



**POLITECNICO**  
MILANO 1863

M.Sc. Computer Science and Engineering  
Hypermedia Applications Project



## Design Document

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## **Abstract**

The goal of this Design Document is to provide a functional and visual description of the website to be implemented, in particular it wants to describe the main structure through some models, schemas and use case scenarios. Moreover, it will also present the structure of the database from both a conceptual and logical viewpoint.

The system to be implemented is a voluntary association website, useful to get to know better the association and retrieve information about its activities.

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# Chapter 1

# Introduction

## 1.1 Purpose

*Lemon Peel* is an Italian no-profit organization that operates in the traditional music field. *Lemon Peel* recognizes that in the last years fewer and fewer people are interested to Italian traditional music that are part of the culture of the country, so it offers free courses to teach how to play the instruments that have been invented in the Italian territory during the last centuries, to avoid the disappearance of this piece of history regarding the Italian traditional music.

## 1.2 Scope

To present its services, *Lemon Peel* needs a website to make itself known and to show to the users what are the services and opportunities that it offers. In addition to the description and the contacts of the association, a website will be used to present an overview of the old known Italian instruments, the courses related to them or to traditional singing, and the teachers of the various instruments and folk songs. Moreover, some events are organized to introduce to the people the sounds, the history and the importance of such kind of music in the various regions, and the website will show the relevant information about them.

## Chapter 2

# Design In-The-Large (Interactive Dialogue Models)

### 2.1 Overview

In this section the design in-the-large of the application is represented. This offers a view of the application in three different levels of details:

- *C-IDM* (Content IDM) represents the types of subjects and how they are grouped and related one to each other;
- *L-IDM* (Logical IDM) represents how the single information are structured and the high level interactions to move across the several topics;
- *P-IDM* (Page IDM) shows how the contents are aggregated in pages and how pages of the same or different topics are linked together.

### 2.2 C-IDM

The first Kind of topic that we encounter in the structure of the model is *Musical Instrument*. This entity represents the instruments that are relevant for *Lemon Peel* association. They are all instruments born in Italy, and each one has two characteristics that represent the region where it was born and the type of the instrument, known as its classification. A *Musical Instrument* is related to the ones who are of the same type or from the same region.

The core of the model is represented by three main multiple topics, related to each other, that are *Course*, *Event* and *Person*. A *Course* represents the activity where the students can learn about regional folk songs or how to play

a specific instrument. Due to their simplicity, some folk *Musical Instruments* might not have a dedicated course, and there are no courses related to more than one instrument. Every *Course* is held by at least a teacher (*Person*) and might be presented in one or more *Events*.

The *Events* are organized by *Lemon Peel* association to let people know about its main goal or to present specific *Courses* to attract more new musicians. There might be *Events* to show what the students have accomplished during the season; in this case no *Course* is related to them. An *Event* is organized by exactly one *Person*, that can be contacted to have specific information about it. *Person* kind of topic include all the teachers who hold at least one *Course*. A *Person* can be expert of several musical fields; in this case she would be related to more than one *Course*.

Two single topics are included in the diagram: they are *Association*, that is the *Lemon Peel* entity, with its history, and *Contacts*, that includes ways to contact the administrative office of the association.

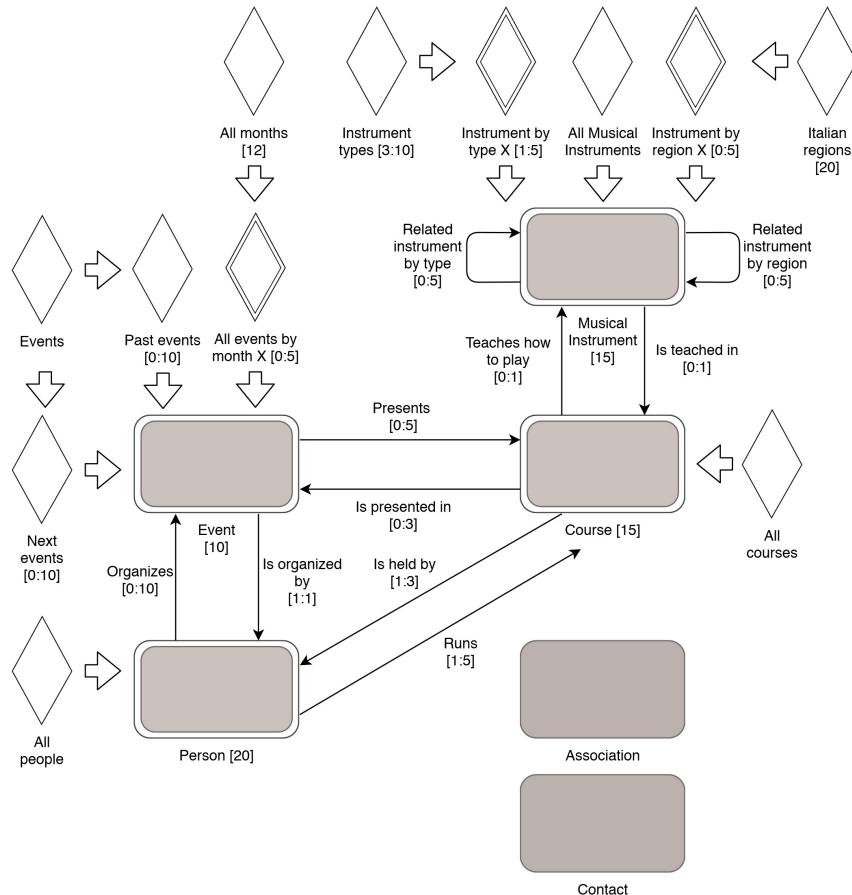


Figure 2.1: C-IDM

## 2.3 L-IDM

*Musical Instrument* contains three dialog acts: the *Description* explains how an instrument works, the *History* is a short explanation about its birth and usage on the years, and the *Image* is a graphic representation of the *Musical Instrument*. *Event* and *Course* are represented by similar dialog acts: the *Description*, the *Practical Info*, that contains information about their schedules (specific date for *Event*, periodic days for *Course*), and the *Image*.

*Person* is composed by her *Biography* and an *Image* that is her profile picture. From an *Event* it can be useful to check its organizer, to ask her for more information, but the other way around is not important, so there is only one introductory act between *Person* and *Event*.

*Association* topic has a *Description* and an *Image*; *Contacts* topic is composed by *Contacts*, that represents the phone numbers and the email to contact the Association, and *Where we are*, with the address of the office and its map.

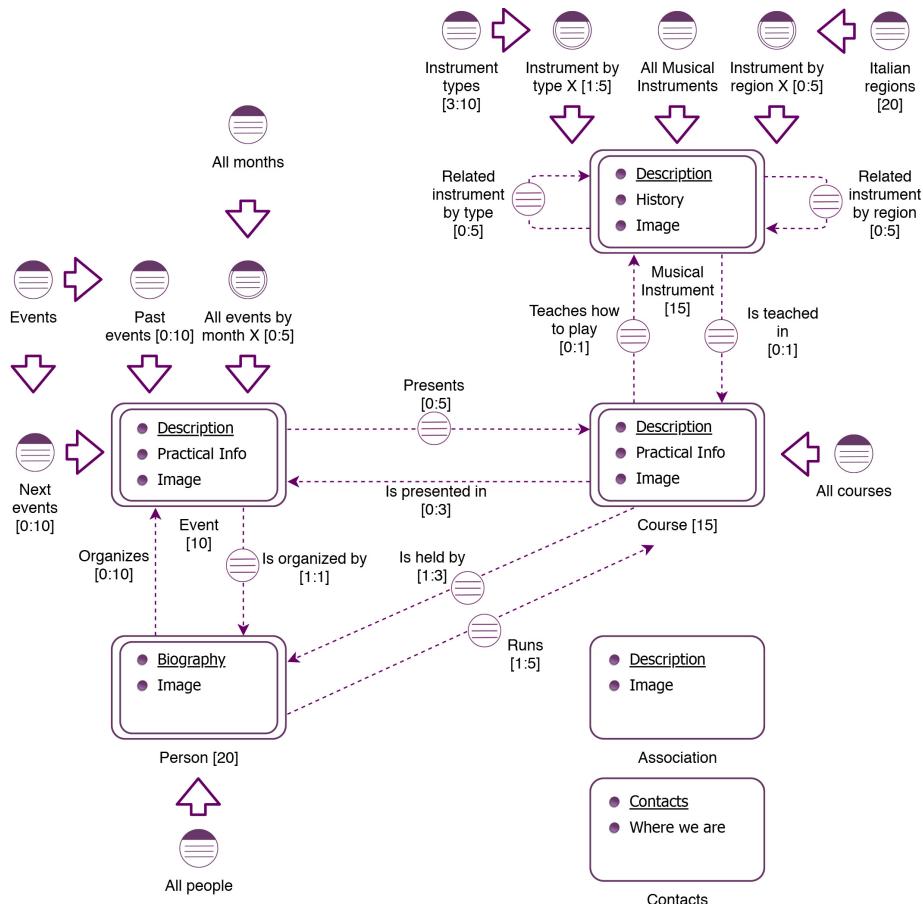


Figure 2.2: L-IDM

## 2.4 P-IDM

The landmarks of the website are composed by the introductory pages of all the kinds of topic, in addition to both the single topics and the *Home Page*. From the *Home Page* it's possible to reach also the very next *Event*.

All the introductory pages use an index pattern to link the single pages of their group. For *Person*, *Event* and *Course* kinds of topic, this is the only way to navigate among their elements. *Musical Instruments*, instead, are linked to the related instruments by an all-to-all pattern: each one has a direct link to all its related *Musical Instruments*.

*Contacts* topic is divided into two different pages (or tabs) linked with an all-to-all pattern (they are simply linked together): the first one contains *Contacts*, the other one *Where we are*.

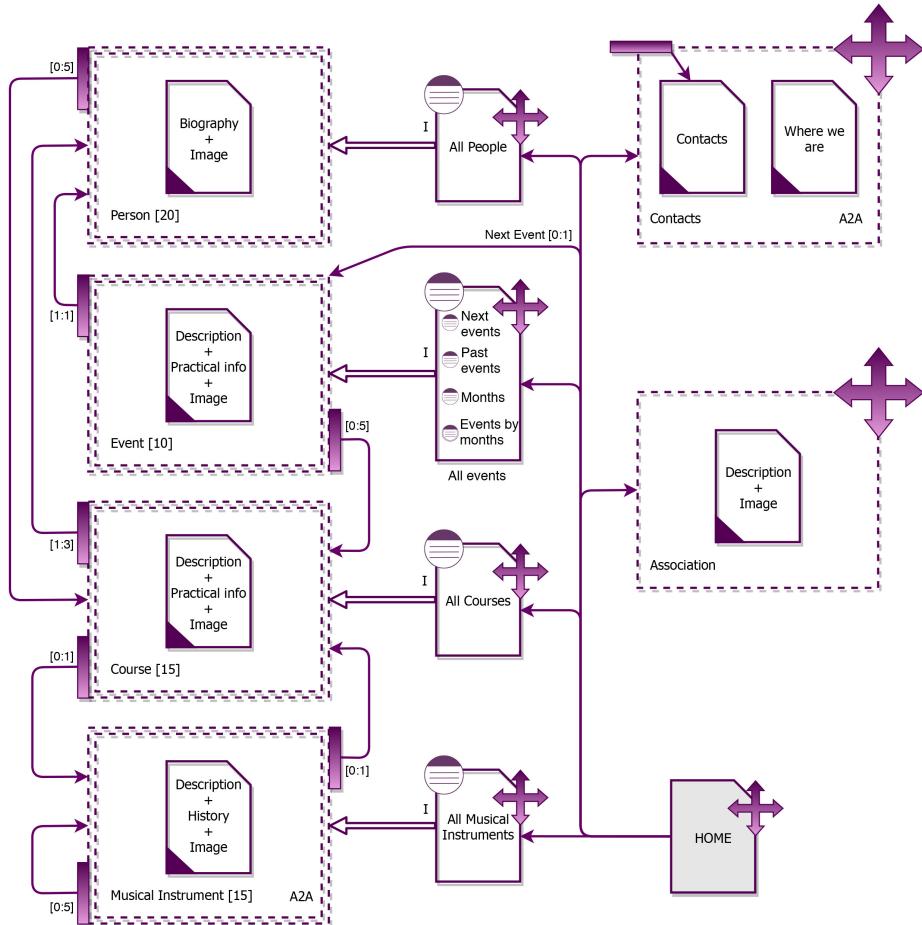


Figure 2.3: P-IDM

## Chapter 3

# Design In-The-Small

### 3.1 Overview

Design in-the-small chapter contains the graphical structure of the main pages of the website. Each page is represented by a low-fidelity wireframe, that shows what the page offers and the basic visual organization of the content, of the navigation and of the interaction elements on the screen, and a high-fidelity prototype, that shows sample elements on the screen and defines all their visual properties. In each page all the links are underlined, labeled with their type, and explained in a short description before the two images.

## 3.2 Home page

At the beginning of the *Home page* an image slider has a *Find more* link to the *Association* page. Below, three row sections are linked to the most used topics of the website: the first one is a link to the very next *Event*, to invite users to participate and let them know what are the news of *Lemon Peel* association; the second section is a link to the introductory page of *Musical Instruments*, where it's possible to deepen all of them; the last section is an invite to join the association, and it links to the *Contacts* page to let the user send a message to the administrative office.

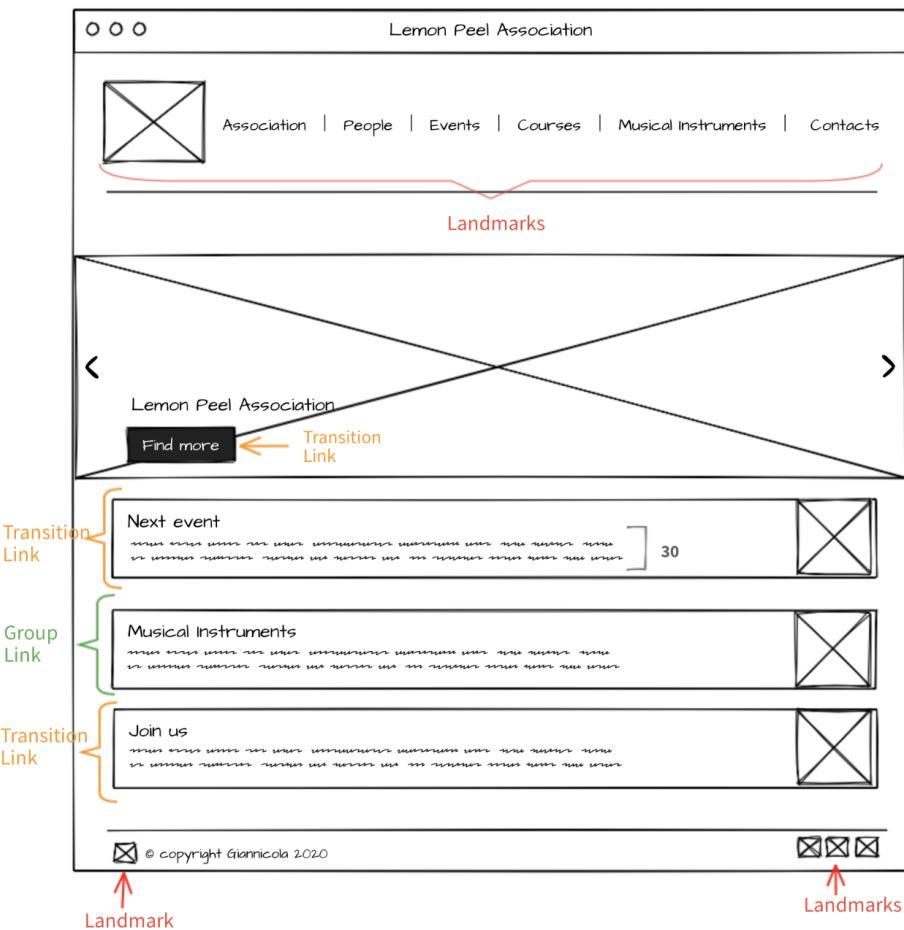


Figure 3.1: Home page wireframe

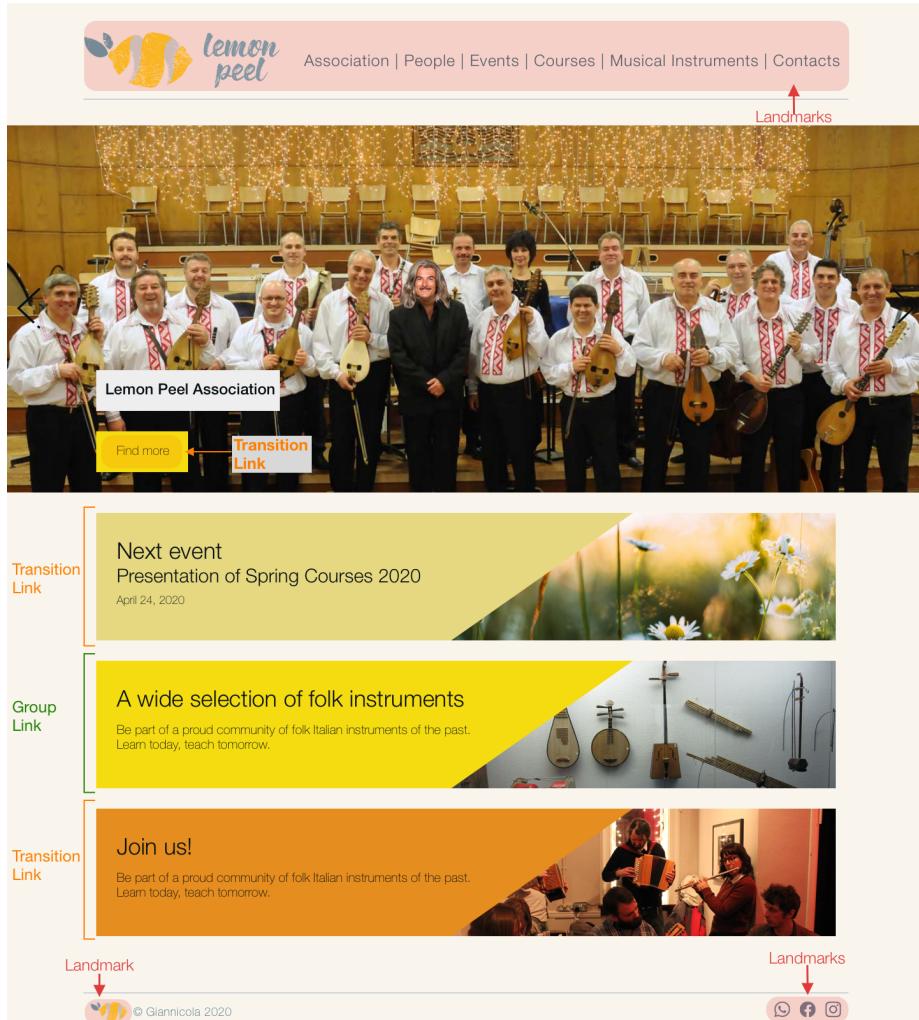


Figure 3.2: Home page screenshot

### 3.3 Topics

#### 3.3.1 Association

*Association* page presents a description and a short history of *Lemon Peel* association and its founders; they include its purpose and what are the shared interests among the teachers and the other people involved in the association.

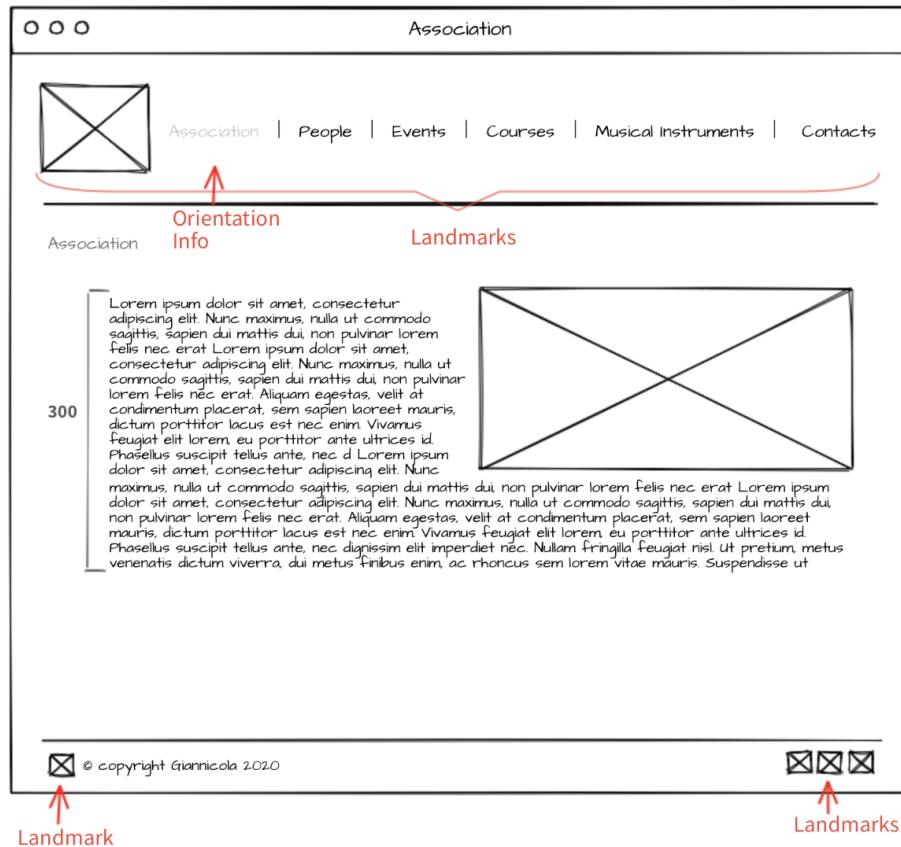


Figure 3.3: Association page wireframe

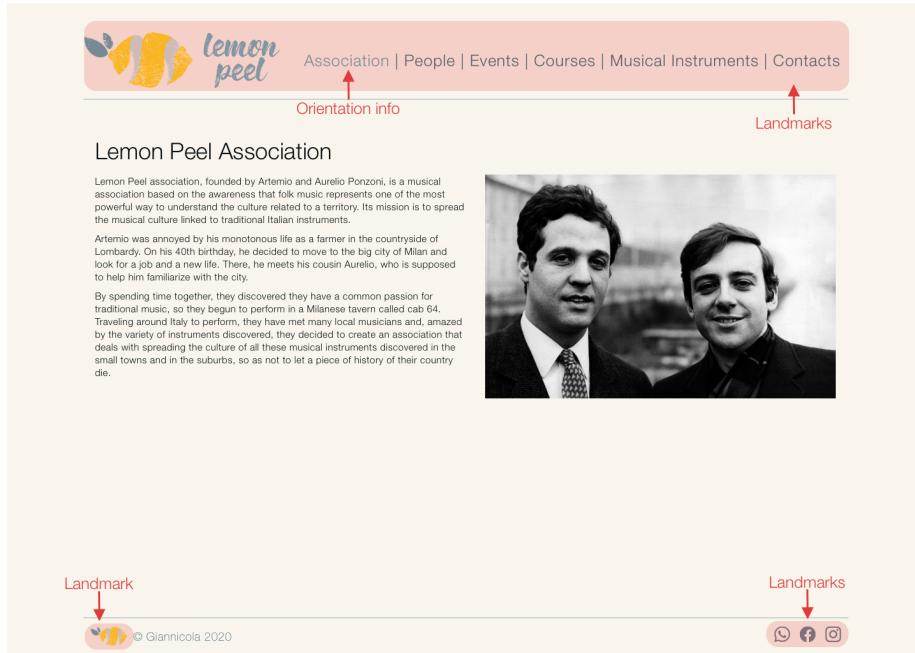


Figure 3.4: Association page screenshot

## 3.4 Kinds of Topic

### 3.4.1 Musical Instrument

*Musical Instrument* page contains the name, the description and the history of the instrument itself. If there exists a *Course* of that instrument, a link to the relative *Course* shows up. There might be very simple instruments that have no *Course* (e.g. Triccheballacche is a percussion instrument that can produce a single sound). *Related instruments* are other *Musical instruments* that are from the same region or of the same instrument type.

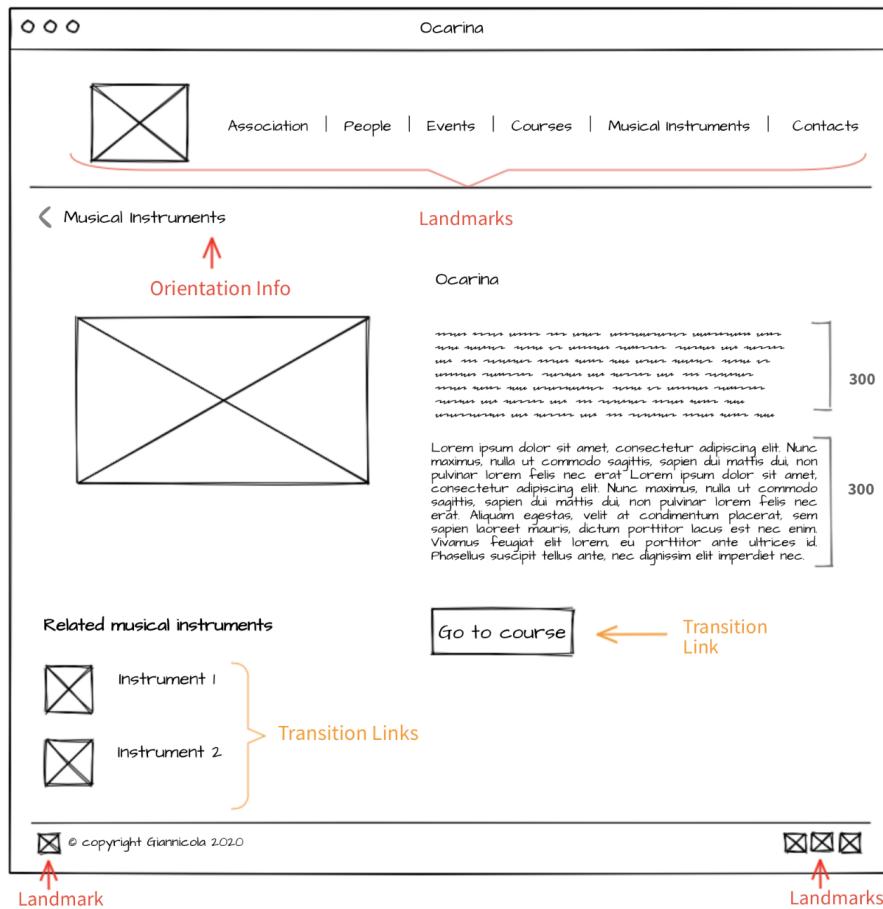


Figure 3.5: Musical Instrument page wireframe

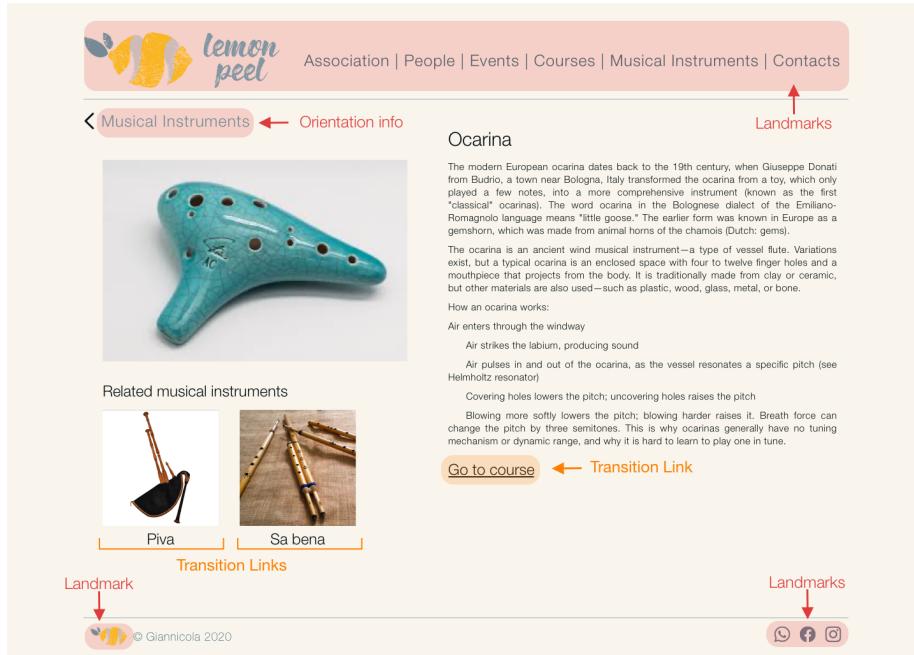


Figure 3.6: Musical Instrument page screenshot

### 3.4.2 Course

Single *Course* page has two main section: the first one represents information about the *Course*, with its description and a detail section containing the days and the time of the lessons; below, there are links to the *Musical Instrument* taught (if it does exists; there might be *Courses* with no related instrument like singing ones) and to the teachers pages.

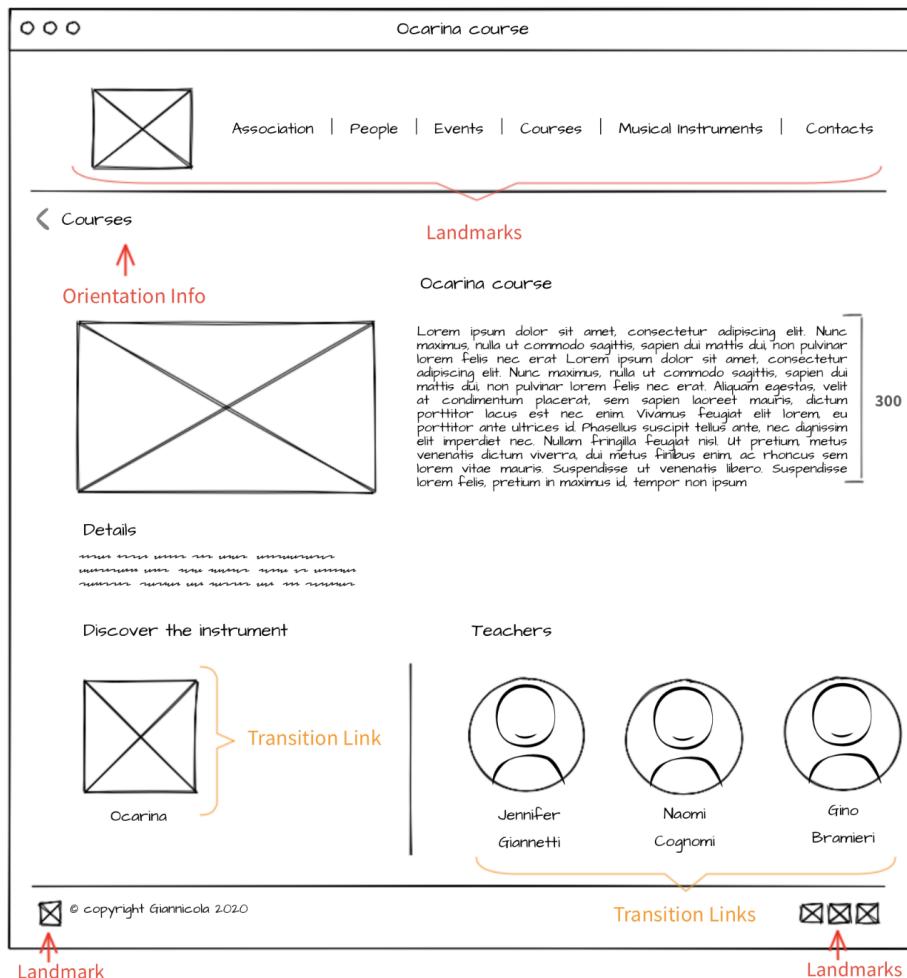


Figure 3.7: Course page wireframe

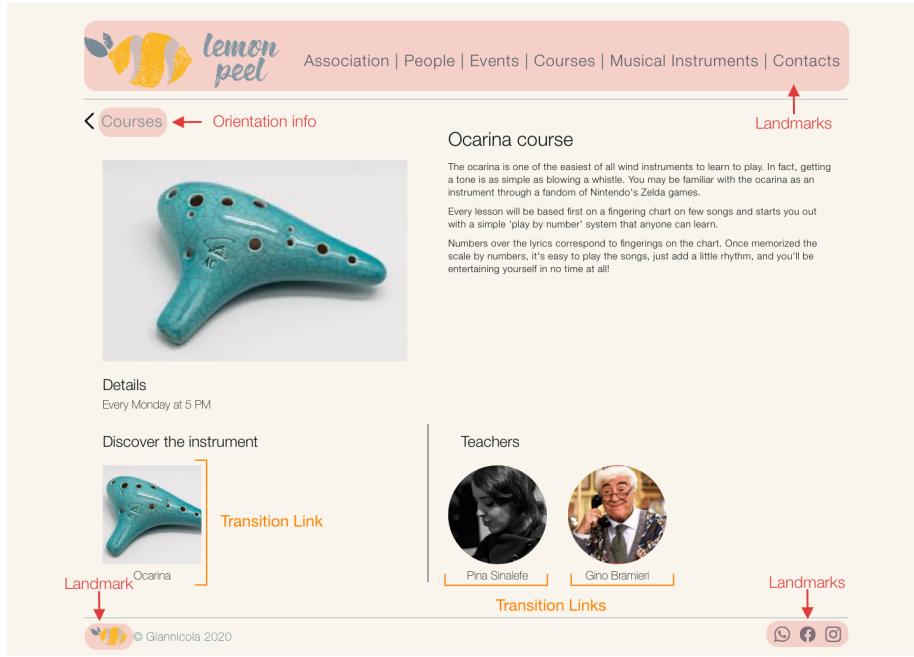


Figure 3.8: Course page screenshot

### 3.4.3 Person

*Person* represents the pages of teachers involved in the association. The page contains the name, a profile image and a biography of the *Person*, and a contact section, with email and phone number. Below, transition links to the *Courses* taught by her are included.

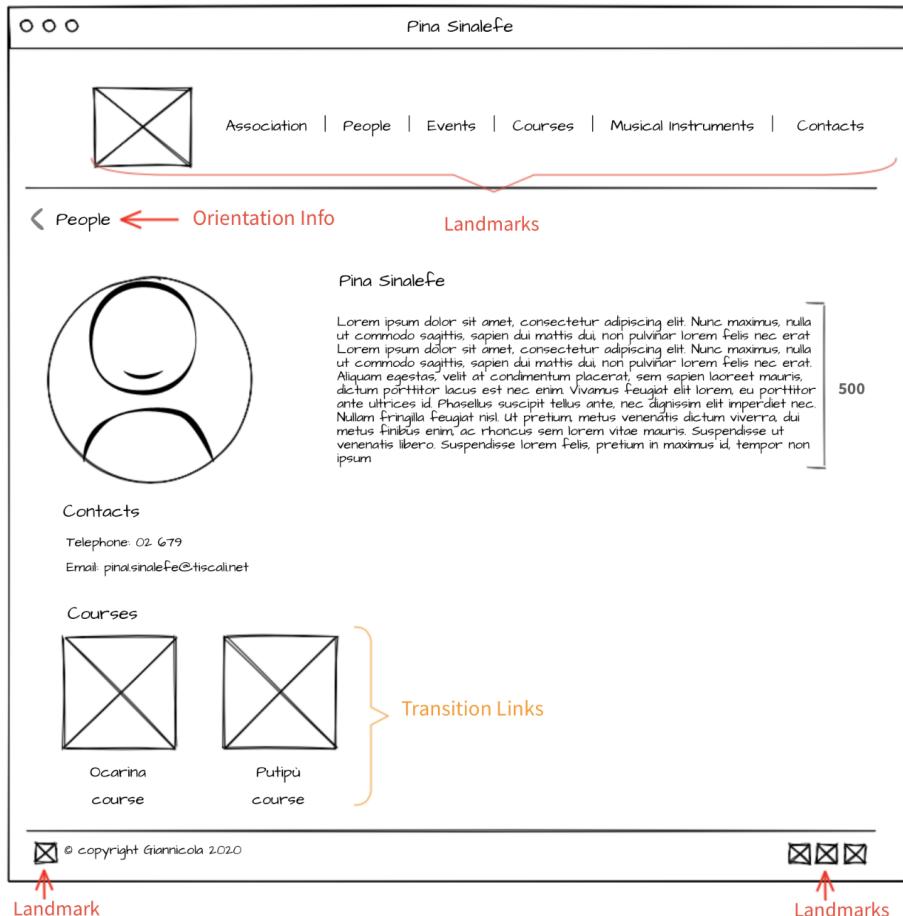


Figure 3.9: Person page wireframe

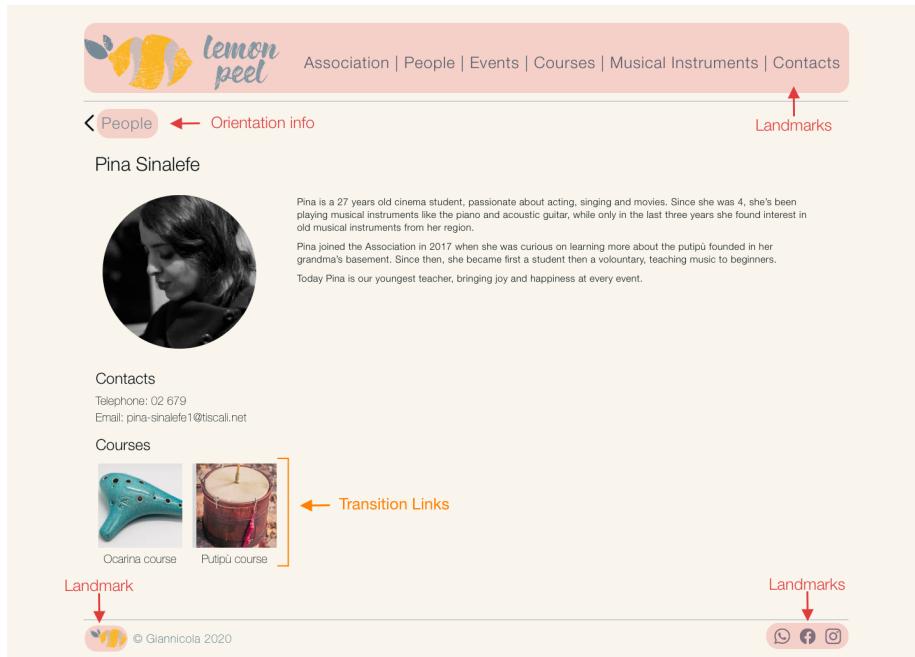


Figure 3.10: Person page screenshot

### 3.4.4 Event

*Event* page is where the user can find all the information about a single *Event*. Its title is shown with an image and a description. A details section contains information about the date and the time of the *Event*. Below there are links to the *Courses* presented during the *Event* (if there are some) and a link to the organizer's personal page, where her contacts and biography are.

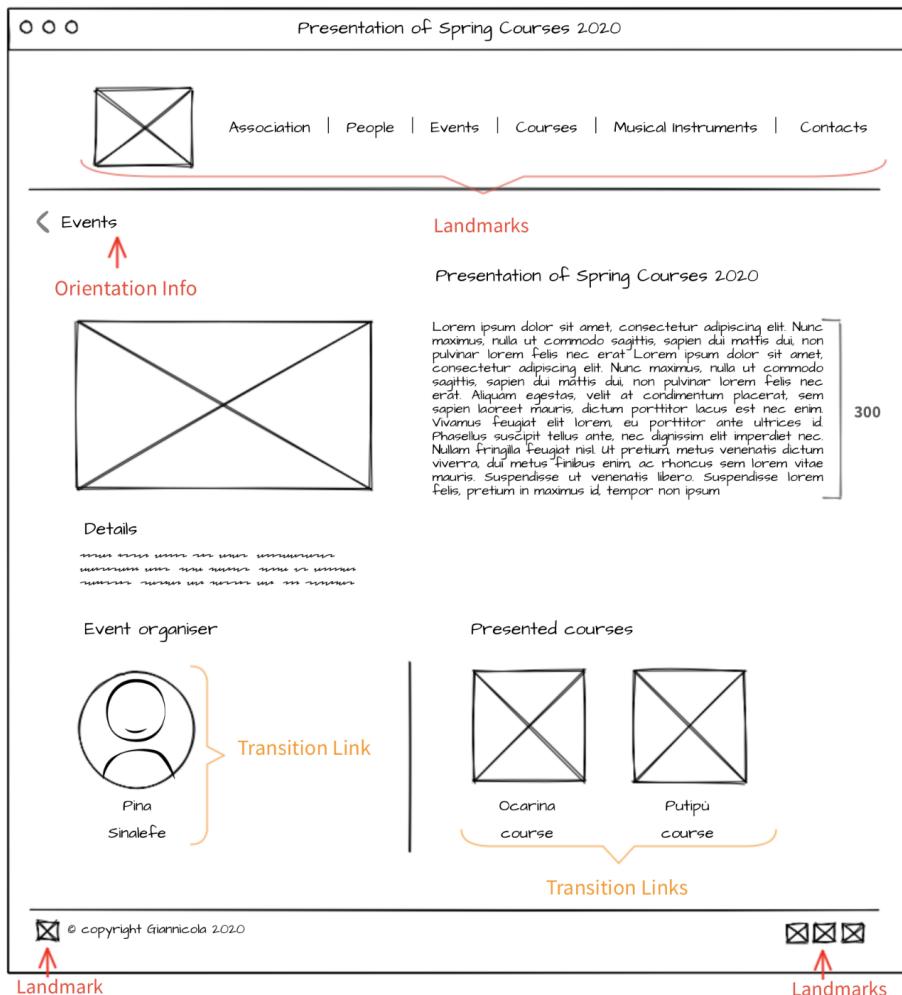


Figure 3.11: Event page wireframe

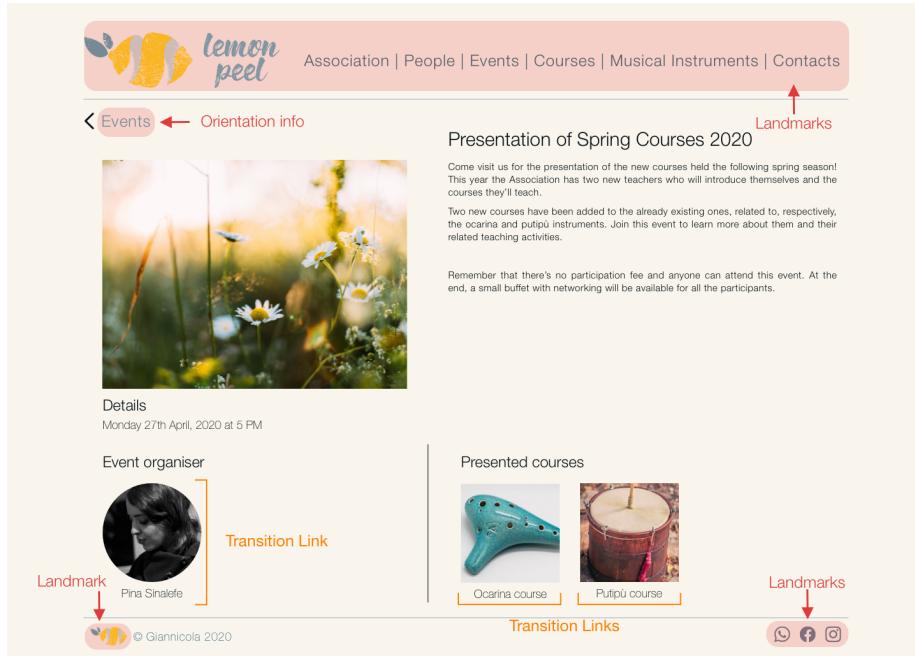


Figure 3.12: Event page screenshot

## 3.5 Introductory Pages

### 3.5.1 Musical Instruments

*Musical Instruments* introductory page contains a list of traditional *Musical Instruments* that are interesting from the association's point of view. Each *Musical Instrument* is represented by its name and a picture, and both are links to the instrument page. Two filters allow to show to the user a subset of these instruments: the first one filters them by type (e.g. Flutes, Aerophones...), the second one selects them by the region they come from.

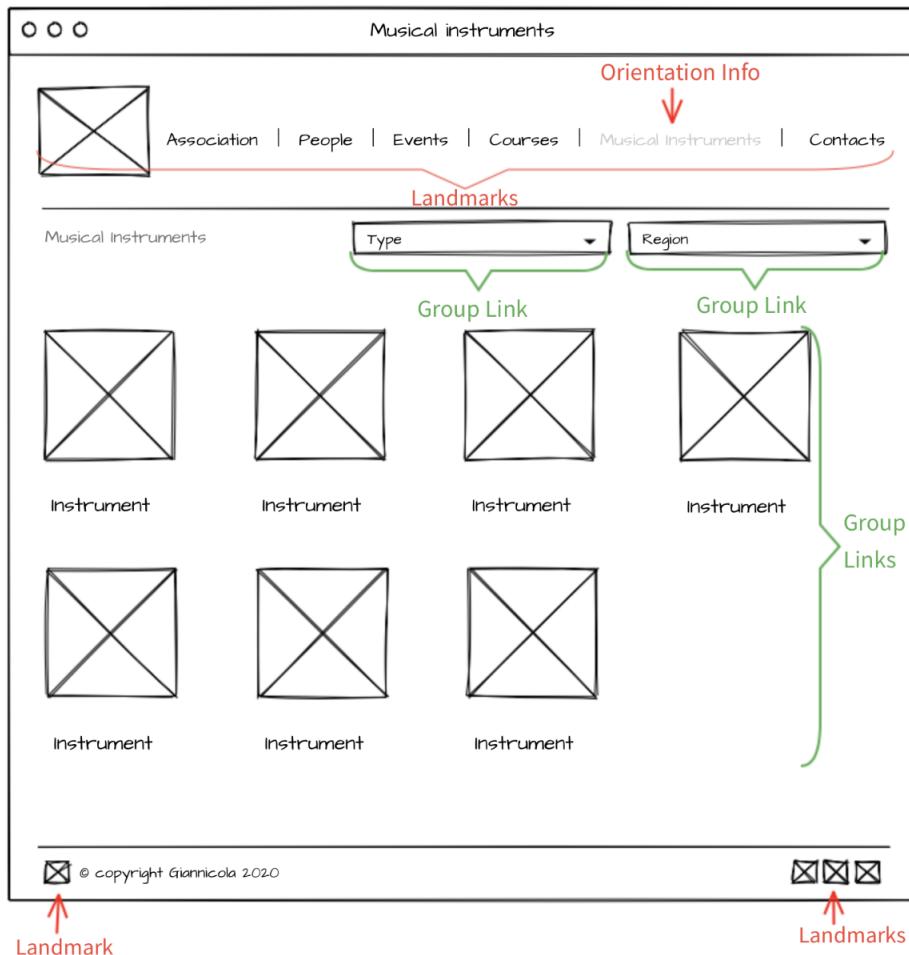


Figure 3.13: Musical Instruments page wireframe

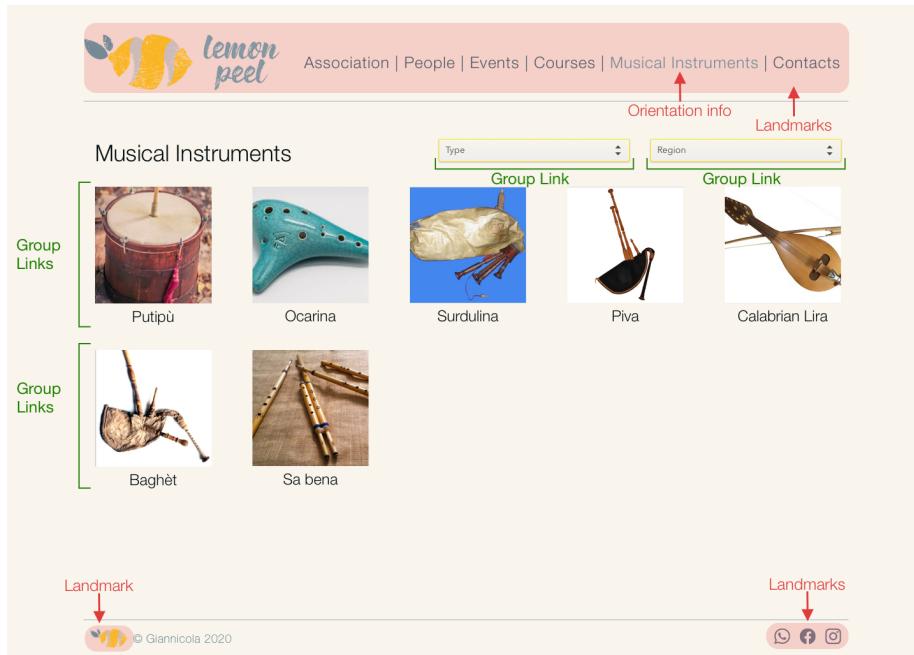


Figure 3.14: Musical Instruments page screenshot

### 3.5.2 Courses

This introductory page contains a list of the courses hold by *Lemon Peel* association. Each *Course* has an image and a title that bring to the single *Course* page, to read more information about it.

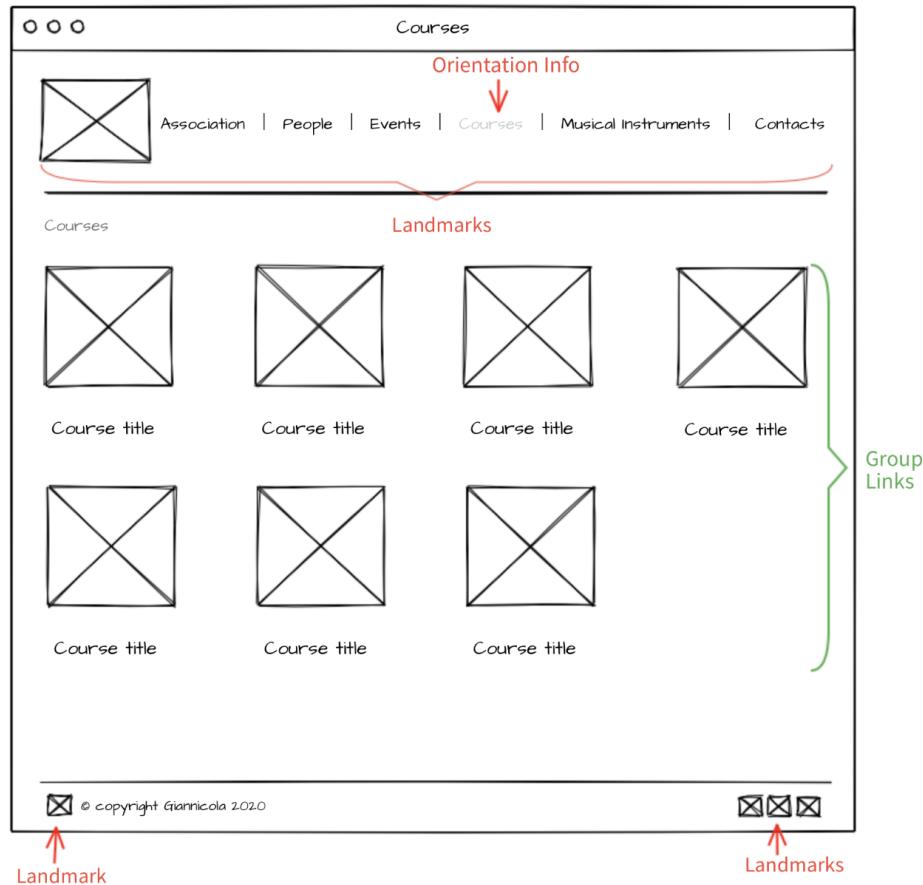


Figure 3.15: Courses page wireframe

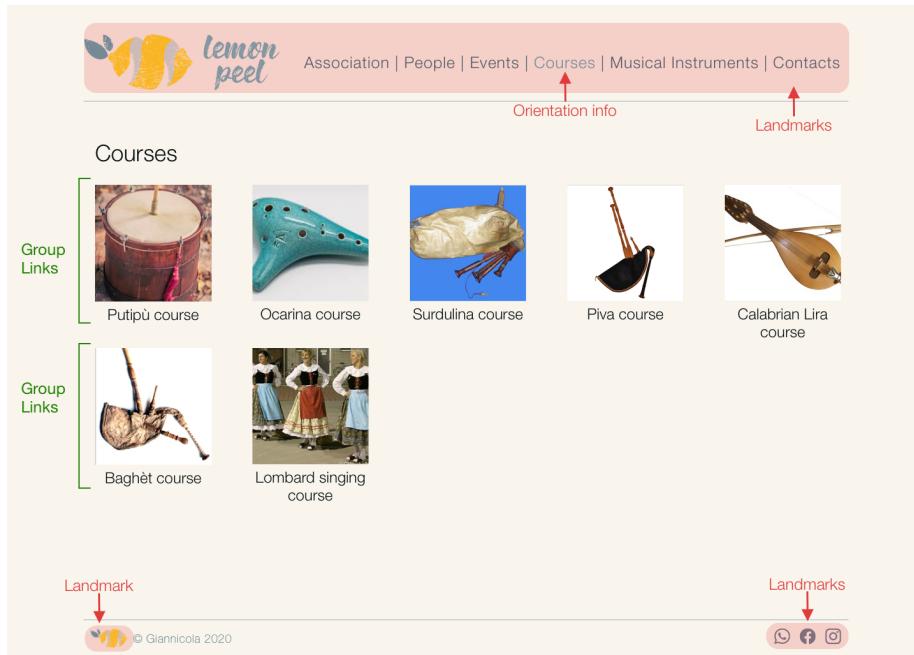


Figure 3.16: Courses page screenshot

### 3.5.3 Events

*Events* page is divided into two main subsections containing next and past *Events*. In this page, all *Events* are represented by an image, a title and a short description that gives the idea of what the event is about. From this page it is possible to open the single-*Event* pages to read more details about them. Through a filter, the user can select the *Events* of a specific month, to have an immediate view of what the association is organizing in a defined time section.

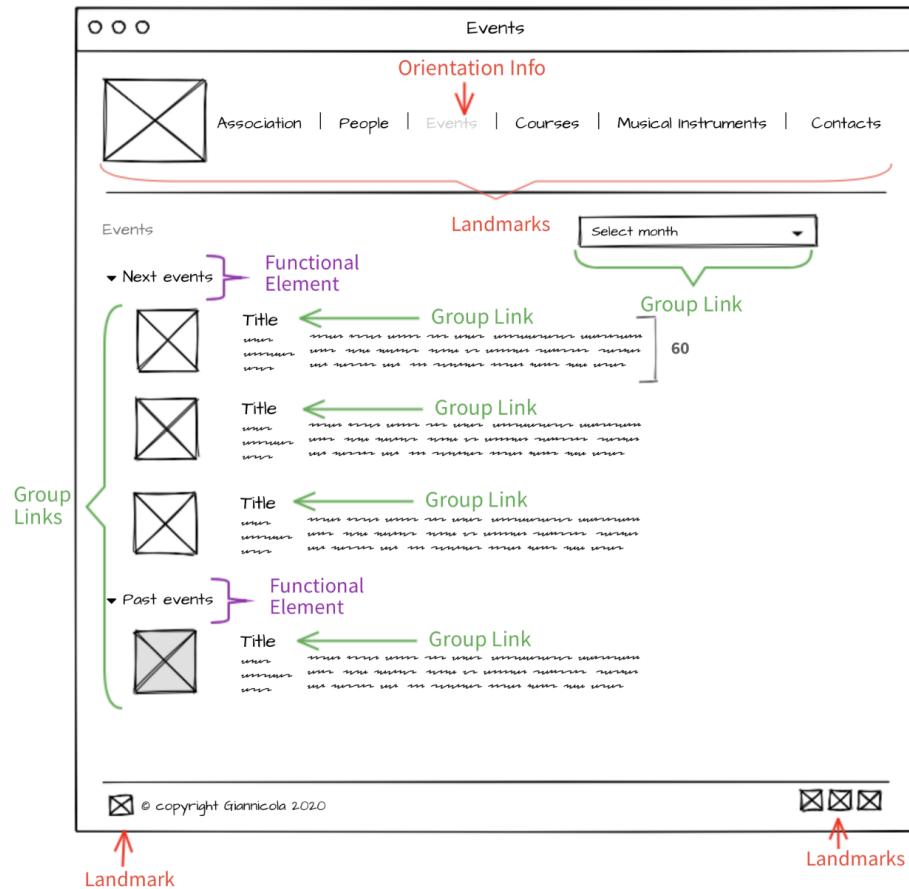


Figure 3.17: Events page wireframe

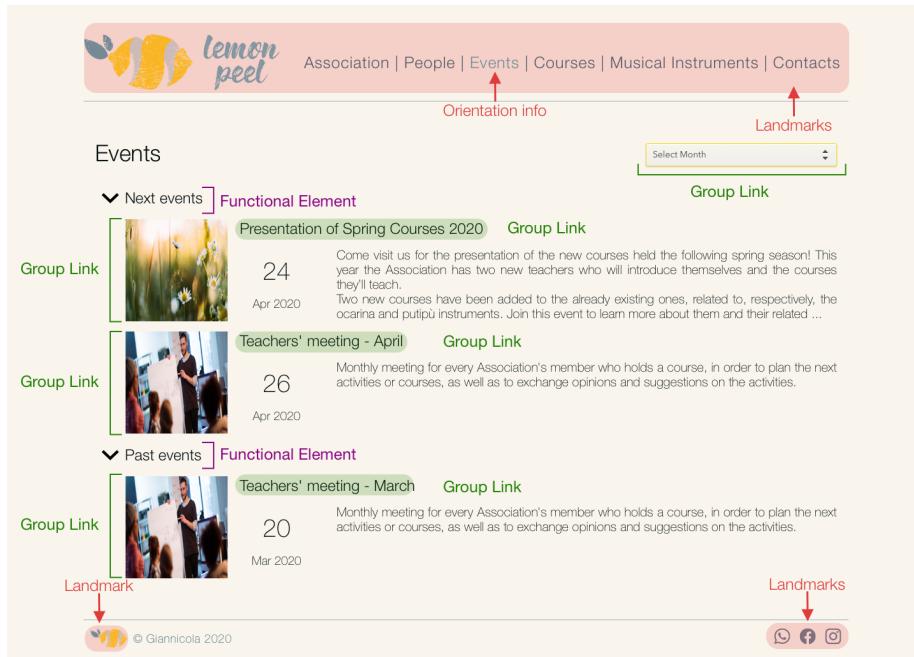


Figure 3.18: Events page screenshot

# Chapter 4

## Scenarios

### 4.1 Use case scenarios

Use case scenarios help to understand how typical users are going to use the application, assuming their profile and the needs the application is going to solve, and highlighting how these standard users interact with the website.

#### 4.1.1 Use case 1

Giorgio is a 80 years old man from South Italy, with a passion for technology and old musical instruments. He has heard of an association in his town whose aim is to teach how to play Italian musical instruments of the past but also anything related to popular and folk music of 19th and 20th century and he's interested in learning more about it.

Accessing the *Lemon Peel* website, he clicks the *Next Event* link from the *Home Page* to check when he might learn more about the Association in person. From the description he notices that the only purpose of the *Event* is to present the new courses, but he would like to know if there will be someone who play some old instruments. So, he clicks on the *Event organizer* link, where he finds her contacts to ask more information about it.

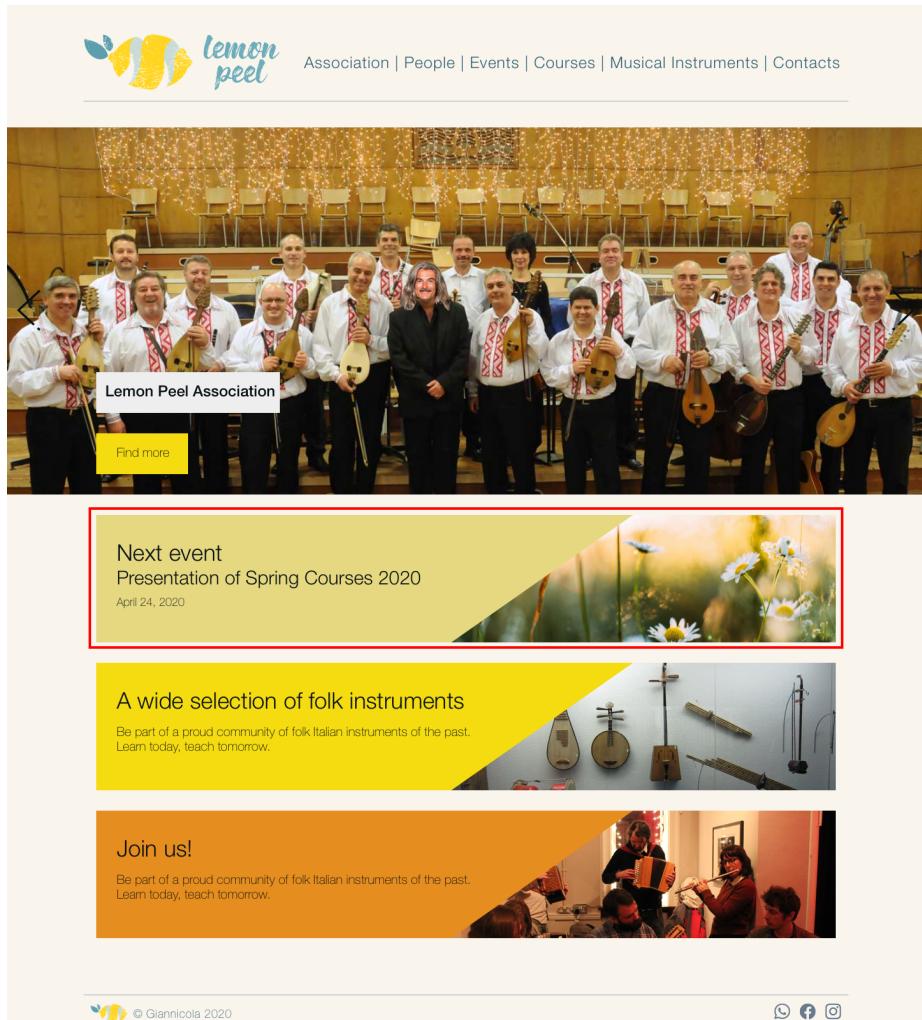


Figure 4.1: Home Page



Figure 4.2: Event Page

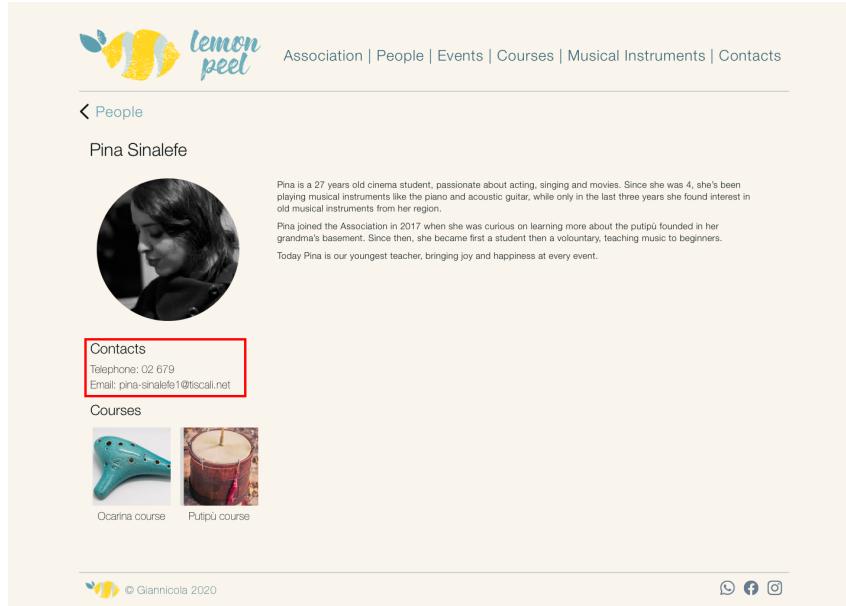


Figure 4.3: Event organizer Page

#### 4.1.2 Use case 2

Amanda is a 17 years old girl who finds a vintage instrument in her house's basement and she wants to learn more about it. She knows that there is an association whose aim is to teach the history of traditional Italian music and instruments.

She opens the website and clicks on the *Musical Instruments* link in the navigation bar; then, she finds that the ocarina, by its picture, is very similar to the instrument she has at home. From the *Musical Instrument* page she reads the story behind it and she finds that there is a course to learn how to play this instrument, so she clicks on the *Go to course* button to have more information about the day and time of each lesson to participate.

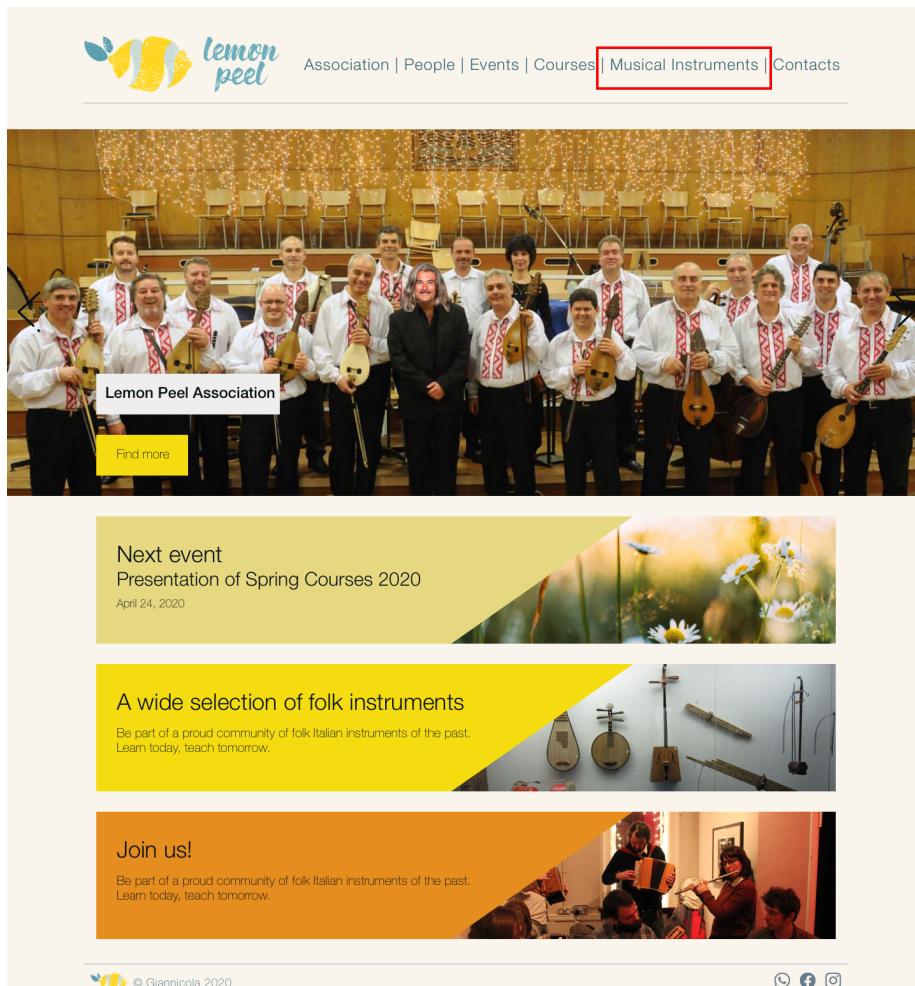


Figure 4.4: Home Page

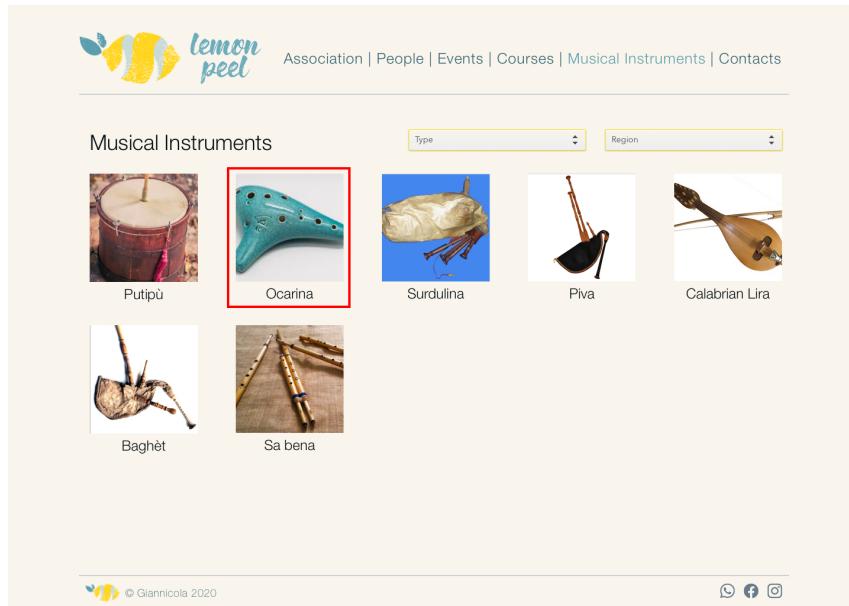


Figure 4.5: Musical Instruments Page

**Ocarina**

The modern European ocarina dates back to the 19th century, when Giuseppe Donati from Budrio, a town near Bologna, Italy transformed the ocarins from a toy, which only played a few notes, into a more comprehensive instrument (known as the first "classical" ocarinas). The word ocarina in the Bolinese dialect of the Emilano-Romagnolo language means "little goose." The earlier form was known in Europe as a gemshorn, which was made from animal horns of the chamois (Dutch: gems).

The ocarina is an ancient wind musical instrument—a type of vessel flute. Variations exist, but a typical ocarina is an enclosed space with four to twelve finger holes and a mouthpiece that projects from the body. It is traditionally made from clay or ceramic, but other materials are also used—such as plastic, wood, glass, metal, or bone.

How an ocarina works:

- Air enters through the windway
- Air strikes the labium, producing sound
- Air pulses in and out of the ocarina, as the vessel resonates a specific pitch (see Helmholtz resonator)
- Covering holes lowers the pitch; uncovering holes raises the pitch
- Blowing more softly lowers the pitch; blowing harder raises it. Breath force can change the pitch by three semitones. This is why ocarinas generally have no tuning mechanism or dynamic range, and why it is hard to learn to play one in tune.

[Go to course](#)

Figure 4.6: Musical Instrument Page

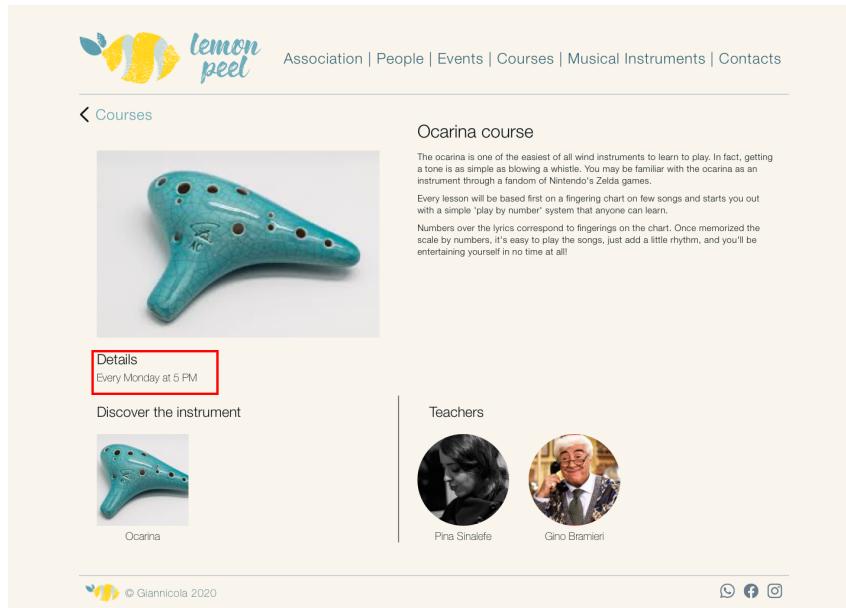


Figure 4.7: Course Page

### 4.1.3 Use case 3

Ippolito is a middle-age man who owns a large collection of historical musical instruments of the past. He knows how to play many of them and he would like to teach it to people who are interested in traditional music.

He goes on the *Lemon Peel* association website and clicks on the *Courses* landmark. He notices that in the page there is no reference to Baghèt courses, a bagpipe from Bergamo that he knows very well. Aiming to teach how to play it, he clicks on *Contacts* landmark to ask to the association if they might be interested to offer this new *Course*. Then, he writes a message explaining what he could bring to the association and clicks on *Submit* button.

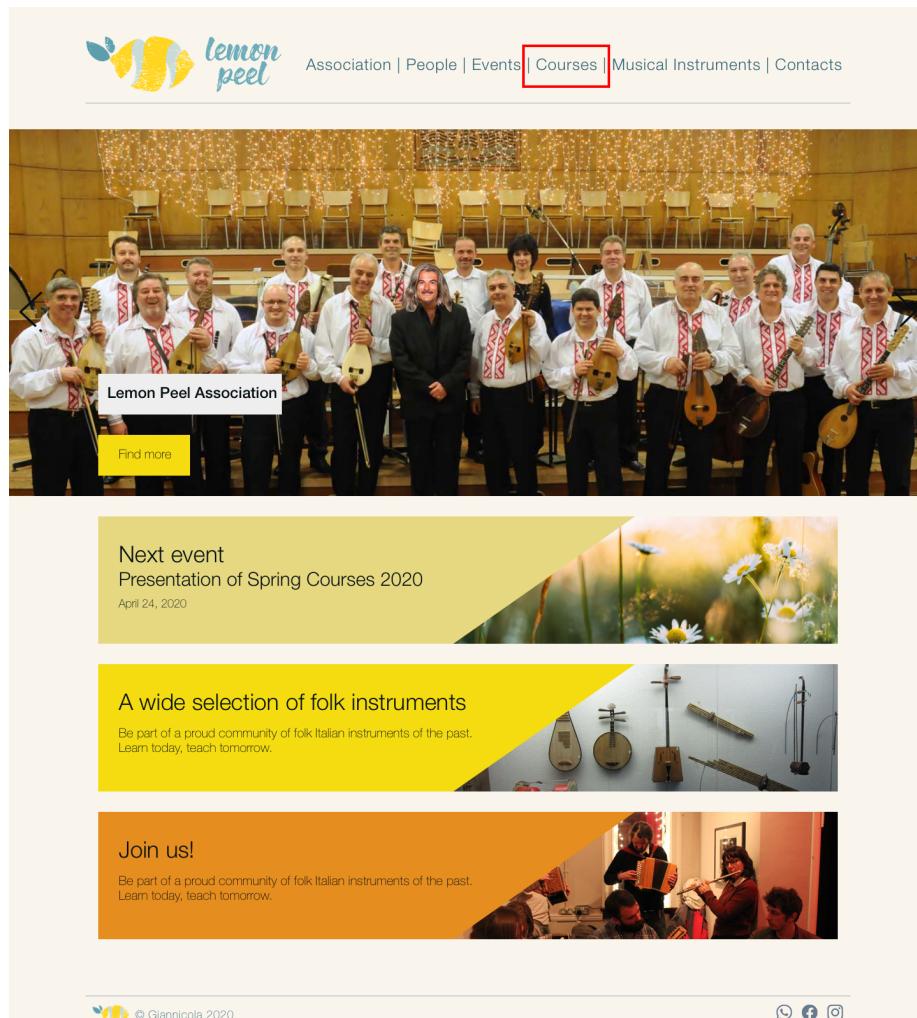


Figure 4.8: Home Page

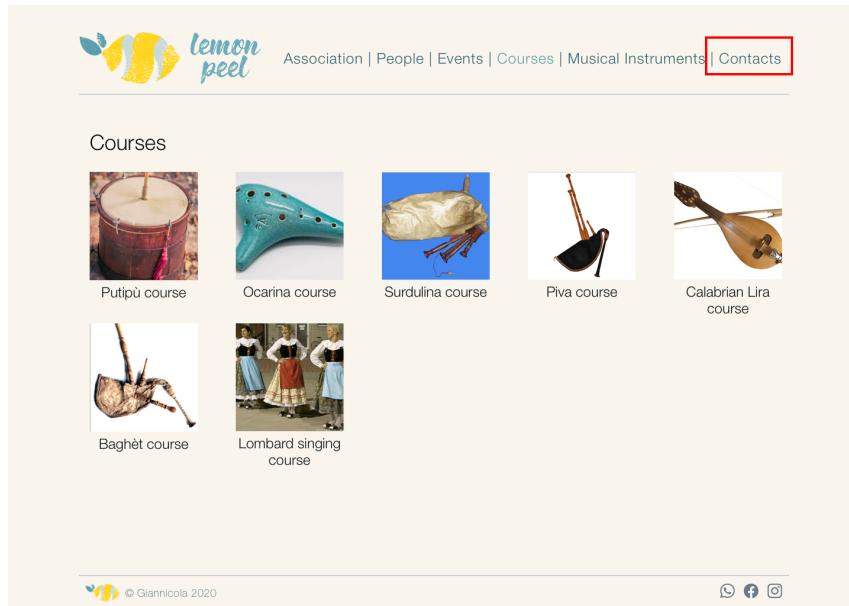


Figure 4.9: Courses Page

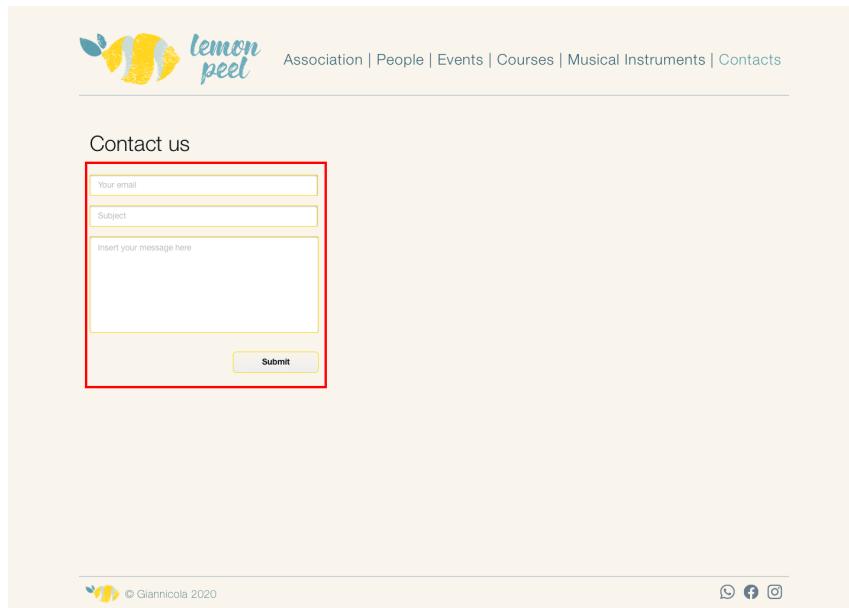


Figure 4.10: Contact Page

# Chapter 5

# Database Design

## 5.1 Overview

Database Design is a collection of processes that facilitate the designing, development, implementation and maintenance of data management systems.

The main objectives of this database designing are to produce a conceptual and a logical design models of the proposed database system.

## 5.2 Entity-Relationship Model

Entity Relationship Model (ER Modeling) is a graphical approach to database design. It is a high-level data model that defines data elements and their relationship for a specified system. An ER model is used to represent real-world entities; entities are things or objects distinguishable from surrounding environment, and they can have relationships with each other.

Cardinality constraints define the minimum and maximum number of relationships in which an entity can participate; in the following diagram, the Min-Max / ISO notation has been used, in which the cardinality values for an entity are positioned near that entity (e.g. a Musical Instrument entity participates in exactly one relationship with an Italian Region entity; the latter can have zero or more relationships with the Musical Instrument entity).

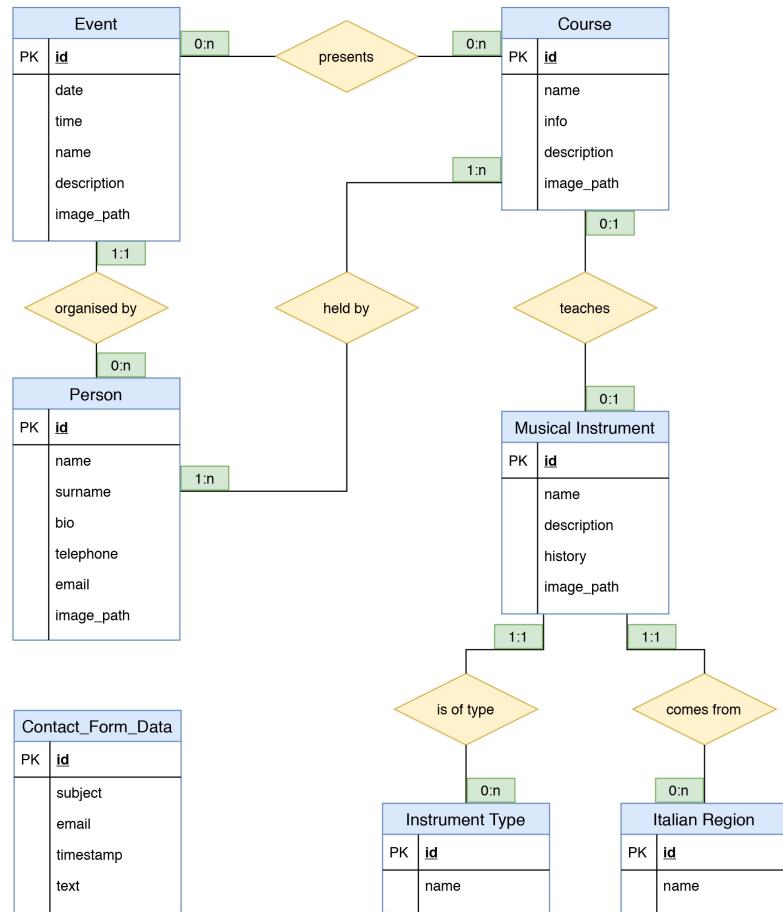


Figure 5.1: Entity-Relationship model

### 5.3 Relational Tables

This section shows the logical schema of the domain modeled in the ER diagram of the previous section, independently of a particular database management product or storage technology.

As it can be seen, the *Contact\_Form\_Data* does not participate in any relationship as it models only a contact form on the website.

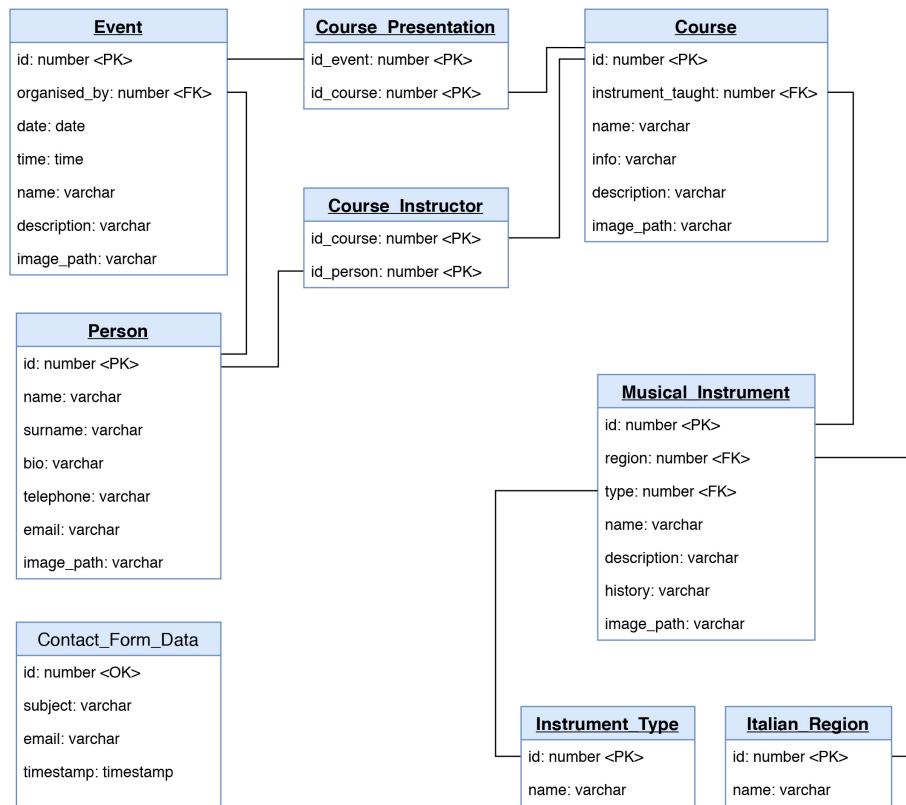


Figure 5.2: Relational Tables