

From Mainframe to Cloud and Beyond: A Short History of IT Management Consulting

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Abstract

Information technology (IT) consulting is a discipline within the broader field of management consulting focused on advising organisations on how best to use technology to meet their objectives. Originating in the mid-20th century as organisations began exploring the potential of computers, the profession emerged in response to the growing need for expertise in adopting new technologies. Over time, IT consulting has evolved in parallel with technological advancements and expanded its scope as new technology, such as the internet or cloud computing, reshaped the business landscape. This paper explores the historical background of IT consulting and subsequently studies the most recent industry reports to recognise the current trends, namely the rise of artificial intelligence, the shift towards remote working, and growing cybersecurity concerns. It concludes that consulting firms that prioritise these areas will not only be better positioned to deliver value, but also enhance the effectiveness of their own services.

Introduction

When Thomas J. Watson purportedly stated in the early days of modern computer technology that there was only enough market space for five computers in the world, he could not have imagined how pervasive the technology would become (Mische, 2017). In the 1950s, organisations began exploring the benefits of computers, and the rudiments of the IT consulting profession started to form (Galal, Richter and Wendlandt, 2012). Not many years later, as the potential for commercialisation of computers became apparent, IBM initiated a research and development programme to build a flexible computer with broad appeal. This was a watershed moment in the history of computing, leading to the creation of the IBM S/360 mainframe in 1964, which catalysed the adoption of computers across various organisations (IBM, 2024). Those organisations needed help to understand how to use the new technology. This laid the foundation of the modern IT management consulting profession.

This paper traces the historical development of IT consulting, from its early beginnings during the mainframe era to its current state in the cloud era. Key technological advancements are identified through a review of relevant academic literature (e.g., Nolan and Bennigson, 2002; Kipping, 2003; Galal, Richter and Wendlandt, 2012; Mische, 2017), industry reports, and historical data, with a focus on periods where technological shifts significantly influenced IT consulting practices and demand. For instance, IBM's PC sales figures illustrate the democratisation of computing; Internet usage rates highlight its transformative influence on business models; and Gartner's analysis of cloud expenditure underscores the extensive adoption of cloud computing. By cross-referencing these insights with historical accounts, this paper aims to present a reliable narrative linking technological changes to the evolution of IT consulting. Subsequently, it analyses the latest industry reports (Accenture, 2024; CompTIA, 2024; Deloitte, 2024) to identify prevailing contemporary trends and offer insights into the potential future direction of the industry.

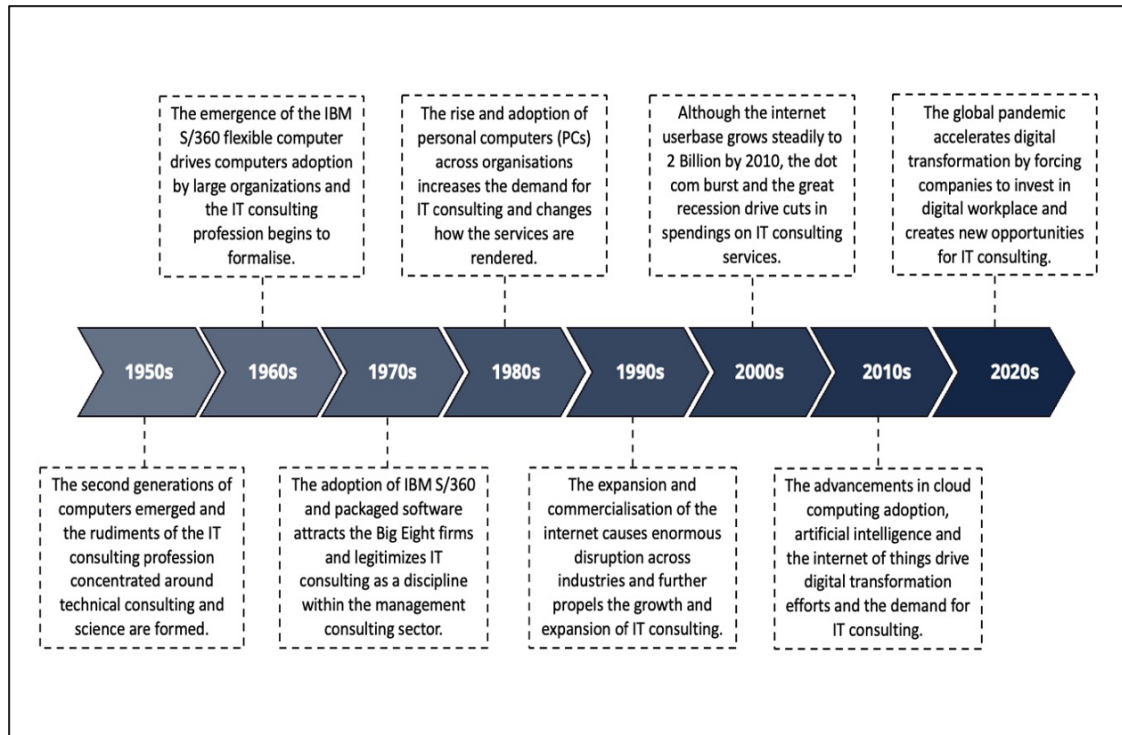


Figure 1: The history of information technology consulting (Collated from Nolan and Bennis, 2002; Kipping, 2003; Galal, Richter and Wendlandt, 2012; Mische, 2017)

Digital Dawn: The Advancement of Computer Technology

As IBM mainframes advanced throughout the 1960s and began spreading across enterprise business functions, much more demand for specialised consulting services was generated. In the 1970s, almost every large organisation had already acquired some computing capability, and most major electronics businesses offered their own computer products. Consequently, more powerful, sophisticated, and functional software products were developed and sold commercially. It was at that time when the largest accounting firms, known as the 'Big Eight' (Figure 2), recognised the opportunity and began acquiring IT competencies which legitimised IT consulting as a discipline within the management consulting sector (Mische, 2017).

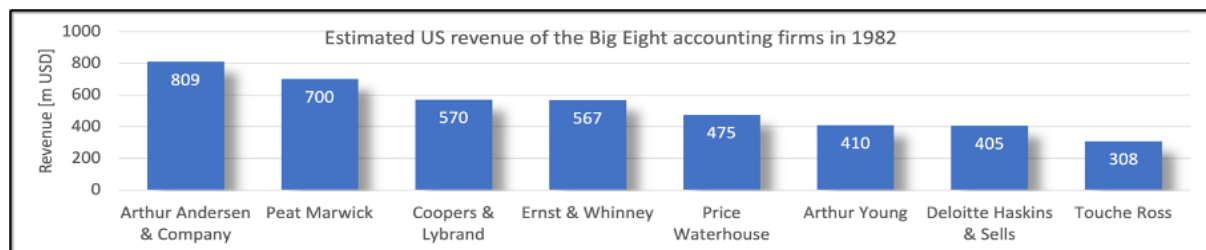


Figure 2: Estimated US revenue of the Big Eight accounting firms in 1982 (The New York Times, 1983)

With the rise of microprocessors, IBM entered the personal computer (PC) market with the prediction of selling nearly 250 thousand units over a period of 5 years. In reality, the firm sold over 3 million units during that period, producing more than 250 thousand PCs in a single month in 1984 (Reimer, 2012). Many new companies, including Apple, Microsoft, and Oracle, also entered the market developing hardware

and software products that shifted the power of computing from those who were technically trained to the hands of non-technical people. The emergence and widespread adoption of PCs (Figure 3) had a twofold effect on technology consulting. Firstly, corporate spending on IT increased significantly and IT began to be viewed as a strategic asset rather than merely an operational or tactical necessity. This naturally led to a hike in demand for IT consulting services. Secondly, PC software, with its new and powerful capabilities, profoundly transformed the tools consultants used and the way their services were rendered (Bradley, 2011).

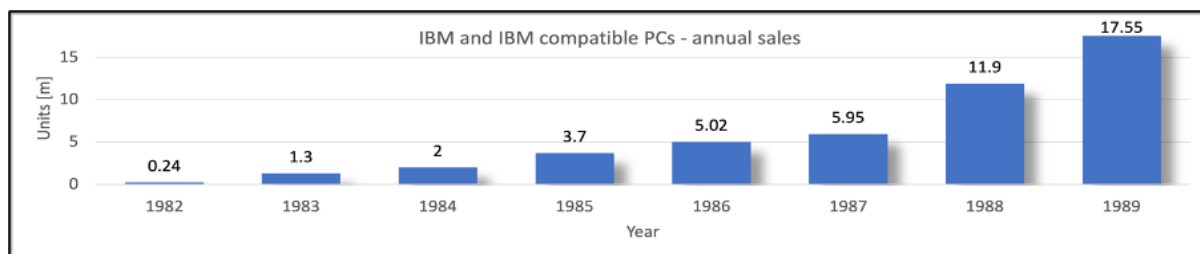


Figure 3: IBM and IBM compatible PCs—annual sales (Mische, 2017)

From Web Boom to DotCom Bust: The Internet’s Rollercoaster Ride

The rise and commercialisation of the Internet in the 1990s caused an enormous disruption across all industry verticals and further accelerated the growth of the IT consulting profession. Large professional services firms (PSFs) profited not only from the mass adoption of standardised customer relationship management (CRM) and enterprise resource planning (ERP) systems but also from e-commerce, and a wide range of new e-business (electronic business) applications. Developing e-business capabilities often required reworking established business models which allowed IT consulting to expand into many new areas and achieve double-digit growth (Nolan and Bennigson, 2002).

The exponential growth of the IT sector ground to a halt and crashed at the start of the 2000s with the “dot com bust”, which saw the NASDAQ index fall from \$6.7 trillion to \$1.6 trillion between March 2000 and October 2002 (Ryan, 2013). Despite the growth of the internet user base, which reached one billion users by 2005 and doubled to two billion by 2010 (Figure 4) (ITU, 2022), the great recession of the second half of the decade forced most organisations to cut their budgets causing the demand for IT consulting services to fall and triggering a contraction within the industry (Mische, 2017). Nevertheless, the decade witnessed the emergence of numerous new technologies, most notably cloud computing, which fuelled digital transformation efforts across industries and revived growth in the IT consulting sector in the following decade (Varghese, 2019).

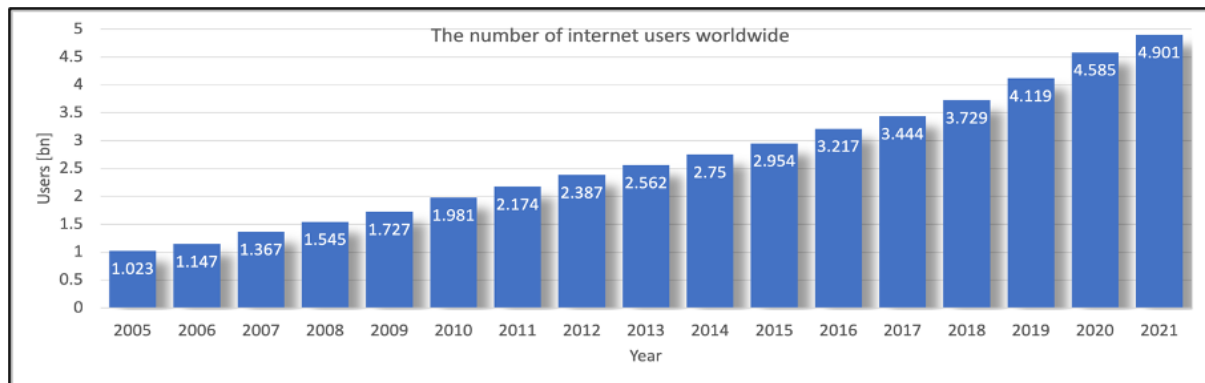


Figure 4: The number of Internet users worldwide (Ritchie et al., 2024)

Skyward Shift: The Cloud's Journey to Dominance

For business organisations, cloud computing represents a paradigm shift that eliminates the need for acquiring IT equipment or licensed software and provides access to computing as a utility service delivered on demand over the Internet. This kind of outsourcing model not only radically reduces the need for capital expenditure but also, when appropriately managed, has the potential to reduce operational costs through shared resources and economies of scale. Notably, the hyperscale of cloud computing providers offers access to virtually unlimited computing resources that are continuously available, highly resilient and can be provisioned rapidly. As a result, cloud computing drastically lowers IT barriers to innovation and enables rapid service scalability according to current end user demands (Bhowmik, 2017)

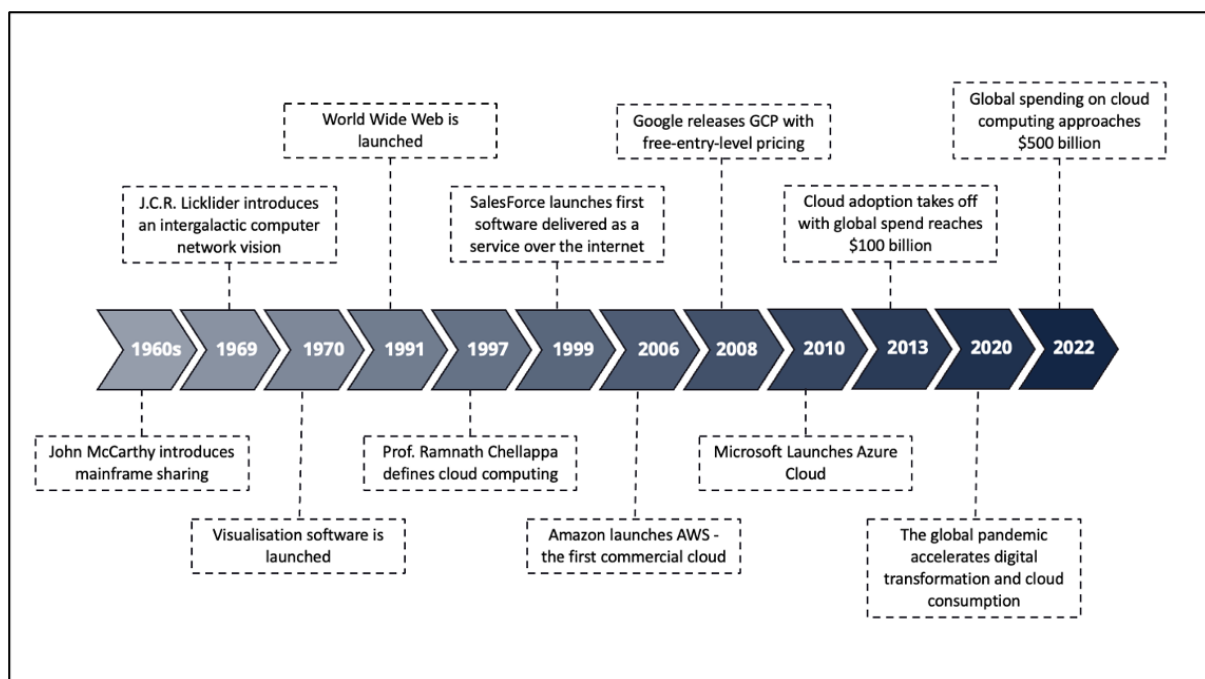


Figure 5: The rise of cloud computing (Collated from: gartner.com, aws.amazon.com, azure.microsoft.com, cloud.google.com)

These cloud computing benefits, if realised, can lead to a significant business advantage. However organisations adopting cloud computing face risks, limitations, and challenges pertaining to cloud governance, cybersecurity, and broad business change (Golightly et al., 2022). Consequently, businesses seek to engage with PSFs who have the expertise in delivering effective cloud adoption programs. The scale of

the challenges organisations face, and the demand for cloud consulting services is evident in the latest Accenture's results. The IT consulting giant reported approximately \$32 billion in revenue from cloud computing related engagements in FY2023 which constitutes 23% growth compared to FY2022 (Figure 6) (Accenture, 2023).

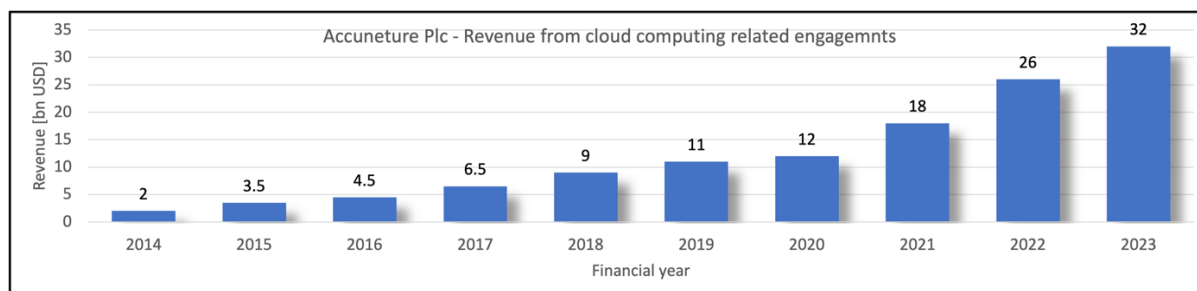


Figure 6: Accenture Plc—revenue from cloud computing related engagements (Accenture, 2023)

The vast growth of cloud computing related IT services is corroborated by Gartner, a technology research and consulting firm, which predicts that by 2028 cloud computing will become essential for executing business strategies (Gartner, 2023b). This is reflected in the global cloud spendings, which is projected to reach nearly \$679 billion in 2024 and grow by another 20% in 2025 to \$825 billion (Figure 7). The researchers conclude that IT leaders will need to implement highly efficient cloud operating models to successfully achieve their business objectives. In this light, the demand for cloud-related IT consulting engagements is likely to intensify, driven by the growing complexity of designing and deploying such models effectively.

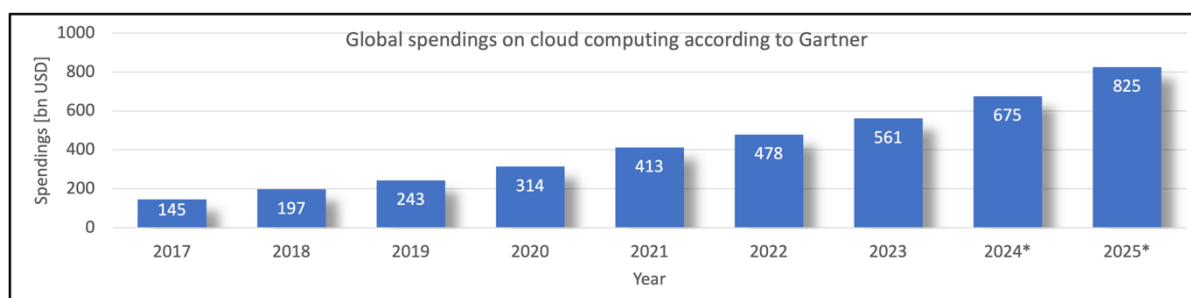


Figure 7: Global spendings on cloud computing (Gartner, 2024)

The Key Trends Shaping the Future

The analysis of the latest three industry reports (Accenture, 2024; CompTIA, 2024; Deloitte, 2024) reveals that three major trends currently shape the continually evolving IT consulting industry. These reports were chosen for their recent publication dates, reputable sources, and comprehensive coverage of the latest technological developments. The identified trends are artificial intelligence (AI), remote workforce, and cybersecurity. However, it is important to note that all three reports also point at cloud computing as a key area of further growth, as this technology underpins advancements in AI and supports the adoption of remote work environments.

Artificial Intelligence

First and foremost, all three reports concur that artificial intelligence is fundamentally transforming businesses across all sectors. Deloitte highlights generative AI as an enormous growth area, predicting widespread adoption in the coming years, particularly in enterprise software and IT services. Deloitte's analysis indicates that nearly all enterprise software companies are expected to embed generative AI capabilities into some of their offerings by the end of 2024, with the generative AI market potentially reaching a revenue uplift of \$10 billion by the end of the year. CompTIA suggests that although the initial hype surrounding generative AI may wane, its integration into business workflows will continue to drive substantial innovation and efficiency. The report notes that over 70% of organisations are already experimenting with generative AI, and many expect to achieve significant automation and productivity gains, particularly in IT operations and business workflows. Accenture views generative AI as a transformative force poised to fundamentally reshape industries. The report emphasises that businesses must innovate with AI to remain competitive and warns that organisations failing to adopt AI technologies may fall behind, as generative AI is expected to drive economic disruption and reshape entire sectors in the years ahead.

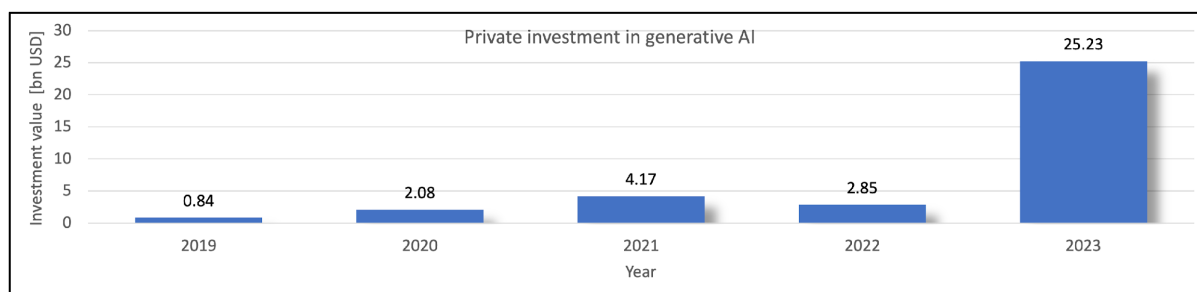


Figure 8: Private investment in generative AI (Stanford University, 2024)

It seems that AI, specifically generative AI, is set to exert a profound impact on the management consulting industry by revolutionising approaches to data analysis, strategy development, and client engagement (Mohan, 2024). The technology is revolutionising interactions with information by shifting from traditional search methods to AI-driven advisory systems and thus transforming decision-making processes. Consequently, the consulting skillset must also evolve to encompass proficiency in AI-driven tools and thereby ensure that consultants can continue to deliver enough value to their clients. It is therefore unsurprising that there is an increasing demand for individuals with deep expertise in AI to guide organisations in integrating AI-driven solutions. This trend is corroborated by Dr Koutroumpis of the University of Oxford, who reports an over elevenfold increase in the number of AI-related jobs globally between 2015 and 2022 (Koutroumpis, 2023). Based on the industry reports, it can be deduced that this trend is likely to persist in the foreseeable future.

Despite its transformative potential, the development of artificial intelligence, particularly generative AI, faces significant impediments that are likely to impact IT consulting. Ethical concerns, such as bias in AI algorithms, data privacy violations, and a lack of transparency in decision-making processes, may erode trust in these technologies (Akhtar, Kumar and Nayyar, 2024). From a legal perspective, regulatory uncertainty across jurisdictions may slow AI adoption as organisations navigate inconsistent or overly restrictive legal frameworks (Comunale and Manera, 2024). Furthermore, high costs, data quality issues, and the limited availability of AI expertise create additional barriers to adopting AI solutions (Radhakrishnan and

Chattopadhyay, 2020). These challenges could make it difficult for consulting firms to deliver solutions on time and within budget, potentially undermining their credibility if they fail to meet client expectations.

Remote Workforce

Secondly, with 91% of organisations recognising workplace flexibility as a critical advantage in attracting talent, the shift to remote workplace (Figure 8) and the adoption of collaboration technologies has become an important component of digital transformation (Payscale, 2023). The Payscale report highlights that remote work significantly broadens the talent pool by providing access to a global workforce and contributes to cost savings by reducing the need for physical office space and associated overheads. Importantly, it must be noted that despite initial concerns, many organisations report that productivity has not declined, with some observing improvements attributed to better work-life balance and reduced commuting (Anakpo, Nqwayibana and Mishi, 2023).

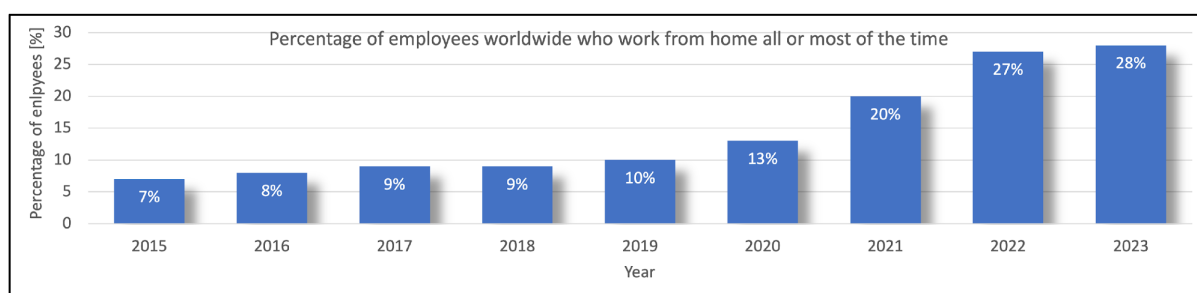


Figure 9: Percentage of employees worldwide who work from home all or most of the time (Payscale, 2023)

Deloitte's report highlights that over 62% of surveyed technology executives believe that remote and hybrid work will become a permanent fixture that requires businesses to adapt their workforce strategies and operations. Accenture also emphasises that remote work is not merely a temporary adjustment but a long-term strategy. The report stresses that businesses must invest in tools and strategies to support flexible work environments, with 72% of organisations already integrating advanced collaboration tools to enhance remote work productivity. CompTIA further elaborates on the operational challenges posed by remote workforce, noting that 44% of IT professionals identify increased complexity in managing IT systems that support remote teams as a major concern.

It appears from the reports that there is an increasing emphasis on developing technology that is inherently human-centric and integrates more intuitively into daily life and work. As organisations increasingly integrate AI-driven collaboration tools and spatial computing technologies, remote work environments are expected to become more immersive and offer greater productivity (Accenture 2024). Spatial computing, which includes technologies such as augmented reality, virtual reality, and the metaverse, enables the creation of virtual workspaces that mimic physical office environments. These virtual spaces could allow remote workers to interact with digital objects and collaborate with colleagues as if they were in the same physical location, thereby reducing the sense of isolation often associated with remote work. Human-technology interfaces, such as brain-computer interfaces (BCIs), eye-tracking, and ambient computing, further enhance the remote workplace by enabling more efficient interactions with technology. BCIs, in particular, could allow

employees to control devices with their thoughts, considerably improving accessibility, inclusion and productivity.

It is evident that the ongoing transition to a remote workforce, coupled with continuous innovation in remote work technologies, creates a growing need for skilled consultants to advise clients on managing remote teams and effectively utilising virtual collaboration tools. To remain productive and effective, consultants must also adopt these tools. The integration of spatial computing could allow consultants to create immersive simulations or virtual environments that enhance collaboration and better facilitate client engagements regardless of geographical boundaries. Such technologies could also facilitate more effective scenario planning, allowing clients to experience and evaluate potential outcomes in a controlled setting before making critical business decisions. This evolution can enhance the consultant's role as a strategic partner, capable of delivering more impactful solutions.

While remote working technologies hold great potential, their associated challenges could significantly hinder IT consulting by impacting the effectiveness of client engagements and the quality of deliverables. Limited access to reliable digital infrastructure in certain regions remains a critical barrier, creating disparities in the adoption and use of remote work solutions (Matli and Wamba, 2023). Furthermore, the erosion of organisational culture and reduced employee engagement in virtual environments can undermine the effectiveness of remote strategies and cause clients to question their long-term viability (Bilderback and Kilpatrick, 2024). Persistent issues such as burnout and isolation, experienced by both clients and consultants, may further harm productivity and stifle innovation (Trzebiatowski and Henle, 2023). These obstacles could diminish consulting firms' ability to deliver optimal solutions and reduce client confidence in remote working as a sustainable long-term strategy.

Cybersecurity

Finally, amidst rapid technological advancements, cybersecurity has emerged as a paramount concern, further exacerbated by the rise of artificial intelligence and remote working. Deloitte identifies cybersecurity as a key focus due to the increasing complexity of IT environments and the integration of AI. The firm predicts global spending on security and risk management to grow by over 10% between 2023 and 2024. CompTIA reinforces this perspective by highlighting the growing demand for advanced cybersecurity skills and governance frameworks, particularly as IT environments become more intricate and remote work becomes increasingly prevalent. Their report indicates that 53% of organisations cite managing cybersecurity in remote work settings as a major challenge, which reflects the pressures on organisations to adapt. Accenture further elaborates on the evolving nature of cyber threats, particularly within AI-driven contexts, and underscores the imperative of embedding security throughout all aspects of digital transformation. The report predicts that by 2025, AI-related investments in cybersecurity will constitute a significant portion of the projected \$200 billion global AI spending.

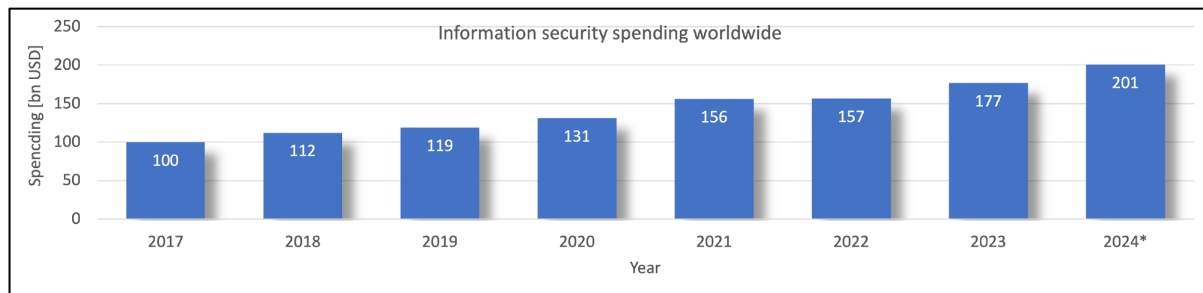


Figure 10: Information security spending worldwide (Gartner, 2023a)

As digital threats grow increasingly sophisticated, safeguarding sensitive data and ensuring compliance with regulatory frameworks have become more challenging. Researchers from Gartner expect global spending on cybersecurity to double between 2017 and 2024, reaching \$200 billion (Figure 10). Meanwhile, according to ISC2, the leading non-profit membership body for cybersecurity professionals, the international cybersecurity workforce expanded to 5.5 million individuals in 2023 (ISC2, 2023). This represents an 8.7% increase from the previous year, equating to the creation of 440 thousand new roles in the field. However, despite this growth, the shortfall in the cybersecurity workforce has reached a record peak, now standing at 4 million professionals. These statistics indicate a growing demand for IT consultants with specialised cybersecurity expertise. Notably, the role of cybersecurity consultants extends well beyond traditional IT security and encompasses comprehensive risk management and strategic shifts in the cybersecurity approach. These numbers clearly indicate that cybersecurity must remain a primary area of focus for IT consulting firms.

It is evident that the rapid pace of technological advancement has intensified existing cybersecurity challenges, particularly with the rise of organised cybercrime, which could significantly hinder IT consulting by undermining confidence in digital solutions (Hyslip, 2020). As cyberattacks become increasingly sophisticated and frequent, clients may hesitate to adopt innovative technologies due to fears of heightened exposure to risks. The complexity of securing interconnected systems could lead clients to question the feasibility and cost-effectiveness of proposed solutions, undermining consultants' ability to deliver viable strategies (AlDaajeh and Alrabaee, 2024). Moreover, the introduction of stringent new cybersecurity legislation, such as the EU's Cyber Resilience Act and the second Network and Information Security Directive, increases compliance pressures on organisations and consultants alike, potentially creating barriers to the swift implementation of new technologies (Ruohonen, 2024). Additionally, the global shortage of cybersecurity talent may impede consultants' capacity to address evolving threats. If these challenges are not effectively managed, consultancies risk being perceived as unable to provide robust, innovative and secure technological solutions.

Conclusion

The evolution of IT management consulting, from the mainframe era to today's dominance of cloud computing, illustrates the industry's adaptability to rapid technological change. As businesses increasingly rely on IT for strategic growth, consultants have become essential in navigating complex business transformation efforts. Today, the cloud offers unprecedented scalability and efficiency, making it a central focus for modern organisations and continuously driving demand for new

expertise. Alongside this, the rise of artificial intelligence is not only revolutionising business operations but also transforming the consulting landscape itself, requiring consultants to develop new skills and tools. Moreover, the shift towards remote working has introduced challenges in maintaining productivity through collaborative tools, and hence, further increased the need for specialised consulting services. Overarching all these developments is the critical importance of cybersecurity, which has become a fundamental concern across every aspect of IT.

While this paper highlights the remarkable adaptability of IT management consulting to technological shifts, it also raises critical questions about the challenges and opportunities that lie ahead. As cloud computing continues to evolve, how can organisations maximise its potential while managing complexities related to business transformation and governance? In the realm of AI, what frameworks will consultants develop to help businesses harness generative AI responsibly and mitigate its risks? Similarly, as remote working technologies advance, how will consulting firms support organisations and can they create inclusive, efficient, and human-centric virtual workplaces? Finally, with the rise of increasingly sophisticated cyber threats, what innovative strategies will IT consultants adopt to ensure comprehensive security and regulatory compliance in ever more complex digital ecosystems? By addressing these interconnected challenges, the consulting industry will play a pivotal role in helping organisations navigate the technological landscape and achieve future success.

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