

# Software Development Lifecycle: Impact of Cloud Computing and AI on Software Development

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## DESCRIPTION

Software development is the backbone of the modern digital world. From mobile applications to enterprise-level software solutions, software development is the driving force behind innovation, efficiency, and scalability in businesses and organizations across the globe. It is a complex, collaborative process that involves the creation, design, deployment, and maintenance of software applications. As technology continues to evolve at a rapid pace, the field of software development has become even more dynamic, embracing new tools, methodologies, and programming languages that shape the way we interact with the digital world.

## The Software Development LifeCycle (SDLC)

The SDLC is a structured approach used by developers to ensure that software is delivered efficiently and effectively.

**Planning and Analysis:** The first step in the SDLC involves identifying the objectives of the software, gathering requirements, and determining the resources and timelines needed for development. In this phase, developers and stakeholders collaborate to outline the project's scope, define user needs, and establish a clear roadmap for the project.

**Design:** During the design phase, the software's architecture is planned, and the User Interface (UI) and User Experience (UX) are designed. This stage also includes creating detailed technical specifications, wireframes, and prototypes. Effective design is crucial for ensuring that the software is intuitive and user-friendly while meeting performance and security requirements.

**Development:** The development phase is where the actual coding happens. Developers use various programming languages and frameworks to build the software. This phase often requires close collaboration among front-end and back-end developers, quality assurance teams, and system architects to ensure that the product is being built according to the specifications.

## Agile methodology: a game-changer in software development

One of the most transformative methodologies in software development is Agile. Agile emphasizes flexibility, collaboration, and iterative development, allowing teams to adapt to changing requirements and deliver high-quality software more efficiently. Unlike traditional waterfall models, where each phase is completed sequentially, Agile development focuses on delivering small, incremental improvements over time.

In Agile, development is broken into short cycles known as sprints, which typically last two to four weeks. At the end of each sprint, a working version of the software is delivered, allowing teams to gather feedback and make adjustments before moving on to the next sprint.

## Trends in software development

The field of software development is constantly evolving, driven by new technologies and shifting business needs. Here are a few key trends that are currently shaping the future of software development:

**Cloud computing:** Cloud-based software has become increasingly popular due to its scalability, flexibility, and cost-effectiveness. Developers are increasingly building cloud-native applications that are optimized for cloud platforms, allowing businesses to scale their operations quickly and efficiently without the need for expensive on-premise infrastructure.

**Low-Code and No-Code development:** By enabling people with little to no programming skills to create applications, low-code and no-code platforms are democratising software development. These platforms provide a visual interface for building software, reducing development time and costs while empowering non-developers to contribute to the software creation process.

**Cybersecurity:** As software becomes more integrated into every aspect of life, ensuring its security has become a top priority.

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**Received:** 19-May-2025, Manuscript No. JRD-25-37188; **Editor assigned:** 21-May-2025, PreQC No. JRD-25-37188 (PQ); **Reviewed:** 04-Jun-2025, QC No. JRD-25-37188; **Revised:** 11-Jun-2025, Manuscript No. JRD-25-37188 (R); **Published:** 18-Jun-2025, DOI: 10.35248/2311-3278.25.13.297

**Citation:** Lio G (2025). Software Development Lifecycle: Impact of Cloud Computing and AI on Software Development. J Res Dev. 13:297.

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Developers are increasingly focusing on incorporating security features from the very beginning of the development process, rather than as an afterthought.

### Challenges in software development

Despite its many benefits, software development comes with its own set of challenges. One of the biggest challenges is managing complexity. As software becomes more sophisticated and feature-rich, it becomes increasingly difficult to maintain and debug. Developers must ensure that the code remains clean, efficient, and scalable. Another challenge is meeting user expectations. With rapidly changing technology and consumer demands, businesses must keep pace with the latest trends and continuously improve their products. This requires regular feedback loops and a commitment to constant innovation. Lastly, resource constraints can be a significant hurdle. Software development requires skilled professionals, time, and financial

investment. For small businesses or startups, securing the necessary resources to compete with larger companies can be a challenge.

### CONCLUSION

Software development is a dynamic and ever-evolving field that plays a crucial role in shaping the digital landscape. From the development lifecycle to the latest trends in Agile, cloud computing, and AI, software development continues to push the boundaries of what is possible. Despite the challenges, its impact on innovation and business growth cannot be overstated. As technology continues to advance, the future of software development looks promising, offering new opportunities for businesses to stay competitive, enhance user experiences, and drive digital transformation.