

Case Study: CareGroup

Patrick Nguyen

University of Louisville

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Professor Reinhardt

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Executive Summary

CareGroup is a health-group dedicated to providing high-quality patient care. It was a factor of mergers and increased revenue to \$1.6 billion, making it one of the largest in eastern Massachusetts. A researcher in the IT team had been notified of a family emergency during the testing of software, ultimately creating a 3 day disruption of hospital services.

Introduction

Healthcare information technology has been an innovative process for health professionals. Implementing technology improves accountability, patient and population health outcomes, and delivery efficiencies to decrease healthcare costs (Maxwell et al., 2023). Tools and applications built into healthcare address the safety of patients by automating drug interactions, using special tools for viewing X-ray films, and even centralizing patient records for ease of access. However, IT is often a single-point failure away from disrupting business operations. CareGroup is one example that experienced a 3-day network outage due to an overloaded centralized switch, disrupting operations. This paper works to examine CareGroup's business issues, conducting industry and competitive analysis, and recommending solutions for CareGroup.

The Business Issue:

Background on the Disruption

CareGroup's IT failure resulted in a three-day network outage that disrupted hospital operations, forcing workers to return to paper-based workflows. November 13th, 2002, marked the collapse of the network outage, which resulted from a researcher on the CareGroup Network. This individual was experimenting with a knowledge management application for file sharing. The application was described as a Napster for healthcare and was designed to automatically locate and copy the information across the network (McFarlan & Austin, pg. 5). Soon after setting up the initial configuration, the researcher received news that his wife was in labor. He

hurriedly opted for a three-week paternity leave, and the new software was left in the original configuration without testing or tuning for the current environment. This allowed the application to explore the network to seek and copy data from other computers.

On November 13th, this software moved terabytes of data throughout the network, soon disrupting operations. The data was transferred quickly, monopolizing a centrally located network switch and rendering it unresponsive to queries from other network components. Surrounding network components concluded that the central switch had ceased to function with the network, so they created alternative paths that did not traverse through it. The complexity of the overall network had a hidden problem, resulting in the loss of service of a major switch. Smaller networks were individually added as the company evolved, causing a drift from the intended specifications. Network components attempted to calculate new paths for data but could not decide which redundant network components acted as primaries and backups. As a result, network components became confused, and alternative data paths could not operate correctly.

Redundancy is common in IT and often duplicates components, creating fail-safe measures. In CareGroup's instance, the network had a primary and backup component. However, both components operated with cross-purpose, ultimately duplicating functionality. One switch would relay a message, and the other would loop the same message back to the first switch. As a result, an infinite loop was created between switches which soon affected the entire network. This issue was not apparent to users, operators, or managers of CareGroup's IT. The information, at that time, was that all network communication suddenly stopped.

Operational Impacts to Healthcare:

According to the case study, Beth Israel Deaconess Medical Center was a key area affected by this outage. Many critical hospital systems, including clinical units, e-mail, admitting

office functions, operating rooms, clinical laboratories, and radiology, were affected. Hospitals are accustomed to using technology, which creates a huge inconvenience for doctors. For example, physicians prescribing drugs use computers to identify drug interactions (McFarlan & Austin, 2005). These programs identify interactions almost immediately with precise accuracy. They even display recent Food and Drug Administration Advisories, which are especially useful for doctors. Without it, there is an increased risk of medication errors, slower decision-making, legal and liability risks, and negative impacts on patient trust. Doctors are required to rely on memory or printed resources in the office, and it becomes significantly difficult to manage when you are caring for multiple patients.

Another operational impact involves digitizing X-rays and using computer tools to view them. This is similar to automating drug interactions. However, radiology residents have never actually touched primitive X-ray films. As a result, they had to adapt to determine diagnoses with older methods. Methods include using paper systems for documenting patients, times, and telephones to replace e-mail communication (McFarlan & Austin, 2005). According to Halamka, CIO of CareGroup, this establishment became a hospital in the 1970s.

Business Issues with CareGroup IT

Based on the case study, it is apparent that CareGroup's IT staff lacks structure, posing many business issues/risks for CareGroup. Upon receiving news on the issue, CareGroup urgently worked to diagnose and restore functionality to the network (McFarlan & Austin, 2005). However, their primary symptom did not convey information to identify the issue. On their end, nothing worked. IT staff frantically formed and suggested ideas concerning the issue but nothing helped. Other staff would claim to know the problem but, their efforts led to dead ends. That being said, it seems CareGroup's IT doesn't have proper procedures for incidents and lacks

logging documentation for the network. Even so, it seems that CareGroup's doctors lack emergency procedures and training.

CareGroup's learning outcomes involved getting the network in spec. During the disruption, it became known that CareGroup's network was out of specification due to numerous instances of network segments connected via bridges or switches. Cisco's subsequent mapping discovered that their network evolved to this state, causing algorithms for recalculating data paths to not function properly. It was soon revealed that these issues were casual changes made by users. Furthermore, it was apparent that redundancy is not enough, and alternative access measures need set in place. This limited CareGroups operations and important systems could have functioned if connected to dial-up modems.

Industry and Competitive Analysis

Background on CareGroup:

Offering a spectrum of health services, CareGroup is a highly respected team dedicated to providing the highest-quality care to patients (McFarlan & Austin, 2005). Its services to residents of eastern Massachusetts range from world-renowned health centers to fantastic community hospitals and various health centers. Hospital members include Beth Israel Deaconess Medical Center (Boston), Mount Auburn Hospital in Cambridge, New England Baptist Hospital, and several others. Over 13,000 employees exist in all facilities along with 2,000 medical staff to fulfill the mission of this business.

CareGroup formed as a three-way merger in 1996 with Beth Israel Hospital, the Deaconess Hospital, and Mount Auburn Hospital. Mount Auburn and other hospitals worked as separate entities while Deaconess and Beth Israel merged into a single hospital, This proved to be a lucrative endeavor for CareGroup. The merger produced \$1.6 billion in revenue, making it

one of the largest groups in eastern Massachusetts. However, it was apparent that nearby competition posed challenges to CareGroup, creating pressure on the organization (McFarlan & Austin, 2005).

Over the years, CareGroup underwent many leadership changes. The merger created a leadership under two CEOs who opted for CareGroup to deal with issues. Over time, CareGroup experienced financial pressure from Mount Auburn. For 15 years, the hospital was profitable but suddenly produced a \$10 million loss, requiring restructuring of operations. The same could be said for Beth Israel, too. Mid-2002 marked a changing point. A new CEO, Paul Levy, was appointed and the group began to recover. It appears that losses continued happening with this company, weakening its industry and competitiveness.

One important individual is John Halamka, CareGroup's CIO. His position started on November 1st, 1998, and he was working on a \$41 million project with the Y2K problem. IT staff, at the time, had 380 members and expenses well over \$50 million. However, Halamka was well respected and knowledgeable. He attended Stanford and graduated with a major in computers and economics. In 2000, Halamka took on CIO at Harvard Medical School in addition to his current role. Harvard Medical assumed Mount Auburn, Beth Israel, and Deaconess. Despite the outage, Halamka took the necessary procedures to fix the problem expeditiously. During his meeting with the board of directors, he stated that healthcare did not suffer, making it a strong organization. He then remarked on the collapse of the long 3-and-a-half days and the procedures staff took to recover along with reverting to older methods (McFarlan & Austin, 2005). That being said, Halamka was a great choice and is dedicated to fulfilling the mission of this organization and industry.

Mission: According to the case study, CareGroup is a team of healthcare professionals striving to provide the best quality care to patients. CareGroup is dedicated to providing personalized care and various services to eastern Massachusetts residents.

Stakeholder Groups

- 1. Patients:** Patients, families, and the community are all considered customers under the umbrella of CareGroup's healthcare services. They are considered one of the most important assets in the healthcare sector (Crowe, 2023). These stakeholders are directly impacted by the organization's ability to deliver healthcare services, and CareGroup must ensure that it provides high-quality care and maintains well-established trust with patients. Patients depend on hospital technology for accurate and safe medical treatments. Relating to the network outage, patients were affected greatly. It is paramount that CareGroup establishes procedures for patient safety during incidents and outages. This helps minimize errors in medical treatment and potentially saves lives. In the end, services to patients were minimally interrupted. However, CareGroup was at risk of legal and liability issues for this outage.
- 2. Medical Staff & Employees:** The medical staff includes doctors, nurses, IT staff and other providers of healthcare. These are valuable stakeholders in the healthcare system as patients rely on them for care, specifically doctors nurses, and other healthcare workers. IT staff works to provide systems for accessing patients' records, systems for scheduling, X-ray tools, drug interaction software, and email communication (McFarlan & Austin, 2005). All technology in healthcare provides benefits and ease to this stakeholder group and other groups

listed. As stated, the network outage showed weakness within hospital staff, opening improvement for the hospital group. This outage required staff to revert to manual processes, increasing the risk of errors and delaying patient treatment. CareGroup needs to learn from this experience and do better for future patients.

3. Hospital Administration: Christina Crowe describes this group as decision-makers. They are responsible for overseeing all aspects of healthcare and management operations. Importantly, they ensure that the hospital is fulfilling its mission and that patient care standards are being met (McFarlan & Austin, 2005). This helps maintain the hospital's reputation and financial health. However, the network outage did pose the risk of financial obstacles and reputational damage. Fortunately, patient operations suffered very little, but risk is always involved. In the event patients suffered as a result of the outage, CareGroup could be facing legal battles. IT was placed within normal employees, but there are few administrative positions involved.

4. Payers: While not necessarily affected by the outage, it is possible that communication between hospitals and payers was disrupted. According to Christine Crowe, payers are a stakeholder group including insurance companies, public health organizations and individuals assuming financial responsibility for healthcare services. Often, this group of stakeholders holds influence over hospital policies, service prices and reimbursement rates.

5. Porter's Five Forces:

1. Threat of New Entrants: The entry of threats is fairly low within Porter's Five Forces. According to Millan Otieno, a health systems manager, the

seriousness of this depends on the extent of barriers. However, as stated, it is quite small for threats to join since there are various barriers and efforts for this endeavor. Some include economies of scale, investment exigency, and product differentiation (Otieno, 2023). Relating this to CareGroup, there were some concerns about a new threat. The Massachusetts medical community discovered that Massachusetts General Hospital, and Brigham and Women's Hospital agreed to merge into a holding company. This was titled partners and put extreme pressure on CareGroup. They feared that it threatened their ability to negotiate with HMOs. CareGroup responded by bulking up negotiating power to push back the HMOs.

2. **Bargaining Power of Suppliers:** According to Strategic Analysis Hub, this is moderately high and involves several factors: Reliance on healthcare facilities and high switching costs. Employees, Government, patients, and generally anyone in the community are reliant on hospitals. Sickness and disease is an everyday risk, and it is something humans cannot control. That being said, bargaining power is high and is amplified. In regards to high switch costs, patients are often limited. It is easier to remain at one healthcare facility than it is to transfer to another. This is especially true in rural areas. However, residents of Massachusetts have more options than most.
3. **Bargaining Power of Buyers:** The bargaining power of buyers is definitely lower. This is a result of limited options and following professional standards. In regards to limited options, patients may be

limited. It is their choice to go with medical advice or go against it.

However, they are taking risks. In the event of an emergency, this may not be an option and doctors would ask the family to choose the best treatment options when a patient is unaware. Furthermore, patients are required to follow doctor's orders. This increases bargaining power for healthcare organizations.

- 4. Threat of Substitutes:** The threat of substitutes is high, especially for CareGroup. Insurers often place policies for areas that are in-scope or out-of-scope. In the event an emergency takes place, it could be financially detrimental for a patient if they are taken to a hospital outside of their scope for coverage. On the other hand, healthcare has evolved greatly over the years. Many low-cost services are making it possible for patients to receive care at low costs. This includes areas such as telemedicine, various pharmacies, and various urgent care centers. The merging of CareGroup made this organization a great substitute for many patients. Integration increased revenue by \$1.6 billion, making it a lucrative option.
- 5. Industry Rivalry:** Rivalry was a concern with CareGroup and could be rated as high. The merging of Partners Healthcare created a dominant organization that CareGroup was afraid to compete with. Partners have better negotiating powers with HMOs, requiring CareGroup to bulk up against the HMOs (McFarlan & Austin, 2005). However, they were already under great financial pressure from FleetBank and Raytheon, companies trying to drive down their medical costs. With the outage, it

makes competitors look significantly better. Few major ones exist, but the minimal effects of the outage are enough to decrease rivalry for those competing with CareGroup.

Recommended Solution

1. Training DR and Incident Plans

The use of Disaster Recovery and Incident Response Plans is critical to infrastructure, especially in a hospital setting. To begin, incident response are set of procedures used in the events of, generally, a security breach. However, CareGroup wasn't well-equipped to solve this issue. That being said, I am recommending the use of a company to develop an incident and disaster recovery plan for further training with staff. According to SourcePass, having these plans shortens downtime, reduces recovery costs, protects sensitive data, and improves stakeholder confidence. The network outage, specifically, decreased stakeholder confidence and decreased CareGroup's competitiveness in the market.

2. Strengthen IT Staff Training and Documentation

Referring back to the case study, it is apparent that the network outage was a huge lesson for the IT team. Lesson #2 states to not let any one individual in an IT group be the sole point of failure. Halamka realized that IT relied on individuals to maintain the network, which decreased integrity. Had another IT worker understood what the researcher was doing, this situation could have been solved exponentially faster. It allows workers to add thoughts on network configuration and could potentially bring up issues with the current configuration.

3. Use Support When Needed.

Maintaining up-to-date network infrastructure and using your support lines is critical to organizations. This protects the confidentiality, integrity, and availability of data, but it also

ensures that your network is running as efficiently as possible. Lesson #1 marked this, and I think it is a valuable lesson for Halamka. Thousands of dollars are spent on contracts. Halamka had signed a \$300,000 contract for advanced services that saved their network from further disruption.

Conclusion

Overall, CareGroup took this outage very well. IT took the proper measures to get the network up and running, and hospital doctors and nurses created minimal disruption for patient healthcare. Despite delays and increased risks, they did a wonderful job. As for solutions, Hamlaka should choose #2. Having a knowledgeable staff is critical, and should not be left for a few people to figure out. That being said, CareGroup's industry standpoint may suffer for a bit, but it is doubtful it will be for long.

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