

The report/paper for the Museums and the Web, Vancouver 2005:

„Visualization of Slovene museums with the method of Virtual Reality Panoramas

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**Abstract** The visualization of Slovenian museums and galleries with Virtual Reality panoramas was in a process in a period from 1996 to 2004. The very first dilemma of the project was the influence of the Virtual Reality visit to a number of real visitors. The analysis, which bases on a questionnaire, displayed that 26% of museums recognized that the project of visualization increased the reality visit, 35% that was no change and 22% that was no change but the visitors were prepared with the Virtual Reality visit what to see in the museum before the reality visit. The majority of museums were interested to cooperate with the local or national tourist organization with the promotion and the tourist offer of the museum region. One hundred percent of museums recognized the method of Virtual Reality Panoramas (and object) as a very interesting and prosperous method to make a documentary of exhibitions.

**Keywords:** Slovenian museums, virtual reality panoramas, QTVR, tourism, visualization, documentary, statistic.

**Introduction:** the idea and start of the project started in 1996 and the idea was to put reality exhibitions in a virtual reality. Therefore, when the display of reality exhibition is over it still exists in a virtual reality and visitors have access via the internet to the present and past exhibitions: so-called accessibility of the exhibitions with the promotion of museums and a documentary. A good example of the documentary was the visualization of the City Museum of Ljubljana in November 1999/January 2000: The collection was set up in 1937 as a founding collection of the newly opened Ljubljana City Museum. On display were furniture and fittings from Ljubljana houses from the 15th to the 20th century, with an emphasis on stylistic development from the Gothic period to the Vienna Secession. The collection was dismantled in 2000. The exhibition is now accessible only with the Virtual Reality tour via the internet:  
[ <http://www.burger.si/MuzejiInGalerije/MestniMuzejLjubljana/ENGMestniMuzejLjubljanaKazalo.html> ]

Each Virtual Reality Museum tour was not standalone but linked with the "Virtual Reality" presentation of the local area: natural and other cultural heritage presented with Virtual Reality tour. Localities were connected into the virtual reality presentation of the country and finally, the Virtual Reality presentation of the country was inserted into the virtual reality presentation of other parts of the world... The evolution of the project during the period was noticeable also with the quality of the VR panoramas. Stitching errors were noticeable within first VR tours and with some lack of resolution, but every following year the quality was improved: better equipment, more experience with VR e.t.c. However, older presentations are still kept within the project as the display of the evolution of the project... Volume of the project The visualization project of Slovenian museums covered 43 museums, 60 museum locations, 97 museum exhibits. The result was 1.289 Virtual Reality panoramas or object panoramas linked into the Virtual Museum tours with the additional link to about 4000 other Virtual Reality geographical locations related to museums or natural and cultural heritage within the same project. Each virtual tour was published promptly on the internet. The web site where Virtual Tours were presented was very simple because of the nature of the work. (Figure 3: "Interactive object movie of the carnival mask in Ptuj Museum". Structure and weak points It was a "one-man-band" - volunteer and enthusiastic project coordinated with the Museum Association of Slovenia, but financed only with the personal

budget and with the support of the Ministry of the Culture of Slovenia. The relation of the museums with the project was very different (the example of what happened if something is done for free)... that is why some VR presentations haven't been translated or are not translated into the English or other language - a weak point of the site and the project. The presentation was not uniform but adapted to each museum. A good example of the museum location and excellent coordination with the curators was Railway museum where was exhibited with the Virtual Reality tour, visualization of twenty locomotives as objects which was a pioneer work by a logistic and linked to the railway constructions all over the country as old iron bridges, railway stations, viaducts e.t.c., also presented with the Virtual Reality panoramas: [ <http://www.burger.si/MuzejiInGalerije/ZelezniškiMuzej/index.html> ] (Figure 4: "Locomotives of Railway museum presented as object movies and as VR panoramas with the interior of each locomotive").

Another good example was the visualization of Open-air Museum in Rogatec [ <http://www.burger.si/MuzejiInGalerije/MuzejNaProstemRogatec/ENGUvod.htm> ], set up in 2000. Cooperation with the museums during the time of the visualization. Rich experience with the visualization of museums was the result of nine years of work with the museums as the institutions and with the curators and other employees. Visualization with the Virtual Reality Tours was still kind of Science Fiction in 1996. Many curators considered the visualization more like a recreation of one enthusiast and were quite suspicious. That is why also different relations and cooperation with the project were... Active cooperation Definition of the "active cooperation" was when the cooperation with museum curators was excellent. Museum exhibit was explained in details so the "photo sampling" and further digital processing and linking into Virtual Tour were more comprehensible. Slovenian language text and add another language text with the explanation of the Virtual reality location was promptly prepared. After the set up of the Virtual Tour, the corrections of "bugs", wrong text and other errors were immediate. The visualization was published within the official web site of the museum, the CD-ROM was completed and the project was promoted in other media. The request for additional visualization of external locations or new exhibitions. The percentage of museums with the "active cooperation" was 21% (9 of 43). Cooperation with the interest Definition of the "cooperation with the interest" was when the cooperation with museum curators was fine. Museum exhibit was explained in general so the "photo sampling" and further digital processing and linking into Virtual Tour were more comprehensible. Slovenian language text and added another language text with the explanation of the Virtual reality location was not promptly prepared but with a delay. The visualization was published within the official web site of the museum but with no additional promotion. The percentage of museums with the "cooperation with the interest" was 21% (9 of 43). Inactive cooperation Definition of the "inactive cooperation" was when the cooperation with museum curators was fine. Part of the museum exhibit was explained in general so the "photo sampling" and further digital processing and linking into Virtual Tour were at least clear. Only short introduction text in Slovenian language was prepared. The visualization was not published within the official web site and with no promotion in media. The percentage of museums with the "inactive cooperation" was 49% (21 of 43). No cooperation Museum agreed with the visualization. No answer after the completed visualization. Curators had no idea that the visualizations were completed. Bad internal communication. The percentage of museums with the "no cooperation" was 9% (4 of 43). Summary 42% of the visualizations was very successful and had justified the idea. 48% of the visualizations were less successful and need to be completed with the additional text, translations or some more visualization need to be processed. 9% of the visualizations were not successful. Analysis of the project The questionnaire In November 2004 - nine years since the project started, the questionnaire was sent to Slovenian museums and galleries, which were included in the project of the visualization in a period from 1996 to 2004. The goal of the analyses of the questionnaire was to acquire useful information about the correlation of the project with the promotion of the museum as a tourist destination. Another goal was to get the information about the project as the educational and documentary tool. Detailed results of the questionnaire are attached. Statistic of the questionnaire: The majority of museums set

up their official web sites before the year of 2000. The first presence of the official museum web site in Slovenia was in 1994. 9% of Slovenian museums had no web site until February 2005. The most important promotion media were the press, internet, and TV. 68% of museum web sites had at least two language versions of the site. 36% of museums had less budget than 3000 US\$ per year for a self-promotion (including internet, adds, brochures). 43% of museums had 15.000-30.000 visitors per year. 52% of museum web sites have no counting or analyses of web site traffic. Only 13% of museums had more than 40.000 unique visitors per year to the official web site. 83% of museums were familiar with the project of the visualization. 30% of museums recognized the project of visualization to be highly important for the promotion of the museum. 26% of museums recognized that the project of visualization increased the reality visit, 35% that was no change and 22% that the visitor was prepared with the Virtual Reality visit what to see in museum before the reality visit. 100% of museums recognized the method of Virtual Reality Panoramas (and object) as a very interesting and prosperous method to make a documentary of exhibitions. 8% of the museum were negative with the opinion or had no answer

with the continuation of the project of visualization. 65% of the museums would continue with the project of visualization but only with the investment of donators. 13% of the museums are ready to invest finances into the project. Correlation between the virtual reality visit and the 'reality' visit When the project started in 1996, the main dilemma was how the Virtual Reality display of the museum will influence the number of visitors to the museum. The correlation of the project of Virtual Reality panoramas tours with the promotion of the museum as a tourist destination and the number of visitors of museum exhibition displayed that the majority of museums which was classified as 'active cooperation' had also the increased number of the visitors of the museum exhibitions in reality, which was directly caused by the VR project. However, the visualization was not the only cause of the increased number of visitors. The main reason was that the curators were initiative, creative and willing to cooperate. Such a relation was easily transferable to the other activities of the museum and the result was a successful museum team. Museums and the tourism The idea of the project was to link the "virtual reality museum" with the "virtual reality town", and the link between the natural and cultural heritage. (Figure 7: "Interactive map of Slovenia, presenting major towns and settlements", see the attachment: SloveniaLandmarks\_Screenshot.jpg). The project was presented with the internet and had over 10 million visitors in the year 2004. Virtual Museums, without other natural or cultural VR locations, had over 600.000 visitors in the year 2004 with the progressive trend: 2000: 114.791 visitors, 2001: 227.315 visitors, 2002: 284.747 visitors, 2003: 335.590 visitors, 2004: 605.642 visitors, Percentage of visitors by the continents: Europe: 74.2 % North America: 10.7 % Asia: 4.2 % Australia: 0.9 % South America: 0.5% Central America: 0.1% Africa: 0.1 % No data of origin: 8.3 % The web site where the project was presented had over 16.000 links from other sites with the majority of tourist web sites (tour operators and other), so the project become one of the major tourist promotion Slovenian sites even the original idea was not so. The paradox Even 42% of the project was successful and had fit the idea and 100% museums recognized the method of Virtual Reality Panoramas as very interesting and prosperous method to make a documentary of exhibitions and 26% museums had increased visit of the exhibitions and 65% of museums would like to continue with the project and extend it to further exhibitions or other external locations, only 13% of the museums are ready to invest own finances into the project. It is not easy to find the reason for the paradox. The possible answer is that museums had no financial participation with the project but the whole project was free of charge. So the project was adopted into the procedure of documentary and promotion of the museums without consideration of the cost. On the other hand, the budget meant for a museum promotion was very low: 36% of museums had less budgeted than 3000 US\$ per year - and the average sum was about 2000 US\$ which was less than a cost of the visualization of one single museum exhibit including the volunteer work. The majority of museums are depended on the support of the Ministry of the Culture or Municipalities and are quite inactive with the searching for additional budgeted. Active museums are also more successful with the number of visitors. "Successful" museums are usually linked with the old medieval towns in Slovenia, but there are some museums, which did not

make a good use of their location and had a very small number of visitors (even less than 1000 per year). Other "successful" museums are special museums, like ethnological or technical museums. Interestingly, those museums are also very regular users of Virtual reality panoramas project. Only a few museums or galleries in Slovenia have employees or even curators who are well trained with the informatics and are even high experts. Some even decided to start with their visualization in the year 2004, as the documentary needs to be prompt. Until January 2005, almost 10% of museums had no web site or still do not use e-mail. What is next? The project will cover all museum locations in Slovenia in the year 2005. All museum locations will be georeferenced with the zoomable map and connected to the local natural or cultural heritage and settlements. The database will be indexed (the searching with the keyword is already possible). 87% of museums are ready to cooperate with the national or local tourist organizations with sharing the virtual reality panoramas or tours and the method of the visualization seems to be prosperous.“