

Today's Digital Applications

Architecture and Classification

GeneXus[™]

Introduction

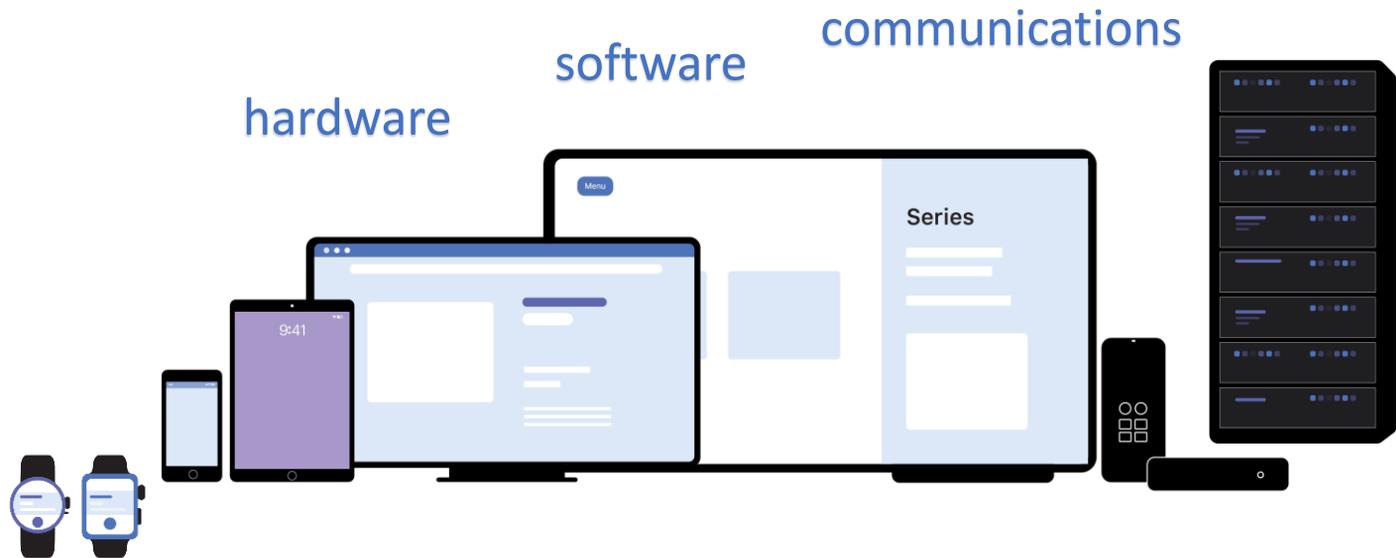


Software has invaded the world today and we have digital applications running on many different platforms, from a wristwatch, a cell phone, or a TV, to cloud server farms or driverless vehicles.

This proliferation of computer systems and the rate at which they have evolved makes it necessary for us to stop for a moment and try to understand the types of current applications and their architecture.

Next we will see how to classify them, understand how they are built and how they can communicate with each other.

Platforms vs. parts of an application

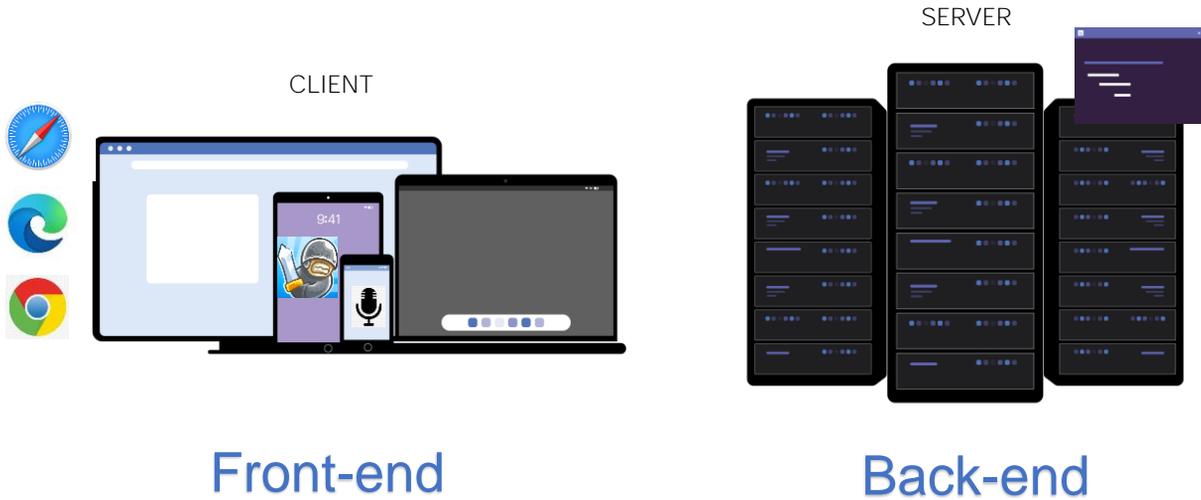


The first thing to consider is that not only there is a great diversity of platforms where applications run, but in most cases one part of the application runs on one platform and the other part on another platform.

This creates a significant number of challenges to overcome, such as knowledge of different operating systems, their hardware and software requirements, and understanding how communication works between parts of the same application or between applications.

To narrow this scope, we will focus on web and mobile applications.

Parts of a digital application

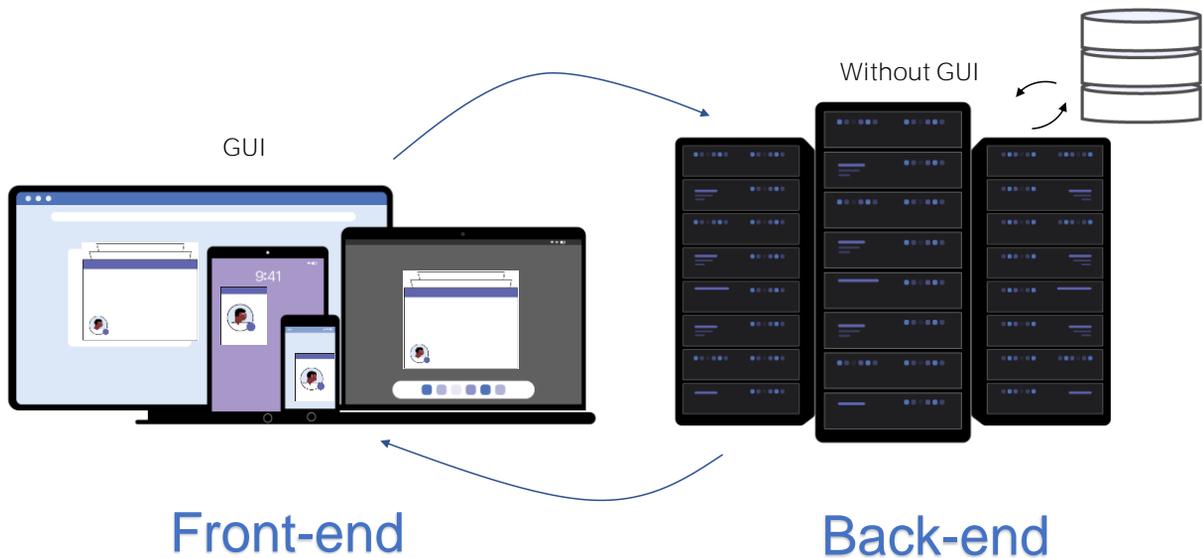


Both web applications and native mobile applications have a part that runs on the platform the user is interacting with, which is called "client" device and another part that runs on a computer dedicated to serve applications, which is usually called "server."

In the case of web systems, the client is the Internet browser, regardless if it is running on a desktop computer, a laptop, a tablet or a smartphone. The server is where the web application is hosted, usually a large computer, capable of handling simultaneous requests from thousands of customers.

For native applications, there is also software that runs on the mobile device locally (client) and other software that runs on a server. The part of a digital application that runs on the client device is called the "front-end" and the part that runs on the server is called the "back-end." Every application is composed of these two parts, which interact.

Parts of a digital application (continued)



The application back-end consists of programs that provide services to the client applications, such as the connection to the database server to return the data requested by the client.

The back-end never has screens with which the user can interact: it receives the orders indirectly, through the application on the client device side. It then runs its services, and returns a response to the client device, precisely to the front-end.

On the other hand, the front-end is the software intended to be used by users, so it has screens where we can interact with the application, for example to query, create, modify, or delete data. All these actions are translated into requests to the back-end, to save the data in the database, or to return the result of a query, an operation on the data, etc.

For example, in the case of web applications, the server performs the requested operations, assembles the web page in HTML format and returns it to the client, where the browser interprets the code and draws the screen for the user.

In the case of applications native to a mobile device, the screen is drawn on the device with the device's own controls and the application on the server is responsible for generating the information to be displayed.

Web front-ends vs. Native front-ends



Front-end applications that run on a web browser, whether on a desktop PC or on a mobile device, have a different design and behavior than front-end applications that run natively.

When running on a web browser, applications are generally responsive (Responsive Web Design); that is, they are designed so that their appearance automatically adjusts to the size of the screen they are being viewed on.

Web front-ends vs. Native front-ends (continued)



So-called native applications, i.e. applications that are programmed in the device's native language, do not use a web browser; instead, their screens are designed using platform-specific components.

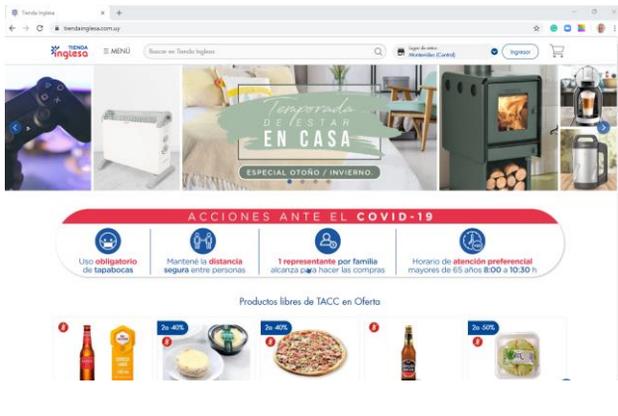
The biggest advantage of native applications over web applications is their speed to run and draw a screen, their access to native hardware resources such as GPS, camera or microphone in the case of mobile devices, as well as access to software resources such as calendar, notebook, or reminders, among others.

Recently, a new type of application has emerged on the market, the so-called Progressive Web Applications (PWA).

These applications are an evolution of web applications as they offer a user experience very similar to that of a native application, with the ability to perform tasks that until now only native applications could do, such as accessing device resources, being able to be installed on the client device or working offline.

As we will see, GeneXus will allow us to develop all three types of applications almost without realizing it. And all this that may seem complex will become unimaginably simple.

Types of front-ends of a digital application



Customer-facing Applications

Front-end

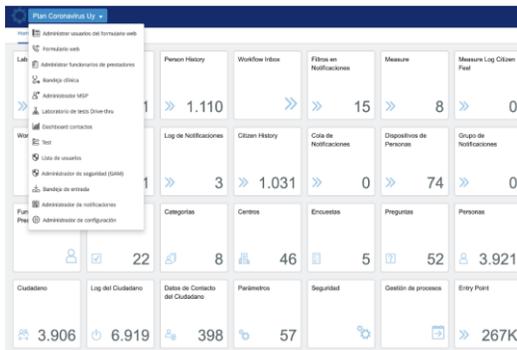
So far, we have focused on the components of a digital application, but let's see how we can classify them according to who they are intended for.

Applications aimed at interacting with inexperienced people, such as end consumers or customers, are called customer-facing applications.

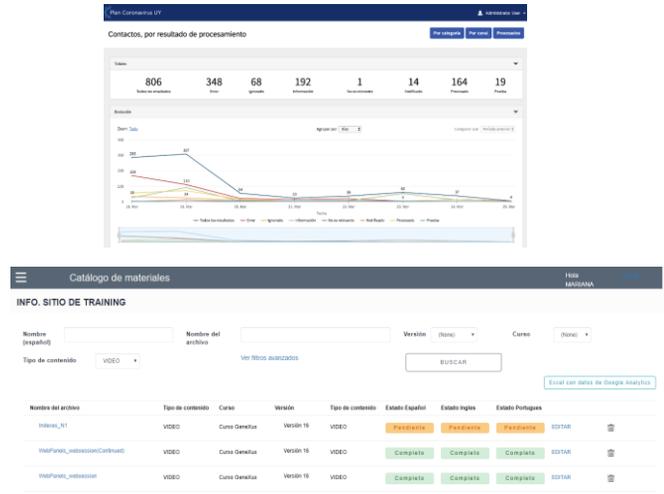
This type of application is characterized by its ease of use, high degree of interaction and careful design, and is aimed at making users like what they see and enjoy the experience of handling it. Information must be displayed clearly and quickly, access to different functions must be intuitive, and the learning curve must be minimal.

Ensuring the best possible performance and user experience can determine the users' loyalty and their intention to use the application again, so no effort is spared in these areas. Both web and mobile applications try to offer the best experiences to their customers, since they are the ones that ensure organizations' revenue or the reason for their existence.

Types of front-ends of a digital application (continued)



Back-office applications



Front-end

There are other applications aimed at the employees of these companies, which allow them to enter and maintain business information, as well as make decisions based on it. These applications are called back-office, because they are for internal use of organizations and are never accessed by customers.

Back-office applications, while they must also provide a good user experience and ease of use, do not focus on these features as loyalty is not an issue here, but rather they must allow for efficient access to information, adequately provide the functionality required by the business, and be reliable in handling the data.

A good back-office application can determine a competitive advantage over other companies in the same industry, while an unreliable or non-compliant application can result in delays, errors or significant financial losses.

Programming languages and tools for each part of the application



There are many tools on the market to develop the front-end and back-end of an application. The most widely used on the market are those that appear on the screen.

For the front-end we have all these... For the back-end we have these other ones, added to these databases.

So as not to overwhelm you, we won't go into details of each one because you won't have to master any of this anyway. GeneXus will implement your digital solution on the platform you request, without you having to worry about knowing anything about it. It will be enough for you to know only one tool/language/platform: GeneXus.

Now, what is GeneXus?

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