SPORT'S DREAM MAKERS

Pause and reflect...the stunning Olympic Stadium in Beijing - *Arup Sport*

From functional arenas to cathedrals of sport, architects face innumerable creative, technical and financial challenges. **Kevin McCullagh** asks a number of leading sports architects about their response to these challenges and about the trends and issues which will drive design and the future of sports architecture.

THEIR VISION CREATES the stadiums and arenas which provide the stages for the incidents and events which are etched into every page of sporting history. Sports architects create the facilities which reflect the pride, prestige and even power of clubs, federations and entire nations and their work reflects the changing aesthetic tastes, technological capabilities and financial constraints of their time.

The scale and prestige of the modern business of building sports venues is such that the word 'iconic' has become over-used. During the Beijing Olympic Games this year, the world marvelled at the dramatic architecture of the 'Bird's Nest' National Stadium and the 'Water Cube' National Aquatics Centre, buildings designed with no expense spared to illustrate the ascent of China as a political, economic and sporting superpower. The buildings were exemplars of how sophisticated sports venue construction has become.

For much of the 20th century, venues were simply built to accommodate as many spectators as was safely possible. But the growing wealth of the world's leading economies, the commercialisation of sport, and the development of media and communications technologies have driven demand for added features and attractive design. Construction and maintenance costs have followed the upward curve of sophistication, with the result that sports venues must now be more economical and flexible in their functions than ever before. There is a huge demand from nations, cities, sports teams and societies in general for these spaces where people can congregate and watch sporting and cultural events. There is a huge demand for these spaces to be beautiful and inspiring, yet not a financial burden on their owners. The modern sports architecture industry has developed into a multi-million dollar balancing act between functionality and beauty.

The Colosseum of Ancient Rome fulfilled many of the requirements of modern sports venues: it allowed large numbers of people to watch events in the same space, it gave them the opportunity to buy refreshments, and, if historians' theories are correct, it even had a retractable roof to protect them from the elements. Up until the late 20th-Century, these were still the criteria demanded of sports venues in terms of functionality.

The importance of aesthetic design was also evident at the Colosseum the architecture of which clearly expressed the grandeur and power of the Roman Empire. Sports architecture up to the present day has symbolised the character of

cities and nations in the same way. One of the most significant examples, at the beginning of the modern era of sports architecture, and mentioned again and again by sports architects asked to nominate influential designs, is the 1972 Munich Olympic Park (Olympiapark). It was revolutionary in its technological innovation, and the symbolism of its design.

"The Olympic park consisted of a free-flowing sequence of stadia which were covered in lightweight, transparent, cloud-like roofs - a breakthrough in engineering and architecture," explains Chris Bosse of the Laboratory for Visionary Architecture, and architect on the National Aquatics Centre in Beijing. "Germany aimed to present a new, democratic, open country and gave the people an Olympic park in the true sense of the word." The ideals the venues were built to reflect were to be cruelly marred by the terrorist attack on the Games, for which they are more frequently remembered than for great architecture.

However even the truly 'iconic' Munich Olympic Stadium (Olympiastadion) has now been overtaken by the rapid development of the modern sports industry. In 2005, its resident football teams, Bayern Munich and 1860 Munich, relocated to the new Allianz Arena. The Olympiastadion's athletics track distances spectators from the action and each other, and the roof covers only half the spectators. The Olympiastadion is just one of many sports venues which has recently become functionally obsolete.

The complexity of modern sports venues has grown hand-in-hand with the complexity and commercialisation of the wider world of sport.

"Society has demonstrated that it wants more sophistication," says J Parrish, architectural director at international building, infrastructure and consultancy firm Arup. An example, says Parrish, is the importance of corporate hospitality as a revenue generator, and the correlative demand for high-spec, luxurious facilities within venues for eating, drinking and entertainment.

But it is not only the prawn sandwich-brigade in the VIP areas that are expecting more. John Barrow, Senior Principal at HOK SVE, one of the world's top sports architecture practises, says the definition of what everyone now expects at a sports venue has broadened to encompass "a mixture of entertainment and pure sport." While sports facilities "must accommodate [their] core activities to perfection...there are usually opportunities to increase the spectators' experience going to and from their seats, let alone during the actual event."

Tim Hupe, one of the architects on the Allianz Arena, says that people have become "more delicate" when it comes to visible design. One of the Allianz's visual design innovations is a colour-changing outer 'skin', which sees the whole building light up in the red of Bayern Munich when that team plays, and in blue for 1860 Munich.

The escalating cost of these increasingly complex buildings has led to demand for alternative uses and in-built revenue generators. Flexible use as concert and exhibition venues, and as destinations for tourists and casual visitors, with all the requisite facilities to entice them to spend money, is becoming the norm.

To cater for the demand for these complex buildings, a relatively small, specialist sports architecture practise has grown around the world. These architects say that specialist knowledge is key to designing buildings which carry out their many functions effectively, and to ensuring that huge capital expenditure does not result in a potentially ruinous 'white elephant'.

"The best buildings are produced by teams that understand how they work," says Parrish, who was architect on Beijing's National Stadium. "Just changing the height of the first row of seats in the National Stadium in Beijing by 100mm could have cost the client £100 million."

Alessandro Zoppini, of Studio Zoppini, a boutique family sports architecture practise in Milan, says that major sports venue clients have given in to the temptation to call in stars of architecture, who nevertheless may not understand as well as the specialists how sports buildings work. He points to the Aquatics Centre in Beijing and the proposed Aquatics Centre for London 2012 as examples of beautiful, popular architecture that may not prove to be economically sustainable. In these particular examples, he says, their sheer size will make them extremely expensive. "These are high energy density buildings. The temperate must be kept high and the humidity must be controlled.

"A balance must be found between popular architecture and functionality," Zoppini continues. "You need experience, otherwise you are not going to get the balance."

The architects of modern sports venues work with large teams that span many disciplines, and even cultures, to deliver their clients' increasingly complex demands. The markets for the big sports architecture practices are global and work is often undertaken in collaboration with partners in the design and construction industries.

"The industry has changed," says Parrish, a sports architect for over 30 years. "In the early days, you would have had an architect, an engineer, a quantity surveyor, and that was it.

"Now, in Beijing, for example, we had local [Chinese] designers, three architects, two sets of engineers, and lots of other disciplines. The best sports architects are very adept at working with other people."

The tools at the modern sports architect's disposal are as sophisticated as the finished products would suggest. Stadium design is Parrish's specialty, and his method relies on use of parametric computer design software of his own construction. The software has a host of pre-built parameters for aspects of stadiums which can be altered to calculate the effect on the whole design. It can be used, for example, to quickly show clients the impact of their request to change a variable such as the width of seating rows. The difference, says Parrish, could be going back to the client with results of the proposed changes in days rather than weeks, and an unwise change being rejected rather than pressed ahead with due to time pressures.

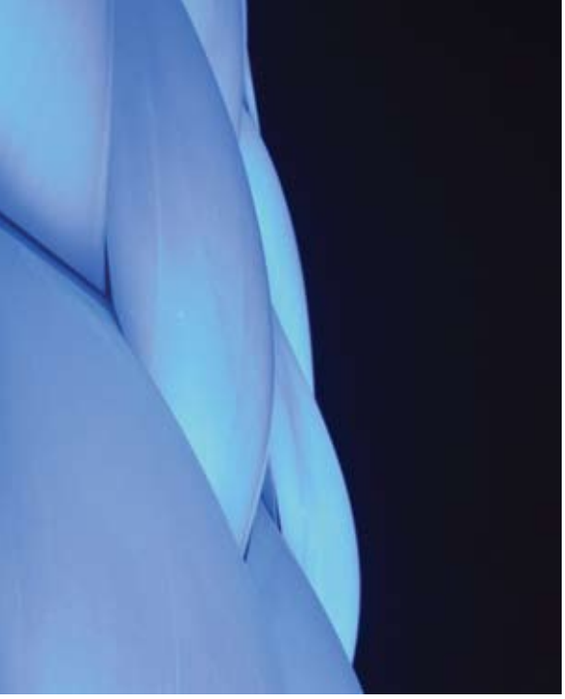
Some key modern trends are radically changing how sports venues are designed.

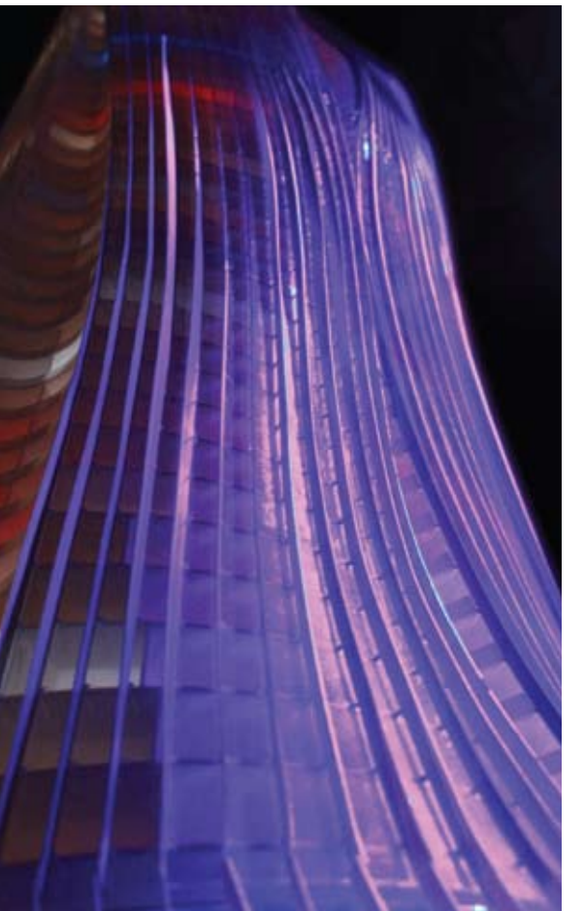
With media coverage so intrinsic to the public's interest in and interaction with sport, huge emphasis is now placed on the accommodation of the media in venues.

"[In] the design of modern stadia, there is no detail that is more stressed than the position of the television cameras and the working conditions of the media representatives," Tim Hupe wrote in a September 2006 article. "50 years ago, no-one cared about reporters!" he added, speaking to Sportbusiness International recently.

Rightsholders such as UEFA lay down extensive guidelines on the provision of facilities for the media in stadiums in which their competitions take place. Desk-space, media rooms, wireless internet and prime camera

The Singapore Sports Hub - *ArupSport*





Top and bottom: The 'Water Cube and Michael Schumacher Tower - *Chris Bosse L.A.V.A*; Middle: The Allianz Arena - *Getty Images Sport*

positions are now de rigeur. Hupe says that it tends to be major international sports events which drive advances in media accommodation, and he does not foresee major changes until at least the World Cup in 2010. Standards are set at these events which stadium-owners such as football clubs follow - if they have the money.

"A surprising problem is that football clubs have very little money for changes to their stadiums," he says.

Sports architects now also see enhancing the atmosphere inside venues as part of their job. With increasingly high-quality audio and video pictures being transmitted to television sets around the world, the atmosphere within stadia is being translated ever more truly to viewers, thus increasing its value.

Tim Hupe's approach to football stadium design, which he believes is part of a growing global trend, takes the atmosphere within a venue as the starting point for the entire design. Whereas the traditional approach, he says, is to design stadia piecemeal - a roof, a seating bowl, and so on - his designs for recent stadia, including the Allianz Arena in Munich, have focused on creating an atmospheric central space to maximise the experience for the crowd.

One reason for this evolution in the thinking behind stadium architecture, he says, is that the technical challenges are not as great as they once were. Modern technology allows huge steel and concrete components to be constructed relatively easily. Thus the architecture that once celebrated these accomplishments and the 'defeat of gravity' is outdated - constructing an atmosphere is the new challenge.

One of the key aspects of creating this atmosphere has been putting spectators as close to the action as possible. The removal of athletics tracks and the steepening of seating tiers has helped achieve this. The effect is one of concentration and density. One of the most common remarks heard from visitors to the National Stadium in Beijing, says J Parrish, was how surprisingly small the interior appeared - precisely the effect the designers were aiming for.

"Architecture for sports is based on three principles," says Chris Bosse, speaking in the context of designing for the Olympic Games. "Atmosphere, performance and iconography."

"The atmosphere has to be unforgettable, inspiring, friendly, light and unique.

"The performance of the building has to drive the athletes to break all records, and, of course, technically and functionally the building has to be up to scratch."

Thirdly, "the building has to...become the postcard that goes out to the world, the emblem of the games, the icon of the country. Broadcasting [reaches] billions of people, while only thousands are able to experience the building in person."

We have seen how important atmosphere and visual iconography are to sports venues, but in the business of sport, it is what Bosse refers to as the "performance" of the building that will ultimately decide whether it stands or falls.

Alessandro Zoppini says his father, Pino, a sports architect for over 40 years and head of Studio Zoppini, has a mantra that a sports venue must be functional "25 hours a day, 8 days a week, 13 months a year."

Studio Zoppini has had recent success in designing an Olympics venue which fulfils a demanding sporting function, and also provides its operators with substantial flexibility to turn revenues from other functions. The Oval Lingotto - the speedskating oval used at the Torino Winter Olympics in 2006 - was designed in collaboration with HOK SVE, and is being used post-Olympics to host over 80 events per year, including exhibitions and fairs for eight months of each year. The building has won awards for its design from the International Olympic Committee (IOC) the International Association for Sports and Leisure Facilities (IAKS), and the International Paraplegic Committee (IPC).

Although it has proved supremely functional, Alessandro Zoppini insists that the building also works as a piece of urban architecture, closely related to the landscape around it. Zoppini believes this is defined by the Lingotto building, an entertainment and shopping complex renovated by celebrated architect Renzo Piano, that was once a Fiat factory of lauded design by architect Mate Trucco.

The functionality and 'performance' of sports venues is at the heart of the much-bandied idea of 'legacy', applied to venues built for big events like Olympics and World Cups. The Oval Lingotto is an example of how a successful legacy can be created if it is the design focus from the very beginning of the project, according to John Barrow of HOK. "Legacy is appropriate for certain venues more than others, demonstrated by the Luge run in Torino, costing over 80 million, but with little opportunity to create a long-lasting profitable use," says Barrow. "On the other hand, the unlikely legacy of the Torino speedskating oval as an exhibition centre required concentration on the challenges at an early stage of design. This was especially the case as the facility had to continue to be a viable speedskating facility. "Strong management input and careful control of both cost and detailing to achieve a year-round active use of the oval resulted in extra efforts by the entire team to ensure that the overall budget of 42 million was maintained."

An awareness of the value to society of sports venues can play a key part in making them flexible, functional, and considered by the public to be worth their huge cost. Tim Hupe believes that this value is now greater than ever, and is not merely based on the commercialisation of sport, but on a deeper social phenomenon.

"Today's stadia stand in [the] tradition of human gathering places where society meets to experience itself," says Hupe. "Here the

individual understands who his neighbours are and, through this, understands the mystery of his own existence."

In less abstract terms, this idea is endorsed by other sports architects. Alessandro Zoppini says that sports buildings must "work socially", and have the ability, like piazza's or town squares, to make urban areas "come alive".

Parrish notes the growing trend in stadium builds 'moving back' to urban centres, and the building of commercial and leisure elements around them.

Moving to urban centres can be economical in its exploitation of existing public transport networks, he says, and also brings stadia into the lives of a broader group of people in a way that out-of-town developments never will.

Of course, Parrish acknowledges, stadiums in urban centres pose huge challenges, including transporting large numbers of people safely, maintaining public order, minimising noise pollution and, not least, the cost of building on expensive land. But he says that successful in-town developments such as the Millenium Stadium in the centre of Cardiff have shown how the benefits can outweigh the costs.

Zoppini says that the move to urban centres, or the development of other facilities around stadia, chime with the trend towards flexibility. He says stadia can become valuable parts of "complex" urban spaces with places for communities to meet, eat, drink, shop, and be entertained.

For both Parrish and Zoppini "the message is getting out" to clients about the importance of flexibility in function, the role of their sports venues in the wider scheme of cities and urban spaces, and the importance of good design, as opposed to merely good-looking design.

"There is a move towards a better balance," says Zoppini, referring to the tension between popular architecture and pragmatic, economical utility. "There is a trend to look for more tailor-made buildings, and a more advanced design approach."

So where next for the brave, bold world of sports architecture?

One development currently under construction which has a remarkable ambition is the Singapore Sports Hub. Parrish and Arup have helped design a multi-venue sports district in Singapore, which the government hopes will catalyse the sporting culture in the country. It plans to create world-class facilities to inspire its citizens to sporting excellence in a tropical climate not conducive to sporting endeavour. The 'Hub' will be just two underground railway stops from the city centre, and will have at its centre a commercial development with restaurants, bars and other features designed to enhance its attractiveness as a destination for Singaporeans. It is rare that construction of such extensive sports facilities takes place without the impetus of the hosting of a major international sports event. The government's hopes for the revitalisation of Singapore's sporting culture are ambitious, but if successful could become a model for countries across the world. Although not a sports venue, a luxury residential tower in Dubai, due to begin construction next year, will be the subject of a novel sports branding project. It will be the first of seven 'Michael Schumacher Towers' planned for locations across the world, all named after the German motor-racing star. It is the first time that such buildings have been branded with the name of a sports star.

Schumacher will be paid for the use of his name, but before David Beckham et al get the scent of a bandwagon, it could be worth considering how rare the brand values embodied by the German motor-racing legend are. Chris Bosse, architect on the Dubai tower, says "a lot of research went into selecting the right brand ambassador for the project." Schumacher was perfect because of his embodiment of ideas such as "perfection, success, high-technology, luxury, fame, wellness, family and altruism."