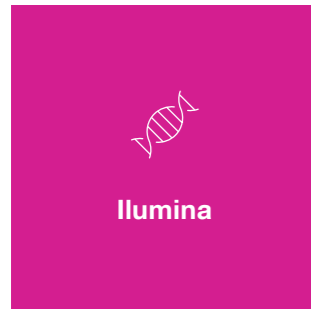


Illumina

Genetic analysis

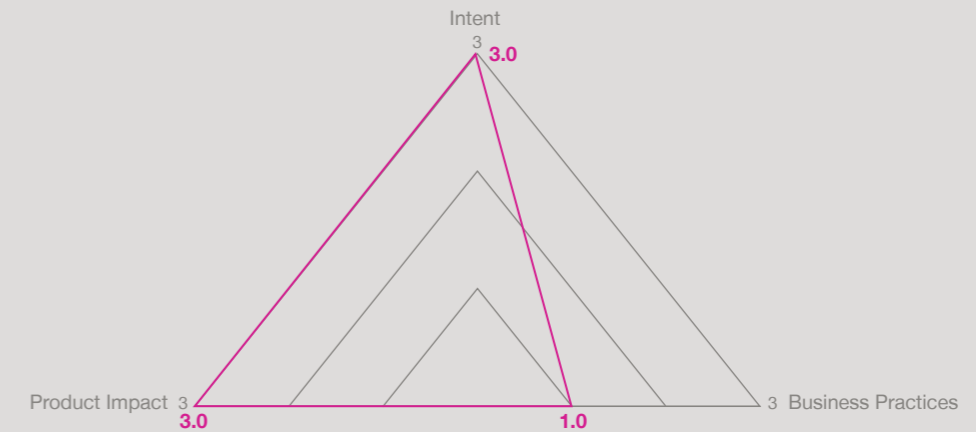


Illumina makes machines for the large-scale analysis of genetics. In simple terms the company's tools enable customers to read and understand genetic function. The company produces two broad types of tools: gene sequencers and microarrays, both of which have significantly improved our understanding of genetics and human disease. They also offer consumables and software for use with their hardware.

Investment Case

What challenge is the Company tackling?	Human biology is very complex, and thus our understanding of the underlying causes of many diseases is limited. As a result, most treatments tend to be based on treating symptoms rather than underlying causes. Many treatments are therefore ineffective in the long run. Since the company's founding in San Diego in 1998, Illumina's goal has been to develop products that significantly improve our understanding of genetics and human disease. Some of the tools the company is offering are enabling studies that were not even imaginable just a few years ago and are moving us far closer to the realisation of personalised medicine. Illumina aids in pushing medicine forward enabling it to become more preventative and precise.
Is the Company's offering sufficiently different and better than the status quo?	At present no other company can match Illumina on a combination of precision, cost and speed of sequencing. 90% of all the sequencing history has been done on Illumina machines. The understanding of human biology's complexities can partly be addressed by Whole Genome Sequencing (WGS). For example, WGS is already benefiting patients. It is increasingly being used to diagnose rare diseases, many of which are as-yet unnamed and cannot be diagnosed with conventional genetic tools. Cancer is another area where genomics can significantly affect diagnosis and treatment, particularly because malignancy is caused by genetic mutations that lead to uncontrolled cell division. During the past 30 years, scientists have uncovered mutations in more than 100 genes that contribute to the development of cancer and – partly thanks to new sequencing technologies – the pace of innovation is increasing.
Is there a committed management team? What have they done before?	Jay Flatley deserves a significant amount of credit for Illumina's success. Without the acquisition of Solexa in 2007 they would not have had a gene sequencing offering. They spent \$600m on a company with zero dollars in revenue; Illumina revenues at the time were ~\$300m. Since then Flatley has overseen the company grow its revenues to over \$2bn. Flatley has moved into the Executive Chairman role and he remains important for the company's long-term strategy. The new CEO, Francis deSouza, is trying to build an organisation in the style of founder owners despite not being a founder. He has a vision and a drive to support Illumina's long-term growth.
How does the Company treat stakeholders?	Employees feel highly motivated by Illumina's mission as the company is the main enabler of genomics through both their technology and thought leadership. The company has strong partnerships with private and public sectors and is critical in driving the adoption and realising benefits of the genome sequencing technology.
Is there a potential to create a profitable and defensible business?	This is already a profitable business with very attractive financial characteristics. 70% of revenues are recurring, operating margins are ~25%, and RoE is ~22%. Given the potential to expand margins the company's incremental returns should be higher. Illumina dominates the sequencing market. It is possible that over time some other players will catch up with Illumina. However, it is encouraging to see that Illumina continues investing in its sequencing technology and clinical applications of sequencing. Illumina's R&D spending is 15–20% of sales (substantially above competitors spend) and their history suggests that the company doesn't suffer from complacency.
Is the business attractively valued?	While genomic sequencing is already benefiting some patients, we are still far away from realising the full potential of the technology. Illumina is one of the companies that wants to make this technology useful for patients and the opportunities are large. The potential addressable market could be as large as \$30bn in around 5 years and over \$100 bn in 10 years. This suggests ample opportunities for growth. We anticipate that Illumina's current market share of 90% will fall but a market share of over 50% in five years' time of this rapidly expanding market is entirely plausible if Illumina maintains its technological and thought leadership.

Impact Analysis



Product Impact

The facilitation of greater genetic analysis will have positive repercussions throughout a vast array of diseases and also outside of healthcare (e.g. agriculture).

Intent

High investment in R&D and commitment to fast paced innovation with a goal to achieve DNA sequencing at a rate that can support a significant upscaling of research and treatment utilising genetic information, leading the industry in this area.

Business Practices

Governance practices have been evolving in a positive way, yet a lack of environmental and social disclosure regarding their manufacturing facilities is a negative.

	Relevant Targets	Relevant Products
2 ZERO HUNGER 	Target 2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality	Agricultural applications of Illumina's gene-sequencing machines help to improve crop resistance to drought and pests.
3 GOOD HEALTH AND WELL-BEING 	Target 3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases Target 3.4 By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being	Illumina's gene-sequencing machines accelerate our understanding of various diseases and enable the discovery of new treatment.
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 	Target 9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending	Illumina has driven significant cost reduction in gene-sequencing, allowing its application in a wide range of scientific and industrial research.

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