ISAAC BENJAMIN, CHARLES DUKE, TYLER GRIFFIN, ABHIMANYU PRABHUNE, ROSS STODDARD

TO REMOTE OR NOT REMOTE…THAT IS THE QUESTION

The Post-COVID workplace continues to evolve with new technologies and worker expectations. Decisions about its future include financial impacts as well as technology and people's needs.

As Sarah Jenkins was driving over the Skyway Bridge early on a Monday morning, she admired the speed at which she was able to commute on what was usually a difficult drive. As usual, Jenkins used the commute time to ponder the week's agenda and mull over the issues that she and her team may be facing in the coming day, week, and beyond. Jenkins was the Senior Office Manager (SOM) for Initech Corporation, a warehouse automation and intra-logistics Subsidiary of Ichiban North America. As the SOM, she was the Chief Administrator of the Sarasota, FL office. With this crown, she held the responsibility of decisions regarding the offices, building, and other tasks for the physical offices. Much had changed in the last 2 years following the COVID-19 pandemic and more change was on the horizon.

As she drove, she could see the morning traffic congestion start to build ahead. Her commute was not going to be as easy as she had hoped. She then recalled the decision she needed to make soon. The previous week, she had received her final notice that the office's lease was up for renewal. A decision would have to be made. End the lease, go to remote work, and save expenses, or keep the lease and risk losing employees in the emerging remote work world. Of the 75 team members that worked in the offices, many of them preferred to work remotely and would gladly shift to that type of model. Further, the company's technologies already support this type of work. This could be easy.

The bridge traffic then came to an unfortunate complete stop. All lanes were blocked. Jenkins would just have to wait for it to clear. As her patience stalled, she realized this decision was much deeper. What about the clients and their expectations? The Sarasota, FL location has always been a key location for the clients for meetings and team collaboration (Refer to Exhibit 1). Further, the office served as a tax benefit for many of the executive team. They were able to live here and receive their checks in a tax-friendly state. A wrong move could jeopardize employee Work-life balance and result in a turnover on all levels.

Jenkins was sure that her decision point could either propel her team to a higher level of performance or it would be a disaster. Either way, the lease was coming due, budgets had to be forecasted and therefore the decision point was coming, and soon.

Editor: Grandon Gill

US Manufacturing and Automation Industry

The Industry

The manufacturing industry in the US has been a culmination of decades of innovation, scale, and outsourcing that creates a deficiency for a company like Ichiban to fill. The end of the 19th century marked an era of prosperity for manufacturing in the United States. New technological inventions changed the fabric of the United States economy, laying the foundation for the United States to be a major player in the new industrial age. During this time, unlike in prior years, there was a decrease in labor shortages partly because of the contemporaneous transportation revolution, allowing areas of the U.S. with lower populations to better connect to city centers. This creation of population-dense urban areas increased the number of workers around larger cities like New York City and Chicago, reducing the traditional labor shortages in the United States at the time. Additionally, the efficiency and production of trade were improved by the quicker flow of resources and goods throughout the nation.

At the same time, the US pioneered interchangeable part manufacturing techniques that made it simple to manufacture and repair rifles and other devices, reducing the time and expertise required for such tasks. A large labor force coupled with innovative technology increases efficiency in production while blunting production costs, leading to the increased profitability and emergency of large-scale factories that manufacture steel, meat, clothing, and other commercial goods.

With the industrial boom in American manufacturing with record growth and record profits, came the labor movement. During this time of the early 20th century, workers organized after poor working conditions and practices skyrocketed and were publicized. This led to the creation of minimum wages, child labor laws, and other worker protections. While these new laws enacted necessary protections to workers, the regulations increase the cost of production of goods. This, unfortunately, partially led to companies exporting labor and production overseas to offset costs and offer lower prices to consumers, setting the stage for the American manufacturing industry today, and the emergence of companies like Ichiban that automate and provide manufacturing services to businesses.

Automation

In 2021, the global industrial automation market size was $191.9 billion. It was projected to grow to $395.1 billion in 2029. In North America alone, the industry was expected to grow by 8.5% from 2018 to 2028 (Refer to Exhibit 2). The market was classified into discrete automation and process automation.

- Discrete automation refers to the use of technology and machinery to control and automate specific actions or processes that have a clear beginning and end. These actions typically involve the movement or processing of discrete items or parts, such as in manufacturing or assembly line operations.

  Examples of discrete automation include robots and other machines that are programmed to perform repetitive tasks, such as sorting, packaging, or assembling products. Discrete automation systems can also include sensors and control systems that monitor and regulate the movement of materials and products throughout the manufacturing process.

  Discrete automation was a key component of modern industrial processes, enabling faster, more efficient, and more accurate production of goods and services.

- Process automation refers to the use of technology and software to streamline and automate complex business processes, such as order processing, financial management, or human resources. It involves using software to map out a process and then using technology to automate the steps within that process.

  For example, in finance, process automation might involve automating the process of invoicing and payment collection, using software to automatically generate invoices, send them to customers, and collect payments. In human resources, process automation could include automating the onboarding process for new employees and using software to streamline the collection of information and paperwork.

  Process automation was designed to increase efficiency, reduce errors, and free up human workers to focus on more complex tasks. By automating routine tasks, businesses can reduce costs, improve quality, and increase overall productivity.

It was then further segmented into automotive, electronics, heavy manufacturing, packaging, and others.

The automation manufacturing industry has decreased the workforce but has increased product quality. There has been a rise in demand and use of automotive technology since the pandemic. Automation usage continues to increase in such industries as food services, automobiles, airports, retail, and manufacturing. In the coming year, the current workforce in the industry would decrease but new jobs would be gained with training in the automotive industry.

ICHIBAN

Ichiban, the parent company of Initech, was founded in Japan in 1937 as a manufacturing company called Nobunaga. The company produced rolling machinery for ironworks and construction. Since then, the company has produced cereal grinding machines, ice shavers, and movie theatre seats. In 1959 Ichiban developed the conveyor system for Japan's first factory. The factory was made exclusively for manufacturing passenger automobiles. In 1983 Ichiban established its first global subsidiary in the USA in Chicago. Ichiban has since developed an automated sorting system for small goods, developed an electric monorail system, created automated warehouse systems, created the first self-serve car wash machine, created an automated book storage system, created a baggage tray system for airport baggage handling and sorting, and more. They provided solutions for production lines and automotive systems while logistically they provided automated storage, transport, and sorting/picking systems optimized for each customer. Ichiban business domain varied from automobile factories, service stations, and airports, to hospitals, semiconductors plants, warehouses, and distribution centers.

In 2013 Ichiban Beck Holding Company acquired Initech. Initech Corporation was a wholly owned subsidiary of Ichiban North America.

INITECH

Initech material handling system services included design/building services, project management design engineering, application engineering, control engineering, software engineering, installation services, advisory in analyst, post-sales support, asset modernization, and client services. The company manufactured and designed integrated packaging conveyor sorting systems, structuring solutions, software solutions, picking solutions, automated storage, automated guided vehicle systems, and robotic solutions.

Initech also supplied expert system integrators who engineer solutions for modern distribution and manufacturing centers. The company had over 35 years of experience.

Initech partnered with some of the world's larger companies. They laid out, "how to use space more efficiently and how to improve productivity — ensuring an operation that is better, faster, smarter".

Ichiban was an industry leader, with the top competitors of Ichiban-Initech ($214 million) being: National Machinery & Conveyor ($6 million), Alliance Industrial Corp. 117 ($25 Million), Montague Legacy Group ($5 Million), and Dynamic Conveyor Corp ($6 Million).

Remote Work

In addition to being in the manufacturing industry, Ichiban, like IBM, was contemplating its conversion to solely remote working. Looking back to previous companies that decided to take the plunge to employees working from home, while there seems to be a lot of buzz about the topic due to the recent coronavirus pandemic, there was also a lot of room for failure.

With whispers of a mutually beneficial, disruptive, and futurist "telecommuting" being heard all the way back in 1989, the style of employment looked as if the only thing hindering its explosion was adequate technology to support it. Employees could see the end of traffic-filled long commutes, and choose more suitable hours to clock in. Similarly, employers might hire candidates that live a great distance from the office, widening the talent pool and forgo expensive real estate, saving the company money.

While navigating this employment opportunity, makers of this decision must carefully weigh the downfalls of the method only a decade ago with the many promises it can bring. For example, in 2009, IBM ordered 40% of its workforce (386,000) employees to work remotely. 8 years later, however, the decision was reversed as revenue slumped.

There were several potential benefits to remote work, including:

- Flexibility: Remote work allowed employees to have more control over their work schedules, which could lead to better work-life balance and increased productivity.

- Cost savings: Remote work eliminated the need for commuting, which could save employees time and money. Additionally, companies may save on office expenses, such as rent and utilities.

- Access to a wider pool of talent: Remote work allowed companies to hire employees from anywhere in the world, giving them access to a larger pool of talent than they might find in a specific geographic location.

- Increased autonomy: Remote work empowered employees to work independently, which could boost motivation and lead to better job satisfaction.

Overall, remote work had the potential to benefit both employees and employers by offering greater flexibility, cost savings, and access to talent. But on the other hand, there were several cons to consider as well.

- Isolation and loneliness: Remote work could be isolating, as employees may miss out on the social interactions and connections that come with working in a physical office.

- Communication challenges: Remote work could make communication more challenging, particularly when it comes to complex or sensitive topics. Misunderstandings could also occur more frequently due to the lack of face-to-face interaction.

- Distractions and lack of productivity: Remote work could be distracting, especially if employees were working from home and had to contend with household distractions like children, pets, or household chores. This could make it more difficult for some employees to stay focused and productive.

- Difficulty separating work and personal life: Remote work could make it harder to separate work and personal life, which could lead to burnout and work-life imbalance.

- Technology challenges: Remote work relies heavily on technology, and technical difficulties or failures could be a major disruption to productivity.

In the words of global workplace analytics president Kate Lister "a lot of it comes down to trust—" trust in employees to maintain efficiency from home and trust that the work can be adequately adapted to the unique environment.

Technology Considerations

The decision of whether to go entirely remote could not be considered in isolation. For the potential savings to be realized, the company's facility would need to shut down. Although the firm had operated remotely successfully during COVID, much of the company's IT infrastructure was installed in the facility. This included QA lab setup, specialized printers, data center components, servers, etc. Thus, the decision to go remote needed to be considered in conjunction with potential changes to the firm's IT architecture."

If the decision was to close the Sarasota facility and perform all the IT operations remotely, a due diligence exercise was necessary to assess the impact on IT systems and hardware. All the technological components present at this facility were evaluated and recommendations were documented. A due diligence checklist was created (Refer to Exhibit 3) It was determined that for hybrid mode or onsite mode, no specific IT changes were needed.

IT Footprint / IT components in scope for due diligence

Based on the due diligence performed at Initech Corporation, below were the IT components that needed to be considered for enabling all the employees working at the Sarasota office to work remotely. (Refer to Exhibit 4 for the technology stack)

IT components that did not need architectural changes/relocation:

- **Individual Hardware:** All the employees were using company-allocated laptops. This operation was managed by corporate IT. Maintenance aspects such as patching, Antivirus updates, laptop replacements, etc. were performed by corporate IT. No additional considerations were needed for

enabling all employees to work from home. It was determined that a few users may need additional hardware such as monitors, keyboards, Monitor stands, and misc. furniture items. (Refer to Exhibit 5)

- **Collaborative Tools:** The main collaboration tool used was MS Teams. It was already deployed for all the employees. As a part of the due diligence exercise, it was determined that there would be a need in the future to get additional licenses for MS Teams and alternate contingency software (Such as Zoom). Since this software was managed by Corporate IT, it was determined that no additional cost was needed. If the need arises, a case would be presented to Corporate IT for the allocation of an additional budget. A small contingency amount was budgeted for this segment. (Refer to Exhibit 5)

- **Office Productivity Tools**: The main tool used was Office 365. All employees already had this tool deployed on their laptops. Few users used Dynamics 365 CRM software. Few users used AutoCAD. For work from home scenario, no additional productivity tools were needed. It was determined that if additional licenses were needed for the productivity tools, a case would be presented to Corporate IT for the allocation of an additional budget. Typically, AutoCAD licenses are expensive and need separate budgeting. However, as these were existing licenses and already deployed on individual laptops, no additional cost was considered.

- **Development Tools:** The development team used MS Visual Studio-based development environment that was already deployed on their laptops. They could download the local version of the SQL server for performing database-related development. MS Team Foundation Server was in place for coding-related version control and collaboration. All these components were on Microsoft cloud, so no additional budget was considered for development tools. Azure DevOps was an additional tool used for development-related collaboration, but it was also a cloud-based tool. Few team members were using the RSLinx tool, but it was also a very lightweight tool deployed on laptops.

- **VOIP System**: VOIP system, 3CX, was in use. Software-based VOIP solution was considered if all employees would work from home. This was managed by Corporate IT. A small contingency amount was budgeted for this segment. (Refer to Exhibit 5). MS Teams call was an alternative to the VOIP system.

IT components that needed architectural changes/relocation:

- **Datacenter Components / Servers:** If the Sarasota facility was closed, 10 servers present at this location need to be moved to another location. Another option was to decommission these servers and move all the workloads to a cloud-based environment.

- **QA Lab:** Initech automated the process of placing shipping labels on the outbound cartons and routing labels on the inbound cartons. There were a few specialized hardware systems located at the Sarasota facility for testing the solutions before deploying them to the production site. There was a need to move the equipment to another location. If the Sarasota facility was closed, the testing team and developers would lose access to this testing lab. (Refer to Exhibit 6).

- **Other equipment:** There was a big, specialized printer located at the Sarasota facility to print site drawings. There was a need to move this printer to another location. If the Sarasota facility was closed, employees in Florida would lose access to this printer.

Available Options

After completing the due diligence phase below options were considered by the IT team if the Sarasota facility was closed. All these options were documented, and the "Complexity Vs Cost" model was created (Refer to Exhibit 7). If a hybrid or onsite (Do nothing) option was selected, very minimal changes were needed from an IT perspective.

Individual tools / Hardware / Dev tools / VOIP

Do nothing. No architectural changes or relocation was needed for these components irrespective of the final decision.

Datacenter Components and Servers

It was determined that if the Sarasota facility was closed, Datacenter components and servers need to be moved. Below options were shortlisted for taking the strategic decision

- **Lift and Shift:** Move 10 servers and attached hardware to Schaumburg, IL facility. The cost associated with this option was $18,200. The main component for the cost was packing and shipping, and professional services for the installation of the hardware at the Schaumburg, IL facility. (Refer to Exhibit 8 Section A)
- **Move servers to Cloud:** Decommission all the servers and move to the Cloud environment. The cost associated with this option was $0 initially but $11,405 annually for the usage. If this option was selected, there was no need to pay an additional amount for maintaining these servers (professional services for data center operations, rack space, hardware depreciation, and purchases) however the exact saving was unknown. At the same time, this would have been the first Cloud-based implementation, so the risk factor was high. (Refer to Exhibit 8 Section B)
- **Reduce Footprint and Shift:** Consolidate applications and databases to a smaller number of servers. A total of 4 servers could have been reduced with this option. This approach would have saved the packing and shipping costs as well as installation and annual maintenance. However, server performance after consolidating the applications and databases was unknown. This option could have created high utilization of servers and hence performance bottlenecks. Proof of concept exercise was recemented before following this approach. (Refer to Exhibit 8 Section C)
- **Reduce Footprint and move to Cloud:** Consolidate applications and databases to a smaller number of servers and then move the workloads to the cloud. The risk involved in this approach was highest as it involves a "move to the cloud" and "reduce footprint" options simultaneously. However, saving potential could be maximum. Also, considering the changing IT trend to move the infrastructure to the cloud, this would be a strategic move. (Refer to Exhibit 8 Section D)

QA Lab

It was determined that if the Sarasota facility was closed, QA Lab needs to be moved to another location. The below options were considered for moving QA Lab

- **Lift and Shift:** Move the QA lab to Schaumburg, IL facility. The cost associated with this option was $13,800. The main component for the cost was packing and shipping, and professional services for the installation of the hardware at the Schaumburg, IL facility. The main disadvantage of this approach was developers and QA testers would have lost access to this lab. This meant a reduced amount of testing before installing the hardware to the customer site and hence a higher

risk of customer issues and escalations. To minimize the impact, an alternate testing skillset can be developed at the Schaumburg facility, but this involves training cost, time, and HR aspects of retaining the QA roles in Florida. (Refer to Exhibit 9 Section A)

- **Portable hardware to testers:** Move the QA lab to Schaumburg, IL facility but provide portable hardware to testers. The cost associated with this option was $25,000. This would have solved most of the testing challenges but the cost of providing portable equipment to each tester was high. Also, this testing does not simulate the same user experience when compared to the testing lab. (Refer to Exhibit 9 Section B)
- **Build Simulator:** Move the QA lab to Schaumburg, IL facility but develop and enhance the simulator application for testing the software instead of testing on specialized hardware. A working simulator was deployed in the QA environment, but additional capabilities need to be added. The major risk in this approach was that the cost and timeline to develop such a simulator were unknown. Also, simulator-based testing was always less effective when compared to testing on real hardware. (Refer to Exhibit 9 Section C)

Other equipment

If the Sarasota facility was closed, the specialized printer installed at this location would have to be moved to another location. In that case, employees in Florida would lose access to this printer and all printing jobs need to be coordinated from the Schaumburg, IL office. In this case, the company may need to use a local vendor for facilitating such printing jobs.

Insider Insights

The Ichiban-Initech Sarasota office had a complex set of stakeholders and variables that all are a part of the consideration to remote or not to remote. These stakeholders were both internal and external to Ichiban-Initech. Internally, the Sarasota office hosted approx. 75 employees consisting of Software development, Client Care, and Executives.

- Software Development used this office as a location for several teams.
  - o Convey: Routing produces logically through a system.
  - o Selections: Order Fulfillment and Product Picking.
  - o Quality Assurance: Simulation and regression testing of Project code.
  - o Labeler: Label formatting and application to produce for Shipping and Routing
- Client Care: a multi-discipline team specializing in Aftermarket support of Software, Controls, and Automated solutions.
- Executives: Leadership and Executive team members including our recently retired CEO, now Chairman of Ichiban-Initech board of directors.

Software development used the office for Collaboration and directed access to the Ichiban network. This helped with deployments and updates to customer systems that either required secure access or speed of connection vs remote access. The Sarasota office hosted several servers for Testing, Simulation, and programming. Along with access to test equipment that would not be practical to have in a home office. Following COVID, the teams used a rotation to come into the office and collaborated on projects and across specialties. Some of the SD team had maintained attendance at the office and found it a welcome second location away from the distractions of a home office.

Client Care tested going fully remote early in the pandemic and was able to transition easily. All Client Care team members had been using remote access to support over 300 customer sites around the world.

However, continued training and collaboration had been limited due to the inability to travel and the lack of interaction, which had fragmented the department into smaller "by discipline" teams. Leadership had been looking for opportunities to find ways to resume in-person or hybrid training to maintain the expertise of the team.

The Executive team had a unique perspective, the Main production line was in Hobart, IN and the Innovation center or "showroom" was in Schaumburg, IL. It was a welcome perk to host customer meetings and Factory Acceptance testing at the Sarasota office during the winter months. As well some executives had moved or worked 180 days in Florida for both tax benefits and access to Florida collegiate programs.

Decision Summary

Sarah Jenkins' decision was not an easy one, and she could either boost her team to a higher level of performance or it would be a disaster. Sarah Jenkins finished her research and looked through the "pros" and the "cons" of each option. Each option she has for the executives explained the reasonably feasible options.

1. Option one was to return all employees 100% back to the office.

The Pros of this option were:

- The executives would have the Florida office for a tax incentive.
- Take advantage of the real estate potential bubble burst to restructure and secure a discounted lease rate for a 7-year period.
- Use the office space and Conference room to conduct training and team collaboration.
- Having an office place will help Ichiban restore and maintain organizational culture and team building.
- The Sarasota office, all the nice year-round weather, and the close beaches serve as an incentive for Ichiban's other offices and clients to meet. And housing servers and other electronics, not to mention processing power, are only available on central computing/servers.

The Cons of this option were:

- Ichiban loses employees, and the company suffers from low retention.
- High monthly cost of utilities and maintenance, especially with the rise of gas prices and an all-time high inflation rate.
- Low employee morale results from long commute time, daily traffic, gas prices, and lost time spent with family and may require Ichiban to increase employee salary.

2. Option two was to go 100% remote and shut down the office.

The Pros of this option were:

- Ichiban keep their employees, and the company increases retention.
- Save on the usual monthly cost of utilities and maintenance.
- high employee morale and Ichiban might save on employee salary.
- Speed of collaboration using Teams Chat

The Cons of this option were:

- The executives would lose their Florida office and their tax incentive.
- Not taking advantage of the real estate bubble burst, secured a discounted lease rate, and might pay higher rates later if the company wants to have office present.
- Ichiban must find another place to house their servers and other electronics as well as a conference room to conduct training.

3. Option three was to have a hybrid approach toward the problem and downsize the office.

The Pros of this option were:

- Downsize the office and eliminate the unnecessary high monthly cost of utilities, maintenance, and square footage rental costs.
- Keeping the executive's Florida office tax incentive.
- Use the office space and Conference room to conduct training and team collaboration, housing servers and other electronics, also Processing power that was only available on central computing/servers.
- Keep the advantage of the Sarasota office and the year-round pleasant weather and the close beaches serve as an incentive for Ichiban's other offices and clients for a meeting.
- Ichiban keeps their employees, and the company increases retention and increases employee morale, and Ichiban might save on employee salary.

The Cons of this option were:

- What was the utilization rate of the office if everyone came into the office?
- Lost opportunity or opportunity cost if Ichiban did not take advantage of the real estate bubble burst and secure a discounted lease rate.

4. Option four was to move the data center, QA, and printing to a low-cost, non-client-facing location while downsizing the current office to a smaller size for client-facing activities.

The Pros of this option were:

- Cost savings: Moving the back-office functions to a low-cost location will significantly save on utilities, rent, and maintenance. This can also help to increase profitability.

- Increased efficiency: The back-office functions can be run more efficiently in a dedicated location with specialized equipment and staff. This can help to improve productivity and reduce errors.
- Improved disaster recovery: Moving the back-office functions inland can improve the company's disaster recovery capabilities, reducing the risk of damage from coastal storms or flooding.
- Flexibility: Having a smaller office for client-facing activities allows the company to adjust to changing work patterns and client needs. This could include working from home, a smaller office, or a co-working space.

The Cons of this option were:

- Upfront costs: Moving the back-office functions to a new location will require an upfront investment in equipment, infrastructure, and staff training. This can be a significant expense for the company.
- Change management: Moving to a new location and changing the way work is done can be disruptive for employees. It may require additional communication, training, and support to help employees adapt to the changes.
- Risk of reduced collaboration: Moving the back-office functions to a separate location may reduce the opportunity for collaboration and communication between teams. This can impact the overall productivity and innovation of the company.
- Client perception: Downsizing the office may make clients perceive that the company is less successful or stable than it once was. This could impact the company's ability to attract and retain clients.

Overall, option four balanced cost savings, improved efficiency, and flexibility while considering the need for disaster recovery and maintaining a client-facing presence. However, it also came with some potential downsides that the company should carefully consider before deciding. The future of the Sarasota location remained uncertain.

Exhibit 1: Sarasota Facility

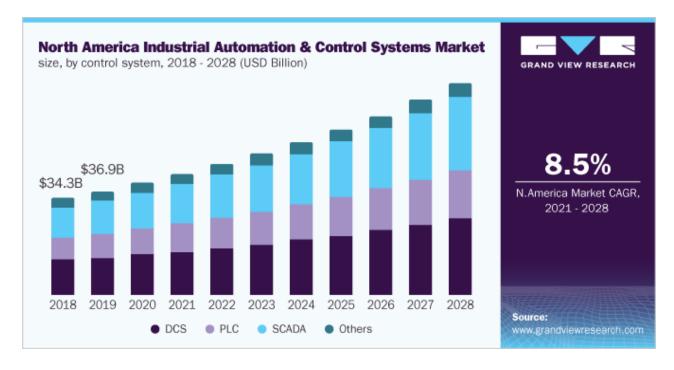## Exhibit 2: Automation Industry Growth

Source: www.grandviewresearch.com

Exhibit 3: Due Diligence Checklist – Technology Considerations

Source: Analysis performed by the team.

	Aspect	Is Applicable	Is Feasible	Is Value Add	Notes
S	Social	Yes	Yes	Yes	• If all employees will work from home, additional social gatherings and activities are needed for building a team. • Better collaboration tools are needed. • MS teams were the collaboration tool for meetings/whiteboard sessions. An alternative tool may be needed for communication. • In the future, an in-house social media platform may help bond the team members and share personal updates so that interpersonal relations and team dynamics can be made better.
M	Mobile	Yes	Yes	Yes	• Collaboration tools (MS teams), VOIP system, and office 365 already have mobile capability. So, if the Remote option is selected, teams can collaborate via phone. • In the future, in-house mobile applications would be a value add for approving leaves/workflows/timesheets, but this is not a critical aspect of decision-making.
A	Analytics	No	NA	NA	• Based on the due diligence activity, no opportunity related to Analytics was discovered that can act as a critical decision point or significant value add to the business operations.
C	Cloud	Yes	Yes	Yes	• Most of the collaborative tools and development tools are already in a cloud-based environment. • Additional opportunities were identified for moving the in-house servers to a cloud-based environment.
D	Distributed Ledger	No	NA	NA	• Based on the due diligence activity, no opportunity related to Distributed Ledger Technology (DLT) was discovered that can act as a critical decision point or significant value add to the business operations.
A	Artificial Intelligence	No	NA	NA	• Based on the due diligence activity, no opportunity related to Artificial Intelligence was discovered that can act as a critical decision point or significant value add to the business operations.
R	Virtual Reality	Yes	No	No	• If all employees will work from home, collaboration activities, meetings, and social gatherings can be simulated more effectively if virtual reality or augmented reality solutions were implemented. However, this was not critical for decision-making. These solutions are expensive to implement so other than a better user experience, there are no material benefits for this aspect.
Q	Quantum Computing	No	No	No	• Based on the due diligence activity, no opportunity related to Quantum Computing was discovered that can act as a critical decision point or significant value add to the business operations.

Exhibit 4: Technology Stack at Initech

Source: Analysis performed by the team.

Technology Component	Notes
Hardware	**Individual:** • Company-allocated laptops. • Peripheral devices **Datacenter Components:** • Server class machines • Network switches, routers **Specialized Hardware:** • Automation - QA Lab • Specialized Printers • Portable testing hardware
Operating systems	• Windows Server 2019, 2022 • Linux (Mainly for emulators)
Middleware / Web servers	• IIS, Tomcat (Very few instances)
Databases	• MS SQL server
Development Tools	• MS Visual Studio • SQL server (Local version) • MS Team Foundation Server (For version control and collaboration) • Azure DevOps • RSLinx tool
Collaboration Tools	• MS Teams • MS Office 365 • VOIP system - 3CX
Productivity Tools	• MS Office 365 • Dynamics 365 CRM software • Auto CAD

Exhibit 5: Cost Calculation – Individual Hardware and Tools

Source: Analysis performed by the team.

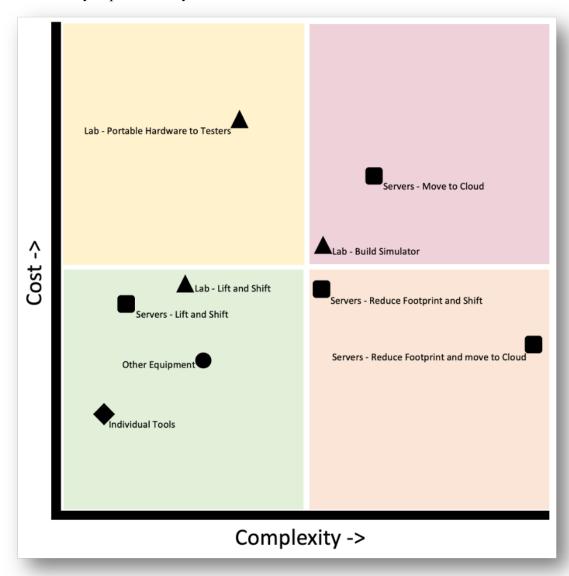| Individual Hardware, Collaborative Tools, Office Productivity Tools, Development Tools, VIOP				
Item	Work From Home	Hybrid	Work From Office	Notes
VPN licenses	$ -	$ -	$ -	Existing process. No change needed.
Furniture / Additional devices	$ 25,000.00	$ 30,000.00	$ 20,000.00	**Work From Office:** 20% furniture will be replaced every year. **Work From Home:** 2/3 staff would need monitors, chair, furniture etc. $500 blended budget is considered.
Collaborative Softwares	$ 12,000.00	$ 12,000.00	$ -	Additional tools for collaboration / Additional licenses 50 MS office licenses
Network Maintenance	$ -	$ 12,000.00	$ 12,000.00	Office Internet and management of local network
Laptops	$ -	$ -	$ -	Everyone has laptop. No additional charge if worked from office or home
Office Computers	$ -	$ -	$ -	Already exists, no additional cost
Internet Reimbursement	$ 5,625.00	$ 2,625.00	$ -	
Software based VOIP	$12,000	$12,000	$ -	
Additional software licenses	$ -	$ -	$ -	Softwares for developers. No additional charges.
Total	$ 54,625.00	$ 56,625.00	$ 32,000.00	

- Additional cost if "Full Remote" Option is selected (When compared to "Do Nothing"): **$ 22,625.00**

- Additional cost if "Hybrid" Option is selected (When compared to "Do Nothing"): **$ 24,625.00**

Exhibit 6: QA Lab Setup

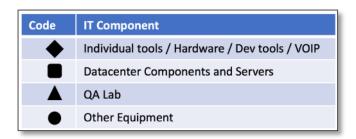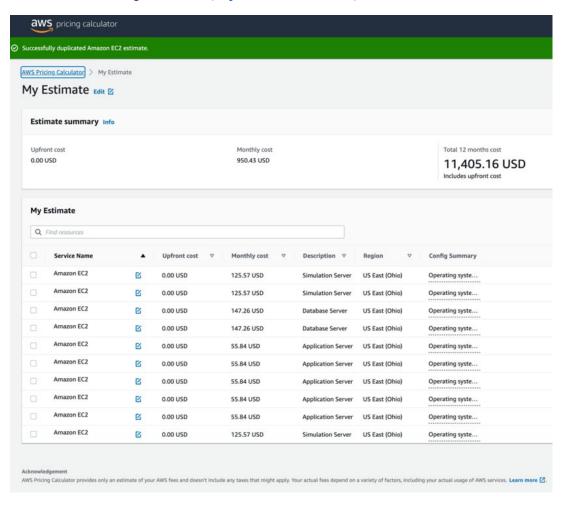## Exhibit 7: Complexity Vs Cost Model - – Technology Considerations

Source: Analysis performed by the team.

Code	IT Component
◆	Individual tools / Hardware / Dev tools / VOIP
■	Datacenter Components and Servers
▲	QA Lab
●	Other Equipment

Exhibit 8: Cost – Moving Servers and Datacenter components.

8A: Option 1 - Lift and Shift:

Item	Cost
Packing	$ 1200.00
Moving to Schaumburg, IL	$ 14,000.00
Reinstallation – Professional Services	$ 3000.00
Total	**$ 18,200.00**

8B: Option 2 -Move to Cloud

Source: AWS Pricing Calculator (https://calculator.aws/#/)

8C: Option 3 - Reduce Footprint and Shift

Item	Cost
Packing	$ 800.00
Moving to Schaumburg, IL	$ 11,000.00
Reinstallation – Professional Services	$ 2000.00
Total	**$ 13,800.00**

8D: Option 4 - Reduce Footprint and move to Cloud

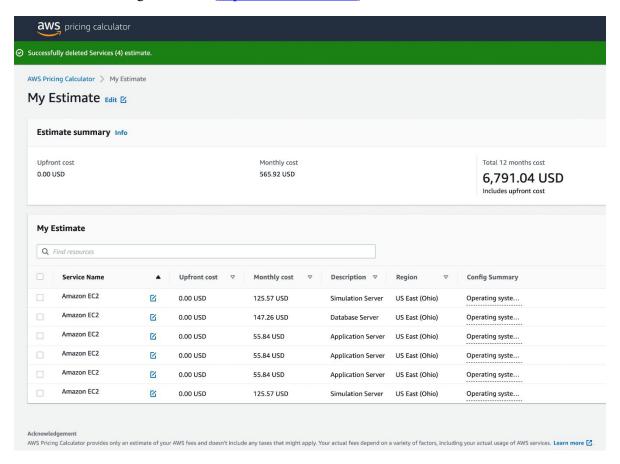**Source:** AWS Pricing Calculator (https://calculator.aws/#/)

Exhibit 9: Cost – Moving QA Lab and Other Equipment

Source: Analysis performed by the team.

9A: Lift and Shift

Item	Cost
Packing	$ 800.00
Moving to Schaumburg, IL	$ 11,000.00
Reinstallation – Professional Services	$ 2000.00
Total	**$ 13,800.00**

9B: Portable hardware to testers:

$5,000 per portable hardware for 5 projects. The total cost considered is $25,000

9C: Build Simulator:

The cost and timeline to enhance such a simulator were unknown. A good faith estimate would be around $18.000

Biographies

Tyler Griffin graduated from the College of Science, Engineering, and Technology at Murray State University in Murray, Kentucky. Tyler is currently pursuing his Master of Business Administration from Muma Business School at the University of South Florida. He has 30 years of operational and EHS experience in the pharmaceutical industry as well as the food and beverage sector. Tyler has also maintained his Certified Safety Professional (CSP) certification throughout his career. Tyler currently serves as the Director of Operations for a pharmaceutical company based in St. Petersburg, FL.

Ross Stoddard graduated from the College of Business at Florida State University in Tallahassee, Florida. Ross is currently pursuing his Master of Business Administration from Muma Business School at the University of South Florida. He has 20+ years of experience in the healthcare technology, software, and consulting industry. He is currently a member of the American College of Healthcare Executives and HIMSS (Health Information Management Systems Society). He currently serves as the Chief Strategy Officer for a Tampa, Florida-based healthcare business management consulting company.

Abhimanyu Prabhune received a bachelor's degree in engineering with a concentration in computer science. Abhimanyu is currently pursuing his Master of Business Administration from Muma Business School at the University of South Florida. He has 20+ years of experience in the IT industry. He specializes in the management of IT system implementation for capital markets, insurance, and healthcare industries. Currently, he works as a senior manager for Infosys. He has received industry certifications like INS21 and INS22 and technical certifications like AWS certified architect (associate).

Charles W. Duke, originally from Barrington, IL, moved to the Tampa Bay area to attend college. He received his bachelor's degree from the University of South Florida's School of Music with a focus in Vocal Performance. After starting his career in Software Support, Charles has cultivated over 15 years of experience in the IT service and SaaS industries. Charles is pursuing his Master of Business Administration from Muma College of Business and leads a global automation support team out of St. Petersburg, FL.

Isaac Benjamin is an accomplished manager with experience in the private and military sectors; Ben has a track record of successfully integrating multiple constituents in planning and implementation processes. He's proficient with multiple analytical and data visualization tools, foreign languages, project management, and Six Sigma, with extensive international leadership and organizational change management experience. In his most recent role as Corporate Applications Lead at TECO, He oversaw projects and functional areas to ensure application stability, data integrity, and policy alignment. Additionally, he has managed R&D projects for government cyber contracts/clients supporting Joint Special Operations Command's strategic, operational, and tactical initiatives.