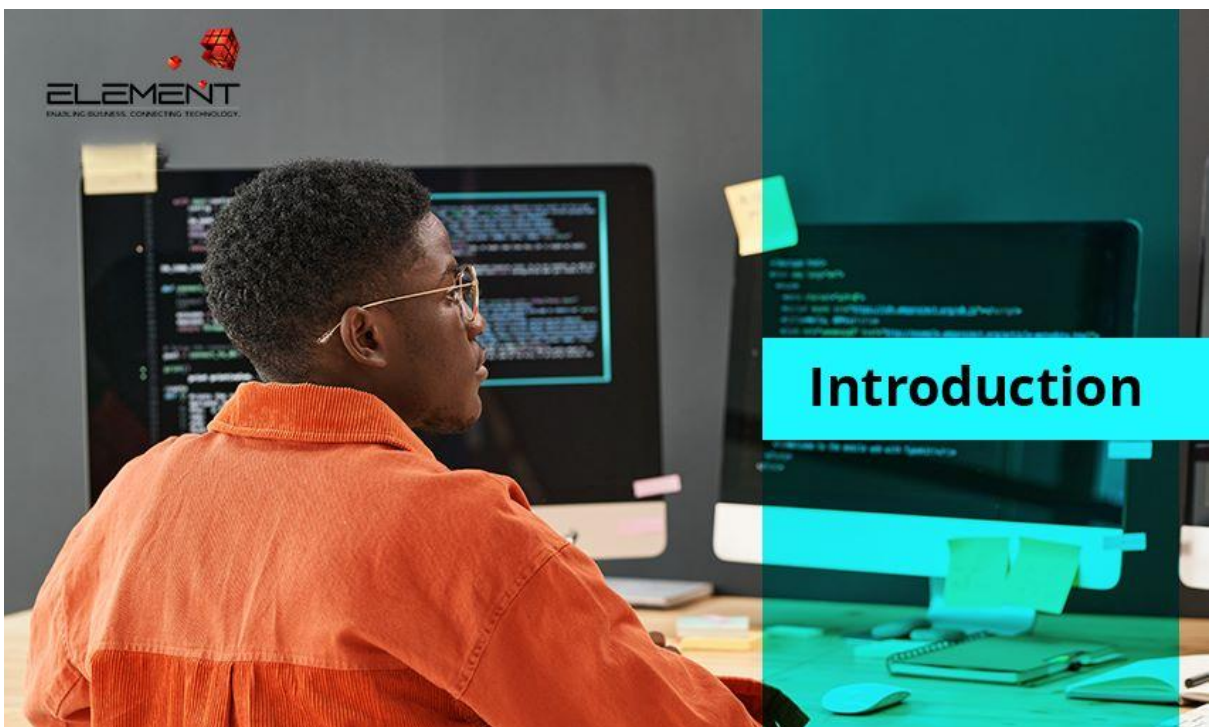


# A Basic Understanding of Modern Tech Skills: Decoding IT Expertise 2.0



## Introduction



The present Information Technology (IT) landscape is rapidly evolving, primarily driven by the growing skill gap. This gap exists due to fast-changing technological trends across different business sectors. Understanding and adapting to these trends has become even more critical in the era following the pandemic. Both organizations and individuals who can effectively adapt to these changes have a competitive edge. One major challenge is finding the right balance between these new technological advancements and the existing resources. There's a large gap between what's needed and what's available, which is widening. This is partly because traditional education and training practices haven't been able to keep up with the speed at which technology advances. These traditional approaches often fail to address the real-world problems businesses face today. This results in a disconnect between technical skills and the ability to apply them in a way that drives business success. At the same time, we're seeing an increased integration of digital platforms and ecosystems. This offers new opportunities but also presents new challenges. We need a fresh approach to training and education, one that better aligns with the realities of today's business environment.

## Machine Learning

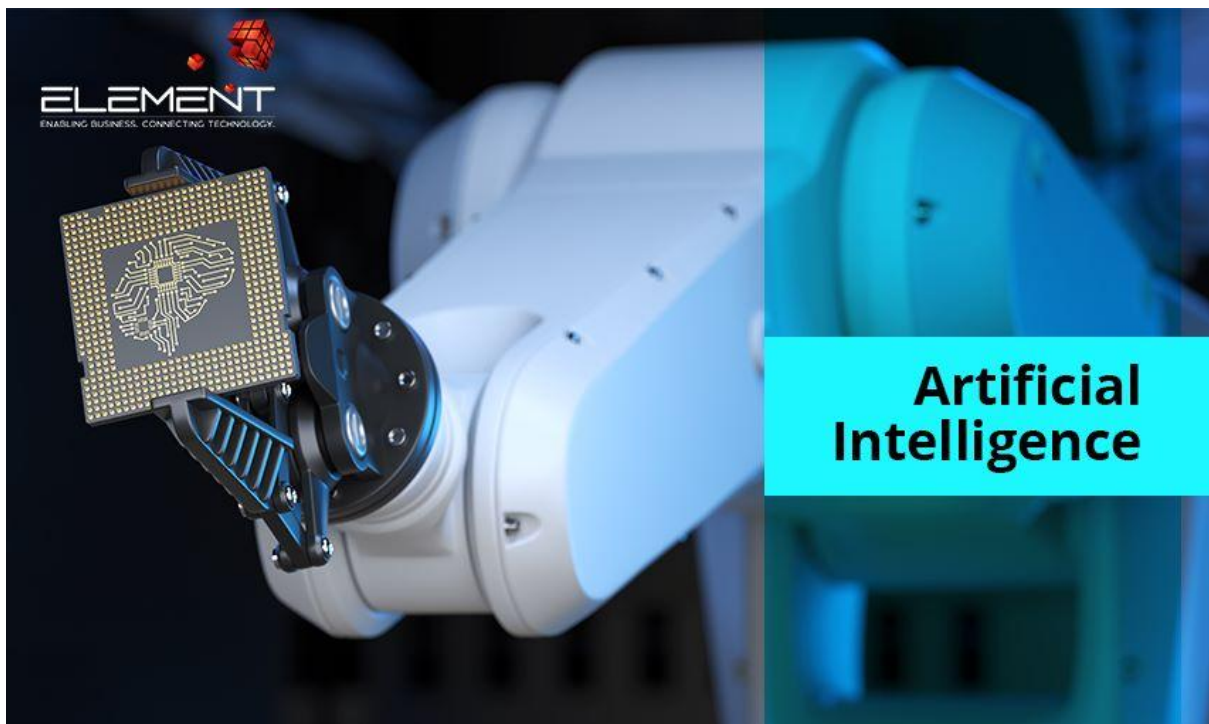


One of the prime IT skills today is Machine Learning (ML), illustrating the shift towards smarter technology. A part of Artificial Intelligence (AI), Open Source ML combines human ingenuity with tech advancements. Today, ML encompasses many specializations like Parametric & Non-parametric Algorithms, Kernels, Clustering, Deep learning, and more. Apart from basic ML skills like Decision Trees, Artificial Neural Networks, Logistic

Regression, etc., professionals are now expected to innovate and devise ways to solve real-world business problems. Probabilistic Machine Learning is a rising skill, simplifying tasks such as debugging. Other sought-after skills include Advanced Signal Processing, Natural Language Processing (NLP), and Reinforcement Learning.

Another emerging skill in the IT industry is the understanding of Foundation Models. These tools have proven efficient in handling large amounts of data, surpassing traditional neural networks. Hence, new IT skills aim to enhance functionalities like knowledge accumulation, content generation and summarization, coding, translation, customer support, and pattern searching. Therefore, companies seek individuals proficient in dynamic skills like GPT-3, MidJourney, and handling complex systems. Other relevant skills encompass Multimodal Machine Learning, Transformers, Embedded Machine Learning (TinyML), No-code or Low-code solutions, and more. From a business viewpoint, emerging trends like AutoML, Machine Learning Operationalization Management (MLOps), Hyper Automation, and Generative Adversarial Networks (GAN) are gaining importance. They play critical roles in design, automatic management, categorization, etc.

## Artificial Intelligence



Artificial Intelligence (AI), overlapping significantly with Machine Learning, is seeing the creation of new roles like AI Ethics Officer. This role is vital in managing risks and governance and is highly valuable to government bodies, non-profits, legal entities, private agencies, and tech teams. The AI Business Analyst, proficient in AI Modelling, Data Science,

and Automation, is another sought-after role, driving value in businesses. Skills like Stochastic Processes, Optimization, and Algorithms also define new roles in AI Architecture and DevOps, along with specialist areas like AI Data Manufacturing Architecture and AI Quality Assurance Management. Employers are keen on emerging skills, such as Citizen Data Science, expected to simplify AI and ML practices while ensuring scalability and cost-efficiency.

IT companies also seek skills such as understanding how to counteract overfitting, dimensionality reduction problems, assessing ML algorithms/tools' performance metrics, and Hyperparameter tuning. This indicates the merging of AI and the Internet of Things (IoT), as professionals prioritize accuracy, transparency, and accountability through skills like Edge AI and Explainable AI (XAI). Core skills like Robotic Scientist and Business Intelligence Developer have added value across industries, while essential skills like problem-solving have been fruitful in business and tech operations. Furthermore, industry leaders are heavily considering deep knowledge in Distributed Computing Efficiency, Bias Detection, Computer Vision Engineering, AI Interaction Design, and AI Delegation.

## Cloud Computing



Cloud Computing is evolving, driven by substantial investments in Cloud Security. This shift is paving the way for revolutionary tech trends. Multi-Cloud strategies stand out, offering enhanced security and flexibility. Similarly, Hybrid Cloud applications are proving to be safer and more up-to-date. IT companies are thus hunting for talent adept at integrating various

cloud models. A practical understanding of Containers like Docker and Kubernetes, mastery of Microservices Architecture, and expertise in automated cloud orchestration practices are in high demand. These burgeoning trends work hand in hand with Serverless Computing or Function-as-a-Service (FaaS), giving rise to new Cloud Computing skills. On the business side, key skills include Disaster Recovery and Backup, which are essential for comprehensive enterprise management. Proficiency in real-time and long-term cloud management through Edge Computing is increasingly essential.

The top skill right now is Cloud Security, a critical line of defense against many cyber threats. Secure Access Service Edge (SASE) is prized for stable access management, and the role of DevSecOps is opening up novel skills related to task automation and workflow control. Network issues have been a bottleneck for the boom of Cloud Gaming, so expertise in 5G technology is capturing the attention of IT recruiters. As businesses seek more autonomy and personalized and efficient services, Open-source cloud solutions are becoming hot skills. In 2023, the role of the Citizen Developer has surged in demand, propelled by tools like Power Apps and HoneyCode from industry leaders like Microsoft, Google, and AWS. Cloud Computing has also fostered emerging AI skills like Creative algorithms and Language Modelling. With the massive volumes of data organizations are dealing with, Quantum Computing, applying Quantum Theory for data organization and analysis, is viewed as the ultimate future skill.

## Data Science



Data Science Management has witnessed the exponential growth of Data Mining with respect to data exploration and data wrangling that denote exhaustive potential in Exploratory Data

Analysis (EDA), intensifying resource modification to derive value-added solutions. Today, data acts as the beating heart of organizations and businesses. This has led to a blend of technical and non-technical roles and skills. A prime example is the Behavioral Psychologist role, merging data science, social science, and the human dimension of the organization's economic context. Tied to ethical AI, this role helps assess the real-world effects of digital algorithms to enhance research results.

The Data Ethicist role also gathers attention as it aims to eliminate unethical practices around human data privacy and ownership. Another intriguing role is the Data Storyteller. While often conflated with Data Visualization, Data Storytelling goes beyond simply depicting data—finding and creatively presenting the story within the data. Data Storytelling simplifies data, focusing on critical aspects to deliver actionable insights and accurately comprehend a phenomenon.

Looking ahead, new skills are emerging through Productization, as exemplified by the introduction of the Data Mesh concept by Zhamak Dehghani, opening up new roles and expertise in data architecture. Other noteworthy trends in data science include Data Democratization, Robotic Process Automation (RPA), and Data Fabric Architecture. Augmented Analytics, combining AI, ML, and NLP, also generates new skills beyond the traditional Data Scientist role, ensuring automated and real-time insights. Employers are keenly seeking skills in Generative AI for Deepfake and Synthetic Data, and Automated Data Cleaning, among others.

## Cybersecurity



Cybersecurity's landscape is constantly changing with new roles and trends. Penetration Testing is a key skill in this field, using exploitation techniques to identify security gaps and fight against malicious hackers. The importance of this skill is showcased by numerous respected certifications like EC-Council Certified Ethical Hacker (CEH), CompTIA PenTest+, Certified Penetration Tester (CPT), and many more.

Another rising skill relates to Forensic Investigation. This new and vital skill aids in cyber incident response and handling. It uses various forensic tools to recover deleted, corrupted, or distorted data from computers, tablets, phones, and flash drives. Moreover, companies are also seeking candidates with legal or regulatory knowledge, such as familiarity with the General Data Protection Regulation (GDPR). Emerging skills like Threat Intelligence and Adversary Emulation also garner attention to identify hidden risks and understand the attackers' perspective. Looking forward, Composable Security is becoming popular, integrating cybersecurity controls into architectural patterns for holistic business process optimization.

A highly sought-after skill in cybersecurity is Linux Server Administration. It provides transparency and versatility when scanning networks and using system services, which most operating systems restrict. Expertise in Kali Linux, an open-source software, has become a top skill. Another noteworthy skill is the Kerberos cybersecurity protocol, a tool underpinned by a cryptography protocol that ensures improved access management, authentication, and encryption for better data integration and user privacy. Competency in Splunk Software is also among the desirable cybersecurity skills today. It plays a crucial role in risk management through continuous monitoring, delivering strategic and custom solutions for clients' unique security needs.

## Blockchain



The blockchain sector is undergoing a continuous transformation with the advent of new competencies. A recently recognized skill in this arena is the Blockchain Legal Consultant, who lends expertise in improving investment and finance management concerning international law. This is crucial as blockchain technology transcends borders. Related skills such as Crypto Journalist and ICO Advisors are also gaining traction.

The main facets of blockchain skills revolve around Web 3.0 Applications, which include Decentralized Finance, Stablecoins, Non-fungible Tokens, and more. Other associated skill areas include Application Hosting for Decentralized Apps, off-chain computing, multi-signature, consensus algorithms, etc. Moreover, a deep understanding of Central Bank Digital Currencies (CBDC) and the resurgence of Ricardian Contracts stand among the most noticeable emerging trends in the blockchain. With Private Blockchain securing its place in the decentralized domain, Federated Blockchain skills are also gaining value, enhancing customization capabilities.

Innovative trends in blockchain signal the convergence with Immersive technologies, particularly the Metaverse concepts. This fusion, represented through the integration of Virtual Reality, Augmented Reality and Blockchain, can be seen on platforms like Decentraland, Axie Infinity, SecondLife, and others. As such, recruiters are looking for individuals with comprehensive or at least foundational knowledge in this area as blockchain continues to broaden the digital economy by leveraging tokens and assets in purpose-driven ways.

Emerging roles in blockchain are also linked to environmentally sustainable blockchain technology. This notion has garnered significant attention since traditional blockchain has



been criticized for its hefty electricity consumption and substantial carbon footprint. Blockchain technology is adopting a "Go Green" approach, which calls for proficient individuals trained in energy-efficient mining tools and associated consensus mechanisms.

## Conclusion

These fresh roles and skills undoubtedly arise due to the special challenges brought by the mix of business environments in the IT field. With the change in how people buy things and the rise of lifestyle shopping, it's more important than ever to fill the growing gap between what the tech industry needs and what it can supply. While some people only see this from a money-making point of view, true, long-lasting success comes from everyone working together. This team effort should go beyond small business rivalries and focus on creating and using top-notch, valuable solutions. This can help break down location, politics, economy, and societal barriers, bringing power to those often overlooked or left behind.