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D6.4 – Report On The Cultural Impact Studies and End Users’ Account

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1 Preface

NANO -Cathedral is a project to develop and to test materials for the preservation and restoration of cultural heritage. The materials were tested on some of the most important, significant and best known monuments of the European cultural heritage, spread almost over the whole continent and covering different climates and many styles of European art history from Romanesque art of the 11th century to modern art of the 21st. All of them are under intense care either by a permanent workshop employing restorers, stonemasons and other specialist, or by an office, experienced in restoration and maintenance of historic buildings. They belong to the core of European cultural heritage. Any change in the practice of restoration technologies would have a strong impact to these and all other monuments, to their appearance, to their authenticity, and to their perception and position in public awareness.

As a first point we wanted to study the specific cultural significance of the project's different monuments, because – despite the high cultural importance of any of them – they have different functions and cover different fields in public cultural awareness.

The workshops are not only responsible for their own monuments, but in their function of flagships for heritage preservation also have a very high importance for the maintenance of other monuments, since they belong to the most important institutions for practical restoration and preservation of built heritage in their areas or countries. So the cathedral workshops and Oslo Opera house tried to point out in this project their present position as centres of competence and the opportunities, NANO-Cathedral gives them to strengthen their position in these fields and to improve the general practice of preservation in the respective countries.

To find out the preferences and opinions of interested people about restoration and innovation in practical conservation, we made public surveys in different forms – online, on a computer terminal and in paper form.

A group of specialists, which is intensely affected by any change in restoration technology, is the group of restorers and stonemasons of the traditional lodges of the cathedrals, who still form the core of the cathedral lodges. They are permanently active to preserve cultural heritage and they are themselves part of intangible cultural heritage by still practising the traditional techniques being in use since the times the cathedrals were built in.

To evaluate the cultural impact of a new technology to cultural heritage and the end users surveys and interviews were conducted and examined, as well as we were monitoring and analysing the reaction of the end-users on the project's media coverage. The social and economic impact analysis is closely connected to the cultural impact on the end-user's accounts. The surveys in the workshops were combined with the surveys on the social and economic impact and the results are linked with the results of the other impact studies. Since some topics are overlapping, relevant information on the perception of heritage protection in different target groups can also be found in Deliverable 6.3.

2 Cultural Significance

2.1 General points

Most of the cherished buildings from the medieval period that are still preserved certainly have played an important role in the lives of generations of people. These monuments and buildings, especially those



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coming from the Middle Ages, and in particular the Gothic cathedrals of Western Europe, carried out an important religious significance. The cathedrals have been extremely influential in the development of religious life and thought, but also of more secular aspects of society. When cathedrals have been serving as locations for religious contemplation and as pilgrimage destination they no less have been important for the cultural development of a region and its population.

Over the centuries their architectural appearance, that initially meant a physical representation of power and of the union people sought with God, often turned into being an important historic and cultural landmark. Even though the religious importance diminished in modern times, beginning with the era of reformation, the cathedrals kept their importance for the people, who still - regardless of their religion, belief or ethnic origin - worship these monuments and consider them being an indispensable part of their identity.

The represented NANO-Cathedral partners tried to pick out the most important aspects of their monuments. The focus was put on public awareness on the monuments in their city, region or country; on the importance of the monuments as landmark, trademark or icon of the respective city or country, its presence in legends, tales or popular literature and music and other parts of popular tradition. Besides being places for religious contemplation, as cathedrals are, or the performance of operas and ballets in the Oslo Opera House, monuments can also be a venue for other cultural events or functions. Other points were: Did the monuments change their function over the centuries? Are they just elaborated vessels, originally created to be the space for religious services or to house precious relics and/or exceptional pieces of art. Or is it the architecture that is in public focus?



2.2 St. Stephen's Cathedral, Vienna

There can hardly be found another capital being so strongly dominated by a single building as Vienna, centred on St. Stephen's Cathedral.

2.2.1 *Symbol for the city*

When the city became important in the 12th century, and spread beyond the Roman walls, the city got St. Stephen's as its new centre. The castle of the archdukes and their religious landmark, the Benedictine monastery were situated on peripheral locations of the city, whereas St. Stephen's was in the cities centre, not only geographically, but also as its symbol of identity. Alternating in time the dukes – later archdukes and emperors – and the citizens were engaged in building and redesigning St. Stephen's. The oldest drawings, etchings and paintings of the city – from 15th century on – signify Vienna with the cathedral's high tower and its glazed tile-roof as icon of recognition.



Illustration 1: Detail from the "Albrechts"-Altar, 1439. Joachim and Anna, in the background the silhouette of Vienna, signified by the tower of the cathedral.

2.2.2 *National symbol*

St. Stephen's became the symbol for Vienna and Austria, not only for the Viennese themselves but also for foreigners and even for enemies. For example there exist many Turkish fairy tales about St. Stephen's and its Golden Apple, and Turkish drawings of the city and its cathedral from the times of the Turkish sieges of Vienna. The cathedral was the objective of the besiegers and it was the symbol that should be defended by the besieged.



Illustration 2: Turkish map of the 2nd Turkish Siege with St. Stephen's Cathedral 1683, Source: Historisches Museum, Vienna

A comparable symbolism appeared even in more recent times. A very notable episode of World War I is adventurous flight of Gabriele D'Annunzio on August 9th of 1918, when a group of several Italian airplanes flew over Vienna without any weapons aboard. His aim was a very special one: to throw flyers in Italian language on the streets of Vienna, and, as it seems, still more important: to take and bring home photos from Vienna, signified by St. Stephen's cathedral.



Illustration 3: On August 9, 1918 Gabriele D'Annunzio is airdropping leaflets over Vienna's inner city (St. Stephen's Cathedral in the top right corner), Source: wikipedia.com

And as a last example for this important national function of St. Stephen's there is to mention the symbol of freedom and independence. At the end of World War II the cathedral was damaged severely by fire and the reconstruction was a public affair involving many people. But the first poster to announce and to celebrate peace and freedom after the war, showed an Austrian flag (having been forbidden for the war period) but not on an official building like the houses of parliament or the chancellery, but on the tower of the cathedral – which at this very moment was damaged and had lost its significant roof.



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Illustration 4: First poster celebrating freedom in April 1945 (Wien Museum)

2.2.3 The cathedral as a symbol for visual arts

Austrian culture and cultural activities of Austrian people are strongly dominated by music, which is obvious in a people with the self-definition as “people of dancers’ violinists”.

But of course there is a rich stock of works of visual arts collected in many different, precious museums. However, the anchor work for art education is the self-portrait of a stonemason (mostly indicated as Master Anton Pilgram) from the base of the pulpit of St. Stephen’s.

It shows both sides of visual arts: there is the picture in the frame, but it is looking to the spectator, coming in contact with him. So the religious function of a work of art in a church, linking both worlds, the earthly one and the heavenly one, is adaptable for our modern, profane times: Here the mason links the world of the spectator and the enigmatic world of art by opening a window and sort of coming out of the frame and inviting the spectator to visit his world – a little bit.

So this relief was used for many educational books, broadcasting series and other programmes to give people a good access to visual art, not only in St. Stephen’s, but in general. And for many people in Austria not one of the great masterworks of the Viennese museums became the symbol of a work of art, but this relief made for St. Stephen’s cathedral.

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Illustration 5: Portrait of a mason (Anton Pilgram?) on the base of the Pulpit of St. Stephen's, 15th century

2.2.4 The cathedral as a trademark for Viennese products

St. Stephen's is used as a trademark for typical Viennese products, for the Austrian Federal Television, for City marketing of Vienna and many other reasons. The unique skyline with the huge roof and the high tower makes the silhouette of St. Stephen's a perfect logo, which is used in different ways and for different occasions. The best known is probably the logo of a Viennese producer of sweets, especially waffles, and is a generous sponsor for preservation work in the cathedral, as a quasi license fee using the logo with the cathedral in it.



Illustration 6: Waffles with the logo of St. Stephen's,

2.2.5 Fairy tales

There exist many fairy tales about St. Stephen's cathedral in Viennese tradition. One of the most popular tells the story of a master builder of the cathedral, who made a treaty with the devil to be able to accomplish the – still unfinished – northern tower of the cathedral. Breaking the agreement by enunciating "Maria" - the name of his fiancé – the scaffold of the tower tumbled down, taking the master builder with it to the ground, who lost his life, his soul and left the tower unfinished up to our days. So most of the fairy tales tried to explain irregularities of the building and other phenomena people couldn't understand and more.

They form a second layer of history covering not only the known history with a more romantic version, but also prehistoric events and transcendent questions.

2.2.6 Songs- Wienerlied

In 19th and 20th century a typical form of popular song was developed in Vienna, in tight connection to the high art waltzes and other immortal classics of great light classics. These popular songs, called "Wienerlieder" have still a vivid scene in Vienna, with new songs being composed even in our times. The songs have as subject typical Viennese life, with frequently mentioning the death, wine, the Danube river and St. Stephen's Cathedral and its tower.. . was written, typical for Vienna, with the subject of "typical Viennese life", mainly consisting of loving life, being merry, drinking wine and loving the cathedral, especially its tower. The Viennese Folk Music Society officially lists more than 500 songs about St. Stephen's. It is a remarkable fact – according to the cathedral's function as symbol for Austria – that many of the Viennese songs addressing St. Stephen's were written in the years between 1938 and 1945 when Austria didn't exist officially.



2.3 Cologne Cathedral

Out of all Nano-Cathedral monuments Cologne Cathedral is probably the one with the most emotional impact on its environment. Regardless of the people's religious beliefs, if they are citizens born there, long-time-inhabitants or have just moved to Cologne: the 'Dom' is an indispensable part of their lives and they are all proud of it. It is the heart of the city, even though it is situated on the north rim of the city centre. Near to train and subway stations it is a meeting point for citizens and tourists. Its towers, being more than 157m high, serve as a point of reference as they can be seen from any part of the city. Today, most important events in Cologne take place at the "Domplatte", the so-called, elevated platform made of concrete around the cathedral. It gives a well-defined base to the cathedral and is one of the most important urban structures in the city. Everybody connects special memories to this part of the city in which the cathedral is always – mostly involuntarily – involved: rendezvous with their loved ones in front of the 'Dom', hanging out and playing the guitar as a teenager in the cathedrals niches or celebrating the Cologne Carnival every year, etc. However, the sober concrete square stays an everlasting much-discussed subject for Cologne's urban planning. The importance of Cologne cathedral has an official testimony in the UNESCO list of cultural heritage, in which it was inscribed in 1996. In criterion (ii) the importance is stated: "Constructed over more than six centuries Cologne Cathedral marks the zenith of cathedral architecture and at the same time its culmination".¹ Clearly the monument is a paradigm for outstanding universal value and more than complies all required criteria for a UNESCO heritage listing. Furthermore it is cited as a powerful testimony to the enduring strength of European Christianity.²

2.3.1 The Three Kings of Cologne



Illustration 7: Altarpiece „The Three Kings“
by Stephan Lochner, Source: wikipedia.com



Illustration 8: Shrine of the Magi,
Source: wikipedia.com

Looking at Cologne's eventful history, especially to constant power struggles between the state, the city and the Bishop, the more the cathedral's cultural significance increases. When in 1136 the archbishop of Cologne, Rainald of Dassel, brought the relics of the Three Holy Kings to the city, the necessity of creating a bigger church to house the sanctuary adequately emerged. In the year 1248 construction had started and,

¹ whc.unesco.org [Accessed 5 Jun. 2018]

² whc.unesco.org [Accessed 5 Jun. 2018]



although the cathedral was far from being completed, it soon became one of the most important pilgrimage churches of the late Middle Ages, next to Rome and Santiago de Compostela.³

2.3.2 Completion as a Symbol for a united Germany

Moving on in the cathedral's odyssey, it is noteworthy that throughout the centuries some of its archbishops were repeatedly banned from the city.⁴ A recurring problem in the city's history is the rivalry between the citizenship and the archbishop. Eventually city of Cologne was finally declared an independent "free imperial city" in 1475 surrounded by the territory of the electorate principality of the Archbishop of Cologne. So the prince archbishops preferred to live outside of the city, finally in 1597 Bonn became the official residence of the Cologne bishop. French occupation after 1794 and the secularization of the ecclesiastical principalities in the Holy Roman Empire many political, social and intellectual constants vanished. ⁵ After the Napoleonic wars Cologne became part of Prussia, the leading state in northern Germany, with a Lutheran majority and a Calvinist king. However Cologne Cathedral became one of the most important symbols for that state, and the completion of the Cathedral, which had begun as a private initiative became a national task, generously supported by the king and many citizens regardless of their confession.

The completion of the cathedral, of which only the grand choir, parts of the nave and lower parts of the towers having been finished in the middle ages was however based on a private initiative: When Sulpiz Boisseree found the missing part of a plan of the western facade of Cologne Cathedral it became possible to execute the mediaeval plans.

So Frederick William I of Prussia, that the cathedral could be completed in the 19th century. During the celebrations at the end of this construction phase in 1844, 1880 he was the first King of Prussia to enter a Roman Catholic house of worship.⁶ Another historical fact that underlines the cathedrals cultural and social impact which is able to unite both confessions for its own cause or more likely, it has been willingly used for political strategies to conciliate the growing catholic population in the state of Prussia.

2.3.3 Central-Cathedral-Building Society

Unity among the people for Cologne Cathedral has also been shown up until today with the founding of the Central Cathedral Building Society (Zentral-Dombau-Verein zu Köln - ZDV). It is one of the world oldest non-governmental and civic associations and it was founded in 1842 to enable the completion of Cologne Cathedral. Ever since people from all over the world donate money for the cathedral's preservation. From 1842 until 1892 the "Kölner Domblatt" was published weekly by the society.⁷ It is considered to be the most comprehensive source of information about Cologne Cathedral during the 19th century. It published building reports from the architect and important articles about the art history of the Cathedral as well as information about other buildings and even society notes. After WWII, within the reconstruction works, they relaunched the newsletter. It is now issued on a yearly base including the report of the cathedral's master builder, professional articles and a statement of revenue and expenditure of the society. To increase donations the ZDV even originated a special cathedral-building-lottery which was called the 'Dombaulotterie'. At first this was considered as an inappropriate hustle but in 1864 the society's committee approved of it and since then it became an important source of income to the ZDV. These

³ <https://www.ff-stadtfuehrungen.koeln/stadtfuehrungen/stadtgeschichte-koelns.html> [Accessed 5 Jun. 2018]

⁴ *ibid.* (e.g. Siegfried II of [Westerburg](#) in 13th and Clemens August von Droste zu Vischering in 19th)

⁵ Hansen, M Herman. (ed.) (2000). *A Comparative Study of Thirty City-State Cultures*. Copenhagen. Reitzels. Vol.21. p.297

⁶ https://en.wikipedia.org/wiki/Cologne_Cathedral [Accessed 5 Jun. 2018]

⁷ <https://www.zdv.de/de/die-geschichte-des-zdv.html> [Accessed 5 Jun. 2018]



national and international voluntary donations are another proof of the cathedral's cultural and social impact throughout the centuries. Without this private financial support sustainably maintaining the built heritage would hardly be possible, mainly because the work is never finished.

2.3.4 The Legend of Cologne Cathedral

As it is mentioned in a version of the famous legend of Cologne Cathedral that the cathedral will never be finished.⁸ The master builder – mostly referred to Gerhard von Ryle being Cologne's first master builder in 1248 – makes a pact with the devil in order to get a sketch of his elaborate cathedral plan. In return the devil wants the souls of his wife and his kids. After master Gerhard realised what he had done he confesses his wife and she then tries to trick the devil. But shortly before the cathedral was finished the devil finds out about it and furiously, he lets big parts of the building collapse. This legend of a never finished cathedral holds up until today, where it is said that Cologne Cathedral will never be seen again without any scaffolding.

2.3.5 Carnival, songs and popular literature

Cologne Cathedral also belongs to the most extolled and besung monuments in literature and music. In Robert Schumann's song cycle 'Dichterliebe'/A *Poet's love* (1840) he set to music the famous poem by Heinrich Heine who refers to his beloved 'Dom' several times. Most probably it is also due to Cologne's long tradition of carnival celebrations that the cathedral is an everlasting popular topic in various songs. A very famous tune is called 'Mer losse d'r Dom en Kölle'/*We leave the Dom in Cologne*/ by the group Bläck Föös/*barefoot*. It was composed as a protest song against the city council's plans to modernize historic quarters and relocate inhabitants in 1973. The great success of this song points out again how Cologne's inhabitants are ready to defend their monuments.⁹ Since then it remains a very popular carnival song.



Illustration 9: Cologne Carneval - twin spires in the back, Source: © Köln Tourismus GmbH, Dieter Jacobi

2.3.6 Poetry

A very important poet of German literature, who was referring to Cologne cathedral was Heinrich Heine (1797-1856). In his critical and satirical epic poem "Deutschland ein Wintermärchen (Germany. A winter's tale), which he wrote in 1844, only 2 years after the foundation of the "Central-Cathedral-Building Society" he wrote in chapter 5:

⁸ Bechstein, L. (1853). *Deutsches Sagenbuch*. Altenmünster: Jazzybee, p. 75

⁹ Svenson, A. (2015) Cologne Cathedral as an International Monument. In: Rüger, J. Wachsmann, N. ed., *Rewriting German History: New Perspectives on Modern Germany*. 1st ed. NY: Palgrave Macmillan.



*“Poor wretches of the Cathedral Trust,[...]
In vain will the great Franz Liszt play
To raise the cathedral’s donations,
In vain will a talented king make
Imploring declamations!
The cathedral won’t be completed!”*

Even in his negative attitude to the activities of completion, Cologne Cathedral is a strong symbol for and of the Middle Ages.

But even if Heine’s poem is significant for the pre-revolutionary phase in Europe, at least when they are concerning Cologne Cathedral, his bitter verses turned out wrong, and the Cathedral was completed.

But even in other poems, which are apolitical, non-satiric and immortal, he mentioned and worshipped the cathedral and its works of art.

Best known are the poems which he published 1823 in his “lyrical intermezzo”, especially these, Robert Schumann used for his song cycle “A Poet’s Love”.

In poem XI he describes the cathedral and a gothic altar piece, which reminds him to his lost love:

*In the Rhine, in that holy river
is mirrored in the waves,
with its towering cathedral
the holy city of Cologne.*

*In the cathedral there is a picture,
painted on golden leather;
into the wilderness of my life
it shone with friendly radiance.*

*Flowers and little angels float
around our blessed Lady;
her eyes, her lips, her cheeks,
are just like those of my beloved*

And in poem LXVI he wants twelve giants, mightier than mighty St. Christopher in Cologne Cathedral to bear the coffin containing his love and pain.

These poems show the presence of the cathedral and even its interior in the consciousness of intellectuals of the time, even if they were very distant to Christendom or Catholicism.

2.3.7 Importance as touristic magnet

Cologne Cathedral is not only the most important landmark of the city and the Rhineland region but with over 6 million visitors per year it is also the most visited landmark of Germany.¹⁰ Even internationally the cathedral had reached an unrivalled awareness level, long before the existence of a UNESCO World Heritage list.

¹⁰

www.nrw-tourism.com/a-cologne-cathedral [Accessed 5 Jun. 2018]



2.3.8 World War II

In post-war Cologne the cathedral became a very frequently photographed subject. The pictures of the badly damaged church and the destroyed surrounding rest of the city were seen all around the world. Newspapers like the Daily Mail titled it as the “Survivor of Cologne”.¹¹ So, once again in history, Cologne Cathedral received international attention and foremost, help from everywhere in the world to get reconstructed. And almost 700 years after its foundation it got rebuilt, again mostly through the appeal for donations by the Central Cathedral Building Society (ZDV – as already mentioned above). Of course, this dramatic fate cemented its position as a monument with an indispensable identity impact for the society even further. It renewed its status as a symbol for survival, a “Christian monument beyond confessional or political and divides”.¹²



Illustration 10: Cologne in 1945 of U.S. Department of Defense, Source: wikipedia.com

2.3.9 „Plan F“

The cathedrals international influence in Gothic architecture already emerged during its early building phase in the 19th century. Due to exceptionally fortunate circumstances the German art collector and art historian, Sulpiz Boisserée, got hold of parts of the originally “Plan F”. This plan was one out of seven remaining medieval architectural sketches, most probably designed by Johannes von Köln, the cathedral’s third master builder, dating from the beginning of the 14th century. One part was found in an attic of a guest house in Germany and the other part in some antique store in Paris and then got smuggled to Germany.¹³ Boisserée managed to buy them and let them put together so that an extremely accurate design of the west-façade, 4,05m high, was the result.¹⁴ Of course, this was a sensation in the architectural scene, even across the borders. At that time Boisserée was already very engaged in the Cathedral’s Building Society (ZDV) and the completion of Cologne Cathedral became an important personal matter to him. He knew very well how to push important donators and in the end he could even convince King Frederick William IV to contribute.¹⁵ The ZDV also published some issues of the ‘Kölner Domblatt’ in French and that way leaders of the Gothic revival in Belgium, France and England could be reached as well. Cologne Cathedral had an impact on the international development of neo-Gothic architecture as well as

¹¹ Svenson, A. (2015) Cologne Cathedral as an International Monument. In: Rüger, J. Wachsmann, N. ed., *Rewriting German History: New Perspectives on Modern Germany*. 1st ed. NY: Palgrave Macmillan.

¹² Ibid.

¹³ Ibid.

¹⁴ <https://www.koelner-dom.de/rundgang/bedeutendewerke/plan-f-end-of-the-13th-century> [Accessed 5 Jun. 2018]

¹⁵ https://en.wikipedia.org/wiki/Sulpiz_Boisseree [Accessed 5 Jun. 2018]



on foreign preservation policies. The famous French architect and monument conservator Emmanuel Viollet-le-Duc was also a great supporter of the cathedral's completion and said "it is in the interest of our national glory!"¹⁶

2.3.10 "Kölner Domplombe" („Cologne Cathedrals's Filling")

Obviously, throughout the history, things that happened in or around the cathedral have always had an emotional impact to its environment. One recent example is the removal of the "Kölner Domplombe" in 2005. The so-called 'Plombe' was a brick stone seal in the west façade of the north tower at about 20m heights, which was done to fill a huge hole in the buttress caused by an aerial bombing in fall 1943.¹⁷

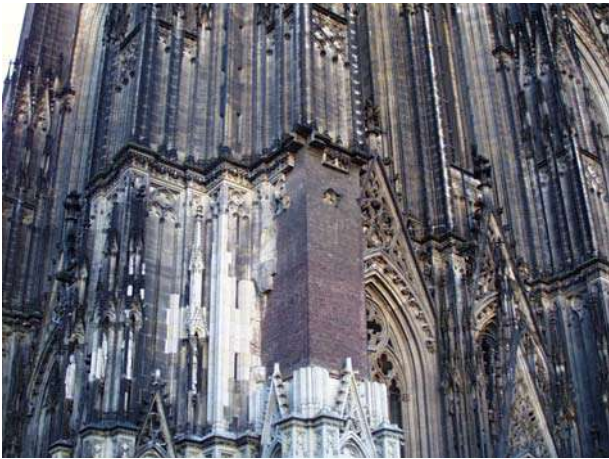


Illustration 11: So-called Domplombe, before and after the reconstruction in 2005, Source: wikipedia.com, Gerd Franke

The former master builder had to act quickly to avoid the risk that more stones would collapse and the tower would be in danger. Today, different versions circulate of the exact sequence of events that happened around the seal. Most probably it is due to the civilian engagement of the commander of a pioneer battalion who discovered the damage and then offered prisoners of war as well as concentration camp prisoners to help safeguard the north tower.¹⁸ In any case, the seal was a tragic testimony of those times and many Cologners saw it as an important memorial against war and fascism. Its removal and the newly reconstructed façade triggered heated discussions among the people.

All these above mentioned facts about and stories around Cologne Cathedral reflect its high emotional value. The 'Dome' is firmly anchored in the consciousness of the local residents and its presence and charisma captures the hearts of all foreign visitors as well.

2.4 Santa Maria Assunta's Cathedral, Pisa

2.4.1 The Cathedral and the Piazza dei Miracoli

The Cathedral and its square are the result of extraordinary human knowledge supported by a persistent civic consciousness and a strong religious faith. The foundation of a new Cathedral in 1064 was a way to celebrate the triumph of Pisa against the Saracens in Palermo, whose spoils were partly invested in building of the church. Therefore, since its beginning, the Cathedral square was connected to the self-awareness of

¹⁶ Svenson, A. (2015) Cologne Cathedral as an International Monument. In: Rüger, J. Wachsmann, N. ed., *Rewriting German History: New Perspectives on Modern Germany*. 1st ed. NY: Palgrave Macmillan.

¹⁷ https://de.wikipedia.org/wiki/Kölner_Domplombe [Accessed 5 Jun. 2018]

¹⁸ Ibid.



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the city state when Pisa was at the peak of its glory and its supremacy in the Mediterranean sea. From the beginning the monuments played an important role in the medieval architectural landscape in Europe and were portrayed in various notable works of art and were referred to in literature. Pisa was so proud of its success that it used to refer to itself as a 'new Rome'. A large amount of ancient marble inscription, taken from local Roman monuments and civil buildings (from the area of the Thermae, close to the cathedral Square), were employed in the construction of the new catholic temple, 'white as the snow'. Those testaments of close attention and the constant care to which the monuments were subjected along the centuries show the importance of the Cathedral Square as a place of social identity for the city of Pisa.



Illustration 12: Pisa Cathedral and the Leaning Tower of Pisa, Source: www.mackenzie.co

Nowadays, the Cathedral square or 'Piazza dei Miracoli' / *Square of Miracles* remained the symbol of Pisa, both for citizens and for tourists. It represents a catholic monumental complex, a place of worship as well as a cultural and touristic destination.

One of the most important works of art within the cathedral is the pulpit by Giovanni Pisano (1250-1315). With its elaborate sculptural decoration and the outstanding architectural structure it is considered to be the masterpiece of Italian gothic sculpture.¹



Illustration 13: Pulpit of Pisa Cathedral by Giovanni Pisano (1302-1310), Source: italianways.com



2.4.2 *The Baptistery*



Illustration 14: The Baptistery of St. John 1152-1363, Source: wikipedia.org

The second building that was erected in the Campo Santo after the cathedral is the Baptistery of St. John. It is the largest baptistery in Italy and probably the most representative of the Tuscany region.

The monument is almost 55m high and gives a perfect example for the shift in architectural style from the Romanesque lower section to the Gothic characteristics in the upper half. It houses one of the first important works of Italian Renaissance Art, the pulpit by Nicola Pisano – the father of Giovanni.¹⁹

2.4.3 *The Leaning Tower*

Differing from the voyagers of the 19th century's Grand Tour, the crowd of tourists that visit the Cathedral Square today are more interested in the Leaning Tower than in the cultural heritage enclosed in the Camposanto or in the Cathedral. Nevertheless, the economic impact of this 'famous' destination has important exploitation effects in the local economy.

Clearly, the icon of the city is the Cathedral's bell tower, better known as the Leaning Tower of Pisa. Along the centuries, what at the beginning in 1173 seemed to be a defect became the reason for the celebrity of the monument. Now, it is so renowned to have become one of the symbols of Italy itself.

¹⁹ Ibid.



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Illustration 15: Instagram Sreenshots #Leaning Tower, Source: Instagram

2.4.4 Pisa's Cathedral as a symbol for the city and Italy

The "Piazza dei Miracoli" and especially the leaning tower belong to the most popular sights of Italy and Europe. It is listed as a UNESCO world heritage since 1987. More than 3 million people bought a ticket to visit the main sights of the cathedral complex, attracting millions of people to take a photo of this famous ensemble. In China it is the best known monument of Italian Cultural Heritage.

2.4.5 Popular Events

In the square and also in the monuments themselves usually events, festivities and other cultural activities take place. For example, the International Sacred Music Festival called *Anima Mundi*, is performed in the Camposanto and in the Cathedral every September since 2001. The Convention *Cattedrali Europee* is held in the G. Toniolo Auditorium every year on a specific theme.

For special occasions and global events, such as Save the Children's global campaign to combat the infant mortality or the fight against breast cancer, the Tower was painted by coloured lights of red, purple, blue or green according to the colour of the event.

2.4.6 Legends, popular traditions

The Cathedral and the other monuments of the square are well mentioned in legends, tales, popular literature and songs. The book *Viaggiatori stranieri a Pisa dal '500 al '900* (ed. Nistri Lischi, 2003) is a collection of records by visitors from different countries from the sixteenth to the twentieth century and gives an overview of how Pisa was perceived by so many people different of nature, culture and provenience.

Moreover the Cathedral square and its monuments are the object of many legends. For example, The Legend of the devil's claws:



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A piece of marble, located at a man's height on the north side of the Cathedral, has many little holes on one side. According to the legend, the Devil, jealous of the beauty of the Cathedral, wanted to destroy it and climbed along the north side to stop its construction. But an angel managed to prevent it and the Devil managed only to cling to this piece of marble, leaving the mark of his claws. Another story is called The betrayer's bell:

In the middle ages, the bell of San Ranieri, called the Bell of the Betrayer, sounded when an execution for treason was carried out. It is said that it also rang the day when the famous Count Ugolino was locked up in a cell with his children, condemned to die by starvation.

Also a song was written in 1939 by Gino Latilla titled "Evviva la Torre di Pisa". The song's chorus is:

Evviva la Torre di Pisa, che pende, che pende ma sempre sta su.

Evviva la Torre di Pisa, che pende, che pende e mai non vien giù.

*(Translated: Hurrah, hurrah the Tower of Pisa/ that leans, that leans/ but it always stands up./
Hurrah, hurrah the Tower of Pisa/ that leans, that leans/ and never comes down.)*



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2.5 Cathedral Santa María, Vitoria

2.5.1 Landmark of the city

The old Cathedral, as Santa María is commonly known, has its great appeal in its Belfry Tower or City Watchtower, where the public and visitors can walk up and have the best view of the city. The belfry tower takes part in the city's most important slogan named '*Las cuatro torres*'/The four towers, where Santa María's tower plays the major roll.



Illustration 16: „Las cuatro torres“, city logo of Vitoria-Gasteiz (Source: www.vitoria-gasteiz.org)

2.5.2 Center of Cultural Life

Santa Maria and its surroundings are important for religious worships and cultural life in Vitoria. It often hosts religious congregations who come to Vitoria to pray or to make tribute in some of the chapels, like Saint Prudencio Chapel or Saint Marcos Chapel, visited by the Jesus Christ Servants or many others visited by priests and friars, even cloistered figures. Also other activities are performed in the Cathedral and the attached workshops and buildings included in its construction: choirs, conferences, different types and genre concerts, journeys, expositions, congresses, storytelling's, theatre, activities for the children, colonies, guided tours, art contests (writing, photography, postcards).

Moreover the most charitable and humanitarian place in Vitoria is allocated in the parish church of the Cathedral, the buildings greatest chapel, the Santiago's Chapel. The church has been always open to the public with no exception (albeit its history suffered from different changes, policies, audiences and names) not only for the local public but also for pilgrims on their way to Santiago de Compostela. Of course, Santa María is part of the UNESCO Heritage also because it is on the way of the 'Camino de Santiago' road to Santiago de Compostela.



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Illustration 17: Interior Cathedral Santa María Vitoria, Source: www.catedralvitoria.eus

2.5.3 Historic Functions of the Cathedral

The cathedral was built in the late 13th century throughout the 14th century in gothic style. Being part of the city's defences, it was conceived as a church-fortress. During Vitoria's battle in 1813 when Napoleon invaded the country, Santa María remained the only existing church, which also points out its historical importance. The cathedral represents the origin of the city, it has preserved it from disappearance over the years, keeping the founding's first vestiges covered from the time decay.



Illustration 18: „Open for works“ at Cathedral Santa María, Source: www.catedralvitoria.eus

2.5.4 The Workshop as a Place of Identification and Discussion

Apart from that, the buildings gantry has been over the years an encountering place for people, workers, merchants, traders, visitors, etc. Moreover the most important archives in the town, such as the provincial and diocese archive, were allocated in Santa María. The cathedral, as a church, had the local importance as a parish church until it became a collegiate church. After this the title 'cathedral' was granted to the building and therefore the place reformed to the bishop's see in the Basque Country, increasing the importance of the church a great deal higher.



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It is indeed one of the most international samples of how a construction deeply decayed to ruin stage can be managed to survive and be reformed and conserved, giving new life to the monument. The restoration master plan is also patented under the 'Abierto por obras' / *Open for Works* slogan, currently being applied in restorations like Santiago de Compostela Cathedral in Galicia (under the Spanish Cultural Heritage Institution - IPCE) or different other buildings in the south of Spain.

1.1.1 Presence in Popular Culture and Literature

Some of the local legends and tales take the Cathedral as a main subject. For example, the catacombs legend, where it is said that the Cathedral holds secret tunnels, so the priests and nobles could go from the church to their nearby palaces subterraneous.

The 'Garbancera' bell tale is the story about one of the cathedral's bells that informs the public about the perfect hour for soaking the chickpeas in order to cook the very traditional Spanish Stew correctly (garbanzo means chickpea).



Illustration 19: Bronze statue of Ken Follett by Casto Solano, 2008, Source: [wikimedia.org](https://www.wikimedia.org)

Moreover also the literary importance of the building has been increasing within the past years, proving the cathedral being the inspiration for the famous writer Ken Follet, author of "The Pillars of the Earth". He was so amazed at his visit around the interior of the cathedral that he got motivated to write the sequel "World Without End" in 2007. One year later a statue of the British writer has been erected, just near the Santa María cathedral. The famous Latin American author Paulo Coelho held talks in the cathedral and uses it in his book "El Zahir". The basque writer, Toti Martinez de Lecea, was born in Vitoria. She is famous for her novels and children books and often includes the Cathedral Santa María in her stories.



2.6 St. Bavo's Cathedral, Ghent

2.6.1 Landmark of the City

Not only because of its exceptionally rich and varied artwork but also because of its monumental architecture the church of Saint Bavo in Ghent is one of the most remarkable cathedrals in Flanders marking almost one million visitors per year. It is the oldest parish church in the city centre of Ghent. Together with the tower of St. Nicholas' Church and the famous Belfry of Ghent, which is the tallest belfry in Belgium, St. Bavo forms the typical look of a Flemish mediaeval city.



Illustration 20: Historical City Centre of Ghent (from left to right: Old Post office, St. Nicholas Church, Belfry and St. Bavo Cathedral), Source: Europeupclose.com

2.6.2 Parish church of St. John's, Cathedral of St. Bavo's

The origins of St. Bavo's Cathedral go back to the middle of the 10th century. In the crypt of the cathedral traces of the former wooden construction of the Chapel of St. John the Baptist are still visible. The crypt also reveals the subsequent Romanesque developments, when the church was expanded in 1038. After the major construction period in Gothic style from 14th to 16th century the actual cathedral was considered completed in 1569. But already ten years before that, in 1559 it became cathedral and changed its patron. This had to do with political decisions made by Emperor Charles V. and his son Philip II.

To assure the royal power over the city, Charles V. built a new fortress in the north of the city, where the monastery of St. Bavo's was located. To get the necessary space, in 1540 the monastery was destroyed and the monks were transferred to the former Church of St. John's.

Under Charles' son Philip the ecclesiastical organisation was totally changed. Ghent, that in ecclesiastic aspects had belonged to the diocese of Tournai in southern Belgium was made an own seat of a Bishop under the archbishop of Mechelen-Brussels. It seems, that Philipp wanted – in reaction to reformation whith its high value for the vernacular in the churches reorganised the catholic church in Belgium according to the language borders. So St. Bavo's became a seat of a bishop rather late in history. Still today, the chapter of Saint-Bavo is housed inside the cathedral.²⁰ The rich baroque interior of the cathedral displays the influence of one of the longest ruling bishops of Ghent, Antonius Triest. (Bishop of Gent from 1616-1657) ²¹

²⁰ Arens, D. (2012) Dumont Flandern. Ostfildern: DuMont Reiseverlag. p. 115

²¹ <http://www.sintbaafskathedraal.be/en/history> [Accessed 5 Jun. 2018]



Illustration 21: „Saint Bavo enters the Convent at Ghent“, Peter Paul Rubens 1624, Source: www.sintbaafskathedraal.be

2.6.3 Home of Works of Art

St. Bavo's Cathedral is home to great works of art of noteworthy artists like Gaspar de Crayer, Jan van Cleef and Peter Paul Rubens. He was commissioned for the paintings of the early baroque high altar by bishop Triest. The panel painting – the original centre piece of the high altar – shows the conversion of Bavo, who was a noble man in the Netherlands in the 6th century. After the death of his wife, he gave away all his wealth and entered a monastery. The picture also refers to the change of the later cathedral's patronage from St. John to St. Bavo. The former knight, Bavo, is kneeling in front of the portal and about to enter the convent to become a monk. He is warmly welcome by the abbot Saint Floribert and St. Amandus, apostle of Flanders.²² In the bottom part of the painting monks give alms to the poor underlining the prosperity of St. Bavo's cathedral and convent.

2.6.4 The Mystic Lamb of the Brothers van Eyck

Of course, the cathedral is mostly recognized for the Ghent Altarpiece, also known as The Adoration of the Mystic Lamb. This masterpiece created by the brothers Hubert and Jan van Eyck is considered to be the most important and influential work of early Northern Renaissance Art. Completed in 1432, it was commissioned by Joos Vijd, a wealthy merchant of Ghent with high political functions and best liaisons to the Duke of Burgundy Philip the Good. In the middle of the 15th century the cathedral was still referred to as St. John the Baptist's church and Vijd was a warden of St. John's at that time. With this monumental altarpiece Vijd made an important contribution to the cultural impact of the church and the city of Ghent, at the same time underlining his religious conviction and his high social status. He wished to see the altarpiece in the cathedral's newly constructed Joos Vijd chapel that was evidently also financed by him.

²²

Arens, D. (2012) Dumont Flandern. Ostfildern: DuMont Reiseverlag. p. 117



He and his wife are represented as donors on the lower outside panels of the polyptych altarpiece. On the inside, the lower panel in the centre shows the most important scene: the famous adoration of the Lamb of God. The composition of the several groups of figures adoring the lamb on the altar, all overseen and blazed by the holy spirit in the form of a dove and the skyline in the background, with the razor-sharp accuracy of the buildings architecture, give proof to this outstanding quality of the panel paintings. Jan van Eyck was a forerunner of artistic realism in Medieval works and he pioneered the art of oil painting which certainly marked the beginning of a new style.

However the Ghent Altarpiece is not only a very important work of art in art-history but also an important contemporary document about the relationship between politics and art. It represents the interface of the early 15th century between theology, politics, society and culture. Up until the 19th there was a rivalry between the Belgium cities Brussels, Antwerp and Ghent and within this competition different cultural and artistic movements arose.²³

2.6.5 Reasons to Visit the Cathedral

While other cathedrals are being visited by people from all over the world to pray to holy relics, St. Bavo's Cathedral is foremost a pilgrim site for art-historians and art lovers. So to say, the Ghent Altarpiece functions as a cultural landmark within the cultural monument and, at the same time, it is a trademark for the cathedral and the city as well.



Illustration 22: The Adoration of the Mystic Lamb, Source: closertovaneyck.be

Already by the end of the 15th century, visitors of the cathedral were paying in order to be able to see the famous panels of the altar. Among these visitors in 1521 also was Albrecht Dürer, the famous German Renaissance artist. He came to Ghent to visit Jan van Eyck's oeuvre and appraised it as a stupendous painting, which gave even more importance to it and increased its popularity within the European art scene.

When the Ghent Altarpiece is mentioned in the same breath as the Mona Lisa and the Sistine Chapel one becomes aware of its art-historical significance. However the altar is also famous for being the world's most coveted piece of art. No other work of art has been taken apart, partly stolen, hidden and then put

²³ www.arts.kuleuven.be/cultuurgeschiedenis/documenten/PhD [Accessed 10 June 2018]



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together again that often than the Mystic Lamb. In 2012 there was even a book published about its history of thefts, “Stealing the Mystic Lamb” by Noah Charney.

2.6.6 Reception in Popular Culture

Also the Hollywood movie “The Monuments Men” (starring actors like George Clooney, Matt Damon and Bill Murray) was about the last important finding of the panel paintings. The film, based on historic facts, follows an allied group during World War II that was put together under the US initiative ‘Monuments, Fine Arts and Archives Program’. The task was to find and save pieces of art or other culturally important goods before they would get destroyed or stolen by the Nazis. At the end they discover an immense art depot in an abandoned Austrian salt mine from where also the Ghent Altarpiece was evacuated.²⁴



Illustration 23: The Mystic Lamb during recovery from the Altaussee salt mine at the End of WWII, Sourced: wikipedia.org

Since October 2012 the altarpiece is being restored within an extensive project carried out by the Royal Institute for Cultural Heritage (KIK-IRPA). The restoration works take place at the Museum of Fine Arts Ghent (MSK) where the visitors can actually watch the treatment in progress behind glass walls. In June 2020, during the Van Eyck year, the restored panels will be installed at the new visitor centre within the cathedral.

²⁴ www.monumentsmen.com [Accessed 10 Jun. 2018]



2.7 Oslo Opera House

Obviously, the Opera House in Oslo is the exception to the other five Nano-Cathedral monuments – of course besides the fact, that it is not a cathedral: a secular building designed in contemporary, very modern architecture made out of a particular uncommon material for its region. However, even though the Opera cannot look back on hundreds or thousand years of history like the partner cathedrals, it gained considerable cultural importance in a comparatively very short period of time. Completed in 2007, the Opera in Bjørvika opened on April 12th 2008 with an evening gala and 2.000 national and international guests, among them important representatives from politics and royal houses, like King Harald of Norway and Queen Margret of Denmark. Already 4 years later, in 2012, it was listed as cultural heritage during the 100th anniversary on the foundation of the Directorate for Cultural Heritage institutions in Norway.²⁵

Now, the Norwegian Opera and Ballet (DNO) is one of the largest and most important public cultural houses in Norway. Its original architecture has received attention far beyond the country's borders. In a short time the building has become a symbol and an attraction and achieved the overall goal of the project, namely to signify the nation's cultural and social life.



Illustration 24: Oslo Opera House with snow, Source: Opera designveileder, 2013

Since years there have been a lot of controversial discussions in the run-up of the plan to build a new opera house. Finally the Norwegian government decided to place a new building right on the water front, in the style of the Sydney Opera House, in Bjørvika harbour. It should mark the centre of a new district in Oslo.²⁶

²⁵ https://en.wikipedia.org/wiki/Oslo_Opera_House [Accessed 10 Jun. 2018]

²⁶ Ibid.



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Illustration 25: Oslo Oper House with visitors, Source: birdseyepix.com/Christopher Hagelund

2.7.1 Architecture and its presence in public discourse

The Opera House is a special building, in many respects. The intention was to make it look like an iceberg that – in front of the city – emerges out of the water. The materials chosen are wood, for a cosy interior, aluminium, glass and stone, namely granite and most important about 90 percent white marble from Carrara. When you look at the building today the mission was fully accomplished. However, working with a stone like marble in a northern climate near salty seawater will always be challenging for maintaining it in proper condition and “iceberg-optic”.

The marble covered outdoor area with sloping positions and accessible roof surfaces have given the audience a new and different experience of architecture. Foremost, the building has attracted a wider audience, opera and ballet fans as well as non-opera-goers. People of all age, citizens and tourists, come to enjoy “the white mountain” which is rising from the sea. Either they just stroll alongside its roof or they stay to sit down and take a sunbath on its marble slopes or picnic there. Also the inside offers facilities that invite the visitor to stay: a bar, restaurants and a gift shop.



Illustration 26: Oslo Opera House interior and Opera Hall and main stage curtain, Source: wikipedia.org; Source: Opera designveileder, 2013



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2.7.2 Cultural Importance as Opera House

The opera and ballet halls have gained recognition throughout its spatial and acoustic qualities and have positively convinced classical music and art fans of all sorts. Already the Opera House has been awarded a number of architectural prizes, and appears in many popular recognitions as building art on a high level.

Being a young monument - in comparison to the other Nano-Cathedral sites - it already represents an important monumental building that marks Norway as a cultural nation and its public adoption clearly proves that it creates an important cultural impact. The opera is thus in a special position, which implies also in the future, that great emphasis is placed on preserving the aesthetic and architectural qualities.

2.7.3 Other Cultural Use, Public Use

The opera house is a very open house, hosting exhibitions, but also restaurants and coffee-houses open during the day, when there is no opera performed, and a traditional single-purpose opera house would look empty and deserted.

On it's it accessible and walkable ramps which form both base and roof of the building, are used for sports, promenades and sunbathing and incorporate the building in all-day life of tourists and inhabitants of Oslo.

3 Centers of Competence

3.1.1 General points

The project partners discussed about ways and strategies to improve and strengthen their position as "Centres of Competence" in regard to their achievements in preservation and conservation. Since they are (already) flagships in representing and maintaining the monuments in their respective countries and areas, the results of NANO-Cathedral can be spread and disseminated on a more effective level by these partners. At the same time the use of NANO-technology can also strengthen the position of the partners themselves as centres of competence.

3.2 Dombauhütte St. Stephan, Vienna

The lodge of St. Stephen's cathedral has itself always seen as a centre of competence in stone restoration and preservation of stone buildings for Vienna and Austria. The lodge tries to preserve and practice the old skills of craftsmanship coming from the mediaeval workshops and is still doing the biggest part of its work by hand.

On the other hand the intense collaboration with official authorities and their laboratories and workshops, like the Austrian Federal Monuments Office, universities, which are engaged in preservation, geology, chemistry, climate research, history etc. both from Austria and from abroad provides a permanent exchange of knowledge. The widespread contacts allow contacts and the exchange of knowledge between different disciplines.

International cooperation of the lodges has a very old tradition, coming from the middle ages and being cultivated even in present times, by exchange-programmes for stonemasons or the permanent cooperation of most of the lodges in Europe (e.g. Internationale Dombaumeisterversammlung – international association of cathedral architects).



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Illustration 27: Traditional craft at the masons lodge of St.Stephen's Vienna, Source: Dombauhütte Vienna

NANO-Cathedral has very much widened this spectrum of contacts and the understanding of other disciplines, so that it has improved the lodge's position as a centre of competence. These mentioned activities have improved the situation of communication and exchange of knowledge between the different institutions and disciplines, active in the field of preservation and restoration of monuments. Actually two times a year the workshop is open for the public and can be visited by anybody. Some of the masons show their practical work and discuss with the people. Information material like posters, slideshows and leaflets help by informing the visitors.

The current activities in communication of preservation-problems should and shall be institutionalized in form of round tables, discussions in lecture halls and on the scaffold with interested people, both professional and interested laypersons.

3.3 Dombauhütte – Metropolitankapitel der Hohen Domkirche, Köln

Cologne Cathedral ranks among the most outstanding examples of Gothic architecture worldwide. Since 1996 the church is part of the UNESCO world-heritage. The building material consists of various stone types, mainly trachyte, sandstone, shell-limestone and basalt. As the cathedral is situated in the heart of the city, surrounded by motorcar and railway traffic, the stone surfaces – depending on their individual durability – are more or less heavily deteriorated by air pollution und environmental stress.



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Illustration 28: Sandblasting at the façade of Cologne Cathedral, Source: Dombauhütte Köln, Foto: M. Wurth

Responsible for the maintenance of the building and its works of art is the Cathedral Works Department (“Dombauhütte”), established in 1823 and headed by the Cathedral Architect. First experiments with stone conservation started already in the 19th century. Today, stone conservation treatments are carried out by stone conservators and experienced stonemasons under the surveillance of scientists. The workshop is annually publishing the reports on its restoration work, which reach a very wide public and have the potential to raise public awareness for the importance of restorers.

3.4 Opera della Primaziale Pisana, Pisa

The Opera della Primaziale Pisana (Opae) was established at the time of the first works for the construction of the monuments in Piazza del Duomo. Between 1064 and 1120, during the building of the Cathedral, the Opera della Primaziale Pisana did not have its own institutional identity yet. This word began to be used in the last decade of the XI century, at the time of Daiberto, Archbishop of Pisa since 1092, and meant precisely the works for the erection of the monument. Since then, the Opae oversees the preservation of the monuments. The institution employs one hundred people including engineers, architects, accountants, restorers, masons, sculptors, gardeners, blacksmiths, carpenters, surveillance and administrative staff.

The workshop is working permanently and its members are well familiar with the buildings, their state of conservation and problems, so most of damages can be quickly detected and repaired. The daily commitment is to ensure that these masterpieces of medieval architecture and their rich collection of sculptures and paintings are transmitted to the future generations. Since 1999, the Opera has had the legal status of a non-profit organisation, subject to its own Charter, which includes, among its institutional purposes, the “protection, promotion and enhancement of its artistic heritage”.



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Illustration 29: Restoration at the Opae, Source: Opera della Primaziale Pisana

The Opae is working to become a Centre of Competence not only for specialists but also for the public as it is shown by the annual conference “Cattedrali Europei” that takes place every year since 2011, with a special focus on a different topic every year. The meeting has become a well-established public event in the cultural programme that Opae has drawn up to promote the exchange of expertise in order to ensure the promotion and preservation of the precious heritage. It’s an occasion to bring together a group of specialists in order to open a debate and a dialogue on a specific theme, related to the conservation and management of historic and artistic heritage of the most important and significant European Cathedrals.

The Opae is willing to improve its position as a CoC and during the last years several projects were undertaken to fulfil this objective.

For instance, the annual conference of European Cathedrals allows collecting educational credits for engineers and architects. Moreover Opae, as the workshop’s leader of AFI (Associazione Fabbricere Italiane), an Italian national association that provides for the conservation and maintenance of the assets of the sacred places, sanctioned by the establishment of periodic technical meetings in order to exchange the expertise of each workshop and to standardize a unified conservative procedure.

Finally, the Opae is working to create a Logistic Pole for the conservation in order to train a new staff of conservators and restorers.

The NANO-CATHEDRAL project allows OPAE to test new technologies applied to conservation. Results may facilitate the OPAE restorers’ daily task: a more detailed process of intervention, supported by a deeper knowledge of the site and its petrographic, chemical, physical characteristics, may be successfully applied. The knowledge that was built up - thanks to the standardization of process of intervention in accordance with decay/petrographic characteristics of sites involved in the project - will provide an appropriate workflow of intervention to be carried out.

Furthermore NANO-Cathedral projects push conservators to widen their own point of view on restoration. Getting familiar with the conservation methods applied in other regions in Europe opens a dialogue that ensures the closest examination of different study cases, the comparison of methodologies and techniques and, as a consequence, the gaining of increasing build-up of “know how” on restoration.

The main goal of the Opera della Primaziale Pisana is to ensure the conservation of the monumental buildings to future generations: efforts are orientated into avoiding any invasive, radical, aggressive intervention of restoration that should stress the UNESCO World Heritage Site. New materials successfully released by the NANO-Cathedral project, to be used as consolidate and protective coatings on the marble

NMP-21-2014: Materials-based solutions for protection or preservation of European cultural heritage



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stones of the Cathedral Square monumental heritage hopefully will ensure long term results and less money consuming actions, as a complex and invasive restoration work could be.

The traditional craftsmanship is still used when it is considered necessary to complete already missing pieces. The volume and form of the original piece are reproduced but not the decorative parts in order to avoid creating a modern fake. Consolidating products are only given when the decay phenomena are very severe and it is imperative to conserve the original piece for the authenticity of the monuments itself.

The exchange of expertise during the 3-years-long NANO-Cathedral project has greatly increased the competence and skills of the Conservation Department. A deeper knowledge of the issues related to the scientist's point of view, the constant collaboration with producers and conservators from different cultural areas has forced restorers to improve their know-how. The participation in an European research and development project had for sure positive effects in expanding the proficiency of each person involved in the project and, above all, in extending the competences of the staff of Opera della Primaziale Pisana.



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3.5 Fundación Catedral Santa María, Vitoria

Since the founding of the organization innovation in heritage management and conservation has been one of the main features of the project. Fundación Catedral Santa María's master plan has been transferred to other building restorations for several times already, not only in Spain but also abroad and it has received many prizes like the Europa Nostra Restoration Award.

The works already performed in the cathedral and the management of the activities allowed it to be part of a successful exploitation pattern, not only looking after a monument but also doing it efficiently on its own.

The group of professionals included in the Fundación Catedral Santa María team, devoted to the restoration of the cathedral, and their works have been requested for several occasions, concerning technical visits or counselling for universities, architects, quantity surveyors, Fine Arts representatives, engineers, archaeologists and, above of all, heritage managers. As an example of innovation, the Fundación made an agreement for the collation among civil and religious programs in the church for 30 years.

In the working methodology for the cathedral's comprehensive rehabilitation there are several paradigms running the day-by-day routine. Accessibility, transversality, networking, knowledge socialization and respect for the monument are essential. It is of utmost importance to be always improving, the continuous upgrading is a part of the pattern to follow. For this, constant work and implementation of new working methods in combination with traditional ones may lead to achieve more progress. As an innovation project for development of materials and solutions for stone conservation, the Nano-Cathedral project set the forefront of the application of new technologies to the Heritage conservation.

A group of the greatest multidisciplinary profiles must accomplish the preservation of a monument and its features – in order to conserve the whole importance of it. It should profit from experienced and attuned professionals aiming for the most suitable outcome. At this regard the project Nano-Cathedral meets the standards and the opportunity this action offers has been exploited thoroughly by all the partners and members within it. As for the achieved improvements for the Heritage concerning the new developed formulations and Nano composites, the path has been set to comprise a first step regarding the consolidation and protection of the stone substrates. This anyhow is a crucial step for the application of new technology (Nano in this case) to the daily basis of a restoration process and needs to be continued with further research and taking as a base the analysed substrates and their results from the different validations.

3.6 Architectenbureau Bressers bvba, Ghent

The Architectenbureau Bressers is a distinguished medium-sized architect's practice specialised in small and large-scale restoration projects and contemporary new architecture. Bressers has long-term expertise and portfolio in restoration projects, as well as in communicating with private and/or public services concerning historical heritage.

As a centre of competence in heritage building related project management it offers coordination and follow-up of the subcontractors in regard to the proposed investigations on site and in the lab.

Bressers executes projects in the fields of civil and social housing, schools and cultural institutions, industrial buildings as well as religious buildings or/and works of art.



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3.7 Statsbygg - Opera House, Oslo

Statsbygg aims to be a role model for the architecture, engineering and construction industry (AEC) on the preservations and management of cultural heritage monuments and buildings. The goal is to safeguard and develop their cultural-historical properties for the benefit of the society, today and in the future. With the Oslo Opera House Statsbygg completed an eight-year-long construction project ahead of time schedule and within budget.

The Nano-Cathedral project will contribute in achieving new knowledge from its activities for the partners involved. The project activities will be an important reference in meeting the requirements on the preservation of cathedrals and monuments, historical as well as contemporary.



4 Survey on the Cultural impact of NANO-Cathedral on the end-users' account

4.1 General points

The partners involved in the task developed an online-survey to capture the attitude of the broad public towards restoration and the importance of cultural heritage in general and the use of modern technologies - like NANO-technologies - in particular. With questions about the users' opinion to subjects like 'their individual value of a monument' and 'their identification with it' the emotional approach to heritage conservation tried to be measured. Further questions covered other categories like intangible heritage, NANO-products as a promising new technology or the danger of changing the monuments surface when NANO-agents are applied. In addition, the reason of the visit to the monument and basic demographic information was queried.

4.2 NANO – survey online and on a workstation in Vienna Cathedral



Illustration 30: Screenshot introduction with short information about NANO-Cathedral, Source: Dombausekretariat Vienna

The survey, which was offered in English, French, Italian, German and Spanish, was linked to the project-sites and the homepages of the partners (if existent). In a short introduction to the survey, a short explanation about the project and the general utilisation of Nano-products was given to the visitor. The users could choose one out of the six featured monuments and their favourite language for the survey. Particular pictures accompanied the questions mostly in accordance to the chosen monument. At the end of the survey some of the partners also offered a few easy questions about their monument as a short, informative quiz. At St. Stephen's cathedral a local survey-terminal was installed.



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Nano-Cathedral

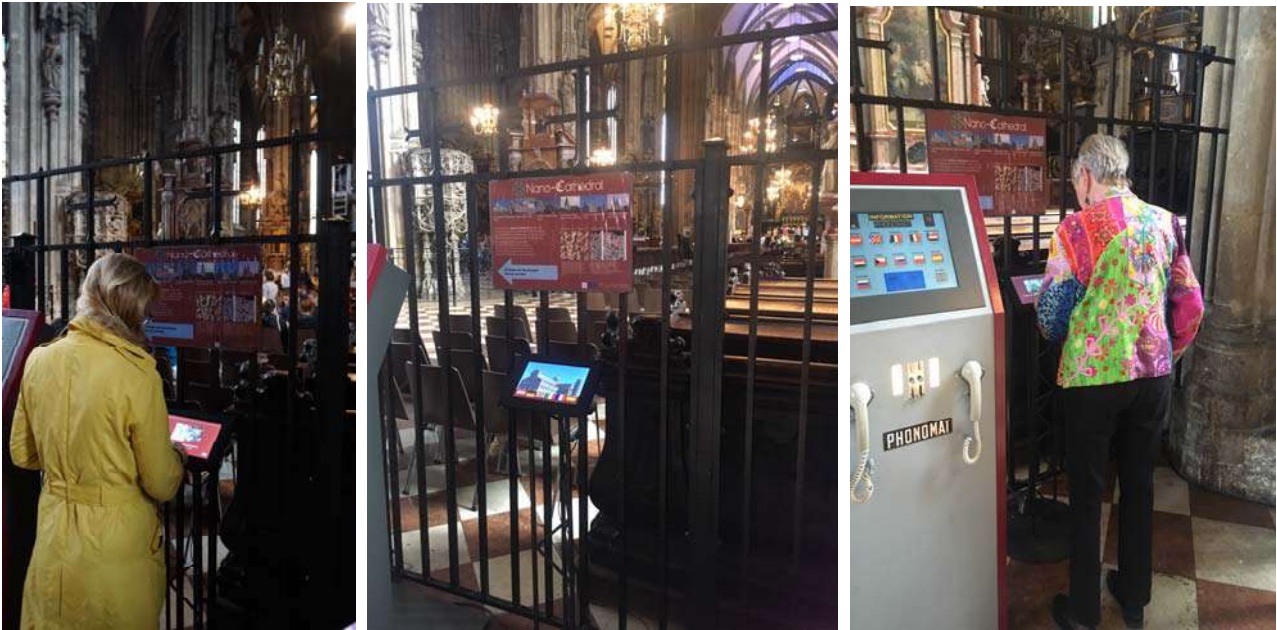


Illustration 31: NANO-survey terminal at St. Stephen's Cathedral, Source: Dombausekretariat, Vienna



Illustration 32: Nano-survey terminal, Source: Dombausekretariat, Vienna

The survey had a great acceptance, especially at the cathedral-terminal.

The online-version was visited in different intensities: about 18.000 participants visited the introduction with the information on the project. The survey itself was started more than 3.000 times, and more than 1.150 times it has been finished online and/or at the terminal in Vienna's cathedral.

The visitors of the online- and the cathedral-workstation used all the provided languages: 46% English, 28% German, 10% Italian, 10% French and 9% Spanish. 55% of the participants were female and 45% male.

The survey itself consists of 18 questions, covering a wide field of interests about the Nano-project:

The first group of questions dealt with the importance of the project's general activities: preservation, restoration and research:

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Grant Agreement no: 646178



Nano-Cathedral

For 78% of the participants, preservation of monuments is very important, for 63% the restoration is very important and for 68% the research in new technologies of preservation has highest priority.

- 1 (outer ring): Is the preservation of historic monuments important for you?
- 2: Should monuments be restored and preserved?
- 3 (inner ring): Research in new technologies in cultural heritage is important

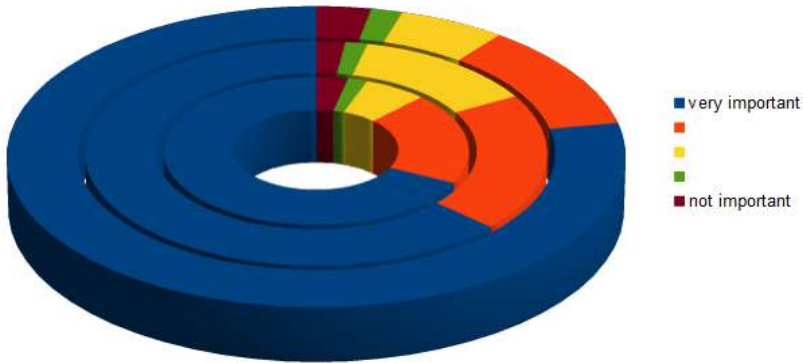


Chart 1: Importance of preservation, restoration and research.

The second category of questions was about the attitude towards NANO-technology in preservation:

For 41% NANO-technology is very promising, for another 25% promising, 43% strongly support the use of NANO-technology, another 26% support it, and only 15% think that NANO-technology changes and distorts the monument.

- 1 (outer ring) NANO Technology is a promising new technology
- 2 (inner ring) NANO Technology should be used for the preservation of monuments

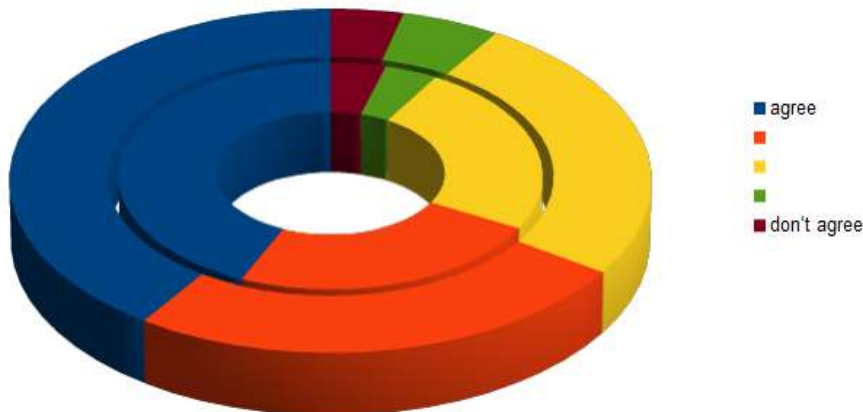


Chart 2: Attitude towards the use of NANO-technology in restoration

The third group of questions was about the craftsmanship of the workshops: people could compare pictures of the cathedral both unrestored and restored. 82% preferred the restored version.



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Which condition do you prefer?

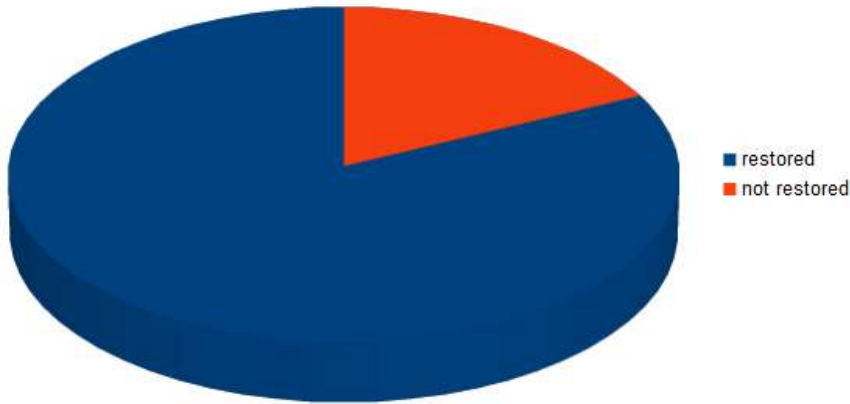


Chart 3: Preferred condition of the monument

Concerning the use of traditional craftsmanship in masons lodges 64% support the use and proliferation of the traditional techniques as well.

Traditional techniques of the workshops should be kept in use for future generations

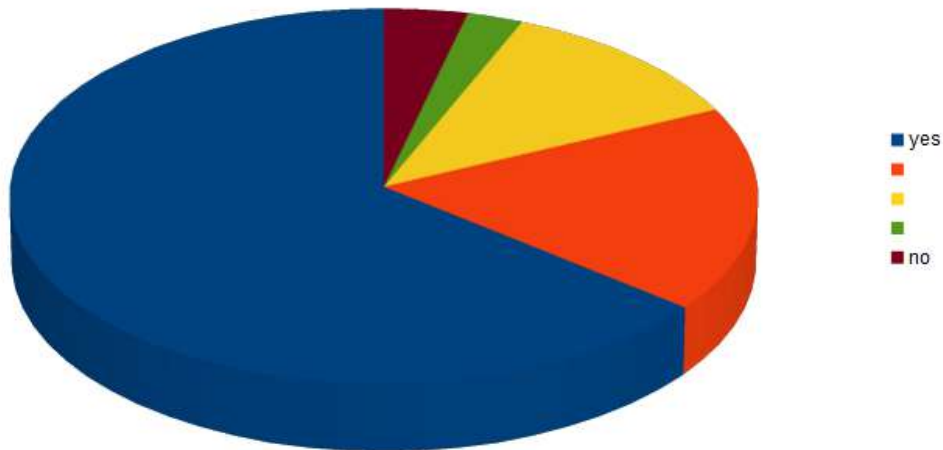


Chart 4: Keeping traditional techniques at the workshops and mason lodges

The fourth group of questions was dealing with the importance of the cathedral in the consciousness of the visitors.

For 57% the cathedral was a very important reason to visit the city, for another 20% an important reason, and for 50% of the inhabitants the cathedral is a very important part for their identity.



1 (outer ring) The cathedral is an important reason to Visit the City
2 (inner ring) for citizens: The cathedral is important for my identity

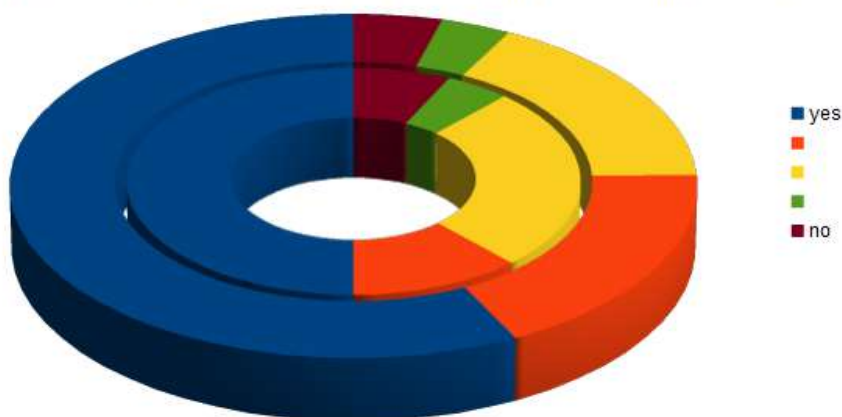


Chart 5: Importance of visiting the cathedral, Importance of the cathedral for participant's identity

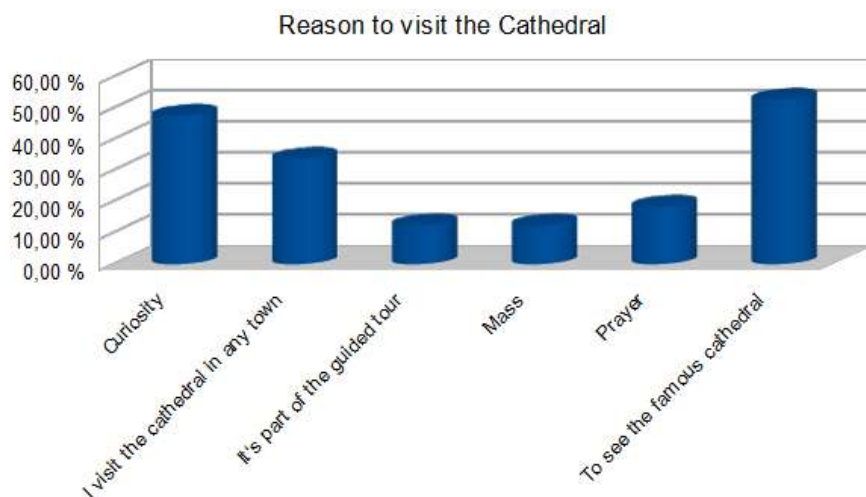


Chart 6: Reason of visit at the cathedral

4.2.1 Statistic Details:

At the workstation in St. Stephen's Cathedral 55 % of the participants were female, at the internet-survey 55% of all participants were male.



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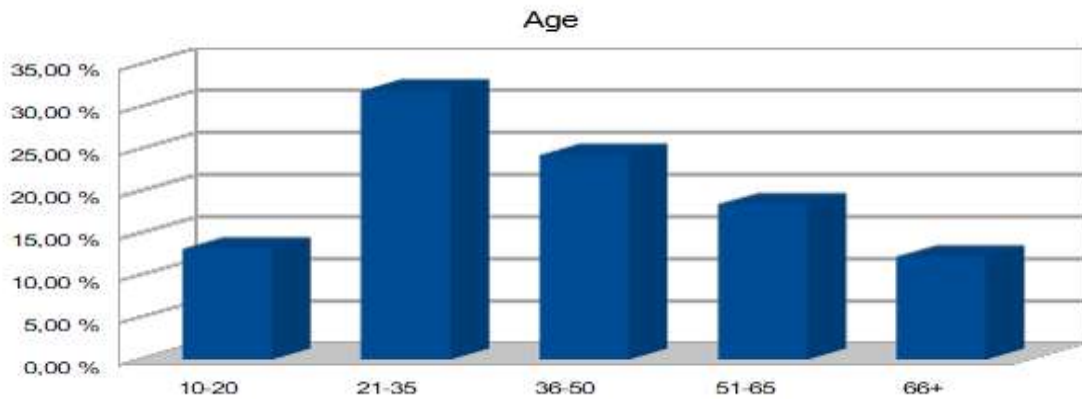


Chart 7: Age span of the participants


Among the participants at an age younger than 20 years less people (68% vs. 78% in average) think that restoration and preservation are important.

But also less of them think that the use of NANO-technology is important for restoration (35% vs. 46% of all.)

4.3 Paper survey in Pisa

On the basis of the DBHWIEN guidelines, OPAE set up a questionnaire as well, which was submitted to visitors of the Cathedral Square. The data collected have been schematically reported to allow the analysis of the cultural impact. More than 360 people were interviewed.



 Nano-Cathedral

- Preservation of historic monuments and works of art is:**
 - not important at all
 - not very important
 - important
 - very important
- Restoration and preservation should be made continuously or only after the occurrence of severe damages:**
 - never
 - only when damaged
 - continuously
- The authenticity of a historic monument depends on its appearance rather than on its original substance.**
 - aesthetic appearance
 - original substance
- Researching new technologies for the preservation of the cultural heritage is:**
 - not important at all
 - not very important
 - important
 - very important
- I am familiar with nano-technology:**
 - not at all
 - a bit
 - a lot
 - I am an expert
- The nano-technology is a promising new technology for the conservation of the cultural heritage:**
 - I don't agree at all
 - I'm partially in agreement
 - I agree
 - I very much agree
- The nano-technology can be used for the preservation of historic monuments.**
 - I don't agree at all
 - I'm partially in agreement
 - I agree
 - I very much agree
- The application of nano-products modifies the historic stones and affects the monument's authenticity:**
 - I don't agree at all
 - I'm partially in agreement
 - I agree
 - I very much agree
- If the sculptures and decorative elements of a monument are degraded, it's better:**
 - to replace them with new copies, and preserving the original sculptures in museums
 - to preserve them on the monument after a consolidant and protective treatment
 - to remove them and replace them with new copies
- The Square of Miracles is an important reason to visit the city of Pisa:**
 - I don't agree at all
 - I'm partially in agreement
 - I agree
 - I very much agree
- The Square of Miracles is Pisa's symbol of identity:**
 - I don't agree at all
 - I'm partially in agreement
 - I agree
 - I very much agree
- Why do you visit the Square of Miracles?**
 - to see the leaning tower
 - religious service
 - because it is included in the touristic tour
 - because it is a place of exceptional artistic importance
- How many people are permanently working for the conservation of the Square of Miracle?**
 - 10-20
 - 30-40
 - 50-60
 - 80-100
- When was the Cathedral founded?**
 - 31 b.C.
 - 753 a.D.
 - 1064 a.D.
 - 1573 a.D.
- What is the material of which the monuments are predominantly made?**
 - limestone
 - marble
 - brick
 - concrete
- What kind of monument is the leaning tower?**
 - A bell tower
 - a sighting tower
 - a work of military defense
- How tall is the leaning tower?**
 - 32 m
 - 58 m
 - 68 m
 - 90 m
- Where are you from?**

.....

THANK YOU FOR YOUR TIME AND FOR HELPING US TO TAKE CARE OF OUR MONUMENTS!

Illustration 33: Importance of preservation, restoration and research. Questionnaire of Opae conducted at the Piazza dei Miracoli, Source: Opae



1. Preservation of historic monuments and works of art is:

not important at all not very important important very important

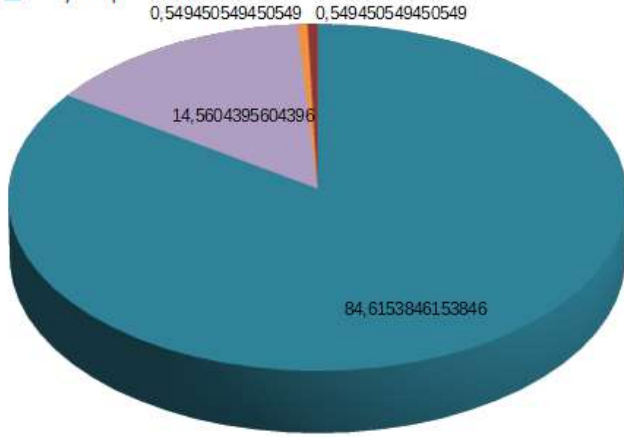


Chart 8: Importance of preservation of historic monuments, Pisa

2. Restoration and preservation should be made continuously or only after the occurrence of severe damages:

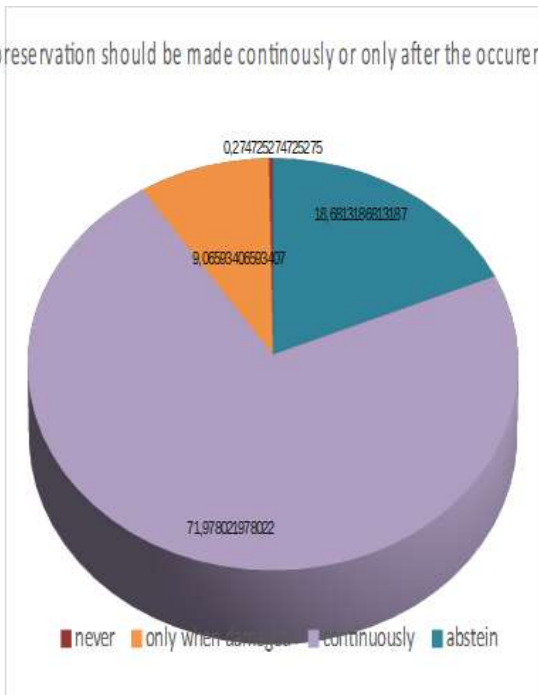


Chart 9: Opinion on continuous preservation, Pisa



3. The authenticity of a historic monument depends on its appearance rather than on its original substance.

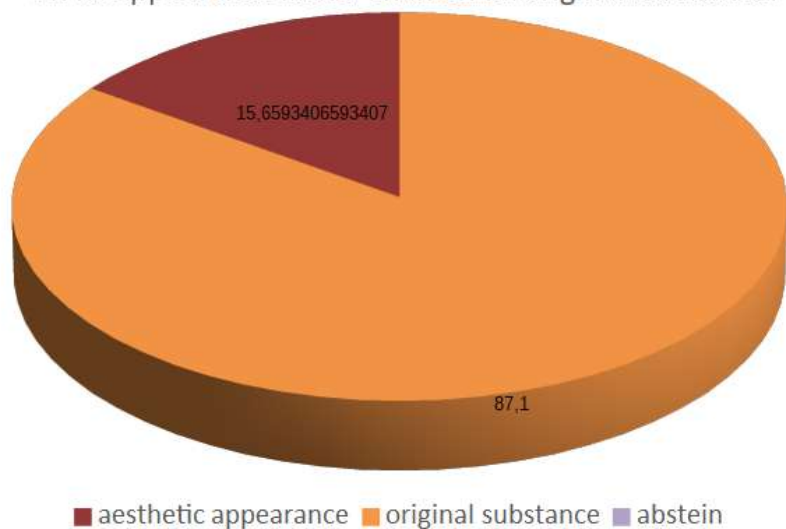


Chart 10: Effect of NANO-treatment on the monument's authenticity, Pisa

4. Researching new technologies for the preservation of the cultural heritage is:

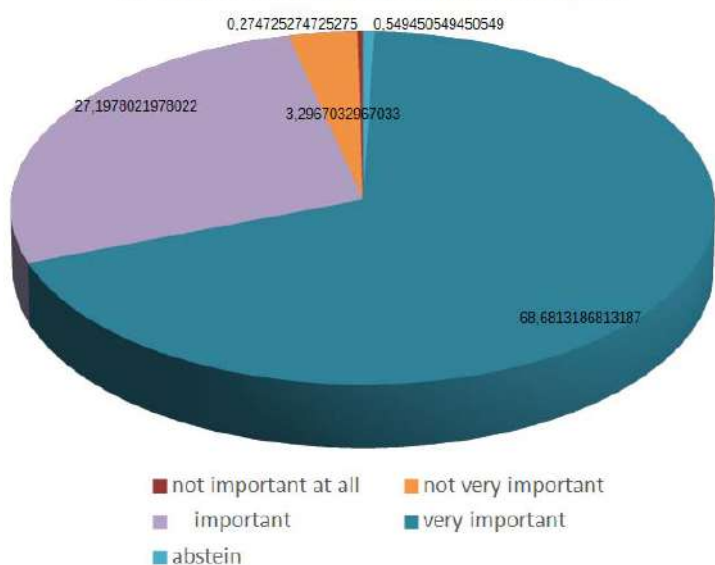


Chart 11: Importance of research on new technologies in cultural heritage preservation, Pisa

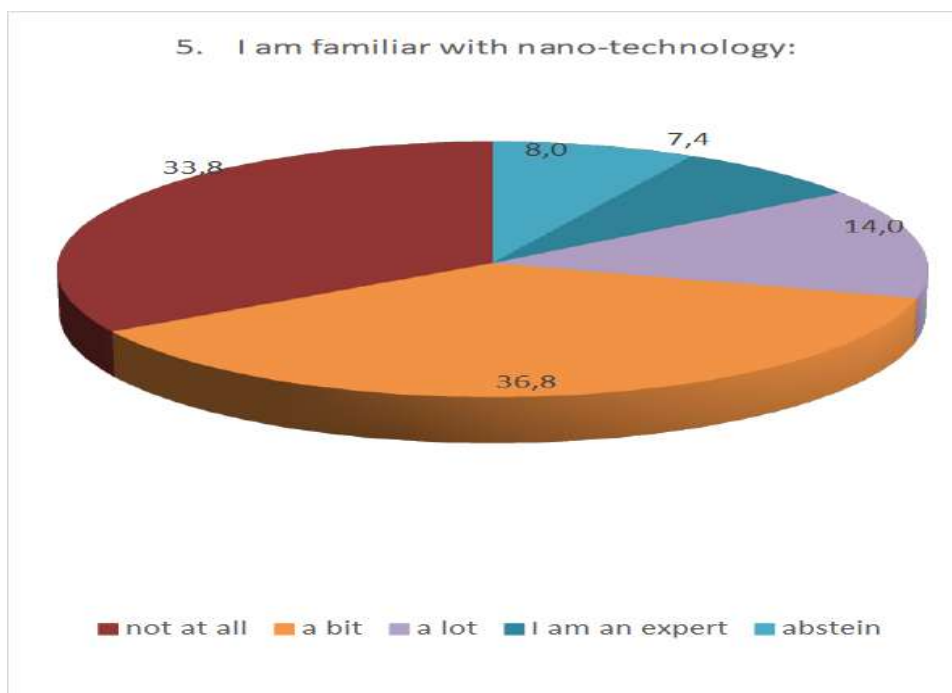


Chart 12: Knowledge about NANO-Technology

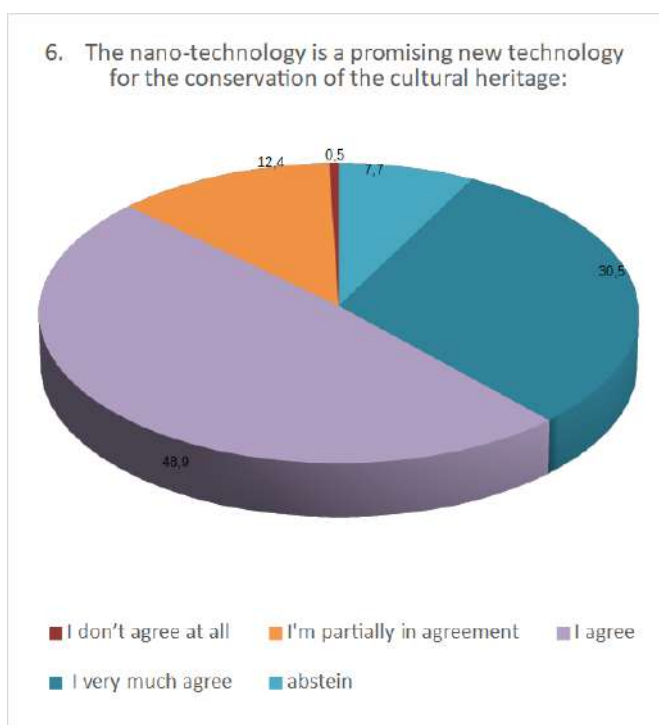


Chart 13: Potential of NANO-Technology



7. The nano-technology can be used for the preservation of historic monuments.

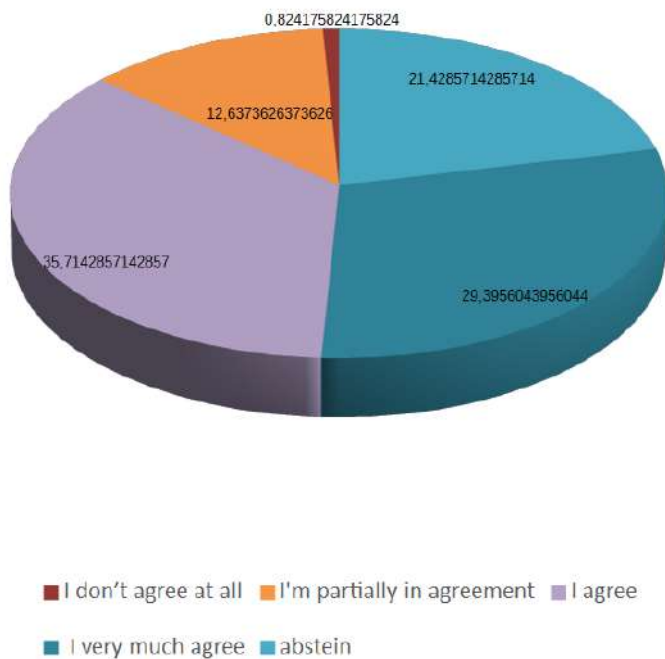


Chart 14: Use of NANO-Technology for preservation of monuments

8. The application of nano-products modifies the historic stones and affects the monument's authenticity:

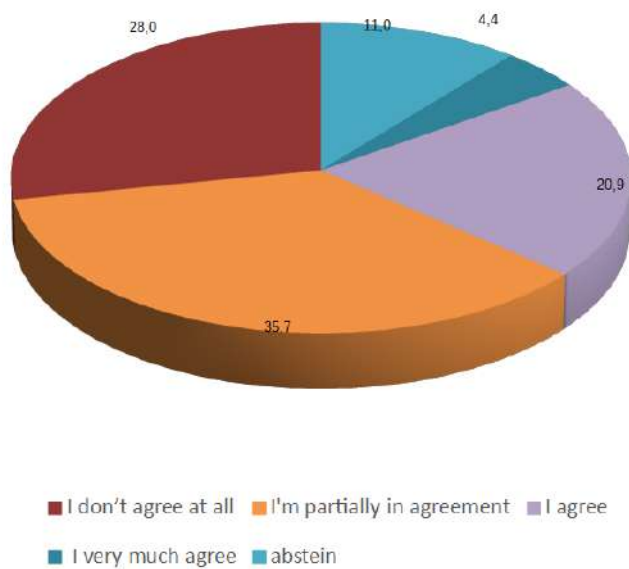


Chart 15: NANO-Technology and its effects on the monument's authenticity



10. The Square of Miracles is an important reason to visit the city of Pisa:

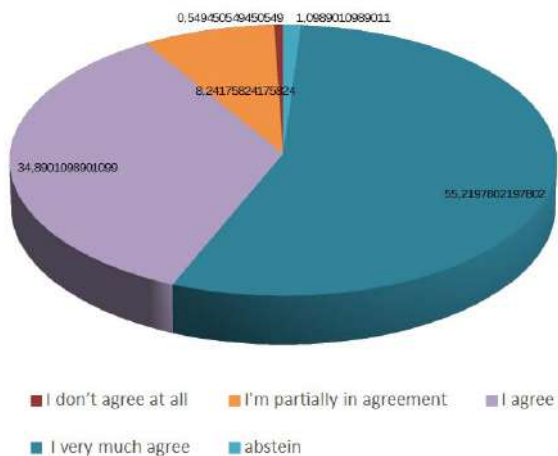


Chart 16: Importance of the monument to visit the city, Pisa

11. The Square of Miracles is Pisa's symbol of identity:

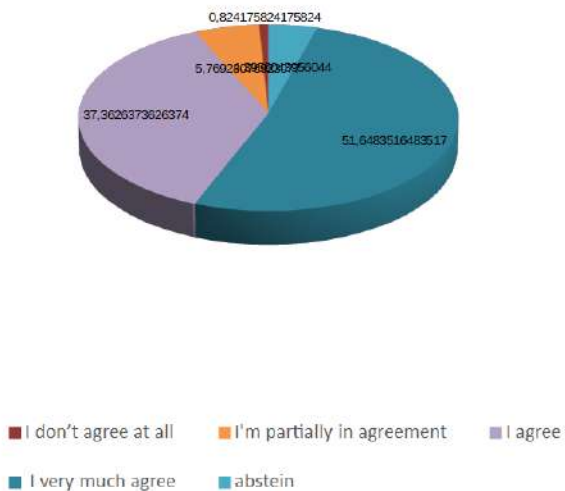


Chart 17: The monument as a symbol of identity, Pisa



12. Why do you visit the Square of Miracles?

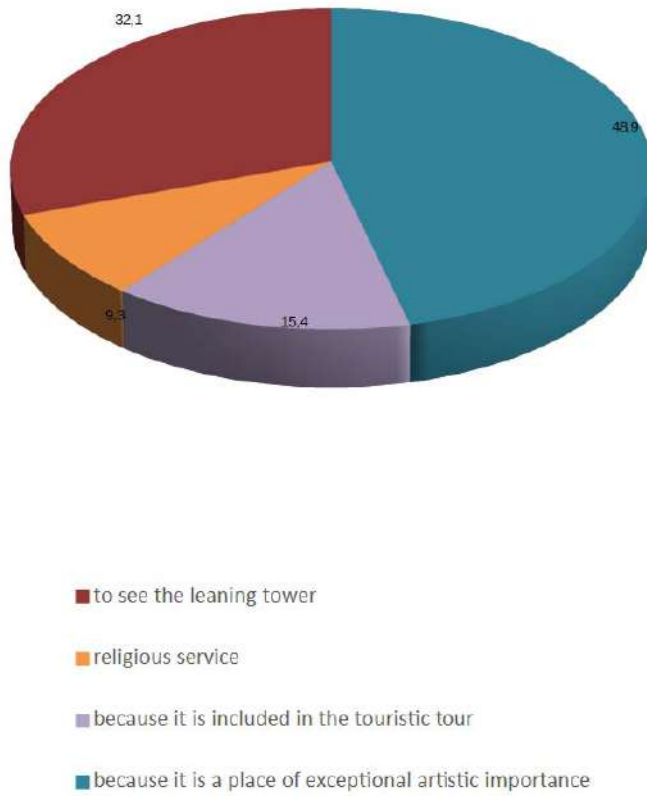


Chart 18: Reasons to visit the monument

4.4 Comparison of the surveys in Pisa and Vienna:

In general, the answers given to the Italian survey differ very little from the answers chosen at the digital surveys. However, each question shows a slight tendency that the participants in Pisa were more confident and enthusiastic about Nano-technology and about the importance of restoration and conservation on the whole. Maybe the personal contact with the interviewer causes a more positive attitude to the subject.

The most significant differences appeared in the attitude to restoration and preservation, where people in Vienna found them a little less important than in Pisa, and in the influence of the use of NANO-technology to the monument's authenticity (4,4% in Pisa and 15% in Vienna).



	Pisa	Vienna
Is the cathedral a Symbol of Identity	51,60 %	50,00 %
Is the cathedral Important Reason to visit the City	55,20 %	57,00 %
Application of Nano-Products modifies the historic stones and affects the monument's authenticity	4,40 %	15,00 %
Nano-Technology is a promising new technology	48,90 %	41,00 %
Research on new technologies for preservation is very important	68,70 %	68,00 %
Restoration and preservation are very important	72,00 %	63,00 %
Preservation of historic monuments is very important	84,60 %	78,00 %

Chart 19: Most significant figures in public surveys in Vienna and Pisa

Comparing answers between Pisa and Vienna

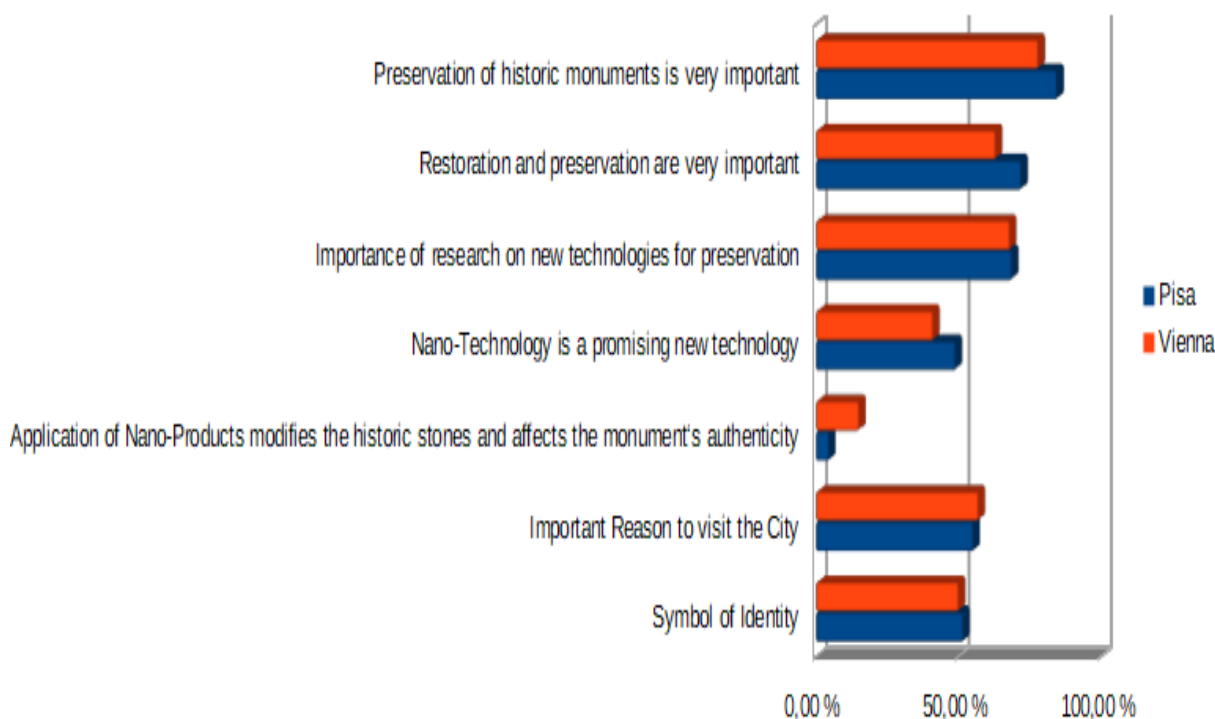


Chart 20: Pisa-Vienna, main questions compared, Source: Opae Pisa and Dombausekretariat Vienna

5 Interview with the members of the lodge

BACES made several interviews with the workshop-guests in Gent, Cologne and Vienna, and a group interview with masons of the lodge of Cologne Cathedral. The results concerning the cultural impact were presented with the results of social and economic impact studies (D 5.3). In addition to these surveys we made a series of interviews focussed on the cultural impact of NANO-Cathedral on the masons.

The members of the workshops are permanently active to preserve cultural heritage and they are themselves part of intangible cultural heritage by still practising the traditional techniques, which are in use for centuries. They are every day dealing with questions of preservation, and they are highly specialized and experienced people in the maintenance of historic monuments.

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So their opinion about new technologies in restoration is important for the practice and for the future acceptance of NANO-technologies. On the other hand a total change in preservation technology would affect their activities and their jobs in a very direct way and would change the culture of preservation. So they are a key group for the cultural impact of NANO-Cathedral.

The interviews with the members of the Viennese lodge were held in the cathedral's lodge in April 2018.

In a different way from Cologne we decided to hold private discussions, with the expected advantage to have no influence of other colleagues, but the drawback to have a less vivid discussion.

Ten masons were interviewed. Most of them have a very long experience, ranging from 9 to 30 years in the workshop.

5.1 NANO-Technology in the opinion of the stonemasons

The first block of questions was focussed on the knowledge and opinions about NANO-technology in general. The masons estimated their knowledge about NANO-technologies as rather low. As known examples of NANO-technology they mentioned car polish for private experience and stone protection in the project as a professional one.

On the question, whether NANO-technologies are rather helpful or rather risky they were cautious, but not negative, with a slight tendency to a helpful function of NANO-technologies. preference of . Most of the answers required more research.

5.2 Attitude of the masons to restoration

The second block of questions focussed on restoration in general.

As challenges for the work on historic monuments made of stone, they saw different aspects as important: a stone-friendly cleaning, which does not destroy the traces of the tools with which the stone was formed. As a big challenge and pride was seen to be in an old tradition, being in charge of the preservation of a historic monument. To maintain the usability of the monument and to restore it in the right way to preserve it for future generation. As an aim it was formulated to repair more than to destroy, and to preserve as much old substance as possible, and to be cautious and gentle to the monument. For aesthetic points they expressed the objective to make the new parts similar to the old ones, so that a consistent appearance of the monument can be achieved.

5.3 New technologies in restoration

The next question was about the use of new technologies in the cathedral lodges.

New technologies were mostly used for physical cleaning of the surfaces (laser, micro sand blasting, microchissel). They laid high emphasis on the traditional techniques, had bad experiences and reserve against the use of chemicals in combination with lime materials, because of the danger of the growth of a vapour barrier. For repairing cracks they said that they use sometimes modern adhesives.

They expressed a positive attitude towards new technologies and mostly good experiences with them, but only after long-term tests. New technologies are considered a good supplement, but the durability of a fresh carved stone is unparalleled by chemically consolidated ones.

In the question whether to preserve a damaged stone or to replace it most of the masons said, that security questions are the decisive points. If there exists the danger, that a falling stone would injure passers-by, it should be replaced, but in other cases the old substance should be preserved as much as possible. Most of them see the possibility to participate in the decision-finding.



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5.4 New technologies in preservation

Their experience with conventional consolidants and protectives was rather poor, because they are not very often used by the workshop, and if not by the masons. The effects were considered as not very good.

Some of them criticized, that the applied consolidants do not last for very long and would appreciate it, if protectives would be more sustainable.

The next theme in the interviews was the expectations on NANO-technologies. The leading opinion was, that NANO-products – like all new products – should be tested intensely and their effects monitored for a longer period before an application on the monuments as a whole.

Most of the masons saw only little potential effects of the use of Nano-technology to their work. However two of them uttered the fear, that the work of the masons could become unnecessary, if a perfect system of consolidation and protection of stones would be developed.



6 Analysis – Media Coverage


To know more about the public impact of the NANO-Cathedral project also an analysis of its media coverage was carried out. The presence on the Internet, via the NANO-Cathedral homepage and on social media channels like Facebook and Twitter was examined by looking at the users behaviour and demographic data.

Observed in the period from July 1st 2016 to April 23rd 2018, the analysis of the audiences behaviour shows that the homepage was mainly reached by organic search with 38,7%, followed by 26,2% direct search and with 25% almost at the same rank by referral. During this time the Nano homepage had its users peak in January 2018. Out of 4.449 users there were 18 returning visitors, altogether with an average session-duration of 2:43 minutes.

When looking at the users origin, Italy is clearly on top of the list with 1.134 (25,16%), followed by Spain with 875 users and Germany on third place with 8,74% meaning 394 users. The other stated countries on this top ten list are the United States, Belgium, United Kingdom, Austria, Norway, Greece and France. Examining the languages of the users it is English (US) that is well ahead of the four other languages with a total number of almost 760 users. Italian is on the second place and Spanish follows on the third position with 473 users (10,56%). German, British English and Norwegian close down the ranking of languages.

Map Overlay

Summary



Country	Acquisition			Behaviour			Conversions		
	Users	New Users	Sessions	Bounce Rate	Pages/Session	Avg. Session Duration	Goal Conversion Rate	Goal Completions	Goal Value
	4,449 % of Total: 100,00% (4,449)	4,467 % of Total: 100,00% (4,467)	7,646 % of Total: 100,00% (7,646)	48,55% Avg for View: 48,56% (0,00%)	2,51 Avg for View: 2,51 (0,00%)	00:02:43 Avg for View: 00:02:43 (0,00%)	0,00% Avg for View: 0,00% (0,00%)	0 % of Total: 0,00% (0)	US\$0,00 % of Total: 0,00% (US\$0,00)
1. Italy	1,134 (25,16%)	1,130 (25,10%)	2,495 (32,63%)	41,24%	2,67	00:03:23	0,00%	0 (0,00%)	US\$0,00 (0,00%)
2. Spain	875 (19,41%)	877 (19,63%)	1,291 (16,88%)	52,59%	2,47	00:02:09	0,00%	0 (0,00%)	US\$0,00 (0,00%)
3. Germany	394 (8,74%)	392 (8,78%)	690 (9,02%)	36,96%	2,96	00:03:14	0,00%	0 (0,00%)	US\$0,00 (0,00%)
4. United States	321 (7,12%)	319 (7,14%)	353 (4,62%)	81,30%	1,53	00:00:36	0,00%	0 (0,00%)	US\$0,00 (0,00%)
5. Belgium	225 (4,99%)	225 (4,99%)	368 (4,79%)	41,58%	2,67	00:02:54	0,00%	0 (0,00%)	US\$0,00 (0,00%)
6. United Kingdom	218 (4,88%)	216 (4,84%)	259 (3,39%)	59,85%	2,17	00:01:25	0,00%	0 (0,00%)	US\$0,00 (0,00%)
7. Austria	203 (4,50%)	196 (4,39%)	328 (4,29%)	39,94%	2,88	00:02:54	0,00%	0 (0,00%)	US\$0,00 (0,00%)
8. Norway	153 (3,39%)	146 (3,27%)	298 (3,90%)	49,66%	2,76	00:03:13	0,00%	0 (0,00%)	US\$0,00 (0,00%)
9. Greece	93 (2,06%)	90 (2,01%)	215 (2,81%)	73,02%	1,60	00:01:15	0,00%	0 (0,00%)	US\$0,00 (0,00%)
10. France	74 (1,64%)	71 (1,59%)	99 (1,29%)	47,47%	2,71	00:02:11	0,00%	0 (0,00%)	US\$0,00 (0,00%)

Rows 1 - 10 of 91

Chart 21: Nano-Cathedral Website Data Location, Source: Warrant Group S.r.l.



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Nano-Cathedral



Chart 22: Nano-Cathedral Website Audience overview, Source: Warrant Group S.r.l.

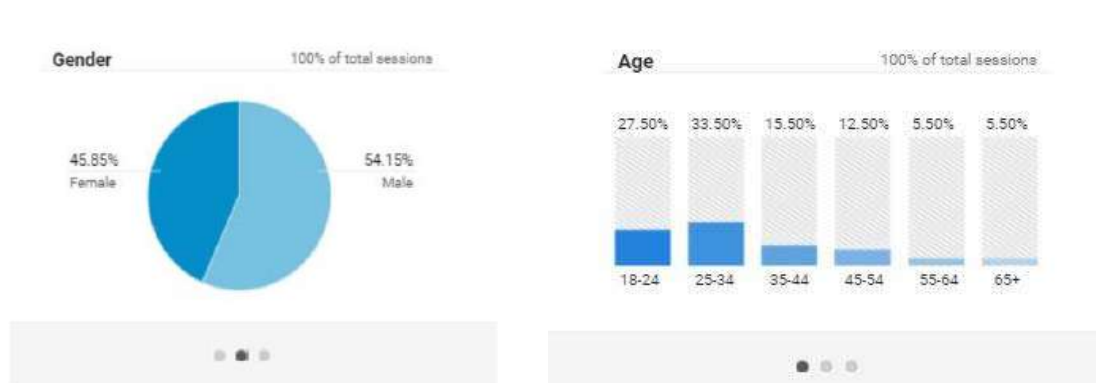


Chart 23+24: Gender and Age of the visitors of www.nano-cathedral.eu, Source: Warrant Group S.r.l.

To disseminate important news to the on-going development of the Nano-Cathedral project newsletters were sent out to all subscribers periodically.

Of course, Nano-Cathedral is also presented on various social media channels like Twitter, Facebook, youtube and LinkedIn. It has 91 followers on Twitter and 187 likes and 189 followers on Facebook.



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Chart 25: Screenshot Facebook account Nano-Cathedral, Source: Dombauhütte, Vienna

7 Summary

In a closer look to the cultural significance of the NANO-Cathedral monuments we found out, that they have a very high importance for many groups of people, even in fields we hadn't expected. It is not only the artistic value, that makes them so important for the people's awareness, and it is not only the historic value, that makes them interesting even for people not caring about art and religion – or in the case of Oslo – Opera. There is also a high emotional value for many people, seeing the monuments as part of their entire life.

The workshops have a high relevance not only for the preservation of the monuments, but for interested people they are esteemed as institutions of high competence in the field of restoration. However there should be made some efforts to strengthen their position and to improve their presence in public awareness. In the project and outside several activities were done to improve our positions and to inform people about our activities in reservation of cultural heritage. These activities will be intensified to strengthen public awareness about the importance of preservation in general and both the preservation of the intangible cultural heritage of traditional techniques and the research in new technologies and their application.

Both approaches – traditional techniques and modern technology - are good partners in preservation of monuments. They all have their different fields and are necessary for a sustainable preservation of cultural heritage.

The public surveys were – of course - made among people with a high interest in cultural heritage. However it was astonishing how high preservation and especially research in new technologies are esteemed by the group reached by our surveys. The attitude towards modern technologies, especially NANO-technology are very positive and should encourage the community to do further work in this fields.

Even the stonemasons, who are a group very intensely affected by possible changes in restoration technology, have a very positive attitude to NANO-technology and would appreciate further developments, but – knowing best the problems of restoration and preservation of cultural heritage – call for long term tests to assure a sustainable effect of the application of new materials. NANO-technology and other



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modern materials are even by them seen as a positive supplement to traditional techniques and a promising development for further preservation of historic monuments.