Writing Postcards from the Museum: Composing Personalised Tangible Souvenirs

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Writing Postcards from the Museum: Composing Personalised Tangible Souvenirs

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ABSTRACT

Building a long-lasting personal relationship with visitors by maintaining their engagement after the visit is one of the most challenging endeavours cultural heritage sites face. When successful, this connection fosters new opportunities for the visitor to get in touch with the heritage, e.g. to visit again or to take part in cultural activities. One way to establish a personal connection is via personalisation services that generate souvenirs for the visitors to take away and foster future engagements with the heritage. This paper discusses how the techniques for personalised text generation can be applied to produce post-visit postcards exploiting the interaction logs collected during the museum visit. The personalised postcard summarises the visit, creates a link with what was experienced and suggests further paths for content discovery. A user study conducted over four weeks confirms the appreciation for the personalised postcard and suggests future developments.

CCS CONCEPTS

• Human-centered computing → Natural language interfaces • Human-centered computing → Empirical studies in HCI

KEYWORDS

Tangible Interaction; Text Generation; Personalised Souvenirs.

1 INTRODUCTION

Building a long-lasting personal relationship with visitors and promoting their engagement beyond the first visit is one of the most challenging endeavours museums and other cultural heritage sites face. Visitors that engage with the museum over a long period of time are more likely to become supporters of the museum in different ways, e.g. to visit a second time; to visit a partner site; to follow up with online exploration. Personalisation services can be instrumental for museums to reach out to their audience and create a special connection. Personalisation means monitoring the choices made by the individual visitor and offering tailored services that, therefore, are more likely to be appreciated. The more pervasive the collection of visitor's data is, the more effective the result. It is worth noting that although personalisation might be intrusive of visitors' privacy [19], it has not necessarily to be so: for many services, data can be collected anonymously and in an unobtrusive way. When applied to multiple touch points (e.g. the museum's website, its exhibition, the shop, etc.), personalisation exploits the logs collected at one touch point to bootstrap the personalised experience at the next: information of what has been experienced is used to suggest what to do next or new paths for content discovery [10,21,9]. This trend of supporting the experience before, during and after the visit is also actively pursued by many tourist destinations [8,16].

The end of the visit is an excellent opportunity to build upon the experience of the exhibition. This is reflected in the success of the museum shops that offer visitors the opportunity to buy objects that capture the meaning and the story of the experience [5,7]. Objects for sale at a museum shop are carefully chosen as they should reflect the museum identity, communicate a suitable message and preserve authenticity. A souvenir then holds an emotional value for visitors; it offers the background for remembering and retelling the visit experience to others, and can be a stimulus to get in further touch with the museum. Via personalisation, interactive technologies open up new opportunities for the crafting of souvenirs that are specific to one's own visit experience.

2 RELATED WORK

Previous work has investigated the feasibility of generating post-visit take-away personalised material. Callaway and colleagues [1] exploited the logs of the users' interaction with an audio guide and the semantic representation of the described contents (frescos from the Fourteenth Century) to generate textual summaries of what captured visitors' attention, enriched with pictures of the frescos details and suggestions for related heritage sites to visit. This was enabled by a rich knowledge base formally encoding the contents of the frescoes and the layout of their details, combined with an infrared localization system that supported sophisticated natural language generation (NLG) techniques [2]. The illustrated summaries were printed out for the visitors to take away as souvenirs. Lanir and colleagues [11] further elaborated on the post-visit report concept to generate an automatic video summary based on a network of video snippets that are tied together according to the visitor's specific data. Although potentially engaging, video summaries have the disadvantage of losing the materiality aspect of the souvenir, that complements the embodied visit experience valued by material culture studies [3].

For the creation of a personalised printed souvenir, interesting results can be obtained also using graphic composition techniques. At the Atlantic Wall exhibition [13] held at Museon in The Hague in 2015 visitors used smart replicas to activate multimedia content during their visit; at the end of the visit the replica could be used to request the printing of a post-visit postcard. The postcard contained a visual summary of the visit personalised according to both the choices made during the experience and the objects seen (Figure 1).

Figure 1: Postcard with visual visit summary described in [17]

The back of the postcard showed a map of the city of The Hague with a reference to the locations mentioned in the exhibition, as an invitation to visitors to explore more outdoors [17]. Most notably, each postcard contained a unique passcode that allowed visitors to connect to an online web interface in order to see their visiting experience mapped to the city of The Hague and access content they might have missed during the visit, as well as to replay content that they really liked. Via this personalised online space, visitors had the option to contribute personal content that complemented the material curated by the museum (e.g., memories and stories related to the Atlantic Wall, photographs from their personal and family archives).

The generation of sophisticated textual summaries and the personalisation of a few graphical elements over a pre-printed postcard template are two examples of how it is possible to personalise a final take-away message that might help strengthen the relationship between cultural heritage institutions and their audience. Notably, they are very different in terms of both the final result (the souvenir) and technical complexity. The research in this paper sheds additional light on the value of combing the evocative power of traditional souvenir postcards with personal textual messages that recall the most emotional elements of the visit. Results from a visitor study conducted at a digitally-augmented exhibition at the Museo Storico Italiano della Guerra (Rovereto, Italy) confirm that personalised post-visit souvenirs reinforce visitors' positive attitude, favour memory and sharing and invite further exploration of other touch points.

3 PERSONALISED POST-VISIT POSTCARDS

The interactive exhibition "Voices from the past in fort Pozzacchio" revolved around the stories of people who worked or fought in fort Pozzacchio – a grand Austro-Hungarian stronghold in the Alps of Northern Italy built at the outbreak of WWI – and those whose lives had been somehow influenced by the constant presence of the fort [18]. Recently restored, fort Pozzacchio is located in the mountains about a 30-minute drive from Museo Storico Italiano della Guerra. The exhibition aimed to raise awareness of an important piece of local history, stimulate reflection on the effect that war conflicts had on the civilians and the landscape, and increase the number of visitors to the fort. The exhibition was hosted in the WWI Artillery section of the museum, located in an air-raid shelter (Figure 2, left): a set of galleries that closely resembles Pozzacchio, which is a fort entirely dug into the rock with dark, humid and cold caverns. An interactive installation complemented artefacts of the permanent collection (weapons and artilleries) and factual information on display (labels, panels and photos) with personal stories of soldiers, officials and villagers before, during and after WWI. Large digital media projections were used to tell the stories in a deeply personal way (first person retelling) and create an immersive and evocative experience that engaged visitors emotionally.

Figure 2: The exhibition space (left), one of the interactive stations projecting graphical animations (middle) and the "pebble" placed on an activation area (right).

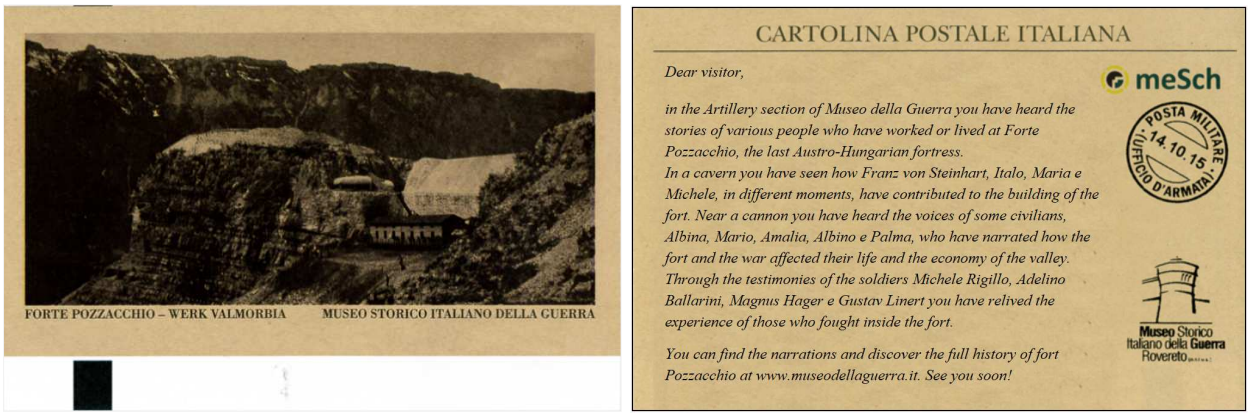

Figure 3: The front side of the postcard with a historical picture of Fort Pozzacchio (left) and the back side of the postcard with the generated text (right).

Four interactive stations along the tour gave visitors the opportunity to encounter many witnesses. While the first introductory station provided general information, the remaining three stations were thematic: all the stories at a given station referred to the same theme. The themes offered were: (1) the fort – its design, construction, combat, and dismantling; (2) the civilians and how their lives were affected by the fort before, during and after the war; and (3) the assault on the fort on the 28 June 1916 told by different witnesses. At each station, four or five audio recordings of personal accounts, chosen by the curators for their special relevance, allowed the visitors to explore the themes listening, often, to contrasting stories of the same event or situation. The intention was to enable visitors to question their own assumptions and to reflect. The stations were designed as stands (see Figure 2, middle), so as to invite visitors to take the best position for viewing the digital content; on the top of each station a line of shallow indentations matched the shape of an activating object (the "pebble", Figure 2, right) that the visitors received at the entrance. At the end of the visit, when returning the "pebble" to the ticket office, visitors were given a personalised postcard printed on demand (Figure 3). The idea was to leave the visitors with a souvenir that would keep a connection with the historical period, the place and the personal accounts they have heard. The concept of the personalised postcard was elaborated starting from the guidelines reported in [17]. Differently to previous work, the design was specifically conceived to improve (i) the familiarity of the memento (a postcard with a historical image on the front and a textual message on the back), (ii) the connection with the past (colours and layout of postcards from the WWI period), and (iii) the personal engagement (the message is directed at the visitor and names those whose stories have brought the caverns of the Artillery gallery to life). The postcard is printed on demand on the basis of the visit just concluded, specifically where and when the 'pebble" was used.

The logs collected by the system in the pebble during the interaction with the multimedia stations are used at the

check-out station in the ticket office to compose a personalised text: pre-prepared small chunks of text are assembled and rearranged in a fluent narrative that describes the salient aspects of the visit as recorded by the logs. The textual summary (i) reflects the order of visit, (ii) mentions the names of the people for whom the visitor has heard their personal accounts, (iii) contains optional phrases depending on what the visitor has actually experienced, (iv) guarantees proper syntactic and lexical cohesion of the text after it has been dynamically assembled. A concluding sentence invites visitors to connect to the museum website to read the stories and find the bibliographic references to the original sources used for the exhibition. A stamp, inspired by WWI postcards, prints the current date on the souvenir. As a result of the personalisation, visitors who have experienced the interactive installation in different ways receive different postcards. The text is printed using a thermal ticket printer over a paper feed pre-printed as an historical postcard.

4 THE TEXT GENERATION SYSTEM

The generation of the textual summaries uses a shallow template-based generation approach [20] where a set of pre-prepared sentences, with some gaps, are written in advance and then dynamically assembled together according to rules of discourse structure, with the gaps filled with phrases that depend on the logs. A schema-based formalism [15] is used to describe the function that each text snippet serves within the discourse (e.g. introduction, example, description, conclusion), and their relative order in the narrative. After the text is dynamically assembled, rules of linguistic surface realization guarantee the correct management of cohesion elements like punctuation, conjunctions and syntactic agreement. This text generation approach is particularly well suited for the creation of personalised texts in domains where standard patterns of discourse organization prevail (e.g. postcards, information booklets, online information dashboards). The text generation system is complemented by a user-friendly graphical interface that facilitates the editing of the text snippets and their annotation with discourse and semantic markers according to a discourse schema. By changing the text snippets and the annotations, different output can be obtained for the same exhibition or for new exhibitions in different domains. The system currently supports the generation of text in Italian and English.

Figure 4 shows the discourse schema used for the "Voices from the past in fort Pozzacchio" exhibition. The schema lists the content items that represent the textual sections of the postcard. For example 'date' and 'salutation' introduce the visit summary that contains the description of what was experienced ('description'); additional details and examples of content heard can be optionally included to enrich the message, to conclude with 'greetings' and a 'post scriptum' message with an invitation to visit the museum website.

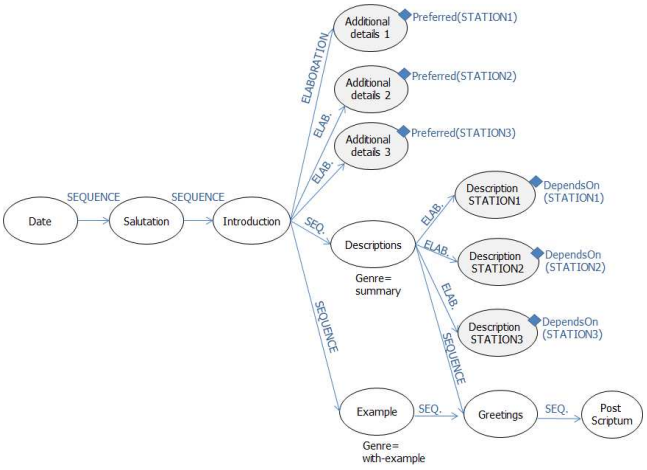

Figure 4: The content network that provides the skeleton for the generation of the post-visit postcard.

Each of these elements has pre-prepared text that is completed, at printing time, with items from the visit log in the pebble. Rhetorical relations ('sequence', 'elaboration') describe the logical connections between the content items [12], and conditional tests govern the introduction of optional parts. The final text to print is assembled by navigating the content network (in Figure 4) traversing the rhetorical relations and collecting those content items that satisfy the conditional tests over the logs. Figure 5 shows a sample generated output annotated with its underlying schema-based discourse structure.

DATE : Rovereto, 14.10.2015

SALUTATION : Dear visitor,

INTRODUCTION: At the Artillery section of Museo della Guerra you have heard the stories of the different people who have worked or lived in Forte Pozzacchio, the last Austro-Hungarian fortress.

DESCRIPTION: In a cavern, you've seen how Franz von Steinhart, the designer of the fort, and Maria e Italo, in different moments, have contributed to build the fort.

DESCRIPTION: Close to a cannon, Albino, Mario e Amalia have told you how the fort and the war changed the life of civilians and the economy of the valley.

DESCRIPTION: Through the testimonies of the soldiers Michele Rigillo, Magnus Hager and Gustav Linert you have lived the experience of those who fought in the fort.

GREETINGS: You can find these stories and get more information about fort Pozzacchio on www.museodellaguerra.it.

See you soon!

Figure 5: A sample generated text.

Parts that are personalised according to the logs collected during the visit and linguistic adjustments are highlighted in grey. The three 'description' sentences summarize what

the visitor has experienced at each interactive station: the order of the sentences reflects the actual order of visit; a whole sentence would be omitted if the visitor has not used a certain station.

4.1 Assuring coherence and cohesion

The *sequence* rhetorical relation serves to reproduce the prototypical order of discourse elements used in postcards; *elaboration* relations allow including sentences that provide additional details. Different types of conditional tests have been used over the logs of the visit: *Preferred*, tests what appears to be the preferred theme for this visitor (for this exhibition this information is based on the station where the visitor heard the most stories); *DependsOn*, tests whether a specific station or content item has been experienced; *DependsOnAll*, tests whether a certain set of content items have been experienced (AND condition); *DependsOnOne*, tests whether at least one content item in a certain set has been experienced (OR condition). Conditional tests can apply both to entire sentences, as well as to single text phrases, as in the example in Figure 6, where the whole sentence is introduced when at least one of the story items at the third station was heard, whereas the specific name 'Albina' is mentioned only if the corresponding story appears in the logs.

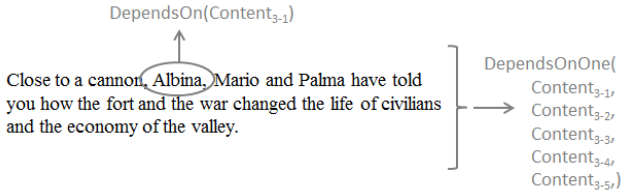

Figure 6: Conditional tests can apply to a single text phrase (Albina) or to an entire sentence.

Special post-processing rules are used whenever adjustments of linguistic surface realization are required to guarantee the cohesion of the assembled text, such as punctuation and conjunctions in phrase lists of variable length, which are dynamically instantiated (e.g. "Albina, Mario and Palma"), or plurals (e.g., has/have).

The sentences used in the text purposefully make reference to the physical environment of the exhibition space and prominent objects within ("In a cavern you have seen...", "Near a cannon you have heard...") to evoke in the visitor the sense of the place. The empathy that curators wanted to trigger with the personal accounts narrated in audio and video, is captured in the use of the first names of the witnesses ("... Albino and Palma, who have narrated how the fort and war affected their life...").

4.2 Experimenting with layout, genre, verbosity

Starting from the same narrative content structure, we further experimented with generating alternative textual souvenirs with variations other than those related to the individual visit history. The following variations were supported in the implemented text generation engine:

- Language in second person, as if the museum is writing to the visitor ("Dear visitor, today you have visited…") vs. language in first person, as if the visitor is writing a postcard to her family and friends ("Dear all, today I have visited…"), to investigate a more direct way to express emotion in text [6];
- Generation of visit summaries vs. inclusion of a direct excerpt of one the stories that the visitor has experienced;
- Generation of short postcards vs. generation of longer A4-size brochures that include both a summary of the visit and excerpts of all the stories that the visitor has experienced.

The interactive installation at the Artillery section of Museo della Guerra, gave us the opportunity to evaluate with the visitors opinions on alternative personalised souvenirs.

5 VISITOR STUDY

A visitor study was conducted over the four weeks of the temporary exhibition, to evaluate different aspects of the interactive installation and the potential of the post-visit souvenir to establish a connection with the visitors. Overall 61 participants engaged in the extended study, which included a self-directed visit of the exhibition observed by the researchers, the completion of a questionnaire and a post-visit interview. In addition, another 82 participants filled out the questionnaire after the visit but were neither observed nor interviewed. A total of 143 questionnaires were therefore collected: about a third of the almost 400 visitors who used the interactive installation during the 4 weeks of the study. Generally, each visit lasted between 30 and 60 minutes.

The 143 questionnaires show a balanced sample with 52% women and 48% men, representative of all age groups (from under 20 to 70+ years old), with the largest participation between 30 and 60 years (71%). For 65% of participants, this was their first visit at the Artillery section of the museum. The majority visited in small groups of 2-3 people (40% with family, 33% with friends), only 27% came alone.

The questionnaire and the semi-structured post-visit interview aimed at investigating the visit as a whole as well as its elements. We questioned visitors' attitudes and preferences toward the interactive installations (technology) as well as what content was preferred and why (information). We investigated the ease of use of the 'pebble' and its effect in engaging visitors at an emotional level. Finally, we aimed to find out whether the visitors felt

a connection with fort Pozzacchio (place) and its history (content) via the thematic interactive installations and the appropriateness of the final souvenir postcard. In this paper, we focus on the findings relevant to the evaluation of the postcard. Other findings are discussed in [18].

The questionnaire used a 5-points scale to ascertain participants' appreciation. Sample questions are shown in Figure 7.

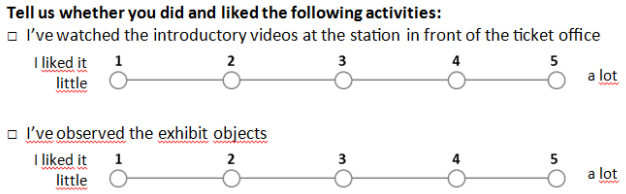

Figure 7: Sample questions of the evaluation questionnaire

The elements of the experience including the introductory videos, the different interactive installations and the postcard were assessed, in comparison to the permanent elements of the gallery. There was a higher appreciation for the most novel elements, that is to say the three immersive interactive stations and the souvenir postcard, compared to traditional elements such as exhibit objects, panels and labels or the introductory videos at the entrance (Figure 8). In particular, the souvenir postcard outperforms the other textual elements (panels and labels) in a significant way (t-test with $p<0,001$).

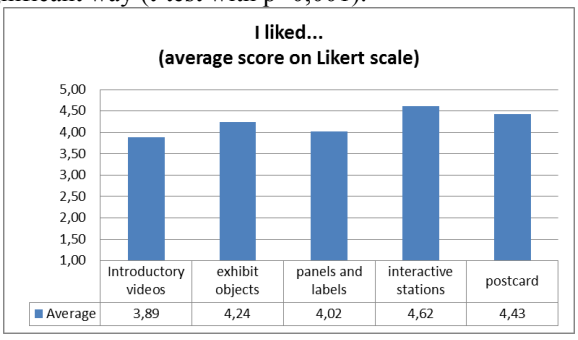

Figure 8: Average score on a 5-point scale that tested visitors' appreciation for exhibition elements

The vast majority of participants agree (32%) or strongly agree (53%) that the postcard summarizes their visit in an effective way. We also asked in which way they would like to remember and deepen what they have experienced. Possible answers were: 1) keep the postcard; 2) read all the stories in a booklet distributed at the end of the visit; 3) visit the museum web site to look at the videos and hear again the audio stories; 4) come back to visit the exhibition with family and friends; 5) go to Fort Pozzacchio. Multiple answers were possible. The analysis showed that the exhibition increases visitors' awareness of the local history and pushes them to visit the actual site of Fort Pozzacchio.

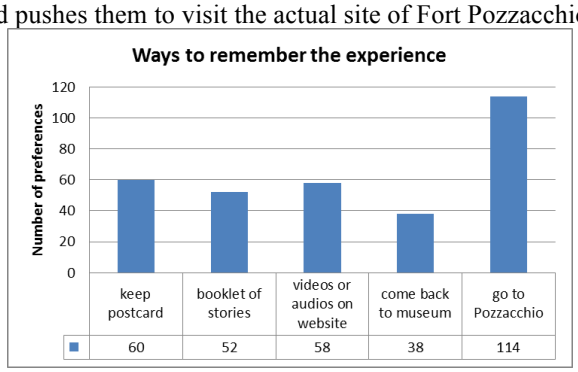

Figure 9: Preference of visitors on ways to remember the experience. Multiple choice question.

In the 61 post-visit interviews we investigated in depth the visitors' opinions about the personalised postcard. Participants positively commented on the familiarity of the design and the format of the souvenir (a postcard to be retained for personal memory or to be shown to others), the image (that recalls the topic of the exhibition), the narrative summary (that retraces the actual experience), the opportunity to find more online. ("*The postcard is a link to what you did and saw. At the end, when you look at it, you say 'I'm going back there'.*") Appreciation was also expressed for the fact that postcards are handed out at the end of the visit as a present, have a pleasant look, can be included in personal collections, can be easily stored and can pop-up again at a later stage at home to evoke memories ("*A gift is always nice; a gift after a visit is the perfect choice! The postcard is not just a souvenir but also a continuation, a link between the visitor and the curator.*").

While the postcards as in Figure 3 were given to all visitors at the end of the exhibition visit, during post-visit interviews we investigated opinions and preferences for alternative layouts, genre and verbosity. We showed three alternative souvenirs generated by the implemented system described in the previous section: a postcard to send (Figure 10), a longer summary with excerpts and images (Figure 11), and a postcard that instead of the visit summary contains an excerpt of one of the stories (Figure 12). A personalised postcard with a layout that leaves space for the address and is written in the first person to resemble a real postcard that could be sent to family or friends was preferred by almost half of the interviewed participants. A postcard with just one sample excerpt of content would be acceptable only if the story is the one actually preferred by the visitor (*"usually I like citations but the fact that it is chosen by the museum, the citation, maybe it is not the one I found most significant, then I would be puzzled"*). Booklets with a detailed summary of the visit that includes

transcriptions of all the heard stories were often commented as less engaging and old fashioned ("*often a sheet of paper is folded, put in your pocket and then thrown away...*"), better replaced by online resources for follow-up exploration. The interest in finding references to online resources was recurrent across members of cultural associations, who were particularly interested in the bibliographic references of the publications that contain the original stories.

Some of the high-school teachers who participated in the study praised the educational value of the exhibition and its potential to engage students more deeply than traditional explanations of historical events. In their view, playing personal accounts recited by actors in place has a more powerful, emotional effect than what can be achieved by the teachers reading the same diary excerpts in class: the narration is more dramatic and has a higher potential to capture the students' attention. This result confirms findings discussed in the literature for other types of digital augmentation where the media content creates a synergy with the sense of place [14]. The possibility of complementing the actual visit with post-visit online resources was seen as a perfect means to extend the educational activity with personalised online assignments for students to deepen what they have learned, reflect and elaborate their own interpretations *("... a questionnaire or some activities to be done at home, exercises...*"). In this context, printed take-away material that reflects the onsite experience is then the perfect bridge to the online activity ("*For interested visitors, for school groups I would find [printed booklets] interesting also because teachers at the end of a visit need something to bootstrap follow-up discussions*").

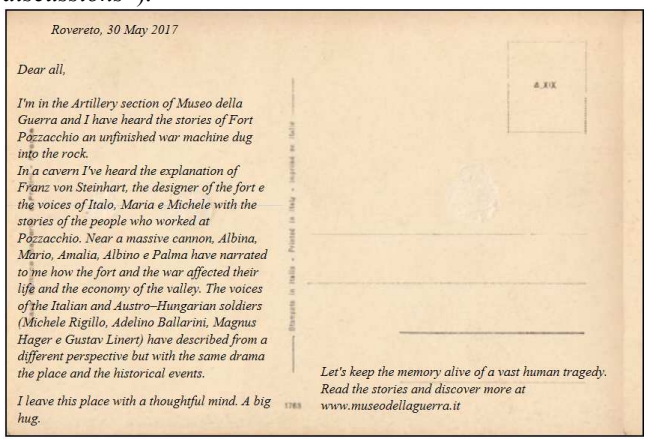

Figure 10: Sample postcard with language in first person and formatted with empty space for the address

Figure 11: Sample page of a booklet that summarizes the visit together with the actual stories experienced by the visitor (text in Italian)

Figure 12: Sample postcard with excerpt of story (text in Italian)

6 DISCUSSION

The analysis of the questionnaires and the interviews provide extensive evidence that gifting a tangible souvenir

that recalls the actual visiting experience is appreciated. A pleasant graphical layout and text support a positive attitude and suggest the postcard becomes an object worth keeping and showing to others. We think this is due to the familiarity of the concept: a postcard is typically used to communicate to others what you are doing / what you have visited, through a representative image and a text message. Postcards are often sold in museum shops as reminders for personal memory and to be saved in collections.

The opportunities opened by personalised text generation are multiple. The possibility of flexibly adding explicit references to places, objects and stories that the visitor has actually experimented first-hand to the summaries increases the chance of reliving the engagement and emotional involvement felt during the visit. Even the automatic adjustment of small details, such as printing the actual date of visit, were noticed by participants and seem to make a difference in visitors' perception ("*… I liked the postcard, first of all there is the date, so I can remember the day I came…*").

Most interviewees expressed a preference for the postcard over longer booklets. They motivated their preference with the aesthetic and tactile pleasure of manipulating it, its convenience for storage or utility (e.g. as a bookmark). However, they appreciated the possibility of getting extra material on request for interested visitors or for those with a specific learning motivation (see also Falk [4] on this aspect). This can be realised via an easy-to-implement option with a text generation engine that can compose alternative texts by simply adjusting settings of verbosity and graphical layout. Participants suggested that richer material would be particularly useful to support follow-up educational activities, possibly integrating thematic content prepared by the museum and selected in advance by teachers for the students to enrich their study. Again, this is a feasible option given that the text is assembled and printed at the moment.

The postcard contains an explicit invitation to connect online to the museum website to read the transcriptions of the stories played at the exhibition and find bibliographic references to the original sources, information that many participants seemed particularly keen on knowing. For the study presented in this paper the analytics of online access were not available, therefore the percentage of visitors getting in touch again with the museum for an online follow-up exploration is unknown. However, the "Voices from the past in fort Pozzacchio" exhibition with its interactive installations will reopen in Summer 2017 with multiple languages for visitors experiencing multimedia stories and the souvenir postcards in both Italian and English. The reopening will provide opportunities for evaluating the connection between the onsite experience and the online follow-up and for understanding the need for novel forms of online personalised engagement. Indeed, the visit logs that are used to generate the personalised postcards are stored on a central server and can potentially be used to create online personal spaces where visitors find an articulated visualisation of their visit: the contents and the exhibit objects they have experienced, what was missed onsite, suggestions for other interesting related contents, news from the museum. The postcard would be an ideal method to share the unique key identifier that grants access to this personal online space.

7 CONCLUSION

The research presented in this paper aimed at investigating the benefits of applying techniques for personalised text generation to produce post-visit tangible souvenirs that reinforce the emotional experience just concluded. A visitor study conducted with 143 participants demonstrated the intuitiveness of the design concept and of the message conveyed, the positive attitude of visitors, their acceptance and intention to keep the souvenir. A preference for the personalised postcard emerged with respect to other types of mementos, although appreciation was also expressed on longer personalised booklets for interested visitors, an option easily supported by the implemented text generation engine.

Due to the flexibility of the method used for authoring the content network, the content of the postcard can quickly be tailored for new exhibitions, or for touristic tours supported by multimedia guides. Portability to new languages is also possible, as demonstrated by the recent porting to English, given that text surface realization employs techniques of shallow template-based generation with limited need of syntactic and lexical adjustment.

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