

case study



National Stadium, Beijing

Honeywell designed, commissioned and installed a custom ELV solution that integrated 15 of the National Stadium's sub-systems that helped the customer fulfill the theme of the 2008 Olympic Games: a people's Olympics, a high-tech Olympics and a "green" Olympics.

Honeywell



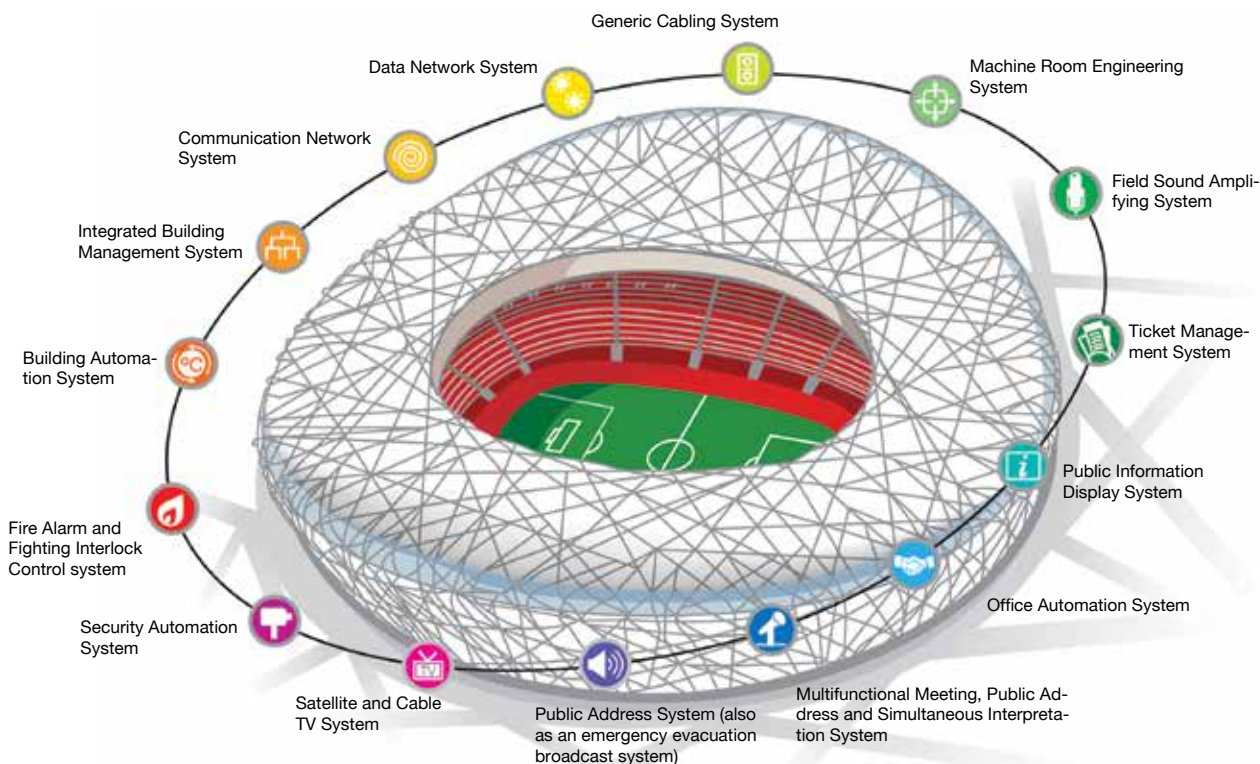
The Customer

The National Stadium in Beijing, also known locally as the Bird's Nest, is situated in Chaoyang district in China's capital. The structure resembles an ellipse with a major axis of 330m and a minor axis of 220m with a total building area of about 250000 sq m. The building height from the elevation of road level is 67.71m and from the foundation top is 62.41m. It is a high-tech building comprising 91,000 seats of which 80,000 are fixed and 11,000 are temporary and can accommodate around 100,000 spectators. Two central rooms are located on level four and zero respectively to control the terminal devices of the security system at the time of the match and to collectively monitor each intelligent building subsystem during, or out of, matches.

The Project

The design and construction of the intelligent system for the National Stadium was not only aimed at supporting the 2008 Olympic Games, but it also needed to be flexible enough to meet various demands for future use after the Olympic Games. Signed in February 2007, this mammoth project was delivered with custom solutions within a short span of 12 months. The Honeywell EBI Integrated Building Management System forms the core of the intelligent building system of National Stadium. It integrates the building automation system, the fire alarm and fighting interlock control system, and the security automation system with distributive database technology DSA for better, and more streamline operations. It also integrates the office

automation system, the ticket management system and the public address system with OPC technology to improve Spectator Management. Through the entire project management experience and technical support of Honeywell Global around the world, Honeywell provided a series of service ranging from further design, equipment supply, installation direction, system commissioning and maintenance to meet all demands of comprehensive modernization management and operation required for a large stadium.



The Benefits

Operational Benefits – The building automation system monitors and controls various electromechanical devices, records data and performs distributed control and centralized management so as to offer a comfortable working, viewing and competing environment respectively for the staff, audiences and players in the Stadium. Operationally, a centralized, enterprise-wide view of the building automation systems allows for data from different applications to be automated so that planning and resource allocations can be better managed.

More Green – The National Stadium also includes some innovative solutions for a “Green” Olympic.

The building automation system integrates and controls the various equipment and devices that affect comfort levels or consume vast amounts of energy. The solution incorporates the concept of “green” holistically and includes considerations for **Air Quality** (looking at as the air handling units, the fresh air units, or the air supply and exhaust systems), **Drainage** (with water supply and drainage systems and monitors the rain flood control systems, the outdoor waterscape systems, the reclaimed water systems), to **Power Generation** (power supply for illumination systems and the elevator systems, the cold and heat source systems such as chillers, heat exchangers and ground source heat pumps). More innovatively, the stadium features built-in environmental features such as rainwater recycling, and cooling heat pumps with underwater source and an aggressive energy management strategy that for example, can limit air conditioning to specific interior spaces such as office or VIP hospitality rooms.

Better User Experience – Technology enabled a more transparent and traceable user identification system so that the access control (Honeywell Temaline) could segment staff, VIPs and general visitors against a predefined database. In addition, the interface with the electronic ticketing system was also integrated with the turnstiles and security checks so that individuals could be tracked from the point of entry.

Safer – The intelligent, integrated system included the use of personalized tickets and face-identification systems customized for the Olympics and Paralympics Games. If an alarm is triggered by a false or unauthorized access card, the nearest CCTV cameras can pin point the area and staff can be dispatched more accurately.

More Secure – Security is a top priority for the National Stadium and the security solution from Honeywell includes integration of video surveillance and control system, the access control system, the intruder alarm system, the guard tour system, the park management system and the integrated security control system. Over 200 analogue, Honeywell-manufactured CCTV cameras were integrated with our proprietary Digital Video Manager recording system to combine the best of technology with quality images and a software-based video analytic tool. It is uniformly administrated by the central management station of the integrated security system and is able to quickly and efficiently handle any unexpected event. The Honeywell team also addressed installation challenges with innovative thinking. As the design of the stadium structure had irregular walls that were not perpendicular, the mounting of CCTV cameras needed a customized approach.

The High-Tech Olympic

The intelligent building system of National Stadium demonstrated that Honeywell has taken full advantage of international new techniques, including:

- Integration technology of information system and automation system
- Network properties and facilities management technology
- Information service and computer network switched in by optical fiber users and communication network technology
- “One Card solution” of smart card
- Digital management technology of voice and video frequency
- Energy-saving technology of buildings

Honeywell provides an extra low voltage project consisting of 15 building intelligent subsystems of the National Stadium, including:

- Generic cabling System
- Data Network System
- Communication Network System
- Integrated Building Management System
- Building Automation System
- Fire Alarm and Fighting Interlock Control system
- Security Automation System
- Satellite and Cable TV System
- Public Address System (also as an emergency evacuation broadcast system)
- Multifunctional Meeting, Public Address and Simultaneous Interpretation System
- Office Automation System
- Public Information Display System
- Ticket Management System
- Field Sound Amplifying System
- Machine Room Engineering System

Building Management System

The building automation system also includes three central management stations that streamline data from over 7500 controlled points and uses 82 direct digital controllers, 769 sensors, 37 water valves and 106 air dampers.

Fire Automation System

The fire alarm and fighting interlock control system consists of the central management station, 13 fire alarm controllers, nine gas fire controlled panels, two water-spray controllers, 24 floor displayers, 3232 smoke detectors, 231 thermal sensors, 564 manual alarm buttons, 1629 control modules, 2,559 single-input monitor modules and 187 double- input monitor modules .

Security Automation System

The Honeywell-designed security automation solution covers 6 security subsystems including a digital video surveillance system connecting 800+ cameras, a Nexwatch access control system with more than 162 readers, a large intrusion detection system built in conjunction with the Honeywell Vista series, a car parking management system covering 800+ parking spaces and a connected tour guard system. All of these 6 subsystems converge for optimal output through Honeywell’s EBI (Enterprise Building Integrator).

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