

LEADERSHIP FOR GROWTH

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## TRADING REVOLUTION

DOMINIC STEVENS PLANS TO TAKE  
THE ASX TO A NEW FRONTIER  
WITH BLOCKCHAIN TECHNOLOGY

### PATHWAYS TO CEO

We reveal  
the typical  
ASX100 chief

### IN THIS TOGETHER

How Millennials  
are rewriting the  
leadership rules

### SILENT EPIDEMIC

The women who  
want to stamp  
out gaslighting



# HIGH STAKES

All eyes are on Dominic Stevens and his ambitious plan to transform the ASX using blockchain technology.

STORY JAMES EYERS PHOTO LOUIE DOUVIS

The entire Australian equities market is sitting inside three 2½-metre-high racks of servers in a secure room in the ASX's data centre in Artarmon, Sydney. You could almost wrap your arms around it but for the black metal cages.

This state-of-the-art equipment, with its fibre-optic cables, blinking lights and whirring cooling fans, is emblematic of the rapid digitisation of financial markets. It's a long way from the trading floors of the 1980s, where orders were scribbled on chalk boards and chits of paper were couriered around the city.

Financial markets have always been early adopters of new technology. But the current ASX project to update its clearing and settlement system, which electronically moves equities from seller to buyer, is off the charts in terms of its ambition and complexity.

Sitting at the head of this is ASX chief executive Dominic Stevens. He describes the new system, which has been inspired by bitcoin's blockchain, as microeconomic reform for the digital age.

But getting the message across to a sceptical market is forcing Stevens, 54, to dig deep into

his 30-plus years at the innovation edge of Australia's financial markets.

The new software, being developed by Digital Asset, a New York start-up of which ASX owns 7 per cent, will sit on servers inside this very cage, alongside the market's trading engine and the rest of this high-tech gear processing \$6 billion of equity trades each day.

ASX's replacement of its ageing Clearing House Electronic Subregister System (CHES) could be one of the most ambitious enterprise information technology projects in the world, certainly among global exchanges. Stevens has the attention of global central and investment banks, which understand the technology could move financial markets closer to real-time settlement of trades, reducing systemic risk.

ASX's project is also seen as a bellwether for the adoption of over-hyped blockchain technology internationally, given it is being applied to a critically important financial market function, a core piece of plumbing for the entire Australian economy.

If Stevens is daunted by the challenge, he's not showing it. He says everything is on track to switch on the new system by the target date of April 2021. It is his biggest test in a formidable career that began at Bankers Trust when he was fresh out of university, and saw him take the helm at Challenger aged 43.

"People make decisions in businesses every day with imperfect information," Stevens says. "If you make the information more perfect, they will make better decisions. It is subtle but that is microeconomic reform."

## 'SOURCE OF TRUTH'

Blockchain, also referred to as "distributed ledger technology" or DLT, could provide annual efficiency savings to the financial markets of more than \$1 billion, although precise figures haven't been quantified. Whatever the figure, it far exceeds the cost of building the system, which hasn't been disclosed by ASX but is thought to be about \$30 million.

But as Stevens has been explaining in public presentations and private meetings over recent months, the system will create opportunities to build new services to improve the process of raising cash and investing.

"Just like CHES took us from paper and chalk to electronic messaging, the next stage is 'source of truth' at all times, rather than when you ask for it," he says. "We have spent a lot of time trying to explain to people that the CHES replacement comes with an interesting

## TO DO LIST

- Deliver the new ASX clearing and settlement system by April 2021.

- Convince a sceptical market of the benefits of using blockchain technology.

- Attract more technology companies to the ASX.

- Shift the clearing and settlement of bond markets onto the blockchain.

Dominic Stevens is undaunted by the challenge of overseeing the ASX's highly ambitious blockchain project.



add-on that can do a bunch of things you couldn't do before and opens the world up for people."

Stevens is an intellectual type, with leadership skills built from his inquisitiveness and curiosity. Those qualities will be imperative in this high-stakes project: ASX is the sole provider of equities clearing and settlement, and the government and regulators expect its new system to be reliable and secure, given it is deemed critical national infrastructure.

If there's anyone able to convince the market and regulators about the frontier technology, it is Stevens, says Chris Williams, outgoing co-head of equities at UBS, one of ASX's biggest clients.

Williams says Stevens has a rare ability to traverse from the big picture to tiny detail while remaining articulate and considered. "Dom's attributes mean he can, in a very approachable way, talk about meaningful industry and strategic change and also engage at a micro level with those who care."

The power of distributed ledger technology is that it provides those who have access with an accurate version of information every

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CHRIS WILLIAMS

time an update is made. Over time, a series of databases is created, forming a digital chain (hence "blockchain"). Because the history is locked into place, users can make decisions with full confidence the information is correct and current, and know that others have exactly the same information.

With CHESSE, ASX has managed the record of who owns what listed company shares at a point in time; the register includes the investor's name, the "holder identification number" and the digital title of ownership. During clearing (where ASX takes on credit risk for share trades) and settlement (swapping the title to a share for cash), the CHESSE system updates the records.

If a stockbroker, registry, nominee,

Chris Williams, of UBS, has faith in Stevens' ability to implement the new trading system.



custodian or any other intermediary wants to know who owns a stock, they find out via their computers sending a message to ASX and ASX sending back a confirmation. Streams of messages flow all day, with participants in the market building and maintaining their own copies of data held by ASX.

But this means there are copies of the information on computer systems all over the market, and they aren't always consistent. This slows down processing times: it takes up to two days to settle an equity trade.

Distributed ledger technology allows all participants in the market to know for sure that the information in their system (known as a "node") is the correct and latest version available.

The technology removes the need to reconcile copies of information and opens the door to automating a host of processes across markets that are cumbersome and often paper-based, such as participating in dividend reinvestment plans.

It is not only information about equity markets that will be improved. ASX wants to shift the clearing and settlement of bond

DANIEL MUNOZ

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markets onto the blockchain, reducing the need for trading firms to have multiple systems for different asset classes. A similar system could in future be used by other industries.

It's a leap of faith by ASX into the technological unknown. When its system goes live in two years, it will be the first time participants in a financial market anywhere in the world will be able to connect directly to "source-of-truth" data.

## WANTED: MORE TECH LISTINGS

Stevens says ASX was seen as a world leader in message-based clearing and settlement systems that did away with paper-based share certificates when it built the CHES system in the mid-1990s. He hopes that Australia can again leapfrog the rest of the world.

But he is struggling to get local players to understand where the future is heading.

"If the industry wants to keep on doing messaging, that's fine," he says. ASX has ensured the new system also provides a status quo option where participants can connect to it via traditional computer back and forth. "But at least there's a card on the table and Australia can move and do something quite special. I hope there are benefits from this for ASX. But I also hope there are benefits for the industry."

The distributed ledger project is part of a broader technology push under Stevens as ASX modernises other information technology infrastructure. When he presented ASX's half-yearly financial results in mid-February, its broader data strategy became clear to the public for the first time.

ASX has built a new data analytics platform, ASX DataSphere, which will be made available to commercial customers in June and allow them to garner insights from data at ASX as

well as their own. ASX is developing artificial intelligence tools that will be offered to clients to use on the platform.

It has almost completed a new communications network known as ASX Net, which runs the crucial Reserve Bank settlement system for banks, and is upgrading its secondary, back-up data centre in Bondi. It is also building a new website for the public to access more comprehensive information about listed companies and markets.

For Stevens, improving ASX's technology is part of a broader world view, where the technology sector becomes a more prominent part of ASX itself, commensurate with its growing stature in the global economy.

He is also responding to a long-held gripe of institutional investors that the local equity market is too skewed towards resources and financial stocks. The list of large Australian companies – big miners, banks and retailers – has been the same for decades. This contrasts with the United States, where new technology giants such as Amazon and Google dominate and have created riches for investors.

ASX is working to attract more technology listings from companies in Israel and the United States, including, most recently, San Francisco's Life360, which listed in May.

The efforts have become more pressing as ASX faces the risk of "de-equitisation", or having fewer public companies in which to trade due to mergers and acquisitions and fewer initial public offerings. This is problematic for a superannuation system whose asset allocation is heavily skewed towards equities, limiting the benefits of diversification.

"If we left technology to other exchanges, then capital, companies, investors and exciting growth opportunities would go elsewhere,

## BY THE NUMBERS

**\$2 trillion**  
Domestic equity market capitalisation \*

**2268**  
Total entities listed on ASX \*

**\$6 billion**  
Value of daily equity trades

**6.9 million**  
Number of Australian share owners

**\$30 million**  
Estimated cost of new ASX system

\*END OF APRIL SOURCE: ASX

and our public market would become less relevant," Stevens says. "By attracting foreign tech companies to list on ASX and build a viable ecosystem, we are also helping ensure that quality local tech companies stay in Australia and remain accessible to Australian investors."

Taking a blue marker from the conference room table at ASX's headquarters in Bridge Street, Sydney, the trim and energetic Stevens approaches a floor-to-ceiling whiteboard that runs the length of the room. He has his sleeves rolled up, figuratively and literally.

He sketches a bicycle wheel. ASX has until now been like a hub, connecting to various spokes. But the new world looks different, he says, drawing a big chess board next to his wheel. In the future, ASX's blockchain "will light up this grid".

It is becoming clear a core element of this grand plan involves the democratisation of data. Stevens wants market information accessible to a broad range of parties, well beyond the inner sanctum of the brokers comprising those spokes.

This will include fund managers, other asset managers, insurers and listed companies themselves. They will all be able to rely on the data as being true and correct at any point in time, and make more confident decisions accordingly. Companies will get more transparency on their shareholders. Regulators will be able to monitor markets more comprehensively. Corporate actions and proxy voting could be automated and digitised.

Stevens' vision is of ASX as host of a big network. "You have to think about where things are heading in 10 years' time," he says. "Small gains happen in front of your head but seeing the big picture is what it's all about."

## STEADY RISE



## Q+A

**How would you describe your leadership style?**

More team captain than army general.

**What would you tell your younger self?**

Trust your instincts and go for it.

**Most important question when hiring?**

What do you enjoy doing when you're not at work?

**What excites you right now?**

The possibilities that come from the changes we're making at ASX.

**When do your best ideas come?**

When I get a few uninterrupted hours.

**What office habits annoy you?**

Starting the day with my calendar full of meetings.

**What is your morning ritual/exercise regime?**

Coffee then absorb media and overnight market news. I tend to exercise after work.

**Favourite holiday spot?**

Africa.

**Last good book, podcast or film?**

I joined the rest of the world finding out who ends up ruling Westeros.

**How do you unwind?**

Family time and travel.

Stevens was born in Sydney, grew up north of the bridge and now resides in a historic, \$21 million mansion in Bellevue Hill, next door to Lachlan and Sarah Murdoch. He says he never sees the glamour couple, whose property is connected to several neighbours. "They come and go," he quips.

The fourth-born of five siblings, Stevens describes himself as a frustrated doctor. His mother was a nurse and his father was a neonatal specialist who used to take a young Dominic to his weekend ward rounds at what is now the Prince of Wales children's hospital in Randwick. The visits seeded a lifetime interest in science and technology.

Stevens and wife Emma have a son and daughter at university (one is studying science and business, the other arts) and his youngest son is doing the HSC this year. The family takes ski trips in Lech, Austria, and more low-key gatherings at a holiday home at Boomerang Beach, three hours north of Sydney, which the couple bought off Emma's parents.

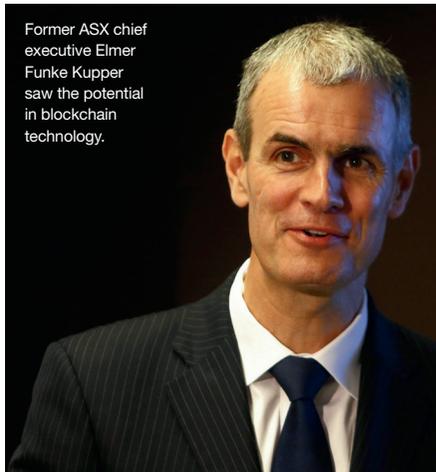
A finance graduate from UNSW, Stevens was incredibly lucky to land his first job on the derivatives desk at Bankers Trust. It was 1987, and new markets were exploding following the Hawke government's deregulation of the Australian economy. He flourished amid the BT brains trust, where the culture encouraged robust intellectual and collegiate approaches to problem solving. "It was a scene where anything was possible, you just had to work it out," he recalls fondly.

He moved to Challenger, which was pioneering annuities, and became CEO in 2008 as global capital markets were suffering a seizure. He held the job for four years and got to know James Packer, who sat on the board.

Some staff who have worked with Stevens describe his style as confronting and intrusive, and his intellect as intimidating. But if he comes across as overbearing, Stevens says, it's not because he's adopting command and control style. Rather, the cultures at BT and Challenger involved smart people vigorously interrogating each other to determine the best answers to curly problems. He enjoys camaraderie and describes himself as "a player in a team, rather than a general".

After leaving Challenger, he and Emma took their children out of school for a year to travel the world, including Africa. After returning to Australia, he worked from a desk at Chifley Associates, where his former boss at BT, Jillian Broadbent, also kept a desk and David Gonski and other senior directors circled the halls.

Former ASX chief executive Elmer Funke Kupper saw the potential in blockchain technology.



Stevens joined the board of ASX as a non-executive director in 2013, and recalls being attracted by its looming technological transformation. He took part in a few angel investment deals and says he became interested in fintech, studying the potentially disruptive impact that peer-to-peer lending could have on the process of bank credit creation. He helped Packer and other members of a consortium invest in SocietyOne, and joined its board in 2014. (He relinquished that role, and his own investing, after being appointed ASX CEO.)

BOSS spoke with several directors who worked with Stevens before he took on the chief executive role, and all described his uncanny ability to grasp the big picture and the micro-level operational details. It was an approach he put into action to assess how to modernise CHES.

## POLARISING PROJECT

ASX began to weigh what to do with CHES in the first six months of 2015. The ageing system was written in an antiquated programming language called COBOL and used proprietary messaging standards, which made it expensive to run and to retrofit into newer IT systems. Then-CEO Elmer Funke Kupper spoke publicly about the potential of blockchain in late 2015, a time of peak hype about the broader application of the technology that made bitcoin possible.

ASX believed that if it did not develop a blockchain option, another clearing provider, such as the London Clearing House or the London-based SETL, might. This could threaten the role of ASX in the future.

One of the start-ups invited to Australia to demonstrate its capability was Digital Asset,

run by Blythe Masters, a former JPMorgan investment banker. Digital Asset had a clear vision of the way digital ledger technology would change financial markets. "Every now and then a new technology comes along that can transform a way an industry operates," Funke Kupper says. "When we got our heads around DLT, we thought it could do this for our equity market."

Several financial institutions had been experimenting with DLT and showed that it could work for a small number of financial transactions, but none had shown it could work for an entire market, he says. "We decided that the only way to discover if it could work for our equity market was to build the real thing."

Yuval Rooz, Digital Asset co-founder who became CEO after Masters stepped down late last year, worked closely with Stevens and the board as they did detailed due diligence on the technology.

While all the directors worked tirelessly to ensure the new system would be secure, Stevens requested additional briefings with Rooz and his chief technology officer to ensure he understood the IT architecture in detail.

"If you think of many technology innovators, they think big because they really understand the tools they have in their hands," Rooz says. "[Dominic] has a vision of what they can do with the technology."

ASX announced in January 2016 that it would work with Digital Asset to build a prototype and would invest in the start-up. Two months later, Funke Kupper stepped down as CEO after a media report made allegations of corruption relating to his time as CEO of Tabcorp. Stevens assumed the CEO job in August 2016. The blockchain project was now his to deliver.

Almost three years in, Stevens' calm and logical approach appears to have given confidence to Australia's regulators. The Reserve Bank, which regulates the clearing and settlement system, was brought into the tent from day one; Stevens and RBA governor Philip Lowe catch up regularly to discuss progress.

In the market, however, the project remains polarising. Many view the adoption of DLT as aggressive rather than defensive. Some say ASX is using its privileged position over clearing and settlement to lock down future revenue streams by expanding the new system into additional services.

Market intelligence group Rainmaker estimates it costs \$22 billion a year to run

the superannuation system. While ASX receives about \$100 million each year for settlement and clearing, huge fees are paid to brokers, custodians, registries and many others who profit handsomely from shifting equities around.

Blockchain could accelerate a trend towards self-service; for example, if clients were able to conduct their own registry management, companies such as Computershare and Link Market Services would come under pressure.

During market consultation, alternative exchanges such as the Newcastle Stock Exchange and Sydney Stock Exchange, and alternative trading venue Chi-X, also raised questions about the CHES replacement project. An unpublished working paper prepared by Deloitte, and obtained by BOSS, says ASX has provided a “slow drip feed of information” not sufficient to assess the impact of the new system.

Brokers are also struggling to understand its impact and fear they are being forced down an uncertain road where the promised efficiencies may fail to materialise.

“They are taking us on a journey, but we don’t know where we are going,” says the head of an equities desk at an investment bank. “There’s a perception of engagement, but it’s more of a sermon to the industry. This has been a tick-the-box exercise.”

Others question the spending required to connect to and run the new system, which will be millions of dollars across the market. The disruption comes at a difficult time for brokers: trading volumes are down, margins are skinny, and there is intense pressure from new regulations and more demanding investors.

ASX has told the market it will not charge for its “nodes” for the first three years after the new system goes live, but hasn’t revealed pricing after that. The market also has no clarity about the cost of additional blockchain-powered services that they feel they will need to buy to remain competitive.

“We can’t do a return-on-investment calculation, as there’s not enough detail on pricing,” says another trading desk head. “We can’t get budget approval to update systems because we don’t know what we don’t know.”

## MODEL FOR OTHER INDUSTRIES

Stevens is empathetic about the wave of disruption, saying: “Change is not without friction.” But he says the market is conflating two issues. CHES was always going to be replaced with something, so participants



were always going to spend to upgrade to that replacement.

He says all new services created on top of the new system will be optional, and promises that clearing and settlement fees will be no higher for brokers connecting the old way.

But he recognises he has more work to do on stakeholder communications, including better explaining what it’s not doing. ASX will not, for example, create and control new data sets. He has also assured the market the new system will be more secure than the existing one.

Williams, who before rising to lead UBS’s equities desk worked at ASX for seven years and also covered the company as an equity analyst for a decade, is confident Stevens will get the doubters over the line.

“When first considering changes, everyone focuses on costs and challenges and it is difficult in big organisations to mobilise resources and prioritise investment spend,” he says. “ASX needs to get the industry to a point where they understand the benefits as well as the costs.”

In May, ASX switched on a “customer development environment” that will allow players to experiment with the CHES information so benefits become clearer.

Progressive investment banks are experimenting with “smart contracts”, software that could hardwire corporate law and regulations into business processes across the market and manage secondary equity capital raisings by assigning legal responsibilities to the various players and ensuring they only see the information they are allowed to.

A chalky listens to calls from the floor traders at the Sydney Stock Exchange in the pre-digital days of 1987.

At the Stockbrokers and Financial Advisers Conference on May 22, Stevens adopted a conciliatory tone, making it clear ASX does not want to compete head on with its customers. Rather, its philosophy is more about providing connectivity.

This can be seen at the ASX’s data centre in Artarmon, known as the Australian Liquidity Centre. There are 300 financial markets organisations connected to ASX inside the room, but many are also connected to each other. Some smaller banks have put their entire core banking systems inside the facility.

Having all the main markets players so physically close reduces the cost of technical services.

Access to the data centre is available only to participants in financial markets, but a range of other industries could benefit from creating a single source of real-time information. Think logistics, property or healthcare.

“We are not just thinking about how customers connect to ASX but how customers connect to the industry,” Stevens says.

For now, ASX is focused on getting the CHES replacement right, but Stevens acknowledges the project provides “optionality” for the future.

“ASX is developing intellectual property in thinking about how industries can be better run, how it could make life easier for highly distributed groups of customers who want real-time information – there are lots of industries who could benefit from that,” he says. “Could that IP be valuable in the future? Yes, it could be.”