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How to Implement Secure Digitization in the Business World with Java

Research Paper

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April 26th, 2020

Abstract

Today, more companies are moving their business resources and processes online. Thus, these corporations experience the benefits of reduced costs and enhanced productivity. They use various tools and solutions to achieve this. Since this change is occuring digitally, this makes the business more susceptible to cyber threats and elicits the need for security. The Java programming language and its platform include a variety of features to implement secure digitization.

Keywords: Java, digitization, security

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What is the first thing that comes to your mind when you think about the 21st century workplace? Robotic colleagues? Work from home? Digital innovation? Well, one thing is for sure, the archaic office days are over. Technological change is here. Typewriters have transformed into powerful computers and encyclopedias have turned into online textbooks. In this research paper, I will detail how to implement secure digitalization in the business world with the Java programming language.

Digitization of Business

Right now, the world is going through a digital revolution. Almost all organizations are migrating to the digital landscape. If companies do not adapt, they face lower rankings, market share losses, and a lack of innovation. For companies that do adapt, they will have business success (Linton, 2017). “Digital Transformation is the use of technology to radically improve performance or reach of the enterprise" (Linton, 2017). Business data and apps can be digitized, as well as its internal operations and external activities. If corporations do this, especially with mobile apps, this will result in increased sales, enhanced customer value, and more (Vlasova, 2019). There are a plethora of benefits associated with digitalization which include: lowered costs, improved security, and enhanced productivity (Linton, 2017).

Hence, there are multiple methods used to achieve digitalization. First, the digitization process must be taken step by step. For example, corporations should begin with a paperless process and gradually move to blockchain. "In fact, mastering digitalization is about establishing an updated layer for future new tech applications for making a life of the enterprise

more streamlined and introducing new quality of customer experience" (Vlasova, 2019). In addition, system integration necessitates involvement of mobile devices, installation of software systems, and linkage of various computing systems & software applications. These integration flows can be created with the use of connectors and processors. Connectors accept or send out messages while processors facilitate messages (Linton, 2017).

Furthermore, digital transformation requires cross-departmental collaboration and introduction of new solutions. Most organizations are starting to implement digitization with technologies such as the cloud, mobility, Internet of Things (IoT), Machine Learning, Internet of Things, Artificial Intelligence (AI), and data-driven decision-making. Yet they lack the adequate infrastructure to defend against security challenges like polymorphic attacks, which ,"Can change and adapt to avoid detection by traditional security solutions" (CSO, 2018). To resolve this issue, security teams can use Fortinet and similar software packages to achieve integration and automation.

Cybersecurity and Secure Digitization

Cybersecurity plays a huge role in digitization. Transformative technologies must be able to protect the organization, assets, and customers. Otherwise, digital transformation is meaningless (Collett, 2020). As a matter of fact, digital transformation is aided by security excellence. In order to form a solid foundation for company-wide digitalization, security must be considered. Information security highlights the need for awareness, involvement, cybersecurity practices, and cyber professionals. It is taking center stage for industry and transformation strategies as well (Collett, 2020).

Likewise, secure digitization is crucial because there are more sophisticated cyber threats and clever bad actors (Borno, 2017). All members in a company have a security responsibility and role in IT culture too. The weakest link could expose the company to a myriad of threats and attacks (Collett, 2020). Organizations could lose millions of dollars to these hackers (Borno, 2017). As a result, companies must do more to incorporate information security in business processes and digital transformations. They can achieve a successful dual approach by implementing automation, artificial intelligence, and predictive modeling (Collett, 2020).

Java and Secure Digitization

Shifting gears, Java is a development platform specializing in web, mobile, and enterprise solutions. Java is well-known since it is the major server-side programming language. However, it is extremely intricate, which causes longer development cycles and market campaigns (Fahran, 2016). Besides, Java is heavily used in business applications. It writes new or rewrites existing mainframe applications ("BMC", 2016)

Moreover, Java can be leveraged in the secure digitization process. Case in point, Java's platform is centered around security (Oracle, 2018). "Java on the mainframe is being used to develop and deploy new applications faster and more economically to meet dynamically changing digital business needs and to take advantage of widely available programming skills" ("BMC", 2016). For instance, a pioneering business specializing in IT solutions, BMC, launched a new integrated systems management solution called MainView for Java Environments. Software developers can view Java's resource consumption and application performance on MainView. This is helpful since Java workloads cause high consumption and effects on performance ("BMC", 2016).

There are other Java tools that can be used to implement secure digital transformation. To start, “A secure class loading and verification mechanism ensures that only legitimate Java code is executed” (Oracle, 2018). Also, programmers can utilize the Java SE security platform. It ensures the safety and security of users, systems, and Java program applications. Basically, the model is a customizable sandbox. Security Application Programming Interfaces (APIs), algorithms, mechanisms, and protocols are just some of its tools. These are tailor fitted to specific areas such as cryptography, public key infrastructure, secure communication, authentication, and access control. Administrators and developers can leverage these tools to accomplish specific job tasks (Oracle, 2019).

To examine this in further detail, Java security APIs provide security in various domains. Implementation independence, implementation interoperability, and algorithm extensibility were the design guidelines for these APIs. The cryptographic and public key infrastructure (PKI) interfaces develop security while the authentication & access control prevent unauthorized users from accessing resources (Oracle, 2018).

Along these same lines, Java restricts access to resources by using modifiers given to classes, methods, and fields. These access levels can be labeled private, protected, public, or package."The most open access specifier is public access is allowed to anyone. The most restrictive modifier is private access is not allowed outside the particular class in which the private member is defined. The protected modifier allows access to any subclass, or to other classes within the same package. Package-level access only allows access to classes within the same package” (Oracle, 2018). A diagram displaying how Java configures resource access levels is shown on the next page.

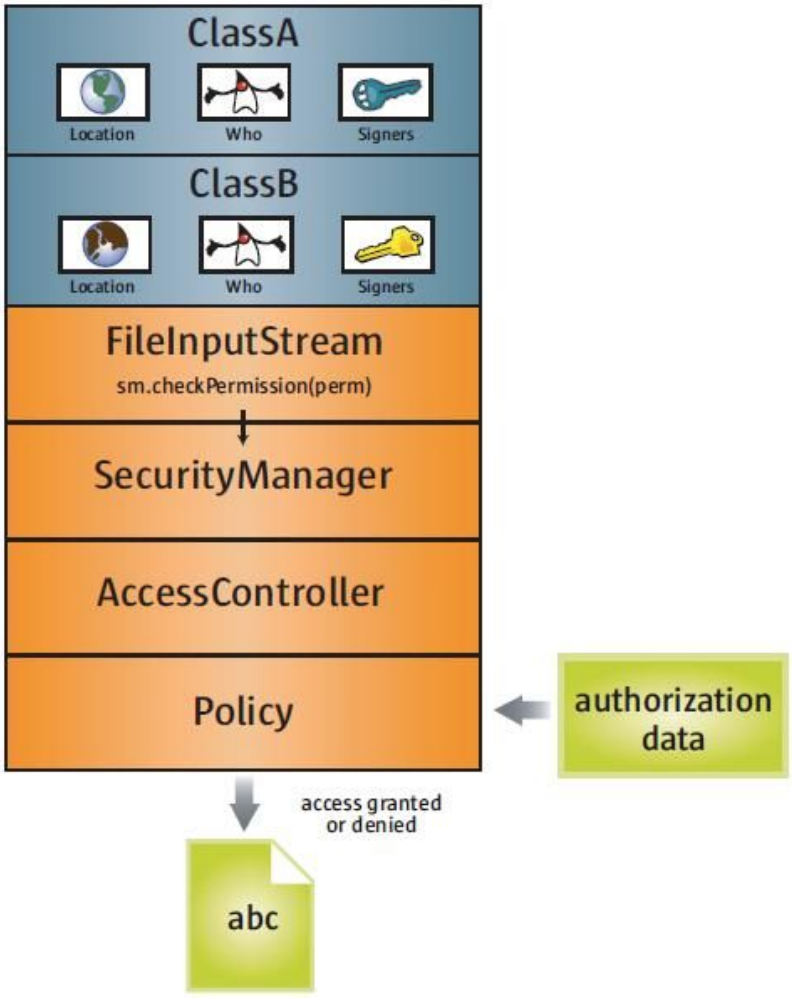

Photo above: (Oracle, 2018)

In conclusion, secure digitization is the wave of the future in the business world. There are a plethora of benefits and opportunities. Therefore, businesses update their software and technologies in order to reap the rewards. Also, the Java programming language can assist corporations in creating secure applications and systems. In conclusion, Alvin Toffler's quote summarizes my key points, "The great growling engine of change is technology."

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