



Media Release

23 August 2021

Completion of independent review of the November 2020 equity market outage

The independent expert review of the ASX market outage that occurred after a new version of the Nasdaq equity market trading system went live on Monday 16 November 2020 has been completed.

ASX commissioned the review by IBM in consultation with the Australian Securities and Investments Commission (ASIC) and the Reserve Bank of Australia (RBA).

The review's report makes recommendations across seven categories. IBM's summary of its recommendations is attached.

ASIC and the RBA have issued their responses today. ASX is engaging closely with both regulators and will address all of the report's recommendations. ASX's actions reflect our commitment to continually improve our resilience by implementing learnings from incidents and outages, and to ensure we maintain a contemporary technology base.

ASX to address all the independent expert's recommendations

Dominic Stevens, ASX Managing Director and Chief Executive Officer, said: "Last November's market outage fell short of ASX's high standards. We believed that the software was ready for go-live, as did our technology provider Nasdaq. Clearly there were issues, which was particularly disappointing given the significant progress we have made on resilience in recent years.

"We acknowledge the findings in the report. It's pleasing that ASX met or exceeded leading industry practices in most areas. But the report does point to some important areas for improvement and we will address all of its recommendations.

"ASX is well advanced in developing a detailed response plan for execution over the next 12 to 18 months, and we'll commission the independent expert to review our actions to meet its recommendations. Our delivery of this program of work will be under the oversight of ASIC and the RBA."

ASX action already taken

Mr Stevens continued: "ASX has undertaken a range of actions since November to help address issues arising from last year's outage. This includes the work already underway to review our operating model. The aim is to ensure ASX's structure best reflects our strategic priorities, better aligns management roles, enhances management responsibility and accountability, and sharpens our focus on customers."

Mr Stevens said: “We have re-aligned our teams under four business areas – *Markets, Technology and Data, Securities and Payments, and Listings*. Under this new structure the former equity trading business now reports to Helen Lofthouse as part of our new Markets division, sitting beside our derivatives trading business. The executives running the four business lines all report directly to me as CEO, with clearer accountability for services, operations and projects within their businesses.

“An important part of the new structure is the creation of an expanded *Customer* function run by Val Mathews. This aims to improve the end-to-end experience for customers by bringing together our customer-facing operations, communications, marketing, digital and program delivery activities.”

The revised leadership team for these areas comprises:

- Helen Lofthouse - Group Executive, Markets
- Dan Chesterman - Group Executive, Technology and Data
- Val Mathews - Chief Customer and Operations Officer
- Timothy Hogben - Group Executive, Securities and Payments
- Max Cunningham - Group Executive, Listings.

In addition to changes in management, ASX has also taken steps to enhance our project delivery and execution practices. Since the outage ASX has:

- Refined and improved our working practices for new service releases with Nasdaq
- Engaged external specialists to improve our quality assurance and testing capabilities
- Aligned our Project Risk Management and Enterprise Risk Management frameworks more closely
- Enhanced the ASX Delivery Framework to improve consistency in our approach to delivering projects
- Reviewed the assurance plan for the CHES replacement project covering project governance and functional and non-functional project objectives, including testing, project risk and issues management.

The importance of operational resilience at ASX

Mr Stevens continued: “ASX takes the resilience and reliability of its markets extremely seriously. That’s why we immediately engaged with our regulators to commission this external review and will address all of its recommendations. It’s also why we’ve already taken action to change our project delivery practices. The changes we’ve made to our management structure are aligned to these objectives.

“Driving technological change is hard and creates transition risk. No market will operate without incidents or outages from time to time. Nevertheless, all outages are regrettable.

“Since 2016, ASX has strengthened its risk and incident management, technology governance and enterprise architecture. In addition, we have substantially increased our investment in upgrading and modernising our technology. As a result, resilience has improved significantly. On a six-month rolling average, the number of customer-impacting incidents has dropped by 87%. There has also been a material reduction in outages. The progress we have made in reducing incidents and outages over the past five years validates our approach.”

For information on ASX’s investment in technology and the reduction in outages, please see the charts below.

CHESS replacement remains on track

Mr Stevens said: “ASX recognises that there is interest in how the findings in this report relate to the CHESS replacement project. We will ensure that any relevant insights that have not already been built into the CHESS project are taken on board.

“CHESS replacement is making good progress towards its go-live date of April 2023. With the disruption caused by COVID and the related large increases in volume, ASX consulted the industry on an updated implementation plan last year, with substantially more time added for testing and quality assurance activities.

“Multiple external experts are providing input on cybersecurity, testing, performance, data migration and governance, alongside the project’s independent assurance program.

“We will continue to work to ensure CHESS replacement remains on track to deliver enhanced infrastructure for the Australian market safely and securely”, Mr Stevens concluded.

Background

Shortly after the market opened on Monday 16 November 2020, a software issue causing a data problem was detected in the new Nasdaq Financial Framework release of the ASX equity trading system. This required ASX to close the market for the rest of the trading day. Nasdaq identified the root cause to be an issue with its software code that caused incorrect functionality in the tailor made combinations order book.

Further enquiries:

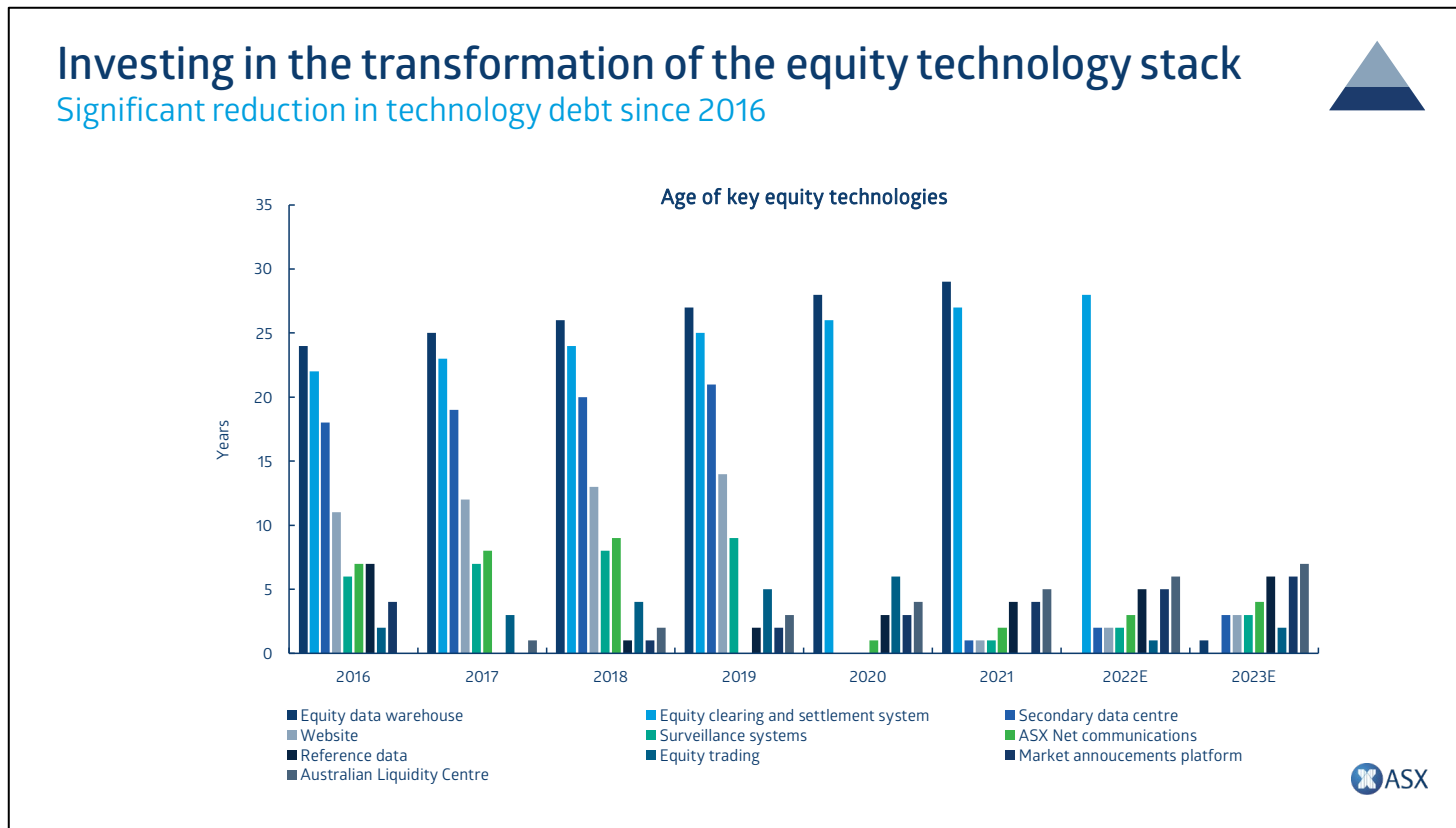
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Increasing resilience and reliability charts - ASX full-year results August 2021

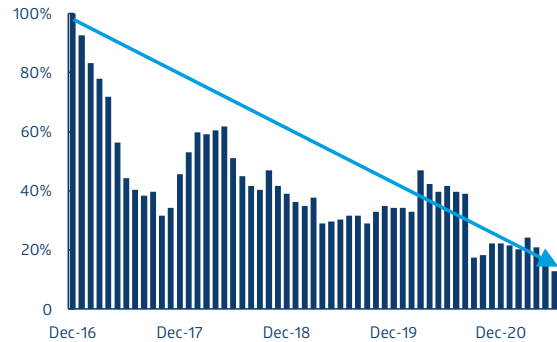


Improved resilience delivered by technology transformation

Significant reduction in incidents and outages



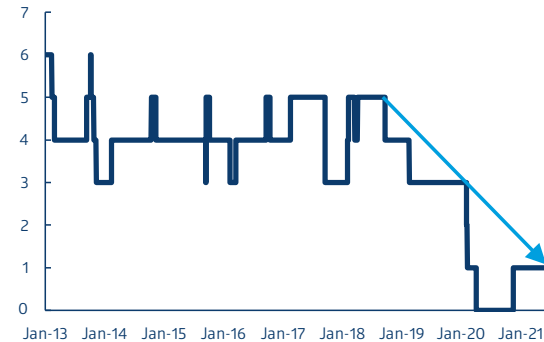
Index of incidents that have a customer impact on a rolling six-month basis (December 2016 = 100%)



- 87% decline in incidents since 2016 reflects:
 - Execution of Building Stronger Foundations initiatives
 - Increased investment in infrastructure and expertise
 - Technology contemporisation

1. ASX Trade, CHES, Austraclear, NTP/SYCOM and Genium clearing.

Number of outages on a rolling two-year basis – five key trading, clearing and settlement systems¹



- No outages for over two years prior to the ASX Trade outage in November 2020
- Averaged 99.98% uptime across all five key systems between 1 July 2017 and 30 June 2021



IBM's summary of its recommendations

1. Risk	2. Governance	3. Delivery	4. Requirements	5. Vendor Management	6. Testing	7. Incident Management	
<p>1.1 Actively promote a risk aware culture, where risks and issues throughout the project delivery cycle are freely identified and managed in accordance to the ASX project policies, ASX enterprise policies, the ASX risk appetite and its responsibility as an operator of a systemically important national infrastructure.</p> <p>1.2 Review and revise the risk policies and templates for project initiation and business case development.</p> <p>1.3 Repeat risk analyses at key points during the project lifecycle, ensure that risks are identified and logged from a variety of key sources, that key risk metrics are reported to governance functions and ERM Line 2 is involved early by suitably qualified staff.</p> <p>1.4 Ensure that Customer related risks to be logged by the Technical Account Managers.</p>	<p>2.1 Review and adjust the composition of project governance forums to ensure appropriate coverage and independence.</p>	<p>3.1 Review and revise the project delivery procedures to emphasise lessons learned, need for quality management, reporting and tracking of expectations.</p> <p>3.2 Implement risk-based paths for project delivery, tied to the PRA assessment and periodic review of the PRA. These paths should mandate key checkpoints and control gates. Project management functions and governance will follow the requirements for the risk path selected.</p>	<p>4.1 ASX should maintain their own detailed requirements log to mitigate against over reliance upon a single vendor and in the event ASX would ever need to change supplier. This log would provide a means to validate the vendor's position and would be in addition to the test cases, documenting non-functional, process, integration as well as functional needs.</p>	<p>5.1 Review and revise the technology vendor management practices to establish clear contractual arrangements, establish clear lines of dialogue regarding quality and maturity issues and establish a contractual acceptance criterion that supports ASX's quality and risk management program.</p>	<p>6.1 Create a program to raise awareness of the ASX Testing Vision and its implications on testing plans, invest in an independent QA function alongside a program of continuous test process improvement.</p> <p>6.2 Enhance in-house capabilities for combinatorial testing strategies, methods, tools and datasets to combine functional, negative-functional, non-functional and operational testing at volume with representative data (real or simulated) in an end-to-end environment to create "production-like" testing scenarios targeted at reducing the risk of latent defects causing catastrophic failures in production situations.</p> <p>6.3 Revise and align the ASX Testing Policy and Guidelines to the ISO 29119 Guidelines and create a training program to familiarise the teams with the ASX Vision, objectives and approach to ensuring delivery of quality products to its customers consistent with the responsibilities of ASX as an operator of a systemically important national infrastructure.</p>	<p>6.4 Review and update the test planning processes, test selection and design guides, templates, and reporting to align with the revised ASX Test Policy and reflect the alignment with the vision statement in the Policy.</p> <p>6.5 Adopt and implement a metrics framework with an associated dashboard for testing metrics and quality tracking and reporting.</p> <p>6.6 Ensure that the new ASX Trade Refresh project is prioritised for the upcoming annual ITDR exercise to increase confidence and reduce risk.</p> <p>6.7 Review the policy to consider whether mixing any form of customer testing with go-live weekend activities is appropriate for critical new system deliveries.</p>	<p>7.1 Document a policy about closing the market based on a pre-determine period of uncertainty due to an outage.</p>