effector®

AN INTRODUCTION TO THE **WORLD OF LOW-CODE**

1. The age of digital transformation

How digital transformation affects business success?

Only one and a half decades after the millennium, about half of the names on the Fortune 500 list have been changed. This greatly demonstrates that organizations responding well to the above questions are able to use the benefits of disruptive technologies creatively, efficiently and profitably and gain enormous competitive advantage.

Digital transformation, meaning directing enterprise processes to digital channels, is the key for the organization to obtain maximum freedom and thus, the ability to react quickly regardless of company size.

Although companies are taking advantage of the opportunities offered by information technology in the transformation process, the IT organizations within the company are not the only ones affected. The basis of digital business transformation is the transformation of the organization's essential characteristics. By doing so, such an organization should be created which changes the way employees work, question their way of thinking, their daily work processes and the strategies they rely on. This is a great challenge, but also a huge opportunity as well: it enables the company to become more efficient, more data-driven and could take advantage of more business opportunities.

In this process, business leaders have a key role, who need to continuously acquire new digital competences, and CIOs, who have been fully responsible for IT previously, now receive new, business-centered tasks.

The leader of digitalization, the CDO (Chief Digital Officer), appears at an increasing number of organizations with independent responsibilities. The role of the CDO is separated from the IT manager's role, often does not have deep technological knowledge. The CDO's job is to explore the linking points between business and technology through which new business areas open up for the company.

The most important driving force behind digital transformation is that the changes induced penetrate into the whole of the society and economy.

More conscious and more well-informed users are appearing who rely on digital technologies with increasing confidence. As a result of digitalization, a wider range has access to resources of key importance, lowering the market entry threshold to a level never seen before, and the market itself has become globalized in almost every segment. New business models, new market channels and working methods have emerged at an incredible speed. Innovation is continuous, which also has a backlash on the legal and tax environment. This certainly requires great flexibility from the companies.

The CEO, the CIO and where applicable, the CDO, must find the optimal way to renew their organization together, otherwise they run the risk of losing the market competition. The economy is irreversibly being digitized, the time-to-market pace has been drastically reduced, requiring

rapid, continuous innovation and integration even from traditional market players. A key element of this is the rapid modernization of the IT, as more and more new businesses are coming in through digital channels (Gartner, 2016).

Digital transformation is, however, not a single project and not a single technology. It is a process in which the company uses digital technologies to focus on meeting consumer needs quickly. In this process, technology is just a tool, the key factors are the people and the business needs. A low-code development model is an effective tool for the corporate IT organization to be able to effectively serve the business's increased and rapidly changing application development needs.

2. What is low-code?
What is a low-code platform like?

The concept of low-code was first defined by Forrester Research in the early 2010s. According to the research company, the goal of a low-code development platform can be summarized in three words: ease, speed, and power – meaning the delivery of business applications quickly, with minimal manual coding and low investment requirements for deployment (setup, training, etc.). This will help the most innovative businesses to maintain and improve their competitiveness.

The use of low-code platforms facilitates rapid innovation, enhances customer experience, improves operational efficiency, even along with constantly changing risks and regulatory environment. It enables organizations to build state-of-art business applications faster than ever before and to quickly adapt to changing consumer expectations.

Representatives from the business' side (so-called citizen developers) give the opportunity to compile applications, matching the business logic with minimal programming skills. Applications can be constructed like LEGO structures, using ready-made modules, reusing, so the application is available in a few weeks instead of months.

The introduction of low-code platforms is enhanced by building on competencies that can be found in most organizations, both on the business and IT side (database programming, Excel, etc.), or can be quickly replaced if they are missing. As these new applications perfectly match the business logic and processes, they provide a quick success to users right after the introduction, which also facilitates their acceptance.

The low-code model provides a common language and interfaces for users on the business side and IT developers to create, iterate and release applications together. These range from a variety of mobile and web apps to sophisticated and intelligent business applications.

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What is the difference between low-code and no code?

Although the content of the two concepts overlaps at many points, it is necessary to distinguish between low-code and no code development. Their common feature is that they both aim to speed up application development. Both use a model-based, declarative approach, which means that the application developer only has to define what the task is. The algorithm then is produced by an interpreter or compiler program built into the platform. This concept perfectly fits to the Software Defined Everything (SDX) approach, created as a response to the constraints of continuous innovation.

A common feature shared by both approaches is that they provide a solution to cost-effective development. But while low-code needs the assistance of the developers, no code can be applied without a background provided by a professional development team.

In case of no code approach, development takes place without coding, exclusively on a graphical interface. It offers development opportunities primarily for business users, who do not have any developer knowledge but want to make use of their business and graphical modeling experience. Its primary purpose is to be easy-to-use, hence business users can use it as self-service. Users receive pre-configured tools – that are often industry-specific - and since they do not need coding skills, they can start its use after a quick training. Overall, the no code platform provides

business users with a simple, self-service application development tool.

To use the low-code platform, more development knowledge is needed and it has a different underlying goal, to speed up the development itself. Although it requires a low level of coding, it not only allows but also requires collaboration between software developers and the users on the business' side. Being fully customizable, it offers much more freedom than no code. Most low-code platforms are next-generation, fast application development tools for professional developers.

In many cases, the best solution is the combined use of the two methods, which is called hybrid application. If quick results are important (e.g. proof of concepts), you can start with no code tools, where, for example, consultants work on a platform, which supports them and they do not have to build up everything from the basics. Then the outline sketch can be parameterized with low-code tools, and business logic can be supplemented with more complex elements.

All in all, in enterprise environments, no-code tools can play an important role in early stages of development projects, since they are perfect for demonstrating an idea or to create a working POC very quick. Nevertheless, in an environment with complex demands, **only the low-code concept provides both velocity and flexibility at the same time**.
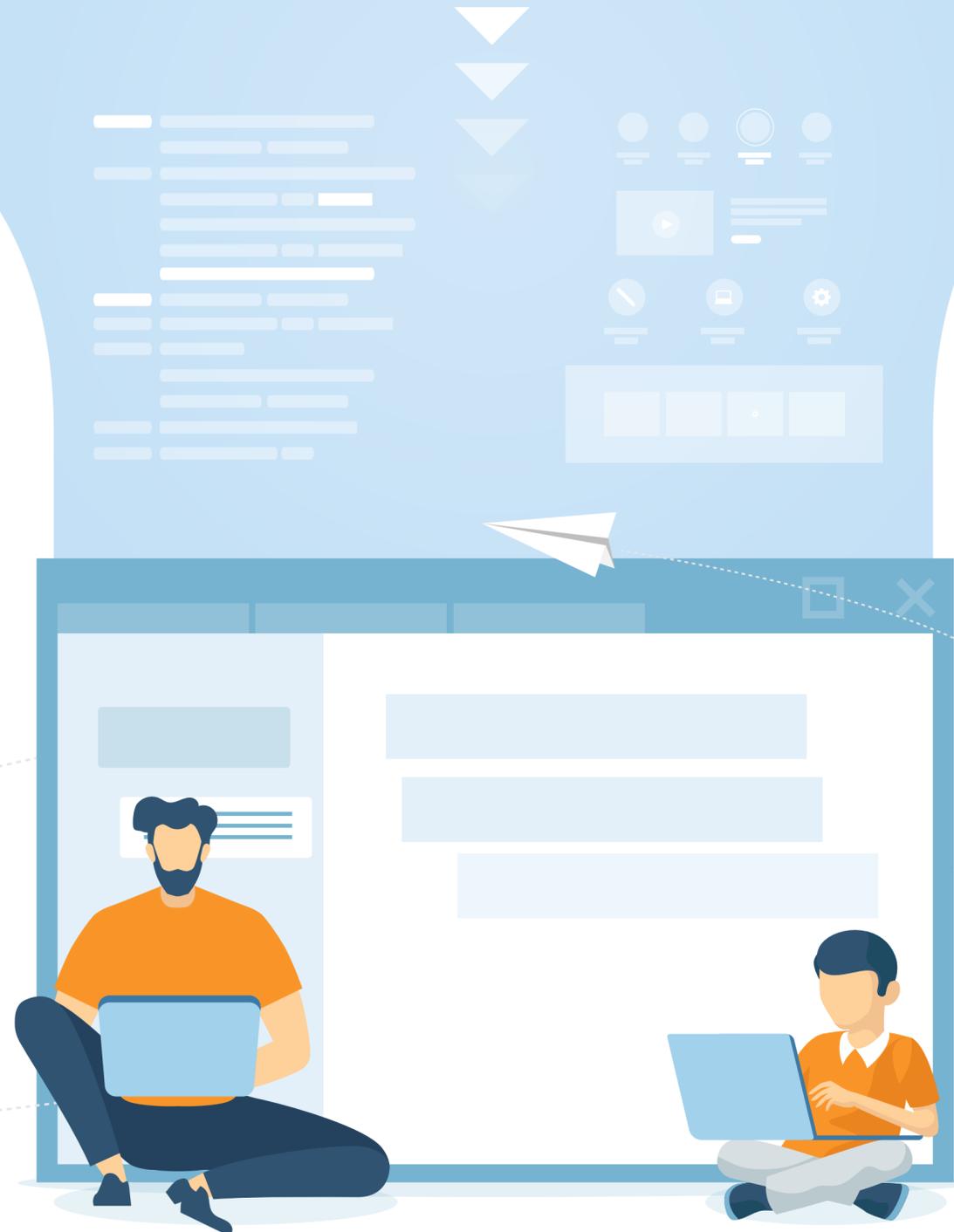
3. Low-coding landscape, market

Are low-code tools widely used?

In recent years, there has been a major change in business application development, which has increased the acceptance of low-code platforms worldwide. Examples include the spreading of cloud (developer) platforms, the need for software automation and the increasing demand for innovative applications, the need to simplify web and mobile application development, the need to reduce development budgets or the requirement of fast launch and low-cost operation.

The global market for low-code development platforms is growing rapidly. In 2016, the global market size was just $ 3.2 billion. However, according to market researchers' forecast, it could reach $ 27.2 billion by 2022, which means an average annual growth rate of 44.5% (CAGR). Even more cautious estimates also indicate an average annual growth of over 30 percent for the same period. There is a consensus among market researchers that the largest market for low code platforms will be America in the next five years, but the European and APAC regions are also facing very significant growth and the latter is expanding the most dynamically.

The potential of the market is also reflected by the fact that major business solution vendors (Dell, IBM, Microsoft, Salesforce.com, Oracle, SAP, etc.) have entered the low-code platform market with their own, primarily cloud-based solutions.

The market growth of low-code platforms is mainly driven by cloud-based installations. For organizations, this provides easier access, better scalability and flexible use at cost-effective, use-proportional expenses, charging the OPEX. Gartner clearly connects low code platforms with PaaS (Platform as a Service) services. Most of the platforms can be used on-premise and from the cloud.

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4. Low Code vs traditional IT software development

Do low code techniques really allow anybody to become a software developer?

It is not that easy. The low-code platform cannot turn business players into qualified developers or integration professionals. Certain tasks still remain in the development team. The low-code platform only unburdens developers of repetitive, generalizable programming tasks and can transfer part of these tasks to the business side, which can satisfy some of the development needs in a self-service manner. In this way, the most important decisions concerning business application development fall into the hands of those who are directly responsible for the execution of business tasks and their results.

The organization needs to identify those areas, where using the low-code platform can save time and money. Also, projects that would still need the knowledge of more qualified development teams should be selected as well. And of course, the IT department continues to play a central role in the key areas of policy management, installation, and operation within the company.

As a matter of fact, the low-code platform also helps the IT department, for example, to respond to new requests much faster than before. It helps to preserve the integrity of IT infrastructure by bringing together business application development to one single platform. This makes it easier to integrate and operate new applications. Transparency reduces the risk of shadow IT deployment and makes security risk management much easier.

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Can low code platforms be used for any kind of development?

In the future, developers with profound expertise will focus on making the most out of the technological advances. Applications serving basic business needs that manage business data from corporate systems or record information from users can be set up almost in every case using a low-code platform.

There are low-code platforms for IT developers and for the business side as well. Therefore, the organization must primarily decide, for what purpose they want to use it: whether the IT needs it, for example, to speed up prototyping, or the business side needs it for swift customized business application development.

The next step is to mark those areas within the company where the low-code platform can increase efficiency. There are three areas that are worth exploring thoroughly.

Innovation: this is the field of experimentation, so its cost can be well optimized with low-code development.

Improving customer experience: facilitating clients and business partners to get into interaction easier with the company and to initiate transactions. Examples include a self-service client portal or a claim submission page for an insurance company. As customer requirements change rapidly, low-code development is a cost-effective solution for keeping track of the changes.

Improving operational efficiency: developing process-supporting applications that reduce the costs, accelerate or automate the processes, etc. For example, when an application succeeds in replacing a paper-based activity. Workflows can be designed, analyzed and optimized in a simple and easy way with no-coding process modeling. Developments enhancing operational efficiency are mostly integrated with the core systems.

There is also another area where low-code platforms can also be used: to modernize the so-called legacy systems. In such cases, typically better user experience and richer functionality business applications are created with a new layer in the existing micro-service architecture.

When choosing a low code platform, the area to which it offers effective features should be taken into consideration. Some low-code platforms outperform in covering the business application development needs of companies as a general tool. Instead, a business application sample catalog is created - for example, for mobile application development, CRM, document management, HR processes, procurement management, management information systems, etc. - to speed up improvements in these areas.

In addition, there might be differences between the platforms, to what extent and with what resource-need it can be complemented.
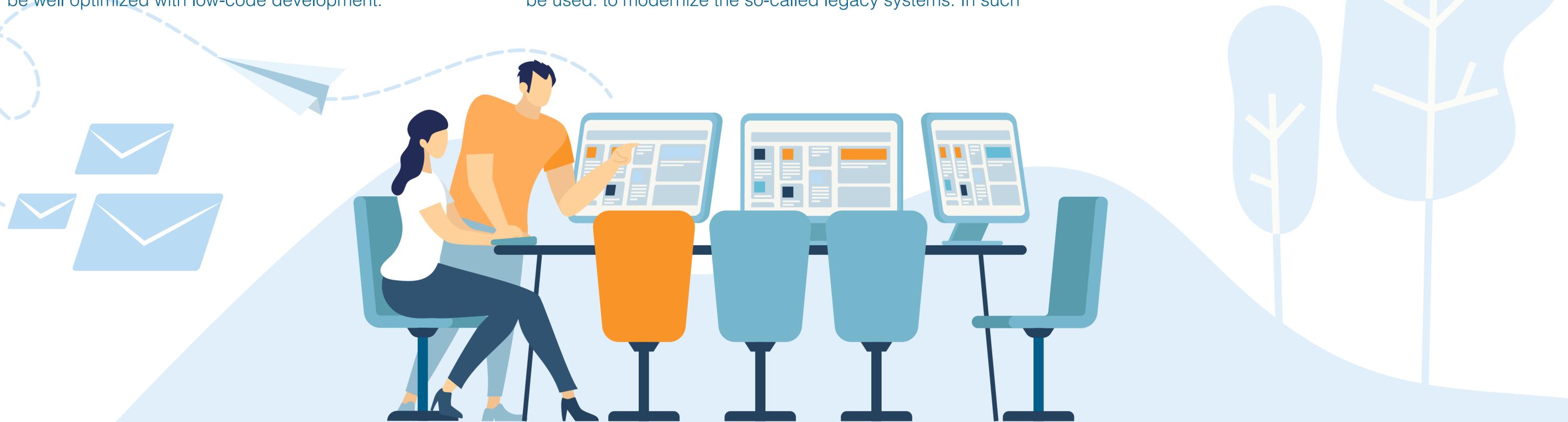
How much faster low-coding technology delivers results than conventional software development?

According to Carl Lehmann from Boston, a leading analyst of 451 Research in the area, the time requirement can be **reduced by up to 50-90 percent** by applying low code technique compared to applying a conventional development method using general-purpose language.

(Lehmann, 2018)

Another accelerating factor is the reduced time spent on fixing bugs. As the process generates only a minimal code, the amount of program errors is dramatically lowered and the software quality is much better.

In the upcoming years, according to Lehmann, more and more people are turning to low-code technology and nearly half of the applications will be developed this way. The low code does not only speed up the creation of the application itself but also the intelligent process automation, for example, by integrating machine learning and artificial intelligence capabilities into development.

How low-code platforms support agile development?

No matter how great the mission of agile development is, it is challenging to implement into a complex software project. The most critical hindering factors are technology complexity, which prevents business professionals from understanding interdependencies; and the size of the developer team itself, which makes short development circles inefficient (and therefore expensive).

However, low-code shows a serious potential to become the natural habitat of the agile methodology. Arriving from different directions, but low-code and agile share most of their values. Almost all points of the Agile Manifesto (2001, https://agilemanifesto.org/) can be applied to the low-code development model, as low-coding technologies can best serve agile development.

The most important condition for customer satisfaction is the fast and continuous delivery of the operating software. The basic principle is that requirements can change constantly and they need to be responded to. The agile methodology calculates with short development cycles and builds on the close and continuous cooperation between the business users and the IT developers.

"Build the project on success-oriented individuals! Provide them the necessary environment and support and trust them to do the job!"
    - states the Agile Manifesto and low-code platforms implement it.

Agile requirements are technical excellence (fewer errors) and a good plan (business approach), as well as "simplicity, meaning the art of maximizing undone workloads", which have been completely fulfilled by low-code component recycling.

5. Market landscape

How should I decide? What services can I expect from a low-code platform?

As previously mentioned, first and foremost you have to ask the most fundamental question: "What tasks do I want to use the low-code platform for?" Everything else comes only after this. Even existing internal expertise is worth considering on several occasions, as it can change at any time, and it is much easier to find a professional for a new area than to alter the well-tried business processes.

Another important aspect is the choice of functions, as these greatly influence whether the goals can be achieved simply or with long-term improvements. First of all, the quality and manageability of the tools that provide the essence of a low-code platform should be thoroughly looked at. It is definitely worth asking for a demo or a full-function version with a time limit.

The underlying essence of low-code is visual process design, therefore, the basic question is always what quality is the visual IDE (Integrated Development Environment) that is offered by the platform. Every platform has to provide the basic tools for visual process planning, visual editing, and tools for declarative development. If mobility is a central feature in the company's IT strategy, we have to be sure that the platform provides instant and automatic mobility of the apps.

If these functions are satisfactory, the following comes next: manageability, platform flexibility, customization, existing internal expertise and the descriptive language used by the platform.

Most of the platforms offer

✖ Free trial version

✖ Free training courses and/or introduction support

✖ Visual design tool

✖ Form builders

✖ Process and/or Workflow Modeling tools supported by the industry regulation BPMN 2.0 standard

✖ Simple tools to customize the app user interface

✖ Database integration support

It is rather frequent, but not general, that the platform enables to integrate third-party applications. In addition, it is worth finding out the amount of coding allowed or required for efficient use, because there is a great difference in it among the platforms.

In the first round of the selection, these functions are needed to be decided on. If the circle is narrowed this way, those features can follow which are directly related to the introduction and daily operation and not less important: what kind of implementation aid and support are offered by the low-code platform provider.

	Effector	Mendix	Outsystems	Microsoft PowerApps	Google App Maker	Salesforce App Cloud
	effector.app	mendix.com	outsystems.com	powerapps.microsoft.com	developers.google.com/appmaker/	developer.salesforce.com/platform
Free trial	✓	✓	✓	✓	—	✓
Free training	✓	✓	✓	✓	✓	✓
Partner program	✓	✓	✓	✓	✓	✓
Easy-to-learn	✓	✓	✓	✓	✓	✓
Workflow modeling	✓	✓	✓	✓	✓	✓
Cloud version	✓	✓	✓	✓	✓	✓
On-premise version	✓	✓	✓	—	—	—
Visual design framework	✓	✓	✓	✓	✓	✓
Integration support	✓	✓	✓	✓	✓	✓
Best for	Back office digitalization	SAP extensions	Front office / customer experience	Automate MS Office workflows	Automate G Suite workflows	CRM automation

Do not choose the coat to match the buttons! When choosing a low-code platform, the most fundamental question has to be asked:
"What tasks do I want to use the low-code platform for?" Everything else comes only after this.

ORIANA

About Oriana

Oriana is a European software company established in 2002 with an R&D center in Budapest, Hungary. The company is a pioneer of the low-code, an emerging software development paradigm which enables companies to boost their digital transformation through cutting the resource needs of software projects back radically. Its product, the Effector platform, is a fully customizable engine powered by a rich function-library which allows building bespoke applications in extremely short time.

For more information about our low-coding development platform, visit our website:

Learn more

effector

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- One platform for delivering capabilities
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- Standardised user management
- Complement the capabilities in your legacy systems
- Standard UI model allows fast user onboarding and training
- Scalable, flexible & secure enterprise grade solution
- Fast developer onboarding: ~1,5 months (SQL, XML)
- No vendor lock