Wrestling with technology
An organizational challenge

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‘Milliseccond’ trading arrives

By Anuj Gangahar in New York

Some of the largest participants in US capital markets are to start using a new system that dramatically cuts the time it takes to trade and communicate with each other, as they respond to the greater demand for speed from hedge funds and other traders.

It will reduce transaction times to just 1 millisecond from about 10 milliseconds at present, in the New York metropolitan area.

Hedge funds and other traders who employ complex strategies, are putting ever greater emphasis on the speed at which they do business, as competition to eke out the best returns intensifies.

The system, known as Radianz region. Institutions that have signed up to use the system already include the NYSE Group, Nasdaq, Boston Options Exchange, BATS electronic communications network, and the International Securities Exchange, among others.

The uptake of the new system comes just weeks after the introduction of Regulation National Market System, a controversial set of rules aimed at levelling the competitive field in the US equity market, meaning trades must be routed to the exchange that offers the best price.

During the recent market sell-off, a week before the introduction of Reg NMS, a spike in trading volumes caused some systems and servers to go down, leading to widespread concern about technology.

BT Radianz developed the new system in response to the growing use of algorithmic and black-box trading strategies by broker-dealers, asset managers, prime brokers and hedge funds. Tom Price, senior analyst in the securities and capital markets practice at the Tower Group consultancy, said: “Speed is a competitive differentiator for market participants using advanced trading strategies. The ability to consume massive amounts of data, translate it into opportunity, and get orders to the appropriate execution venue ahead of the competition, is key to success.”
Why did markets automate?
Traditional explanations: *economics*, of course!

Automation made trading *cheaper*
But these explanations fail to make sense of the market organization:
It assumes that stock exchanges had an interest in becoming public software companies rather than member-owned private clubs.
Today:

Automated financial markets are the products of particular infrastructures.
Why did markets automate?

Who built the infrastructures of finance? Why?
My answer:

Not the top of the organization or the top of the industry, but the invisible and obscure *organizational middleware*
What is the organizational middleware?
Tony Carey and the MPDS maintenance mini van, c. 1973
Photo courtesy of John Scannell
Testing EPIC input terminals, 1977
Photo courtesy of John Scannell
The back office, the settlement room, the R&D labs, [...] 

the invisible corps of information technologists that keep the market running.
A story of how infrastructural workers captured an exchange, revealed its infrastructures and converted the marketplace.
Long process of organizational encroachment by infrastructural workers.

c.f. Thelen’s (2004; p. 34) slow institutional change: institutions are ‘transformed through political re-alignments and specifically through the incorporation of groups whose role in the system was unanticipated at the time of their creation’.
1950s

- Cultural and organizational core: the trading floor
- Trading mechanism: competing market-makers
- Peripheral tasks: settlement, which was costly and time consuming
1960s

- The Exchange internalizes some technologists to keep the computers in order
- Technologists as largely invisible ‘sort of plebs’ (Buck interview)
- Invisibility and expertise translated into autonomy to define problems and build solutions
early 1970s

- Technologists develop price information systems for the market makers (e.g. MPDS)
- They also create a distinct niche within the organization (DISS)
- Their systems are successful: they become a source of revenues for LSE
late 1970s

- Information systems have become taken-for-granted
- Technologists gain further autonomy to develop solutions for the organization

IT Staff: ~500
Buildings (Stock Exchange): ~8
early 1980s

- Exchange technologists gain visibility within the organization and across the field
- Involved in preparing for Big Bang (date set by UK government to ‘deregulate’ market)
late 1980s

- Technologies eliminated the trading floor
- Through a long process of layering (Mahoney and Thelen 2010) they captured the exchange

IT Staff: ~3000

Buildings (Stock Exchange): ~16
the whole driving force came from the IT people. [But] this became a problem, because the IT people were effectively setting policy and, like it or not, around Big Bang time it was working very well. It was a bull market, everyone was onwards and upwards, the old member firms were cashing out, new member firms were coming in. [...] Then, in 87 we had the market crash, and gloom and doom flooded the market, you know, everyone was over geared, they’d spent too much, they pushed the throttles, and everyone went inward looking, and that’s when the Stock Exchange started to go inward looking.

Peter Bennett, Advanced Systems Group
<table>
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<tr>
<th>Year</th>
<th>Costs and Revenues (£m)</th>
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<tr>
<td>86/7</td>
<td>250</td>
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<tr>
<td>87/8</td>
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Sociomaterial and discursive strategies that make visible (reveal) the infrastructures of the market and their moral dimensions to create ‘a sense of security in the system’ (Hargrave and Van den Ven 2009, p. 130).
Tradepoint as opposition

“[Tradepoint was] consumer led at the institutional level [Investors would] have equal access to the price formation mechanism, which would then bring along competition, lower charges, be better for the pension funds, better for the savings. We even thought of calling it “The People’s Exchange” [...] in the sense that it would be working very much at a neutral stance

Michael Waller-Bridge interview”
[Tradepoint used commercial] computers, [and] I do remember [...] investors saying: “This must be a huge computer, absolutely vast to deal with an electronic market!” [But] the actual computer was probably the size of [a] sofa. So I [asked our operations manager to] “go and buy the biggest, fattest wire [possible], like [the ones] in a James Bond film? And you have a room, and it says ‘Computer Room’ on it, and you put the computer in there, and then you have this giant wire, [this] sort of pipe thing [coming out of the room].” [Then we can say] “The computers are in there, we don't like to disturb the computers, but that is the Computer Room” [...] [and investors would see this huge pipe] going in, and it somehow gave a sense that there was power and depth to it.

Michael Waller-Bridge interview
conversion

Process whereby infrastructural workers enroll actors disadvantaged by the existing institutional order ‘to use their advantaged status vis-à-vis other institutions to enact change’ (Mahoney and Thelen 2010, p. 9).
“The whole point [of authorizing Tradepoint] really was the belief that competition was a good thing. We wanted more competition in financial services.”

Interview with Treasury official

“[The LSE’s market making system] should be removed.”

Salomon Brothers’ Gordon Lawson, in *Treasury Committee 1996*

“[Some] members [of Tradepoint] were represented by boxes with flashing lights. And there was definitely experimental algo-trading.”

Interview with Waller-Bridge
Exchange reforms given go-ahead

By George Graham, Banking Correspondent

A London Stock Exchange steering committee has recommended unanimously that the UK stock market should move towards the introduction of electronic order-driven trading, even though the committee was dominated by marketmakers who originally opposed the change.

Mr Donald Brydon, deputy chief executive of BZW, the investment banking arm of Barclays Bank and one of the largest marketmakers, said extensive
Why did markets automate? (and what is gained by an infrastructural account?)

- Certainly, traders, dealers, and investors mattered: Their adoption of technologies was necessary for their survival

- But market technologists and the organizational middleware also matter: without their organizational entrepreneurship, markets might have followed an altogether different route