Score Management System

Summary

- A musical work consists of a set of scores, one for each type of instrument, plus another score for the conductor containing all the instruments.

Summary

- Small bands usually have their musical archive in paper, more or less organized in cabinets. Common problems are that there are compositions whose originals have been lost and only copies of copies are available, there are compositions with missing instruments, or there are multiple copies of the same piece.
- The goal of this project is to create an information system to digitally store, organize and provide access to the compositions in the archive of the band.

Requirement Analysis

How are the users?

PERSONA

Persona

- Pepe García is in charge of the musical archive of the municipal band of Villa Pelotas de Arriba. He is 63 and he has been assigned to this position recently and has been asked to organize it.

- The band has a not very modern computer and a photocopier which is capable of scanning, and Pepe has come up with the idea of organize the archive digitally. He has notions of computers at user-level (knows the concept of files and directories, uses Word, knows how to surf the Internet, etc.)

- Pepe is concerned by the magnitude of the work to be carried out. Firstly, he has to scan a large number of composition (the score for each piece is composed of 50-100 pages, and there are around 200 pieces). He'd like the system to facilitate the digitalization process minimizing the work to be carried out. He does not intend to do the scanning once, but in batches (for example, scanning at the beginning 20 works per week, and then add compositions as they are needed).

- Another task of Pepe consists in preparing the concerts. The conductor of the band asks Pepe to prepare copies of a work for the musicians. Pepe then has to print a score for each member of the band (there may be repeated instruments, and there may be scores that are not printed because there is nobody playing that instrument).

Persona

- Gerardo Pérez is the conductor of the band. For preparing a concert, he would like to be able to quickly scan through the available compositions in the system, and query when was the last time they were performed. He would also like to query the system per type of composition (for example, double march, parades, etc.) Gerardo has no computer at home, but he has a tablet and knows how to surf the Internet.

What will the system do?

CONCRET USE CASES

Task: Introduce a composition from scratch

Concrete Use Case

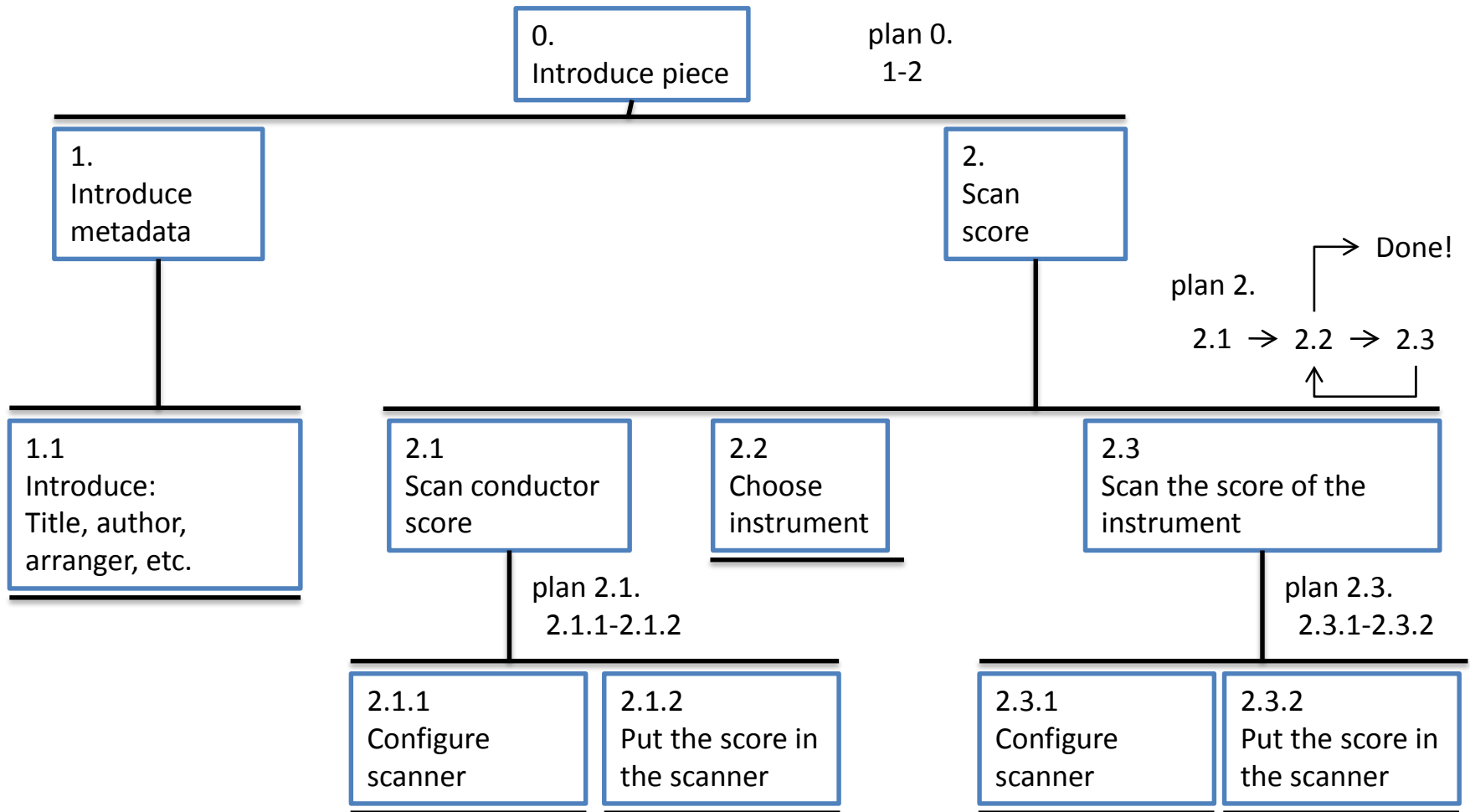| User Actions	System Response
The user asks for introducing a composition	The system asks for the metadata of the piece: title, subtitle, author, arranger and types (tags)
The user introduce the metadata	The system asks the user to introduce the conductor score in the scanner. It shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned
	The system asks for the name of an instrument
The user introduces the name of an instrument	Shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned The system asks if there are more instruments to scan
The user answers whether there are more instruments to scan	If there are more instruments the systems returns to step 4 If there are no more instruments, the system shows a message telling that the composition has been completely scanned

Task: Print a concert composition

Concrete Use Case

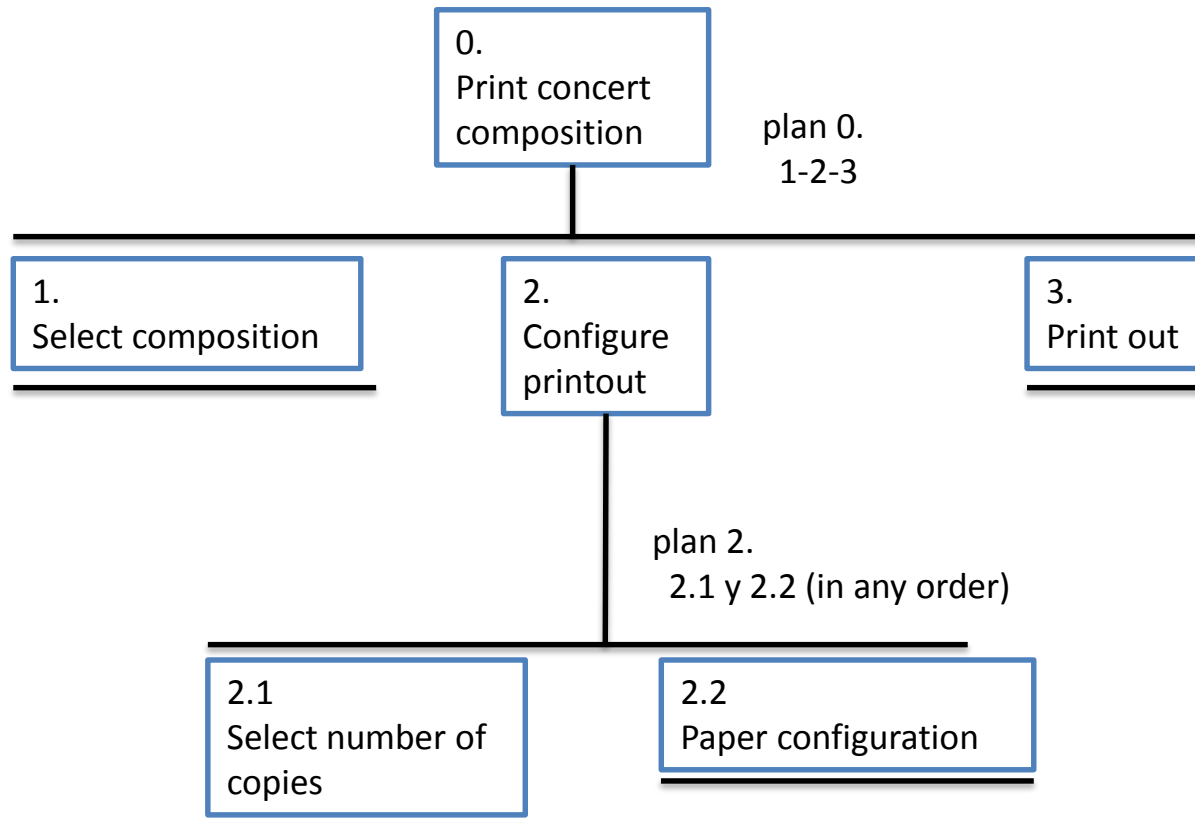| User Actions	System Response
Selects the option to print a composition	The system asks for selecting the composition
Selects the composition	The system asks the user to introduce the number of copies
Introduces the number of copies	Shows the printer configuration (simple, doble page, orientation, size, pages order)
Sets the printer configuration parameters and request to print	Prints the composition

What will the system do?

TASK DECOMPOSITION

Task: Introduce a composition from scratch

Hierarchical Task Decomposition

Task: Print a concert composition
Hierarchical Task Decomposition

```
                    ┌─────────────────┐
                    │ 0.              │
                    │ Print concert   │      plan 0.
                    │ composition     │         1-2-3
                    └─────────────────┘
```

1. Select composition	2. Configure printout	3. Print out

plan 2.
   2.1 y 2.2 (in any order)

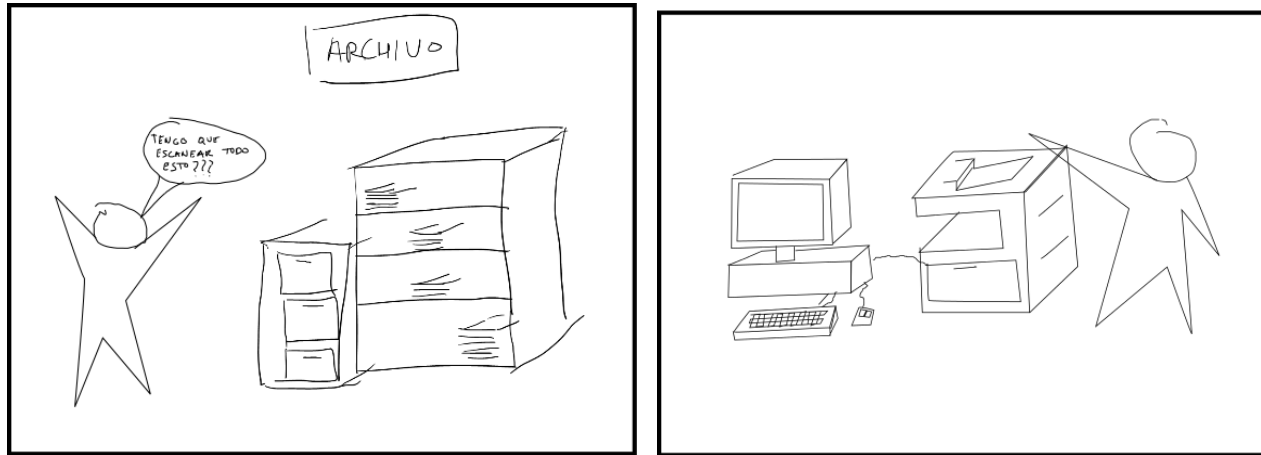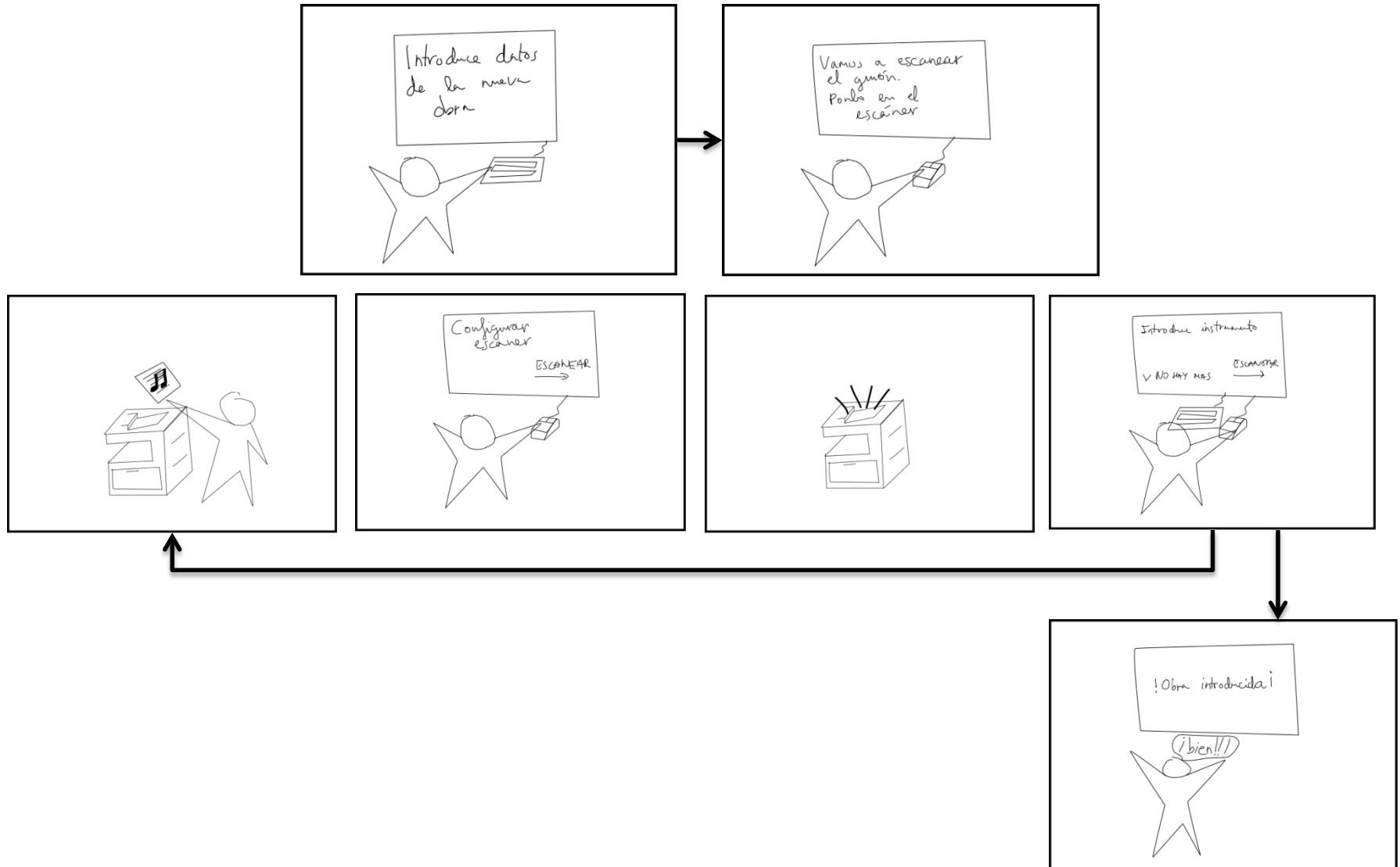| 2.1 Select number of copies	2.2 Paper configuration

Why and When will users use the system?

STORY BOARD

Task: Introduce a composition from scratch

Scenarios

Task: Introduce a composition from scratch

Scenarios

CONCEPTUAL DESIGN

Steps

1. Obtaining the object task tables: object-attributes-actions
2. Obtaining the containers
3. Obtaining the content diagram

1st. Step

TASK OBJECT TABLES

Task: Introduce a composition from scratch

Concrete Use Case

User Actions	System Response
The user asks for introducing a composition	The system asks for the metadata of the piece: title, subtitle, author, arranger and types (tags)
The user introduce the metadata	The system asks the user to introduce the conductor score in the scanner. It shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned
	The system asks for the name of an instrument
The user introduces the name of an instrument	Shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned The system asks if there are more instruments to scan
The user answers whether there are more instruments to scan	If there are more instruments the systems returns to step 4 If there are no more instruments, the system shows a message telling that the composition has been completely scanned

Task: Introduce a composition from scratch

Concrete Use Case

User Actions	System Response
The user asks for introducing a composition	The system asks for the metadata of the piece: title, subtitle, author, arranger and types (tags)
The user introduce the metadata	The system asks the user to introduce the conductor score in the scanner. It shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned and a pdf is created
	The system asks for the name of an instrument
The user introduces the name of an instrument	Shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned a pdf is created

The system asks if there are more instruments to scan |
| **The user answers whether there are more instruments to scan** | If there are more instruments the systems returns to step 4
If there are no more instruments, the system shows a message telling that the composition has been completely scanned |

Task: Introduce a composition from scratch

Tables object-attribute-action

Task object	Attributes	Actions
COMPOSITION	Author Year Arranger Title Subtitle Types List of scores Date of last performance Conductor score	Print for a concert Update date of last performance View Create Delete Save Edit

Task object	Attributes	Actions
SCORE	Name of instrument PDF document	Create Delete View Print Edit

Task: Introduce a composition from scratch

Tables object-attribute-action

Task object	Attributes	Actions
CONDUCTOR SCORE	PDF document	Create Delete View Print Edit

Task object	Attributes	Actions
INSTRUMENT	Name	Create

Task object	Attributes	Actions
SCANNER	identifier Paper size Single/double sided Path where to save the file	Edit configuration Scan

2nd. Step. Task: Introduce a composition from scratch
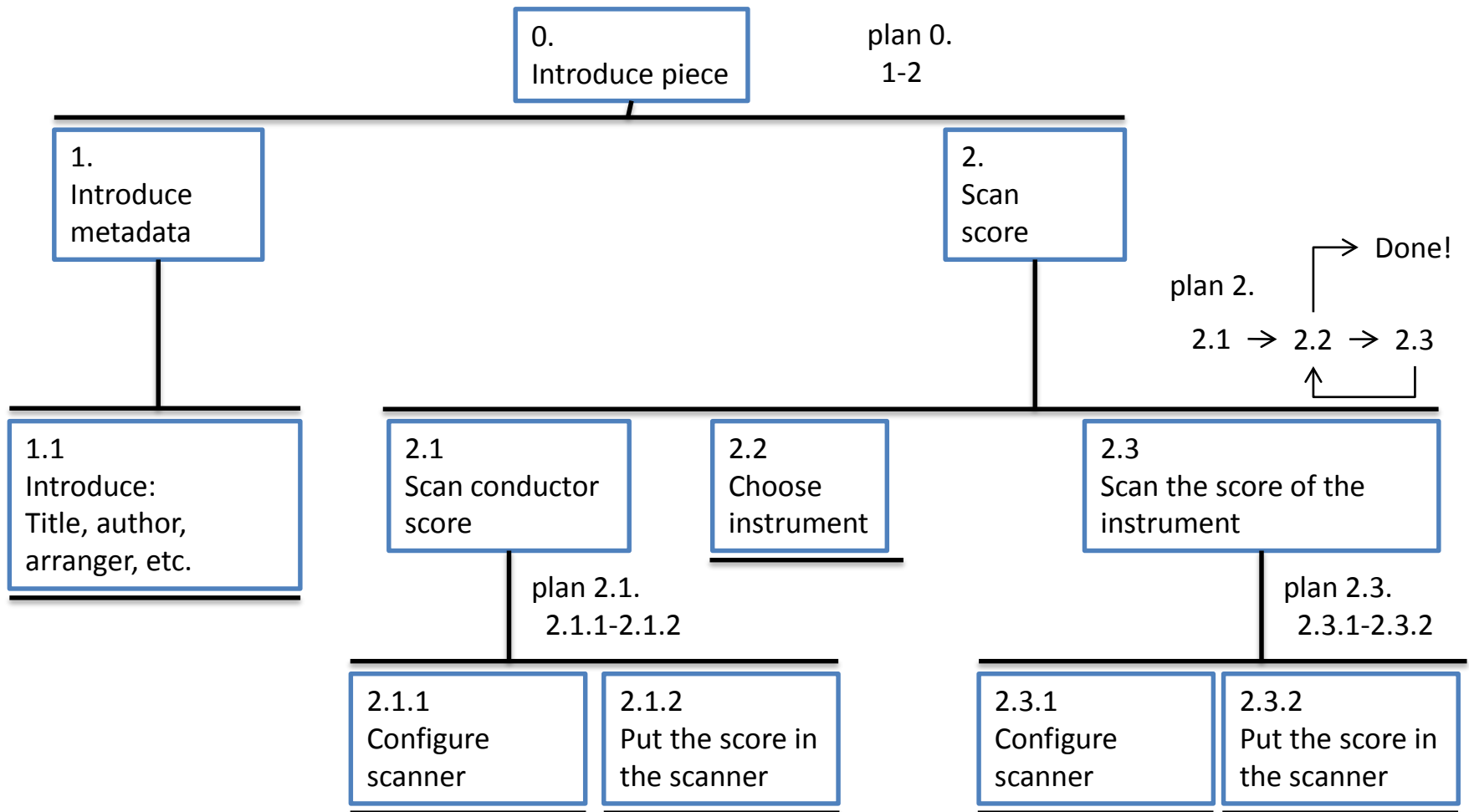
CONTAINERS

Task: Introduce a composition from scratch

Concrete Use Case

User Actions	System Response
The user asks for introducing a composition	The system asks for the metadata of the piece: title, subtitle, author, arranger and types (tags)
The user introduce the metadata	The system asks the user to introduce the conductor score in the scanner. It shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned
	The system asks for the name of an instrument
The user introduces the name of an instrument	Shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned The system asks if there are more instruments to scan
The user answers whether there are more instruments to scan	If there are more instruments the systems returns to step 4 If there are no more instruments, the system shows a message telling that the composition has been completely scanned

Task: Introduce a composition from scratch

Hierarchical Task Decomposition

Task: Introduce a composition from scratch

Containers

Name: *Input the data of the composition*

Purpose: *Obtain the data of the composition from the user*

Functions:
- *Introduces: author, year, arranger, title, subtitle, types of composition*
- *Creates a new composition*

Links:
- ▶ *Scan conductor script*

Objects:

Composition

Constraints:

User Actions	System Response
The user asks for introducing a composition	The system asks for the metadata of the piece: title, subtitle, author, arranger and types (tags)
The user introduce the metadata	The system asks the user to introduce the conductor score in the scanner. It shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned
	The system asks for the name of an instrument
The user introduces the name of an instrument	Shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned
	The system asks if there are more instruments to scan
The user answers whether there are more instruments to scan	If there are more instruments the systems returns to step 4. If there are no more instruments, the system shows a message telling that the composition has been completely scanned

Task: Introduce a composition from scratch

Containers

Name: *Input the data of the composition*

Purpose: *Obtain the data of the composition from the user*

Functions:

- *Introduces: author, year, arranger, title, subtitle, types of composition*
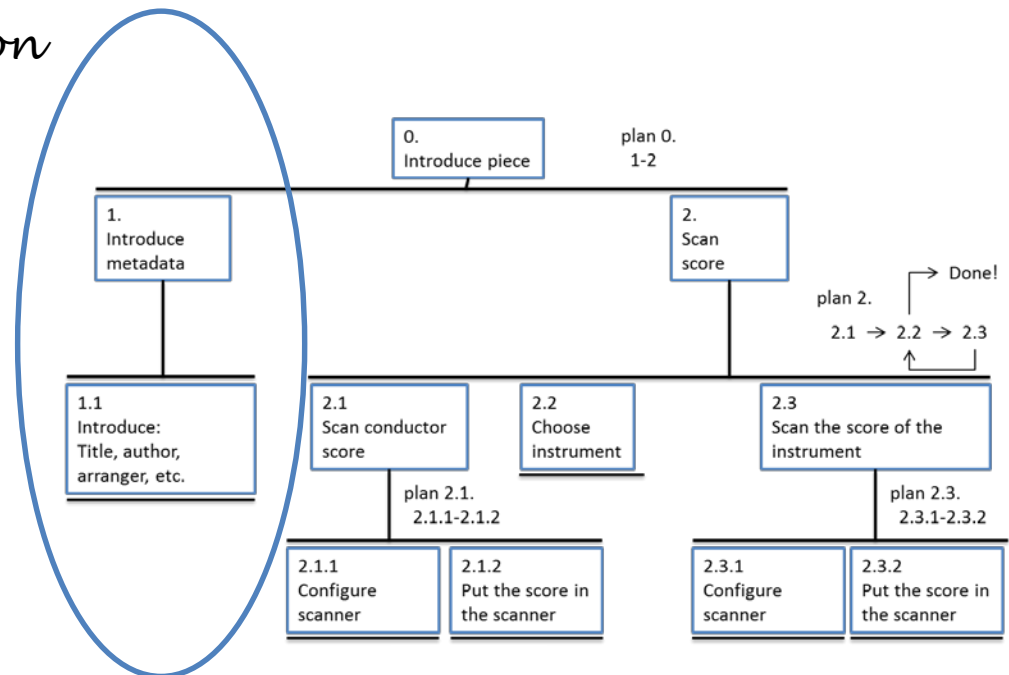- *Creates a new composition*

Links:

▶ *Scan conductor script*

Objects:

Composition

Constraints:

Task: Introduce a composition from scratch

Containers

Name: Scan conductor score

Purpose: Configure the scanner and scan the conductor score

Functions:
- ■ Asks the user to put the score in the scanner
- ● Places the score in the scanner
- ■ Shows the default configuration of the scanner
- ● Changes the scanner configuration
- ● Requests Scan
- ■ Scans and saves

Links:
- ►Select instrument
- ►►Change scanner configur

Objects:

Composition, Conductor s

Constraints:

User Actions	System Response
The user asks for introducing a composition	The system asks for the metadata of the piece: title, subtitle, author, arranger and types (tags)
The user introduce the metadata	The system asks the user to introduce the conductor score in the scanner. It shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned
	The system asks for the name of an instrument
The user introduces the name of an instrument	Shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned The system asks if there are more instruments to scan
The user answers whether there are more instruments to scan	If there are more instruments the systems returns to step 4 If there are no more instruments, the system shows a message telling that the composition has been completely scanned

Task: Introduce a composition from scratch

Containers

Name: *Scan conductor score*

Purpose: *Configure the scanner and scan the conductor score*

Functions:
- *Asks the user to put the score in the scanner*
- *Places the score in the scanner*
- *Shows the default configuration of the scanner*
- *Changes the scanner configuration*
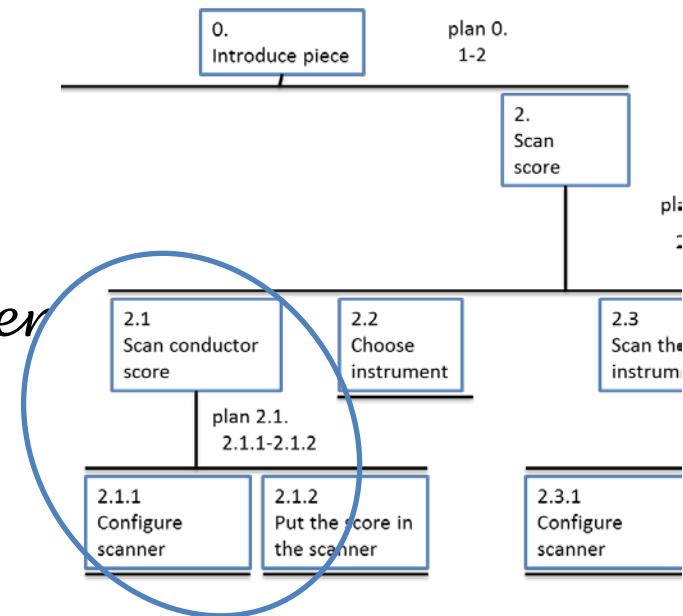- *Requests Scan*
- *Scans and saves*

Links:
- ►*Select instrument*
- ►►*Change scanner configuration*

Objects:

Composition, Conductor score, Scanner

Constraints:

Task: Introduce a composition from scratch

Containers

Name: *Select instrument*

Purpose: *Choose the instrument whose score is going to be scanned next*

Functions:
- *Shows the list of instruments/request instrument*
- *Selects instrument*

Links:
- ►*Scan score*

Objects:

Score, Instrument

Constraints:

User Actions	System Response
The user asks for introducing a composition	The system asks for the metadata of the piece: title, subtitle, author, arranger and types (tags)
The user introduce the metadata	The system asks the user to introduce the conductor score in the scanner. It shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned
	The system asks for the name of an instrument
The user introduces the name of an instrument	Shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned The system asks if there are more instruments to scan
The user answers whether there are more instruments to scan	If there are more instruments the systems returns to step 4 If there are no more instruments, the system shows a message telling that the composition has been completely scanned

Task: Introduce a composition from scratch

Containers

Name: *Select instrument*

Purpose: *Choose the instrument whose score is going to be scanned next*

Functions:
- ▪ *Shows the list of instruments/request instrument*
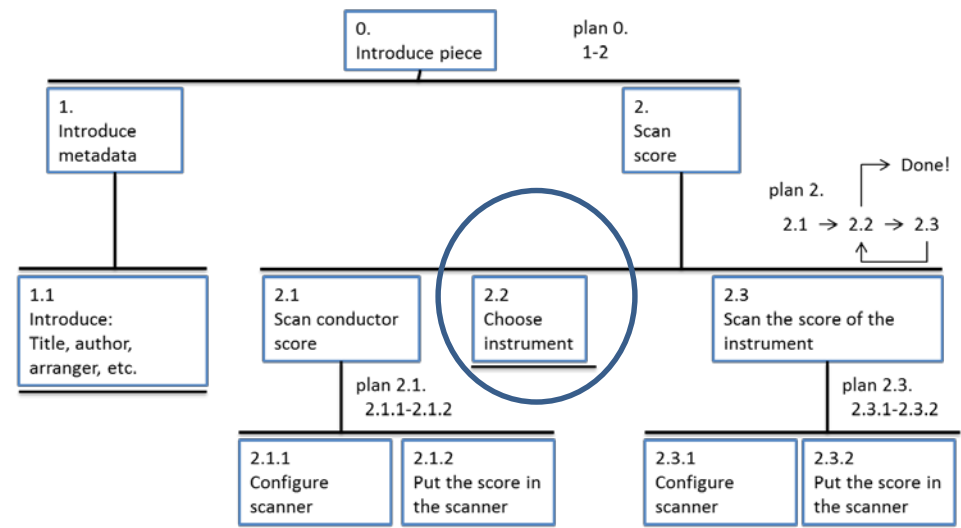- ● *Selects instrument*

Links:
- ► *Scan score*

Objects:

Score, Instrument

Constraints:

Task: Introduce a composition from scratch

Containers

Name: *Scan score*

Purpose: *Show the scanner configuration and scan the score*

Functions:
- *Shows the last configuration of the scanner*
- *Changes configuration*
- *Places the score in the scanner*
- *Requests scan*
- *Scans and saves*

Links:
- ► *Done?*
- ►► *Change scanner confi...*

Objects:

Composition, score

Constraints:

User Actions	System Response
The user asks for introducing a composition	The system asks for the metadata of the piece: title, subtitle, author, arranger and types (tags)
The user introduce the metadata	The system asks the user to introduce the conductor score in the scanner. It shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned
	The system asks for the name of an instrument
The user introduces the name of an instrument	Shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned
	The system asks if there are more instruments to scan
The user answers whether there are more instruments to scan	If there are more instruments the systems returns to step 4. If there are no more instruments, the system shows a message telling that the composition has been completely scanned

Task: Introduce a composition from scratch

Containers

Name: *Scan score*

Purpose: *Show the scanner configuration and scan the score*

Functions:
- ■ *Shows the last configuration of the scanner*
- ● *Changes configuration*
- ● *Places the score in the scanner*
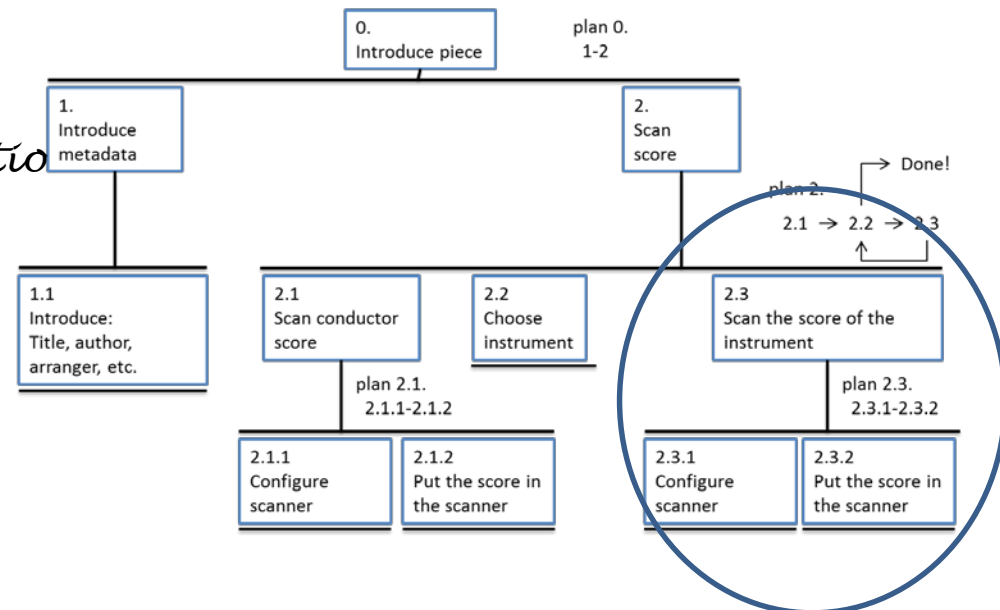- ● *Requests scan*
- ■ *Scans and saves*

Links:
- ► *Done?*
- ►► *Change scanner configuratio*

Objects:

 Composition, score

Constraints:

0. Introduce piece	plan 0. 1-2

1. Introduce metadata		2. Scan score

plan 2.
2.1 → 2.2 → 2.3 → Done!

1.1 Introduce: Title, author, arranger, etc.	2.1 Scan conductor score	2.2 Choose instrument	2.3 Scan the score of the instrument

plan 2.1.
2.1.1-2.1.2

plan 2.3.
2.3.1-2.3.2

2.1.1 Configure scanner	2.1.2 Put the score in the scanner	2.3.1 Configure scanner	2.3.2 Put the score in the scanner

Task: Introduce a composition from scratch

Containers

Name: *Done?*

Purpose: *Ask the user if all the instruments have been scanned*

Functions:
- ■ *Asks user if the scan process has finsihed*
- ● *Select yes/no*
- ● *Show the final message, with the summary of the process*

Links:
- ► *Select instrument*

Objetos:
  Composition

Constraints:

User Actions	System Response
The user asks for introducing a composition	The system asks for the metadata of the piece: title, subtitle, author, arranger and types (tags)
The user introduce the metadata	The system asks the user to introduce the conductor score in the scanner. It shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned
	The system asks for the name of an instrument
The user introduces the name of an instrument	Shows the scanner configuration
The user selects the configuration of the scanner (paper size, single/double sided paper) and puts the paper in the scanner	The score gets scanned
	The system asks if there are more instruments to scan
The user answers whether there are more instruments to scan	If there are more instruments the systems returns to step 4. If there are no more instruments, the system shows a message telling that the composition has been completely scanned

Task: Introduce a composition from scratch

Containers

Name: *Change scanner configuration*

Purpose: *Select the options for scanning the scores*

Functions:
- ■ *Show the current configuration*
- ● *Change configuration*
- ■ *Save a new configuration*

Links:
- ►► *Scan conductor score*
- ►► *Scan score*

Objects:

Composition
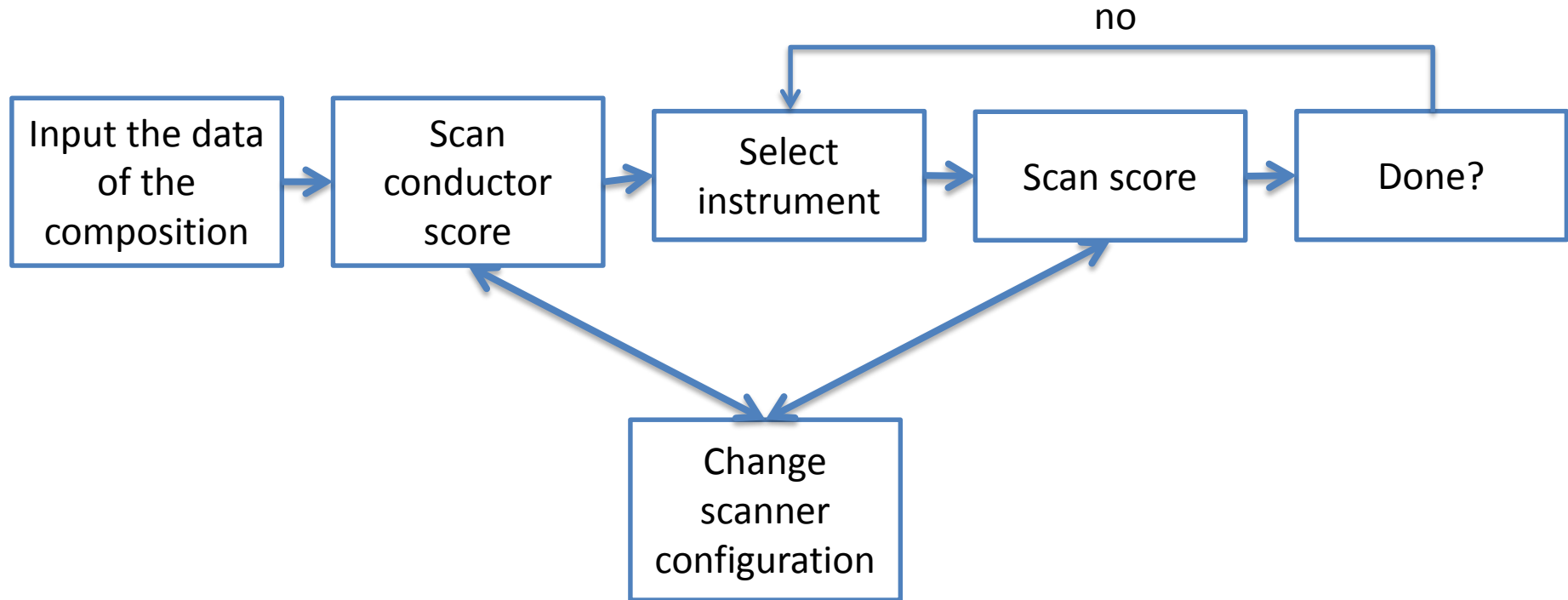
Constraints:

3rd. Step. Task: Introduce a composition from scratch

CONTENT DIAGRAM

Task: Introduce a composition from scratch
Containers

1st. Step

TASK OBJECT TABLES

Task: Print a concert composition

Concrete Use Case

User Actions	System Response
Selects the option to print a composition	The system asks for selecting the composition
Selects the composition	The system asks the user to introduce the number of copies
Introduces the number of copies	Shows the printer configuration (simple, double page, orientation, size, pages order)
Sets the printer configuration parameters and request to print	Prints the composition

Task: Print a concert composition

Tables object-attribute-action

Task object	Attributes	Actions
Printer	Number of copies per instrument Simple/doble page Orientation Paper size Page order Pages by sheet	Configure Print

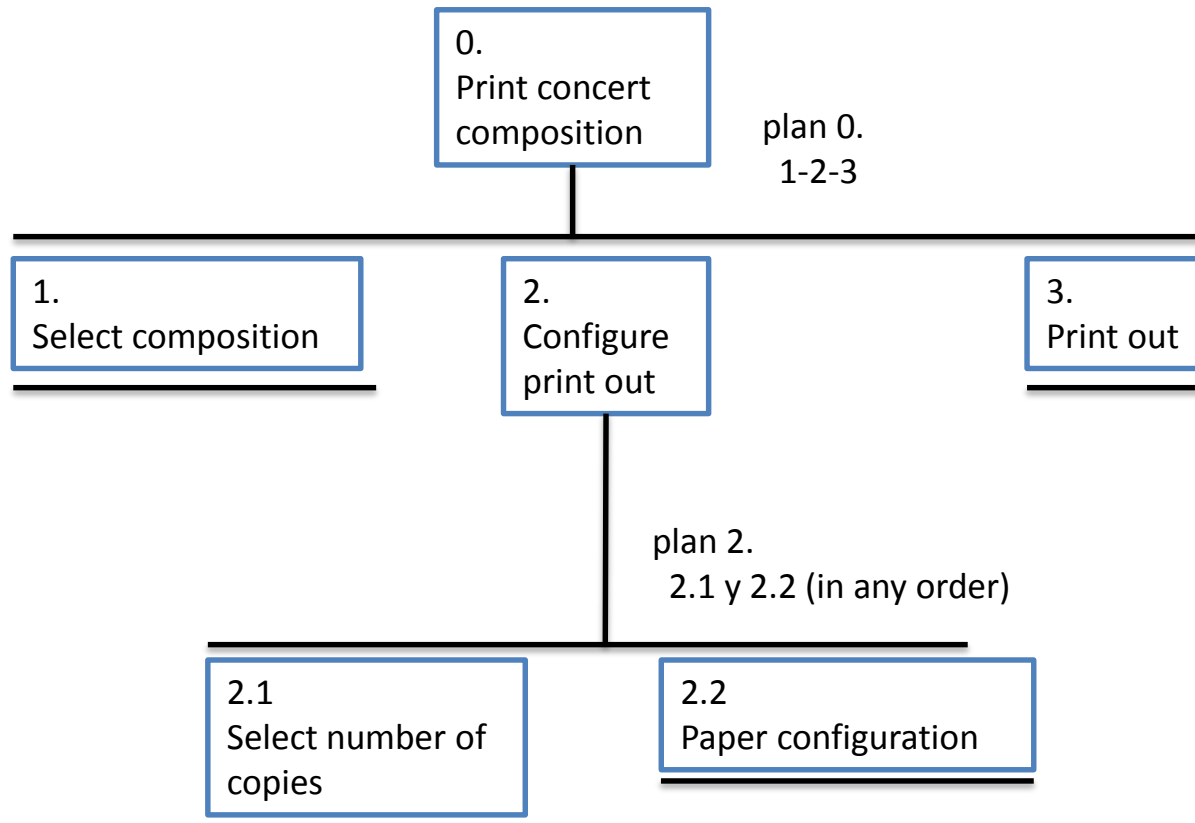2nd. Step. Task: Introduce a composition from scratch

CONTAINERS

Task: Print a concert composition

Concrete Use Case

User Actions	System Response
Selects the option to print a composition	The system asks for selecting the composition
Selects the composition	The system asks the user to introduce the number of copies
Introduces the number of copies	Shows the printer configuration (simple, doble page, orientation, size, pages order)
Sets the printer configuration parameters and request to print	Prints the composition

Task: Print a concert composition
Hierarchical Task Decomposition

```
                    ┌─────────────────┐
                    │ 0.              │         plan 0.
                    │ Print concert   │           1-2-3
                    │ composition     │
                    └────────┬────────┘
        ┌────────────────────┼────────────────────────┐
┌───────────────┐   ┌─────────────────┐       ┌───────────────┐
│ 1.            │   │ 2.              │       │ 3.            │
│ Select        │   │ Configure       │       │ Print out     │
│ composition   │   │ print out       │       └───────────────┘
└───────────────┘   └────────┬────────┘
                             │            plan 2.
                             │              2.1 y 2.2 (in any order)
                ┌────────────┴────────────┐
        ┌───────────────┐         ┌───────────────────┐
        │ 2.1           │         │ 2.2               │
        │ Select number │         │ Paper configuration│
        │ of copies     │         └───────────────────┘
        └───────────────┘
```

Task: Print a concert composition

Containers

Name: *Select composition*

Purpose: *Select the composition to print out it*

Functions:
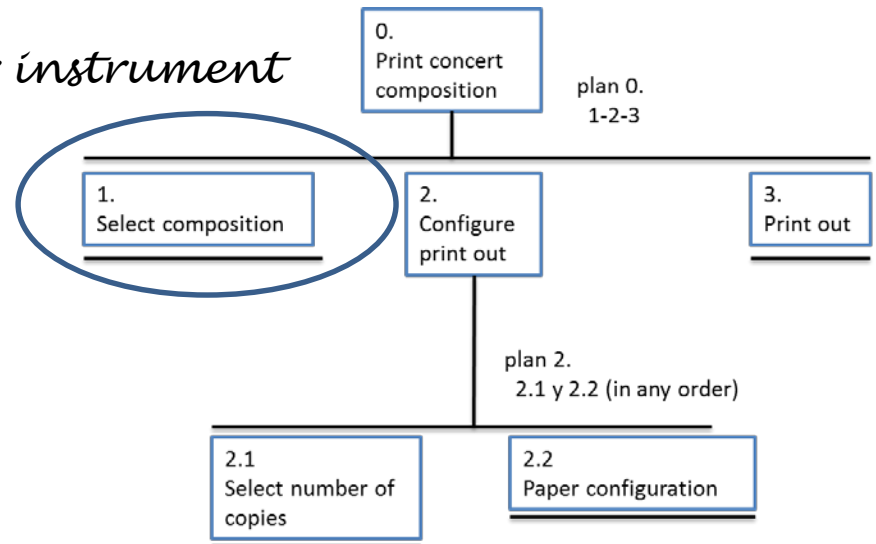- ■ *Shows compositions*
- ● *Selects composition*

Links:
- ► *Select number of copies per instrument*

Objects:

Composition

Constraints:

User Actions	System Response
Selects the option to print a composition	The system asks for selecting the composition
Selects the composition	The system asks the user to introduce the number of copies
Introduces the number of copies	Shows the printer configuration (simple, doble page, orientation, size, pages order)
Sets the printer configuration parameters and request to print	Prints the composition

Task: Print a concert composition

Containers

Name: *Select composition*

Purpose: *Select the composition to print out it*

Functions:
- ■ *Shows compositions*
- ● *Selects composition*

Links:
- ► *Select number of copies per instrument*

Objects:

Composition

Constraints:

Task: Print a concert composition

Containers

Name: *Select number of copies per instrument*

Purpose: *Select how many copies print by each instrument score*

Functions:
- *Shows the default value od the number of copier per instrument*
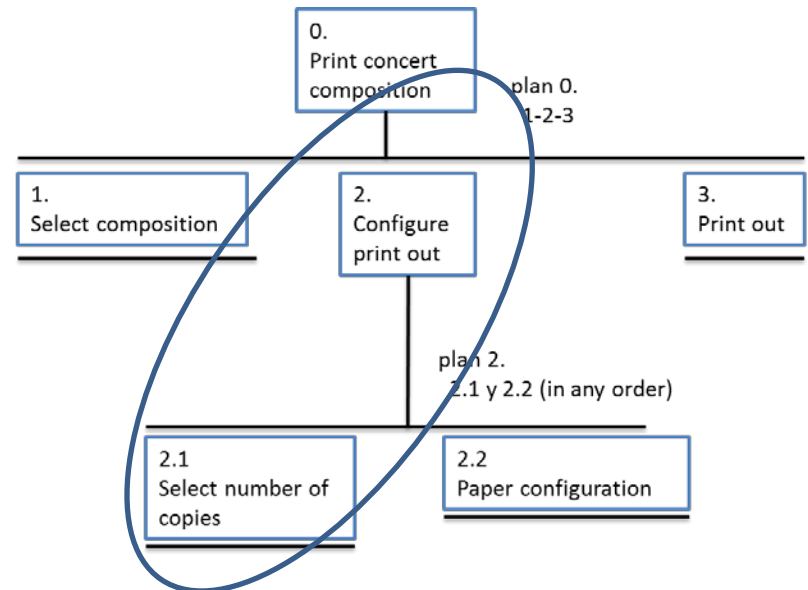- *Selects the number of copies*

Links:
- *Show printer configuration*

Objects:

Printer

Constraints:

User Actions	System Response
Selects the option to print a composition	The system asks for selecting the composition
Selects the composition	The system asks the user to introduce the number of copies
Introduces the number of copies	Shows the printer configuration (simple, doble page, orientation, size, pages order)
Sets the printer configuration parameters and request to print	Prints the composition

Task: Print a concert composition

Containers

Name: *Select number of copies per instrument*

Purpose: *Select how many copies print by each instrument score*

Functions:
- ■ *Shows the default value od the number of copier per instrument*
- ● *Selects the number of copies*

Links:
- ► *Show printer settings*

Objects:

Printer

Constraints:

Task: Print a concert composition

Containers

Name: *Show printer settings*

*Purpose*: *Indicate how to print the scores*

Functions:
- *Shows the default/ last settings*
- *Sets the printer settings*
- *Selects printing*
- *Prints the composition*

Links:

Objects:

Printer

Constraints:

User Actions	System Response
Selects the option to print a composition	The system asks for selecting the composition
Selects the composition	The system asks the user to introduce the number of copies
Introduces the number of copies	Shows the printer configuration (simple, doble page, orientation, size, pages order)
Sets the printer configuration parameters and request to print	Prints the composition

Task: Print a concert composition

Containers

Name: *Show printer settings*

Purpose: *Indicate how to print the scores*

Functions:
- *Shows the default/ last settings*
- *Sets the printer settings*
- *Selects printing*
- *Prints the composition*

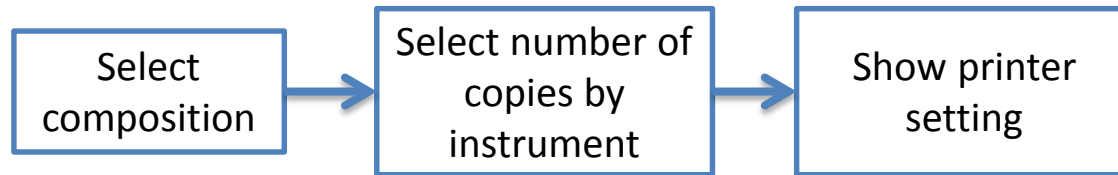*Links*:

Objects:

Printer, Composition

Constraints:
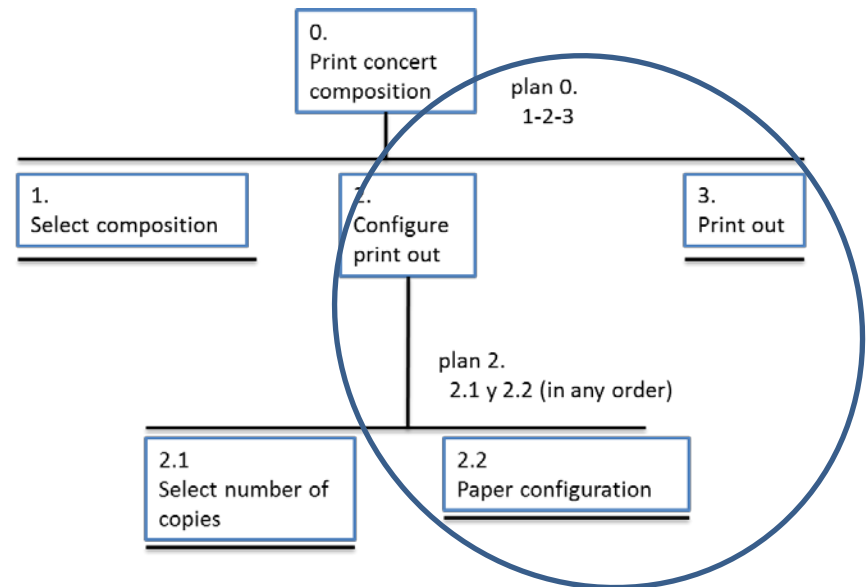
3rd. Step. Task: Introduce a composition from scratch

CONTENT DIAGRAM

Task: Print a concert composition
Content Diagram

```
┌──────────────┐      ┌──────────────────┐      ┌──────────────┐
│    Select    │ ───► │ Select number of │ ───► │ Show printer │
│ composition  │      │   copies by      │      │   setting    │
│              │      │   instrument     │      │              │
└──────────────┘      └──────────────────┘      └──────────────┘
```

Final result

CONTENT DIAGRAM

Score Management System

Container

Name: *Main*

Purpose: *Select the task to be performed*

Functions:
- *Selects print composition*
- *Selects introduce composition*

Links:
- ► *Input the data of the composition*
- ► *Select Composition*

Objects:

Constraints:

Score Management Systen
Final Content Diagram
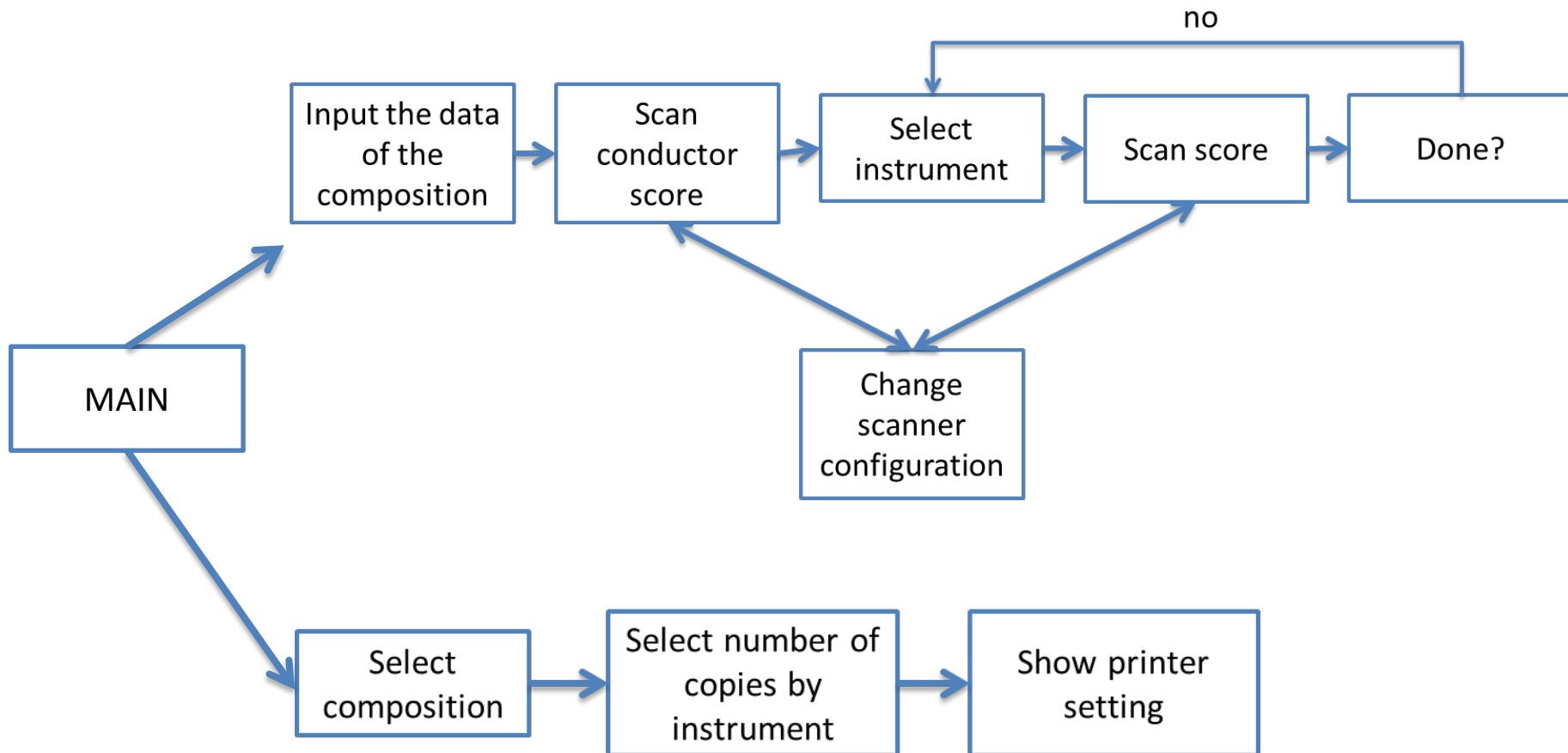
PHYSICAL DESIGN

Task: Introduce a composition from scratch
Sketches

Task: Introduce a composition from scratch
Sketches

Task: Introduce a composition from scratch

Sketches