

# **arrowhead**

## **~ the next-generation trading system ~**

**Tokyo Stock Exchange, Inc.**

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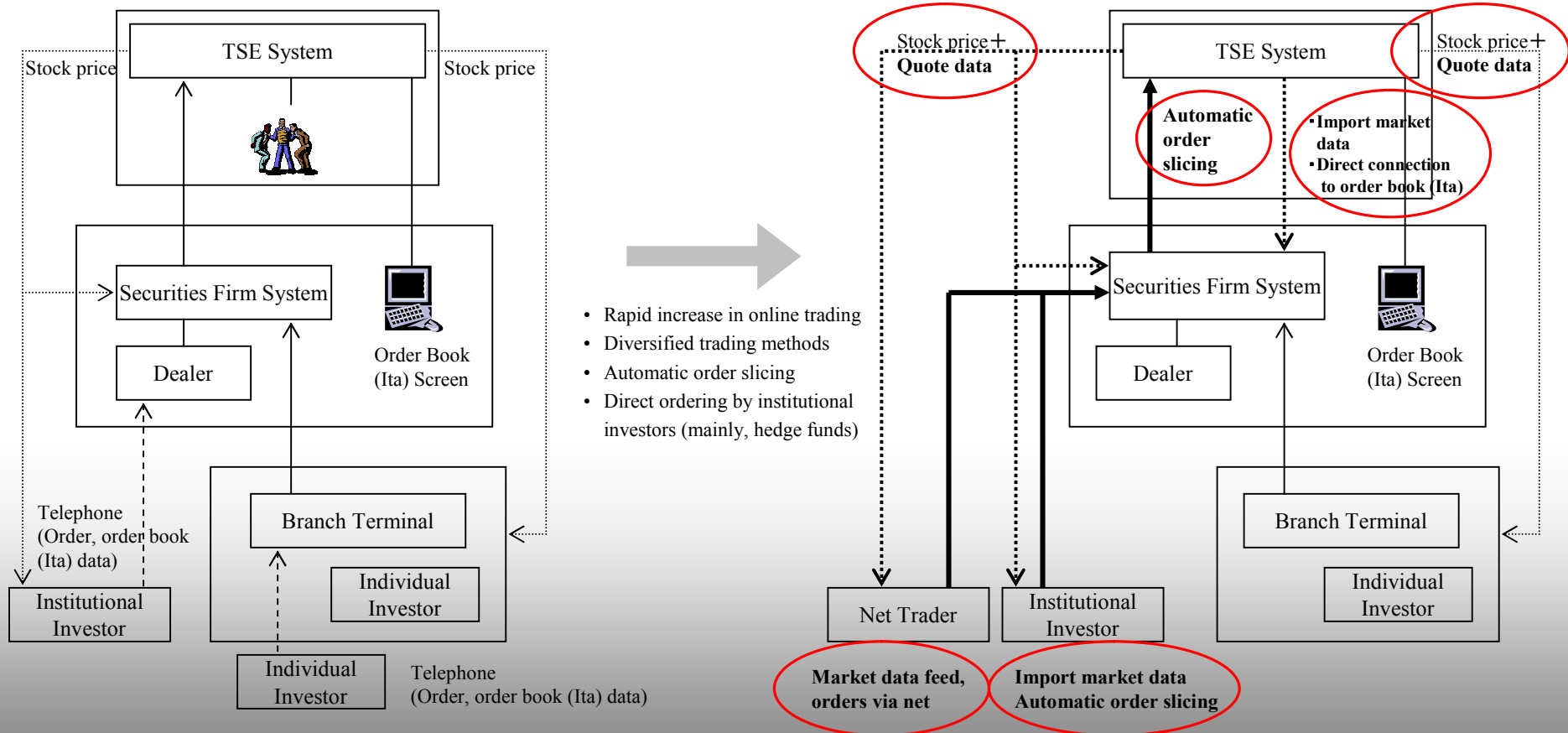
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2. Summary of arrowhead
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# 1. Introduction: Changes in order placement activity by market participants

- Individual Investors: As fast trading while monitoring real-time market data is now possible, this has led to a growing share of internet trading and a significant increase in the number of orders.
- Institutional Investors / Securities Companies: Diversified trading styles such as large lot basket, VWAP, arbitrage trading, etc. Importing market data of such transactions in real-time and using certain programs to perform automatic order slicing is now mainstream.



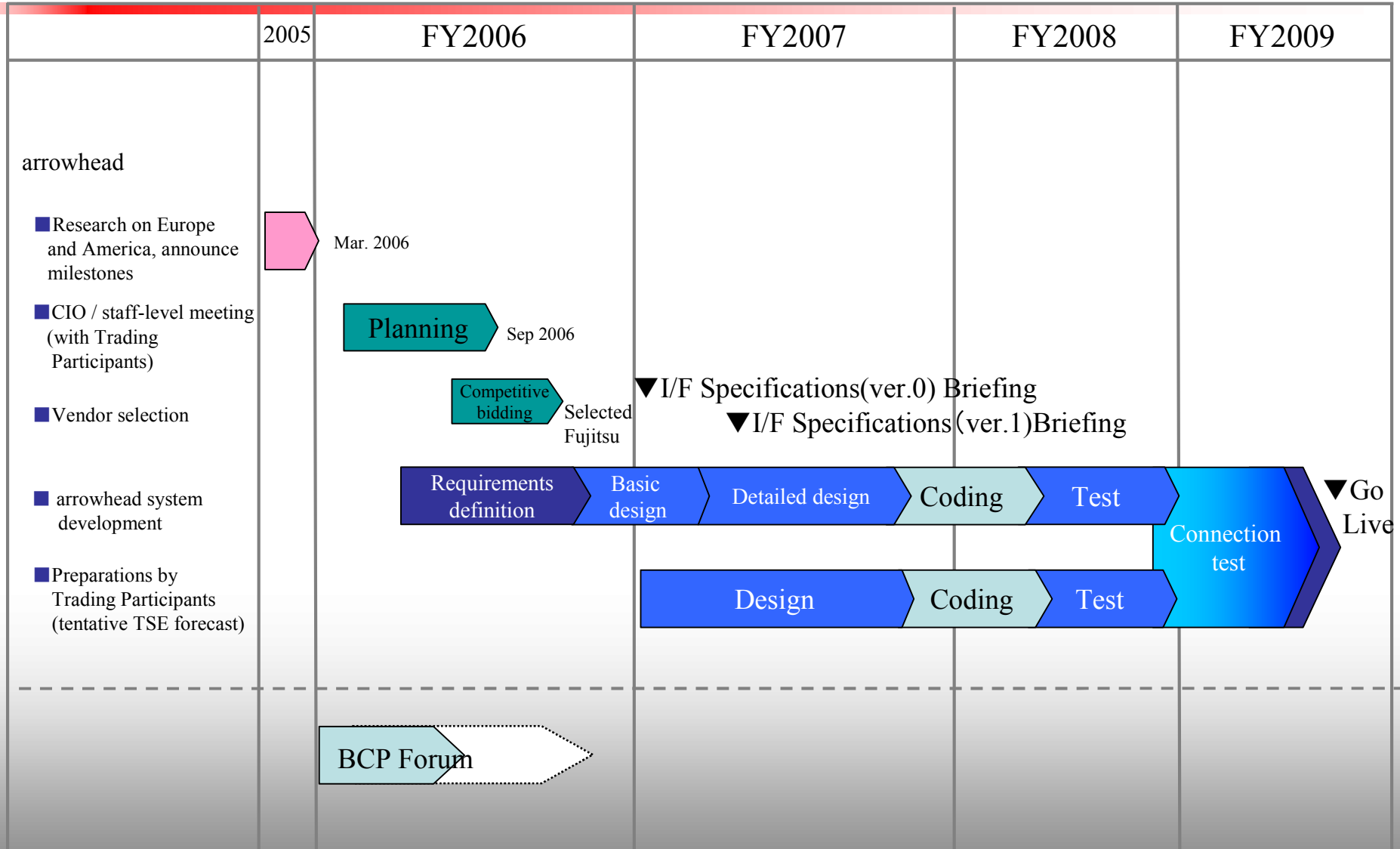
## 2. Summary of arrowhead: What is arrowhead?

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### » What is arrowhead?

- Name of the next-generation trading system scheduled for launch in January 2010.
- Handles auction trading of all cash products (stocks and convertible bonds).
- Combining low latency with an order response, and high reliability brought about by the protection of trading information such as order, execution, and order book information by synchronized 3-node data back-up memory, arrowhead is an exchange system of the highest global standard.

## 2. Summary of arrowhead: Project schedule



## 2. Summary of arrowhead: Basic concept

### Compile and present basic concept of arrowhead structure, based on overseas research

Reliability/ Scalability	<ul style="list-style-type: none"> <li>◆ Able to accommodate within approx. one week in the case where the predetermined scalability criteria was exceeded.</li> <li>[Scalability criteria (assumed)]</li> <li>The case where actual peak value of no. of orders per minute exceeds half of no. of orders that can be received per minute (=system threshold limit value)</li> <li>= prepare capacity that is twice the peak no. of orders per minute</li> </ul>
Low Latency	<ul style="list-style-type: none"> <li>◆ 2 millisecond Order Response</li> <li>◆ 2.5 millisecond Information Distribution</li> </ul>
Flexibility	<ul style="list-style-type: none"> <li>◆ Able to accommodate diverse products, new trading rules, and their changes within a short period of time</li> <li>◆ Parameter functions with optional business logic attachments</li> </ul>
Robustness	<ul style="list-style-type: none"> <li>◆ Highly Reliable System built with State-of-the-Art Technology</li> <li>◆ Construct secondary site (back-up center). Recovery within 24 hours.</li> </ul>
Others	<ul style="list-style-type: none"> <li>◆ Enhanced data distribution function</li> <li>◆ Durable and reliable system operation</li> <li>◆ Enhanced security</li> </ul>