2023 INVESTOR DAY – GLOBAL TECHNOLOGY

TRANSCRIPT

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MANAGEMENT DISCUSSION SECTION

Operator: Welcome to the stage Lori Beer, Global Chief Information Officer.

Lori Beer

Global Chief Information Officer, JPMorgan Chase & Co.

Good morning. I'm Lori Beer, the firm's Global Chief Information Officer. I'm happy to be with you today to provide an update on the progress we have made towards our mission to deliver leading technology at a global scale with speed that enables business growth. Last year, I laid out our technology strategy across four pillars. We remain committed to this strategy and our talented team of more than 57,000 technology employees have executed against it to drive our business forward.

Let me share some more details that highlight our progress, starting with our products. We build products and platforms that provide economies of scale and deliver seamless multi-channel experiences. We rapidly deploy new features to continually improve our offerings and delight our customers. There are many examples of this work across our businesses and my colleagues will cover some of them in their presentations today. Products and platforms need a strong foundation to be successful, and ours are underpinned by our mission to modernize our technology and practices. We are already delivering product features 20% faster than last year, and we continue to modernize our applications, leverage software as a service and retire legacy applications.

We are doing all of this while we continue to make progress on our multi-vendor public cloud strategy, leveraging the benefits of public cloud where it makes sense while also optimizing our data centers. We continue to embed data and insights into everything we do, and we are ahead of our plan on our commitment to drive $1 billion in business value through AI investments by the end of this year. We have increased the number of AI use cases in production 34% year-over-year, with more than 300 in production. And we are actively evaluating opportunities with large language models and see great potential in that space.

Finally, but critically important, we work every day to protect our firm and our customers. We remain steadfast in our commitment to proactively defend against cyber threats both within the firm and by advising our customers, the industry and our communities and governments. And despite ever increasing volumes and more sophisticated capabilities, we have kept our expenses relatively flat to volume increases. Cyber is a differentiator for us and continues to drive value for the company. I'll cover our strategic pillars in more detail later but first, I'll talk about our total spend in technology.

For 2022, we ended the year at $14.3 billion in technology spend. This was a little higher than what we shared with you last year, primarily driven by structural headwinds from labor inflation. These were largely offset by internal efficiencies and incremental investments were in line at $1.1 billion.

For 2023, we expect to end the year at $15.3 billion in spend driven by increased volumes, wage inflation and targeted investments primarily in CCB. We expect to see continued business volume growth, fewer headwinds from attrition and wage inflation, and once again, we expect this to be offset with internal efficiencies and our productivity efforts totaling a half a billion dollars.

On the right, you see total investment of $7.2 billion, consistent with what we discussed last year. $4 billion is in support of delivering customer and client experiences and product development, while the remaining $3.2 billion sits across three of our strategic focus areas and represents in firmwide platforms that give us scale, including development, data, public cloud and cybersecurity.
Through our disciplined investment approach, we have been able to keep technology spend as a percent of revenue relatively consistent over the past several years at around 10%, with the majority of the expense growth since 2019 due to investment spend across our strategic pillars. Lastly, you'll see our run the bank costs have remained relatively flat, despite increasing volumes, demonstrating our ability to scale efficiently.

We have worked to offset increases in business volumes and wage inflation through productivity and efficiency gains. We are delivering a half a billion dollars against the commitment we made last year to realize $1.5 billion in productivity and cost efficiencies over three years.

These gains are tied to investments and actions we've taken in the way we deliver software and our modernization efforts. Specifically, we have driven $300 million in efficiency through modern engineering practices and labor productivity, and we have developed a framework that enables us to identify further opportunities in the future. Our infrastructure modernization efforts have yielded an additional $200 million in productivity, driven by improved utilization and vendor rationalization.

And now I'll walk you through more details behind the modernization efforts and the results we are seeing. Our modernization work covers three areas: applications, infrastructure and engineering practices. Adoption of industry-leading software-as-a-service solutions is an important driver of application modernization. In total, we have more than 560 SaaS solutions across our technology estate, a 14% increase since 2022. One example is our communication and collaboration tools, where we will migrate nearly 60% of our tools to SaaS by the end of 2023, which will allow us to rapidly scale new products to more than 290,000 employees. In addition, we continue to retire legacy applications with more than 2,500 decommissioned since 2017. And finally, we are investing in modernizing the applications we build to allow more rapid delivery, efficiency and scale.

There are two ways we are modernizing our infrastructure. The first is migrating applications to more efficient data centers. To date, we have moved about 60% of our in-scope applications to new data centers, which are 30% more efficient, and this translates to 16,000 fewer hardware assets. We are also migrating applications to utilize the benefit of public and private cloud. 38% of our infrastructure is now in the cloud, which is up 8 percentage points year-over-year. In total, 56% of our infrastructure spend is modern. Over the next three years, we have line of sight to have nearly 80% on modern infrastructure. Of the remainder, half is mainframes, which are highly efficient and already run in our new data centers.

Our cloud journey will ultimately create a faster and more efficient environment for our businesses. By working toward our target state of multi-vendor public cloud and modern strategic data centers, we have been able to keep our infrastructure expenses relatively flat, while our compute and storage volumes have increased 50% since 2019 and tripled since 2015. This strategy will be critical as we continue to scale in new areas such as AI.

The third piece of our modernization strategy is equipping our 43,000 engineers with the capabilities and tools they need to optimize their work and boost productivity. We targeted 80% adoption of our enterprise tool chain by the end of 2022. We are currently at 84% with a plan to reach 100% by the end of this year.

Additionally, engineering excellence is measured through the productivity framework I mentioned earlier and is tracked across speed, agility and stability. Over the past year, we have made steady progress on all three, showing improvements in the number of applications and teams that are adopting the framework, as well as seeing meaningful improvement in outcomes.

On speed, we've achieved 60% framework adoption and 20% year-over-year improvement in the speed to move features from backlog into production. In agility, 60% of our teams have adopted agile practices and measurement frameworks. This has directly influenced business outcomes, a few of which I will highlight on the next slide.

Speed and agility only matter if you have stability. Our change volumes have increased 60% year-over-year, which means we are making many more frequent changes. Despite this increase, we have a 99.9% success rate in executing those changes.

Let's discuss some real examples of how modernization has created value for the firm. In CCB, our Chase.com ecosystem continues to become more modern and offer more products to our customers. The migration of Chase.com to the public cloud was completed in the fourth quarter of 2022, with all customers now being served through AWS. Leveraging the public cloud, Chase.com delivers an average of 15 releases a week. And as we launch new features for our customers, we have maintained stability despite a 22% increase in change volume.

Also in CCB, we have launched Connected Commerce, an innovative product ecosystem that leverages APIs to offer our customers targeted products and services across their buying journey. You'll hear more about this from Allison Beer later.

In CIB, we have developed a scalable modern transaction engine for processing global JPMorgan payments. We are growing our capabilities, including the expansion of real-time payments, and have been able to reduce our launch time from 18 months down to 3 to 6. This is also our third largest payments platform and soon to be the second largest.

Finally, we have our Markets Regulatory Reporting Platform, a public cloud hosted data warehouse operating in more than 15 locations, which provides global regulatory reporting across cash equities, futures and options. This is a great example of the benefits of our strategy to run modern data platforms on the cloud. The platform is scalable to 2.5 billion trades per day versus 500 million when hosted in our data centers, with monthly running costs decreasing more than 50%.

The third pillar of our strategy is unlocking the power of data and AI. The importance of this effort has never been more clear with artificial intelligence appearing regularly in the headlines. We have made tremendous progress building what we believe is a competitive advantage for JPMorgan Chase. We have over 900 data scientists, 600 machine learning engineers and about 1,000 people involved in data management. We also have a 200-person top notch AI research team looking at the hardest problems in the new frontiers of finance. We were recently ranked number 1 on Evident AI’s Index, the first public benchmark of major banks on AI maturity.

Demonstrating the progress these teams have made, last year we committed to delivering $1 billion in business value by the end of 2023. We are close to realizing that goal ahead of schedule and are therefore increasing our target to $1.5 billion by the end of this year.

This value is driven by more than 300 AI use cases in production today for risk, prospecting, marketing, customer experience and fraud prevention. Last year, I highlighted trading and risk use cases, and we continue to see great value from both. But today I'll highlight two other examples, which are generating real revenue for the firm.

In the retail space, AI is helping us offer more personalized products and experiences to our customers, such as credit card upgrades. And collectively, this work has delivered over $220 million in benefit in the last year alone. And we aren't just focused on retail. We are also leveraging AI in sales to generate insights to deepen our relationship with clients across our lines of business, such as in the Commercial Bank, where AI is helping provide growth signals and product suggestions for bankers. These efforts delivered $100 million of benefit in 2022.

Our ability to drive this level of value is driven not only by the sheer volume of data we possess, but also our modernization investments, which have enabled us to migrate large amounts of data to the public cloud and enhance the capabilities in our underlying data platforms. These platforms enable us to develop models faster with embedded governance, demonstrating our investment discipline as we deploy AI across the firm. We are seeing strong returns and have increased our ROI 25% from 2021 to 2022. And we expect this to continue in the future.

We couldn't discuss AI without mentioning GPT and large language models. We recognize the power and opportunity of these tools and are committed to exploring all the ways they can deliver value for the firm. We are actively configuring our environment and capabilities to enable them. In fact, we have a number of use cases leveraging GPT4 and other open-source models currently under testing and evaluation.

We take the responsible use of AI very seriously, and we have an interdisciplinary team, including ethicists, data scientists, engineers, AI researchers and risk and control professionals helping us assess the risk and build appropriate controls to prevent unintended misuse, comply with regulation, and promote trust with our customers and communities. We know the industry is making remarkably fast progress, but we have a strong view that successful AI is responsible AI.

As Daniel mentioned earlier, cybersecurity is paramount to our company and our industry. Everything we do is underpinned by our commitment to protect our customers, clients and the firm, and we believe we are best in class. On the left, you can see we are accomplishing more with our cyber investment, expanding our capabilities and holding expenses relatively flat while the number of attempted attacks continue to increase. We have partnered with suppliers and proactively mitigated more than double the supplier vulnerabilities than the year before. We continue to grow our cybersecurity awareness program for our employees and our clients, sharing best practices and leading preparedness exercises.

Our focus here does have tangible business value. Through automation and efficiency, we are freeing up more of our developer's time to focus on building best-in-class secure products for our clients. We are continually evaluating our ecosystem and looking to leverage technology to improve our overall cybersecurity posture. We are proud of the ongoing partnership with policymakers and the US government as we improve the underlying security of the overall financial services ecosystem. We are leading in security research and continue to actively collaborate with NIST on what security looks like in the future and how we are prepared for quantum safe encryption. Cybersecurity is fundamental across our company and strategic priorities. We are laser focused internally and across the ecosystem in which we operate by securing our systems and protecting our data, our clients and our customers.

We've covered a lot today, so let me summarize the key points for you to take away. Last year, we laid out our technology strategy to deliver business growth on a global scale. We have delivered across all of our pillars, and today we remain committed to our strategy. First, there are a number of examples across our businesses where we're building and deploying innovative new products and services on modern platforms. You will hear more about them throughout the day from our business CEOs.

Second, we have made great progress with our modernization strategy. We are on target to achieve 100% adoption of our enterprise toolchain this year. We also continue to modernize our application portfolio, moving toward our target state of multi-vendor public cloud, backed by modern strategic data centers. Our efforts have already yielded a half a billion dollars in productivity and efficiency gains, and we are on track to deliver against our three-year goal of $1.5 billion.

Third, we continue to lead the industry in data and AI and are ahead of plan on the commitment we made last year to realize $1 billion in business value. With over 300 use cases in production and many more exciting ones in development, I am confident we will hit our new target of delivering $1.5 billion of value by the end of this year, demonstrating our leadership position in AI.

Finally, I cannot overstate the importance we place on protecting the firm and our customers. Across all of our strategic priorities, maintaining the security of the firm has been consideration number one. In doing this, we have discovered new areas of opportunity, new partnerships and principally new value to the firm, the industry and our communities.

Technology is the foundation of current and future growth across all of our lines of business, and you will hear this reiterated by my colleagues throughout the day. Our focus on disciplined investment has allowed us to protect our firm and grow our business, while keeping our technology spend relative to revenue consistent at around 10%. With this proven strategy, JPMorgan Chase is well positioned to continue leading in all of our businesses backed by resilient, scalable and innovative technology for years to come.

Thank you, and I can take a few questions now.

QUESTION AND ANSWER SECTION

Mikael Grubb
Head of Investor Relations, JPMorgan Chase & Co.

All right. We have time for a couple of questions. Mike Mayo?

Mike Mayo **Q**
Analyst, Wells Fargo Securities LLC

You can't laugh until I ask my question. Look, you said you have flat infrastructure costs with double the compute since 2009. You're gaining the tech savings as expected, the $500 million this year. You're ahead on the AI-driven savings. You retired 2,500 apps and you're 38% on the cloud, up 8% year-over-year. But then slide 2 says you're spending $1 billion more on tech. And so, what are the related revenues? I know part of that is simply to keep the lights on, part of that is to modernize, which you don't see for a few years, and some of that's for revenues. So, it'd be nice to equate that $1 billion of additional tech spend to some kind of current revenue figure or future revenue figure. Thank you.

Lori Beer **A**
Global Chief Information Officer, JPMorgan Chase & Co.

Yeah. And I think you'll hear a lot of the businesses talk about how their technology investments, it's probably best, Mike, that they share those examples. When you look at the increase in $1 billion, keep in mind there's a couple of things embedded in that. There's definitely investments in CCB, which you'll hear from Marianne and Jenn, they'll cover those in detail. But remember wage inflation. And so, we went through a period of high tech demand, as I mentioned, I think we will absolutely, attrition is very low, we will see that moderate over time.

And remember business growth, now, business growth comes in many forms. First of all, when we grow on modern platforms, we grow a lot more efficiently. I talked about that. The second thing to think about growth is we still need to support the business while we're growing onto the modern platform. So, that will help us grow even more efficiently over time. And third, just think about the technology we need as we build a new building, as we expand branches and we continue to grow our business. So, when you look at business volume growth, those are the ways you can think about it. And again, I think since most of the increase is CCB, Jenn and Marianne can do a better job explaining the value they're seeing for those investments.

Mike Mayo **Q**
Analyst, Wells Fargo Securities LLC

If I can just try one more way. If you think of investing along a J-curve, you invest and it's a headwind, it's a headwind, and then it becomes a tailwind. Where do you see JPMorgan today, or are you always at the bottom of that J-curve?

Lori Beer **A**
Global Chief Information Officer, JPMorgan Chase & Co.

Look, I think we're definitely seeing our ability to offset. When you look at the three-year plan that we laid out, I feel very good with our – remember, we're moving to modern data centers. You have duplicate or bubble costs while you're doing that. You have bubble costs while you're moving to the cloud. So, I think I feel really good about the upside and the continued delivery in that $1.5 billion that we laid out. I think we're at a great place with our framework around engineering productivity, continue to drive innovation. And I also think there's great opportunities when you think about applying AI to even the software engineering process. So, I think we're in a great spot where we're continuously delivering productivity and we have new tools to continue to do that into the future that we're going to continue to see our ability to create value while our business grows so that we can continue to scale efficiently.

Mikael Grubb
Head of Investor Relations, JPMorgan Chase & Co.

Chris back there.

Chris Kotowski **Q**
Analyst, Oppenheimer & Co., Inc.

Hi. I wonder if you could just discuss how you measure that business value? Is that saved cost versus what you would have had or incremental revenues or some combination of that? And I'm sure it's like the holy grail of trying to measure the value of tech spend, right?

Lori Beer
Global Chief Information Officer, JPMorgan Chase & Co.

A

Yeah. I think there's definitely a bucket of, as you've seen, we've continued to drive automation and you can continue to drive automation across a lot of fronts. One is certainly from an operations perspective or even having more intelligent interfaces such as what we've continued – seen as virtual assistants almost a copilot as you go forward. So, one I would think about in the bucket of how do I drive automation around business processes and continued ways to be able to serve our customers in a more technologically advanced way. That's one. I think there's definitely revenue. I think Takis can talk about that, Marianne and Jenn will talk about, and I think all of the business leaders you'll see today as they go through the presentations can talk about how those technology investments are both driving as we add new customers being able to add them more cost effectively or in some cases creating new ways to generate revenue as the examples I shared with you in the AI section. So, it's a combination of both.

Mikael Grubb
Head of Investor Relations, JPMorgan Chase & Co.

Okay. So, maybe one last question. Betsy. Right there.

Betsy L. Graseck
Analyst, Morgan Stanley & Co. LLC

Q

Hi. Thanks. Lori, you mentioned about JPM payments and transaction engine, and you had a couple of comments in there that were interesting, highlighting that I think the volumes are the third largest, but soon to be in the second largest. Could you give us a little more color and context around those statements?

Lori Beer
Global Chief Information Officer, JPMorgan Chase & Co.

A

Yeah. I think it aligns to what Takis laid out last year. It's where we are in the cycle of our payments transformation. And so, it's the third largest because we continue to migrate to that strategic platform. The team has a good plan that goes in through the next year to be able to continue to migrate those workloads. We shut down those legacy applications, and that platform continues to grow. And so, it's a little bit of a statement around where it is in the modernization journey of the underlying ecosystem for payments and is very much aligned to what Takis had laid out last year in terms of how we're delivering.

Okay. All right. Thank you.