2022 Predictions

RFG Perspective: COVID-19 remains the top concern of most governments globally as 2022 begins, with limited prospects that it will disappear anytime soon. The global economic and geopolitical environments will be negatively impacted by mandates and shutdowns around the world – for at least the first half of 2022.

The structural impacts of the lockdown mentality and the digitalization of corporate business models will add to the overall distress and uncertainty, as companies and individuals strive to determine how to survive and prosper in the New Normal environment. To address these challenges, business and IT executives must re-examine their business models, culture, people, processes and supply chains – and all of the impacts caused by external pressures.

Business and IT executives will have to address the "great resignation" and the worker burnout challenges – along with the associated employee attraction, skills, and retention issues. There is a silver lining here, because 2022 will be the year for enterprises to rebuild, reengineer, and restructure their companies around the mixed work-from-home (WFH) and hybrid office environments.

Executives will need to resolve the personnel challenges through collaborative, interactive, and personalized approaches that will diminsh employee malaise and stress. These process changes will leverage AI, analytics, IoT technology, mass personalization and mobility to connect remote and onsite employees throughout the organization. The same approach will be used to enhance connectivity with business partners, customers, and supply chains. At the same time, IT executives must address the data integrity, privacy and service level concerns that impact business outcomes, productivity, revenues and cybersecurity – all with the goal of building more confidence in IT and the organization as a whole.

To achieve these objectives, IT executives must increase their focus on analytics, automation, componentization, containerization, machine learning (ML), environmental and operational efficiencies, orchestration, privacy, and security. By focusing on these priorities, IT will be able to deliver more and better offerings faster – and at a lower cost – while protecting the business from cybersecurity attacks and vulnerabilities.

Two years into the COVID-19 pandemic, and still world leaders grossly underestimate the long-term impacts of COVID-19. Every time they felt the worst phase of the pandemic was over, and things could return to normal, another variant arrived. The good news is that businesses are now accepting the COVID virus and the need to adapt to compliance changes as part of the New Normal business environment – and they are planning accordingly.

In the United States, enterprises will experience a positive year overall, even though inflation, COVID mandates and new regulatory constraints have the potential to minimize growth. Outside of the U.S., most countries will struggle to see a level of positive growth

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as their governments mandate new lockdown restrictions and other constraints throughout the year. Further tensions and disruptions are expected to arise at the usual hotspots, which could have a substantial negative impact on global commerce.

Moreover, cybersecurity breaches are forcing businesses and governments to reconsider their business culture, their processes and their views on privacy and security. All this means that executives must invest in transforming their business with a constant eye on cybersecurity and the evolving office/work-from-home (WFH) environment. They must drive process improvements to remain competitive, contain costs, enhance compliance, minimize risks, ensure privacy, and improve resource utilization.

Major Trends for 2022

Below are six areas that will be focal points in 2022:

Business Transformation – COVID-19 mandates and fears – as well as the shift to online transactions – translate to organizational business transformations. The meaning of "work location" has changed from being fixed to variable. That means that where and how people work – and who they work with, will fluctuate during 2022 – and that is likely to be the norm going forward. Business processes are, indeed, being reshaped: one new option for change is that business campuses are being re-evaluated for new uses as alternative worksites. Work processes will be in flux in 2022 as companies attempt to interact via a standard set of social media and software tools. However, security, privacy, and data-governance guardrails must be constructed to minimize the exposures created by the evolving work environment. For IT executives, 2022 will be the year for eliminating the exposures, making process and structural changes, and getting new controls in place. Additionally, 5G will be coming of age as the high-speed cellular network – and that will create a new set of process transformations. Software that ensures the new functionality will require automated oversight. Firms will be automating their business processes and operations, performing process re-engineering, and re-evaluating supply chains. Lastly, companies will tackle the online customer experience because users prefer working with enterprises that simplify the process of doing business with them, making interactions more natural.

Cloud/Edge/IoT – First it was all about moving applications to the "cloud," which led to a transition to hybrid cloud, then to multi-cloud – now with extensions to the Edge. As always, the network/server/storage topography continues to evolve, with new products and solutions coming onto the scene, especially those that incorporate 5G technology to reduce network latency. All of these changes will make it difficult for IT executives and cloud architects to construct application and data architectures that can survive long-term without sparking major outages or failures. The year 2022 will be the year for enterprises to address their cloud BC/DR requirements, as the frequency of outages by cloud service providers (CSPs) is forcing business and IT executives to recognize that clouds are not always available and the CSPs do not have all the availability answers – yet.

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While new methods of abstraction, automation, orchestration, and portability are emerging to address these growing issues. But many companies still find themselves locked into legacy on-premises and cloud solutions with "islands of data" that remain unconnected with other key systems on-prem and off-prem. Having these data islands, or data silos, makes the productive use of business analytics more difficult for IT and for the business it supports. Cloud affinity and lack of portability means that architects must determine the best target cloud/Edge solutions for each workload early in the design/development (DevOps) cycle. While more workload migrations to clouds, Edge, and IoT are planned for 2022, the business impacts and business results will be mixed until the full spectrum of these cross-organizational issues are addressed.

Cybersecurity and Regulatory Compliance – The number, sophistication, and variety of cyberattacks is expected to rise in 2022. The use of analytics, along with artificial intelligence (AI) and machine learning (ML) software, will improve real-time analysis and reduce the risks. But RFG believes that cybersecurity breaches will remain a major challenge that IT executives must address in 2022 for the following reasons:

- the security guardrails are still too lax
- third-party software contains vulnerabilities
- state actors – and non-state actors – will aggressively push to find the weakest links in security and data-protection software
- successful ransomware attacks are giving rise to the next wave of attacks

RFG expects that the year 2022 will produce more of the same, with the average financial impact poised to increase next year, as business levels build during the economic recovery. On top of that, most users remain oblivious to the impacts caused by poor business practices, including insecure email practices, insecure mobile apps, and insecure IoT (Internet of Things) embedded devices.

It is evident from examining recent security breaches that many organizations have worse people and process failures (including the application of configurations, encryption, patches, and quality code), overtaking the impact of pure-play technology failures. To clean up their recent shortcomings and longer-term technical debt, CEOs and Boards of Directors must establish cyber mitigation strategies, while CISOs, CSOs, and other security executives must re-imagine their security practices from all angles. This includes the need to develop a methodology that reduces the exposure to third-party software vulnerabilities, especially those flaws that are made public when new software patches are released and downloaded.

Furthermore, the lack of cloud service provider (CSP) transparency remains an issue and an exposure in 2022. Part of the problem here is that the exact causes of some CSP outages are not publicly reported – and some security providers imply that some (if not most) breaches may have been caused by customers' failures. On the compliance front, RFG expects that countries and localities worldwide will continue to pass their own privacy acts,

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adding to the patchwork of requirements across geographies, making full compliance a struggle for many firms. Thus, in 2022, IT executives will be hard-pressed to keep up with compliance requirements globally while improving users' support for compliance. To address these issues, IT executives will need to work with auditors and regulators to develop better proactive processes that enable continuous compliance while reducing the cost of compliance and risk exposure.

Data Analytics and Data Management – Data analysis and data usage will be the key to business advantages as economies recover globally during 2022. Unfortunately, the shift to clouds and the Edge, and the associated architectural decisions behind these moves, will be focused on application workloads – and not focused on the data. This situation aggravates customers' data integrity and privacy challenges, while increasing their exposure to data loss. Organizations must place more emphasis on all aspects of data management if this issue is to be properly addressed in the coming year. RFG expects that a data-centric approach will occur naturally in some companies, often driven by security failures that will force change in other organizations (see the SolarWinds and Colonial Pipeline events in 2021).

Artificial Intelligence (AI) is a required component for nearly all new solutions that require some form of analytics. AI options are already visible in several software areas – including robotic process automation (RPA), virtual agents, machine learning, deep learning, and reinforcement inference learning. RFG firmly believes that 2022 will see significantly more of these creative RPA and no-code/low-code implementations to address the business problems of 2022. As is already evident, AI and ML software will prove to be highly valuable components for most of the new solutions for analytics and data management. This extends to customers' applications development processes, IT operations (in the form of AIOps), and OT (Operations Technology) production tools – all of which are proving to be highly effective in transforming IT in the New Normal COVID environment.

DevSecOps / DataOps – The trend toward DevOps and DevSecOps – now joined by DataOps for more effective data analytics – will gain momentum in 2022. However, progress will remain slow, because most companies are still a long way from adopting these methodologies as standards for their development processes.

The challenge is not the technology – new and enhanced CI/CD and other automation/orchestration tools continually come into the software marketplace. Rather, it is the organizational culture and adherence to legacy processes that is impairing customers' shift to DevSecOps. Another new approach is the no-code/low-code development paradigm, which is still immature but gaining attraction and adoption, over time. The challenge is clear: businesses must overcome reservoirs of deep-seated organizational resistance to change – and the acceptance of new, and expanded, roles and responsibilities for application developers who are writing a new wave of applications that will transform the Core, Cloud and Edge.

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The incorporation of security into DevOps (to DevSecOps) – so that security will not become a bottleneck for new applications – has not been easy.

Here are some highlights: Enterprises are struggling to find the right set of tools for new application code scans and tests, and to do regression testing that is easy to use without impacting the process flow. However, success has been limited by not having the right metrics in place and by having uneven results when monitoring progress throughout the year. Until this situation is corrected, progress associated with applying DevSecOps will be limited.

As a new methodology, DataOps, an automated, process-oriented methodology, is a needed counterpart to the more well-understood DevSecOps, although DataOps has yet to gain widespread adoption. RFG is convinced that customers will come to see the benefits of DataOps in coming years because of its potential to improve data quality and to reduce data-analytics cycle-times. DataOps will be more widely adopted by 2030.

DataOps gives IT organizations a new process to eliminate or minimize the islands of data in the enterprise data center – and in the clouds – that were created over time in previous development efforts. It is problematic to have new DevSecOps applications available for production within a few weeks or months, especially since some of the supporting data for those applications cannot be extracted, transformed, and loaded in less than six months.

RFG believes that interest in DataOps will grow in 2022, leading to a year of piloting, proofs-of-concepts (PoCs), and early trials for DataOps in many large enterprises.

Carbon Neutral Data Centers and Sustainability – Businesses and governments can no longer ignore the impacts of climate change and the decisions that have already made because of the concerns of global warming. There is a scarcity of power and/or water in many locations. That situation is driving up the costs of carbon offsets and fossil fuels – in some areas a factor of 10x. Enterprises will not only need to reduce their carbon emissions, but they will also need to find ways to become more efficient and more sustainable. The last time when enterprises were incented to improve their data center efficiencies was about a decade ago – and, sadly, much of that institutional knowledge is now lost through attrition and downsizing.

Nonetheless, some CEOs are making commitments that their companies will become carbon-neutral by 2050. Those statements will affect CIOs in 2022 in the form of other goals to make near-term improvements and target commitments for 2030, depending on the degree of environmental improvements targeted. Many of these corporate initiatives for sustainability were detailed at the recent COP26 environmental sustainability conference in Glasgow, Scotland, in November 2021.

The proposed 2021 changes to the European Energy Efficiency Directive, if accepted, will put specific targets in place, along with establishing new metrics and audit requirements

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for companies and organizations. One such target is an overall European energy reduction of 32.5 percent by 2030 over 2007 levels, which will filter down to large enterprises to implement. The good news here is that there are significant actions for IT and facility executives to take that can reduce their carbon emissions and power usage by as much as 50 percent compared with current levels. However, it will require cooperation between multiple business units, all working together to understand their current baseline metrics and create a fundable business case that can achieve a corporate-wide result for improved efficiencies and sustainability.

Summary

The paradigm shift to a digital and WFH economy is a work-in-progress – especially since companies, governments and individuals have not yet seen the last of the COVID-19 dislocations for business and the global economy. It is important to recognize that business transformation goals now being proclaimed are not primarily a technology issue. Rather the challenges are to address business-model issues, and these transformation goals must be recognized as such. IT organizations are there to support the shift; but business units – and their funding for new initiatives – are driving the train.

Business executives must make the key decisions that guide their company's business and digital transformations. As leaders, senior executives need to determine which businesses they plan to participate in – and to make the appropriate structural changes to implement those plans. In 2022, business leaders need to create the strategies that lead to selecting which processes and applications will be designed and implemented across their organization. Although planning and implementing a Business Transformation initiative is a multi-year initiative with a lot of moving parts, many components must be delivered in 2022 if companies expect to remain competitive in today's rapidly changing world.

RFG POV: The year 2022 will certainly be another challenging year for business and IT executives. IT organizations need to work harder to integrate their goals with those of the business – and to work collaboratively to enhance operations (whether onsite, in the cloud, or at the Edge) and to innovate new, simpler approaches for doing business.

Additionally, IT executives will need to invest in AI/ML software, cybersecurity, DevSecOps, DataOps, data center efficiency and sustainability, and other process improvements to help contain costs, mitigate the skills shortage, enhance compliance, increase flexibility and responsiveness, minimize risks, and improve resource utilization.

Business and IT executives must collaborate throughout the year, so that IT budgets, plans and strategies will dovetail with the primary goals of their organization – in business and in government – and ensure that they remain tightly integrated with the goals of their business throughout the year.

Additional relevant research is available at www.rfgonline.com. Interested readers should contact RFG Client Services to arrange further discussion or interview with Mr. Cal Braunstein. Jean S. Bozman of Cloud Architects llc, contributed to this report.

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