Business Information Systems - Part 2

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1 KPMG on Low Code

I'm not sure which one of you is familiar with this new term, but it's gaining a lot of attention globally. Although it may not be as popular in Europe and Italy, there is another approach to software development that is worth exploring. While technologies like that may be the current trend, they are not the only ones that software engineers should focus on in the next decade. There are new methods emerging that make software development easier, faster, and more secure. Now, let's dive into the details of low-code development, which is the topic we will be discussing today.

1.1 Definition and Scope

Low-code development is more than just a platform or a cloud solution. It encompasses a combination of these elements. Now, let's move on to discuss the major technologies involved in low-code development.

1.2 Historical Context and Evolution

Over the past decade, companies have been increasingly focused on optimizing and streamlining their core processes, such as procurement and operations. However, it's important for companies to consider not only their core operations but also the surrounding components that impact their overall efficiency. This includes visualizing and automating common user tasks and leveraging data to improve communication and collaboration with other departments.

In order to foster innovation, companies need to shift their attention and resources towards individuals who can generate new ideas and solutions. One common approach is to automate repetitive tasks or non-value-added activities. This trend started years ago in large US companies, including industrial giants like GM and banks, as well as government institutions. Initially, the focus was on workforce optimization rather than investment analysis. This was a simple and straightforward solution at the time.

1.3 Global Trends and Adoption

In order to maintain our jobs and avoid outsourcing to low-income countries like India, we need to take action. We can achieve this by finding skilled individuals in these countries who can perform our job effectively and at a lower cost. By doing so, we can reduce our expenses and present a compelling case to management. This strategy is commonly referred to as "Outsourcing" It is crucial for all of us in the driving industry to understand and embrace this concept.

1.4 Automation and Low-Code

In these companies, there is a strong focus on automating activities that were previously done by humans. This is the first aspect of low-code development: automation. The idea behind this approach is to find ways to automate these activities using robotic process automation software. This technology is not new; it has been around for 14 years and is commonly used in various applications. By implementing this technology, companies can streamline their processes and reduce costs.

1.5 Analytics and Data

The second aspect we will discuss is analytics. Analytics involves the ability to analyze data collected from various sources within an enterprise software system. It is important to create reports that not only provide valuable insights but also optimize cost-effectiveness. Analytics plays a crucial role in boosting automation. Automation relies on both software and data, similar to how humans require data to perform tasks efficiently. For instance, if a human needs to transfer data from one window to another, they need the data to be organized and in a suitable format. This ensures greater efficiency and effectiveness in the overall process.

1.6 Artificial Intelligence and Low-Code

Lastly, but certainly not least, is the application. Sometimes, you need tools to help you understand data and make informed decisions, especially in automated processes. This is where artificial intelligence (AI) comes into play. When AI intersects with low-code development and automation, it creates a powerful combination that can drive international competition.

1.7 Low-Code as a Competitive Advantage

In the realm of international competition, the convergence of three key elements—software, robotics, and business operations—is of utmost importance. This combination allows for the creation of applications and technologies that can significantly enhance business operations. One notable advantage of this technology is its ability to automate crucial tasks, resulting in increased efficiency. Moreover, the speed at which these applications can be developed is truly remarkable. With this technology, it is possible to create and deploy applications rapidly.

1.8 The Future of Software Development

In the future, the landscape of software development will be drastically different. Currently, companies rely on a large number of employees to write code and build applications. However, with the advancements in analytics, artificial intelligence, and automation, this process will be revolutionized. These technologies will replace the need for manual coding, making it much faster and more efficient.

As a result, the role of universities in teaching high-level programming languages may become less important. The traditional approach to software development will be replaced by low-code development, which allows for faster and more streamlined application building. This means that individuals who are currently studying programming may need to reconsider their career paths, as the demand for manual coding skills may decrease significantly in the next century.

It's important to embrace these changes and adapt to the future of software development. By understanding the potential of low-code development and the power of analytics, AI, and automation, individuals can position themselves for success in this evolving industry.

1.9 Low-Code Market Value

Why am I saying this? Because even today, if I want to develop a simple enterprise application that requires some coding, I would have needed to hire a Java or .NET programmer in the past. It would have taken them around 10 to 20 days to complete the task. However, with low-code development, I can do it myself in just one day. This demonstrates the efficiency and time-saving benefits of low-code.

In the near future, I may not even need a person to configure the low-code platform. Companies like Microsoft are continuously improving their low-code tools, making them more user-friendly and accessible. This evolution in low-code development is not just about individuals, but it also has a significant impact on industries. Low-code has already revolutionized billion-dollar infrastructures, not just small businesses.

The global market value of low-code is currently around $100 billion per year, indicating a significant shift away from traditional development methods.

2 The Impact of Low-Code

2.1 Job Market and Industry Changes

My role here is to acknowledge a significant shift in the job market. In my interviews with colleagues, I've encountered individuals who aspire to be full-stack programmers, back-end developers, and content developers. While these roles are valuable, it's important to recognize that they may become less prevalent in the future. Companies like ours, have chosen to focus on the strength of technology rather than relying on a large number of developers spread across the globe. We have witnessed the growing importance and popularity of technologies like cybersecurity and bandwidth growth. This is why we have made the decision to invest in these technologies and share this information with you.

2.2 The Role of Traditional Software Development

I understand your concerns about your ability to excel in your job and the challenges you face in the software industry. It can be difficult when there is a lack of resources and support. However, it's important to remember that the industry is constantly evolving, and there are new opportunities emerging.

One such opportunity is low-code development, which allows individuals without extensive coding experience to create applications. Low-code platforms provide a visual interface and pre-built components that simplify the develop-

ment process. This means that even if you don't consider yourself a skilled engineer, you can still contribute to software development.

The rise of low-code development has also led to increased automation in the industry. Tasks that were once time-consuming and manual can now be automated, freeing up valuable time for more complex work. This automation is particularly beneficial in the front-end development space, where there is often a shortage of skilled individuals.

However, it's important to acknowledge that the traditional software development industry is still relevant and necessary. While low-code development offers advantages, there are still complex projects that require the expertise of experienced engineers. It's about finding the right balance and leveraging the strengths of both approaches.

In conclusion, the software industry is evolving, and low-code development is becoming a competitive advantage. It provides opportunities for individuals without extensive coding backgrounds and enables automation in the development process. However, traditional software development still plays a crucial role in tackling complex projects. It's important to adapt to these changes and embrace new technologies to stay relevant in the industry.

2.3 New Opportunities in Software Industry

There is a new and rapidly growing software industry that is gaining momentum. It may seem like a small trend, but it has actually been developing for the past 20 to 30 years. Initially, there were only a few companies involved, but now there are countless players in the market. These companies are often overshadowed by larger, more well-known organizations, but they are making significant contributions in various sectors, including healthcare and media.

The emergence of this new software industry has created numerous job opportunities, but there is a shortage of skilled professionals who are familiar with the technology. One reason for this shortage is that many people are not yet aware of the potential of this industry. Additionally, traditional software developers may be hesitant to transition to this new field.

However, it is important to recognize the potential and embrace the changes that this industry brings. It offers exciting prospects and opens up new avenues for innovation. It's time to break away from traditional norms and explore the possibilities that this new software industry has to offer.

3 Low-Code in Practice

3.1 Intelligent Automation

So, returning to our presentation, these are the tasks that someone working in intelligent automation can perform. It's not just about developing solutions; it involves IT professionals engaging in a wider range of activities. It's not like being a software developer, where you gather requirements, develop an application, and then test and deploy it. In intelligent automation, we also have the task of discovery. We engage in value-added activities to understand how automation can be applied to companies, build those automation solutions, and incorporate elements of cognitive and artificial intelligence. And, ultimately, we also handle management. Let me provide an example. One of our projects serves as a very interesting use case.

3.2 Use Cases and Efficiency

For an automotive company that increased its production of luxury cars, there was a challenge related to checking the labels on each vehicle. These labels contain important information, such as the manufacturing location and pressure specifications, and must comply with local regulations and be in the language of the market where the car is sold. Previously, employees on the production line manually checked each label for accuracy and compliance.

To address this issue, a discovery process was conducted to identify opportunities for automation. A solution was developed using a combination of low-code development, cognitive technology, and artificial intelligence. An app was created for tablets used by the employees on the production line. They could simply take a picture of the labels on the car doors and other locations, and an Amazon Web Service configured with label recognition capabilities would automatically analyze the image. The system would determine if the label was correct, in the right position, and compliant with regulations. The results were recorded and archived in the tool.

By implementing this automated solution, the automotive company was able to reduce the number of employees needed for label checking from five to just a couple. This resulted in significant cost savings for the company.

3.3 Tools and Technologies

At our company, we go beyond just being software engineers. We strive to find the best solutions and automation techniques to add value to our clients' businesses. We use various tools, such as Microsoft, AWS, and others, to cre-

ate high-level architectures for automating human activities. One of the tools we use is Robotic Process Automation (RPA), which allows us to automate repetitive tasks. We also utilize HR and cognitive services, as well as low-code development, to build applications. Think of us as painters who combine different technologies to automate work processes. This approach is incredibly powerful and transformative.

3.4 Traditional vs. Low-Code Development

If we look back 10 or 20 years ago, the only option for software development was writing code in specific programming languages like .NET or C#. However, today we have a wider range of technologies available to us. This has led to the emergence of low-code development.

Traditional development is a manual process carried out by humans, which can be prone to errors and requires significant resources. Developers often spend a lot of time searching for code, trying to understand it, and sometimes making mistakes that require further investigation. On the other hand, low-code development offers a different approach.

With low-code, developers have access to a palette of pre-built components and services that can be reused. Many of these components have already been created by other developers, allowing for efficient reuse of their work. This is the essence of low-code development: the ability to create applications without having to write traditional code.

4 The Future of Low-Code

4.1 Predictions and Market Trends

Low-code development is gaining popularity due to its ease of use and ability to bridge the gap between business needs and software development. Compared to traditional software development, low-code allows for faster results and the ability to showcase them more quickly. This is particularly important because by 2025, the majority of enterprise application development is expected to be done using low-code. This shift towards low-code presents a significant opportunity for industries to adopt this approach. The low-code market is projected to reach $30 billion by 2025, making it crucial for businesses to embrace this trend and stay competitive.

4.2 Digital Solutions and Legacy Modernization

Low-code development offers a range of possibilities for various applications. One key benefit is the ability to create new digital solutions that can be used both internally and externally. These solutions can be utilized by employees within the company as well as by consumers who want to interact with the organization.

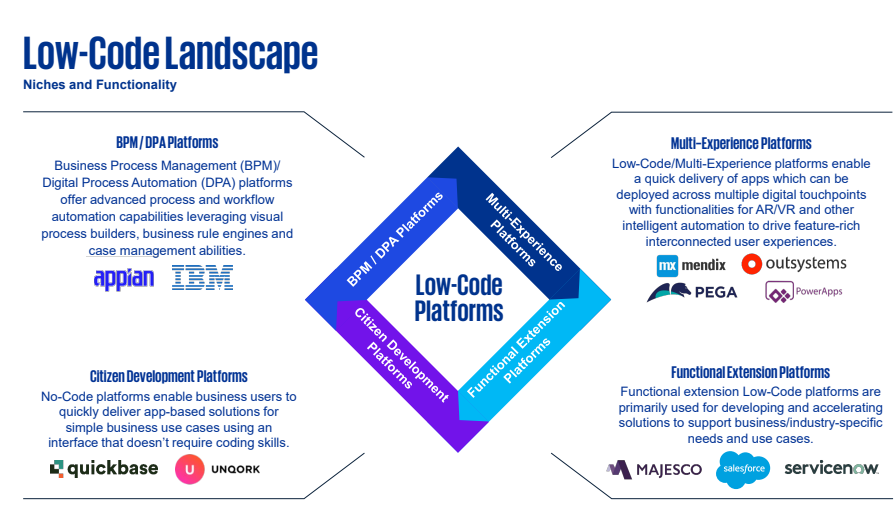
Another valuable use of low-code is the modernization of legacy applications. Many industries, such as banking, still rely on outdated applications developed in the 70s or 80s. With low-code, companies can transition these old technologies to more modern platforms by developing low-code applications.

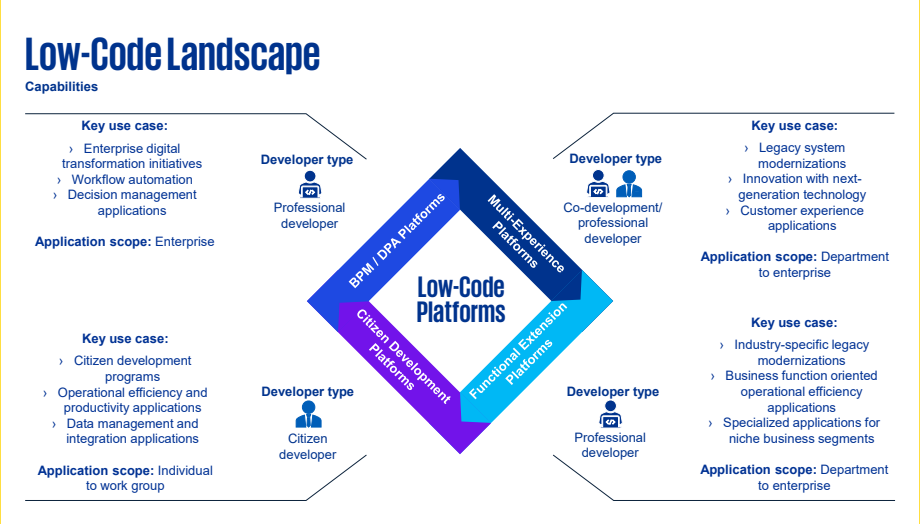
Additionally, low-code can be used to streamline and consolidate applications across different departments. In the past, companies would build separate applications for each department, resulting in a lack of cohesion. Low-code allows for the unification of these applications into a single, integrated system.

Lastly, low-code enables the automation and orchestration of existing processes, as well as the design of new processes. This means that companies can automate repetitive tasks and workflows, improving efficiency and productivity.

These four areas—creating new digital solutions, modernizing legacy applications, unifying applications across departments, and automating processes—are the primary use cases for low-code development.

4.3 Low-Code Landscape





In the landscape of low-code development, there are different types of applications that can be built. One example is multi-experience platforms, which allow you to develop applications that can be deployed on mobile devices, tablets, or web browsers. These platforms focus on providing a seamless user experience across different devices.

Another type of platform is functional extension platforms. These platforms are used to enhance existing enterprise software by configuring and augmenting processes. They enable businesses to extend the functionality of their software without the need for extensive coding.

For those who are new to coding or prefer a more user-friendly approach, there are citizen developer platforms. These platforms require no coding knowledge and are designed to be easy to use for anyone, including non-technical individuals. They are often used by companies to create small-scale applications quickly and efficiently.

Lastly, there are business process management platforms. These platforms are used to digitize complex processes within organizations. By leveraging these technologies, businesses can develop solutions that streamline and automate intricate processes.

Overall, the low-code landscape offers a range of platforms tailored to different application development needs, from multi-experience platforms to functional extension platforms, citizen developer platforms, and business process management platforms.

5 Hands-On Exercise

5.1 Design Activity and User Experience

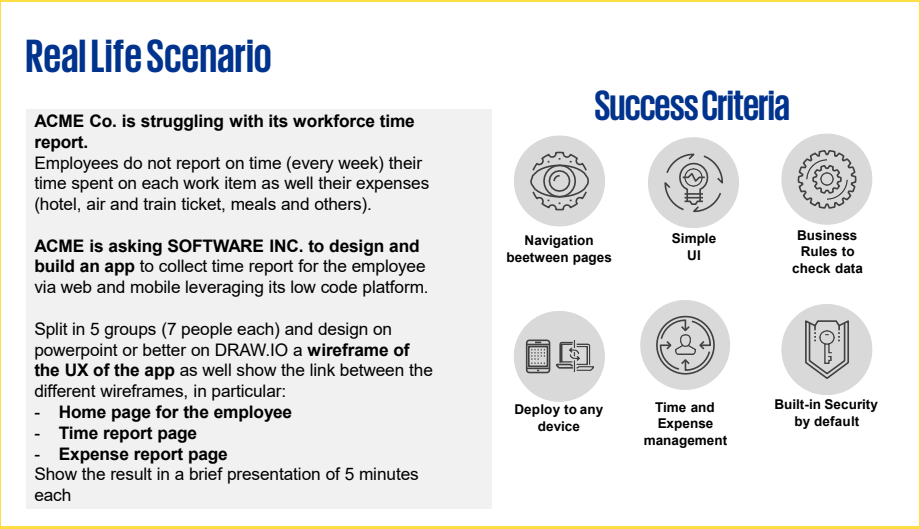
Low-code development can be used in various scenarios, such as digital transformation initiatives, workflow automation, creating specialized software for niche industries where enterprise software is not available, and modernizing legacy systems. The versatility of low-code allows for a wide range of applications.

For today's exercise, we will focus on a low-code platform and simulate a project similar to what we do in real-life low-code projects. One of the initial phases in a low-code project is the design activity. During this phase, we need to consider the process, the data involved, the users of the application, and the user interface.

Designing a user interface is a complex task in today's world. We need to develop applications that are easy to use for everyone and accessible across multiple devices. Low-code software can assist in this process by providing a palette of optimized graphic layouts for mobile, laptop, and public use. However, creating a user interface that meets these requirements remains challenging.

For today's exercise, we will focus on user experience (UX) and user interface design (UI).

5.2 ACME Company Case Study



ACME, a company, has approached us to develop a workforce time report.

A time report is essentially a calendar where individuals working on projects or for a company can log their time. They record the number of hours spent on specific tasks, such as training, project work, or email responses. ACME has requested us to design the entire solution, including the user interface.

When it comes to the user interface, our usual approach is to create a wireframe. A wireframe is a sketch of the user experience that takes into account the technical requirements of IT software. It needs to be compatible with webpages, easy to use, and mobile-friendly. Designing a user experience is a complex task that requires careful consideration.

To facilitate this process, we recommend using a tool like Draw.io. It allows us to create detailed wireframes that align with ACME's needs and preferences. By collaborating as a group, we can ensure that the final design meets all the necessary criteria for a successful workforce time report.

5.3 Success Criteria and Business Rules

One of the free tools available on the web for building a user experience is wireframing. While you can use PowerPoint, I strongly recommend using a tool specifically designed for this purpose. To create the wireframes for ACME Company, we need to start with an on-page for the employee. As an employee, I would need to enter my username and password, and there could also be additional authorization steps such as multi-factor authentication or a one-time password. We also want to include navigation to the time report page and an expense report page.

The expense report page is where employees can enter their expenses, such as travel expenses. This page should allow users to input details about the expense, including the date, type, receipt upload, amount, and location. It's important to consider all the necessary information for expense reporting.

When designing the wireframes, it's crucial to keep in mind the success criteria. As consultants, we are always evaluated based on these criteria. One important aspect is the navigation between pages. It's common for teams to focus on designing beautiful pages but overlook the seamless transition between them. Users should be able to easily navigate back and forth between pages, as mistakes can happen during data entry.

Another consideration is the user interface (UI). Avoid using large white boxes on a page, as this can be a common mistake. Just like you as a consumer wouldn't appreciate a lackluster UI on your iPhone or Android, it's important to judge your own design from a user's perspective. Additionally, it's essential to define the business rules behind each page. These rules will guide the functionality and behavior of the application.

By taking these factors into account and creating wireframes that prioritize user experience, navigation, and a visually appealing UI, we can ensure the success of the ACME Company application.

6 Closing Remarks and Exercise Instructions

For example, let's consider a validation process. It's important to ensure that expenses are only entered for the days worked. Keep in mind that these validations are not optional—they are necessary. Additionally, it's crucial to make sure that the user interface (UI) is responsive and adaptable to different devices. Instead of relying on adjusting the power pointer, it's recommended to utilize the UI, which is accessible across all devices. Remember, we are not just focusing on time, but also on expenses. It's important to consider the user experience and not overlook the needs of the users. Lastly, building security is essential. An authentication mechanism should be implemented to protect sensitive data. This exercise is designed to help you understand the group's requirements. Since there is a lot of work to be done and a meeting scheduled for later this afternoon, it would be beneficial for you to start working on it now.