

CS5030-A1

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While a relatively new development in human history, the emergence of software engineering has revolutionised the modern world - from the wider scale of how governments operate down to the everyday actions of the average citizen. Over the last 50 years, there are few industries that haven't been transformed by its introduction and rapid expansion. Whether it's agriculture, business, government, or the everyday communication and leisure practices of the people - software has permeated all aspects of the everyday functioning of modern society. The way we communicate, get news and purchase goods and services is not only facilitated by software - but many of the actions of our daily lives that we take for granted would now be impossible without it.

The value of software is not only embodied in product sales revenue, but in the improvement of industry application functions, efficiency, quality, and stability. At present, with the continuous evolution of software and deepening of informatization, networking, and servicing of the real economy, new software technologies and new applications are changing traditional industries in the entire chain.

Software has become inextricably intertwined with the daily operating of the modern world, and as the world continues to come up against ever-present new threats, the development of new software does and will continue to play a massive role in addressing and managing these challenges. Now more than ever, with the world seemingly at a standstill in the wake of the Covid-19 pandemic - software is playing a critical role in both the maintenance of everyday life (facilitating remote learning, communication in remote workplaces, allowing for neighbourhoods and communities to remain connected) but also in actively managing and fighting the spread of the virus (track and trace, decimation of news and new regulations).

According to BeAPython [11]: "Due to the impact of COVID-19, food and drink delivery apps, such as Grub-Hub have seen a 71% increase in usage compared to the same period in 2019. New installations have also increased by 102%. Gaming apps in particular have seen a 130% jump in the number of installs in March this year, compared to the same month in the previous year." It can be seen that software development will become more important.

A range of online learning software has enabled a vast increase in accessibility to education in recent years, and more specifically during the Covid-19 pandemic. Given that in 2017 a Digital Trends Survey [2] found that 81% of US college students claim digital learning technology is helping them boost their grades, it is unsurprising to learn that pre Covid-19 the market for online education was projected to reach \$350 Billion by 2025 [12]. Some advantages of online learning include; increased flexibility in location and time, customization and variety of mediums such as pre-recorded video, text, live classes [5]. A large range of software, systems and tools for online learning is also available to teachers [14], such as Zoom, Google Classrooms and Microsoft Teams. This variety enables educators to select and combine platform usage for learners and their own needs such as technical literacy, cost, teaching style and bandwidth [2]. With an estimated 1.2 billion children out of school [12] due to the Covid-19 pandemic, online learning software has become an essential tool for educators and learners. For example, the aforementioned Google Classrooms - which helps students and teachers organize, share and mark work - has seen users double from 100 million since the start of March 2020 [4].

Over the last decade, education technology has evolved in a more interactive way of learning, providing a more suitable experience for students [3]. There has been significant effort to develop specialized tools to cope with the increasing demand for online education software [9]. Adopting an online learning approach has created an opportunity to expand flexible learning methods. Multiple companies are developing better software applications to match the students' needs with different learning styles, including students with

disabilities that require enhancing accessibility features, such as audio narration and sign language video [7].

Thanks to technology, it is now possible for students to engage in all sorts of online activities, such as group work, tutoring, online assessments and video conferencing with outstanding results and it is believed that the transition to distance learning as the basis of education is expected to accelerate over the next few years [6]. Covid-19 has challenged the way in which teaching is delivered around the world and even when a vaccine is approved, digital platforms will aim to correct deficiencies that already existed in the education system. Online learning has proved to be an essential part of the education sector that could eventually transform into the main source of learning [8].

Online learning has reshaped the way education is delivered in the modern world. As opposed to several decades ago, anyone with access to the internet can get up skill themselves easily.

Online education has been beneficial to rural areas. According to UNESCO, 1 in every 5 children in the Sub-Saharan Africa and other developing countries did not participate in any form of education in 2016 and the advent of distance learning and massive open online courses (MOOCs) are playing a crucial role to reducing these numbers. The open distance education universities in these regions have enrolled, in total, more than 7 million students [13]. Bill Gates, Philanthropist and co-founder of Microsoft quoted that “Over the next 15 years, that quality will get so good that the free or very low-cost stuff will be pervasive and anyone with a cell phone or cheap tablet will have access to that – and it really will change education” [1].

Online learning has opened the doors to ‘asynchronous learning’, which refers to being able to study consume the study material in your own time and not having to adhere to a rigid schedule. Being in control of when, how often and the pace at which to review the lectures is a powerful tool to optimize the amount of information absorbed during a class [10].

Covid-19 has forced several universities to switch entirely to a remote delivery of teaching which is a testament to how versatile and future-proof online learning can be. It has been able to tackle some of the problems that were present in the traditional mode of teaching while continuously proving to be future proof.

Word Count: 1032 words

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