

# The UMHS Samuel and Jean Frankel Cardiovascular Center

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The paper illustrates potential benefits the University of Michigan Health System would gain with the implementation of a specialty hospital for cardiovascular care in an existing healthcare complex in Michigan. Through an introduction of some of the many business strategies of healthcare delivery in the American healthcare system, an overview of delivery within a specialized hospital is provided. Benefits of these various strategies are examined in the specific context of the University of Michigan Health System and the Samuel and Frankel Jean Cardiovascular Center. The Integrated Care Model of the Michigan Health Complex creates numerous benefits, including economy of scale and avoidance of double examination. Through the new construction of the Cardiovascular Center, the patient flow through the system could be improved. With a concentration on a business strategy of specialized care, they can enhance excellence in patient values and product differentiation through the focus on cardiovascular diseases.

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## **1 Demand for new strategies at the hospital market in the United States**

Porter and Teisberg (2006, p. 20) define the U.S. healthcare system as a “dangerous path, with a toxic combination of high costs, uneven quality, frequent errors and unlimited access to care”. Evidently, the system faces a few challenges such as rising health care expenditures<sup>1</sup> (OECD, 2017b), an aging population<sup>2</sup> (OECD, 2017a) and increasing availability of technologies. The demographic change and the new technologies cause an increasing demand for healthcare services, and an increasing availability of tests and procedures (Denton, 2013, p. 183). As a result, providers need to improve the efficiency of the healthcare delivery systems, which would result in decreasing costs while improving access to care (Denton, 2013, p. 75). The challenges, economic trends and demographic changes in this system (Denton, 2013, p. 182) require health care provider to plan and coordinate health care resources (Denton, 2013, p. 75). The problems in healthcare delivery are primarily due to structural and managerial weaknesses (Porter and Teisberg, 2006, p. 149). Healthcare delivery is becoming increasingly challenging and complex for providers, who must incorporate stringent regulatory requirements, integrate new medical technologies and constantly improve services. This is further complicated by the lack of a proper strategy, direction or focus. Success or failure of the health system is in part attributed to the way patients receive care as well as how medicine is practiced. As a result, every organization has to develop a strategy in which kind of business it will operate, which services they want to offer and how they want to differentiate themselves from their competitors (Porter and Teisberg, 2006, pp. 149–151).

The paper will aim to answer the question of which structure of facility and which strategy of healthcare delivery an implementation of a specialty hospital in an integrated care system would provide additional benefits. This will be answered by highlighting a strategy of healthcare delivery on the business case and the delivery of high-end care at the Frankel Cardiovascular Center (CVC) in Michigan.

## **2 The concept of integrated care delivery**

### **2.1 Building a business strategy in health-care delivery**

The hospital market is one of the largest industries in the U.S. and operates in a unique institutional setting (Gaynor and Town, 2012, p. 524). Hospitals or health delivery providers need a clear strategy to compete and establish themselves in the hospital market (Porter and Teisberg, 2006, 151). One guiding point is to focus on increasing the value for the patients. The value<sup>3</sup>, in this case, can only be understood at the level of

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<sup>1</sup> e.g. 12,5 % of share of domestic product in 2000 to 16,9% in 2015

<sup>2</sup> e.g. 12,4% of population are 65 or older in 2000 to 14,9% in 2015

<sup>3</sup> Defined as „the health outcomes achieved per dollar of cost compared to peers” (Porter and Teisberg,

medical conditions,<sup>4</sup> including how well the medical condition is treated through all activities and specialists (Porter and Teisberg, 2006, p. 158). Therefore, the first step in building a strategy is to define the goal they want to achieve, for example “excellence in patient value”. The patient value should include management of the strategic and operational choices, resulting in informed decisions for delivery of services. When providers can achieve good outcomes for patients, they can compete with hospitals that offer similar services. The choice which medical conditions for which they want to offer treatment should be guided by the questions of whether they can gain excellence in value and if they have the frameworks to provide appropriate services (Porter and Teisberg, 2006, p. 159ff.). With excellence and, hence, an improved reputation, more patients will come to the hospital, resulting in greater efficiency and higher margins. (Porter and Teisberg, 2006, p. 156) As a result, specialized providers will also have the facility and the space to act more profitable. When providing specialized care like cardiac care, they can gain high standards on value, have the ability to compete on results, can have generous reimbursement rate and also receive the benefit of focus (Porter and Teisberg, 2006, p. 162).

Furthermore, the competing hospital providers have to consider geographic and product differentiations (Lindrooth, 2008, p. 1). The hospital must know in which geographic area they serve and compete with patient care. The concentration on the geographical side should be on the national or even regional markets, due to its growth potential as well as possibility to form partnerships (Porter and Teisberg, 2006, 158 - 159). An important decision point for patients is the distance to the hospital, adding weight to the importance of the geographical aspect of service provision (Lindrooth, 2008, p. 21).

Another aspect is product differentiation in the healthcare market. The hospitals should concentrate on either clinical or non-clinical patient preferences. (Gaynor and Vogt, 2000, pp. 3–4). Healthcare providers have the potential to distinguish themselves through the quality of the services offered on the clinical or non-clinical level. An example for non-clinical preferences is offering patients private rooms with features of a four-star hotel. The hospital can also gain advantages compared to their competitors by offering specialized treatments that patients cannot get at their local hospital. Patients are often willing to travel a longer way to receive the specialized treatments. It can be concluded that both product differentiation and geographical focus are thus two underlying factors when developing an effective strategy (Lindrooth, 2008, pp. 21–22).

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2006, p. 154)

<sup>4</sup> Includes “diseases, illnesses, injuries, and natural circumstance such as pregnancy” (Porter and Teisberg, 2006, p. 105)

## 2.2 The Approach of Integrated Care

A frequent challenge in the healthcare sector is to directly provide healthcare services more efficiently. As a result, new forms of institutional and contractual arrangements in the health care sector, like managed care, can arise. In this context, vertical integration, which takes various forms, can be a possibility for providers and insurers to be more efficient. (Douven et al., 2014, p. 345 f.). According to expert opinions, 20 percent of healthcare expenses can be saved with managed care programs. These programs affect patient orientation, efficiency, and quality of health care by using suitable organization forms and management principles. Providers utilize different combinations of organizational models and management instruments. One accepted type of managed care is the approach of integrated care (Amelung, 2014, Preface).

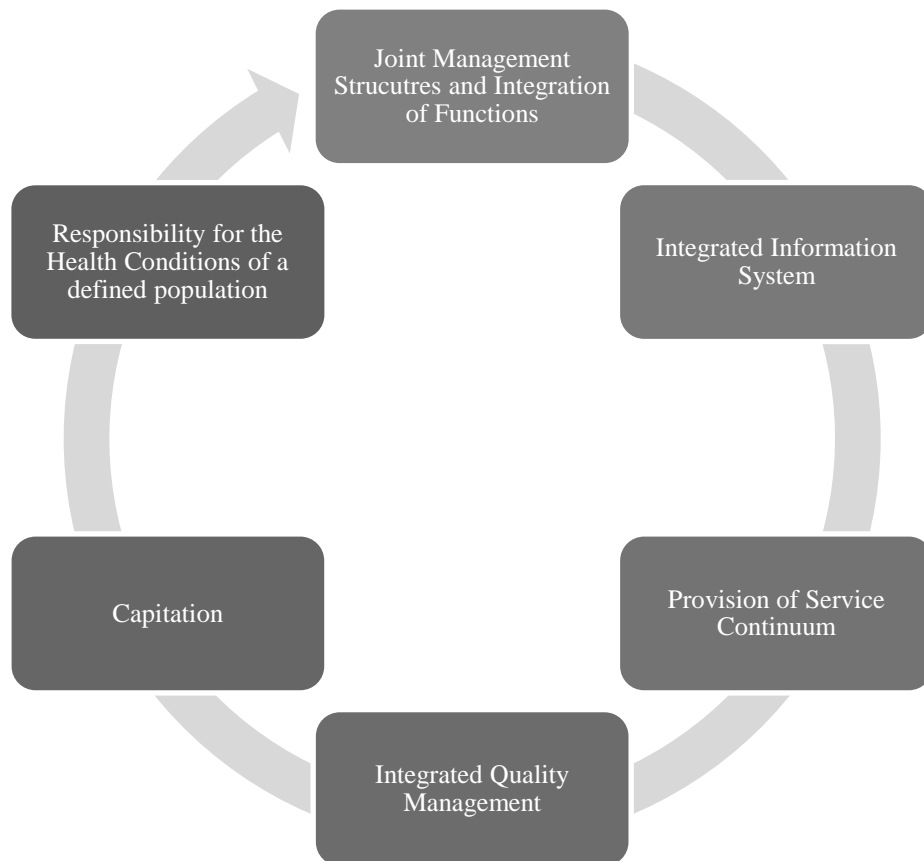
There are many different definitions of integration and integrated care (World Health Organization, 2016, p. 3). One definition is from Kodner and Speeuwenberg (2002, p. 2) and indicates the integration of various methods and models have “the goal to enhance the quality of care and quality of life, consumer satisfaction and system efficiency for patients with complex, long-term problems cutting across multiple services, providers, and settings. The result of such multipronged efforts to promote integration for the benefit of these special patient groups is called ‘integrated care’.” This definition points out the complex and inter-sectoral character of integrated care. (World Health Organization, 2016, p. 4) On principle, it is the combination of organizations and professionals with the goal to improve outcomes (Curry and Ham, 2010, p. 3).

There is, therefore, a distinction between different types of integration. In this context, the distinction is made between functional, organizational, service and clinical integration. Functional integration is designated to integrate non-clinical support and back-office functions, such as electronically organizing patient records. When different organizations formally join, by mergers or virtually with coordinated provider networks, it is called an organizational integration. The integration of different clinical services at the same organizational level as multidisciplinary professionals or teams is known as service integration. Clinical integration includes integrated care for patients in a single or coherent process within and across professions, for example, through the shared use of guidelines and protocols (Contandriopoulos and Denis, 2005 cited in Fulop et al., 2005, p. 4).

There is also a difference between horizontal and vertical integration. Horizontal integration describes the process of two or more organizations or service deliverer of care coming together at a similar level, for example, two or more acute hospitals. Vertical Integration, on the other hand, is the merger between two or more organizations or service delivering care at different levels, such as when an acute hospital and community health services come together (Curry and Ham, 2010, p. 4).

The goal of the integrated delivery system (IDS) is to have integrated care across all systems through the coordination of all health services by either providing the health services by itself or through purchase. The system has both the medical and financial responsibility for all services, and consequently, assumes an insurer function by transacting with large employers or by compensating with capitation (Amelung, 2014, p. 69).

Figure 1: Characteristic of Integrated Care



Source: Own presentation according to Amelung, 2014, p.70

The IDS has some important characteristics, shown in Figure 7.1, which lead to integrated care for the population. The first step is functional integration, which leads to a coordination of the management levels, and thus, of all non-medical services, like personnel department and financing. The next step is to implement an integrated information system, which is strategically relevant and a core function of an IDS. It allows access to all patient information and financial aspects concerning the whole system. (Amelung, 2014, p. 70) Providing a continuum of services across the system is also part of an IDS, which means that the care has to consist of three service components. These components include hospital services, clinical services as well as the possibility of an outpatient operation center or day clinic (Sanofi Aventis 2006 cited in Amelung, 2014, p.70). The IDS has the advantage of the concrete planning of necessary services

and hence the precise, internal management of service requirements (Amelung, 2014, p. 71). Planning the internal care processes leads to a reduction of overcapacity, shifts the supply stage to a more economically optimal point and tends to restructure important, expensive treatments to be more affordable (Witgert and Hess, 2012 cited in Amelung, 2014, p. 71). Further advantages of integrated care result from an increased economy of scale, because of the avoidance of double examination. Improved communication amongst health care professionals leads to optimized and more efficient health care services, and provides uniform standards like infrastructure (Amelung, 2014, p. 72).

### **2.3 Options for optimizing processes through an integrated system**

The complexity and specialty of healthcare delivery require patients to go to different types of physicians in various settings. Furthermore, improving and advancing innovations tend to result in a larger quantity of tests and procedures. This contributes to the challenge of provide more quality care at lower costs to the patients (Denton, 2013, p. 183). One solution to improve patient satisfaction and achieve better outcomes more efficiently is to speed up the patient flow through the health systems (Arthur, 2011, p. 4) for just in time treatment and maximum utilization of available tests (Hall, 2013, p. 3). It is important to know how disruptions or delays in the patient flow develop, and what problems arise because of them. The patient's process through the healthcare system starts when a patient becomes ill and goes to see a physician; this process ends when the patient becomes healthy or gets discharged from the hospital. However, there are lots of steps between the starting point and the discharge. It is possible that there are problems in the patient flow, which result in delays of treatments, medical errors and poor outcomes (Arthur, 2011, p. 19). There are a few possibilities that cause delays in the delivery of healthcare. A lack of physical capacity, missing important informations like lab tests, bad planning for use of equipment (Denton, 2013, pp. 183–184) or space, as well as inadequate use of technologies (Hall, 2013, p. 72), are all possible reasons. There are a lot of approaches and strategies to improve the patient flow through the healthcare system. On the one hand, there are simple opportunities for eliminating waste and time like lowering the given time in the stages of the delivery process, cutting stages and unnecessary treatments, combining stages or reducing the time between the different stages (Denton, 2013, p. 184). On the other hand, a possibility to enhance the patient flow and the capacity is through the design of the healthcare delivery system. For that to occur, there is a need for essential design strategies that will promote contemporary capacity and flow management (Hall, 2013, p. 71). A strategy to improve the patient flow is depicted by Lean Management, which focuses on slim processes (Töpfer, 2009, p. 3). Concentrating on the value of the products or services (Gorecki and Pautsch, 2014, p. 1), this strategy reduces bottlenecks without adding resources. During the average hospital stay, 95% of the patients need to wait between several stages (Arthur, 2011, p.

21). With this in mind, one opportunity to reduce the time between the stages is with the design of the cell. A cell is an arrangement of workstations, machines, and equipment to improve the patient and product flow through the system with reducing costly transport, minimize delays, saving floor space and decreasing inventory. An example for cells is exam rooms in the Emergency Department, which are provided with all necessary resources and equipment, and process patients with a selection of similar products. In order to minimize lab and waiting times, they sometimes are offer CT-Scanner or MRI-machines as well (Arthur, 2011, pp. 40–41).

### **3 The case of the Frankel Cardiovascular Center at the University of Michigan Health System**

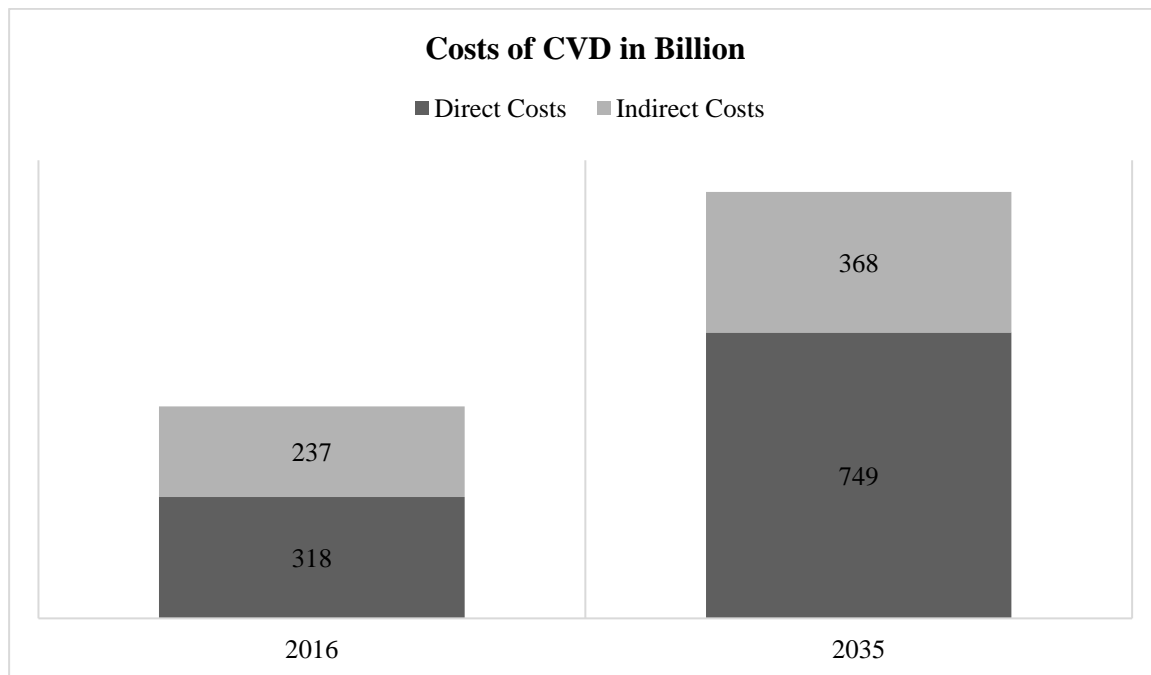
#### **3.1 Cardiovascular diseases**

Diseases of the heart and blood vessels, coronary or ischemic heart disease and hypertension etc. are included in the group of cardiovascular disease (CVD). Many of these problems and illnesses occur because of atherosclerosis (Tulchinsky and Varavikova, 2014, p. 257), which means that plaque builds up inside in the wall of the arteries. In the worst case, the plaque can result in a blood clot, which stops the blood flow and can lead to a heart attack or a stroke (The American Heart Association, 2014). All types of heart and cardiovascular diseases are treated in the CVC at Michigan.

In every country, heart disease is one of the leading causes of death. About 30 percent of global mortality is induced by heart diseases (Tulchinsky and Varavikova, 2014, p. 258). In the United States, heart disease is the number one cause of death for men and women (The American Heart Association, 2017b, p. 5). The number of heart-related deaths every year includes about 800,937 Americans. Statistically speaking, that means one in every three deaths is caused by heart disease (Mozaffarian et al., 2016, p. 185) The overall mortality rate of 2013 was 222,9 per 100 000 Americans (Mozaffarian et al., 2016, p. 41).

CVD is not only the most common disease in the U.S. population, but is also the most costly (The American Heart Association, 2017b, p. 5). Studies from the American Heart Association (AHA) show the continuing rise of the costs and economic pressure due to CVD (The American Heart Association, 2017a).

Figure 2: Costs of CVD



Source: Own presentation according to The American Heart Association, 2017, pp.5-6

The AHA released a study in February 2017 in order to forecast the future costs and prevalence of CVD. The study showed that CVD costs will continue to rise and will result in economic, as well as health-related problems for the United States finances and healthcare system. (The American Heart Association, 2017a). The costs are expected to climb from current 555 billion dollars with 102.7 million Americans affected, to 1.1 trillion dollars and 131.2 million Americans with CVD in 2035. Furthermore, the study demonstrates that the population from the age of 45 has a 50% risk of suffering from CVD. Past the age of 85, the chance of being affected by at least one sort of CVC increase to 90% (The American Heart Association, 2017b, pp. 5–6).

### 3.2 The Frankel Cardiovascular Center at the University of Michigan Health System

The University of Michigan Health System (UMHS) is a not-for-profit institution (The University of Michigan Health System, n.d.c), which means that they do not have shareholders who are entitled to their earned profits (Phelps, 2013, p. 214). The system's philosophy is to offer excellence in research, medical education and patient care (The University of Michigan Health System, 2015, p.1). Their vision is to form the future of healthcare with research and development, become a national leader in health care, and receive health care reform, biomedical innovation, and education. The system consists of three hospitals, the University of Michigan hospital, the C.S. Mott Children's Hospital and the Van Voigtlander Women's Hospital (The University of Michigan Health System, n.d.e). Additionally, the health system owns more than 40 health centers



and clinics throughout the state of Michigan along with the University of Michigan Medical and Nursing School (The University of Michigan Health System, 2015). A few specialized health centers and programs are included in this system like the Kellogg Eye Center and the Frankel Cardiovascular Center (The University of Michigan Health System, n.d.a). Besides offering medical services, the UMHS is also involved in research and community health. To further community health, the UMHS supports programs and services for a healthy community like “Ann Arbor on Wheels” and the “Bureau for seniors,” services that patients and families can benefit from (The University of Michigan Health System, n.d.d)

The Cardiovascular Center of Michigan is a specialty hospital that can offer high-quality care at their facility along with the traditional University hospital (Schneller and Smeltzer, 2006, p. 159). There is a continuous growth in single specialty hospitals (Al-Amin et al., 2010, p. 294), which focus on specific treatments and procedures for patients (The United States General Accounting Office, 2003, p. 1). One pending question is how these specialty hospitals influence the costs or the quality of care (Barro et al., 2006, p. 703). They may have advantages like economies of scale, improved quality, decreasing costs from the aggregated volume and focus on patients with the same medical services (United States General Accounting Office, 2003, p. 1) and be more efficient than general hospitals (Kumar, 2010, p. 94). In terms of all specialized hospitals, the cardiac care section produces the greatest aggregated revenues (United States General Accounting Office, 2003, p. 10).

The cardiology and heart surgery at Michigan Medicine is nationally ranked 22<sup>nd</sup> by the U.S. News and World Reports amongst all cardiovascular-related hospitals (The U.S. News and World Report, 2016). Construction of the CVC was completed on June 11, 2007, and includes a 350,000 square foot multidisciplinary facility. The facility provides space for outpatient visits and tests, an inpatient unit, connecting walkways to university hospitals, outpatient clinics and specialized care for children. These elements show that the CVC is a central location for coordinated cardiovascular care. The building includes beds for surgical post procedures, vascular general/moderate care and rooms for cardiac procedures, cardiac and vascular surgery operations and endovascular procedure labs (The Samuel and Jean Frankel Cardiovascular Center, n.d.a). For the procedures and treatments, they work with the most advanced digital technology, such the 64- slice CT scanners, compounding CT, MRI systems and a PET -scanner (The Samuel and Jean Frankel Cardiovascular Center, n.d.h). There is a health information system installed in the whole building, including computers in the private and consultation rooms, as well as in the workstations at the moderate and intensive care unit. These computers provide access to all patients’ information. This includes, for example, test and lab results, medications and information from the portable monitors, which measure the heart rate

and rhythm vital signs, oxygen level. For the patients and visitors, the CVC has private rooms (The Samuel and Jean Frankel Cardiovascular Center, n.d.i), an Atrium with tropical garden and flowers, an indoor and outdoor garden, quiet meditation rooms, a patient skill lab, a healthy heart café and a Mardigian Wellness Resource Center, where health-related questions can be answered (The Samuel and Jean Frankel Cardiovascular Center, n.d.c). Patients also have access to a Patient and Family-centered Programm (The Samuel and Jean Frankel Cardiovascular Center, n.d.e). The CVC provides a multidisciplinary medical team for heart and vascular care. There are specialist from different disciplines, such as cardiologists, cardiac and vascular surgeons, as well as stroke neurologists helping patients with cardiovascular diseases (The Samuel and Jean Frankel Cardiovascular Center, n.d.d).

## **4 Additional benefits of the Frankel Cardiovascular Center**

### **4.1 Benefits through the business strategy**

In this section, the CVC at Michigan will be analyzed in connection to the business strategies for health care provider mentioned in Section 2.1 and the Epidemiology of CVD in section 3.1 of this paper. The CVC belongs to the UMHS; it is a specialty hospital for CVD. Thus they have the possibilities to concentrate in a separate facility with more space for CVD to gain excellence in patient value and compete on results with the benefit of focus. They can thereby offer unique or rare treatments, which result in a better reputation and patients who will travel a longer way to receive that special treatment. The new building of the Cardiovascular Center offers a few non-clinical components, like the indoor and outdoor garden. The goal is to create a comfortable atmosphere for the patients and their families, resulting in increased patient satisfaction. Focusing on cardiovascular care has advantages, and since the prevalence of CVD is high, and they have the opportunity to increase the number of patients in their facility. Besides that, cardiovascular care treats conditions with generous reimbursements from the insurance companies. However studies from AHA show the costs of cardiovascular diseases will continue to rise. Therefore, the UMHS aims to work more cost-effectively and save money, even within the specialization.

### **4.2 Benefits through the integrated system**

The implementation of the CVC in one of the largest healthcare complexes in the world (The University of Michigan Health System, n.d.e) cause a couple forms of integrations and integrated care. Some contents of Section 2.2. will be revisited in this section, though will be focusing specifically on the CVC in Michigan. As previously mentioned in Figure 7.2, there are a few characteristics which lead to an integrated care system.

First, there is a functional integration of the CVC in the Michigan Medicine Health System, which integrates their nonmedical-services and management. An example of the functional integration are the electronic patient records, which are available throughout the whole system (The University of Michigan Health System, n.d.b). For that, the CVC implements computers at the examination rooms and the workstations in order to have a connection to all relevant patient's information. Thereby they accomplish an integrated information system. As a result, the CVC and the UMHS provide a continuum of services to their patients. There already is an outpatient clinic and diagnostic unit for cardiovascular care and the inpatient clinic at the CVC. They have the facilities to combine clinical and hospital services, along with an outpatient operation center in the Cardiovascular Center. With the connection to the C.S. Mott Children hospital and University Hospital, they can integrate a few more services (The Samuel and Jean Frankel Cardiovascular Center, n.d.g). There is a walkway to the C.S Mott Children's Hospital, where physicians have access to children suffering from heart diseases. Patients can also be transported across a sky bridge to the University Hospital (The Samuel and Jean Frankel Cardiovascular Center, n.d.h). At the CVC doctors and nurses from five different disciplines like cardiac surgery and vascular surgery work together (The Samuel and Jean Frankel Cardiovascular Center, n.d.g). Therefore, they have an improved communications, and as a result, they can offer optimized and more efficient health services and avoid double examinations, which lead to increased economy of scale.

### **4.3 Benefit through optimizing processes**

Through the built up of new facility, the UMHS gained a couple of additional benefits for enhancing the patient flow. This paper will certainly only give a few possible examples of the strategies previously mentioned in Section 2.3. At the CVC doctors and nurses from five different disciplines including cardiac surgery and vascular surgery work together so that the patients can get coordinated care from several specialists, often all in one day. (The Samuel and Jean Frankel Cardiovascular Center, n.d.g) For instance, the patients don't have to go to different types of physicians of cardiac care in various settings (Denton, 2013, p. 183). As a result, it is likely they can reduce the stages or the labs between the stages in the delivery process (Denton, 2013), and consequently, decrease the waiting times. The facility also provides a 14 room- diagnostic area at the Diagnostic and Outpatient- Unit with, for example, a treadmill stress test, echocardiogram, ultrasound exams and a station for blood tests (The Samuel and Jean Frankel Cardiovascular Center, n.d.g). Just as CT-Scanners in the Cardiac Procedure Unit (The Samuel and Jean Frankel Cardiovascular Center, n.d.f) and in the surgery and intensive care level (The Samuel and Jean Frankel Cardiovascular Center, n.d.h). The advantages resulting from this are that they have immediate access to important information and therefore reducing waiting times and delays for important data and hence decreasing the time

between the stages. The workstations at the moderate care unit and the intensive care unit arranged between each pair of the room for the patients and implied computers with computerized records with all patient information. (The Samuel and Jean Frankel Cardiovascular Center, n.d.i) Moreover, a cupboard with all necessary items stands next to the doors. This cell design has provided the benefit of reducing ways for the staff, saving floor and consequently improve the patient and product flow.

## **5 Conclusion**

In conclusion, there are a number of additional benefits the UMHS has gained through the construction of the Cardiovascular Center beside their University hospital and in their healthcare complex. At first, through the concentration on a business strategy of specialized care, they can gain benefits like excellence in patient values, product differentiation through the focus on cardiovascular diseases and by offering unique, special treatments. Additionally, they can achieve benefits through offering non-clinical components through new construction and offering a great atmosphere to the patient. Besides the benefit of a focus on cardiovascular diseases with the implementation of the center in a healthcare complex, there are a few benefits associated with establishing a form of an integrated delivery system. Benefits such as economies of scale and avoiding double examination can be a result of integration. Furthermore, some form of management instrument and strategies for optimizing processes could be achieved through the new design and infrastructure of the building. This leads to enhancing the patient flow through the Cardiovascular Center and thus through the University Michigan Health System. The assumed strategies mentioned in this paper are only a few of many business strategies in the complex American healthcare system. The goal was to provide an overview of some basic strategies of providing health care delivering in a health system with a specialized hospital. Besides the benefits, there are of course some negative components of specialty hospitals, such as cherry-picking patients (Porter and Teisberg, 2006, p. 162). However, mentioning all drawbacks would go beyond the scope of this research paper. The existing negative components of specialty hospitals in today's literature are often associated with for-profit specialty hospital. (Barro et al., 2006, p. 702) The specialty hospital in Michigan however, is a nonprofit institution belonging to University of Michigan Health System.

The University of Michigan Health Systems has a great opportunity to differentiate themselves from competitors in the cardiovascular field and gain some additional benefits. Furthermore, due to the research and development in their facility, they are able to further grow and provide the latest procedures and treatments to the patients, (The Samuel and Jean Frankel Cardiovascular Center, n.d.b). With that in mind, it is possible to imagine that in a few years the Cardiovascular Center could reach an even better spot than the 22<sup>nd</sup>, as ranked by the U.S. News and World Reports.

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