Introduction

The rise of the Internet industry has brought the IT industry into the limelight. As one of the most fundamental components of the entire industry, software engineering is particularly important because of its irreplaceable position between the needs of enterprises and the operation of machines. According to ISO/IEC/IEEE International Standard (2017), software engineering will be defined as the systematic application of engineering methods in the software development process. Due to the tremendous role played by software engineering in the recent coronavirus outbreak, this article will focus on related issues since 2019. This essay is divided into three main sections, these three sections will discuss the importance of software engineering, the challenges of modern software development and the role of ethics in software engineering, respectively.

Importance of Software Engineering

The third technological revolution has brought the whole human society into a more advanced information era, in which the development of computer science, especially software, has played a huge role. The importance of software is particularly evident in these years of new coronavirus outbreaks. According to Curran (2020), during the outbreak of new coronavirus, more than 81% of the survey subjects were working remotely. When they were asked if they would be willing to work remotely when the outbreak is over and everything is back to normal, more than 41% showed a positive attitude. It is obvious that during the pandemic, they need to use meeting software to get contact with colleagues as well as finishing their work, the meeting software covers almost the vast majority of productive life in this period. PR Newswire (2021) evidenced that in Brazil, there will be twice as many cyberattacks in 2020 as in 2019. Due to the high price and very poor portability of hardware firewalls, security software played a huge role in this phase as the primary way for individual and business users to defend themselves against network intrusion and cyber fraud.

the challenges of modern software development

During the outbreak of COVID-19, managers are very concerned about software engineers doing things that are not related to their work while working online (Sako ,2020). On the one hand, it is obvious that the blurred line between home and workplace often makes software engineers feel inefficient. With elderly people and children to take care of at home, they sometimes cannot focus on their own work, which is a great hindrance to the process of enterprise software development and also reduces the code quality to some extent. On the other hand, managers often invest a lot of energy and time to focus on whether employees are at their positions and doing personal things during working hours, rather than coordinating the division of labor and cooperation among individual employees. This greatly reduces the efficiency of software development and the enthusiasm of software engineers, and also causes a certain degree of damage to the relatively loose and free corporate culture in Internet companies.

At the same time, almost everyone was working online during this period, which directly led to some small companies' servers being frequently accessed remotely by many software engineers. As reported by incomplete statistics, more than one-third of people use passwords for their work accounts in public places, and more than half regularly share their passwords with colleagues (Sarginson, 2020). This has a significant negative impact on enterprise information security in the software development process. Enterprises in the core software development process may lead to code leakage due to employees' wrong distinction between intranet and extranet, which can disrupt the development plan of some confidential projects and thus affect the development progress of the whole team project.

the role of ethics in software engineering

The increasing computing power of computers has led to a boom in big data-based software, but the ethical issues associated with data collection pose many problems for software users. According to Siddiqua et al (2021), software providers often collect users' personal information without their knowledge. This makes it easy for companies to profile users. On the one hand, users often complain that they receive a variety of advertising emails for no apparent reason, and a large percentage of them don't even know when they gave their personal emails away. On the other hand, ad providers are more likely to buy users' information on the black market to precisely push ads. This is undoubtedly a serious ethical and legal issue, but because it is very difficult to establish jurisdiction in the legal sense on the Internet, these illegal and unethical harassment of users often go unanswered. In addition, the software development process is limited by certain machine learning algorithm datasets, and the algorithms are often biased (Johnson and Smith, 2021). Since machine learning was initially developed in Europe, with the Americas taking the lead, almost the vast majority of datasets were collected from whites. This has, in part, made the algorithmic models trained naturally biased against people of color.

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