Cape Town Stadium was built with technology in mind, with IT included in the plans from the outset.

SMART STADIA

Stadia and arenas have become high-tech venues that use the latest technology to ensure smooth operations and maximum service; with the latest IT solutions acting as effective facility management tools, as feature-writer Guy Oldenkotte reports.

Knowledge is power and instant-access to updates on sales, attendance figures, error-messages throughout the venue or 'behaviour' of equipment and systems allows venue operators to be flexible and act appropriately. With ticket and access control, point of sales messages, video walls and lighting all integrated into one operational system, among many other elements of operating a venue, the command centre at a stadium these days rivals that of the White House war room. This also explains why prices for stadium construction projects have escalated drastically in recent years, much to the dismay of the general public, who is often unaware of the intelligence that has been incorporated.

With a price-tag of US$560m for the 55,000-seat Cape Town Stadium — an amount not dissimilar to the cost for the 90,000-seat Wembley Stadium in London — the venue is regarded by many having cost too much, particularly as it has not yet managed to secure an anchor

Morgan Kurk of Enterprise Intelligent Buildings, CommScope Inc., believes that data centres at stadiums can also be shared with other companies.

tenant. But, according to Neil Cameron of Johnson Controls South Africa, the stadium is amongst the most sophisticated buildings available. "I have never seen so much wiring in a building before. Everything is connected," he said.

Cameron also advised that the tender for Cape Town Stadium went out with 'IT' included. "Cape Town Stadium wanted to be the most intelligent stadium in the world. Cost didn't matter that much." Johnson Controls was one of the companies involved in the kitting out of the venue and connecting the various systems.

At Cape Town Stadium almost all systems are connected, including the fire detection and voice evacuation system, access control, CCTV, audio visual services, telephony and data services.

According to Morgan Kurk, Senior Vice President at Enterprise Intelligent Buildings, CommScope, Inc., when it comes to integrating IT, stadiums do not pose insurmountable challenges. "From an IT engineering point-of-view, sports venues are very much the same as other facilities. The difference is that they have a period of extremely high-usage and a certain period of non — or very low usage, which is more extreme than that of a typical office building."

CommScope has been involved in various IT projects at stadiums around the globe. Kurk also commented that the changing trend of stadiums becoming multi-functional has been a major driver in changing views to the importance of IT. "One day you are a traditional sports stadium and the following day you might host something completely different, like motor cross. In order to be able to deliver customer focused services, you must adapt."

In the past, some events required significant change to the infrastructure that increased downtime at the venue. With an integrated IT solution many things can ➲

In the past, significant change to the venue's infrastructure was required for different events, which increased downtime. However, with the latest integrated IT solutions, downtime has been significantly reduced, with certain elements capable of being changed instantly.

SMART STADIA

Turning the Industry around

"When it comes to utilising the data that is retrieved through smart systems and combining it with ways to increase revenue from offering products and services, the sky is almost the limit," said Peter van Gend, former President of Siemens One Major Events and now the founder and Managing Director of Van Gend & Partner.

"My view is that there will be three tiers when it comes to using all of this technology. The first tier will focus on managing the basics; access to a venue, as well as the HVAC and lighting. (Where I believe there is still room for improvement.) The second tier will be about utilising technology intelligently, by taking advantage of clever building management systems that also improve energy management. Thirdly, I foresee we will have a level of usage that will incorporate all new mobile technology and different applications. It will incorporate social media, as well as Customer Relationship Management (CRM) systems," he added.

With the level of acceptance of cell phone/mobile technology, in addition to iPad's integration of social media and CRM systems that has recently undergone exponential growth, van Gend believes such technology will continue to grow apace over the next few years. "The number of applications that are now available for smart phones is amazing. All these systems will have a serious impact on spectator behaviour. It will change the way they are spending their money, as well as revealing what they are actually interested in. Being able to have access to all that knowledge, read it, and understand what it is all about, will give you a cutting edge advantage over other venues," said van Gend.

The level of acceptance of technology and integration of knowledge does, however, have a downside, as van Gend explained: "Until two or three years ago technology was relatively limited and most venues were able to implement it in the venue. But with so much being possible these days it is almost inevitable to have it included right from the beginning, when a new stadium is designed, as it can have serious consequences for the design."

As a result, van Gend says, design teams will have to re-think their point of departure when it comes to drafting a new design for a stadium. "It is no longer about simply the environment, sightlines, etc. Design will also now need to revolve around technology and IT."

Having a vision alone is no-longer sufficient, as van Gend warned: "You must also have the courage to take risks and do something different."

With an increasing quality and variety of information being shown on TV, stadium managers will have to convince fans to come to the stadium. "It will be all about convincing the fan that it will be worth it to come and experience the match. It is no longer about watching the match. It will, therefore, be important to bring all the knowledge together and create the ultimate experience. All the data collected through the various systems will be important in achieving this."

be changed instantly. "Some events have sponsors that are different from those at other events, making signage, playlists, pricing and other communication different on a per event basis. By having all the electronic advertising messages connected to a system that is based on IP, changes can be made on the fly," Kurk advised.

Virtual Machine Software System

At Cape Town Stadium, all information is managed through a Virtual Machine software system. "This increases the utilisation and flexibility of the hardware," said Philip Young of WSP Consulting Engineers. "It saves cost by managing information flow through servers to prevent having servers idle while others are reaching peak CPU load."

The ICT at Cape Town Stadium has been equipped with a system master clock. This timing system filters down to all equipment; servers, desktop computers, telephones and the Building Management System (BMS) and enables cross referencing of security, fire and other service disciplines. "All technology is based on Open Source Technology," confirmed Cameron. "This allows for the easy integration of new interfaces and software."

Thanks to the introduction of Ethernet, connecting the various dots (or actually; systems) has become easy, as Morgan added: "Ethernet is flattening everything on the same platform. Everything is now speaking the same language."

With new technologies and systems being introduced at rapid speed, it is difficult to determine what has to be included when a new project is commissioned.

The Dallas Cowboys Stadium is perhaps best known for its centre-hung LED display, which is the largest in the world. However, the venue also has 3,000 TV monitors installed making it the largest IPTV based installation in the world.

"You always need to be planning for the future. The infrastructure that is closest to the customer is typically the hardest and least convenient to change. Although it is nearly impossible to predict what data will be used for tomorrow, it is clear that more and faster data will be required," said Kurk. "We advise everyone to put in an excess of the highest data throughput cable available. The cost of the physical layer pales in comparison to the cost of retrofitting new cable post completion. In addition, although electronics have a short lifespan of less than five years, cable and connectors typically last in excess of twenty years. For an average stadium, this means we will include copper and fibre cabling that can handle up to 10GB."

Like the stadiums themselves, Kurk believes that the data centres that run the venues should also be considered as multi-functional, ensuring the investment can be retrieved quickly. "Stadiums move a lot of data around yet only during certain times, thus they can share their data centres with others to maximise utilisation."

Building with IT in Mind

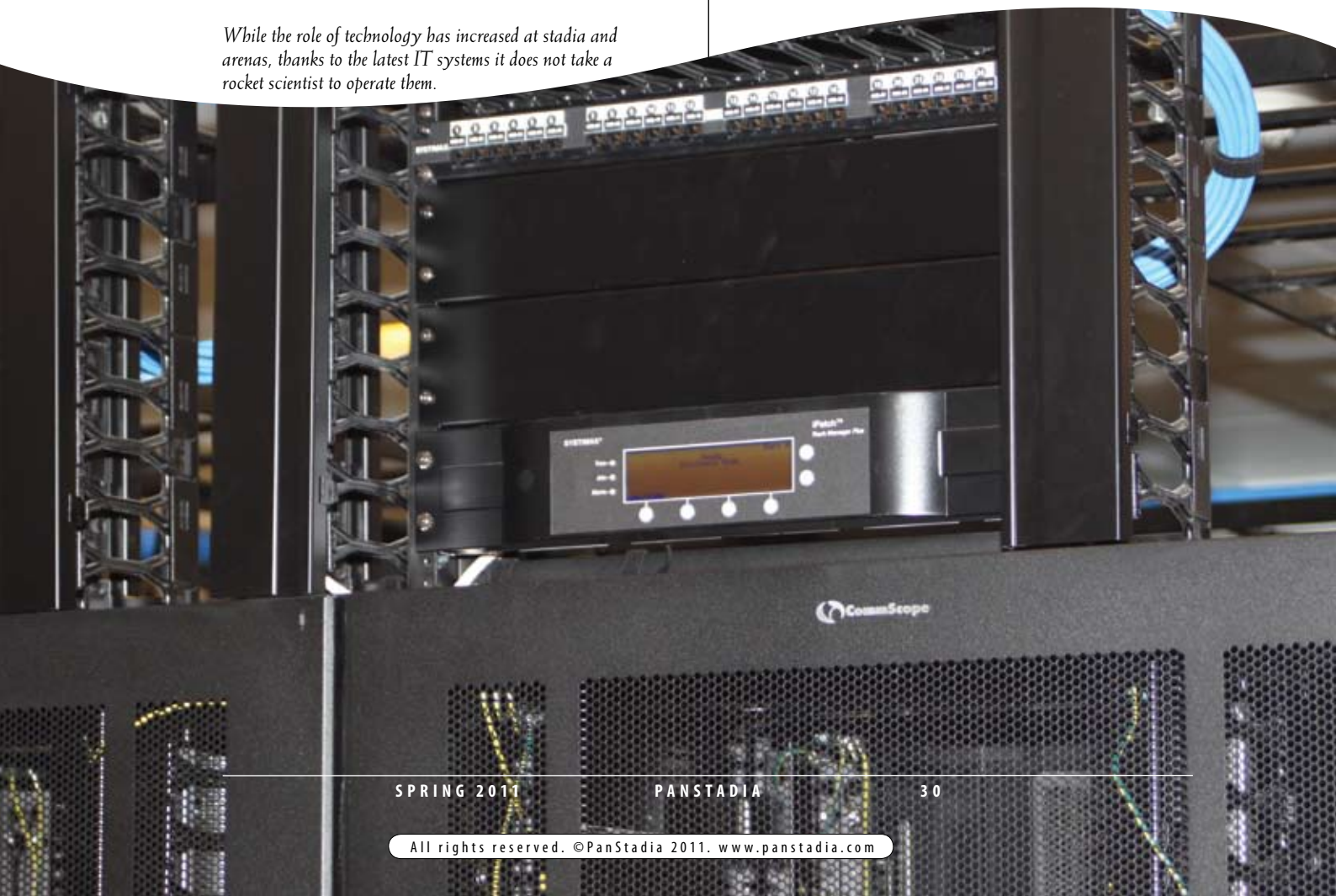
While Cape Town Stadium stands out compared to other 2010 FIFA World Cup venues, other South African venues have also installed sophisticated systems to alleviate the pressure on the stadium management.

SMART STADIA

"It depends on the stadium to decide about how sophisticated the system will be," said Cameron. "The system we installed at Cape Town allows a highly skilled operator to do more. At the Moses Mabhida Stadium in Durban, on the other hand, each suite controls light and HVAC themselves. This, perhaps, makes the system not as sophisticated from a technical point of view, but it still does the job."

Kurk's favourite installation is the Dallas Cowboys Stadium in Arlington, Texas, in the US, for which CommScope played an integral role in both the structured cabling and the wireless system. "That stadium is very advanced. It has 40,000 ports throughout the venue that connect all the systems. The entire venue was built with IT as an integral part."

Dallas Cowboys Stadium is perhaps best known for its huge centre-hung LED video display, which is the largest LED display in the world. However, the venue also has 3,000 TV monitors installed — making it the largest IPTV based installation — all of which are connected by 800km (2.7 million feet) of cable. Kurk advised that while the technology for the stadium has evolved, it has actually become easier to maintain, as "all the systems are on the same platform".



While the role of technology has increased at stadia and arenas, thanks to the latest IT systems it does not take a rocket scientist to operate them.