

Successful Businesses Will Adopt a New Wave of Custom Software

By Greg Lemiska

In 2022, the global enterprise software market reached **\$583 billion** ([Grandview Research](#)), with custom software accounting for only **\$28 billion** ([GM Insights](#)). Less than **5%** of the market was devoted to custom solutions.

This presents an interesting dichotomy: business thrives on differentiation. Organizations devote massive resources to anything they believe will provide a competitive edge, yet off-the-shelf software, SaaS in particular, is not known for supporting customization or differentiation. So why are custom solutions that support differentiating capabilities so unpopular?

It was not always this way; everything was custom in the early days before companies like SAP, Oracle, and IBM built their industry solutions. Commercial-off-the-shelf (COTS) software became the preferred choice for businesses because its scale made it cost-effective, quick to deploy, and backed by robust vendor support. On the other hand, custom software has been viewed as expensive, difficult to maintain, and complex to scale.

But this narrative is changing, thanks to two transformative technologies: **artificial intelligence (AI)** and **advanced databases**. Together, these innovations will revolutionize the commercial software industry. Over the next few years, custom software will gain significant market share, completely disrupting the traditional players.

Off-the-Shelf Software Dominated For Good Reasons

COTS thrived because software is challenging to create, especially in complex business environments. Centralizing the talent and resources to develop complex software like ERPs created vast economies of scale.

1. **Reduced Cost:** Effectively, businesses in various industries shared development costs, making the software more affordable.
2. **Fast Deployment:** Businesses can implement pre-built software almost immediately, avoiding lengthy custom development cycles.
3. **Vendor Support:** The package includes regular updates and security patches, and the costs are shared among many customers.

However, these benefits came at the cost of flexibility. COTS software often requires businesses to adjust their workflows to match the software, limiting innovation and adaptability. This rigidity bottlenecks organizations with unique processes, dynamic data, or evolving requirements.

Risks Associated With Custom Solutions Held Them Back

In comparison with COTS, custom software has the potential to meet bespoke business needs, enable innovation, and evolve with the business. However, custom software historically faced three significant challenges that most companies wisely chose to avoid:

1. **Maintenance Costs:** Ongoing updates and bug fixes required dedicated resources.
2. **Scalability Issues:** Scaling custom systems often meant expensive redesigns.
3. **Data Rigidity:** Traditional relational databases constrained flexibility, making it difficult to adapt software to evolving needs.

These challenges made custom software impractical for all but the most innovation-driven organizations. **Today, advancements in AI and databases are addressing these pain points, unleashing the potential of custom solutions.**

AI Reduces Scalability and Maintenance Hurdles

AI is a game changer in overcoming pain points one and two above. Maintenance and scalability become far less complex and costly as AI tools evolve and improve. Here's how:

1. **Easier understanding and faster enhancement of existing code.** AI tools like GitHub Copilot and OpenAI Codex are revolutionizing how developers interact with codebases. These tools can understand existing codebases, accelerate development, and ensure scalable enhancements.
2. **Automated, dynamic resource management.** Scaling custom software often involves managing infrastructure, which can be costly and time-consuming. AI simplifies this process by optimizing cloud resources, anticipating usage patterns, and managing resources to reduce costs.
3. **AI has predictive and self-healing capabilities.** It automates critical tasks that previously required skilled human technical teams. Functions like real-time monitoring and response, predictive maintenance, and issue resolution require less human intervention.

These capabilities drastically reduce the operational overhead of maintaining custom software while improving system reliability. From a strategic perspective, modern technology offers another set of benefits: flexibility.

New Databases Unlock Data Flexibility

Data structures are at the core of all software. Traditional databases have been hierarchical and rigid, contributing to the overall rigidity of complex software. NoSQL/NewSQL, graph, time-series, columnar, and multimodal databases are replacing or enhancing traditional Relational (RDBMS), hierarchical, network, and flat file databases. Without going too technical, the point is that these new database standards, platforms, and innovations play a pivotal role in the next generation of commercial software because they add flexibility. Gen AI will get the spotlight, but a modern DB will be behind every good AI-enabled application.

1. **No more reliance on rigid schemas.** Relational databases, long the standard for software development, require rigid, predefined schemas. This makes adapting to new data requirements costly and time-consuming.
2. **Modern databases, especially graph databases, provide flexibility.** Graph databases store data as nodes and relationships, making them ideal for modeling complex, interconnected systems. Unlike relational databases, graph databases adapt quickly, handle complexity, and scale effectively.

Custom Software Does Things That COTS Cannot

Imagine an online retailer managing its customer experience. A COTS solution might offer basic customer segmentation and product recommendations, but a custom solution leveraging AI and a modern database could offer features like:

1. **Bespoke Recommendations:** A COTS system might offer some typical input/output options for a recommendation system. A custom system allows the retailer to create a differentiating customer recommendation experience with unique parameters and inputs based exclusively on its own strategy. This could be AR/VR or whatever cutting-edge idea comes next.
2. **Realtime Response to Trends:** A COTS system will always evolve slowly because the vendor must evolve its entire ecosystem for all its customers. A custom solution can respond much faster because its scope is limited to one organization; it has far fewer dependencies and complexities.

These bespoke features provide differentiation and business value, but a savvy technology resource might argue that they are possible with legacy technologies and enough resources. The true power of software founded on modern AI and database technology is that the investment to implement these things, **and the**

next thing, becomes exponentially less costly. These new solutions' scalable, adaptable nature will make them the better long-term option. Business technology leaders get to have their cake and eat it, too.

A New Wave of Custom Software Will Create Differentiating Capabilities Without Added Risk or Cost

Software investment decisions all come down to a business case. Previously, only the highest-value drivers and differentiators could justify custom software development and maintenance costs. As that cost comes down, the business cases for custom software get stronger. With the combined power of AI and modern database tech, custom software is no longer a high-maintenance, inflexible option. Instead, it's becoming a scalable, efficient solution for businesses that succeed based on their ability to differentiate.

The Hybrid Future

Off-the-shelf software has dominated because of its simplicity and scalability, but the rise of AI and the evolution of databases are leveling the playing field. Custom software, once considered risky and costly, is now more flexible, scalable, and accessible than ever.

Of course, even with custom software's advantages, standardized off-the-shelf software will retain a place in the business IT landscape. Non-differentiating, well-defined processes are suitable for cost-effective off-the-shelf software, even if the line between COTS and custom begins to blur.

One thing is for sure: the business software market will not remain 90% COTS and 10% custom for long. Will it become 50/50? Will custom overtake COTS? Who will become the premier provider of custom software? It's an exciting time to be in the software industry.

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