

An Analysis of the King Abdullah University of Science and Technology in Saudi Arabia

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Abstract

King Abdullah University of Science and Technology (KAUST) is an international, graduate research university dedicated to advancing science and technology through interdisciplinary research, education, and innovation. Students, faculty, scientists, and engineers conduct fundamental and goal-oriented research to address the world's pressing scientific and technological challenges related to water, food, energy, and the environment. This paper will provide an analysis of the structure of KAUST based on Brache's *How Organizations Work: Taking a Holistic Approach to Enterprise Health* (2002). To analyze the health of KAUST as an organization, it is helpful to understand how the university manages "an intricate and entwined set of variables" such as goals, customers, culture, policies, and more (Brache, pg.3, 2002). Following the analysis, recommendations are offered to further ensure success for KAUST as an international university.

Key words: structure, organizations, analysis, resources, leadership, culture.

1. Introduction

Founded in 2009, King Abdullah University of Science and Technology (KAUST) is a private graduate university in Thuwal, Saudi Arabia. As the first mixed-gender university in Saudi Arabia, KAUST has many labs, research facilities, and the fastest supercomputer in the Middle East. The main three focus areas of KAUST are Biological and Environmental Science and Engineering; Computer, Electrical, and Mathematical Science and Engineering, and Physical Science and Engineering. With students from over 60 nationalities, there are only about 840 students at KAUST due to the competitive programs and admissions as well as the fact that it was only founded within the last 6 years. The university has 132 staff and 401 postdoctoral researchers.

According to Brache (2002), it is important to analyze organizations from a holistic approach similar to providing a "360-degree picture of organizational dynamics" (p. v). The picture of an organization such as KAUST includes external variables such as the market, suppliers, competitors, and community shareholders of the university as well as more internal variables such as the leadership, goals, and culture of the university. With this holistic approach, an analysis of KAUST allows one to see which variables have important effects on the university's success and where improvements can be made.

2. External Performance Variables

I. Markets and Customers

The market for KAUST is a high-achieving scholar seeking graduate degrees and research experiences. Customers are scholars from countries throughout the world, but they must have specific scores on academic tests and other qualifications. For example, students admitted to KAUST have an average GPA of 3.7 to 4.0. No more than 50% of the student body can be from Saudi Arabia in order to maintain the "international experience" (Havergal, 2015). Due to this, only 35% of the customers of KAUST are from Saudi Arabia. Currently, KAUST has 901 students, with 572 male and 329 female students from 67 countries. Of these 901, only 268 students are from Saudi Arabia. As noted by Brache (2002), a company must be able to define its market and remain competitive to be successful. As a relatively new university, KAUST is likely still forming these definitions of the market and threats to and opportunities for this market (Brache, 2002).

The university offers its students state-of-the-art research facilities and highly productive futures. There have been 32 spinoff companies created from KAUST and over 4,000 publications made by the faculty and students of KAUST.

II. Suppliers & Resource Providers

According to Brache (2002), a company's suppliers and resource providers fuel the company with money, people, technology, and all the supplies necessary to keep the company in operation. The Saudi government provides the \$20 billion endowment for KAUST. KAUST has over 36 industry partnerships including IBM,

Boeing, Halliburton, Rolls Royce, and many Saudi companies. These companies work with KAUST to aid each other in research and development. Other suppliers and resource providers for KAUST include human resources of the faculty, staff, and administrators of the university. Of course, resources such as office supplies, paper, computers, and other technologies are also paramount in keeping KAUST successful with science and technology education.

III. Competitors

Other international universities with similar goals are what Brache (2002) would call “direct competitors” for KAUST (p. 25). For example, Ivy League universities in the United States such as Harvard, Princeton, and Yale could be direct competition. Specifically, universities focused on science and technology is competition for KAUST such as California Institute of Technology, Massachusetts Institute of Technology, and Carnegie Mellon. A benefit of KAUST is its geographical location in the Middle East where many countries surround it with scholars seeking higher education.

IV. Community Shareholders

According to Brache (2002), the shareholders are the owners of the company who invest in it and may or may not care about the day-to-day running of the company (p. 26). The Saudi Arabian government is the only shareholder of KAUST. The government is very interested in the running of the university and takes great pride in its world-renowned university. The government tasked the oil company, Saudi Aramco to develop KAUST in 2006. As noted by King Abdullah Bin Abdulaziz Al Saud, “Out intention is to create an enduring model for advanced education and scientific research.” (KAUST, 2016) In this effort, KAUST reaches out to the community in many ways. There are enterprises on the campus of KAUST such as mail, banking, food, beauty, and other shopping services (KAUST, 2016). The goals of the shareholder are to create an international university that is the first in its class when it comes to science and technology education so that global changes can be made to benefit humans of the world.

V. Government & Economy

KAUST was founded and is funded by the government of Saudi Arabia, so it follows specific guidelines. KAUST has a \$20 billion endowment, and the first \$10 billion endowment was provided by the king of Saudi Arabia in 2008-2009. However, the Kingdom’s religious police do not operate on the campus. Unlike other universities in Saudi Arabia, KAUST serves both men and women and religious classes are waived. Also, KAUST has established self-directed organizations and even has Internet access that falls outside the Ministry of Education’s jurisdiction and censors. Its graduate student council was established in 2009, for voicing students’ interests. Under the council there are four subcommittees: Academic and Research Committee, Graduate Life Committee, International Business Relations Committee and University Relations Committee (KAUST, 2016). Of course, the leadership of KAUST under a Board of Trustees has both governmental leaders and international leaders in science and industry.

Brache (2002) writes that the economy of a company is the profitability and productivity of that company. KAUST students all receive a fellowship to attend the university, which includes the cost of their tuition, a living allowance, health care coverage, housing, and relocation support. So, although KAUST does not make a monetary profit from students, the university profits in many other ways such as through its partnerships with science and technology industries.

3. Internal Performance Variables

I. Leadership

Brache (2002) describes leadership as being both about “*how* things are done and *what* things are done” to include such ideas as vision, development, risk taking, and more (p. 34). The president of KAUST is Jean –Lou Chameau. There is a Board of Trustees that is made up of international leaders in science, finance, industry, and other areas. The Board meets at least three times every year to monitor the progress of KAUST and is also responsible for appointing the president. There are 12 Board members from Saudi Arabia and 12 international Board members. There are also two Emeritus Trustees. Other leaders of the university include the Executive Vice President for Administration and Finance, the Vice President of Academic Affairs, the Vice President for Research, and the International Advisory Council (IAC). The IAC supports and advises the president and is made up of 14 professors and leaders in their field. KAUST also has a graduate student council to voice student

concerns. All of these leaders work together toward the goals of KAUST in working to benefit global society through science and technology research and education.

II. Strategy

The primary strategy of KAUST is to take advantage of the expertise in the field of science and technology, to promote innovation, and to stimulate sustainable economic development of enterprises, regions, and global countries' practices. KAUST seeks to meet the technology and educational needs and resources of the Kingdom's industry and society as well as those of students globally. As a graduate-level research university, KAUST is dedicated to inspiring a new age of scientific achievement in the Kingdom that will benefit the region and the world. Brache (2002) notes how strategy is what provides the "context for operational decisions" (p. 51) and can take a long time to develop. Because KAUST was first discussed in 2006 but did not open until 2009, one can see how Saudi Aramco and the Saudi government had to take time to work together and form the best strategies to meet the goals for KAUST.

III. Business Processes

As noted by Brache, "business processes...convert inputs to outputs" (p. 68). In converting all of the inputs that go into a successful university experience into satisfied and effective graduate students as well as science and technology impacts on global welfare, KAUST has many processes in place. From hiring effective faculty to forming industry partnerships to keeping the university clean and functional, there are many various processes that keep KAUST running.

As noted before, because KAUST students do not pay for their own tuition, the outputs of KAUST are research and educated scholars as opposed to cash or specific goods. Because KAUST has so many resources at its disposable, both in the form of money from the government and knowledge and resources from industry, the business processes can run smoothly.

IV. Goals and Measurement

As written by Brache (2002), goals are the objectives or expectations of a business that indicate strategic success. In other words, the vision of the organization leads to specific goals and ways to measure those goals. The vision for the KAUST Business Development is to aim to be the region's premier platform for Business Development Engagement by 2020 and to output important global science and technology innovations. Strategic goals also include the mission to advance and promote all new and existing business opportunities (major commercial projects) within the University's facilities, community, and properties to generate a long term, continuous revenue stream. As found by Brache (2002), operational goals are those that communicate whether or not a business is successful and healthy. For KAUST, this could be measured by the fact that there have been 32 spinoff companies and over 4,000 publications made by the faculty and students of KAUST. Other ways to measure the health of KAUST could include the number of students and industry partnerships. To see them increase each year is a sign of business vitality.

V. Culture

Because KAUST is an international university located in Saudi Arabia, it has a certain culture, values, and goals that make it unique. Brache (2002) writes that culture is basically the "way you do things" and that it can greatly influence goals, outcomes, and satisfaction in the company (p. 102). The overall culture of KAUST is focused on science and technology development through collaboration and industry partnerships. The culture is also focused on solving global challenges through this collaboration with specific importance given to the study of food, water, energy, and the environment.

The university focuses on curiosity and goal-oriented research with diverse student body to contribute to the welfare of a global society. With students who are "people of the world", KAUST values diversity, achievement, integrity, and openness. The welfare of the public is at the forefront of the culture of KAUST with centers focused on clean combustion, solar and alternative energies, and water desalination and reuse.

As the first mixed-gender university in Saudi Arabia, KAUST is somewhat distinct from the surrounding culture. As a deeply conservative society, Saudi Arabia has maintained schools and universities with strict separation of genders. However, KAUST as a more international culture with students from 67 different countries, so the

religious police of Saudi Arabia do not operate on the KAUST campus. Notably, women do not need to wear veils and are permitted to drive on campus.

Overall, KAUST can be described as the “nexus of research and industry” with a focus on collaboration and research (Weche, 2015). KAUST focuses on training future leaders of science and technology with the goal of maintaining an industry perspective.

VI. Human Capabilities

With such a strong focus on the development of science and technology in graduate students, faculty of KAUST must be leaders in their fields of study. Faculty have a Ph.D. and continue their research studies to impact global change. Faculty and staff must have very strong interpersonal skills and cross cultural sensitivity and awareness. They must value the culture of KAUST in which global welfare and science and technology are fundamental to solving goal-oriented problems.

Once faculty joins KAUST, they have access to excellent salaries, state-of-the-art equipment, and a healthy work-life balance. Some employees experience difficulty living in Saudi Arabia due to environmental and cultural changes from their home countries. Also, some complain about a lack of competent management to support employees and about the leadership positions mostly retained for nonlocal workers.

VII. Information and Knowledge Management

KAUST handles media relations through a Marketing Communications team to provide background and research news and facilitate interviews with KAUST faculty and students. KAUST uses Twitter, Facebook, Instagram, Pinterest, Google+, and the sharing of videos and photos to manage and share information. In addition the KAUST website provides a great deal of information about the university including information about the programs of study, history, student affairs, campus living, administration, and recent news stories featuring KAUST. The website also provides information about industry collaboration, specific research developments, faculty profiles, and more. In addition, for inquiries about KAUST, the website has specific locations for questions regarding student admission, employment opportunities, and other correspondence. This can be shared through email or a postal address.

VIII. Organization Structure and Roles

The structure of an organization includes the hierarchy or the chain of command, which can be organized in many different ways such as by geography, project, function, or business process (Brache, 2002). At KAUST, the structure is arranged by function with the Board of Trustees at the top of the chain. The Board appoints the next in line, the President of the university. The Board also appoints the senior administrator and faculty with the recommendation of the President. Next is the Executive Vice President for Administration and Finance, the Vice President of Academic Affairs, and the Vice President for Research. Next, the President's International Advisory Council is made of leading professors and industry members.

4. Recommendations

Because KAUST is a newer university, it is changing every year and working through issues. There are many areas in which KAUST is excelling. For example, the university has made many important industry partnerships and is free for students to attend. As of now, it seems like three specific issues that should be addressed include increasing enrollment, recruiting more Saudi Arabian students, and finding better management solutions through a needs assessment.

I. Increasing Enrollment

With KAUST being a multi-billion dollar organization that has noble and extraordinary goals for global citizens, student enrollment is critical to the university's success. When KAUST first opened in 2009, the university served 400 students. By 2013, the university had 600-700 students. Now, KAUST has 901 students from 67 countries. Although it is a sign of success that enrollment has continued to increase, the student population is still relatively small for an international university. To fulfill its goals and truly continue to be internationally acclaimed, KAUST needs to continue increasing enrollment. For example, a report in 2011 found that only 4% of the world's total research papers come from the Middle East. While KAUST has certainly added to this percentage in the last several years, increasing enrollment and opportunities for useful research is important to the university's outlook.

A challenge to this may be the fact that the university offers fellowships and living allowances to all students. If enrollment becomes too large, perhaps funding would suffer. However, because the endowment is so large for KAUST and there are so many industrial partnerships, it seems that this would be an issue that is relatively easy to overcome. For instance, industries could offer scholarships to students for research that supports their own goals. In addition, students' home countries may be willing to offer scholarship support in exchange for promises of work or other benefits.

II. Recruiting Saudi Arabian Students

As of now, about 35% of KAUST students are locals from Saudi Arabia. While KAUST has taken great strides to be known as an international university, it does not do well to alienate those scholars from the university's home population. Even the policy of never having more than 50% of its students from Saudi Arabia has been known to offend. For example, the King's own niece called the KAUST a "disaster" in 2014 due to its lack of attention to local men and women (Matthews, 2014). She further complained that those students who are accepted into KAUST are from a very small group of elite locals. Even employees of KAUST have complained, "leading positions are kept for non locals" (Glassdoor, 2016). In order to maintain success and a healthy relationship with locals, KAUST should work toward recruiting locals closer to the 50% cut off policy. As noted by Brache (2002), issues within an organization can be seen as threats, opportunities, or both. Having so few local students, KAUST could be threatened by a lack of local support. Also, by increasing the number of local students, KAUST would be creating opportunities for better community relations and for contributing to an educated populace in Saudi Arabia.

Barriers to this recommendation include competition from a high number of qualified applicants from around the world and the threat of favoritism over merit. However, by maintaining the policy of no more than 50% local students and by maintaining the high enrollment standards, KAUST should not have issues in recruiting more locals. The fact that KAUST already offers scholarships to gifted and talented high school and undergraduate college students in Saudi Arabia is a sign that the university does care about its local population.

III. Management Solutions

Another issue for KAUST is in its successful management of so many intelligent scholars and staff. There have been some complaints that KAUST "Need[s] more vision in general and better plans for implementing efficient and effective administrative tactics." (Glassdoor, 2016). Others claim that the students should be more involved in decision making because they are such an important and knowledgeable asset to the university. Because the university has so many industries, faculty, departments, and other facets, clear and fair management is key to its success. I would recommend that KAUST hire an external needs assessment analyst to take a closer look at how its management functions. For example, using the behavior-engineering model to organize and report data about management needs could help KAUST keep up-to-date on necessary management changes and techniques (Phillips, 1995). Without a satisfied staff and management that functions well, KAUST will not succeed.

Obstacles to a needs assessment could be a refusal by current management to be assessed or a lack of funds to pay for an analyst. It seems that by having leaders from the administration, faculty, and students all come together to study the benefits of a needs assessment, KAUST would feel it was beneficial and necessary. This would make the university likely find the needed funds and overturn any opposing manager complaints.

5. Conclusion

In conclusion, KAUST appears to be a very successful, yet new research university. With goals to provide important research and development for global industries to benefit all of the world's citizens, KAUST is providing important benefits to its students on an international level. The university is progressive in its move to include women and maintains an international focus free of conservative regulations in Saudi Arabia.

However, there are certain areas where KAUST could make improvements in order to contribute further to the university's goals. In order to maintain continued success past the university's infancy, it will need to increase enrollment, recruit local students, and ensure management needs and solutions are continuously assessed and provided. By following some of Brache's (2002) ideas with a more holistic approach in examining and supporting different variables within the university, KAUST is poised to gain further success as an international university.

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