









Contents

1 > Introduction	03.
2 > What is it?	05.
3 > How does it work?	06
4 > Advantages	07.
5 > Use cases	10.
6 > Implementation methodology	13.
7> Application catalogue	16.
8 > Conclusions	21.
9 > References	22

Fondo Europeo de Desarrollo Regional







1. Introduction

Web site design, dynamic online forms, automatic emailing for customer loyalty, tracking statistics, staff time management and a myriad of automated procedures and service provision.

Low-Code (and No-Code) digital tools offer many opportunities and can be used by freelancers and SMEs without the need for a specific IT department. Thanks to these solutions, a better internal management of the SME and a greater attraction of customers is achieved.

According to forecasts established by the analysis firm Gartner, it will be determined that, by 2024, **75% of large companies will use some Low-Code and No-Code tool** [REF-01].

Given this forecast, SMEs and the self-employed cannot be left behind: they have to join the bandwagon of the democratization of applications, to increase the efficiency of their processes and provide better services to their customers. The digitization of a company can greatly increase its productivity, and is a pending task for Spanish SMEs, as pointed out in the European reports on the digitization of the economy and society (Digital Economy and Society Index) [REF-02].

Fondo Europeo de Desarrollo Regional





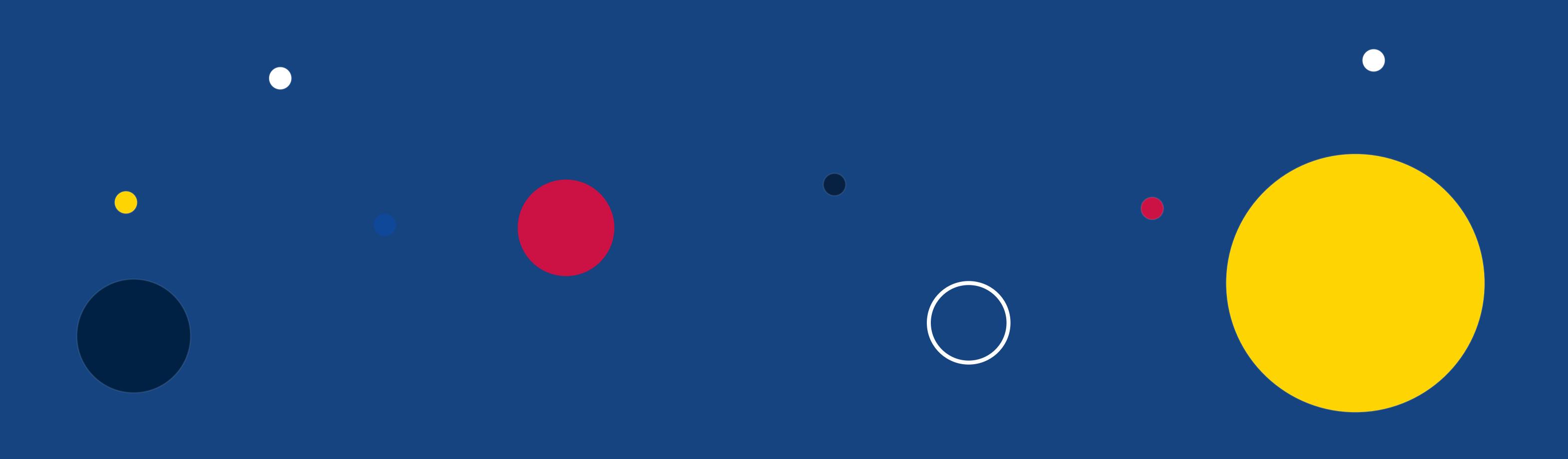




Low-Code (and No-Code) allows to develop applications in a much simpler and faster way, both the part viewed by potential customers and the applications created to manage the team or the company internally, thus improving productivity and quality of service.

Thanks to its greater ease of use, it is conceived as a "digital philosophy" consisting in "democratizing" software development, because it is not necessary to write code or programming languages: it can be created by anyone. This considerably facilitates the digitization of SMEs and freelancers..

Due to their multiple possibilities, combined with their ease of use, Low-Code and No-Code are the future of applications. According to Gartner's 2022 Annual Trends Report, Low-Code application development will account for 65% of all application development activity by 2024 [REF-03].



Fondo Europeo de Desarrollo Regional









2.What is it?

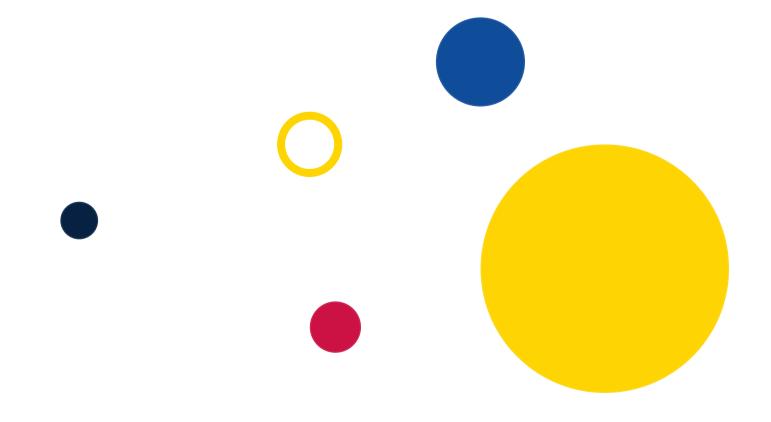
Context

The origin of the term **Low-Code** is relatively recent, it was **coined in 2014** by Forrester technology analysts Clay Richardson and John Rymer in a report on applications that required almost no manual code development. Since then, this technology has continued to evolve to enable greater autonomy in its use, even reaching No-Code.

If Low-Code can be translated as "low-code", No-Code would be "no-code", and it is common to speak of both together.

They are platforms that allow the development of applications and technological tools in a graphical interface without the need to program by creating a code from scratch. Instead of having to create lines of code, the code base is already written and allows a flexible and interactive way to visualize what is being developed in a simpler and more efficient way. Essentially it allows the acceleration of developments through rapid prototyping. They are created in a very intuitive way [REF-04].

The difference between Low Code and No Code is that, with the latter, no programmers or prior knowledge is required. It is common to see the two terms together, or as synonyms, and ultimately they share a base, with No-Code being a simpler type of Low-Code. No-Code does not require technical knowledge, but its possibilities are at the same time more limited, while Low-Code allows more complex solutions [REF-05]...



Fondo Europeo de Desarrollo Regional







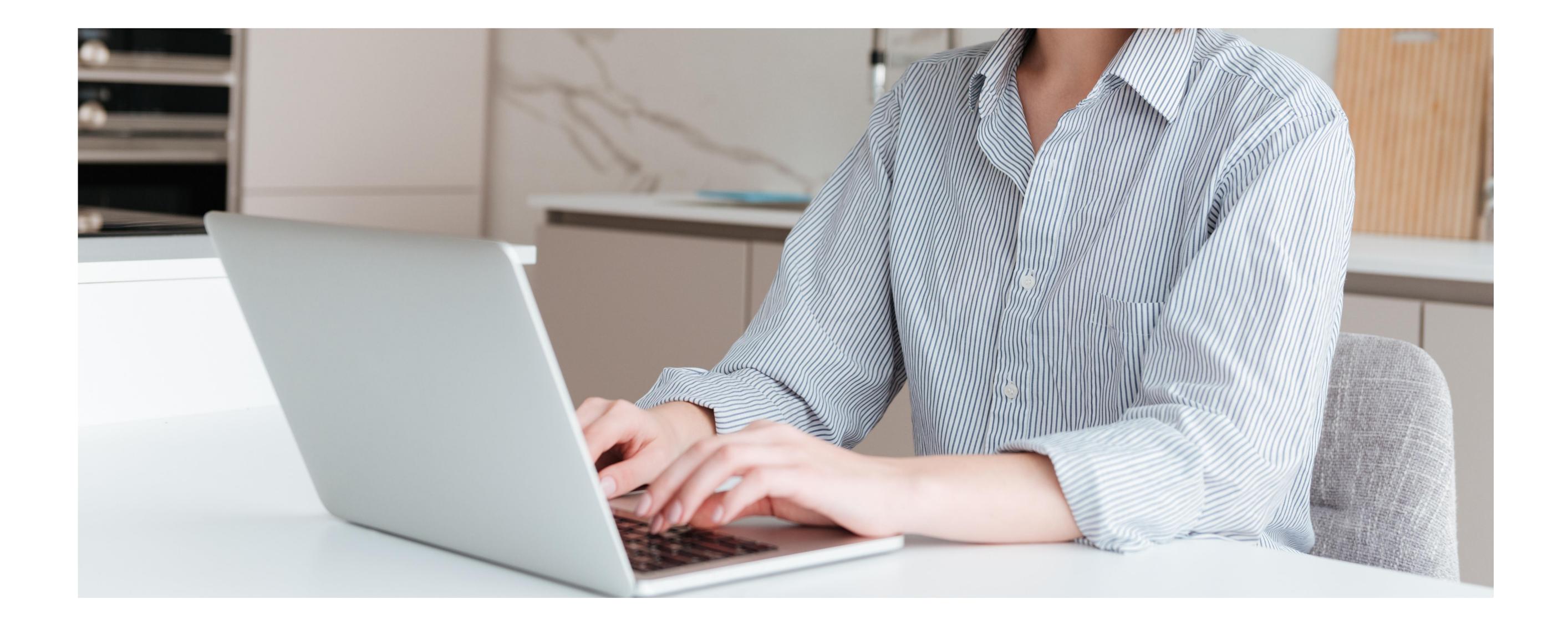


3. How does it work?

It works through a platform that allows you to move the elements (grab and drag) such as content boxes in the form of text, buttons, images, forms, etc.. They are intuitive to facilitate their use by inexperienced people. Some low code applications offer predesigned templates to facilitate a good design and therefore the "user experience".

As an SME, with the limitations that exist, making the leap to digitization can be a journey of uncertainty, as is entrepreneurship; however, this type of solution allows you to approach without fear, or with a parachute, the advantages that technology and the world of applications have for companies and entrepreneurs.

Gartner predicts that by 2026, "developers" outside formal IT departments will account for at least 80% of users of Low-Code tools, up from 60% in 2021 [REF-06]. This provides an idea of the speed at which the use of Low-Code is expanding among non-tech professionals.



Fondo Europeo de Desarrollo Regional



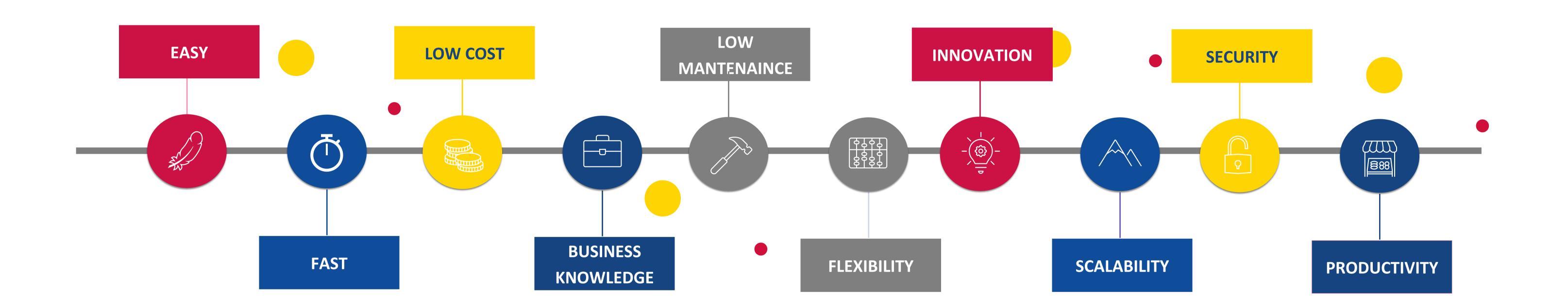






4.Advantages

The advantages of Low Code and No Code are detailed below, especially those that are most relevant for SMEs and freelancers [REF-07][REF-08].:



Simple to use

The main advantage is that it does not require developers to have extensive knowledge in code and can be used even by people who are not familiar or specialized with the subject. This is especially true for No-Code technology tools.



It allows a more immediate visualization of both the creation of the application itself, as well as its changes. It is therefore faster than traditional applications that require much more time to create. In 2021, 29% of respondents to a global survey indicated that Low-Code development is 40% to 60% faster than traditional development [REF-09].

Cost reduction

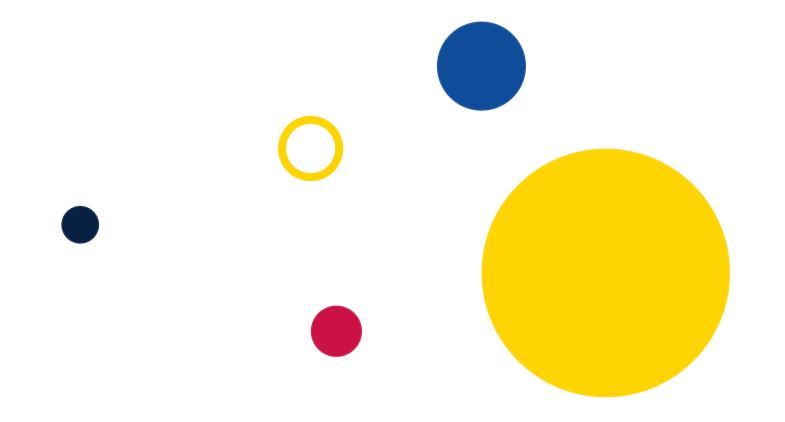
This is due both to its rapid implementation and to the fact that it does not require so many specialized personnel, with the great saving in the cost of programmers - which many small and medium-sized companies cannot afford. This last point is especially true for No-Code software.

Fondo Europeo de Desarrollo Regional









Solutions with internal business knowledge

It is the workers themselves who create these applications, implement automations or visualization pages for the company's customers, knowing better the business or service, that is, the real needs and the most critical problems to be solved. Communication problems between real needs and solutions proposed by the technology teams are broken. Moreover, even when technical teams are involved, technological solutions are easy to understand and, therefore, easy to involve for those who know the business well.

Low maintenance Since these are "standardized" applications, incidents or failures in the system are reduced (it should be taken into account that technical incidents are common in the development of applications; however, with these programs the use is more controlled and this risk is reduced).

Adaptability and flexibility

Readjustments can be made easily and quickly according to business needs, with flexibility when making modifications, reducing possible errors in the code.

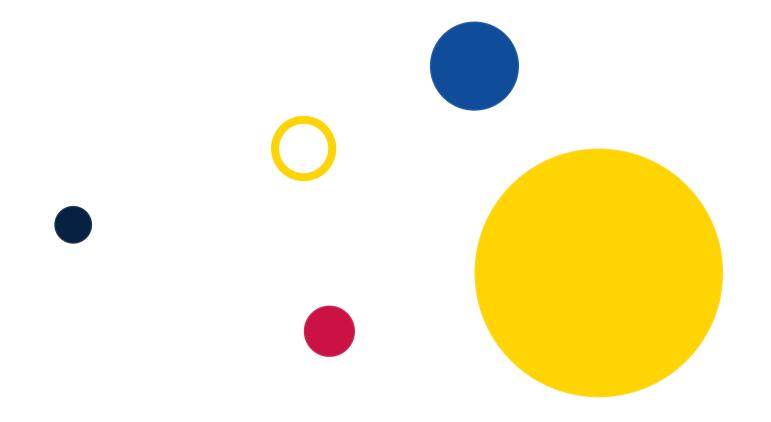
Fondo Europeo de Desarrollo Regional











Innovation Empowerment

Since it is easier to implement changes with these applications, it allows for more experimentation without risk because of the ease of making and reversing those same changes if necessary.

Scalability

If the company has programmers, they benefit from the use of Low-Code, by facilitating their work and increasing the possibilities of use of the application by a person with more knowledge in technology. These are applications that can be "expanded", that without knowledge offer many opportunities, but with knowledge even more.

Security

Low-Code's own tools provide a security standard at all layers and levels.

Increased productivity

Thanks to the speed of implementation, the low cost and the fact of being able to improve the internal management of the service (which optimizes processes and improves daily operations).

Fondo Europeo de Desarrollo Regional









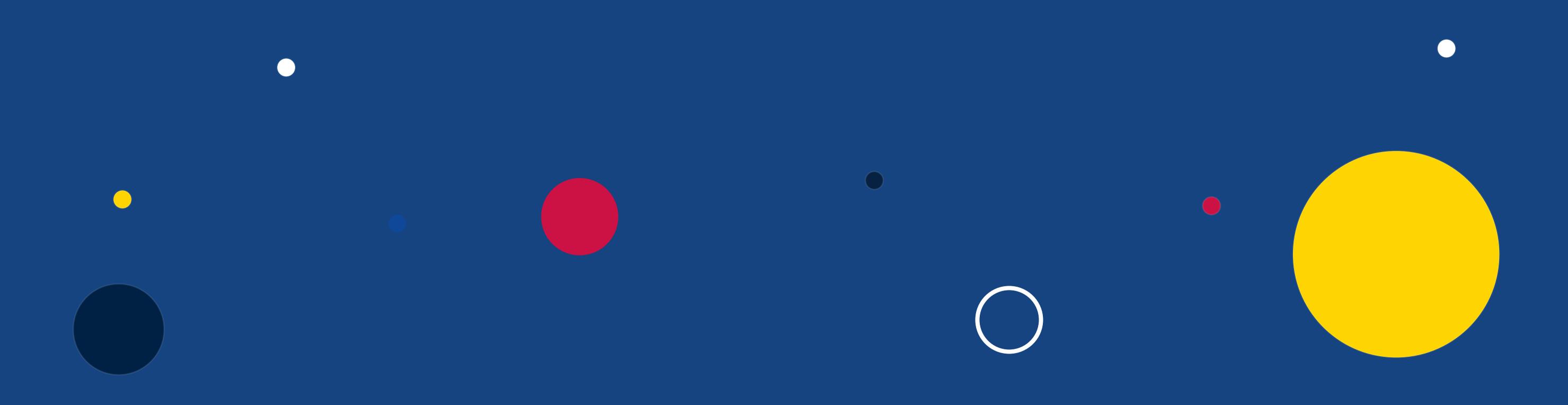
5. Use cases

It should be noted that various use cases are described in order to understand the practical applicability of these technologies, although it will be necessary to see in each specific Low-Code or No-Code tool whether it can develop all these functionalities or only some of them.

No-Code solutions allow for simpler business cases, following the CRUD (Create, Read, Update and Delete) model, and without connections to third party systems - other than those of the tool itself - while Low-Code applications allow for more complex and customised use cases.

In general

- Orchestrate processes: these tools allow processes to be developed autonomously, when they are repetitive and may not require human intervention. [REF-10].
- Examples: managing periodic payments and collections, managing payroll, automatically sending an email to a customer after a purchase, processing an order... Automation also allows workers to spend more time on aspects that add value to the company.



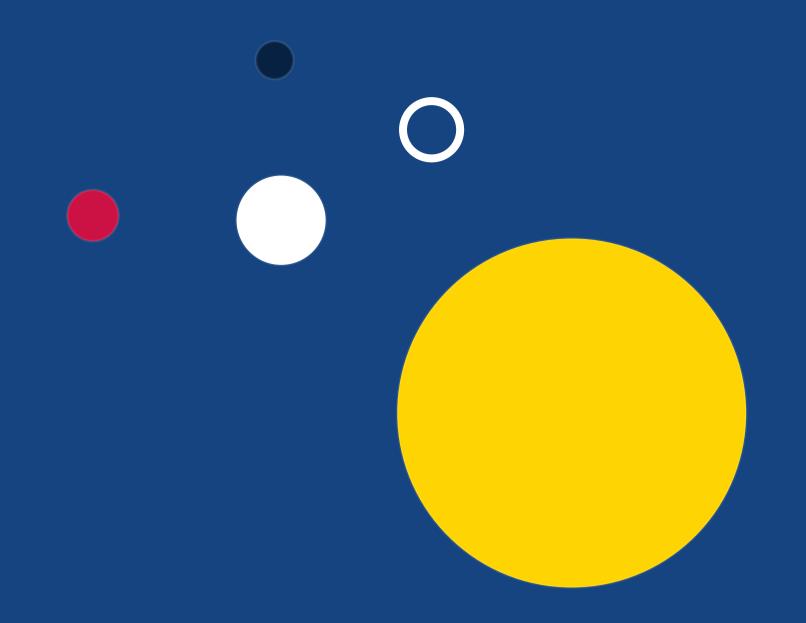
Fondo Europeo de Desarrollo Regional











Customer-focused use cases:

- . Website design, thanks to predefined templates and help to make the so-called "user experience" good, i.e. websites that are understandable, easy to use, and attractive to potential customers.
- 2. Creation of a company mobile application, This is advantageous because there is a growing audience that prefers to use applications directly, allowing connection with them.
- 3. Creating dynamic online forms, which serve for example for the collection of data for an order, for the resolution of problems or complaints about orders, etc.
- 4. Personalised notifications and automatic email blasts for customer loyalty (e.g. after purchase, birthday, after receipt of shipment...).
- 5. Design of user services, through the web channel.

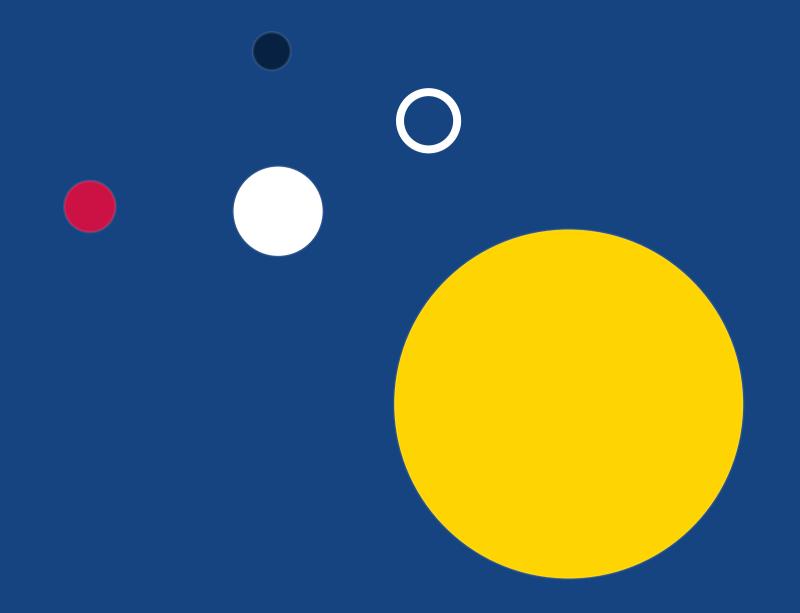
Fondo Europeo de Desarrollo Regional











Use cases focused on internal management:

- 1. Accounting and invoice management, if specialised applications are not available.
- 2. Collection and payment processes necessary within the company, e.g. for payments to external suppliers.
- 3. Inventory creation with information relevant to the business, easily accessible, from which to find data of interest and facilitate data-driven decision making.
- 4. Automating payroll management of the workers, saving on administrative procedures.
- **5. Timetable management** This facilitates everything from shifts that may be available and need to be planned, to compliance with regulations regarding clocking in, etc.
- 6. Attracting talent thanks to a website and candidate filtering process.
- 7. Monitoring statistics; dashboards can be created more easily, allowing greater control over the evolution of the business and the fulfilment of set objectives.
- 8. Automated report generation, from monitoring the company's objectives to reports of payments made.

Fondo Europeo de Desarrollo Regional









6. Implementation methodology

In order to implement the use of these technologies, a series of steps must be taken beforehand to facilitate the choice of the best tool and the use cases that are most relevant for the company. The following main phases and activities will be carried out:

- •Review of business needs, both for internal management (e.g. accounting, human resources, time and attendance, supplies, planning, etc.) and customer needs (making the company's application more attractive to the public, achieving more effective and potential customers, standing out from competitors, improving customer loyalty...).
- 2. Study the possibilities of automation: identify which of these needs can be automated thanks to a Low Code application (accounting, tracking statistics, payments, etc.), i.e. activities that are repetitive and can be done without the need for a person, following simple rules.
- 5.Study the possibilities of improvements to attract customers: identify which part of the needs can be improved thanks to an application (with more attractive websites for potential customers, forms to facilitate purchases and data on profiles of interest to our business, automatic mailings to build customer loyalty...).

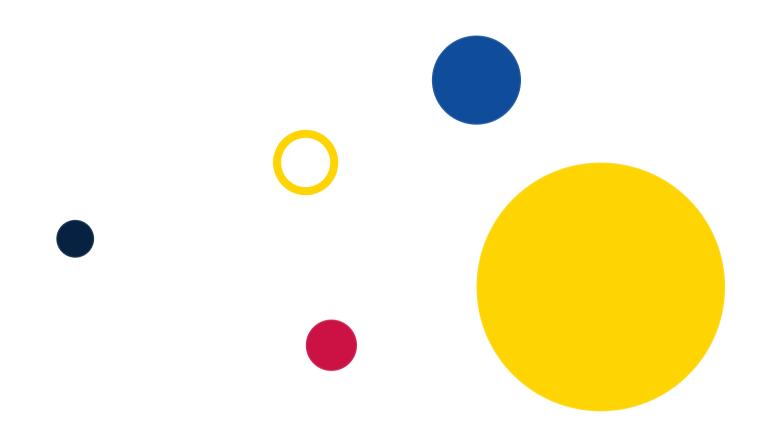
Fondo Europeo de Desarrollo Regional











- Team building: choosing the people or person in charge of implementing the tool, and considering whether it is an IT specialist, a developer or a person with no previous knowledge, in order to choose the Low Code/No Code tool that is most appropriate. In other words, if you are a specialised person, you may want to purchase a more complex tool.
- 5. Review of the Low Code tools available on the market, using our guide.
- •Feasibility study: to analyse which tool is most suitable, depending on the company's needs and investment possibilities, carrying out a profitability study.



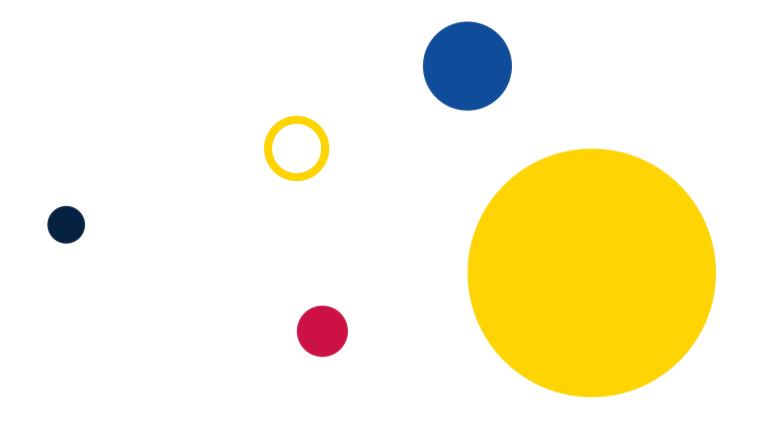
Fondo Europeo de Desarrollo Regional





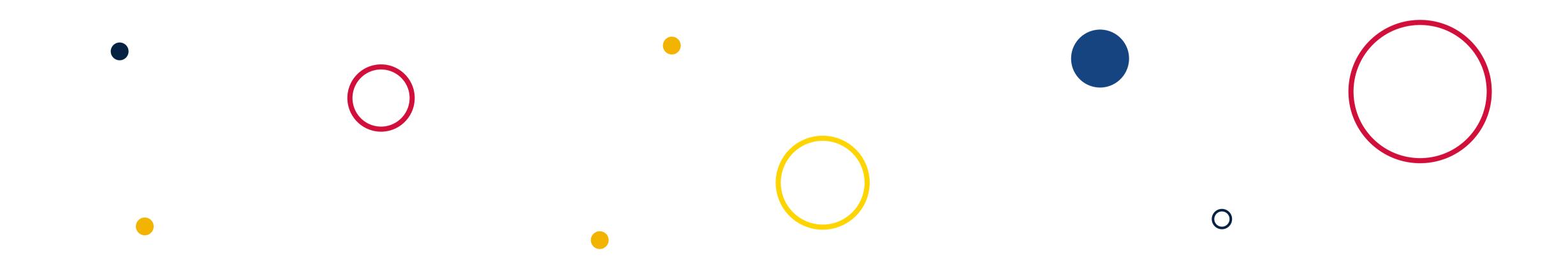






Define an implementation plan for the tool:

- Prioritise aspects to be implemented, according to order of need and initial ease.
- Identify specific measures.
- Carry out an initial planning of the changes to be made and the time required.
- Take change management into account (i.e. informing the rest of the workers, in the case of SMEs, about the changes to be implemented, involving them in this digital transformation).



Fondo Europeo de Desarrollo Regional









7. Application catalogue [REF-11], [REF-12], [REF-13]

No Code Applications:

(Those that do not require support from programmers or experts).

CARRD: allows you to create a website in a few minutes and in a simple way, so it is ideal for SMEs or entrepreneurs who still need to create a website and have an online presence, but do not have much time or digital skills. It has a free trial version, with 12 templates to choose from and allows you to create 3 websites, with a "Pro" option that allows you to expand the basic features.

WEBFLOW: is another tool for creating websites, in a more professional way, with an online visual editor. It is not based on templates, but allows you to create websites from scratch, which makes them more customisable. It allows you to use it for free to visualise the result before paying for it. It is a more complex tool, but allows a higher level of creativity.

SHOPIFY: it is used to create an ecommerce and point of sale (online shop) in an intuitive way. It has more than 100 templates, both free and paid. It has a higher price, but allows a 14-day free trial period.

BRAVO: is a startup that allows you to create apps for iOS and Android quickly, without code, in just a few days. There are plans ranging from free to more expensive depending on the potential.

Fondo Europeo de Desarrollo Regional







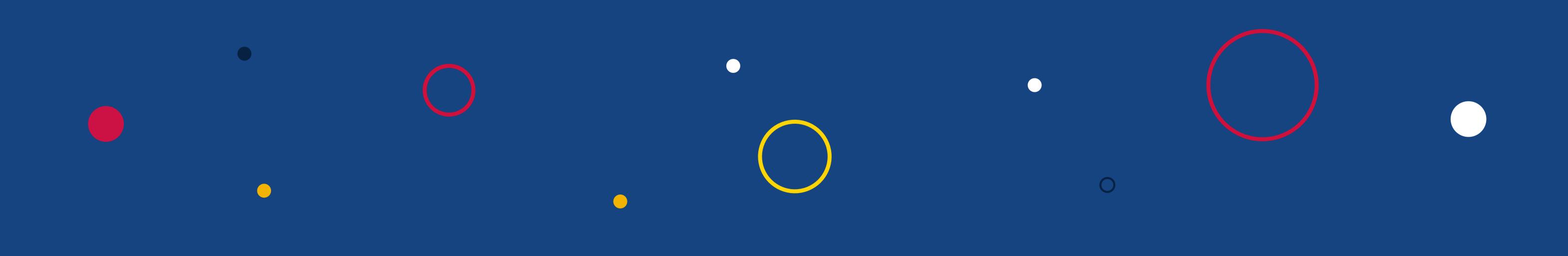


AppMaster: allows you to create a website and a mobile application at the same time, in an easy and intuitive, fast and economical way; although it allows scalability in the functions. It works by dragging and dropping the "components" to be included.

Andromo: free of charge allows you to design the application and pay only at the end, if you are happy with the creation. It has a catalogue of options that includes videos, audios, forms, maps and integration with social networks. In addition, it also allows a version that is no longer Low-Code to be able to program and create more complex functionalities..

Appy Pie: creates applications in a simple way, through modules. Each module consists of a function that can be added, and then customised. It provides tracking data to see how the application is evolving.

Other No-Code platforms are: Andromo, Glide or Fliplet.



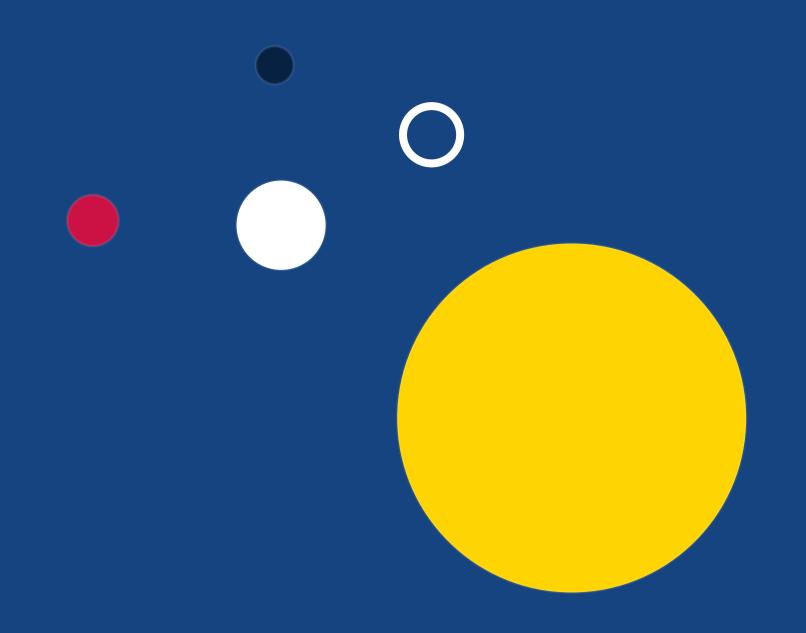
Fondo Europeo de Desarrollo Regional











Low code applications:

1. Cost-effective applications with good value for money:

Zoho Creator: is a very popular, intuitive and easy to use software programme, particularly suitable for small and medium-sized services, with flexibility of action and scalability from simpler to more complex functions, and at the same time more economical than others. It is also free of charge for 15 days.

Web.com development platform: is characterised by the design of websites and email-related functionalities, serving to automate aspects such as marketing and social media management.

Microsoft Power Apps: runs via browser and does not require installation by the user, which is a benefit of the SaaS model. The main advantage is the integration it offers with Microsoft services. Using this platform you can have Microsoft Power Apps, Power Automate, Power BI, Power Virtual Agents and it is included in Office 365 and Dynamics 365. It is competitively priced.

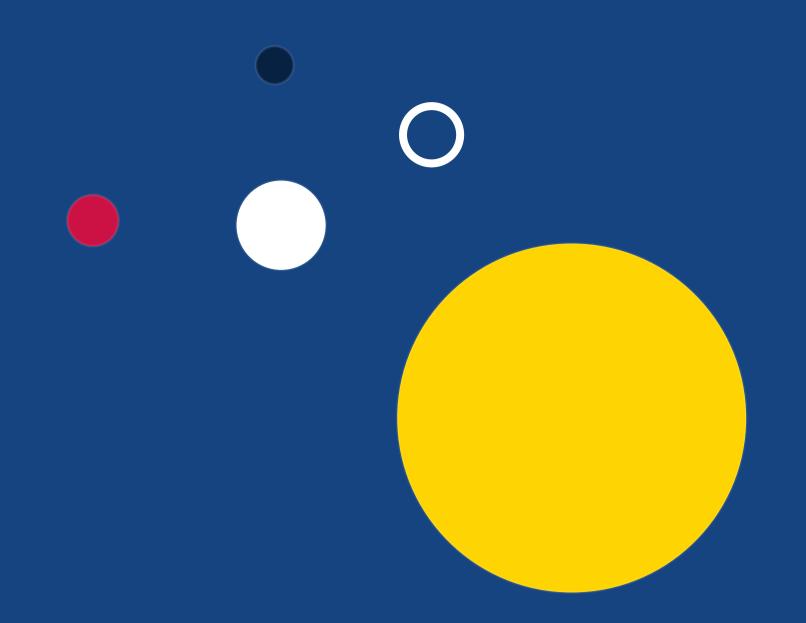
Fondo Europeo de Desarrollo Regional











Low code applications:

2. More complex and comprehensive applications

OutSystems: is a high-performance low-code application development platform. It facilitates visual coding for developers, offers AI automation, as well as integration with multiple technologies and tools, thus reducing the time of the development process. OutSystems enables scalability in application development, facilitating changes and enhancements to the same code without disrupting it and increasing developer productivity.

Appian: is characterised by its ease of learning and use, as well as its multifunctionality and management capabilities: it allows the creation of productivity and collaboration tools, visual process models, interfaces or decision rules based on the Decision Model and Notation standard. In addition, it supports multiple digital touch points and can be integrated with or without code and is scalable. It has a free level with the possibility of integrating different variables.

Fondo Europeo de Desarrollo Regional





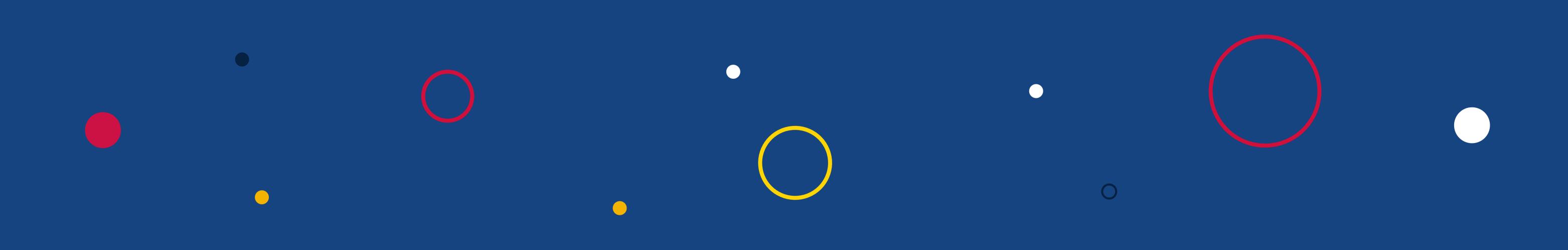




Mendix: is a tool that can be accessed via the web and resembles a traditional development environment. It has an auto-save function and allows visualisation of work in test or production environments. Paid versions allow more test environments and facilitate simultaneous collaboration of developers on the same code. Although it is more expensive than others, it has more technical functionalities for developers looking for more control.

Visual LANSA development platform: allows both traditional and Low-Code coding, and is used to design and implement mobile applications and commercial websites in a very complete and easy way.

Oracle: offers among its services Low-Code software, and makes particular sense for companies that already have their database in Oracle, thus allowing the storage of projects in the cloud. It is characterised by the creation of a data-driven model. It is more complex and more suited to technical teams that want more software engineering tools. Unlike other platforms, Oracle Visual Builder does not charge for plans, but instead charges for the CPU usage per hour of the product under development.



Fondo Europeo de Desarrollo Regional









8. Conclusions

There are many possibilities of use and a multitude of options in the Low Code and No Code tool catalogue. All are easy to use, cost-effective and secure. These technologies are the future of applications. The Low Code ones allow more potential in their development, although the advantage of the No Code ones is that they do not require programmers or specialised personnel at all, so they can be very useful for SMEs and freelancers.

The choice of the type of technology to implement, and specifically the tool within the extensive catalogue that exists, will depend on the budget and investment capabilities of the company and its specific business needs. In some cases, the creation of a website with an online purchase option may be sufficient, in others, it may be necessary or desirable to invest in more complex functionalities, such as accounting or management activities. The choice will also be influenced by the availability of technical staff and developers.

The choice of the right tool is one more aspect of the company's digitalisation process, as it is a fundamental investment in the business, which brings great benefits and allows it to reach a wider target audience [REF-14]. In addition, it enables cost savings in internal management.

Today, more than ever, it is within the reach of an SME to count on these applications and websites to grow and expand, and these are opportunities that should not be wasted. In addition, most tools offer free initial versions, which allows you to try them out without having to make a commitment.

In short, Low Code and No Code have democratised the digitisation of business, which is both a triumph and a great opportunity for SMEs and freelancers.

Fondo Europeo de Desarrollo Regional









9. References

[REF-01] – Informe previsiones 2021, Gartner

[REF-02] – Índice de la Economía y la Sociedad Digitales (DESI) 2022 de España https://digital-strategy.ec.europa.eu/en/policies/desi-spain

[REF-03] – Informe anual de tendencias 2022, Gartner

[REF-04] ¿Qué es una plataforma Low Code? Características y ventajas, Incentro, https://www.incentro.com/es-ES/blog/que-es-desarrollo-low-code

[REF-05] –Qué son las plataformas Low-Code y No-Code y por qué son un aliado para las empresas, PFS GROUP, , https://www.pfsgroup.es/que-son-las-plataformas-low-code-y-no-code-y-por-que-son-un-aliado-para-las-empresas/#:~:text=Las%20principales%20diferencias%20entre%20estas,puede n%20integrar%20a%20sistemas%20terceros

[REF-06] – Gartner Forecasts Worldwide Low-Code Development Technologies Market to Grow 20% in 2023, Gartner https://www.gartner.com/en/newsroom/press-releases/2022-12-13-gartner-forecasts-worldwide-low-code-development-technologies-market-to-grow-20-percent-in-2023

[REF-07] – Infographic: 7 Ways to Drive Digitalisation With Low-Code Development, Salesforce https://www.salesforce.com/ap/blog/2022/10/why-low-code-is-the-future-of-software-development.html

[REF-08] – ¿Qué es el low-code?, Creatio, https://www.creatio.com/es/low-code,

[REF-09] – How much faster is low-code development comparing to traditional development?,

Statista,

https://www.statista.com/statistics/1254662/low-code-development-speed-compared-traditional-

it/#:~:text=In%202021%2C%2029%20percent%20of,users%20to%20develop%20applications%20themselves

[REF-10] – IDC technology spotlight, IDC, 2020

Fondo Europeo de Desarrollo Regional







[REF-11] – What is an Enterprise Low-Code Application Platforms (LCAP)?, Gartner, <u>enterprise-low-code-application-platform</u>

[REF-12] - Best 20 Low-Code No-Code Platforms for Small Business in 2022, Saginfotech, https://blog.saginfotech.com/low-code-no-code-platforms-small-business https://digital-strategy.ec.europa.eu/en/policies/desi-spain

[REF-13] – 10 herramientas 'no code' para que digitalices tu negocio sin tener ni idea de programación, en pocos días y con poco dinero, Emprendedores, https://www.emprendedores.es/gestion/herramientas-no-code/

[REF-14] – La digitalización, clave para el crecimiento de las empresas en 2021, Economía Digital, https://www.economiadigital.es/tecnologia/la-digitalizacion-clave-para-el-crecimiento-de-las-empresas-en-2021.html

Fondo Europeo de Desarrollo Regional









Fondo Europeo de Desarrollo Regional





