NUCLEUS RESEARCH

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ROI CASE STUDY
MAJOR CHILDREN'S HOSPITAL
JOHNSON CONTROLS

THE BOTTOM LINE

A major children's hospital used Johnson Controls Technology Contracting Services to both accelerate the completion of its new 1.4 million square foot facility, as well as reduce the cost of building systems and construction management.

ROI: 79%

Payback: 5 months

THE COMPANY

The children's hospital is a full-service health care provider with 13 locations in and around a major urban area, where medical care is given to children for a broad variety of ailments including asthma, cancer, blood-borne diseases, and diabetes. The hospital's primary facilities are located on a 48-acre campus where all aspects of the facilities are designed to maximize both the quality of care and the peace of mind of the hospital's patients and their families. Amenities include playrooms, family-oriented libraries, teen centers, and private rooms with pull-out beds for parents.

THE CHALLENGE

In constructing new facilities, the hospital is continually seeking ways to achieve a number of often conflicting objectives, including:

- Technology. The hospital requires extensive networking and integration capabilities so that diagnostic and therapeutic information can be readily exchanged among care givers. Facilities also need to accommodate a variety of diagnostic technologies such as radiology and tomography.
- Flexibility. Because the hospital can not always predict what technologies it will be using, or the diseases it will be treating, its data networking and diagnostic facilities must be flexible enough to be readily modified, upgraded, or replaced.
- Caregiving. In order to maximize the quality of care, doctors, nurses, and other therapeutic staff need access to a variety of diagnostic and therapeutic technologies.
- Cost. Although caregiving abilities and flexibility should be maximized, the hospital is extremely cost conscious, since its budget is fixed and raising new funds is difficult. Additionally, the more the hospital is able to achieve fiscal prudence, the more consistently it will be able to raise funds.

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TOPICS

IT Management & Operations

- Speed. Construction project timelines need to be shortened in order to minimize project financing costs.

THE STRATEGY

When constructing a new facility for its headquarters, the hospital was seeking new ways to manage its projects so that it could stay within its budget and reduce costs, while also maximizing the quality of patient care. One area in which the hospital was seeking to make improvements was vendor management. The hospital knew that the integration of networking and building technologies, which typically occurs at the end of a construction project, was one of the most unpredictable parts of construction management and a primary contributor to cost overruns and project delays. For this reason, the hospital sought help from organizations that would not only manage this part of the project, but also act as a sole contractor and purchaser in order to reduce project costs.

The hospital evaluated proposals from Siemens, Johnson Controls, and two smaller consulting and management firms. Johnson Controls was chosen for a number of reasons, including:

- Predictability. Johnson Controls was willing to guarantee its cost to single source and manage all integration of the hospital's building management, networking, and other critical technologies.
- Breadth. During the proposal and evaluation process, the hospital became convinced that Johnson Controls' knowledge and expertise in a broad variety of technologies — including networking, wireless, nurse call systems, and various diagnostic technologies — would enable it to cost effectively improve this part of the construction project. The hospital also wanted to tap into these areas of expertise in order to not just manage the construction process, but proactively find ways to improve it.
- Experience. The project manager had prior experience with Johnson Controls and was confident of their ability to manage large projects involving various types of technologies and vendors.

In early 2006, Johnson Controls was hired as the sole contractor for the design-assist, procurement, and installation of all building technologies for the hospital's new facilities. At the time, the project was 10 percent complete, which posed some challenges because the existing contractors had to change some workflows in order to accommodate the new role of Johnson Controls in the project.

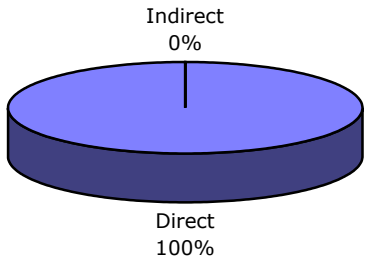
KEY BENEFIT AREAS

Contracting Johnson Controls as the sole contractor for building technologies enabled the hospital to reduce system costs and accelerate project completion. Key benefits from the service include:

- Reduced materials costs. Because Johnson Controls was the sole contractor for all of the wiring in the facility, it was able to reduce costs by maximizing the utilization of equipment such as wiring, conduits, antennas, kiosks, and networking hardware. Additionally, because Johnson Controls was the only vendor purchasing these materials on behalf of the hospital, buying power was concentrated, which also reduced the cost of materials.

- Reduced project costs. Using a single vendor for the wiring and integration of the facility simplified the project, made it more predictable, and dramatically reduced the amount of change orders necessary to complete the project. As a result, the project was completed three months earlier and the hospital reduced the amount of money it spent on contractors who complete finish work at the end of the project, such as sheet rockers, plasterers, and painters.
- Reduced staffing costs. Integration of the wiring and networking for the hospital is a complex job that would have required the full attention of one project manager from the hospital or the construction management firm it hired. This cost was avoided because it was managed by Johnson Controls.

BENEFITS

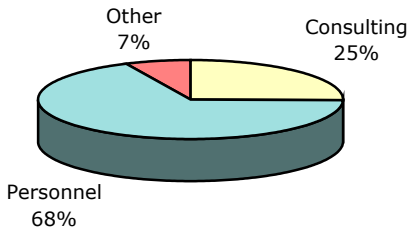


TOTAL: $3,317,000

KEY COST AREAS

Key cost areas for the project included personnel, consulting, and administration.

COSTS



TOTAL: $1,404,000

The project was already underway when Johnson Controls was brought on, so consultants from Johnson Controls worked with the hospital, its project managers and subcontractors, to look for ways to redesign the existing building systems plans to simplify their deployment and lower costs. Personnel costs consisted of the labor provided by Johnson Controls and its subcontractors for the wiring,

installation, testing, and fine tuning of the systems installed under the contract. Other costs consisted of administration.

BEST PRACTICES

Although the hospital's decision to single source its wiring and networking with Johnson Controls generated a strong ROI, the hospital recommended that this decision be made as early in the construction process as possible. Hospital construction is both expensive and highly complex, with many interdependencies between the various parts of the building, subcontractors, and architectural objectives. For this reason, it's best to reallocate any cost savings from the sole sourcing of wiring as early as possible, when changes are most readily and inexpensively made. For example, halfway through a project, the structuring of a hospital is largely complete, which means that it is difficult to make certain architectural changes, such as the expansion of an emergency room, in a way that is cost-effective or shortens the project timeline.

Companies seeking to add a technology contractor to their construction management process should anticipate resistance. Single sourcing of wiring and networking is new to many organizations, and typically not pursued by construction management firms. For this reason, champions should be prepared to make the case for this early in the construction planning process by advocating it as a way to reduce costs, shorten project timelines, and improve project predictability.

CALCULATING THE ROI

Nucleus calculated the costs of consulting, personnel, and administration over a 3-year period to quantify the hospital's total investment in Johnson Controls Technology Contracting Services.

Direct benefits included the avoided costs of hiring or subcontracting a project manager, reduced payments to trades people as the result of a 3-month reduction in the construction project timeline, and reduced costs of equipment, materials, and systems.

DETAILED FINANCIAL ANALYSIS
MAJOR CHILDREN'S HOSPITAL

SUMMARY

Project:	**Johnson Controls Technology Contracting Services**
Annual return on investment (ROI)	**79%**
Payback period (years)	**0.42**
Net present value (NPV)	**1,480,348**
Average yearly cost of ownership	**468,000**

ANNUAL BENEFITS	**Pre-start**	**Year 1**	**Year 2**	**Year 3**
Direct	0	3,317,000	0	0
Indirect	0	0	0	0
Total Benefits Per Period	0	3,317,000	0	0

DEPRECIATED ASSETS	**Pre-start**	**Year 1**	**Year 2**	**Year 3**
Software	0	0	0	0
Hardware	0	0	0	0
Total Per Period	0	0	0	0

DEPRECIATION SCHEDULE	**Pre-start**	**Year 1**	**Year 2**	**Year 3**
Software	0	0	0	0
Hardware	0	0	0	0
Total Per Period	0	0	0	0

EXPENSED COSTS	**Pre-start**	**Year 1**	**Year 2**	**Year 3**
Software	0	0	0	0
Hardware	0	0	0	0
Consulting	355,000	0	0	0
Personnel	952,000	0	0	0
Training	0	0	0	0
Other	97,000	0	0	0
Total Per Period	1,404,000	0	0	0

FINANCIAL ANALYSIS	**Pre-start**	**Year 1**	**Year 2**	**Year 3**
Net cash flow before taxes	(1,404,000)	3,317,000	0	0
Net cash flow after taxes	(1,404,000)	3,317,000	0	0
Annual ROI - direct and indirect benefits				**79%**
Annual ROI - direct benefits only				79%
Net present value (NPV)				1,480,348
Payback (years)				**0.42**
Average annual cost of ownership				468,000
3-year IRR				136%

FINANCIAL ASSUMPTIONS

All government taxes	0%
Discount rate	15%