

DESIGNING EMOTIONAL SERVICES FOR UNDERGROUND STATIONS

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Abstract: Underground stations, while offering necessary access points to public transportation service facilities, offer great opportunities of urban dinamization. The paper presents the results of a design project aimed to improve the travel experience of passengers in the local transportation system. The design activities were based on ethnographic research on field, demonstrating that the quality of social interaction is a relevant component of the travel experience, also influencing emotions and psychological wellbeing of passengers; the design solutions were provided in terms of innovative collaborative services and produced a variety of suggestions about the potential role of non tangible solutions in the creative improvement of public spaces. The paper presents the results of the ethnographic investigation, outlines the design methodology employed, and reports some designed solutions.

Keywords: *service design, interaction design, collaborative services, perception studies, cognitive processes, emotional service design.*

1. Introduction

Underground stations are core points for urban social life. Every day, a large number of citizens cross the access areas leading to trains, spending a non negligible time in transportation activities; even in a middle size city like Milan, some intersection stations count daily more than 100,000 travellers and the efficient working of the service influences significantly the quality of life of individuals and of the community as a whole.

During the travel, the users live an experience that is produce by several different components: the efficiency of the transportation process, the quality of stations and train physical environments, the interaction with the company employees and other travellers, the presence of subsidiary information and services, and so on. The quality of the travel experience plays a non-negligible role in the global image of a town; it can be taken as a measure of the efficiency of the public administration government and an indicator of the city values.

In several towns, such as Zurich, Stockholm, Amsterdam, underground stations are magnificently designed and appear as interesting places worth to be visited; in other cases, such as in New York, stations have often essential dimensions, and consists only of a simple thresholds and stairs system to allow access to trains. In Milan, like in several other towns, underground stations have usually large dimensions but are conceived as functional spaces, and in most cases offer quite a modest appearance although clean and quite comfortable. While the local administration is making a great effort to

enlarge the urban area covered by the service, little importance seems to be paid to the aesthetic requirements.

During the last two years, our institution, the School of Design at Politecnico di Milano, together with the Milan school of art, Accademia di Brera, have cooperated with ATM, the local transportation company in Milan, in order to investigate the opportunities of improving the travel experience for underground users in the MIND – Milan Network Design project.

The authors of this paper cooperated with this initiative and carried on design activities with students of master course project laboratories of “Interactive system design”. Final presentations of designed solutions were prepared to appear in purposely created multimedia gazebos located inside two between the most populated underground stations in Milan.

The design activities faced a number of tight constraints:

- *Safety issues.* Due to topological characteristics and symbolic factors, the whole underground system is considered as critical from the safety point of view. The different aspects of security include severe factors as fire events, terrorist attacks, crime phenomena, and so on.
- *Non-interference* with the main performances of the transportation service. As the core performance is transportation, individual activities should not be interrupted or delayed and designed solutions should not interfere with the normal traveller flows. Individual needs of privacy should also be taken into account in the design of interactive solutions.
- *Non-invasive character.* Designed solutions should not be invasive or require significant physical changes of interiors. This constraint rises from economic reasons and other factors related also to way finding issues and to the relevant role played by advertising postings.
- *Acceptability requirements.* As the public transportation service is a public facility offered to all citizens, it is important to take into account acceptability needs in the widest sense.

Given the constraints, in the authors’ opinion it seemed mandatory to organize an activity of intense analysis of all the factors influencing the travellers’ experience also involving the students participating to the project courses. The design final goal was the creation of solutions capable to modify the emotions related to the travel activities without interfering with them and without modify the physical characteristics of spaces; in order to produce events, interstitial while relevant from the emotional point of view, we first had to better understand the complex of emotions that are relevantly associated to the underground travel experience. Then, the solutions had to be designed in terms of services, i.e. nonmaterial interactive systems offering functionalities, information and supporting user activities; the main goal was not the satisfaction of practical need, but the improvement of users attitude and feelings toward the local context and the transportation system as a whole.

2. Understanding the travellers experience

In the design of public utility services, usually the attention is directed toward the solution of practical problems and aesthetic gratification is considered as a secondary (Maiocchi 2011). More, in the design of interactive solutions, aesthetic effects are often taken into account only with respect to material or visible artefacts employed in the service delivery: web interfaces, graphic design to support brand identity, physical appearance of service touch points, and so on.

But from the user’s point of view, interactive processes mainly determine the quality of a service and during the design or the re-design of an interactive system; special care should be given to dynamic aspects of the experience. Furthermore, as it has been deeply investigated in game design theoretical studies (Bogost 2007), procedures and sequences of actions can be designed as powerful rhetoric artefacts; as well described by Vilayanur S. Ramachandran and William Hirstein in their “The Science of Art” the authors believe in the law of “Perceptual problem solving” by which the discovery of an object after a struggle is more pleasing than one which is instantaneously obvious.

To produce effective solutions, we needed a better understanding of emotions and feelings related to the fruition of the underground service and to the physical environments (station spaces, platforms, train interiors, and so on).

The analysis phase was carried on with a variety of techniques:

- Ethnographic research on field in the tradition of contextual design (Beyer 1997) including interviews, forms, activity observation and modelling;
- Self-reflective analysis of personal experiences as traveller;
- Quantitative analysis of social behaviours also including the tracking of most practiced routes, interaction between strangers, space occupation, walk speed in the different contexts and so on;
- Observation of measurable factors usable as indicators of people feelings and emotions: postures, gestures, facial expressions, walk speed in the different areas of stations, availability to conversation and so on;
- Analysis of people reactions in presence of purposely organized performances;
- Collection of *extreme* cases of observable events and behaviours taking place in Milan underground stations and trains;
- Collection of digital documents available in social networks (YouTube, Twitter,...) providing hints of events, opinions, personal stories related to the underground services around the world;
- Collection of video excerpts extracted by popular movies and set in an underground environment.

As observation on field played a fundamental role in the understanding of the underground context and phenomena, we organized them carefully together with the students. The service opening hours were divided into time segments characterized by homogeneous crowding conditions; each group of students spent a few tenths of hours in the underground stations observing travellers in the access areas, in the platforms, inside the trains. The variable observed included face expressions (for which a reference palette was previously defined), body attitude, activities, walk speed. Some students performed also around forty shadowing to measure walk speed and change of attitude in the areas just outside the stations and in the different location in the interiors. Others observed the willingness of passengers to crowd in small and medium size groups and established a relationship between the observed data and the events taking place in the town (as an instance, football match). Furthermore, with respect to the passenger behaviour in the access locations, we maintained a distinction between the data concerning the travellers entering the stations with respect to those leaving the ground.

On the whole, the observation activities involved sixty-three students that spent a total of few hundred hours in the underground system. Most of these observation activities were performed without interfering with the environment. We collected a great amount of materials, but as the course was mainly project focused, we were able to process only a part of the collected documentations.

Anyway this documentation demonstrated the potentialities of the observation methodologies and a number of different phenomena were observed. As an instance, one student spent three hours sitting on a bench in a platform keeping a camera on her knees, and made a video documenting manifestations of anxiety. Other students collected a number of peculiar behaviours that could provide an interesting base to re-design train interiors.

Some groups interfered with the normal travel routines and organized some little events to verify previous intuitions concerning people behaviours. As an instance, some students prepared some peculiar posters to be hanged on station and platform walls and spent hours observing the reactions of travellers; thanks to these experiment they could ascertain the quantitative and qualitative information about real passenger attention with respect to poster communication.

The great amount of information gathered during these activities was analysed in order to ascertain the most common mental attitudes of travellers during the trip experience. A number of behaviour trends, personal strategies, recurring situations and social positions were brought to evidence; the population travelling in the underground was classified in a number of different *ethnic groups*, each one characterized by a mind attitude, a physical behaviour, or a strategy. We present in fig. 2 an example of the deliveries produced by students at the end of the observation phase.

The classification confirmed a quite diffused tendency to self-insulation for most lonely travellers: as expected, depending on the time of the day, boredom, anxiety, sensitiveness were quite diffused since

life style in Milan is quite frenetic; furthermore, observation and experiments revealed a statistic scarce attention toward commercial advertising and other visual events animating the environments. On the other hand, a number of personal *survival strategies* were evidenced providing interesting inspiration to project. Our underground seems to be populated by *readers, space invaders, hygiene fanatics, sleepers, chat catchers, workers, music listeners, phone users*, and other species capable to invent practical solutions to feed their personal needs during the trip. The trip experience seems to be much more pleasurable for people that have the opportunity of social company: small or big companies use the travel time to talk about a variety of subjects: work matters, personal confidences, sports, shopping wishes and so on. Also casual conversations with unknown partners (when not roused by unintentional offense), seem to bring positive effects on the atmosphere, also influencing the neighbour area attitude. Quite controversial is the effect produced by animating events, such as the presence of music players, beggars, noisy people or lively children.

As an instance, as confirmed by the observation data, the walk speed of several passengers (mainly women) accelerate when entering the descending corridors; several women change the bag position entering into the underground; the space disposition of people and personal postures change when the train leaves the underworld entering into the open-air parts of the route.

While absolute mind disposition are impossible to identify and measure, physical changes can be taken as a signal of a modification of emotions, attention, and attitude especially when they show systematically. The modelling of people behaviour and emotional attitude were supported by knowledge provided by brain sciences and neuroscience literature explaining human conscious and non-conscious mental processes, empathy phenomena through mirror neurons effects, decision processes and emotional mechanisms related to action.

In Figure 1 we report one of the schematic models assumed in the analysis of users' cognitive processes.

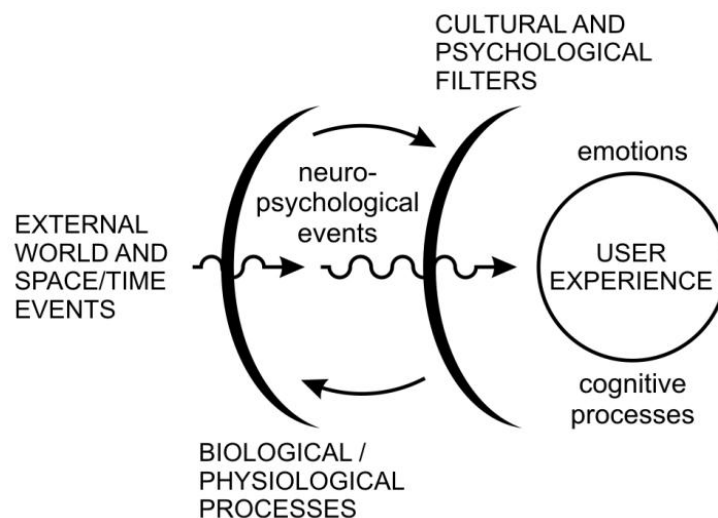


Figure 1. A basic model of human perception processes (see Maiocchi2011)

In most cases, the behaviour of individuals seems to be quite affected by the presence of other travellers and most people seem to be willing of being considered coherent with the dominant attitude and not noticeable. In other words: people tend to avoid any kind of contact with other unknown passengers and try to develop strategy to avoid conflict or interaction.

Observations also demonstrated a diffused sense of anxiety generally related to the permanence in the underground contexts probably related to the specific topological conditions of confinement in closed tunnels. This phenomenon can be ascribed to a number of different reasons such as claustrophobic

effects related to the physical characteristic of the environment; suggestions related to literature and movie memories and due to the fact that underground trains and stations offer ideal sceneries for suspense actions; automatism often related to *train catch* experiences regardless to a real condition of haste.

In movies, underground contexts often provide the scenery for thrilling actions, offering intricate paths with obstacles, corridors and stairs; the feeling of oppression related to the mouse trap suggestion and the metaphor of the labyrinth way finding experience create the ideal set to communicate the prisoner escape run feeling. And, as documented by media news, in some cases underground stations can be dangerous, especially when and where the passenger frequency is lower.

As a synthesis, social interaction in any sense plays a crucial role in the final perception quality of the travel experience. In normal conditions of working, i.e. when the basic transportation service functions are efficiently delivered, passengers experience is significantly influenced by the presence of other travellers.

Crowded platforms and train vans are often associated to feelings of anxiety, nuisance, annoyance, distaste. In the presence of high people density, simple manoeuvres such boarding and getting out, taking place and getting a sit, offer the opportunity for competitive behaviours, little verbal aggressions, reproachful glance exchanges so causing irritation, frustration, or simply (and mostly) a careful attention in avoiding any kind of interaction with other people.

On the opposite, while the service fruition is obviously easier when few travellers are in the area, in less populated spaces the presence of other individuals is felt as something that must be checked up in order to avoid unpleasant events.

On the other hand, when people have the opportunity of positive social interaction in some form, from a simple exchange of smiles to a full conversation, including some speechless collaborative gestures, the flavour of the travel experience appears significantly improved.

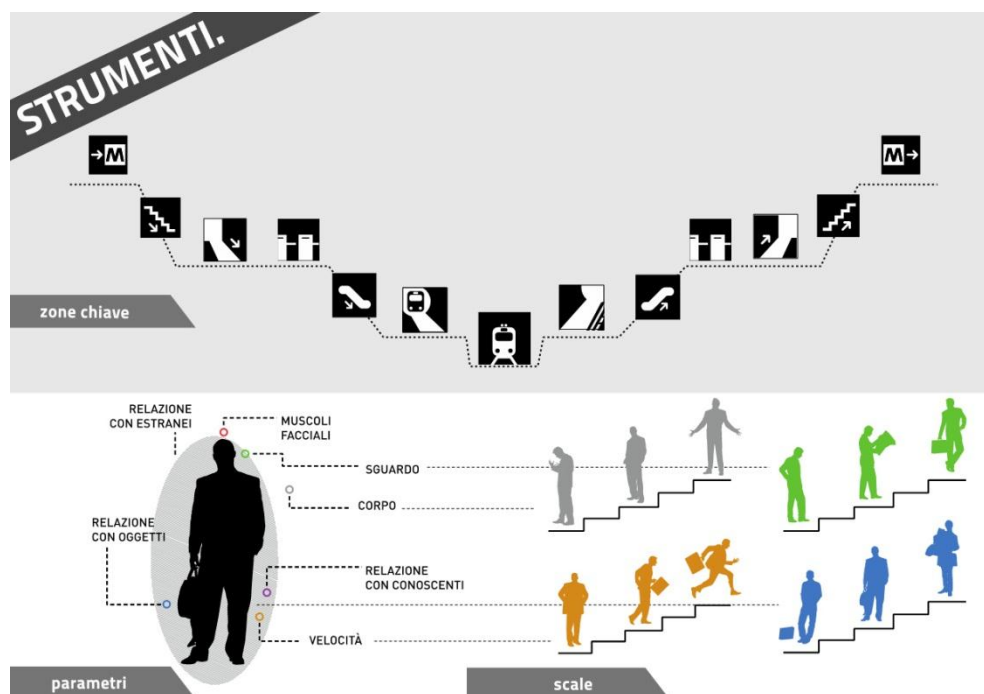


Figure 2. An example of the final results produced during the observation phases of the project. S.Acerbi, M. Arduini, P. Berardelli, M. Corradini produced the representation. In the upper part of the image, the different locations of the underground system that were taken as a reference are represented; in the lower the scheme of the observed variables.

3. Designing services to improve travellers' experience in the underground

A number of different interactive solutions were designed during the project courses on the base of the observation activities reported above.

It is important to stress the fact that the search of concept in terms of collaborative or participated service design was not imposed but descended directly from the constraints imposed by the context and by the guidelines provided by the observation phase.

In most cases the design concepts were entirely finalized to the improvement of emotion and mental attitude during the time spent in the underground spaces: stations, platforms, vans. In the design of new concepts, the results of the analysis provided inspiration in three different directions. A first approach focused in the solution of a specific source of disappointment or discomfort, trying to modify people behaviour or to induce awareness about the consequences of travellers' actions. As an instance, passengers experiencing a frustrating event (as an instance, a stressing coming out of a train van in crowded hours), often don't dare to manifest their annoyance directly to the actors involved in the action, but tend to express their indignation indirectly speaking to other passengers during in a subsequent time; in order to support frustration burden, a group of designer (F. Fracapane, S. Leso, F. Perrotta), proposed a digital version of the antique *cahier des doléances*, a sort of electronic ear audio-recording the comments of travelers enfacing disappointment produced by the other passengers uncorrected behaviours. Comments, remonstrance and suggestions produced by travellers would provide a living school of good manners and a sort of new politeness guideline collaboratively generated. The recorded voices could be conveniently mounted and broadcasted in the underground spaces so providing entertainment and education.

The second approach focused on self-generated solutions adopted by travellers to cope with negative emotions connected to the travel experience. As an instance, as several passengers cope with the tediousness of the trip reading – reading everything, everywhere – a number of solution can be designed fostering this attitude a providing qualified reading materials on digital supports and also available on personal smart phones, but available in the underground local environments, also employing gamification mechanisms of social content sharing. Furthermore, music is a preferable solution to boredom for several travellers, but quite often the presence of passengers hearing loud music still audible through the headphones produces disappointment in the neighbour people; to face with this two opposite and legitimate attitudes, M. Bernardi, I. Murrau, and L. Pome' designed a solution based on dedicated vans, identifiable at sight by special decorations, dedicated to underground music consumer, where special broadcast programs would also encourage socialization between passengers.



Figure 3. A schematic representation of the solution designed by S. Bonafini, E. Cattaneo and M. Ider.

Finally, following a third different approach, S. Bonafini, E. Cattaneo and M. Ider designed a very simple and effective solution starting from the observation that several people are quite keen to collaborate with other travellers if kindly asked; in some cases, passengers are quite willing to give information and explanation provided that they are not too much in a hurry and from the experiments performed during the on field activities, it appeared that giving information is a gratifying experience, and an opportunity to proudly demonstrate the personal familiarity with the local environment. The role of the designer in this context is the capability of support the match between people needing information and travellers willing to offer support. The designed solution, that is schematically represented in fig. 3, consist of a very simple artefact: a simple orange circle (employing the official colour of the local transportation company), providing a *query area* where a person needing information can place in order to communicate the need of help without facing the effort of a direct search to all the passengers.

All the services were designed following an approach based on service representation including scenario description of user experience also taking into account worst case and start up activities; actor/motivation system analysis; interaction simulation aimed to prototypal service enacting and testing.

4. Comments and conclusions

Public spaces such as underground stations can be dinamized introducing services and interactive solutions aimed to promote different and more pleasurable social interaction. Service design is mostly finalized to the solution of practical problems, but should be seen also as opportunity to broadcast social metaphors also promoting new lifestyles.

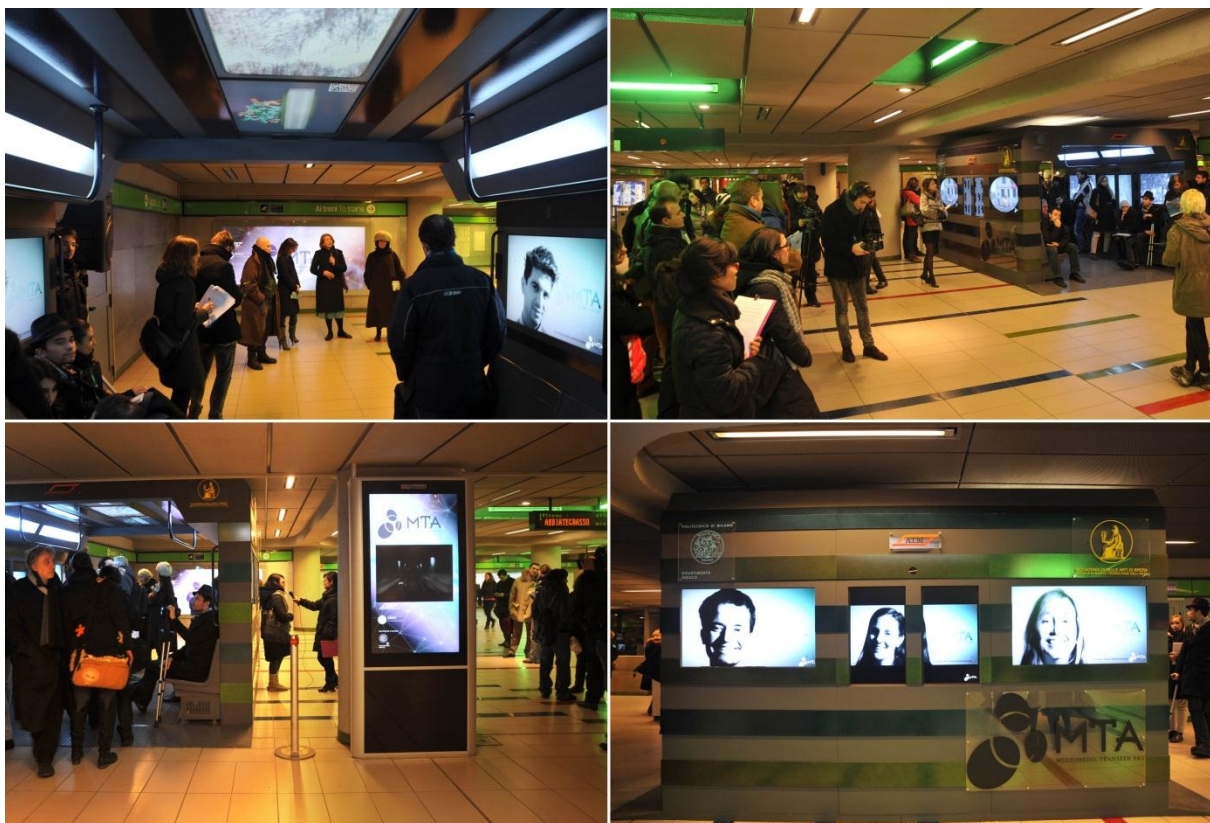


Figure 4. One of the two multimedia gazebos for the presentation of student works inside Garibaldi underground station in Milan we shared with the Accademia di Brera.

In the teaching and design experience reported in this paper, we demonstrated that the quality of travellers experience is strongly influenced by the social relationship between the passengers. An

improvement of the social attitude would create a better context but also would give a contribution to solve practical problems, such as safety. The involvement of passengers in collaborative services appears as an ideal approach to promote a new and more open attitude toward social interaction in the underground environment. In this case, services were designed keeping in mind more the social goal than to solve practical needs.

Students were actively involved on field observation and analysis. It was a meaningful experience for them and they fully understood the importance of activities finalized to in depth understanding of user experience complexity. While most of them had a life long experience as service users, they could understand the relevance of the analysis conducted with an external eye and professional tools with respect to design concept generation. Brain sciences provided theoretical support to transform ethnographic analysis into an activity capable to describe user emotions and mental attitude; interaction design methodologies and tools provided the support to design activities through prototyping and testing.

As stated above, the reported activities were performed within a more ample cooperation between our institution and Accademia di Brera. Both institution developed projects dedicated to our local underground system during the last year and some videos presenting the designed concepts have been produced and projected in the dedicated spaces inside two underground stations, so making possible the sharing of ideas and concepts generated by students with the citizens living in Milan.

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