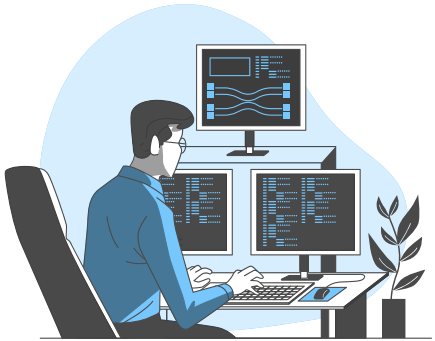

Tutorial 1

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Q1
Tokyo Stock Exchange (TSE)

JPX
JAPAN EXCHANGE GROUP
TOKYO STOCK EXCHANGE

- Faced a series of technical problems
- Launched new trading system, “arrowhead”, on 4 January 2010
- Able to process orders much faster, in 0.005 seconds
- As good as the dealing systems in New York and London

(a) Despite the **historical technical difficulties** faced by the Tokyo Stock Exchange (TSE), why do you think the exchange **decide to go ahead with the upgrades?**

Reason 1: Maintain its competitiveness and position as one of the world’s financial centres to attract companies to the TSE

- New high-speed trading trading system
- Comparable to any other exchange in the world
- Struggling with foreign companies leaving the TSE

arrowhead

(a) Despite the **historical technical difficulties** faced by the Tokyo Stock Exchange (TSE), why do you think the exchange **decide to go ahead with the upgrades?**

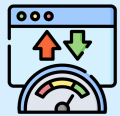
Reason 2: Improve its tarnished reputation against rising competition from other Asian exchanges

- In 2005, a software problem forced the TSE to suspend trading in all shares for the first time ever
- Tarnished its reputation amidst growing competition from the Hong Kong and Shanghai exchanges

(a) Despite the **historical technical difficulties** faced by the Tokyo Stock Exchange (TSE), why do you think the exchange **decide to go ahead with the upgrades?**

Reason 3: Meet the needs of clients

- Huge portion of trading volumes come from high-frequency traders
- Prefer markets that execute trades quickly and reliably
- Speed is essential for modern exchanges



(b) What are the **potential benefits** of having such a **new system?**

1. Speed
   - Faster order processing time of 0.005 seconds/order
   - Allows market participants to act quickly on the changing market prices; especially important for high frequency traders
   - Increases market liquidity

(b) What are the **potential benefits** of having such a **new system?**

2. Scalability
   - The new system has 4 times the capacity of past peak volume
   - System capacity is flexible and scalable to accommodate an increase in number of orders

(b) What are the **potential benefits** of having such a **new system?**

3. Reliability
   - Processes trading information such as orders, executions, and order books on synchronized 3-node data servers.

(b) What are the **potential benefits** of having such a **new system?**

Overall:
- More seamless trading experience
- Facilitate growing trade activities in the Japanese stock market
- Attract more companies to list on the TSE
- Gain market share from more tech-savvy rivals (eg HKEX)

(c) What are some of the **risks** involved with such a system?

Technological Risks eg software glitches, technical problems
- Could result in a suspension of trading
- Throw stock markets into disarray and incur losses
- Damage reputation
- High costs could delay IPO even more

(d) In 2018, the **Singapore Exchange (SGX)** updated their new high-speed trading engine. What is the **name** of this **new trading engine?**

SGX REACH

- Part of SGX's $250 million technology investment to strengthen market infrastructure

(d) What are its **key characteristics?**

- World's fastest trading engine offering 10 times more capacity with ultra-low latency of less than 90 microseconds

- Establish a world-class data centre for SGX and seamlessly connect trading communities in global financial hubs to Singapore

(d) **Why** do you think SGX decide to invest in this new system? In what ways are these motivations **similar to or different from those faced by TSE?**

Meeting needs of clients:
Better market quality & liquidity allowing more efficient price discovery and enhance SGX's position as the Asian Gateway, putting it ahead of many global financial centres.

"Trade at Close" (TAC) session -> transact at already-established closing price -> price certainty/fill orders that are not completely transacted

(d) **Why** do you think SGX decide to invest in this new system? In what ways are these motivations **similar to or different from those faced by TSE?**

Maintaining competitiveness:
- Forge joint ventures with exchanges in India and Taiwan
- Establish a presence at key data centres in Chicago, London, New York and Tokyo.
- Lower cross-border connectivity costs and facilitate participation in Asia's growing markets

Thank You