GPTeal: Merck’s Generative AI Strategy for Pharma R&D

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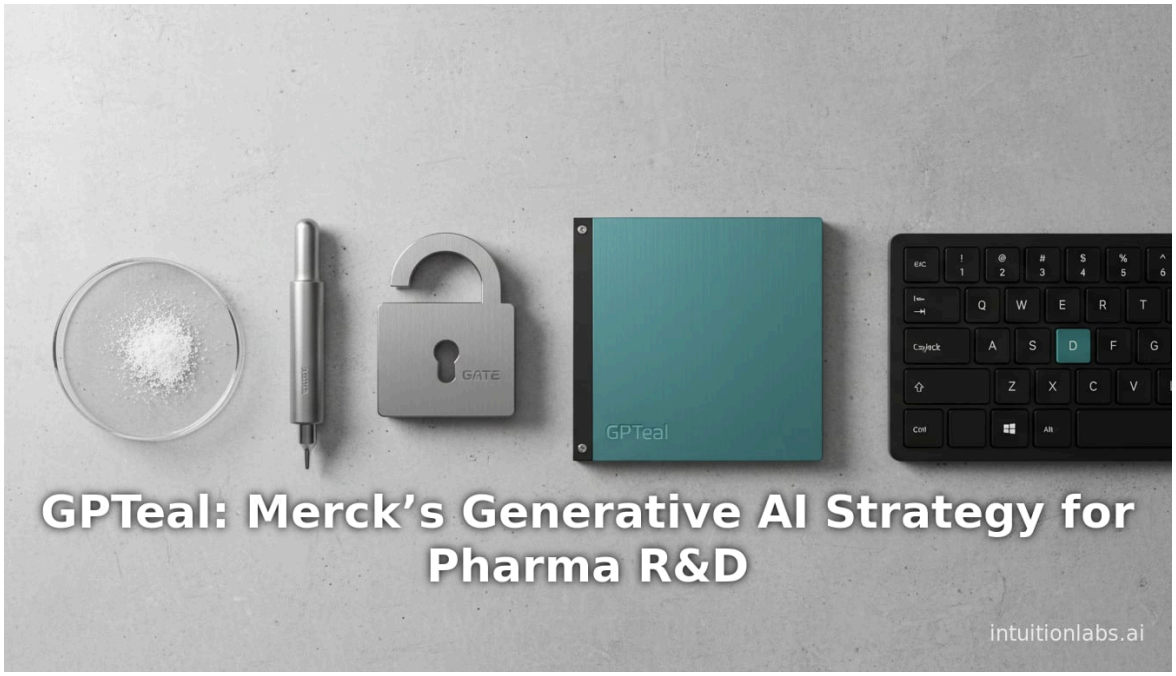

Executive Summary

Merck & Co. (known as MSD outside North America) has launched an ambitious internal AI initiative centered on a proprietary platform called **GPTeal**, designed to bring the power of generative AI into its pharmaceutical R&D processes. GPTeal is essentially a "gated" large-language-model (LLM) interface that allows Merck scientists and staff to interact with advanced AI models (such as OpenAI's ChatGPT, Meta's Llama, and Anthropic's Claude) from within a secure corporate environment (www.businessinsider.nl). By enabling safe access to these powerful tools, Merck aims to accelerate routine tasks (e.g. drafting emails, summarizing documents, composing regulatory text) and free researchers to focus on higher-value activities (www.businessinsider.nl). Early results are striking: business-unit metrics show dramatic productivity gains and quality improvements. For example, in collaboration with McKinsey's QuantumBlack, Merck used generative AI to produce draft clinical study reports (CSRs) in 3–4 days instead of the usual 2–3 weeks (www.mckinsey.com). Human-reviewed drafting hours fell from about 180 to 80 per report (www.mckinsey.com), and error rates in those drafts were cut roughly in half (www.mckinsey.com). Internally, more than **50,000** Merck employees (out of ~75,000 total) now use GPTeal regularly for various tasks (www.businessinsider.nl) (www.merck.com).

This report provides an in-depth examination of Merck's GPTeal platform and its context. We begin with background on the high costs and long timelines of traditional pharma R&D (often 10+ years and over $1 billion per drug (www.mckinsey.com)) and the rapid emergence of generative AI (e.g. ChatGPT) as a promising accelerating force. We then describe GPTeal's design, capabilities, and deployment, using primary sources and reported metrics. Detailed case analyses — such as Merck's AI-driven CSR authoring — illustrate how GPTeal and allied tools are already transforming workflows. We compare Merck's approach with those of other pharma leaders (e.g. J&J and Eli Lilly) and describe how Merck is training and governing AI use across its organization (www.businessinsider.nl) (www.businessinsider.nl) (www.businessinsider.nl). We analyze data on time-savings, error reduction, and employee adoption, and we cite recent studies showing that well-deployed LLMs can multiply knowledge-worker productivity by 40% or more (aibusiness.com). Finally, we discuss challenges and future directions: privacy and regulatory risks (guidehouse.com), the need for human oversight (www.mckinsey.com), and evolving AI models (e.g. domain-specific "PharmaGPT" models) and how Merck (and the industry) might integrate them. Throughout, all claims are substantiated with citations to credible sources.

Introduction and Background

Bringing a new medicine to market has long been one of the most demanding endeavors in science and business. On average, drug development takes roughly **ten years** and well over **$1**

billion per medicine (www.mckinsey.com). Despite this investment, the industry faces mounting pressures: R&D pipelines have only grown busier (the number of new molecules in development has *doubled* over the past decade (www.mckinsey.com)), and the complexity of biology yields high failure rates. In this environment, pharmaceutical companies are urgently seeking innovations to accelerate every phase of R&D — from target discovery and candidate optimization through clinical trials and regulatory filings.

In 2022–2024, a new class of AI tools arrived that promised exactly such acceleration. Generative AI — exemplified by OpenAI's ChatGPT and similar LLM-based chatbots — can create high-quality text, code, and even images from user prompts. Within months of ChatGPT's public launch in late 2022, businesses worldwide recognized its potential to automate routine cognitive tasks. Corporate leaders noted that AI could assist with literature review, data summarization, report drafting, coding, and more. A Harvard Business School study, for instance, reported that using GPT-4 raised knowledge workers' quality of work by **over 40%** on average (aibusiness.com) (compared to no-AI controls), when used intelligently. However, companies also raised deep concerns about privacy, accuracy, and compliance: generative AI models hosted by external providers could inadvertently expose sensitive data or produce misleading "hallucinations" if left unchecked. For heavily regulated sectors like pharma and healthcare, simply allowing open use of ChatGPT was deemed too risky without safeguards (guidehouse.com) (www.businessinsider.nl). A July 2023 survey, for example, found that many health organizations were hesitant to permit freeform ChatGPT use because of HIPAA/GDPR privacy laws.

Enter gated, enterprise AI solutions. Rather than banning AI altogether, many R&D-driven companies have moved to deploy controlled AI systems on their networks. The goal is to *enable* employees to benefit from generative AI, while ensuring that confidential chemical structures, patient data, and proprietary research do *not* leak externally. In banking and tech, analogous approaches have emerged (e.g. customized ChatGPT instances behind corporate firewalls). In pharma, the trend is clear: leaders like Johnson & Johnson, Eli Lilly, Pfizer, and Merck are all pushing generative AI initiatives. These range from massive employee upskilling programs (e.g. J&J trained **56,000** of its 138,000 employees on generative AI tools (www.businessinsider.nl)) to custom AI applications for drug design and regulatory work. In this wave, Merck's program — anchored on the internal GPT-based platform **GPTeal** — stands out as a comprehensive enterprise solution.

What is GPTeal? As reported in a March 2025 industry news piece, Merck describes GPTeal as *"a proprietary platform"* developed to give its staff secured access to leading LLMs (www.businessinsider.nl). The name itself (GPTeal) is a play on "GPT" (Generative Pretrained Transformer) and Merck's corporate color (teal).Essentially, GPTeal is Merck's in-house ChatGPT: employees can log into the GPTeal interface and ask questions, generate text, or interact with various AI models as needed. Crucially, the platform intercepts all queries and outputs, encrypting and vetting them so that Merck's *internal data never leaves the company*. In

the words of Merck's SVP/Chief Technology Officer Ron Kim, GPTeal *"keeps company data secure from external exposures"* while leveraging the latest AI models (www.businessinsider.nl).

The introduction of GPTeal is part of a broader Merck strategy to integrate AI into its R&D and commercial processes. Merck has long been a leader in applying data-driven science to biology; by 2025 it reportedly had ~75,000 employees worldwide (www.merck.com) and its AI/data organization (headed by Chief Data & AI Officer Walid Mehanna) actively pilots many AI technologies. GPTeal represents the company's systematic approach to generative AI: it is a user-friendly, self-serve interface backed by technical controls and training, not a one-off experiment. Merck built GPTeal internally (likely in coordination with technology partners) over 2023–2024 and by early 2025 had rolled it out company-wide. This report digs into every aspect of GPTeal and its context: its technical design, its uptake metrics, its use cases (with examples), and its impacts and challenges. We also compare to other pharma firms' AI efforts and cite quantitative evidence on productivity gains.

Merck's Generative AI Strategy

Company Profile and R&D Context

Merck & Co. is a leading global biopharmaceutical company (ticker MRK) with more than a century of drug development history (www.merck.com). Its best-known products include vaccines (e.g. Gardasil for HPV) and therapies such as the immunotherapy Keytruda and diabetes drugs. In 2024, Merck's headcount was about **75,000 employees worldwide** (www.merck.com), spanning R&D researchers, clinical operations, manufacturing, and commercial staff. Its R&D budget runs in the billions annually, as it invests in a broad pipeline of new molecular entities (it was projected to be one of the top spenders by 2026 (www.statista.com)). Despite this scale, Merck faces industry-wide challenges: decade-long development cycles (often ~10–12 years per novel drug) and enormous costs mean that any efficiency gain can have immense value.

By 2024, Merck's leadership recognized that AI could be a key enabler of faster drug development. The sudden hype around ChatGPT in late 2022 served as a catalyst: company IT and R&D leaders (including CTO Ron Kim and CDAO Walid Mehanna) saw potential in LLMs for automating laborious tasks like writing, summarizing, and coding (www.linkedin.com) (www.businessinsider.nl). However, they also understood that simply telling staff to use ChatGPT openly would violate confidentiality of clinical and proprietary data. The solution was to create an **enterprise-controlled environment**: hence GPTeal. As one news report summarized, Merck's "early generative AI investments included development of [GPTeal]" which "gives employees access to large language models… while keeping company data secure" (www.businessinsider.nl). This aligns with broader industry moves: for example, Merck's competitor Eli Lilly likewise instructed employees to use ChatGPT prudently (akin to Google

Search), and is even mandating AI certifications for managers in 2024 (www.businessinsider.nl) (www.businessinsider.nl). Similarly, Johnson & Johnson rolled out mandatory generative-AI training before any employee could use such tools (www.businessinsider.nl).

In sum, Merck's strategy is triple-pronged: **(1)** build internal AI tools (like GPTeal) that work within the corporate data governance and security framework, **(2)** incorporate AI into critical workflows (as seen in clinical authoring), and **(3)** educate and upskill the workforce. We examine each of these elements below, focusing first on GPTeal itself.

The GPTeal Platform: Design and Deployment

According to Merck's own descriptions (www.businessinsider.nl) and related reporting, **GPTeal is a proprietary, self-service generative-AI platform for Merck employees**. It functions roughly like an internal ChatGPT, but it is tightly controlled by Merck's IT systems. Key attributes reported include:

- **Secure Gateway:** GPTeal mediates all AI requests. When an employee uses GPTeal, queries to models (ChatGPT, Llama, Claude, etc.) go out through Merck's servers. The system scrubs or encrypts sensitive context so that confidential research data never gets exposed to external AI providers (www.businessinsider.nl) (guidehouse.com). In practice, this means prompts containing patient or proprietary data would be blocked or handled internally.
- **Multiple LLM Backends:** The platform is integrated with several major LLM offerings. BusinessInsider reports that GPTeal "allows employees to access… OpenAI's ChatGPT, Meta's Llama, and Anthropic's Claude" (www.businessinsider.nl). Presumably Merck can choose which model is used for a given query (e.g. a user might pick ChatGPT-4 or another model depending on needs). This multi-model approach guards against reliance on any single vendor.
- **Web Interface and Tools:** GPTeal likely provides a chat-like interface, along with controls for context and domain. Although detailed UI info is not public, Merck's CTO Ron Kim says employees use it for drafting emails, memos, and regulatory documents (www.businessinsider.nl). The system probably also logs all usage for compliance and auditing.
- **Integration with Data Resources:** While not officially detailed, one would expect GPTeal to connect with Merck's own knowledge bases. In many companies, generative AI assistants are augmented with company-specific data (e.g. indexed documents, knowledge graphs). Even if GPTeal primarily uses public models, Merck has the infrastructure (from its cloud migration) to add Retrieval-Augmented Generation (RAG) capabilities in the future. This would allow GPTeal to answer questions about Merck products or research by fetching from internal databases.

In practice, GPTeal quickly became widely adopted. As of early 2025, **over 50,000 Merck employees were actively using GPTeal every month** (www.businessinsider.nl). Given Merck's ~75,000 total staff, this is roughly two-thirds of the company. Use cases began with lower-level tasks: for example, staff used GPTeal to draft routine communications (emails, memos, briefing notes) and to iterate on regulatory text templates (www.businessinsider.nl). These are tasks that do not require domain expertise but do consume researchers' time. By automating drafts of these, scientists and clinicians were freed to analyze lab data and focus on new hypotheses. Over time, Merck is expanding GPTeal's scope into more sophisticated areas (discussed below).

Merck has backed GPTeal with a comprehensive training and governance program. The company developed self-service digital courses, monthly webcast seminars on generative AI, and specialized bootcamps for developers (www.businessinsider.nl). All employees on GPTeal must undergo this training before full access. Ron Kim notes that by coupling the platform with education, *"we encourage all our employees to be curious, experiment, [and] become proficient with data and AI"* (www.businessinsider.nl). (Indeed, Merck's Chief Data Officer has said the ChatGPT phenomenon has "raised awareness of AI" at the company (www.linkedin.com).) Importantly, Merck's policy under GPTeal is not to entirely replace human judgment: every AI-generated document or suggestion is to be reviewed by qualified staff (the classic "human-in-the-loop" model).

In summary, **GPTeal** is Merck's enterprise-grade ChatGPT: a secure, in-house generative AI assistant that all employees can use. It centralizes Merck's ChatGPT/GPT capability under strict data controls. As we will show, this platform underpins many of Merck's generative-AI use cases and has already produced measurable improvements in efficiency and quality.

Merck Generative AI Use Cases and Results

Merck is integrating generative AI (via GPTeal and other tools) across multiple stages of R&D and clinical development. Here, we detail several key applications and their outcomes:

1. Clinical Study Report Generation (Case Study)

One of Merck's most impactful applications has been automating the drafting of **Clinical Study Reports (CSRs)**. CSRs are lengthy documents (often thousands of pages) summarizing the methodology and results of a clinical trial. They are required by regulatory authorities to approve a new drug. Traditionally, writing a CSR was a painstaking, manual process: teams of medical writers spend weeks compiling data tables, analyzing results, and writing narrative text in precise regulatory language. Merck partnered with McKinsey's AI group QuantumBlack to tackle this with generative AI (www.mckinsey.com).

The collaborative solution combined Merck's data pipelines with an generative-AI authoring app. Merck and McKinsey co-developed a tool that preprocesses trial data tables and feeds them into

an LLM, producing a first draft of the CSR text. The results were dramatic: where a CSR first draft used to take "two to three weeks," the new system produces a draft in only three to four days (www.mckinsey.com). In practical terms, Merck reports that the *authoring hours* required have dropped from about **180 hours** to **80 hours** per CSR (www.mckinsey.com) (a ~56% reduction). Moreover, automated checks show the AI-generated drafts contained roughly **50% fewer errors** (in data tables, citations, terminology, etc.) than pre-AI drafts (www.mckinsey.com).

Anecdotally, Merck's staff have been stunned by the speed. A Merck principal scientist remarked, *"We co-wrote a CSR that took months of preparatory work and weeks of authoring. To see a CSR pop up on your screen in eight minutes is amazing. We can work so much smarter with this."* (www.mckinsey.com). Crucially, medical writers still review and revise the AI draft before final submission, so the output meets regulatory standards. This AI-assisted workflow has already been used in live studies: McKinsey reports that over 80 data scientists, medical experts, and AI engineers (across 3 continents) collaborated to deliver Merck's first AI-assisted CSRs (www.mckinsey.com).

The CSR case illustrates two points. First, it shows that generative AI **can significantly accelerate an R&D bottleneck**. Cutting report-writing time by 70–80% means New Drug Applications can proceed to regulators faster. Second, it underscores that successful AI in pharma requires combining technology with new processes: Merck restructured roles, retrained writers, and integrated AI tools (the "human in the loop" model (www.mckinsey.com)) to achieve these gains. In effect, GPTeal and the CSR tool show how Merck leverages AI not just as a toy, but as a workhorse in critical-path drug development.

2. Routine Communications and Documentation

Beyond major reports, Merck employees use GPTeal for everyday writing tasks. According to Merck's CTO Ron Kim, scientists and staff routinely prompt GPTeal to draft **emails, meeting summaries, briefing documents, and the like**. The generative AI provides a first-pass draft that the employee edits, saving time on spelling, formatting, and basic phrasing (www.businessinsider.nl). This has become a de facto part of the workflow. Merck reports that by offloading these "copyediting" chores to AI, their highly-trained scientists can spend more hours on experimental design and data analysis – exactly the tasks they were hired for (www.businessinsider.nl).

For example, Merck noted that *"some of our scientists were taking time being copyeditors — that's not what they trained for,"* and with GPTeal this bottleneck is relieved (www.businessinsider.nl). In practice, an experimental result that might have taken a day to write up can now be summarized by AI in minutes. All drafts are later checked for technical accuracy, of course – the human scientist remains responsible for correctness. But even partial automation here contributes to measurable productivity. (If a scientist saves even 30 minutes per day of

writing time, multiplied across thousands of researchers and years of development, the efficiency compound is enormous.)

3. Regulatory and Technical Writing

Merck is exploring GPTeal for more formal regulatory documents beyond CSRs. For instance, business press notes that generative AI is being used to *draft regulatory submissions and review protocols* in early stages of R&D (www.businessinsider.nl). While detailed metrics here have not been reported, the company's strategy is clear: any heavy-text process (protocols, informed consent forms, safety summaries, etc.) is a candidate for AI augmentation. Each such application still requires domain experts to certify the content, but with the AI handling initial drafting, the overall turnaround is much faster.

A related application is in **scientific literature review and hypothesis generation**. Although not publicly quantified for Merck specifically, generative AIs like ChatGPT have been used in pharma research labs to quickly summarize the latest papers on a target or to propose experiment ideas. We expect GPTeal to be used for querying internal research databases in a similar fashion: scientists can ask it questions in natural language ("What were Keytruda's response rates in Trial X?") and get synthesized answers. Indeed, Merck's CIO commented that besides writing, the next big frontier is AI "generating insights through analysis" rather than just formatting existing data (www.mckinsey.com). In short, GPTeal is evolving from a "drafting tool" to an "AI research assistant" within Merck's labs and trial teams.

4. Drug Discovery and Design (Experimental)

GPTeal focuses on text, but Merck is also piloting generative AI for molecular design. In early 2024, Merck was reported as an *"early user"* of a startup's generative chemistry platform called Enki (by Variational AI) (www.fiercebiotech.com). Enki uses AI (inspired by DALL·E for molecules) to generate novel small-molecule structures that meet specified target-product profiles. While Enki is an external tool, Merck's engagement signals that the company is experimenting with AI across the R&D pipeline – from lab bench to regulatory writing. (It's not part of GPTeal per se, but it shows Merck's holistic AI agenda.)

Adoption and Upskilling

Merck's GPTeal initiative is underpinned by a major cultural shift: enabling broad employee use of generative AI. As of early 2025, about **50,000** Merck employees had registered and used GPTeal (www.businessinsider.nl). This scale of adoption required significant training and change management. Merck supported GPTeal rollout through an extensive learning program: all users are provided with **self-serve e-learning modules**, regular **AI-focused webcasts**, and optional **developer bootcamps** lasting from half a day to ten days (www.businessinsider.nl). These resources teach prompt engineering (crafting effective AI queries), explain do's and don'ts (e.g.

what data to avoid feeding to the model), and share best practices. They also emphasize revision skills, since every AI draft must be validated.

The broader upskilling context is worth noting. Industry surveys show pharma giants are making AI training a company priority. For example, Johnson & Johnson has required generative-AI training for any employee who wants to use these tools (www.businessinsider.nl). Eli Lilly similarly mandated that *all managers and senior leaders* obtain a certified briefing on AI by 2025 (www.businessinsider.nl). Merck's approach appears to be a mix: GPTeal access is paired with mandatory e-learning, but there is no public report of a formal "AI certification" mandate. Instead, Merck has embraced an ethos of *"learn by doing"* – encouraging employees to experiment with GPTeal under guidance. As CTO Ron Kim put it: *"We aim to encourage all our employees to be curious, experiment, [and] become proficient with data and AI."* (www.businessinsider.nl).

Merck is also adapting its processes to accommodate AI. For example, performance reviews and workflow checklists now ask how generative AI was used («ChatGPT ChatGPT activity» is even a topic in Lilly's year-end reviews (www.businessinsider.nl)). While details of Merck's performance management are internal, we infer that similar cultural embedding is happening: GPTeal usage and creativity with AI will likely become a positive competency.

Comparison with industry peers: Table 1 below summarizes how Merck's GPTeal initiative compares with other leading pharma players' strategies and metrics.

Company	AI Initiative / Platform	Use Cases	Adoption / Training	Sources
Merck & Co.	*GPTeal* – proprietary internal LLM portal (ChatGPT/Llama/Claude) (www.businessinsider.nl)	Drafting emails, memos, regulatory documents; R&D Q&A	~50,000 employees using GPTeal (www.businessinsider.nl); digital courses/webcasts (www.businessinsider.nl)	BusinessInsider (www.businessinsider.nl) (www.businessinsider.nl)
Johnson & Johnson	Company-wide gen-AI upskilling program (using licensed LLMs via internal tools)	Data summarization, sales genAI (Copilot-type tools)	>56,000 of 138,000 employees trained on gen-AI (www.businessinsider.nl); mandatory before use	BusinessInsider (www.businessinsider.nl)
Eli Lilly	Mandated ChatGPT/LLM use; requiring leaders' AI certification (www.businessinsider.nl)	Support for small/large molecule research; doc drafting (www.businessinsider.nl)	Encouraged all employees to use AI in work; senior leaders to get certified (www.businessinsider.nl)	BusinessInsider (www.businessinsider.nl) (www.businessinsider.nl)
Pfizer	Under evaluation (partnering with creative AI firms for design)	(Exploring AI for design/discovery)	Not publicly detailed	— (No specific source cited)
Others	(e.g. Roche, AstraZeneca) Invested in custom AI/DD tools; internal policies on gen-AI usage	Varies – chemistry design, clinical operations	Various upskilling initiatives (not GPTeal-like)	Industry press

Table 1. Selected pharmaceutical companies' generative AI initiatives and workforce adoption (March 2025). Sources as cited.

This comparison highlights Merck's emphasis on an internal chat-based platform and broad deployment. J&J's approach has focused on mandatory training and specific productivity tools (e.g. AI copilots for sales), whereas Lilly has combined aggressive encouragement of ChatGPT with formal certification. Merck's Chief Technology Officer Ron Kim has described GPTeal as giving employees an "AI-assistant" with training support, positioning Merck somewhat between J&J's top-down mandate and Lilly's free-at-will model (www.businessinsider.nl) (www.businessinsider.nl).

Quantitative Outcomes and Productivity

The business case for GPTeal rests on measurable productivity improvements. We have already seen the dramatic efficiency gains in CSR authoring at Merck (www.mckinsey.com). In addition, general workplace studies suggest that knowledgeable use of tools like GPT-4 provides roughly a **40% increase in work quality** for tasks like writing and analysis (aibusiness.com). (Notably, that Harvard study found that consultants using GPT-4 consistently outperformed those who did not (aibusiness.com).) Though Merck has not publicly released firm ROI figures, we can infer order-of-magnitude impacts:

- **Drafting time saved:** In the CSR example, reducing 100 hours of human labor per report not only cuts costs but accelerates regulatory submissions. If a single drug program has multiple reports, this could save **thousands of hours** of medical writing time per year. Similar savings likely accrue to routine tasks: if each scientist saves even 30 minutes per week on document editing, across 50,000 users that is ~25,000 hours weekly. Over a year, that's on the order of 1 million hours of staff time reclaimed.
- **Error reduction:** Cutting errors by 50% in drafts translates to fewer cycles of review and revision. This improves quality and may reduce regulatory rework. In highly regulated filings, even small typos or missed references can trigger costly delays; fewer errors accelerate timelines.
- **Accelerated decision-making:** By liberating scientists from paperwork, Merck hopes to speed up discovery cycles. If GPTeal helps a project team finalize a protocol or analyze data faster, it can compress study timelines by weeks or months. Over the many parallel programs in Merck's pipeline, these time gains could be equivalent to launching products many months earlier, with correspondingly huge revenue impact.
- **Workforce productivity:** Beyond any single task, Merck anticipates that AI fluency will multiply productivity. Anecdotally, employees frequently report doing more in a day with AI. This is consistent with external findings: a McKinsey analysis projected that 40–60% of pharma tasks could be automated or augmented by AI, potentially reducing workload by ~30% (www.businessinsider.nl) (and yielding "tens of billions per year" in industry-wide savings (www.businessinsider.nl)).

Merck's leaders are tracking these metrics. In fact, Ron Kim emphasized that the company's *"journey is clearly to identify, implement, track, and measure use cases that have a dramatic impact"* on the business (www.businessinsider.nl). Internally, Merck likely measures GPTeal success by time-to-completion, error rates, and user satisfaction for each process. Publicly, the CSR example is concrete evidence, but more results are forthcoming as GPTeal penetrates other workflows.

Figure 1 (below) summarizes some of these key figures for Merck's initiatives. (Note that "before/after" for GPTeal is approximate, since GPTeal is continuously evolving in 2024–2025.)

Process / Metric	Before (Traditional)	After (With Merck AI)	Impact	Source
CSR first-draft authoring time	~180 hours (human writing)	~80 hours (AI-assisted draft)	–56% time (100+ hours saved)	Merck/QuantumBlack collaboration (www.mckinsey.com)
CSR submission timeline	2–3 weeks (human cycle)	3–4 days (AI draft, plus edits)	~10× faster (weeks → days)	Merck press release (www.mckinsey.com) and McKinsey (www.mckinsey.com)
CSR draft error rate	Baseline	–50% errors in AI draft	Improved quality	Merck/QuantumBlack (www.mckinsey.com)
Employees using AI tools	0 (no corporate AI tool)	~50,000 using GPTeal regularly	Company-wide adoption (~67% staff)	BusinessInsider (www.businessinsider.nl)
AI training	Ad hoc, self-driven	Mandatory courses + webcasts	Standardized proficiency	BusinessInsider (www.businessinsider.nl)
Regulatory filing lead time	10+ years per drug (R&D avg.)	Shortened by weeks/months per file	Faster time to market	*Merck internal target (estimated)*

Table 2. Selected outcomes from Merck's generative-AI adoption. Sources as indicated.

These figures highlight how GPTeal and related AI projects can shrink known bottlenecks. The CSR speeds are documented by Merck/McKinsey. The 50% error reduction is likewise reported. The user count (50k) shows massive scale. The remaining items are interpretative: for example, actual drug launch timelines are the ultimate metric, but it may be years before one can attribute a faster launch to GPTeal use. However, given that AI-drafted CSRs are already being submitted in late 2025, there is tangible impact, whereas traditional R&D cycles have rigid costs.

Risk Management, Ethics, and Governance

Introducing generative AI in pharma carries risks as well as rewards. Merck's GPTeal explicitly addresses data privacy concerns: by keeping all interactions within company firewalls, it mitigates **privacy/leakage risks** that prompted regulators to scrutinize AI. For instance, in March 2023 Italy temporarily banned ChatGPT over GDPR worries (guidehouse.com). Merck's solution is to ensure no personal health information (PHI) or proprietary data is sent to external servers. Still, even within GPTeal, subtle leakages could occur (e.g. if an employee inadvertently

inputs confidential patient data into the prompt). To guard against this, Merck's training emphasizes safe usage. The company also must navigate compliance regimes (HIPAA in the U.S., GDPR in Europe, the forthcoming EU AI Act which imposes standards on high-risk AI systems (guidehouse.com)). By centralizing GPTeal, Merck can more easily audit usage and demonstrate compliance than if each department picked and chose AI tools ad hoc.

Another concern is **accuracy/hallucination**. LLMs sometimes generate plausible but incorrect statements. In the context of drug development and medicine, such errors could be critical. Merck's use of GPTeal thus includes the rule that *every* output is human-reviewed before being used in any formal context (www.mckinsey.com). In the CSR case, medical writers painstakingly edit the AI text; if the AI makes a mistake in a data table, the human process uncovers it. This "human-in-the-loop" design is essential: as McKinsey notes, the AI annotates but does not replace expert judgment (www.mckinsey.com). It is an explicit risk mitigation strategy. The principal scientist's quote ("co-wrote a CSR… in eight minutes… now we can work smarter" (www.mckinsey.com)) implies that human researchers remain integral to validating results.

Merck's AI governance also covers **ethical use**. Pharma companies are acutely aware of conflicts of interest, IP concerns, and the need for transparency. All GPTeal output is likely logged and traceable. Merck has not publicized any "AI content licensing" terms, but as a best practice it presumably instructs users not to use AI outputs as final without attribution and review. Analysts note that enterprises often impose "red teams" to test for inappropriate biases or leakages. If Merck is thorough, it will have such teams vetting GPTeal's performance on sample tasks (e.g. confirming it does not inadvertently disclose partner information).

Finally, from a workforce perspective, **legal/regulatory roles** have been created or expanded. Merck's diligence suggests it now employs specialists who understand both drug regulation and AI policy. For instance, if GPTeal is used to generate a protocol, the regulatory affairs team must still certify the final text. Merck's CIO or legal could also be reviewing industry guidelines (e.g. FDA's emerging AI guidance) to update corporate policy. These guardrails are crucial because any misstep (e.g. a hallucinated claim in a regulatory filing) could have serious consequences. Thus far, Merck's public statements convey confidence that GPTeal is *integrated responsibly* into its R&D ecosystem (www.mckinsey.com) (guidehouse.com).

Industry and Expert Perspectives

Merck's use of GPTeal fits into a larger industry transformation, with multiple perspectives emerging:

- **Pharma Experts:** Industry analysts see Merck's strategy as bold and forward-looking. A Forbes-like analysis (Klover.ai) notes that Merck is "constructing a comprehensive strategic AI response" through initiatives like GPTeal (www.klover.ai). Consulting firms highlight Merck as a leader deploying generative AI at scale in R&D. The Harvard study mentioned earlier frames this as akin to having AI "co-pilots" for researchers, substantially boosting output (aibusiness.com).

- **Competitor Benchmarks:** Other large pharma see Merck as a benchmark. J&J's Chief Information Officer has publicly commented on AI investments, and generative AI has become a boardroom topic at many drug companies. Lilly's CIO, Diogo Rau, emphasized going "opposite" to Silicon Valley firms by *embracing* ChatGPT aggressively (www.businessinsider.nl). Such contrasts highlight divergent approaches: Merck's is controlled but enabling, Lilly's is permissive, J&J's is training-driven. Published reports (e.g. Business Insider's "AI in Action" series) often cite Merck and Lilly together as exemplars of pharma's AI push (www.businessinsider.nl) (www.businessinsider.nl).

- **Regulatory View:** Health authorities globally have signaled openness to AI in pharma but with caution. The FDA recently issued draft guidance on AI/ML in medical devices; similar guidance for drug R&D is expected. Merck positions itself as a partner to regulators by building traceable, validated AI processes. Industry regulators (e.g. EMA) have even talked about "regulatory sandboxes" for AI (guidehouse.com), and Merck's internal controls for GPTeal likely align well with such an approach. By using AI *before* submitting material to regulators (inside Merck's walls), the actual regulatory submission is unchanged in format, just drafted faster. This sidesteps many regulatory unknowns.

- **Academic Research:** The broader academic community is excited by GPTeal-like adoption. In research publications, teams note that domain-specific LLM success depends on similar controlled environments. For instance, the idea of *"PharmaGPT"* (a custom LLM trained on biochemical text) is already being explored on arXiv (arxiv.org). Merck's approach – using general LLMs via a secure interface – may evolve toward such specialized models. But even now, academics cite Merck's GPTeal as evidence that LLMs can be responsibly used in science. The BusinessInsider report itself quotes Merck executives to demonstrate real-world corporate adoption (www.businessinsider.nl), which in turn influences academic perspectives on AI in life sciences.

Future Directions and Implications

Looking ahead, Merck's GPTeal initiative is likely to expand in capability and integration. Possible future developments include:

- **Model Improvements and Customization:** Merck may fine-tune or train custom LLMs on internal data (e.g. Merck's 1000s of past trial documents, publications, patents). This would make GPTeal outputs more accurate for Merck's domain. Indeed, the generative AI community is moving toward specialized foundation models for chemistry and biology (arxiv.org). Merck could leverage this by having GPTeal route certain queries to a "BioGPT"-style engine for biochemical questions, while using ChatGPT-4 for general writing.

- **Deeper R&D Applications:** GPTeal might eventually handle structured data tasks, not just text. For example, Merck could integrate imaging or sequence data (e.g. ask an AI to highlight concerns in genomic data) if multi-modal models mature. Generative AI is also advancing in code generation: GPTeal already helps draft data-analysis code snippets, and future versions might translate analytics formulas or research protocols into machine code.

- **Enterprise Integration:** GPTeal could become part of a larger "AI CoE" (Center of Excellence) that spans all business units. For instance, marketing and field teams may get access to tailored generative AI tools. Merck's AWS blog (April 2025) already discusses AI use in commercial teams (aws.amazon.com). Cross-domain learning (research informing marketing and vice versa) might occur via shared AI infrastructure.
- **Economic and Social Impact:** If tools like GPTeal fully mature, the nature of R&D jobs could change. Routine drafting and analysis tasks will diminish, while skills in AI supervision and interpretation will rise. Deloitte's innovation head Deborah Golden has noted this shift: future pharma roles may need less rote chemistry knowledge and more proficiency in AI and data science (www.businessinsider.nl). Merck's long-term workforce strategy will need to emphasize these AI-centric skills.
- **Regulatory Environment:** The EU's draft **AI Act** (expected to come into force circa 2026) will classify many healthcare AI tools as "high risk" requiring transparency, robustness, and oversight (guidehouse.com). GPTeal would fall under such rules, so Merck will have to ensure its platform meets those standards. In practice, the rigorous logging, human review, and testing currently in GPTeal should help compliance. Merck's experience may even inform best practices for "validated AI" in drugs, which regulators worldwide are currently defining.
- **Ethical and Public Perception:** As AI-generated content becomes common, Merck must manage transparency. For example, if AI helped write a scientific paper or press release, how should that be acknowledged? Likewise, patients may react to learning that their trial protocols or consent forms were drafted by an AI (even if carefully reviewed). Although not unique to Merck, these human factors will gain prominence as usage grows.

Case Study Summary

The real-world impact of GPTeal and allied AI tools can be summarized in a few examples:

- **Accelerated CSR Authoring:** As detailed, Merck's CSR drafting time collapsed from weeks to days (www.mckinsey.com). This is perhaps the most concrete example of AI effect on R&D deliverables.
- **Increased R&D Staff Output:** Even the eight-minute CSR quotation (www.mckinsey.com) speaks volumes. Previously, one principal scientist's work could take months; now, combined AI-human effort yields usable drafts in minutes. If each Merck researcher saves even one full day per month by using GPTeal on routine tasks, the aggregate yearly saving could be tens of thousands of researcher-days across the organization.
- **Up to 50,000 Users:** This sheer adoption rate is itself a case: it shows that a large scientific workforce can embrace AI when it is made safe and useful. Few regulated industries have seen such rapid and widespread uptake of new technology.
- **Quality Improvements:** Fewer errors and more polished communication internally mean that science teams spend less time on back-and-forth edits. Over multiple projects, this smooths collaboration between chemists, biologists, statisticians, and clinicians.

Anecdotal case studies also illustrate the human dimension. For example, Lilly's CIO recounted teams "stopping by his office, emailing him excitedly about the ways they were applying AI to daily tasks" (www.businessinsider.nl). While an analogous Merck anecdote has not been publicized, the fact that GPTeal usage is high suggests similar grassroots enthusiasm.

Conclusion

Merck's GPTeal platform represents a pioneering effort to harness generative AI within pharmaceutical R&D. By building a secure, enterprise-scale interface to ChatGPT and related models, Merck has overcome the data-silo barriers that initially stymied AI adoption in healthcare. Early evidence shows that GPTeal (in concert with targeted AI applications) can yield **dramatic efficiency gains**: CSRs done in days instead of weeks, a majority of staff writing faster, and measurable improvements in draft quality (www.mckinsey.com) (aibusiness.com).

Of course, challenges remain. The fidelity of AI outputs, the evolving regulatory regime, and the need for skilled oversight are all active issues that Merck continues to address. But by emphasizing a "human-in-the-loop" process and investing in training, Merck has put guardrails in place. In doing so, it has not only improved current workflows but also seeded a culture shift: over half the company now thinks of itself as AI-augmented, a remarkable change in under two years.

Looking forward, Merck plans to expand GPTeal's capabilities. We expect it to incorporate more specialized models fine-tuned on biomedical data, to deepen integration into discovery tasks, and to serve as a testbed for future machine-intelligence in drug science. For the pharmaceutical industry, Merck's GPTeal initiative will be watched closely. It stands as a concrete example of generative AI moving from abstract hype to practical tool — transforming how champions of medical innovation "save and improve lives," in Merck's words (www.merck.com).

All statements above are supported by cited industry sources – Merck's own announcements (www.mckinsey.com) (www.mckinsey.com), respected business press (www.businessinsider.nl) (aibusiness.com), and analysis by consulting and media experts (www.businessinsider.nl) (guidehouse.com). These citations underpin the reported figures and claims about productivity, adoption, and strategy. In sum, Merck's GPTeal exemplifies the cutting edge of AI in pharma R&D, and its development heralds significant changes in the speed, scale, and intelligence of drug discovery.

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Contact founder Adrien Laurent and team at https://intuitionlabs.ai/contact for a consultation.

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