



Empowering Life Sciences

Unleashing the potential of a
GenAI-enabled workforce

April 2024





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Foreword

In an era of accelerating technological advancements, few innovations have captured our attention quite like Generative AI (GenAI). This cutting-edge field of artificial intelligence has emerged as a game-changer, revolutionizing the way we approach complex problems, generate creative solutions, and unlock untapped potential across industries.

GenAI is not just another technological breakthrough; it is a catalyst for a fundamental reimagining in the way we thought things to be possible.

The Life Sciences industry is at the forefront of a major transition, with GenAI transforming the very fabric of the workplace. AI-driven automation, coupled with rapid advances in technology, is disrupting the conventional business model, elevating the role of human capital at the core of innovation. The rise of GenAI-driven automation in Life Sciences is a significant trend that is presenting both opportunities and risks for this highly regulated industry, one of which is the expected displacement of a considerable number of jobs.

In order to survive and thrive in this rapidly evolving landscape, organizations will have to prioritize the humanization of AI and adopt an evolutionary mindset that emphasizes the upskilling and reskilling of their workforce. For the sector to stay competitive and deliver value to its stakeholders, it must embrace the transformational impact of GenAI.

This will not only ensure the effective adoption of AI but also enable employees to thrive in an ever-evolving

technological landscape. With automation taking center stage, the industry must fundamentally reimagine its workforce strategy. The era of GenAI demands a transformation of the Life Sciences industry's workforce, ensuring that they are equipped to embrace the change and create value for the economy and society.

This publication seeks to delve into the implications of GenAI for the Life Sciences workforce, exploring the necessary transformations and opportunities for human-AI collaboration.

Furthermore, this paper provides a comprehensive analysis of the major trends shaping the Life Sciences industry, as it navigates the era of GenAI, highlighting potential opportunities for value creation, and providing recommendations on how to develop and implement a workforce strategy that effectively integrates GenAI.



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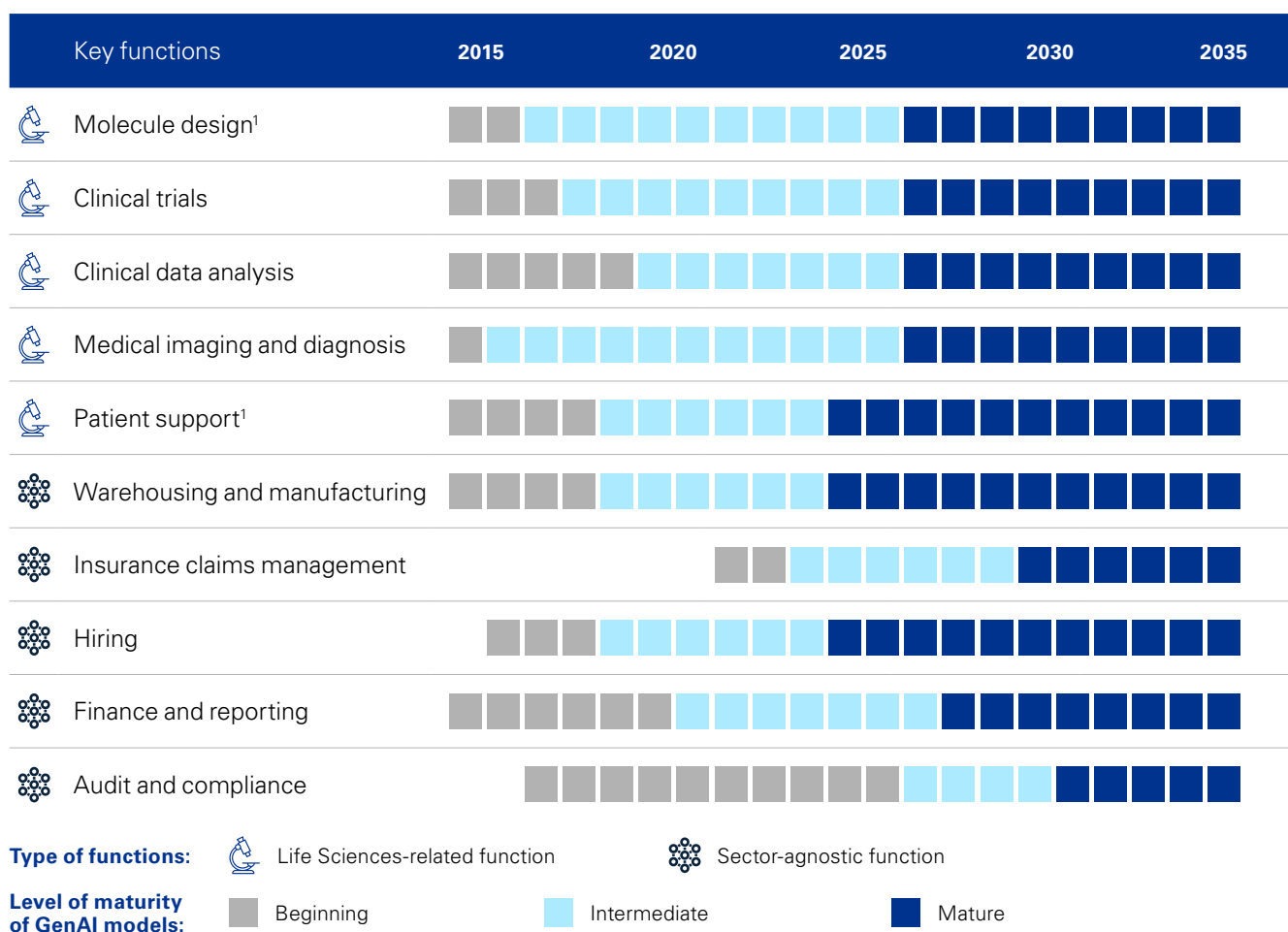


GenAI - Adapting to new realities and potential workforce disruptions

GenAI as part of the workforce today and tomorrow

GenAI as a concept has been around since the 1970s. However, the recent launch of open models (e.g., ChatGPT) and the availability of larger datasets and better analytical models, has driven companies across sectors to recognize the disruptive power of the technology. The same holds true for Life Sciences firms, even though they happened to be its early adopters.

GenAI application and level of maturity across key functions



Source: KPMG in Germany, 2024

Key factors influencing the growing popularity of GenAI

- Transformational benefits across functions:** GenAI holds the promise of revolutionizing end-to-end value chain of Life Science industries, from drug discovery to launch & commercialization.
- Experimentation and integration of GenAI tools:** Life Science Organizations are actively exploring and incorporating GenAI into both internal processes and customer-facing activities.
- GenAI augmentation reshaping the workforce and industry norms:** From niche applications to mainstream adoption, GenAI is fundamentally changing how business models operate and how new ways of working are established.
- Within Life Sciences, GenAI is expected to transform the workforce, requiring employees to polish their technical and analytical skill set while upgrading their personal skills. The use of AI systems will necessitate a balance between technical proficiency, regulatory compliance, and ethical considerations, benefitting those who adapt to this change in the rapidly-evolving industry.
- Thus, as companies embrace GenAI, it is crucial that employees are appropriately educated and trained on the use of this technology to realize expected efficiency gains.

¹ Role explained in more detail in the [Glossary](#)



GenAI - Adapting to new realities and potential workforce disruptions

Workforce-related threats posed by GenAI and how to counter them

The road to helping the workforce adopt GenAI is laden with several risks, particularly for Life Sciences firms that already face several challenges in finding and retaining talent. As with all new technologies, adaptation to new roles will be necessary, requiring companies to adopt a proactive approach to responsible development, thoughtful regulation, and retraining efforts associated with GenAI.

GenAI-related risks of today



Application awareness

As employees look to leverage GenAI for routine tasks, they may lose out on developing baseline skills, and may sometimes accept inaccurate or misleading interpretations. Thus, the workforce should be trained to work with and without these tools, and triangulate GenAI generated results in the right manner.



Quality quagmire

GenAI, much like other AI/ML-related systems, is susceptible to bias, and can often yield inaccurate or hallucinated information. This may expose firms to risks, such as prejudice towards specific patient/employee groups. The workforce should be trained to identify such bias and devise strategies to eliminate them.



Lawsuit lurk

Generative AI used for legal confirmations or evaluations can circumvent necessary ethics, compliance and independence programs, and impact regulatory liability. Organizations can think about employing smaller, more specialized models rather than a pre-built generative AI model, to match their goals.

GenAI-related risks of tomorrow



Job jeopardy

GenAI can potentially displace human workers in various tasks and occupations, particularly those involving repetitive, low-skill, or data-intensive work. This could lead to unemployment, underemployment, or skill mismatch for some, while education digitally-dark areas may struggle to keep up with market demand.



Skills shift

With the increasing adoption of AI, tasks that were once handled by humans are becoming automated. This trend may lead to existing skills becoming outdated and obsolete, requiring workers to adapt or reskill to remain relevant in their fields.



Effective risk management in Life Sciences is pivotal to mitigate the ethical and workforce-related risks associated with extensive or unregulated use of GenAI. A robust AI risk management strategy must be foundational to organization's enterprise strategy to allow sustainable future-ready transformations, including tech incubation and workforce upskilling.

Markus Fabel

Partner, Consulting, Global Head of Quality & Risk Management Advisory, KPMG in Germany













GenAI – Outlook on skills shift and potential opportunities

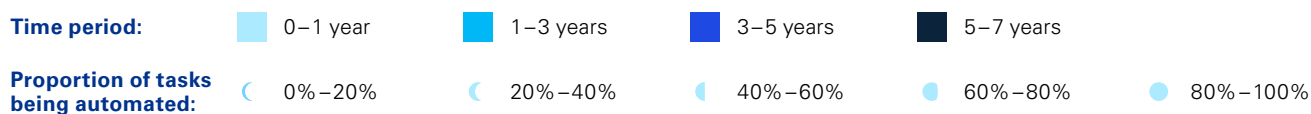
KPMG’s ‘Job Automation Outlook’ – Expected impact of GenAI on job automation

Integration of GenAI into the Life Sciences industry, is expected to enhance operational efficiencies, automate routine tasks, and boost productivity. However, it is important to recognize that GenAI cannot replace the critical thinking, creativity, and strategic input of highly skilled professionals.

- To determine the expected proportion of jobs being automated in the near-to-medium term, KPMG conducted a qualitative assessment of key roles across the Life Sciences value chain.
- KPMG’s ‘Job Automation Outlook’ maps key job roles on a timeline, highlighting roles that may undergo rapid evolution as many of the expected tasks are automated by upcoming GenAI tools.
 - The degree of automation is likely to differ across job roles and has been gauged subjectively, as explained in the examples listed below.
- While level of automation may be led by the pace of advancements in GenAI technology, high regulatory requirements within the industry may delay automation across some roles in the near term.

Examples for automation in different value chain segments

Value chain	Key examples of selected job roles	Level of automation (expected timeline)
 Research and development	Pharmacologist ¹ – GenAI can expediate data analysis-related tasks, including molecule design and disease modeling. However, it is unlikely to affect other high-value tasks, such as critical analysis and innovation.	 20%–40% (in 3–5 years)
 Manufacturing and logistics	Manufacturing engineer ¹ – GenAI can automate manufacturing tasks such as quality control and assembly. However, specialists skilled in critical thinking and problem solving would be required in technical projects.	 20%–40% (in 5–7 years)
 Commercial services	Healthcare professional (HCP) ¹ – GenAI can automate recording patient data, making notes, and advance diagnosis. However, human expertise would be required for critical decision making and proper patient support.	 20%–40% (in 5–7 years)
 Regulatory	Compliance officer ¹ – GenAI can be used to track market entry requirements and prepare documents for submission, but personnel will still be needed for strategic planning and decision-making.	 20%–40% (in 3–5 years)
 Corporate functions	Hiring manager – GenAI could automate routine tasks including exit management, attendance/ time management, and workforce management. However, creativity and soft skills would be required in strategic decision-making roles and activities associated with people management.	 40%–60% (in 5–7 years)



Source: KPMG in Germany, 2024



As more jobs become automated or augmented, Life Science organizations must prioritize GenAI literacy. Human-AI collaboration will become crucial to gain a competitive edge. KPMG’s ‘Job Automation Outlook’ provides a starting point for firms to initiate workforce transformation.

Holger Kneisel
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¹ Roles explained in more detail in the [Glossary](#)

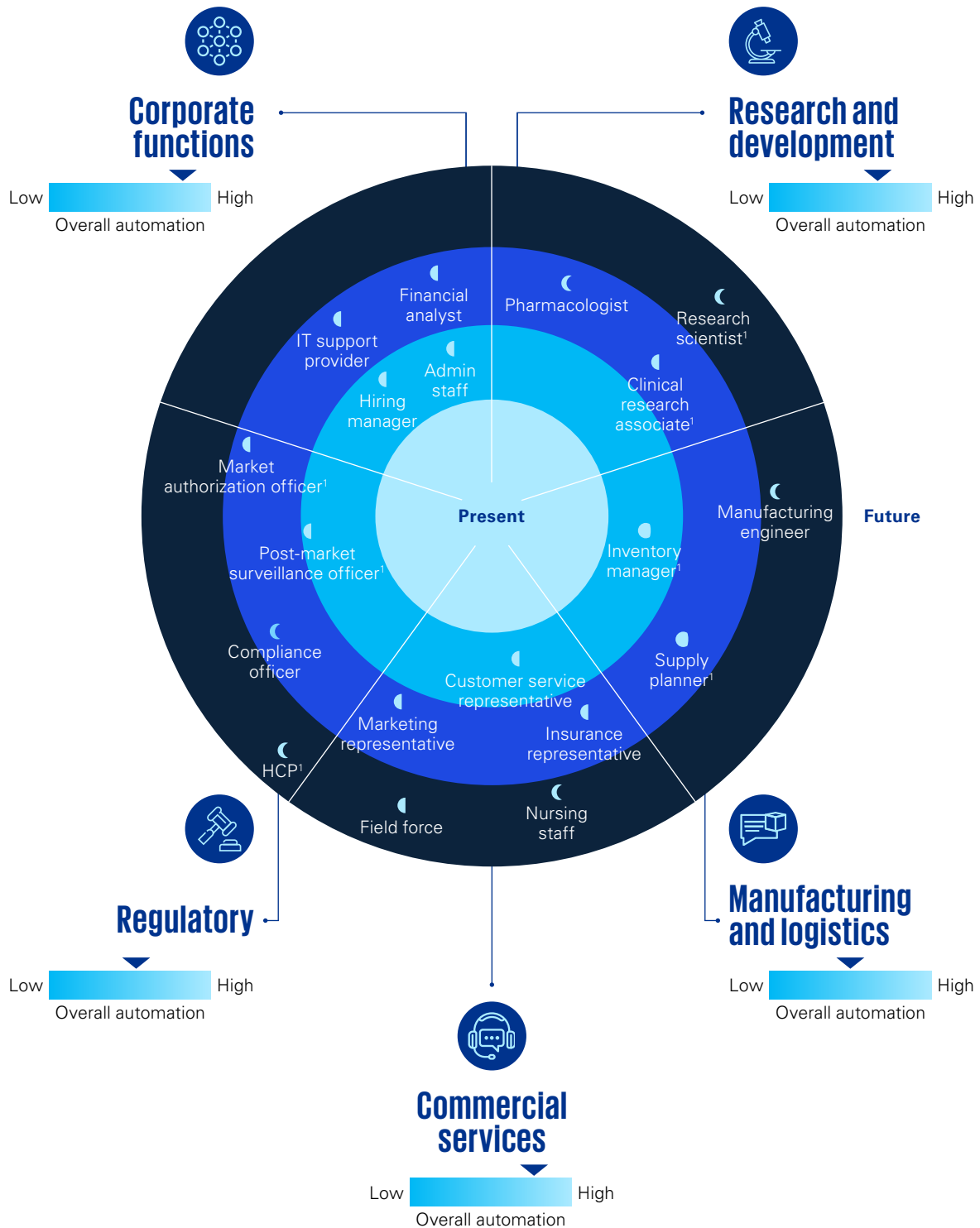


GenAI - Outlook on skills shift and potential opportunities

Future automation across segments and key job roles

As Life Sciences firms explore different use cases of GenAI across various verticals of the value chain, some job roles are likely to be more exposed to displacement as several tasks pertaining to these roles can be automated using GenAI tools. However, it is imperative to remember that even for these roles, the industry is expected to witness a steep evolution and/or re-definition of job roles, rather than elimination.

KPMG's 'Job Automation Outlook'



Time period: 0-1 year, 1-3 years, 3-5 years, 5-7 years

Proportion of tasks being automated: 0%–20%, 20%–40%, 40%–60%, 60%–80%, 80%–100%

Source: KPMG in Germany, 2024

¹ Roles explained in more detail in the [Glossary](#)



GenAI - Evolution of the workforce of the future

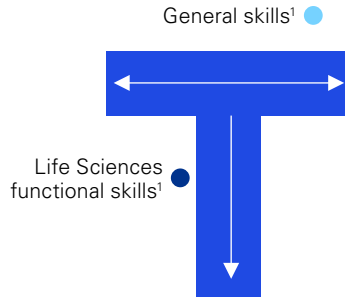
Evolution mindset as part of a paradigm shift

As Life Sciences companies look to incubate GenAI solutions across different verticals, they will be expected to re-skill/upskill their workforce and help employees leverage these solutions effectively.

To this effect, companies may benefit from transitioning from the currently famous T-skill framework to the KPMG's GenAI M-skill framework, which directs firms to help employees develop proficiencies across multiple domains in GenAI, coupled with a diverse, cross-disciplinary set of digital competencies and aptitudes that enable individuals to collaborate with professionals from diverse backgrounds and areas of expertise.

Skills shift driven by GenAI

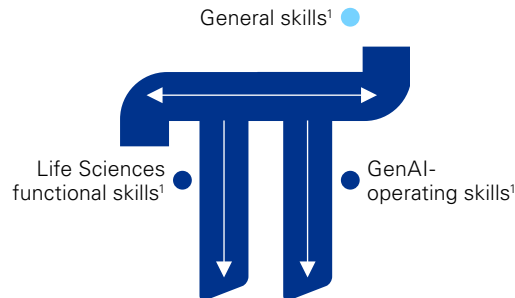
The T-skill framework



Until 2023

Employers encourage the Life Sciences workforce to complement their functional skills (in molecular research, clinical trials, or patient health data management) with a healthy mix of general skills like project management and leadership as well as skills in ethical use of internet and digital technologies.

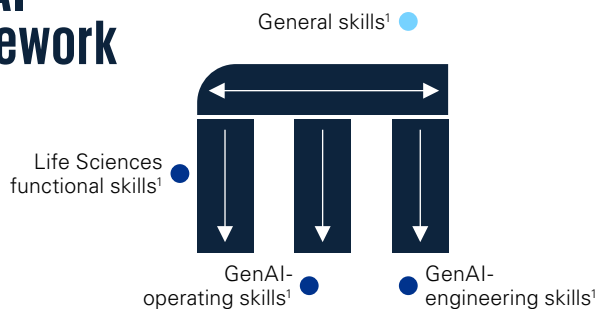
The Pi-skill framework



2023 – 2024

With the rapid adoption of GenAI, organizations are now encouraging the workforce to acquire as well as develop capabilities and expertise on the use of GenAI tools. This necessitates learning new skills, such as prompt engineering¹, machine learning algorithms, basic programming, and robotics & automation.

KPMG's GenAI M-skill framework



2025 +

As the GenAI landscape continues to evolve, the Life Sciences workforce will need to adopt a continuous learning mindset and acquire advanced engineering skills. This includes proficiency in software engineering principles, as well as knowledge in natural language processing and GenAI model designing. Investing in a skill shift with an interdisciplinary workforce that is comfortable with digital literacy in building AI systems, as well as adapting and optimizing existing AI systems to meet specific Life Sciences functional needs, will be a significant differentiating factor.

- Strategic-level understanding
- In-depth knowledge

Source: KPMG in Germany, 2024

¹ Concept explained in more detail in the [Glossary](#)



GenAI – Evolution of the workforce of the future

KPMG’s implementation model to assist the workforce transformation

The advent of GenAI is expected to have a transformational impact on the highly regulated and short-staffed Life Sciences industry, requiring companies to upskill/re-skill their workforce at lightening speed.

The impact of GenAI is far-reaching, and to remain competitive, industry players should look to adopt an evolution mindset that emphasizes continuous training, effective career pathing and regulatory engagement.

Here’s a KPMG model that combines GenAI strategy, risk management strategy, and workforce strategy into a single transformative enterprise strategy that promotes sustainable growth and value.

Enterprise strategy for growth



Empower the enablers

- Critically assess workforce's potential for leveraging GenAI
- Identify and map roles, capabilities, and competencies to better manage the impact of automation
- Recognize skill gaps or areas of potential innovation, and then focus on upskilling the workforce



Assure against risk

- Conduct rigorous assessment to identify potential risks associated with GenAI integration
- Create and adhere to ethical and regulatory guidelines
- Provide role-based training and development on risks and compliance procedures related to usage of GenAI tools



Enrich job roles

- Enhance and augment the existing roles of employees
- Implement and monitor use of GenAI solutions by employees at all levels
- Provide training tailored according to job roles and optimize its efficacy over time



Maximize value

- Enhance employee engagement through feedback, regular updates, and training
- Optimize workforce potential progressively by monitoring results of GenAI implementation
- Refresh workforce strategy on an ongoing basis

Workforce of the future



The Life Sciences industry is at the forefront of a major transition, with GenAI transforming the very fabric of the workplace. In order to survive and thrive in this rapidly evolving landscape, organizations will have to prioritize the humanization of AI and adopt an evolutionary mindset that emphasizes the upskilling and reskilling of their workforce.

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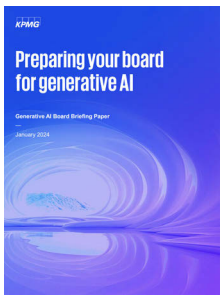
Glossary

Definition of key terms used in the report

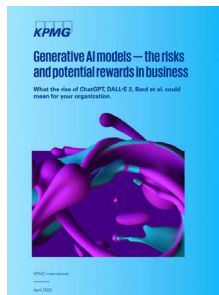
S.no.	Key term	Definition
1	Clinical research associate (CRA)	CRAs manage and facilitate clinical trials. The role involves working with investigators or sponsors to oversee and coordinate activities related to clinical trials
2	Compliance officer	Compliance officers ensure compliance with relevant laws, regulations, and industry standards. They develop, oversee, and implement risk mitigation plans related to compliance within their organization
3	GenAI-engineering skills	This category covers advanced skills, including data curation and GenAI model design, essential for customizing and engineering GenAI to achieve business objectives. These skills complement existing Life Sciences specialist skills and help organizations to remain competitive and relevant in the evolving GenAI world
4	GenAI-operating skills	This category covers skills required to develop expertise on the use of GenAI tools, such as prompt engineering, basic programming and new-age management
5	General skills	Includes soft skills, such as basic understanding, leadership and people management, as well as technical skills such as internet use and ethical considerations associated with the use of new tech tools
6	Healthcare professional (HCP)	HCP is a trained and licensed individual such as a physician or medical technologist who provides care and services to patients within the healthcare industry
7	Inventory manager	Inventory managers are responsible majorly for managing inventory levels, determining reorder points, managing stock levels, and coordinating with suppliers to ensure the timely delivery of inventory
8	Life Sciences technical skills	This category includes skills associated with one or more areas of expertise within Life Sciences, such as specific arms of research (e.g., genomic, proteomic and/or biostatistics), clinical trial management, and/or regulations and pharmacovigilance
9	Manufacturing engineer	Manufacturing engineers oversee the design, development, installation, and monitoring of equipment and machinery used in manufacturing of Life Sciences products
10	Market authorization officer	Market authorization officers ensure that products comply with regulatory requirements, oversee processes related to pre-market approval applications and manage the regulatory interactions with health authorities
11	Molecule design	Molecule designing is a process within drug development stage, that involves designing/modifying the structure of molecules (such as drugs or biologics) to improve its efficacy and safety profile
12	Patient support	Patient support includes patient education, adherence management and streamlining of interactions with other stakeholders (e.g., HCPs)
13	Pharmacologist	Pharmacologists are a specialized set of research scientists who focus specifically on the study of drugs and their effects on biological systems
14	Post-market surveillance officer (PMSO)	PMSOs are responsible for monitoring the safety of drugs once they reach the market, after the successful completion of clinical trials
15	Prompt engineering	Prompt engineering refers to the art of crafting effective instructions for generative AI models, to help generate the desired output

S.no.	Key term	Definition
16	Research scientist	Research scientists refer to professionals that plan and conduct experiments and analyze results to develop new products or broaden scientific understanding. They may work towards a definite end-use, such as for commercial applications, or to advance the general understanding of science
17	Supply planner	Supply planners, along with inventory managers, help streamline supply chain management functions, such as demand forecasting, production planning, supplier management, and logistics management

Related GenAI Thought Leadership



Preparing your board for generative AI



Generative AI models – the risks and potential rewards in business



The potential impact of ChatGPT and the new AI on business



The flip side of generative AI: Challenges and risks around responsible use



Generative AI: From buzz to business value

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¹ Responsible according to German Law (§ 7 (2) BerlinerPresseG): Ashish Madan

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