

# Projection mapping: Spectacular Opportunities



**Panasonic CONNECT**  
in association with **Installation**

# Projection

## spectacular opportunities

### Executive Overview

Demand for projection mapping is growing. Over the past three years, both the number of projects and the revenue they have generated have grown, driven by the need of a broad range of organisations to respond to the growing sophistication of increasingly blasé, tech-saturated consumers.

It's not just integrators, rental/staging companies and those associated with the creation of events who have seen a positive impact on their business. There is widespread evidence that the organisers of those events – from advertisers and brands to pop stars and rock bands, from cities and towns to visitor attractions – have also seen a substantial return on their investment.

Projection mapping is a market enabled by a combination of the growing capability of projectors and the availability of cutting edge tools to enable the imaginations of creative designers to express themselves almost without restriction.

### Introduction

The projector market has shown remarkable resilience in the face of growing competition from flat panel displays. That's due in no small part to the ability of projection to undertake many applications of which flat panel displays are not capable – and a compelling example of this is projection mapping.

Projection mapping – once called video mapping, and sometimes referred to as “spatial augmented reality” – has been around since the late 1960s. However, the growing sophistication and performance of projectors from companies like Panasonic have transformed what's possible, enabling unparalleled creativity and innovation to deliver a level of audience engagement that is spectacular in all senses.

Simply put: while projection is normally associated with delivering images to flat screens, projection mapping projects images onto any three dimensional surface of any shape and geometry. Often, this is a building or other structure – but can equally be someone dancing on a stage.

# mapping:



"Scale and complexity have grown, with producers desiring to go bigger and better – matched by the heightened desire of consumers to be awed. Amon Tobin's ISAM tour was a benchmark that meant many other artists and DJs had to now incorporate 3D mapped stages to stay on the same level."

In theory, any projector can be used for projection mapping. However, for the most captivating and enthralling results, high brightness, high contrast, high resolution and a high quality lens will be required. Projectors that support warping and edge blending enable even greater creative freedom. An example would be Panasonic's PT-DZ21K2 Evo 20,000 lumen projector with WUXGA resolution.

It is no exaggeration to say that projection mapping has the ability to create illusions that transform reality into something truly magical. That's why it is establishing itself as a firm favourite with organisers of major events – especially opening and closing ceremonies – at visitor attractions and entertainment venues, at concerts and music festivals, for product launches and for high profile advertising campaigns. Projection mapping captures both attention and imagination in a way that is absolutely unique. There are also numerous instances of projection mapping being used purely to create a spectacle or festival.

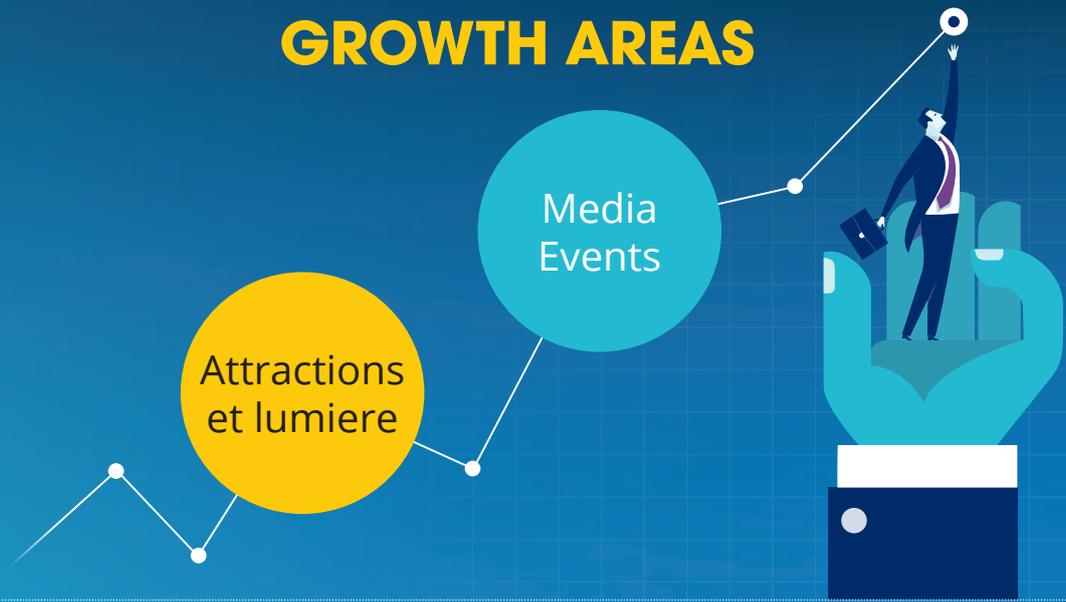
This white paper is based on the results of a survey of projection mapping professionals. It looks at the state of the market, and analyses where and how it is growing.



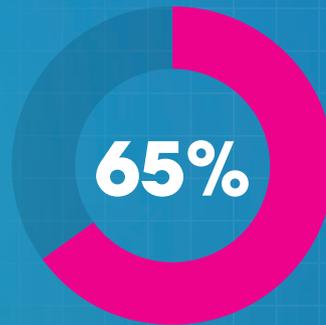
"Objects are getting more complex – and they are starting to move. This past year, I have moved from buildings to cars, aircraft and moving set pieces."

# PROJECTION MAPPING

## GROWTH AREAS



## SURVEY



Saw an increase in projects between 2012-2015



25% surveyed experienced **growth in projection mapping projects of more than 50%**

## WH



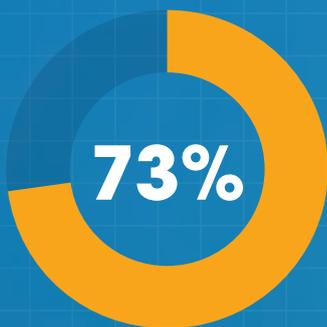
**Over 50%** surveyed said that there was a greater desire for clients to differentiate themselves

# ING: EXCITING TIMES

## TOP 2 FEATURES OF A PROJECTOR



## RESULTS



saw an increase in revenue between 2012-2015



75% agreed that **mapping was being used instead of traditional approaches like fireworks**

## Y?



You can tailor the experience to the location and greater creativity

es

## A growing market

Only two years ago, 65% of those surveyed indicated that they were undertaking five or fewer installations each year, while one in 40 were engaged with 25 or more projection mapping projects. By 2015, a substantial shift had taken place. The number of those executing five or fewer projects during the year had declined markedly to around one in three – while those reporting 25 or more projects during the twelve month period had increased to almost one in ten.



“As the technology becomes more readily available, it’s a cost-effective and fairly low impact way to achieve spectacular results.”

The increase in projects is, unsurprisingly, reflected in a similar growth in revenues. In 2012-2013, almost half the companies surveyed saw a rise in revenues from 3D projection mapping of no more than 5%. By the following year, of those same companies, almost one in four indicated that they’d seen revenues rise by up to 25%. For 2014-2015, a similar number of companies were seeing revenues increasing by around the same amount – but almost as many said they’d seen income from projection mapping rise by between 25% and 50%.

**A Growing Market: Percentage Increase in Revenue From 3D Mapping**



Question: What was your company’s percentage increase in revenue from 3D projection mapping between...

Perhaps most remarkably, a quarter of those surveyed had experienced growth in their projection mapping revenues of more than 50%, with almost half of those (just under 14% of all participants) saying that their revenues had grown by more than 100%. That compares with just over 2% for 2012-2013 and just under 5% for 2013-2014.

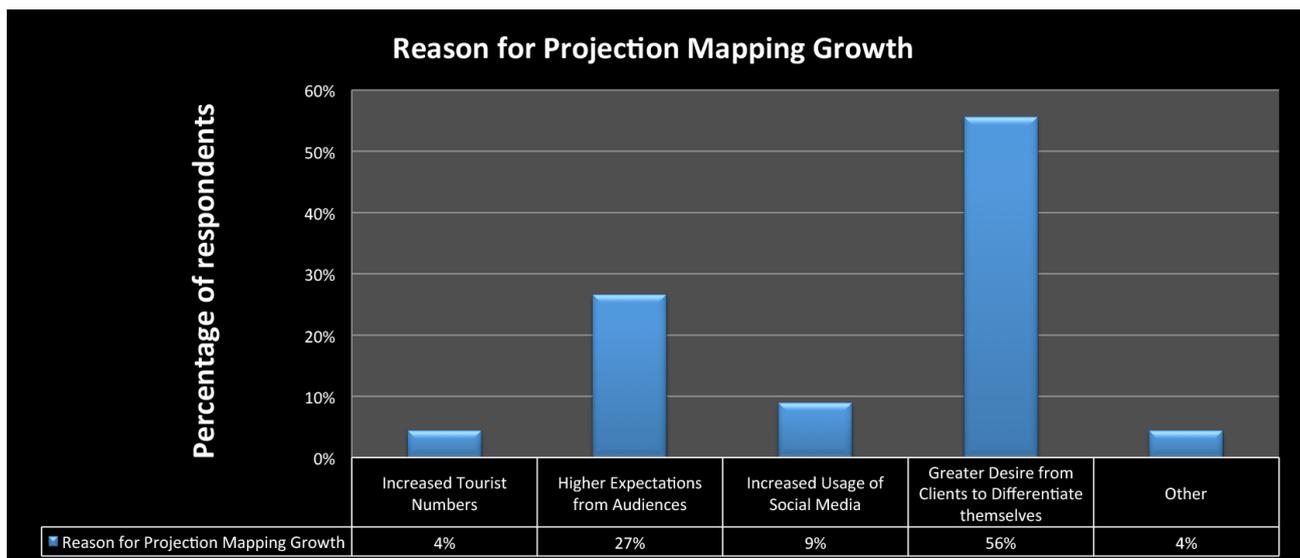


"We are a manufacturer of media servers for projection mapping – and we are seeing large format mapping growing by the month. The size and complexity is growing rapidly as people see what can be achieved."

The conclusion? Over the past few years, the companies surveyed have seen a worthwhile increase in the revenues they derive from projection mapping, and most especially in the past year – evidence of not only a growing market, but also a market where growth appears to be accelerating.

## What's behind the growth?

But what's driving this growth? Whether it's a temporary installation – such as the one that used Panasonic projectors to celebrate 500 years of the Hampton Court Palace in London – or more permanent, such as the Panasonic installation at the Tower of London, where projection mapping is being used to tell the story of the Crown Jewels – survey respondents were clear that audiences expect more, and have higher expectations when it comes to being entertained and informed. But: more than half of those surveyed believe that, in an increasingly crowded marketplace, their clients are looking to differentiate themselves when it comes to being seen as a premier visitor attraction or when launching or advertising new products, for example.



*Question: What do you think is the most significant driver of the growth in projection mapping?*

Beyond this, a general rise in tourist numbers is creating new opportunities in visitor attractions, and renewed levels of investment. There is plenty of evidence that imaginative use of projection mapping can actually drive tourist/visitor numbers. Meanwhile, the inexorable rise in social media is seeing increasing numbers of people sharing their experiences, creating a groundswell of desire among others to share those experiences for themselves.

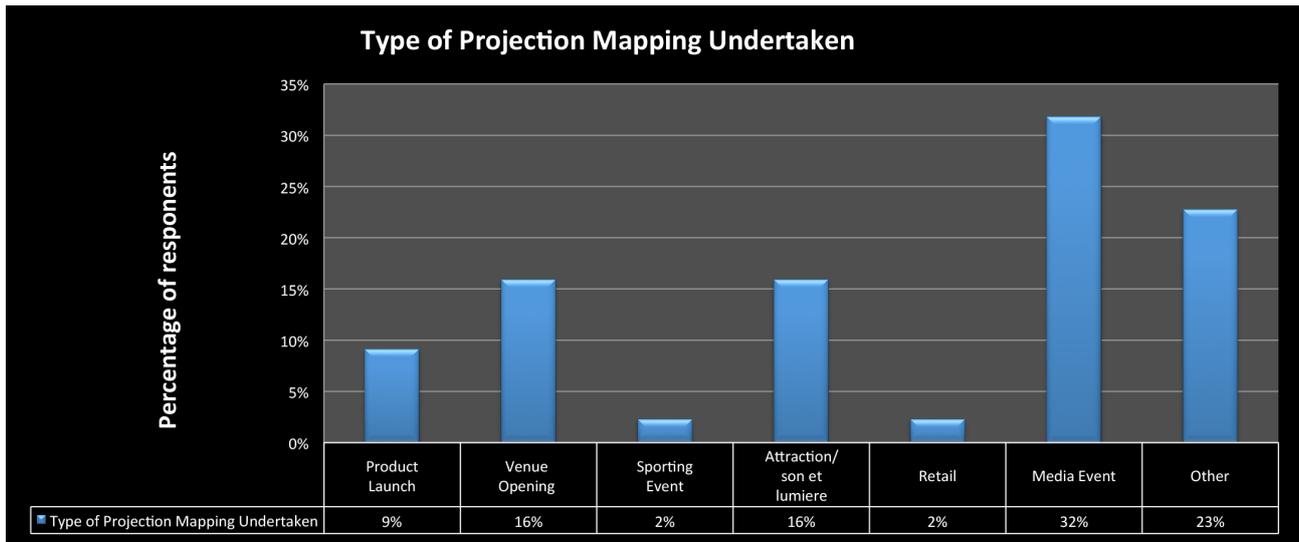


"It's the current flavour that everyone wants – and there are a lot of good examples around on the web, so people know what to expect and how to specify their wants and desires."

One in three survey respondents said they have seen the biggest growth in projection mapping used in spectacles at attractions. One in five have seen growth in media events using projection mapping as show organisers look to leave a lasting – and favourable – impression.

A similar number noted a rise in product launches being supported by the technology, and one in ten reported growth in projection mapping being used for the opening of venues. Retail and sporting events were also mentioned as growing application areas.

Today, however, the projection mapping market is driven primarily by media events, with one in three saying that those were the most frequently undertaken projects. Venue openings and spectacles at attractions are also cited as being important in the market.



*Question: Which type of 3D projection mapping project do you most frequently undertake?*

## Mix and match?

There is, of course, a broad range of audiovisual technology – and others, like fireworks and laser shows – that can be used to create a compelling spectacle. More than 75% of those surveyed thought that projection mapping was increasingly being used in place of more traditional approaches – “the new fireworks”.



“Projection mapping is being used by all sorts of verticals. More recently, it has been adopted by the digital advertising market to help engage customers more with the brand.”

That said: more than one respondent noted that projection mapping is also often a more cost-effective way of creating a spectacle than using, for example, a fireworks display, while others noted that projection mapping, light shows and fireworks are not necessarily mutually exclusive: they can be combined, to great effect.

Respondents also noted the ability of projection mapping to “tell a story” – something that other approaches cannot match.



**“Storytelling and advertising go hand-in-hand. Projection mapping gives the creative team a big canvas for stunning visual effects and great possibilities for storyboarding. At the same time, brands can be integrated into the content and be part of the show. Big brands have recognised that – and funds for big outdoor projects are increasing.”**

*Hartmut Kulesa, European Projector Marketing Manager  
Panasonic*

## The economic case

The opportunity for revenue generation with projection mapping is not, as was noted in the introduction, limited only to those who provide the necessary equipment and services. It is also an opportunity for those who commission the truly compelling spectacles that projection mapping enables.

### Spectacles

- The biennial Lumiere Festival organised by Durham County Council has been estimated to have brought 175,000 visitors to the city of Durham, generating economic benefits of £5.8 million (€7.5 million) in 2015 and delivering some £4.3m (€5.6m) of benefit on the previous occasion.<sup>1</sup>



- By the time London’s first ever Lumiere light festival closed in January 2016, over one million people had experienced 30 light installations. “We have been astounded by the crowds,” said London mayor Boris Johnson, “which exceeded all our expectations and brought a boost to the West End and King’s Cross.”<sup>2</sup>

## Tourism

- A study commissioned by the historic Iranian town of Esfahan noted: "Projection mapping can help the city of Esfahan not only to improve tourism but also to increase visitor satisfaction. There are no limitations to the creative side of projection mapping, and in addition to its attraction and learning aspects, it creates new occupations, employment opportunities, and generates income."<sup>3</sup>
- In 2003, a small town in France started to install projection mapping at several sites. After several years, the project was discontinued because of its cost. Tourist numbers plummeted. In 2013, the project was revived at a cost of € million. The tourists have returned.<sup>4</sup>
- World landmarks that have benefited from projection mapping include Australia's Sydney Opera House, Ottawa's Parliament Hill, the Eiffel Tower in Paris and Niagara Falls.
- In its Budget Speech of 2014, the Hong Kong government said: "We have to keep enriching our cultural, art and sports programmes which will, apart from enabling local residents to enjoy more, refresh our city's appeal to overseas visitors and attract them to come back again at different times. We shall provide additional funding of \$50 million to the HKTB in the coming two years... (We will) introduce 3D projection mapping technology to help showcase the magnificent night view of the Victoria Harbour during mega events. Residents and visitors alike can enjoy this projection mapping show."<sup>5</sup>

## Advertising

- Household names that have successfully used projection mapping in order to create consumer enthusiasm for their brands include Adidas, BMW, Bombay Sapphire, Carlsberg, Disney, Fanta, Hyundai, Johnnie Walker, Nissan, Nokia, Ralph Lauren, Red Bull, Samsung and Toyota.<sup>6</sup>
- When H&M brought its flagship store to Amsterdam, the opening was enhanced by 3D projection mapping on to the historic building. A highlight of the show was a red ribbon, wrapped around the building, untangling and transforming the building into a colourful dollhouse where nothing is what it seems.<sup>7</sup>



The impact of a projection mapping event often far outlasts the event itself. A video of the projection mapping spectacular staged in Dallas to promote the movie *The Tourist* has received almost 2 million YouTube views<sup>8</sup>. The launch of LG Electronics' Cinema 3DTV in Sofia used projection mapping – and has been viewed on YouTube over 1 million times<sup>9</sup>. Video of the BMW JOY launch event in Singapore – which also used projection mapping – has been viewed almost 400,000 times<sup>10</sup>.

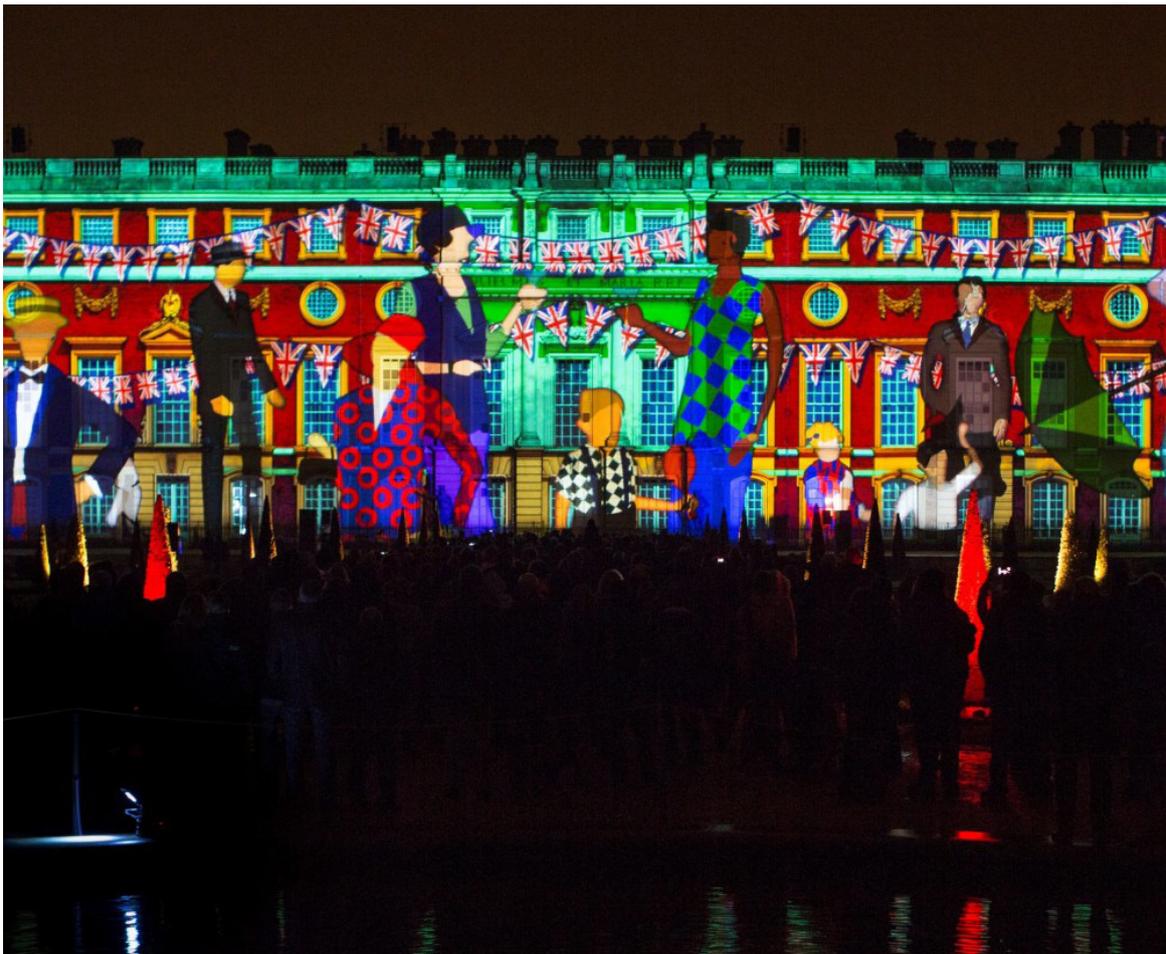
## Summary

There is real evidence that projection mapping is far from a cost. Its ability to attract visitors can help create employment, fill hotel rooms, sell restaurant meals and increase retail sales, bringing economic benefit that can outweigh the investment in creating the event. For brands, projection mapping can create truly memorable experiences that will benefit from repeated sharing on social media – greatly extending the viral reach of advertising.



**“Projection mapping is now established as an integral part of many commercial events, capable of creating business and revenue for organisers as well as suppliers.”**

*Hartmut Kulesa, European Projector Marketing Manager, Panasonic*

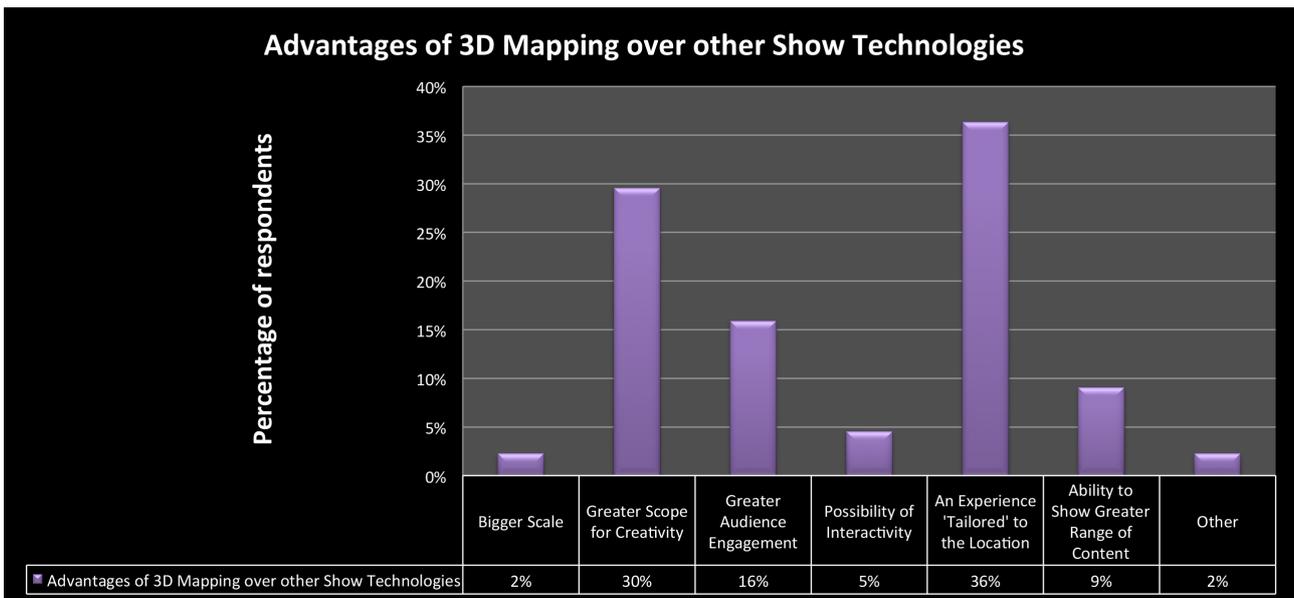


Projection mapping has a unique ability to “tell a story” – as it did at the celebrations of 500 years of history at London’s Hampton Court.



"Projection mapping delivers endless possibilities, spectacular results, ease of installation and off-site preparation. That makes it a very attractive proposition."

Projection mapping is perhaps most commonly used to transform the façade of buildings – so it's not surprising that more than one in three of those surveyed believed that the most significant advantage of the technology is that it can readily be used to create an audience or visitor experience that is more precisely tailored to the location. Almost as many believed that it is the greater scope for creativity that projection mapping delivers that is increasingly making it a popular choice. Others noted that it is better at creating audience engagement, and that it allows the incorporation of a broader range of content.



*Question: Projection mapping offers a number of advantages over other show technologies. Which of these do you think is the most significant?*

## Projector attributes

Finally, those surveyed were asked to rank the projector attributes that were most important in delivering the optimum projection mapping experience.

Unsurprisingly – given the need not only to deliver a highly detailed image, but also to deliver it to what is often a very tightly defined area of an object or façade – resolution was ranked number one. As with many demanding projection applications, it is almost impossible to have too much resolution. High resolution means little, however, if lens quality is inadequate, so, as might be expected, respondents rated lens quality in their top five requirements. Second most important was brightness – unsurprising, given that typical deployments take place in sub-optimal ambient light, with the projectors mounted at some distance from the façade. As with resolution: the more brightness, the better.

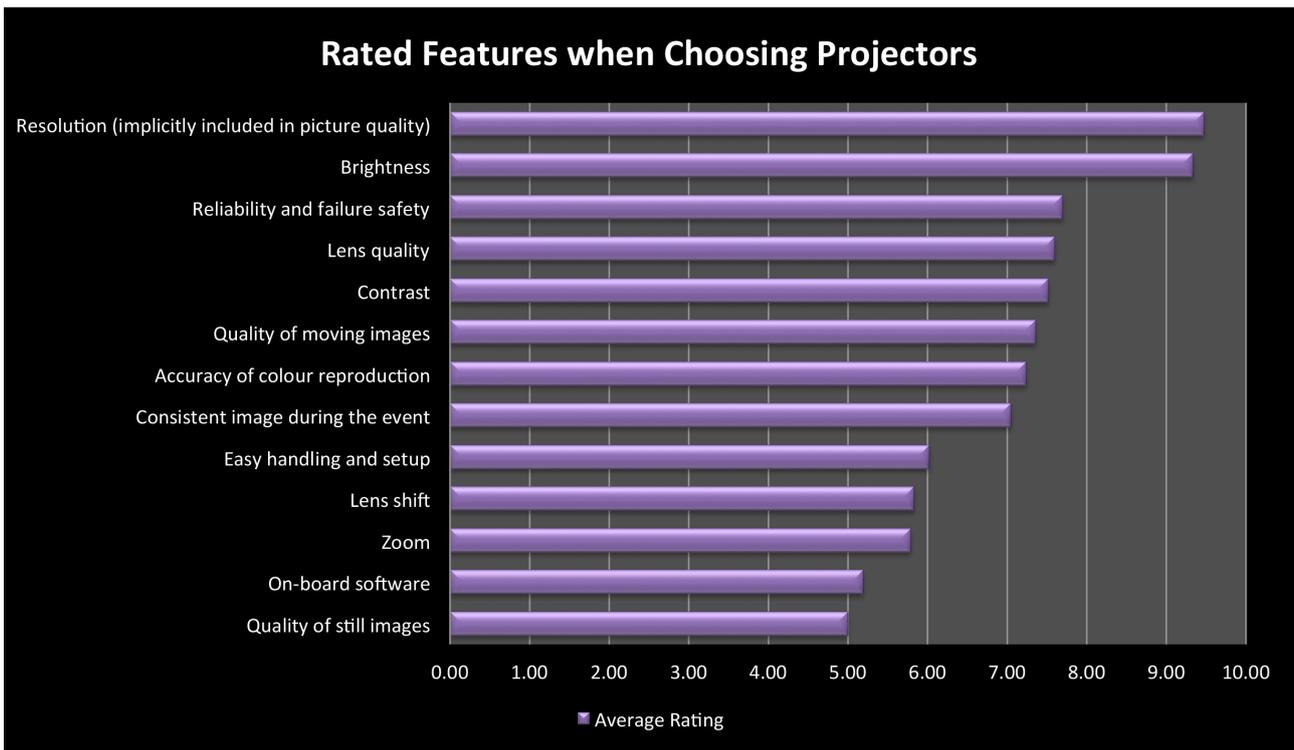
The events at which projection mapping is deployed are almost always very high profile, with much riding on them (not to mention an often substantial investment). As such, failure is not an option – so, predictably, respondents rated reliability and ease of fail-over as the third most important requirement.

Contrast ratio, colour accuracy and image quality and consistency were also ranked among the top ten pre-requisites for a projection mapping projector.



"A few years ago, if a mapping project used ten projectors at the same time, it was awesome. Nowadays, you can see more than a hundred projectors in the same place."

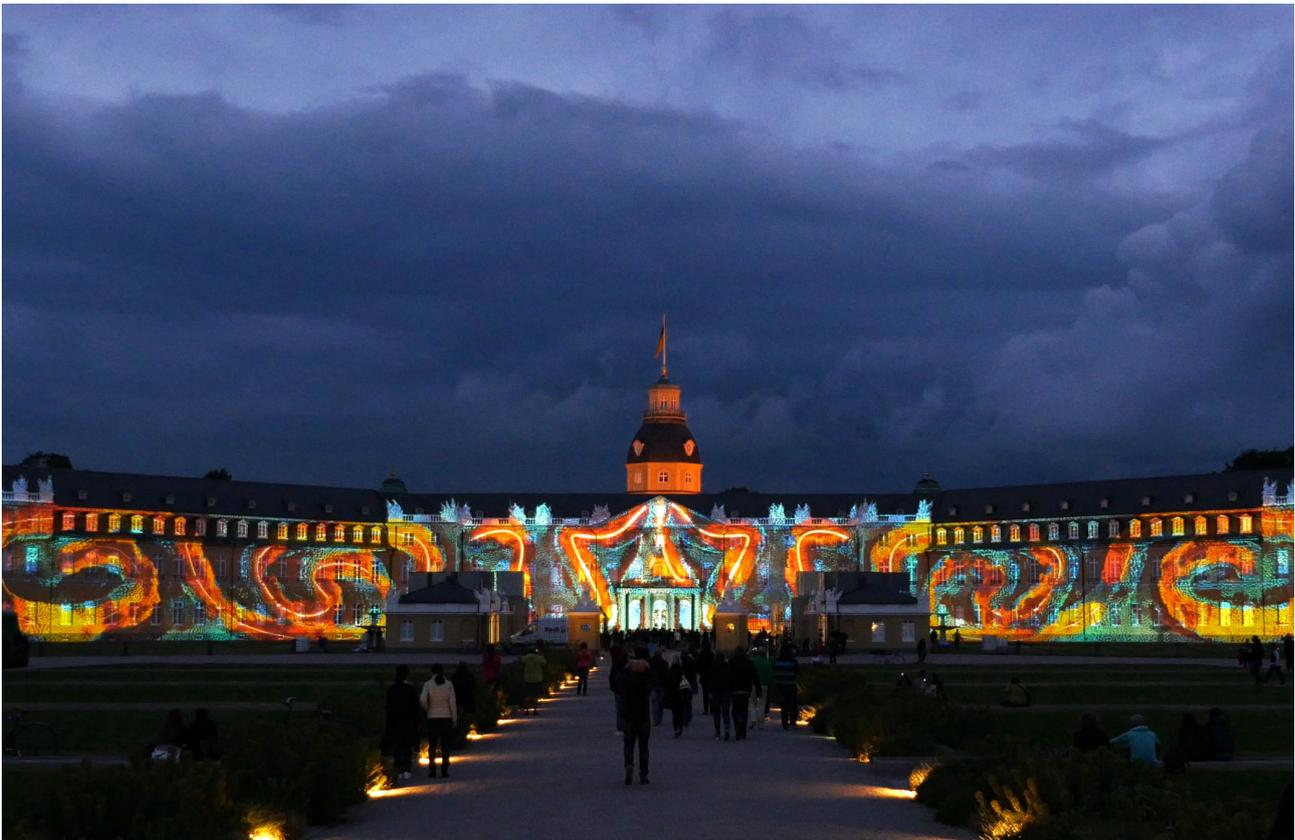
Moving image quality ranked sixth. Here, Panasonic's offering has some significant advantages, especially as 4K resolution becomes more popular. The higher resolution creates opportunities for mapping artists to deliver images of outstanding quality and detail – but it also creates challenges in terms of the content creation process. Panasonic projectors feature unique technologies in terms of upscaling and high frame rate projection that not only mitigate those challenges, but also produce moving images without the motion blur that can be highly visible when images are delivered on a very large scale.



Question: Here are a number of projector features. Arrange them in order, from greatest to least, with regard to their importance when choosing projectors for mapping projects.



"In 2012, we were using 6,000 lumen projectors with Ubuntu, Blender and VLC. We were only playing back pre-rendered animations. Now we still use Blender as the backbone, but we've gone on to create audio-reactive projection shows with Millumin and 40,000 lumen projectors, along with holographic projections using Holo-Gauze."



Video mapping specialists Maxin10sity used 24 Panasonic projectors at the German city of Karlsruhe's 300th anniversary celebrations.

## Conclusion

The rise in the market for projection mapping represents the confluence of two factors. The first is the demand on the part of a broad range of organisations – visitor attractions, consumer goods companies and the like – to deliver compelling, captivating, memorable experiences to audiences who have become increasingly hard to impress. The second is the increasing power and functionality of projectors – coupled with sophisticated, innovative creative tools that allow designers to exercise the full extent of their imaginations. The projection mapping industry has reported rapid growth in recent years, and it seems highly likely that the acceleration in numbers of projects and revenue from those projects will continue to accelerate – not least as they are shown to deliver real return on investment to those supplying them and those commissioning them.

One interesting impact not fully explored here is the effect that laser projectors will have. Most projection mappings currently run for a limited time or for single night events. Our research identified many projects that were not been realised because of the high operating cost caused by replacement lamps and service requirements. The move to laser projectors, such as the 28,000 lumen Panasonic PT-RZ31K laser projector, which operate on a no-maintenance concept, is expected to grow the market for projection even further with more permanent installations being commissioned.

## For example...

Typical of the applications for which projection mapping is being used to great effect was the Coca-Cola Sochi Vlivaisya 3D show that took place every night during the Sochi 2014 Olympic Winter Games. Twenty-four 20,000 lumen Panasonic projectors were used to deliver an amazing spectacle onto the exterior of the gigantic Iceberg Skating Palace. To see the results, go to <http://channel.panasonic.com/contents/12243/>.



## About the survey

A total of 44 companies – including design/production agencies, events companies, end users and manufacturers – took part in an online survey in mid-2015. Just under 7% worked exclusively in permanent/fixed installations; a little over 38% worked entirely in temporary installations; and just over half worked in both fixed and temporary installations.

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