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IVEY

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STARS AIR AMBULANCE: AN INFORMATION SYSTEMS CHALLENGE

Professors Malcolm C. Munro and Sid Huff wrote this case solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

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In a hangar near Calgary International Airport, three sleek red BK117 helicopters sat waiting to be dispatched to accident sites in southern Alberta. In an adjoining building overlooking a landing strip, dispatch staff quietly monitored multiple screens at a dozen workstations in the Emergency Link Centre. In the pilots' lounge and surrounding offices, helicopter pilots, nurses and paramedics were on standby 24 hours a day, seven days a week. A myriad of other professionals, including experts in clinical operations, aviation, engineering, communications, disaster preparedness and base operations, to name only a few, comprised the support group of the STARS Air Ambulance service, or, as it was more formally known, the Shock Trauma Air Rescue Society (see Exhibit 1). According to Dr. Greg Powell, the STARS chief executive officer (CEO), the business of STARS was to "find patients, take care of patients, and transport patients"; the entire organization was focused on this simple but challenging mission.

In early 2008, Sharaz Khan, the recently appointed chief information officer (CIO), confessed he was still so new that he had to be careful to avoid getting lost as he navigated the many hallways and staircases in the STARS office facility. With extensive experience as director of technology at a Chicago hospital and two master's degrees, including one from Harvard University's Kennedy School of Government, Khan brought valuable expertise and vision to the organization and had much to contribute. However, when he arrived at STARS, rather than inheriting a well-oiled machine he could fine-tune, Khan quickly realized he needed to rebuild many aspects of the information technology (IT) operation. An interim manager had begun the rebuilding process but much needed to be done.

A big part of the problem was a simple lack of awareness across the organization of the critical nature of IT over time. Glancing out the window after lunch in the Wings restaurant as a corporate jet glided past, Khan pointed out with mild chagrin that in the recent 72-page *STARS Critical, Strategic and Operational Plan*, technology merited only a single paragraph. Still, he felt the oversight was largely a result of the absence of executive-level IT representation when the STARS executive team had developed the plan. Yet several elements in the plan clearly hinged on a strong and effective information systems function. Khan saw that among his many problems was the need to better communicate the importance of information systems to other STARS managers and to gain their buy-in for improving the IT function in STARS. He needed to bring together a comprehensive plan to stabilize information services (IS) and create conditions for change

in the broader organization. Many matters needed to be dealt with, and he knew others would emerge. Khan would soon have to explain to the CEO how he intended to proceed.

STARS BEGINNINGS AND DEVELOPMENT

In 1985, on a highway in southern Alberta, a woman bled to death following the birth of her baby. A study showed Alberta's death rate due to trauma was 50 per cent higher than other leading trauma centres. In the wake of these events, Dr. Greg Powell, who was then a Calgary emergency physician, and others secured financial assistance from the Lions Club and founded STARS.

In the early days, two pilots using beepers would fly a helicopter to a hospital, pick up a medical team, then retrieve the seriously injured from the accident site. STARS also flew critically ill patients from smaller hospitals to better equipped major hospitals. The first mission occurred in December 1985 when a premature baby at Lethbridge Hospital required neonatal care at Foothills Hospital in Calgary.

Helicopters saved considerable time because they could carry medical personnel from hospitals directly to accident sites. Additional time was saved when volunteer nurses and paramedics joined the regular on-call flight crew. (Previously, the first part of a mission would entail flying to a hospital to pick up a designated nurse and paramedic.) In five years, STARS had flown 1,300 missions but only half of the province was being served. The medical community in Edmonton soon requested a similar program, and its STARS service was established in the fall of 1991. In 2006, a STARS base was established in Grande Prairie to serve Alberta's northern communities. Five STARS helicopters were now available for the province: one in each of Calgary, Edmonton, and Grande Prairie and two backup units.

From the start, financing had been a difficult month-to-month issue. STARS services were initially provided free of charge to the patient; partial recovery was achieved by billing Alberta Health and Wellness (a provincial government health services agency), and STARS was further funded by donations. But an air rescue service proved to be an expensive undertaking. On more than one occasion, when loans came due and expenses mounted, the organization had been in imminent danger of having to close. But gradually, as the service proved its worth, the flow of donations improved, and STARS became financially stable. Its public profile was boosted when STARS decided its white helicopters were too bland; they were almost invisible in the promotional photographs. Fortuitously, Field Aviation, from whom STARS rented building space, had a generous quantity of leftover red paint and obligingly provided the paint job. What emerged came to be the iconic STARS red helicopter with white stripes (see Exhibit 2). Fundraising efforts eventually included targeted campaigns, an annual STARS calendar sale and a highly successful annual STARS lottery.

In 1996, Powell secured the support of the Canadian Association of Petroleum Producers to establish the Emergency Link Centre (ELC) (see Exhibit 3) to facilitate communication in the many rural areas where oil and gas companies worked. In a proactive mode, the ELC instituted a site registration scheme to capture valuable information about oil and gas company operations, including maps and facilities to assist flight crews attending accident sites. A small charge was levied for each site included. STARS played an important role in preserving human life in these sometimes challenging environments. In the years that followed, the ELC matured into a sophisticated communications system linking the various players in the "chain of survival": hospitals, ground ambulance services, police, firefighters, search and rescue organizations, and park wardens. Recently, Geographical Positioning System (GPS) technology was adopted to enable the ELC to display the real-time location of each helicopter on a monitor in the operations room.

STARS developed an outstanding reputation for excellence in its field and won accreditation, awards and competitions. The number of missions rose to more than 1,000 a year, an average of 3.4 per day. The organization itself became more complex with the formation of the STARS Centre for Education and Research and the Alberta STARS Service Foundation (see Exhibit 4). By 2007, personnel included approximately 250 full- and part-time staff, hundreds of volunteers from medical and kindred professions, and the community at large. Further recognition for STARS came when Powell, the founder, president and CEO of STARS, was named one of Alberta's 100 Physicians of the Century and was invested as an Officer of the Order of Canada by the Governor General of Canada in 2007.

The STARS mission statement spoke of "providing a safe, rapid, highly specialized emergency medical transport system for the critically ill and injured." STARS had a core commitment to deal with serious trauma within "the golden hour," a reference to the goals of providing expert pre-hospital care and transporting critically ill and injured patients to definitive hospital care within one hour. Statistics had shown that survival rates increased dramatically in such circumstances. A strong culture developed within STARS, which Powell referred to as "the set of values and beliefs that drives our behavior." Co-operation among diverse professionals to help patients was a key strength and central to the STARS vision of "saving lives through partnership, innovation and leadership."

A TYPICAL STARS MISSION

Following an emergency situation, such as a traumatic or serious medical event in the community, a call was placed to 911. The 911 dispatcher, or another emergency service provider in the chain of survival, called the STARS Emergency Link Centre requesting assistance. A communications specialist in the ELC determined the location of the patient and the type of injury, then called an alert for a possible helicopter dispatch.

As soon as the call was received, a helicopter was moved from the hangar to the flight area. Meanwhile, the STARS air medical crew (AMC) — typically a pilot, co-pilot, nurse, paramedic, and in 25 per cent of the missions, an emergency physician — prepared for a safe mission response, which included the pilot's weather check and ensuring the AMC's safety and special equipment requests were met. When a specialized team was required (such as a fire department dive rescue team or a neonatal intensive care unit team), the aircraft was reconfigured to accommodate the extra personnel.

Staff in the ELC continued with the referral process, confirmed the location, secured a helicopter landing zone and dispatched the helicopter. The helicopter was in flight within eight minutes of the time of dispatch unless delayed by significant weather considerations. Upon takeoff, the pilots communicated with air traffic controllers and got the helicopter on its way. At the same time, the AMC communicated with the ELC and were informed of pertinent mission information (such as critical patient data and landing zone information). If the mission was an inter-hospital transfer, the AMC communicated with the ELC and the referral emergency physician to familiarize themselves with the patient's condition and communicated with the sending hospital staff to ensure the patient was prepared for flight transport.

When the helicopter arrived at the scene or hospital, the crew immediately met with the ground emergency services or hospital staff and rapidly prepared the patient for transport with the other partners in the chain of survival. Depending on the patient's condition, additional treatment of the patient might be administered by the paramedic or nurse prior to departure. The patient was loaded onto the STARS stretcher and moved into the helicopter for transport to the receiving hospital. The AMC continued to treat the patient during the flight, with a physician either on board or available online to provide medical advice. The crew was also in

contact with the receiving hospital, providing information and updates on the patient's condition and treatment to help the receiving hospital prepare the appropriate resources for the patient. Upon arrival at the hospital, the STARS AMC worked with the emergency physicians and nurses to transfer all necessary patient information and patient care as quickly as possible. When the STARS crew returned to the base, the helicopter was refueled, cleaned and medically restocked for the next mission.

THE NEW STARS CHIEF INFORMATION OFFICER

Sharaz Khan earned a bachelor of commerce degree at the Haskayne School of Business at the University of Calgary in 1991. While completing his degree, he held various part-time healthcare positions and gained database development experience. After graduation, he was hired by the Calgary Regional Health Authority to create electronic medical records. He worked with the various hospitals in the region, which had their own systems and standards, to create a common database, a project that took about three years.

In 1996 when his wife was accepted to optometry school in Chicago, Khan took a job as assistant director for technology at a local hospital. After a few years, he was appointed director of technology at another hospital, reporting to the chief financial officer. In this position, he implemented a mission statement, vision statement and business plan and worked to align IS with the hospital's mission. During this time he also completed a master of science degree in health systems management at Rush University in Chicago. While completing his master's degree, he worked with the World Health Organization in Geneva and Johns Hopkins University on a project involving knowledge management, which was, in turn, followed by an implementation project in Africa. A few years later, Khan completed a second degree, his master's degree in public administration, at Harvard's Kennedy School of Government.

After considering job possibilities in the United States, Khan posted his availability at a job website in Calgary (where his parents and siblings resided). STARS responded and Khan accepted the invitation for an interview. He had three interviews with STARS and was asked many questions to determine his fit with the organization. Although he had several other job opportunities, he accepted the STARS offer, in part because he had been deeply influenced by the dedication and insightfulness of the CEO, Dr. Powell. He felt comfortable with the IS operation as he understood it, and concluded he would be building on a sound infrastructure of technology and practice. The reality turned out to be different.

INFORMATION SYSTEMS AT STARS

The information systems group at STARS consisted of seven internal full-time people, three full-time consultants and one manager, supplemented from time to time by additional consultants. One of the full-time consultants was a network administrator, one was a developer and the third was involved in continuity planning. Of the permanent staff, some maintained the existing systems, and three worked on systems development, but for the most part Khan found that the roles of the permanent staff were not well defined. He felt that the lack of role definition was best exemplified when one of his staff was unable to provide an answer to the simple question, "What do you do here?"

Khan found that the consultants enjoyed free rein to pursue whatever activities they preferred or were pressed to undertake, operating in a reactionary mode. For example, users needing assistance (for example, to get a printer working) called on their "favorite IT person" for help, who often turned out to be a consultant that billed the company at full consulting rates for the time spent coaxing a printer to work. Expensive consultants were sometimes called just to change user passwords. Khan became concerned that

some of the consultants may have been taking advantage of the apparent lack of supervision. Khan once asked a consultant what he was working on, to which the consultant replied, "Three or four different projects." Khan asked for a timeline on the projects, but the consultant couldn't provide one. "When I told the consultant to focus on one specific project, drop the others, and develop a project plan, the guy was taken aback," said Khan. A comfortable relationship with another consulting company, based on prior friendships and associations, had resulted in the practice of eschewing the usual "request for proposal" approach. Khan's predecessor as director of IT had been a contractor who mainly focused on executing his own particular consulting assignments. He came and went, working on whatever he thought needed doing. He also tended to hire many consultants. Consequently, the consulting costs were huge.

INFORMATION SERVICES PROJECTS

As a further step in developing his own understanding of the STARS IS environment, Khan took an inventory of "knowledge documents" and related activities: paper documents, electronic documents, service activities, projects under way and so on. This inventory was followed by an effort to describe the nature of STARS data, databases, applications, and how they were (or were not) interlinked. He was soon able to display the entire set of applications and databases diagrammatically on a single page (see Exhibit 5). The resulting "STARS Technology Environment" diagram was a novelty to the IS staff to see the scope of what they were supporting. With further investigation, Khan was able to identify 24 projects currently underway, many cited as being "critical." "They can't *all* be critical!" commented Khan, only partly joking. He showed the list of projects to the CEO who had never seen this sort of information previously. Khan concluded that, in the past, IS projects were given little forethought or planning and were purely reactive in nature, a "we fight fires" mindset — and nearly all of the "fires" were critical!

A project of particular concern to Khan was the Network Change Project. This activity had many parts to it and included a complete review of the architecture, configuration, maintenance and administration of the entire STARS network. The project scope also called for establishing the measures required to create operational efficiency around these areas. Khan discovered that only sketchy project plans existed, and the project description made no mention of planning for network backup or maintenance.

Khan had discussed with the CEO the idea of creating a formal Project Management Office at STARS. However, Powell wasn't yet convinced of the value such a function would provide; and of course, it would require additional money to staff and operate.

DISTRIBUTED INFORMATION SERVICES ACTIVITIES

Khan then began to explore the larger scope of IS activities in the organization. In particular, he sought to determine the total IS costs for STARS. He soon found that other departments employed their own systems staff and had their own projects underway. Some of these projects were being implemented on the organization's network and could significantly affect network effectiveness and response time. The former IS director had decided not to participate in most of these technology efforts by other departments, a frustrating situation for the CEO. Khan gave the example of a new state-of-the-art computer-assisted dispatch system, involving eight servers and costing more than $500,000: a huge project. A plan had been developed, but the project was being managed by consultants. Apparently the previous CIO had disavowed the project entirely, having been frustrated by his lack of authority and control over it. The technology itself proved sound, but the project lacked a line of responsibility from the project manager (a consultant) to the company.

Khan also learned that other departments used outside consultants and vendors to do maintenance work on the systems that the consultants had developed, instead of calling on the IS department to perform such work. A further complication was that consultants were employing their own systems development methodologies, thereby generating a lack of uniformity in systems development practices throughout the organization. Khan also examined how other departments managed their projects, and found that some had "self-appointed" project managers (usually someone from within the department who was particularly interested in the project); in other cases, project leaders were "volunteers" from within the initiating department. Occasionally, a department head would show up at the IS door with some new system that had been developed within their department, instructing IS to implement it.

In effect, STARS had a "distributed" IS budget in which some individual departments hired their own IS staff or contractors, purchased their own computer equipment and developed their own applications independent of the IS department. Individual departments had created their own "silos" with regard to IS. As a result of the disconnection between the centralized IS function and IS personnel working in other departments, Khan was unable to determine total IS costs for the organization. As long as other departments had their own budgets for IS, they could do whatever they wanted. "I can't manage what I can't control," Khan commented.

Regarding physical infrastructure, Khan found he needed to replace a lot of old technology. For example, he found IS had too many servers (and each server was handling only a single application), whereas today a single server could handle multiple applications. Also, because many of the servers had passed their warranty period, STARS paid for costly vendor service visits. One company charged a minimum of $2,400 for a service visit plus $250 per hour. Khan also saw the need to ramp up and stabilize other aspects of the physical infrastructure, such as cables and power supply systems. He was also concerned about security of the network and systems. In the past, security matters were often handled on a firefighting basis. He noted that frequently, when a security breaches occurred, consultants "would swoop in to fix the problem. Later an invoice for $20,000 for a day's work appeared."

PRESENTATION TO THE EXECUTIVE COMMITTEE

After a few weeks, Khan pulled together his thoughts regarding the state of IS in STARS and presented them at a meeting of STARS executives and department managers. His presentation was well received, and everyone seemed to agree in principle with his ideas. But he had the uneasy feeling that perhaps the managers hadn't taken his comments very seriously, even though they nodded their heads respectfully as he spoke. He wondered whether they were really grasping the impact of the initiatives he had in mind. He was concerned that perhaps the closer he came to affecting their individual operations, the more resistant they might become. Still, following the presentation, one manager approached him and expressed relief that finally someone in IS spoke the language of business managers. Khan also received a phone call from a doctor who was surprised that Khan was able to discuss his needs in an understandable manner and would provide the functionality the doctor required. Khan also reminded himself that within STARS was the ethic of according strong respect for the professional expertise and responsibilities of others in the complex and challenging STARS environment in which teamwork was a critical success factor. He reasoned that he should receive similar respect. Although he had seen some promising signs, Khan still felt that overcoming resistance from department managers might be a challenge.

An unexpected result of Khan's presentation to the executive committee was the reaction of his own IS staff. Khan had the foresight to have the full IS group in attendance. Following the meeting, Khan was told

that previously, IS people felt considerable individual pressure from other department managers to respond to their requests, but the staff felt Khan's presentation had relieved them of this stress. In effect, Khan had stepped up and identified himself as the individual responsible for IS activities and the person with whom other managers should speak when they had IS matters to discuss. The staff also told him this was the first time the IS group had been given this kind of visibility within the organization.

Khan knew he had to substantially improve the quality of service provided by IS to the company if he were to be successful. His immediate predecessor, the acting manager, had clearly made improvements and created a better working environment. Khan knew he and his predecessor could work together to provide high visibility, exposure and technology value to the organization and its partners. He told the IS staff that he would find the budget and do whatever it took to ramp up the collective skill sets of the IS group. In return, he expected excellent performance and superior customer service from them. Overall, Khan felt the whole event had had a salutary effect on the morale of the IS group.

THE CHIEF EXECUTIVE OFFICER'S BOTTOM LINE

Dr. Powell, the CEO, commented that the orientation Khan provided was exactly what was needed. Powell was clear that delivering real value to the organization was his "bottom line," and IS was also expected to deliver real value soon. He reminded Khan that in the coming year, STARS would begin replacement of its BK117 helicopter fleet with the custom-equipped, faster and much longer-range AW139. The good news was that this new fleet would allow STARS to improve the service it provided, and to expand its service coverage and scale of operations. However, Powell told Khan that he should anticipate a 10 per cent budget reduction to help meet the additional costs expected. As Powell left the meeting, he said he looked forward to having Khan present his strategy for IS in the next few weeks.

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Exhibit 1

STARS WEBSITE

Source: http://www.stars.ca/bins/index.asp, accessed March 25, 2008.

Exhibit 2

STARS HELICOPTER, PILOT AND PARAMEDIC

Source: Case author.

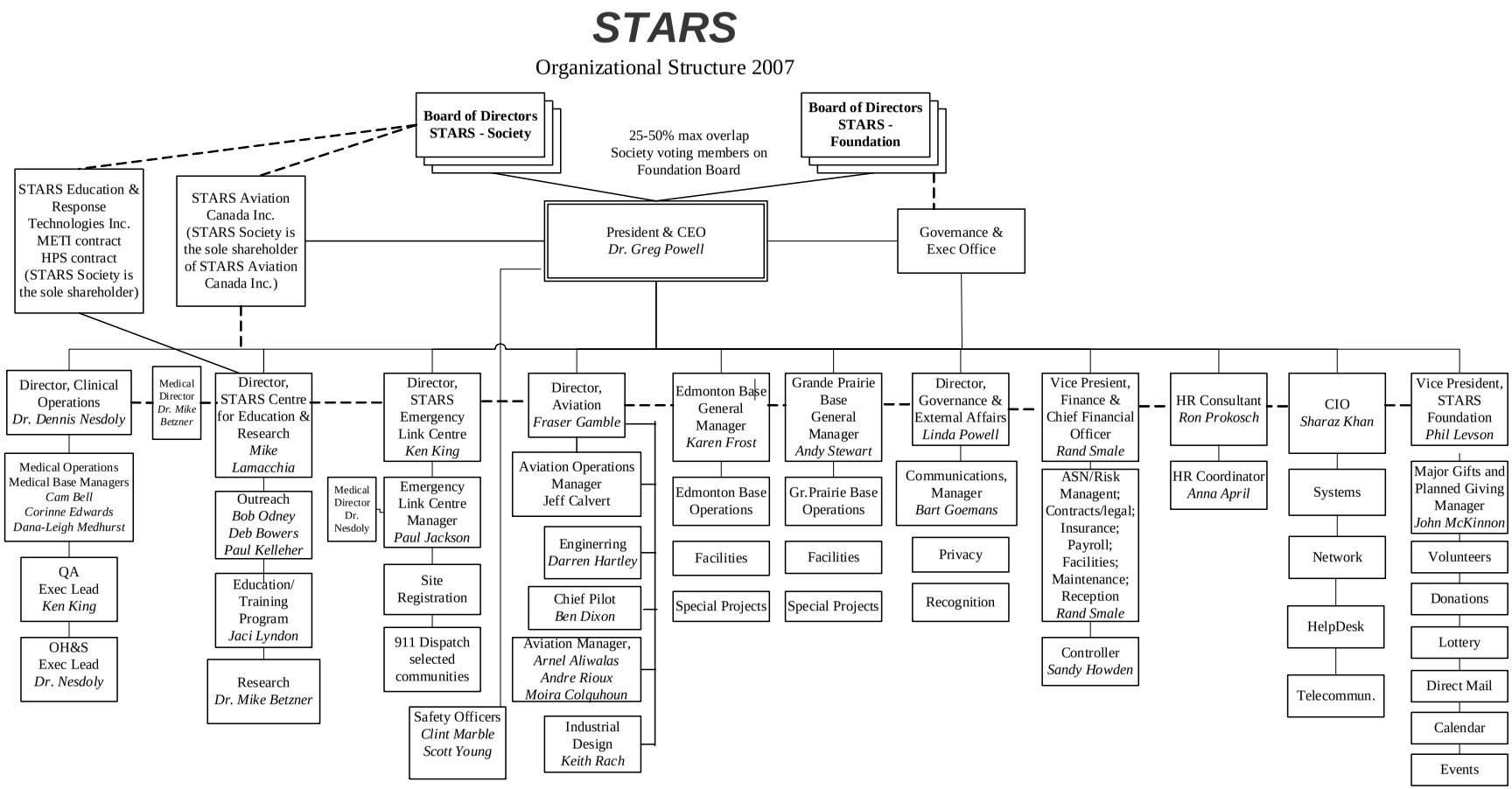
Exhibit 3

THE EMERGENCY LINK CENTRE

Source: Case author.

Exhibit 4

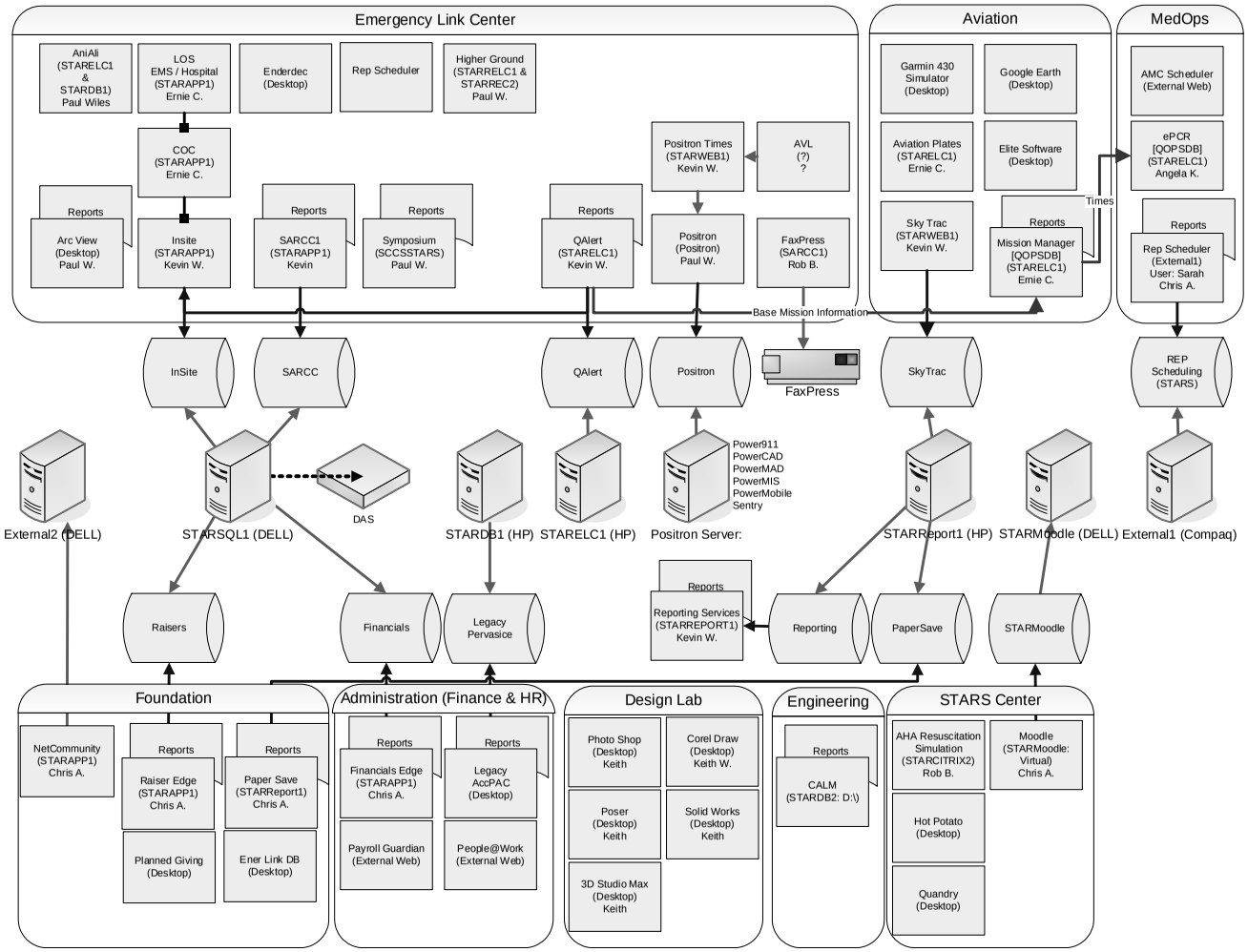
STARS ORGANIZATION CHART



Source: Company files.

Exhibit 5

STAR TECHNOLOGY ENVIRONMENT



Source: Company files.