

# xChange

A Virtual Exhibition of Piazzola

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# Broad Concept

## Idea

xChange is an open, interactive virtual exhibition surrounding the contemporary Piazzola market. The exhibition pieces together a diverse set of objects, media, data and historical facts about the market in 2019, to keep as material evidence of modern intangible exchanges. Both a metaspaces and an educational service for users, it is multi-accessible and ever-changing. xChange allows the visitor to make their own conclusions about the circumstances and time in which these items were exchanged and whether these can provide evidence of contemporary life in Bologna.

## Background

The fundamental role of the market in the development and in the consolidation of urban structures over the centuries is a highly-researched theme. Max Weber, in fact, states there is no city without its local market:

Another characteristic that has to coexist in order to talk about 'city' is the existence of a regular, not just occasional, exchange of goods [...], that is to say, the existence of the market. [...] In the broadest sense of the word, the city is a mercantile settlement. (Weber 1950).

A perfect example of such claim is the *agorà* of the Hellenistic Age, whose location within the urban tissue has always been clearly defined. The *agorà* was, in fact, a multi-functional public space: it hosted mercantile buildings alongside political, judicial and cult places—a feature that ensured many types of daily exchanges. This is the reason why it also served as a way to gather and maintain the habits of the local élite. The importance of the single buildings was constantly changing at the time, but the creation of new structures was always influenced by the old ones. Without going into details about the formation and the changes of *agorai* over the centuries, which would require dedicated research, it is important to highlight that it

is possible and valuable to carry out a comparative study of these inner centres of the city (Sielhorst 2011).

Given these premises, it is useful to spot a sort of motif of markets over the centuries—on the one hand, the architectural relationship between a market, its city and its surroundings; on the other hand, the market as a place for social reflection. This kind of research is aided by the possibility to find meaningful items within this public space- they can range from the most trivial ones—a vase, a flower—to representative objects— like statues and pictures.

Because every market that ever existed is thus material evidence of man and his environment, it becomes necessary to spend a few words about its role of social representation. In this context, the market can perfectly function as a witness of demographic change throughout history. For instance, the traditional stands of bolognese farmers who sold fruit were moved in 1877 from the city center to a dedicated coven market “for the interest of urban decorum” (Biblioteca Salaborsa, 2018). In the same year, Piazzola was born as a way to differentiate the markets meant to sell various types of goods rather than foods. As a result, in the years following the Unification of Italy (1861), Comune di Bologna began a series of operations directed towards the demographic differentiation of markets, by grouping sellers on the basis of their primary occupation. Piazzola remains one of the few that does not generally sell food.

Up to now, Bologna has maintained this division and the fact that it is possible to visit multiple markets throughout the center has become one of the main characteristics of the city. Yet, there is wide variety within each of these markets: wandering through the different stands, it is possible to witness a wide variety of goods, but also people with different backgrounds and stories that work together. In the Piazzola market of Bologna, historically the vast majority of sellers was born and raised Bologna. The demographic changes and rise in sellers with different ethnicities is especially evident now. xChange takes into account the historical and archaeological implications of the market, but also, and most importantly, the culture of the society that they are intertwined with.

## Purpose

xChange serves the purpose of researching, documenting, and contextualizing the interactions and exchanges taking place in Piazzola from 2019 on. By situating the market and its exchanges in the past and in the present, xChange provides a space for identification, social integration and cultural production. The virtual museum makes users both consumers and producers: it provides a space for users to both learn about and contribute to the digital archive. Overall, xChange is a time capsule for the preservation of sociological facts and collective memory.

## *Education*

One of the key purposes of xChange is education. As a place for historical learning, xChange invites visitors to become better acquainted with the multi-faceted history and importance of markets and exchanges in the development of social, political, demographic and even architectural aspects of cities and towns. The museum aims at providing information about the history and importance of the Piazzola itself, as well as of the varied items that have been sold and are currently being sold in it.

Deloche 2001 sees a virtual museum as a concept that globally identifies the problem areas of the museum field—specifically the effects of the process of contextualisation and recontextualization (Deloche 2001). This idea was central to the development of xChange, as it serves the purpose of both contextualizing and recontextualizing certain images, words, facts, and products for the visitor to think about their origin, creators, management, and life cycle. As a mediator between seemingly innocuous recordings—visual and auditory—of daily exchanges, xChange also serves an educational purpose to the viewer in relation to themselves and the reality of the society surrounding them:

This approach makes the museum, the custodian of the evidence and signs of humanity, one of the best places for this inescapable mediation which, in offering contact with the world of cultural works, leads each person on the path of a greater understanding of self, and of reality as a whole. (Desvallées & Mairesse 2010, pg. 48).

In this way, xChange situates the visitor in the social and political reality of the Bologna in which they are living or visiting. This includes information about demographic and ethnic diversity, affective and factual information about immigration and change in general.

### *Heritage-Based Learning*

By its mediation of the history and present of exchanges in a geographically designated area, xChange also ventures into the area of heritage-based learning. Specifically, the virtual experience links the ideas of markets as key stages of sociological development with the actual people engaging in them. In this way, it provides answers and questions regarding who the main actors have been and are at the Piazzola, making the visitor think about who counts as an Italian “exchanger” or trader in 2019.

This dwelling into Piazzola as a place for Italian or, perhaps more accurately, Bolognese identity also lends the virtual museum a purpose as a place for identification. In a way, the hope is that xChange will let new generations of Italians with different ethnic backgrounds or with immigrant stories to “see” themselves in a piece of archeological and sociological history. Its focus on learning about and “humanizing” sellers aids in the social integration of some of the sellers. This social role of a museum as a place of cultural identity has been identified by the Universal Declaration of UNESCO on Cultural Diversity, 2001 and by the *Convention sur la protection et la promotion de diversité des expressions culturelles*, UNESCO 2005. As a service for the preservation of collective memory—of the visual, auditory and conceptual experience of a slice of Bologna in 2019—xChange also serves as a promoter of social integration.

### *Archival*

Another crucial focus of xChange is its conceptualization as a “time capsule” of what a Bolognese market looks, sounds, and feels like in 2019. In this sense, xChange has an archival role, of contemporary content and media as well as the cultural production taking place inspired by it. This archival purpose is guided by two main

endeavors: first, the acquisition of original media assets in April and May of 2019, and second, monthly 'screenshots' of the online presence of the market (through Google reviews and public Instagram pictures). The virtual museum creates a database from all this content, which is public, usable and searchable by users. Therefore, xChange serves to support search and discovery by users to access its rich set of digitized materials. Additionally, content stored in these archives will in the future be available to be utilized and combined to create different thematic projects, including perhaps more online virtual exhibitions or sociological research.

## **Design Concept**

The virtual museum is guided by the concepts of metaspaces + metadesign, as well as interactivity, multi-accessibility and installability. While xChange is itself focused on a real, physical location (the market at Piazzola), its status as a co-creative virtual museum warrants its definition as a non-space. xChange functions as a service rather than a location, which provides the visitor with opportunities to re-learn, imagine and co-create cultural heritage in an open, interactive, and tailored way.

### Interactivity, metaspaces, explorability

Interactivity of an open exhibition like xChange is based on the existence of open patterns for the virtual visitors to approach the virtual object(s). The user can then tailor their path from beginning to end, and in any case this course of action is not going to alter the meaning of the exhibition itself. This concept implies a very specific definition of virtual location. In fact, it differentiates from a physical place-although it is something that can be found in a permanent way, it is better to talk about metaplace when referring to virtual exhibitions like xChange (Giaccardi 2006). Gibbs and Tsihritzis too, when coining and giving a definition to the term 'Virtual Museum' (1991) focus on the fact that virtual realities in the cultural heritage tend to serve more as services rather than locations. As a matter of fact, this kind of service aims to serve as a cultural mediator through the storage of meaningful information. In this way, the user has multiple ways to learn thanks of the many tools of different

kinds that the virtual environment provides--it can evoke memories, feelings, and even past experiences through the means of an emotional approach.

All in all, xChange is meant to be a highly interactive project. The user can choose where to begin to enjoy their experience and move around how they want. Secondly, they can directly contribute to the exhibition with their own reviews, uploads of their own Instagram posts or audios. All of these actions are fundamental to develop a new, collective imagery of Piazzola and to connect it with the archetype of the market 2.0. Read more about the specifics of interactivity in the “Output” section.

### Accessibility/Installability

According to Schweibenz (1998), digital objects in a virtual exhibition are special given their multi-accessible nature (including their remote accessibility). xChange is meant to embody this concept, since it is a multi-accessible experience that brings the user to feel more involved into the experiences presented.

Not only is the website responsive, and can thus be accessed from every device with an internet connection, but it also actually provides downloadable offline documentation (such as user guides and other tools, see “Documentation”). The main design concepts of xChange surrounded the idea of individual users/visitors interacting with the service and tailoring their experience as they want. Furthermore, xChange offers the possibility of translating the website experience into a physical experience.



# Output

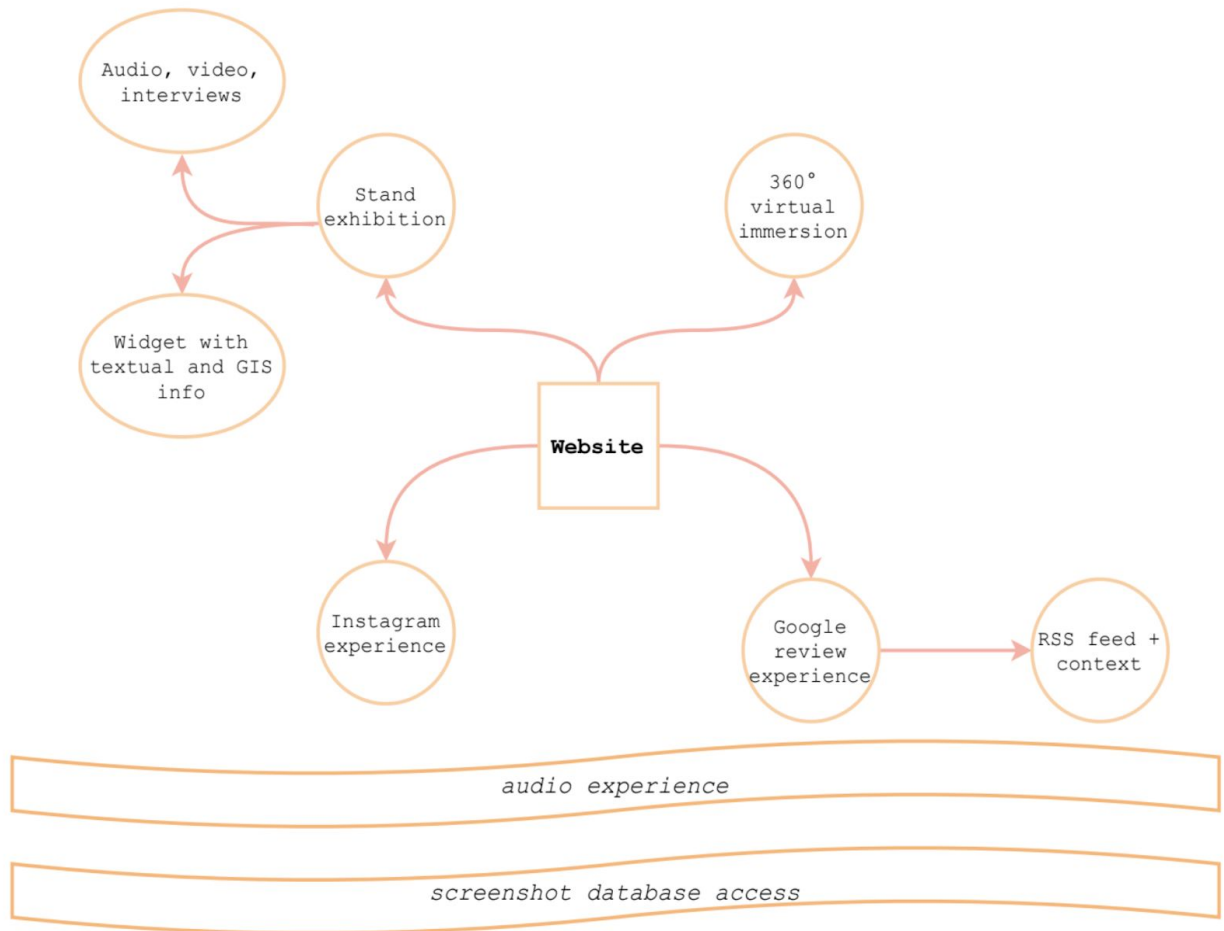


Figure 1: Diagram of the multi-modal output of the xChange project.

The outcome of xChange is meant to provide a unique experience to visitors. It is mainly a multimedia service accessible through an Internet-connected website. As an open experience, xChange allows different user patterns to emerge, as the visitor can begin the visit from the resource that she likes and end it where she wants. Specifically, the user is presented with a birds-eye-view map of the Piazzola, and is invited to choose one of the location markers (which represent the exhibition stands). Additionally, the user can find other entry points to the museum from a widget on the site. Throughout the virtual museum experience, the user will experience site-specific audio, which begins at the loading of the main page. From

the starting point of her choice, the user can then explore a variety of services: Piazzola stand exhibition, a 360 experience, a Google Review experience, an Instagram experience, and more.

## Stand Exhibition

The Stand exhibition involves different kinds of multimedia materials. Entering the chosen stand, the user would be able to hear its background noise while seeing related pictures and videos. Information and selected quotes from the interview can be viewed at any time. This way, xChange takes advantage of multi sensorial inputs in order to create an immersive experience. Another feature of this exhibition is a box on a sidebar containing information about the specific seller—who are they as a person and how can we connect this data to the story they tell?

## 360° Virtual Experience

One of the main features of the exhibition, which guarantees a fully immersive experience, is the creation a 360° experience through the use of immersive virtual software. Thanks to camera work in panorama mode, the experience includes the possibility to wander around Piazzola and listen to the background noise of multiple points around the Piazzola. As an extremely dynamic environment, the people in the market cannot be captured in stable way. This means that the outcome virtual experience would be defined by a dynamism and even shapelessness that transmits the feeling of movement and energy exchange.

## “Bolognesizzatevi!” - Google Review Experience

From a widget, the user can access the Google review experience. It is an ongoing collection of data about Piazzola on Google reviews, both in English and in Italian. Both languages are displayed on one section, along with an ever-changing five-star animation reflecting the current “status” of Piazzola on Google reviews.

The choice of displaying English and Italian and not just one of them comes from the fact that there is a noticeable difference in perceptions of the market when

switching from one language to another. Therefore, xChange has the feature of filtering the reviews by language and by specific words. The user can search any word they wish, or choose one of the default ones [exchange, immigrant, quality, prices, bolognesizzatevi]. The user would then be presented with a list of reviews that contain the chosen word(s).

In order to provide an explanation for the criteria of the words selection, xChange redirects the user to an additional page in which the political context of Bologna 2019 is explained. To aid this explanation, an RSS feed of news about Piazzola is included. The purpose of this last addition is to gather all the news related to the market, in order to make an explicit connection between words and the contexts in which they are used. To encourage further thinking about the whole experience, a most-used words cloud is shown at the bottom of the webpage.

Additionally, another section will contain user-provided xChange reviews—that is, reviews about the virtual exhibition itself—with its own five-star animation. The rating of this section changes as the user leaves their rating and their own thoughts behind. This is a unique aspect of xChange as a virtual exhibition: it allows and invites users—whom may have never been to Piazzola, nor have ever even seen the other exhibitions within xChange—to inject their own judgments, prejudices, and general thoughts at any point of their virtual visit. Since the act of writing a review doesn't come with limitations, the project is actually meant to focus on collective conceptions and their consequences. When a user contributes to the webpage, they are influenced by their previous experiences, from direct witnessing of events to just word-of-mouth, so that these ideas will never be unbiased. As each review contributes to the final rating, as shown on the animation, the user can see how much their thoughts can make a difference. Perhaps they will carry on with the other exhibitions of xChange, and then come back to change their impressions, or if not, they would still have something to reflect on during their daily lives.

The possibility to carry out a custom word search, along with the fact that the user can write their own review, make the Google review experience very interactive. In

this way, the meaning of xChange itself changes and evolves with the people that take part in it, with their own backgrounds and personal thoughts.

### Instagram experience

Considering social media is one of the pillars of today's sociological researches, and one of the best ways to acquire data about people, xChange also includes an Instagram experience. A custom Instagram feed is composed of the latest 20 pictures geotagged or hashtagged in Piazza VIII Agosto, and it changes every month. Therefore, everyone can contribute to its dynamics while, at the same time, observe what other posted about it—was it just a selfie with friends or a picture documenting the trash resting on the ground at the end of the day? The user can periodically see trivial and non-staged witnesses of Piazzola at a specific time of the year, but the selected number of the posts shown at once reminds them it is just a limited point of view. Implementation of this feature is made with Elfsight apps.

### Documentation

Before starting to navigate, it is useful—but not necessary—for the user to have a look at the documentation that comes with the project. These .txt files are contained in a zipped folder directly downloadable as the website loads and contain:

- a) a document specifying the technical requirements to access the exhibition, both Operative System-wise and browser-wise;
- b) a document specifying the process and necessities for the implementation of the virtual museum into a physical space.

## **Physical translation**

The multifaceted content of xChange allows it to be translated into physical space in many ways. This tangible correlation is fundamental to fully understand how the location of an ever-changing environment can influence its surroundings. Although every case of implementation would be unique, the power of this multi-sensorial experience would irreplaceably cause an observable pattern in the visitors' reactions. This translation provides a different point of view, and thus a different set of priorities

and tools that have to be implemented in the future. In this case, for example, it would be necessary to take into account many people visiting the location at once and the relationship between space and sound.

What would be the best ways to capture the essence of xChange and make it even better with concrete elements? A possible physical translation of the 360° experience would have additional features, such as surround sound representing the real sources of sound, and a virtual headset to make the experience more immersive. This and other additions would firstly require an isolated space, preferably a room, not necessarily big but possibly circular, with a projector, a headset and high-quality audio systems. Other high-tech items—such as touch-screen tables with handwriting recognition for the Google Reviews experience—could make the physical experience even more interactive.

Furthermore, xChange as a whole can also be implemented with additional features—it is not only about including more Instagram pictures, but also, for instance, about the creation of educational games or the connection with other markets of the world.

## **Methodology**

xChange—as a multi-part service—was designed and implemented with a detailed workflow that spanned from the choice of equipment, to the preparations such as feasibility studies and theoretical research, to the implementation of a pilot project and the conceptualization of a final implementation:

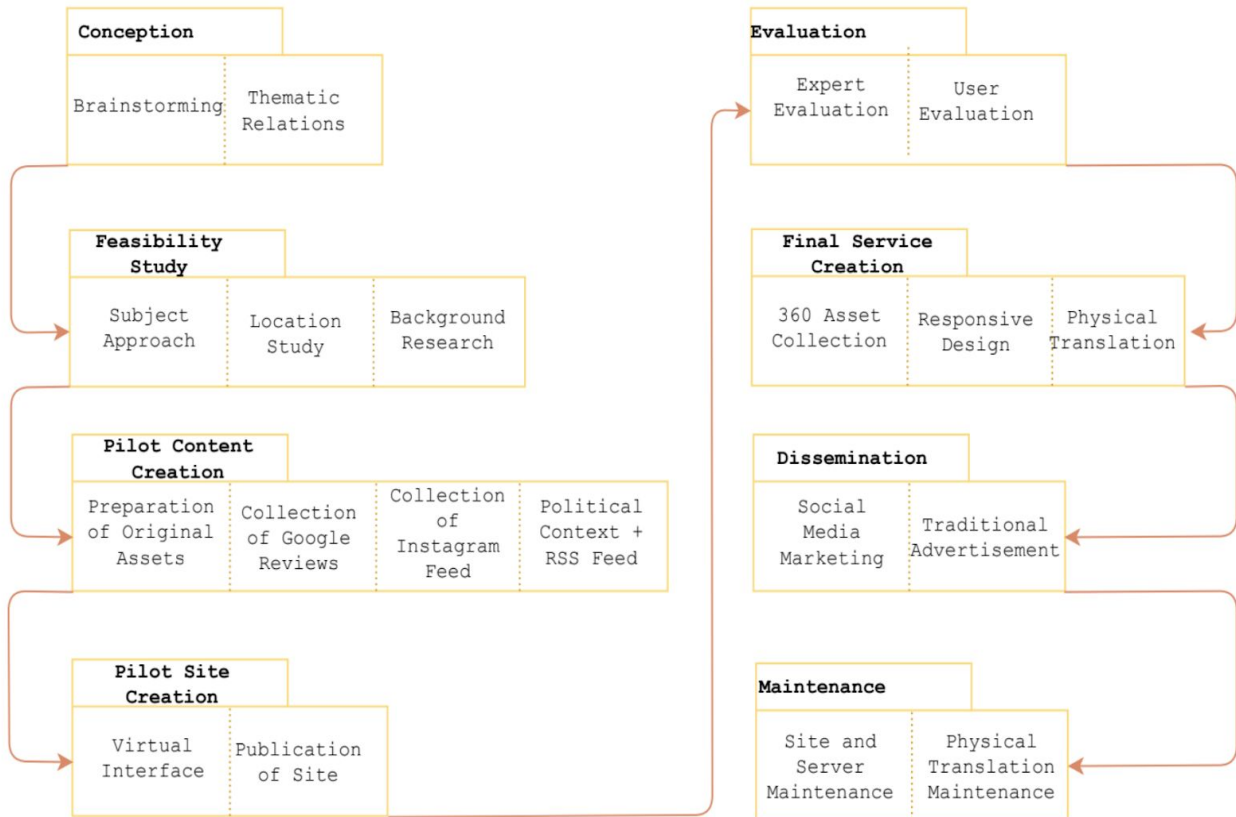


Figure 2: Diagram of the methodology and workflow of the xChange project.

The workflow for the implementation of xChange was based on the following outline of the methodology:

A. Equipment

1. Photographic and Video Camera
2. 360 Degree Camera
3. Voice Recorder
4. Computer with access to internet
5. Software (GIMP, Panorama, JavaScript packages, etc)
6. Bibliography for research

B. Stage 1: Preparation

1. Feasibility study (at Piazzola)
  - a) Subject Approach
  - b) Location Study

c) Background Research

C. Stage 2: Pilot

1. Preparation of original digital assets
  - a) Virtual assets collection (at Piazzola)
  - b) Refinement and selection of assets
  - c) Asset database production
2. Collection of Google reviews
  - a) Selection of relevant reviews to include
  - b) Coding of interface
3. Collection of dynamic Instagram feed
  - a) Writing of Instagram algorithm/software to use to collect dynamically
4. Creation of the RSS Feed
5. Graphic design of the virtual interface
6. Publication of the website
7. Dissemination to stand owners and Piazzola at large

D. Stage 3: Final Product (Additions to and refinement of Pilot)

1. 360 Panorama Virtual assets collection (at Piazzola)
2. Creation of VR experience
3. Expansion to off-line experiences

## Pilot Project

The pilot project containing partly-implemented experiences as explained in the “Outcome” section can be found in [xchange-piazzola.github.io](https://xchange-piazzola.github.io).

## Evaluation & Maintenance

### Evaluation

xChange is a Virtual Exhibition, therefore usability is a main interest to consider during its evaluation. According to ISO-9241 (Ergonomic requirements for office work with visual display terminals) (ISO 1998) standard, “usability of a system is its ability to

function effectively and efficiently, while providing subjective satisfaction to its users". The same source identifies five main parameters to study the usability of an interface: it has to be easy to learn, efficient to use, easy to remember, it has to have few errors and, most of all, be pleasant to use.

In order to carry out a complete evaluation, both formative and summative approaches would have to be taken into account. The first one is considered when designing the interface, while the second one when there is the possibility of an upgrade of the finished system and it therefore relates better to maintenance.

Furthermore, two main actor groups would have to take part into the evaluation—experts and users. While the first group would have to answer a previously-established questionnaire (QUIS 2005), the second one will be given a custom one. The main difference between the two would certainly be in the questions—the group of experts, composed by museum curators, would have more knowledge to answer specific questions with technical terminology. On the other hand, what would be interesting to know from users would be what engaged them best and what they liked the least—something that concerns more their thoughts and feelings rather than the technical side of the exhibition. Also, the survey would have to involve a minimum of 100 people to have a sample base large enough. Some examples of questions they would find on a dedicated page of the website would be:

- Would you recommend xChange to friends? Why or why not?
- What did you like the least?
- Did you learn or gain anything from xChange?
- Have you written your own Google Review?

Lastly, user-based evaluation is meant to be way less time-consuming than the other one, since the average visitor doesn't want to waste time. Although this last method is more biased than the one carried out by experts, all reviews are equally interesting and formative. They will be kept into a constantly-updated database, and collected for an yearly review of xChange.



## Maintenance

The maintenance of a virtual exhibition closely relates to remaining up to date with the latest technologies. There should be a periodic upgrade of the system, the server and the softwares involved, as well as a check up on whether the website is still supported by the most used browsers.

According to the aforementioned summative approach, a report about the meeting of the exhibition's goals and objectives written at the end of the year should also make some points about the direction towards which the project is headed. When considering the maintenance of xChange, in fact, the user perception of system benefits would have to be principally taken into account. Thanks to evaluation surveys, it is possible to acquire knowledge on the main factors to focus on when working on enhancing the exhibition. Finally, cost-effectiveness and cost-benefits analyses have to be addressed as well, determining how efficient the virtual exhibition is, year after year, with respect to its cost.

In the case of a physical translation of xChange, this last point about funds is particularly relevant for its maintenance, as it is closely connected to the lifetime of electronic appliances. All in all, summative data collected during evaluation are, again, the main tool to start from when maintaining xChange in a physical environment. In this case, too, a yearly report is necessary to keep track of the progress made so far, and to note emerging issues that need to be taken care of.

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# Appendix

Interview questions for sellers:

- Can I record this?
- What's your name?
- How has your day been going so far?
- What time did you set up?
- How early did you have to get up?
- How long does it take to set up?
- Do you do it alone?
- Shifts?
- Do you eat here? What? From where?
- What's your favorite place in Bologna?
- How long have you been doing this?
- Have you always sold the same products?
- Where do you get them from?
- What's your favorite item that you sell?
- Are you from Bologna?
  - How long have you been in Bologna?
  - In Italy?
  - From where?
- What is your relationship with customers?
  - Do you have loyal customers?
  - Do you enjoy talking to them?
    - In what language?
- What is your role in this stand? (owner, worker)
  - What is your relationship with your boss?
- What do you do during the week? Main job?
- What percentage of your income comes from the market?
- What happens when it rains?
- When do you like being here the most? Winter? summer?

- Do you buy from other stands?
- Are you friends with other sellers?
- What percentage of other sellers would you say you know?
- Competition with other stands with similar products?
- What are the main problems you encounter while doing your job?
- What time do you leave?
- How long does it take you to put everything away?
- What do you do with the trash?
- Do you keep unsold products?
- Do you use your own products?
- If you could sell anything, what would you sell? Why?