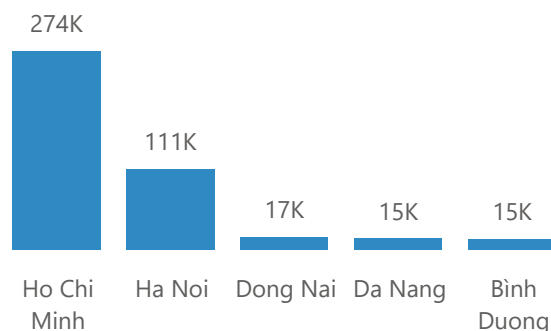


## By weekday



- There is a seasonality on weekly basis. Customers make significantly higher order quantity on Tuesday and Wednesday.  
- Unlike common sense that customers buy things at the weekend due to much free time, mid week is the golden time for shopping, especially Wednesday.

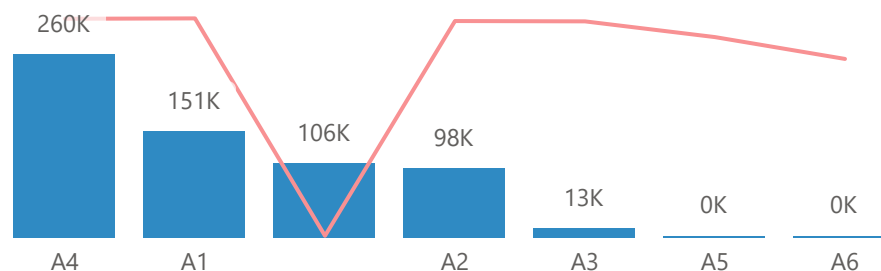
## By destination



- Ho Chi Minh dominates other delivery destinations (~270k orders), followed by Hanoi with ~110k orders

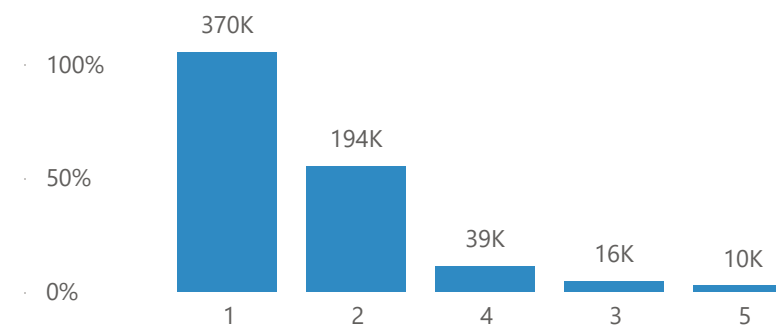
## By delivery company

● Count of increment\_id ● % complete



- A4 is the most familiar delivery brand, while A4, A1, A2, and A3 have impressive complete rate (~95%) despite huge difference in quantity. All orders with unnamed company are not complete

## By warehouse



- Warehouse 1 supply most orders (~370k), followed by warehouse 2 (~200k). Other warehouses only contribute a minor number.

# Overview of Order Value

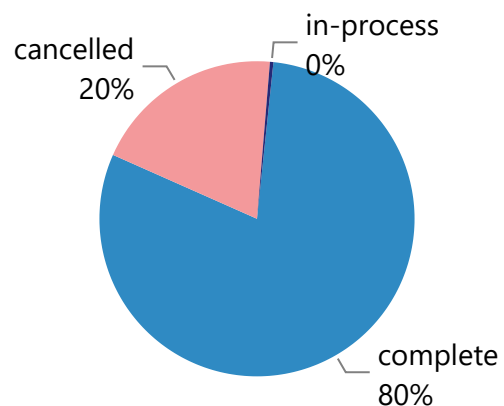
304,638,738,000

Total order value

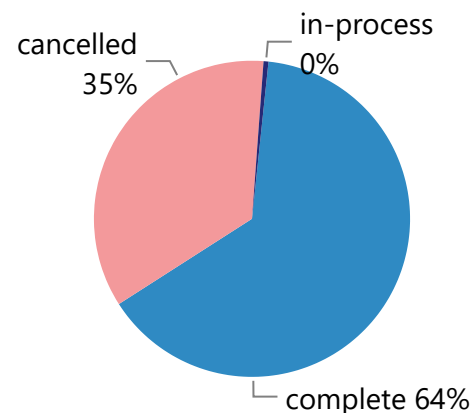
484,273.04

Avg value per order

## Order quantity by delivery status

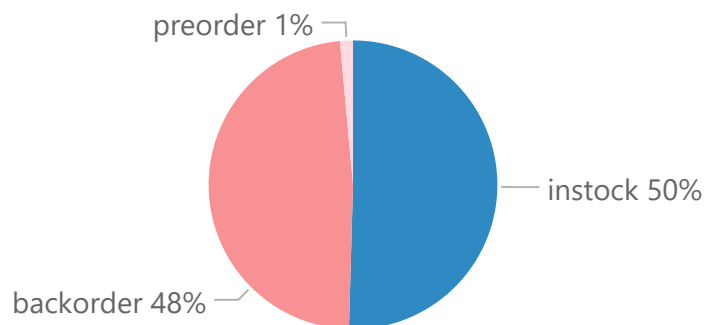


## Order value by delivery status



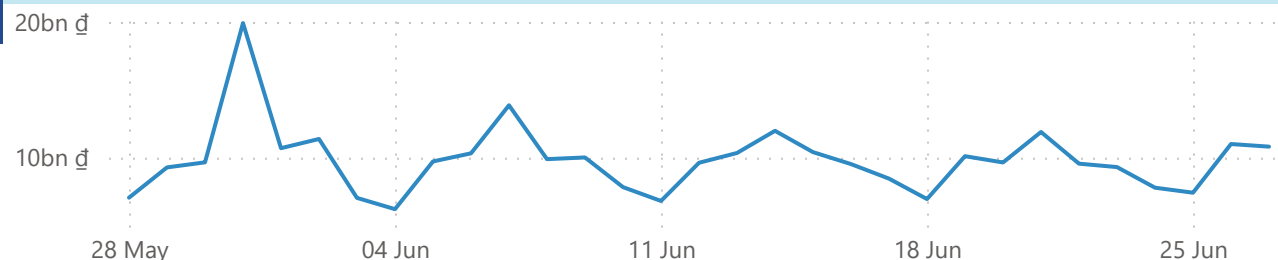
- Although there are only 17% of total orders being cancelled, value of these order makes up for about 1/3 of total.

## By order type



- Interestingly, backorder orders share the similar proportion with in-stock ones (~50%) despite the much lower proportion regarding quantity.

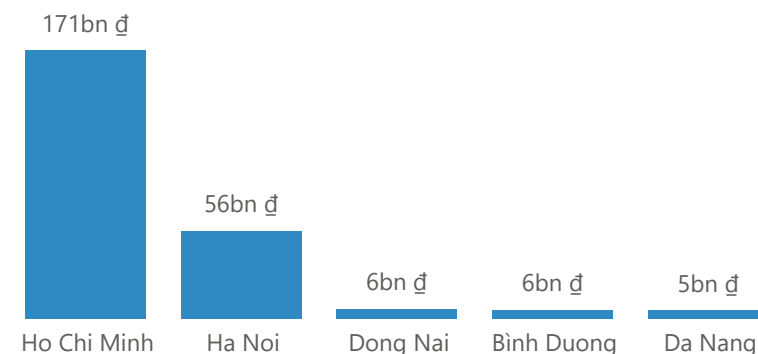
## By purchase date



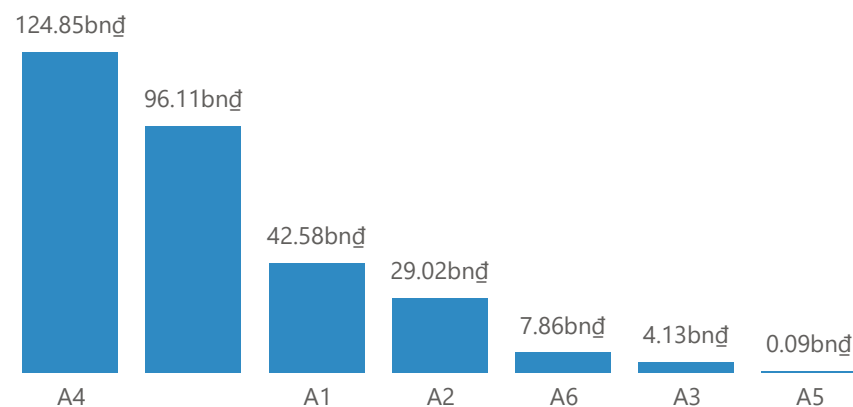
- 31th of May witness a surprising rocket of order value compared to overall trend

## Top 5 destination

- Position of Ho Chi Minh and Hanoi remain with the similar level of difference between them and others with the situation of order quantity.



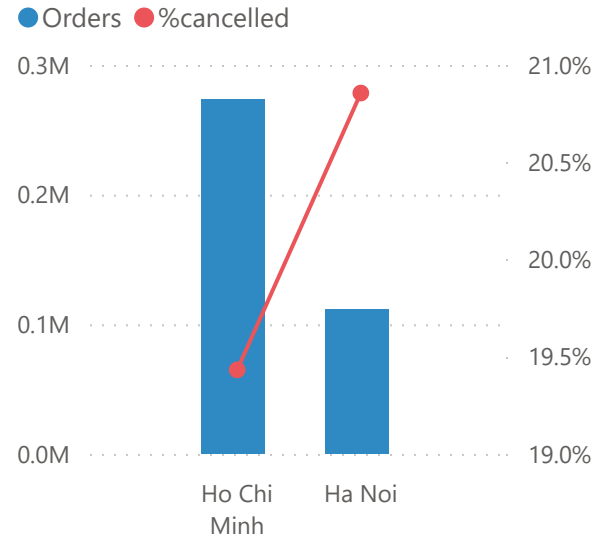
## By weekday



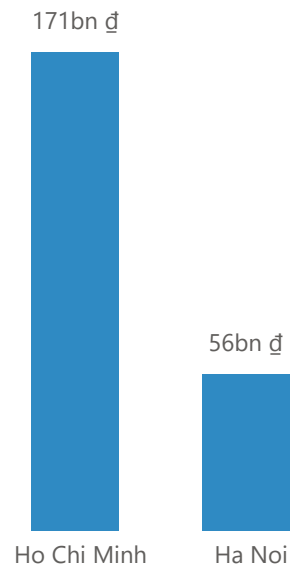
- While A4 clearly deliver orders with highest total value, unnamed brand have the second highest number despite the similar metric of order quantity.

# Examining Provinces / Cities

## Ho Chi Minh and Hanoi - Quantity



## Ho Chi Minh and Hanoi - Value



- Despite being a metropolis like Ho Chi Minh, Hanoi have substantial lower order quantity and order value than Ho Chi Minh. It means Ha Noi have huge potential for development.

- Also % cancelled of Hanoi is higher than that of Ho Chi Minh.

## Locations with order value

Location	Value
Ho Chi Minh	171,299,478,000 đ
Ha Noi	55,962,163,000 đ
Dong Nai	6,078,116,000 đ
Binh Duong	5,732,032,000 đ
Da Nang	5,155,699,000 đ
Hai Phong	3,143,929,000 đ
Ba Ria - Vung Tau	2,900,471,000 đ
Khánh Hòa	2,486,689,000 đ
Can Tho	2,402,541,000 đ
Lam Dong	2,373,878,000 đ
Long An	2,300,905,000 đ
Kiên Giang	1,821,540,000 đ
Thanh Hóa	1,699,921,000 đ
Nghe An	1,678,166,000 đ
Hai Duong	1,634,180,000 đ
Quang Ninh	1,615,191,000 đ
Thua Thien Hue	1,506,035,000 đ
Bac Ninh	1,480,555,000 đ
Dak Lak	1,476,064,000 đ
An Giang	1,469,258,000 đ
Binh Dinh	1,457,232,000 đ
Dong Thap	1,351,170,000 đ
Tien Giang	1,343,216,000 đ
Quang m	1,240,263,000 đ
Hung Yên	1,046,795,000 đ

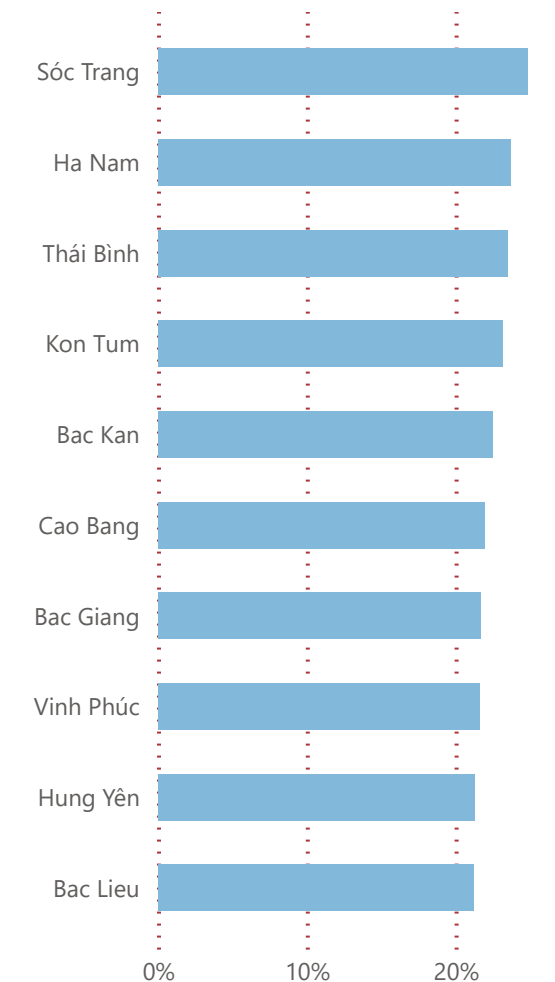
- Orders shipped to provinces in Northern area have highest cancelled rate, especially destinations being far from Hanoi (the capital), such as: Cao Bang, Bac Kan, Yen Bai.

- Many provinces in Central and Northern areas have lower value than those of Southern.

-The investment in Central and Northern areas is suggested

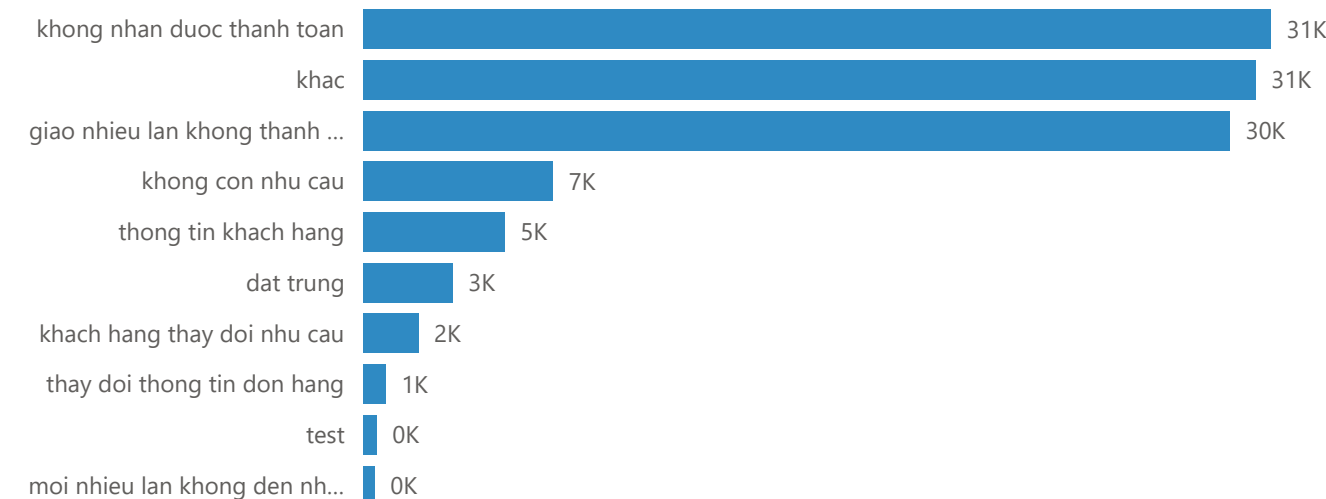
- Ha Nam and Thai Binh have low order value but their cancelled rate is the highest. Moreover, Soc Trang and Kon Tum have low order value but their fail rate is also the highest. There 4 provinces should be paid attention.

## Top 10 locations with % cancelled



# Reasons of Cancelled Delivery

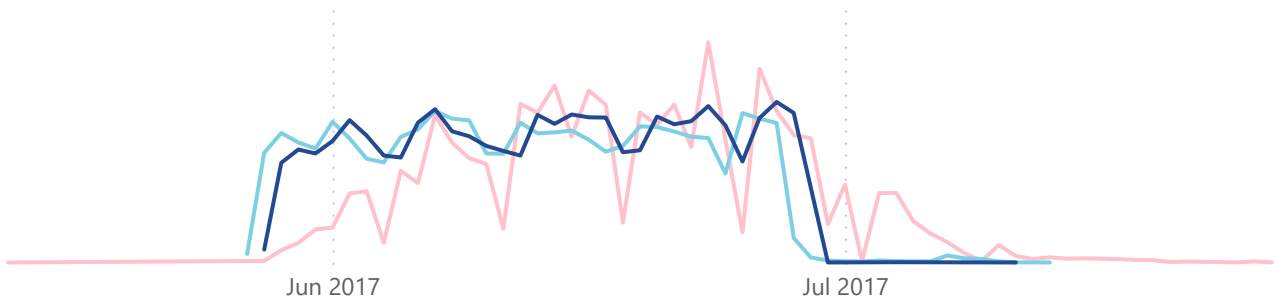
## Top 10 reasons



- Three major reasons of incomplete delivery are: no payment, multiple delivery incomplete, and other reason, with about 30 thousands orders each reason.
- The other reasons should clarified as these orders account for a large proportion.
- Multiple incomplete delivery witnesses a increasing trend over time.

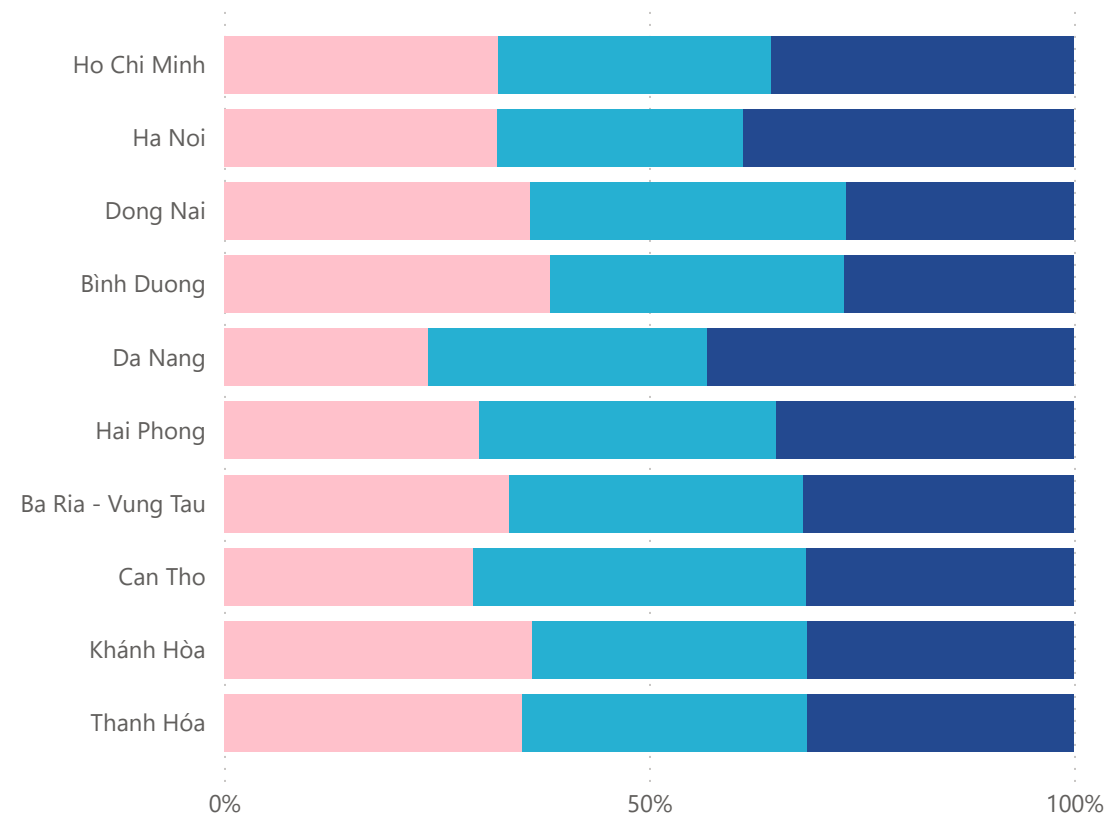
## Timeline of top 3 reasons

reason\_cancel/fail\_delivery ● giao nhieu lan khong thanh cong ● khac ● khong nhan duoc thanh toan



## Top 3 reason by Top 10 countries with highest # cancelled

reason\_cancel/fail\_de... ● giao nhieu lan khong thanh co... ● khac ● khong nhan duoc th...



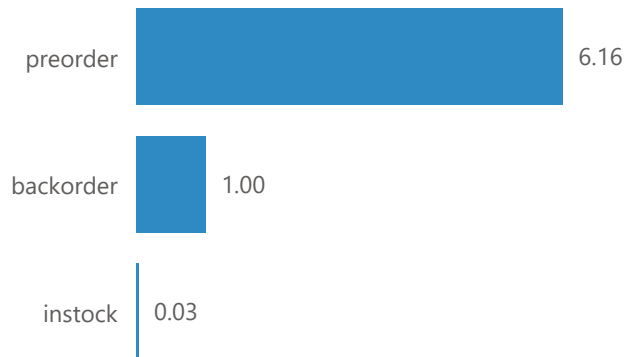
- Customers in Da Nang and Ha Noi tend not to complete the payment (43% and 39%). It means soon investigate on payment system or customer behaviour is necessary.
- Binh Duong, Dong Nai, and Khanh Hoa witness high percentage of multiple delivery incomplete. This requires an examination on customer habit in these locations, or a new delivery policy.

# Stages in Logistics Chain

0.31

Avg fulfill time

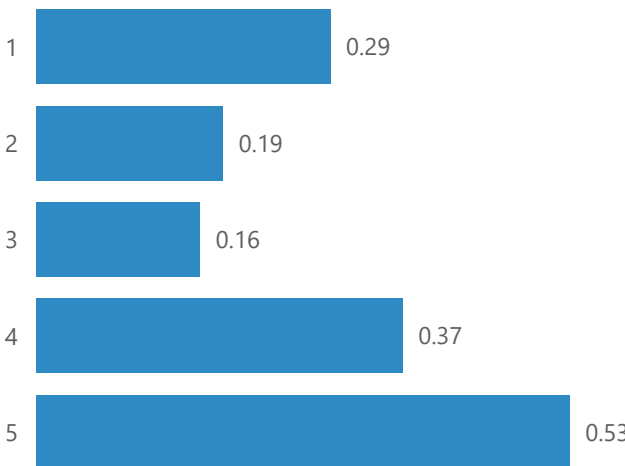
## Avg fulfill time by Order type



0.27

Avg picking time

## Avg picking time by Warehouse



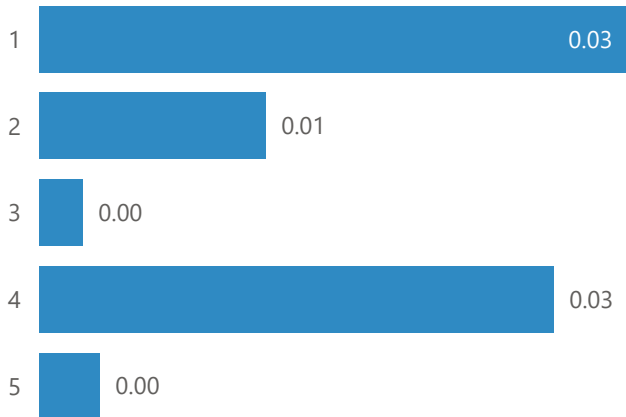
- Pre-orders take nearly a week to prepare products, as they are not open for sale. Customers must wait until brands launch them, however, customers are aware of this situation
- It takes about 1 day to prepare back-orders (purchase from a store). This number can be reduced by a collaboration between warehouse and sellers

- At picking stage, warehouse 5 have poorest performance when they spend over half day for picking up goods
- Better storing and automation machine are suggested for them in order to reduce time of this stage

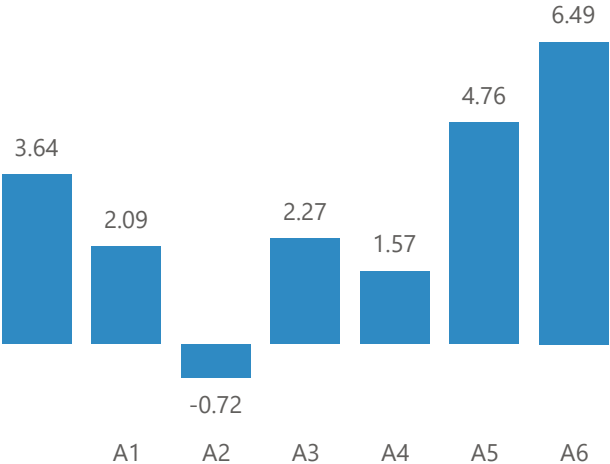
0.02

Avg packaging time

## Avg packaging time by Warehouse



## Avg packaging time by Warehouse



1.32

Avg delivery time

- At packaging stage, warehouse 1 and 4 spend too much time for this activity with about 0.03 day (~0.72 hours)
- Warehouse 1 and warehouse 4 should improve this performance, by investing in workforce, machine, and instruments. Learning from warehouse 3 and warehouse 5 is encourage

- At delivery stage, A6 and A5 companies do not work well, with about 6.5 days and 4.7 days on average, respectively.
- Better route planning and more vehicles are recommended for these companies.
- Remarkably, some orders are delivered with much more time than average but we do not know which company is in charge.

# On-Time Delivery

607141

Meet deadline orders

96.5%

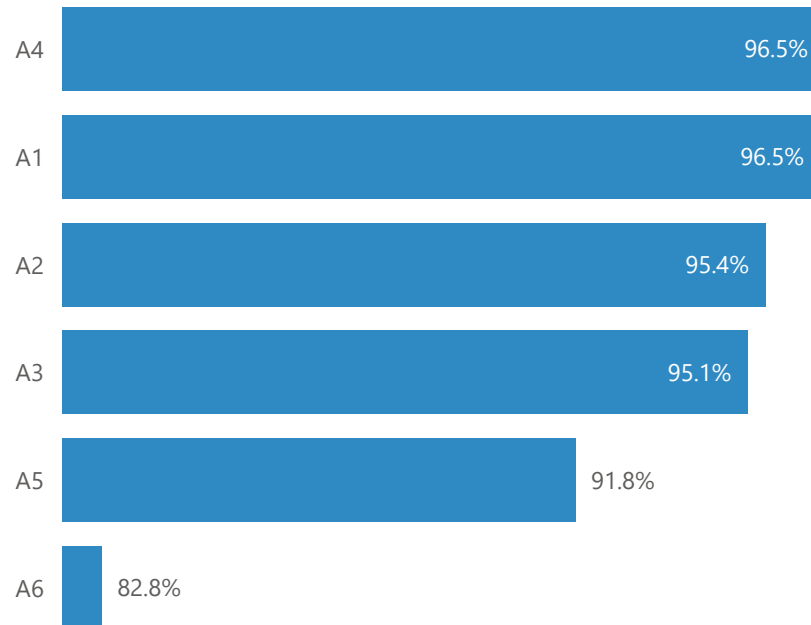
% meet deadline

13,640,276,000 đ

Value of late orders

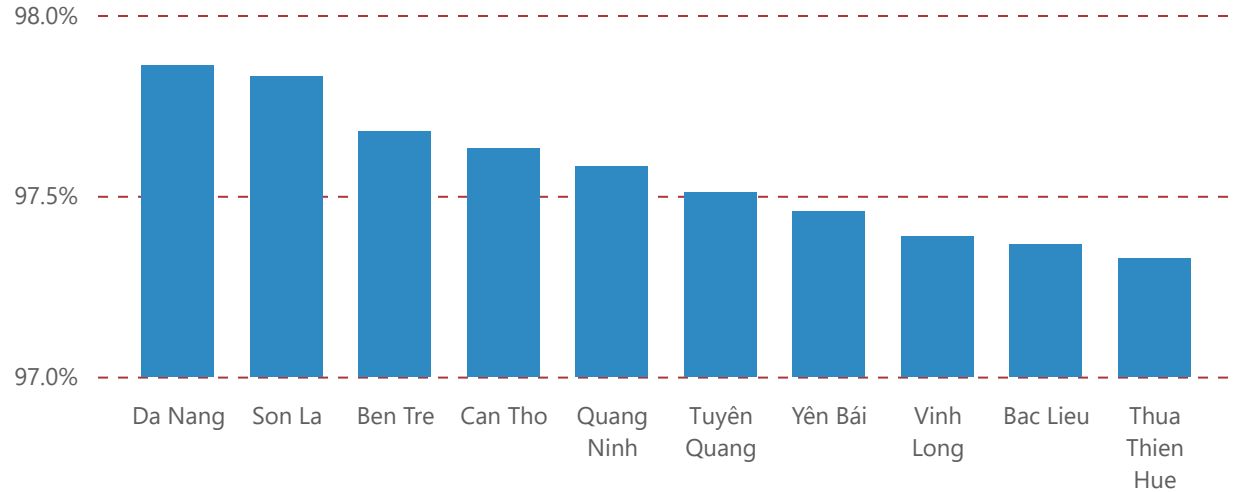
- Overall, the number 96.5% on-time is relatively impressive
- Although there are only 3.5% late delivery, these orders value over 13.5 billion VND. In case customers cancel order after waiting too long, these huge amount of money would be the loss.

## % meet deadline by Delivery company



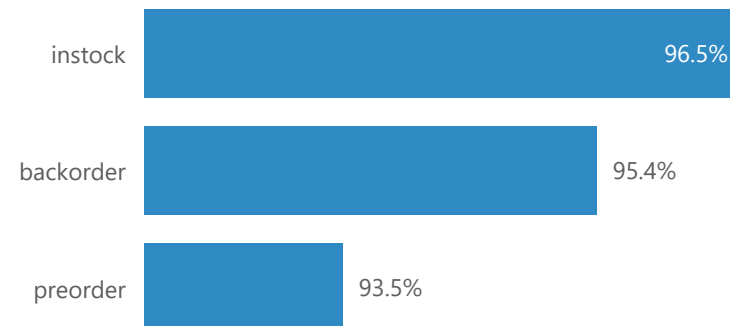
- Company A6 has the poorest % on-time with only ~83%, which is significantly lower than others (all over 90%)
- Company A1 and A4 deliver goods with the highest rate of on-time.
- Stopping collaborating with A6 and concrete partnership with A4 and A1 are recommended.

## Top 5 provinces



- Interestingly, Son La have the second highest % on-time despite the substantial distance from Hanoi (the capital).

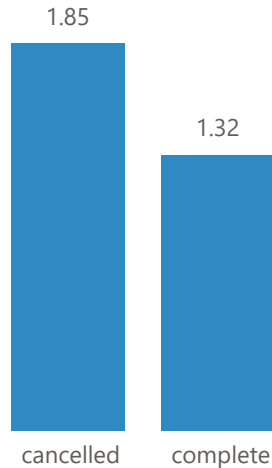
## % meet deadline by Order type



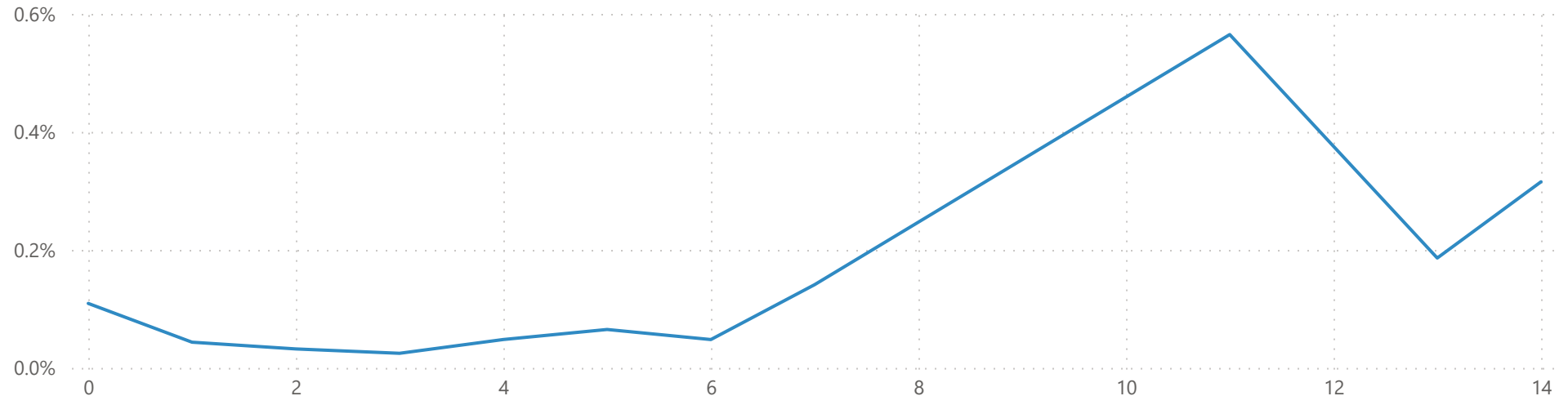
- It is understandable when in-stock orders have the highest % meet deadline, as it does not take much time to prepare goods
- By contrast, pre-orders has the lowest rate, as these items even are not available in the market

# Delivery Time and Cancelled Rate

Avg delivery time by status



% cancelled by delivery time



- There is a positive correlation between delivery time and % cancelled, which means customers tend to cancel orders when they must wait too long
- This relation is significant in the range 6-11 days of delivery time
- As the average delivery time is only 1.32 days, around a week of waiting is too long
- Also, customers may check the estimated delivery time from packaging time. Thus it is suggested to alter the estimated time (minimum and maximum) with orders shipped to distant locations, so that customers may understand the situation and are more patient.
- Moreover, one major reason of cancelled orders is multiple fail delivery. It is possible that customers give a wrong address, lose patient after waiting, and cancel the orders. Thus, try to tackle this reason may help improve the situation.