

Simulation

Bridging the gap between design ideals and the challenges of reality

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Simulation - Bridging the gap between design ideals and the challenges of reality

“The beginning is the most important part of the work” - Plato

Executive Summary

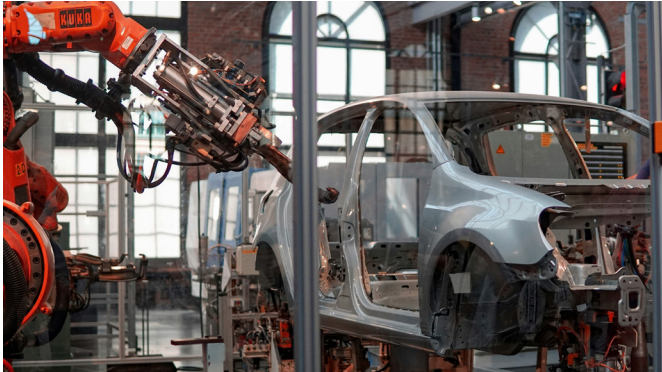
The recent announcement of the acquisition target status of one of our investee companies gives us the chance to reflect on our approach to stock selection. Our investment process at GIB Asset Management focuses on identifying companies with substantial growth potential and inherent value. In this piece, we delve into our methodology and highlight how it guided us to a company like Ansys, a leading player in engineering simulation and how solution providers are sought after.

- With rising product complexity, inefficiencies in the research and development process result in 95% of new product ideas failing.¹
- Simulation can enable companies to see how their designs will react to the physical demands of the real world and help reach the targets for SDG 9.
- This is done by enabling engineers to innovate rapidly, lower production time, conceptualise complexity, and produce quality sustainable products.
- Ansys, a portfolio company in the GIB AM Sustainable World Fund, is an industry leader in providing software in engineering simulation across various disciplines, with multiple tailwinds accelerating business fundamentals.



The challenge

The pursuit of innovation stands as a cornerstone for business success, where companies aspire to bring forth new, dependable products to market swiftly and efficiently—a trifecta encompassing "better, faster, cheaper." Product development is fraught with obstacles, and far too often, promising ideas never translate into reality.



The numbers are worrying. Harvard Business School professor Clayton Christensen reports that among the 30,000 new products introduced annually, a staggering 95% fall short of success.² This alarming failure rate is not purely attributed to chance but is a direct consequence of the escalating complexity in product design.

Gone are the days of straightforward design modifications. Modern products are going beyond simple aesthetic changes, and incorporating sophisticated electronics, stringent safety requirements, and ergonomic demands. Product design has transitioned into a multi-dimensional puzzle. Converting static blueprints into functional, three-dimensional realities—a task loaded with inherent challenges.

Take for example warranty costs, an indicator of product flaws. In 2022 alone, the U.S. vehicle industry, already grappling with margin pressures, witnessed a 17% increase in warranty claims, surpassing a staggering \$9.4 billion.³

Yet, within these complexities and challenges lies immense opportunity. Product development stands as the cornerstone for achieving sustainability goals. It aligns with the Sustainable Development Goal 9 (SDG 9) on fostering innovation and helping bend the dial in industries challenge to operate more sustainably.

The solution

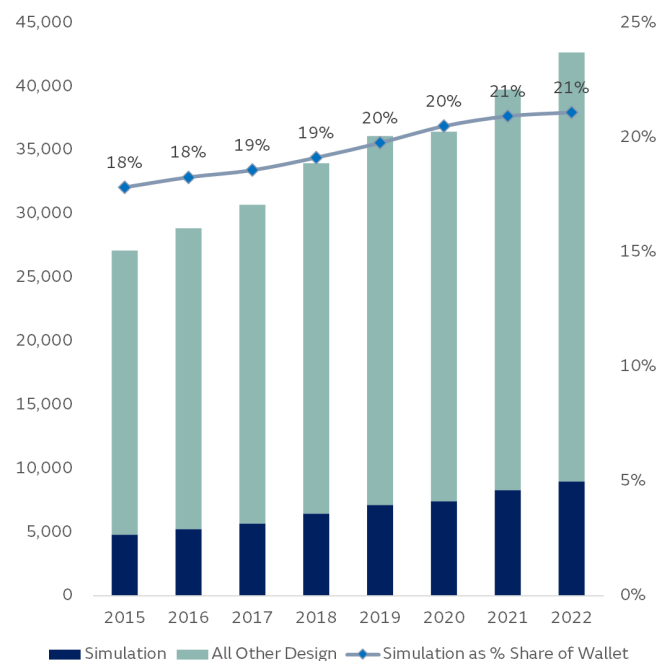
Simulation, is the art of creating an accurate virtual prototype that replicates the real world, providing insights of designs under scrutiny. For engineers, simulation equates to acquiring superpowers. It grants them the scientific precision to anticipate how designs will respond to real-world demands.

The advantages are extensive. We view simulation as an R&D superpower, where each dollar invested yields enhanced returns. Virtual iterations replace physical prototypes, reducing time and resource expenditures, and elevating product quality, thereby minimizing warranty costs.

From automotive crash testing to semiconductor design, simulation replaces cumbersome physical processes. A shift towards virtual testing is underway in aerospace, pharmaceuticals, 5G, and industrial IoT, evidenced by escalating investments in sophisticated simulation solutions.

As R&D budgets expand, the share allocated to simulation rises, attesting to its transformative capacity in unlocking a future marked by innovation, efficiency, and sustainable progress. Simulation plays a pivotal role in achieving SDG 9, enhancing industry efficiency, sustainability, and resilience.

Chart 1: Engineering Software Market⁴



¹ <https://hbr.org/2011/04/why-most-product-launches-fail>

² <https://hbr.org/2011/04/why-most-product-launches-fail>

³ <https://www.warrantyweek.com/archive/ww20230323.html>

⁴ Baird, 2023

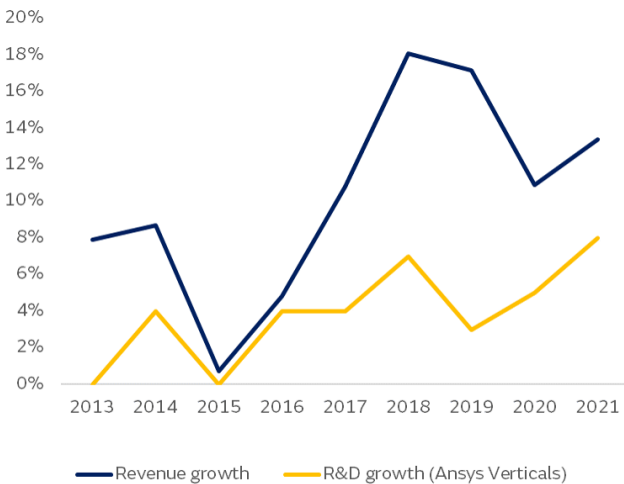


Case study - closing the gap between design and reality

In the 1970s, through the innovative vision of John Swanson a Westinghouse nuclear engineer, Ansys emerged. An innovator in engineering simulation, liberating complex analysis from manual calculations.

Since then, Ansys' simulation software has grown from strength to strength and is now a cornerstone for over 50,000 companies globally⁵. Its impact spans diverse sectors, from aerospace, where it has contributed to a 15%⁶ reduction in fuel burn by helping design more aerodynamic aircraft, to the intricate world of electronics.

Chart 2: Ansys has outgrown R&D growth⁷



Opportunity

Excess returns stem from the revision in expectations. As part of our investment process, we focus on both the risks and opportunities, and we perceive a misinterpretation in the market regarding Ansys' structural growth, the importance of simulation, and its strategic positioning.

Dominant Market Position and First-Mover Advantage:

Ansys has carved out a leading position in the engineering simulation arena, backed by a 50-year legacy that solidifies its best-of-breed standing. This

leadership is bolstered by substantial switching costs tied to retraining engineers familiar with Ansys' platform, engrained in their customer workflows. Ansys has cultivated robust relationships with over 3,000 global universities, ensuring a continuous supply of trained engineers proficient in Ansys. This strategic move not only fosters brand loyalty but also supports Ansys' market share which we estimate surpassing 25%.⁸ Whilst there have been new entrants into the market, Ansys' has continued to invest in building out its portfolio of solutions and not mortgaged its moat.

Willingness to Pay: A Hallmark of Ansys' Value Proposition:

Despite the premium price tag of Ansys software, our due diligence affirms a compelling value proposition. A mere 3-4% of a product's R&D budget is allocated to the initial design phase, yet a substantial 80% of its cost is fixed at this stage. To create a 360 view of the company, we interviewed a senior engineer at a leading German automaker, who underscored Ansys' critical role in accelerating product development for organizations like Apple, Qualcomm, SpaceX, Rolls Royce, and Medtronic—organisations where design failures are simply not an option.

Reinvestment Opportunity and Market Expansion:

An expansive opportunity lies in the fact that many organisations still prioritize physical testing over virtual simulation. Whilst we still believe there is a role for physical prototypes, the large addressable market presents fertile ground for Ansys to capture a larger wallet share. Additionally, the ongoing evolution of product design has moved simulation beyond turbulence and combustion, and towards electromagnetism and optics, higher-growth areas, positioning Ansys to introduce new modules and expand its already impressive average customer module purchases - in recent quarters, over 90% have purchased three or more physics offerings. Combined with cloud computing's ability to broaden out the addressable market, making it cost effective for smaller organisations to have access to leading simulation tools.

Resilient R&D Budgets: A Buffer against Economic Downturns:

Ansys' products are underpinned by R&D budgets, a reliable source of funding even during economic

⁵Pitchbook: <https://pitchbook.com/profiles/company/11728-09>

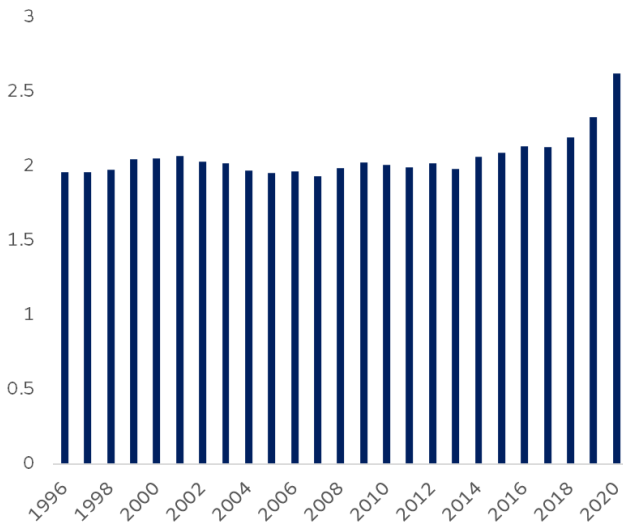
⁶ Ansys Product Handprint Use Case Aerospace: <https://investors.ansys.com/static-files/71815f2f-5752-4331-bbd9-16183c149931>

⁷ GIB AM Analysis, 2023

⁸ GIB AM Analysis, 2023

downturns. This characteristic, coupled with historical resilience, positions Ansys as a relatively secure investment option in uncertain economic climates.

Chart 3: R&D as % of Global GDP ⁹



Conclusion

At GIB AM, our investment ethos revolves around identifying companies addressing critical social and environmental challenges. We prioritize solution providers whose offerings not only yield positive performance but also create enduring, sustainable impacts. In the current economic landscape, characterized by constrained growth, the companies that exhibit secular growth drivers, deliver tangible consumer surplus, and possess the capacity to reinvest at elevated rates will excel.

In conclusion, Ansys' strategic alignment with both thematic tailwinds and fundamental drivers positions it for robust, sustainable growth in a resource-constrained environment. Its capacity to yield high returns while fostering positive impacts aligns with our investment philosophy, rendering Ansys an opportunity in an increasingly complex world.



⁹ GIB AM Analysis, 2023



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