

232. GO (GOLANG) AS A TOOL FOR INDUSTRIAL DEVELOPMENT AND ITS GROWTH AREAS

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The paper is about the Go (Golang) programming language, features, advantages and disadvantages, areas where it is used.

Go (Golang) is an open-source programming language developed by Google in 2007 and officially released in 2009. It was designed with the goal of combining performance and security of a low-level language like C with the simplicity and productivity of modern languages like Python. Go emphasizes simplicity, concurrency, and efficient compilation [1].

The Go (Golang) programming language has several significant advantages. Go is a compiled programming language that produces machine code directly, which allows programs to run significantly faster than programs written in interpreted languages such as Python. In many practical scenarios, its performance is comparable to languages such as C++. Another important advantage of Go is its built-in support for concurrency. Go provides special mechanisms called goroutines and channels, which allow developers to create concurrent programs more easily than with traditional thread management systems. Goroutines are lightweight threads that are managed by the Go runtime environment, enabling applications to handle a large number of tasks simultaneously without excessive resource consumption.

Go is also known for its simple and clean syntax. The language was intentionally designed to be easy to read and understand. Many complex features that exist in other programming languages, such as deep inheritance hierarchies, were deliberately excluded from Go in order to keep the language simple. Another advantage of Go is fast compilation. Compared with many other compiled languages, Go programs compile very quickly, which allows developers to test and update their code more efficiently and speeds up the overall development cycle. In addition, Go includes a strong standard library. The built-in library provides extensive support for networking, HTTP servers, cryptography, and data processing.

Despite these advantages, Go also has several disadvantages. One limitation is the relatively small number of language features. Go intentionally avoids many advanced programming constructs that are available in languages such as C++ or Java. Another disadvantage is verbose error handling. In Go, errors must often be checked explicitly after function calls. Additionally, the Go ecosystem is still smaller than those of older programming languages such as Java or Python. Finally, Go has limited use in certain domains. It is not commonly used for mobile application development or game development [2].

Go is used in many areas of modern software development. One of the most important areas is cloud computing and infrastructure development. Another important area of application is web server and backend development. Go is often used to create high-performance web servers and APIs. Go is also widely used in distributed systems. Its concurrency model and performance characteristics make it well suited for microservice architectures and large-scale distributed applications. In addition, Go is frequently used to develop command-line tools.

When compared with other programming languages, Go demonstrates several distinctive characteristics. In comparison with Python, Go generally provides better performance because Python is an interpreted language. Go offers superior performance and more efficient concurrency management. When compared with Java, Go offers simpler syntax and faster compilation times. Go is often preferred in microservice architectures and cloud infrastructure projects due to its simplicity and efficiency. In comparison with C++, Go sacrifices some low-level control over memory and hardware in exchange for easier development and improved safety. Go simplifies development by providing automatic garbage collection and built-in concurrency mechanisms.

The Go programming language represents a modern approach to software development that prioritizes simplicity, performance, and scalability. Its built-in concurrency model and efficient compilation make it highly suitable for cloud infrastructure, distributed systems, and backend development. Despite certain limitations, such as a relatively smaller ecosystem and fewer advanced language features, Go has become an important tool in modern software engineering.

References:

1. Go Programming Language (Introduction) - URL: <https://www.geeksforgeeks.org/go-language/go-programming-language-introduction> (date of access: 9.03.2026).
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