6-6-2024

Creating a capital-efficient organization: Accele BioPharma

Jesse Lee Brown
Coastal Carolina University

Tyechia Paul
Fayetteville State University, tpaul5@uncfsu.edu

Creating a capital-efficient organization: Accele BioPharma

Jesse Lee Brown, III and Tyechia Veronica Paul

Clayton Duncan and Dick Gammans were both in the Accele BioPharma office in Oklahoma City preparing for a Board of Directors meeting scheduled for the end of the month. Clayton Duncan was the chief executive officer of Accele BioPharma, Inc., a biopharmaceutical accelerator which he founded four years earlier and Dick Gammans, PhD, was his Chief Operating Officer. The objective of the accelerator was to fund and manage startup companies until they reached proof of concept and then sell or license the technology to a pharmaceutical company which could take the drug candidate through the remaining food and drug administration (FDA) approval process. The first three years of the accelerator's existence had focused on four biotech startups to get them to this stage of development. The most recent six months had been more positive in that three of the startups had received additional funding through grants and venture capitalists which indicated that the technology looked attractive. Both men were in the conference room discussing the format for the presentation to the Board:

Clayton: Since we only meet with the Board twice a year, we need to start by updating them on the progress we have made. Three of our startups have made significant progress toward proof of concept. JORTAN is the only exception, and it is time to inform the Board that we have decided to stop work in this area.

Dick: We also should update them on the grants we have received especially the sizeable NIH grant that Synereca received. I am sure they will also be glad to hear about the interest that the Swedish pharmaceutical company has shown in Synereca. Finding a way to prevent antibiotic resistant bacteria is a major breakthrough, and they seemed to agree with our market analysis for this therapy. I think they will move into the due diligence stage very soon.

Clayton: I am sure our investors would be very excited if this deal goes through. We also have to be prepared to inform the Board that we plan to raise funds for Accele Venture Partners Two. We have demonstrated that our team can help these startups move into clinical trials, and I know our investors want to see us bring new drugs to market that can address critical needs.

Dick: We always planned on starting a second venture fund. We know there are other opportunities in the labs that could be the next major breakthrough in drug research with the right management group behind them. Since we have decided to start a second venture fund, we need to consider what additional resources we will need and how to structure our management team. We have added people to the team as the need arose but haven't really given a lot of thought to the structure of the management team.

Clayton: From an organizational standpoint, we should think about how to become more efficient and better leverage the management team resources. We want to maintain an entrepreneurial culture, but some degree of standardization would help to clarify and make our processes more consistent.

Jesse Lee Brown, III is based at the College of Graduate and Continuing Studies, Coastal Carolina University, Conway, South Carolina, USA. Tyechia Veronica Paul is based at the Department of Management, Marketing, Entrepreneurship and Fire and Emergency Services Administration, Fayetteville State University, Fayetteville, North Carolina, USA.

DOI 10.1108/TCJ-01-2024-0002
 ISSN 1544-9106

Dick: I definitely think our future organizational plans should be part of the presentation to the Board.

Dick agreed to work with Jason, the vice president (VP) of Business Development and Operations to develop a draft of the presentation for the Board. They agreed to meet the following week to review it. Dick knew they had to present a strong organizational plan to the Board to maintain their support going forward.

Industry background

Pharmaceutical drug development process

The new product development process in the pharmaceutical field consisted of two distinct stages, drug discovery and drug development, as shown in Exhibit 1. In the discovery phase, new drug candidates were synthesized and screened *in vitro*, which implies that the drugs were tested in a petri dish at the cellular level to see if the drug interacted with the disease. If the drug showed efficacy, the drug then entered pre-clinical trial in animals (*in vivo*). As shown in Exhibit 1, only a small percent of the drug candidates moved into pre-clinical trials. Animal testing was more time-consuming and expensive.

History of the pharmaceutical industry

Post Second World War, the pharmaceutical industry was in a very innovative and research-oriented period and produced many new product introductions, such as penicillin and new vaccines for childhood diseases. Most pharmaceutical companies were vertically integrated doing all their research, development, manufacturing and marketing within the firm. The upstream research competencies were considered proprietary and core competencies which provided a competitive advantage. Up until the 1960s, the typical approach was to chemically synthesize and test a large number of compounds in a trial and error manner to see if there was any biological response. In the late 1970s, a "rational" drug design approach emerged which allowed scientists to reduce the number of compounds tested. These transformations had come in part because of increases in medical knowledge about disease processes. This knowledge allowed scientists to target particular biological pathways and cell receptor sites. There had also been advances in scientific techniques to facilitate the design of new drug candidates for these diseases (Grabowski, 2011).

One of the key events that impacted the industry was the passage of the 1984 Hatch–Waxman Act. This act provided incentives to the generic drug industry to file an Abbreviated New Drug Application making it easier to get FDA approval for a generic drug. This law resulted in shorter product life cycles for branded drugs as market share shifted to generic equivalent drugs sooner (Grabowski and Kyle, 2008). While these changes had a positive effect on sales revenue for generic drug firms, they had a negative effect on branded drug companies as shorter product life cycles reduced the return on investment (ROI) for new drugs (Schramm and Hu, 2013).

Because of concern about ROI, pharmaceutical companies started to look for ways of reducing the costs involved in the new drug development process. Companies began outsourcing much of the clinical trials to contract research organizations (CROs) who specialized in running human clinical trials that met FDA approval process. Companies also started to partner with smaller startup companies. Large pharmaceutical firms increasingly looked to alliances with discovery-stage startups to gain access to new technologies and strengthen their R&D pipelines. This was a major change from the vertically integrated model where major pharmaceutical companies developed new products largely through their own R&D laboratories. These partnerships ranged from true joint development agreements, to transfers of development-stage products through licensing deals, to marketing options in exchange for development-stage funding and future payments.

Partnership agreements in turn often led to subsequent acquisitions by the major pharmaceutical firms (Grabowski, 2011). At the earlier stages of R&D, small research-oriented firms were seen as having a number of advantages relative to their larger rivals. These include their proximity to the cutting-edge technologies emerging from universities and publicly supported basic research, willingness to take risks on disruptive technologies and less bureaucratic organizational structure (Scherer, 1999). By contrast, larger pharmaceutical and biotechnology firms had advantages in the more advanced stages of development, where large-scale clinical trials required significant resources and expertise in meeting regulatory requirements (Scherer, 1999).

The virtual model for drug discovery and development was a further step away from vertical integration. The hallmark of the virtual model in life sciences was that both research and development were outsourced using "fee-for-service" arrangements, where firms were compensated based on the services performed. Use of these fee-for-service arrangements resulted in a situation where no labwork or "wet science" was conducted by company employees. The use of CROs for human clinical trials had been a standard mode since the 1980s. Pre-clinical research and development had become a rapidly expanding business, and for some CROs, it became their primary focus (Nicol *et al.*, 2013). The virtual model was adopted more often by the younger and smaller biotech startups, but many of the traditional pharmaceuticals also moved in this direction. One study in Australia found that 52% of the biotechnology companies had adopted this model (Nicol *et al.*, 2013), and another study in the UK found that 40% of the companies had moved to a virtual model (Kamuriwo, 2009). The virtual model was the foundation for newer business models in pharmaceutical R&D and set the stage for accelerators, described in the next section.

Incubators, venture capital funds and accelerators

Business incubators had been around for many years for the purpose of providing entrepreneurs with support. Incubators were often associated with a university and provided physical space, office support and classes on running a business. Expert advice was provided especially in developing business plans and marketing strategies. Venture capital funds had been a very useful way for startup biotech firms to gain funding. The capital funds came from a variety of sources, from individual investors to large corporations. The funds were managed by a small management team that analyzed and selected investment opportunities. The venture capital fund took a certain percent equity ownership in the company. The management team at times provided expert advice, but did not typically get directly involved in the daily operation of the company.

Accelerators had come into existence primarily in the biotechnology or other high-tech industries where empty office space had not been sufficient to run the business. Biotech startups typically needed lab space and advance analytical instrumentation. The goal of the accelerator was to speed the time to market and lower the barriers to entry for entrepreneurs, startups and early-stage companies working on scientifically and commercially promising next-generation drug candidates. They provided funding and took a percent ownership equity. They offered lab space and classes to help the startup and network with other experts. The startups typically paid a management fee to the accelerator for this support.

Biopharmaceutical accelerator industry outlook

According to McKinsey & Company (Otto *et al.*, 2014), the biopharmaceutical industry is large and rapidly growing with global revenue of $63 billion. Biopharma is the fastest-growing segment of the pharmaceutical market, with an annual growth rate of 8%, double the rate of conventional pharma. This growth rate is expected to steadily increase in the foreseeable future. The number of applications for biotech patents has increased by 25% annually since 1995 (Otto *et al.*, 2014).

The market outlook is optimistic in terms of growth, revenue and R&D productivity as measured by patent applications (Otto *et al.*, 2014). However, that optimism is guarded because of the market recovering from the rapid inflation and high interest rates since the COVID-19 pandemic. During the pandemic, to take advantage of low interest rates, many biotech companies took on debt. Shortly after, when interest rates began to rise, 20 biotech firms declared bankruptcy in 2022. The number of bankruptcies increased to 41 in 2023 and is expected to continue increasing. The post-pandemic financial climate led the biopharmaceutical market to become sluggish. Then, in an effort to obtain and preserve working capital, companies had to engage in distressed dealmaking, mergers and acquisitions to generate and preserve working capital (McIntosh *et al.*, 2024).

Throughout the industry, instead of firms centering on the frontier of scientific exploration, the focus expanded to more traditional commercial models that are market-driven and reactive (Numerof, 2023). The biopharma market and its accelerators reacted to consumer needs, regulatory changes and the increase in mergers and acquisitions. Instead of decisions being made primarily by physicians, they were increasingly made by cross-functional committees. There was an increase of mergers and acquisitions among health-care systems, which has shifted the decision-making power dynamics in the procurement of biopharmaceutical and biotech products. Consumers, with less buying power because of inflation and an increased focus on societal equity, have pushed back against high drug prices (Numerof, 2023), leading to the passage of the Inflation Reduction Act and associated laws that allow the USA to negotiate and therefore cap prices on costly, nonsubstitutable drugs and monopolize the market. Additionally, the Federal Trade Commission (FTC) filed lawsuits to block two mergers, Amgen's acquisition of Horizon Therapeutics and Pfizer's acquisition of Seagen, because of the possible harm of using precedence to guide dealmaking (McIntosh *et al.*, 2024).

Going forward, continued growth is expected in the biopharmaceutical industry despite an increasing number of bankruptcies and mergers.

The founding of Accele BioPharma

Clayton Duncan grew up in Bahama, NC. He had a masters's degree in English and worked as a freelance writer for a while before enrolling in the Keenan Business School at University of North Carolina. After graduating, he went into investment banking and gained experience financing various types of projects. During this time, he developed an interest in biopharmaceutical startups and later left investment banking to start up Sphinx, one of the first biotech companies in Raleigh, NC. Since then, he led Seven Life Sciences companies, orchestrated three exits, two successful IPOs and four R&D collaborations with major pharmaceutical companies.

Dick had first crossed paths with Clayton when Clayton was asked to set up a cardiovascular project at Indevus. Dick became part of the team on that project back in the 1980's. Dick's own career had spanned both senior management positions in large multinational pharmaceutical companies as well as several biotech startups.

After selling his most recent successful startup in 2009, Clayton was looking for his next challenge. He had read about the concept of an accelerator and had started discussions with various research institutes. Then, a friend of his and a very influential person asked Clayton to set up the accelerator in Oklahoma City. This friend was President of the Oklahoma Medical Research Foundation (OMRF), a private research institute founded in 1948.

Clayton realized that securing the funding was a major hurdle, so when OMRF decided to help support the accelerator with funding, Clayton was pretty much sold on Oklahoma City. Additional funding came from a year's effort of contacting family foundations, corporate foundations and other groups. Two other major investors were the Presbyterian Health Foundation and i2E (Innovation to Enterprise), a nonprofit which managed state economic

development and federal matching funds. The $14m raised formed the first venture fund, called Accele Venture Partners One. Once the funding was looking positive Clayton called Dick Gammans and asked if he was interested in being Chief Operating Officer. Accele BioPharma was officially founded in August 2011, with a mission to:

> "Create a capital-efficient mechanism to identify, finance and manage groundbreaking early stage life science technologies that have the potential to dramatically improve human healthcare, have strong commercial promise and have the potential for generating early proof of concept data." (www.accelebio.com)

Accele BioPharma startup companies

Once the funding was in place, Clayton and Dick began to search out emerging technologies. OMRF was a large research foundation and a fertile ground of opportunity. He and Dick walked around the halls of OMRF and talked with the scientists to learn more about their work. They set up meetings with the principal scientists that directed various projects. They did much the same at the University of Oklahoma medical school and the Health Science Center. They also worked with the technology transfer groups whose function was to help get the university research ideas into commercialization by finding interested entrepreneurs. Accele BioPharma was not limited to finding technology just in Oklahoma, and one of the companies did result from discussion with the UNC technology transfer group.

Within a few years, Accele BioPharma had four companies under its management: JORTAN, Otologic, Synereca and Pamlico. These companies were all formed to bring various potential new drug candidates to market, but they were in very different stages of the drug development process. In all of the four companies, the basic research on the disease or the human physiology was carried out as the work of a senior research fellow over his career. These scientists typically wanted to remain academic researchers and were not interested in running a pharmaceutical company. Even moving one or two drug candidates out of the lab into animal testing and human clinical trials was time-consuming and required extensive knowledge of the FDA regulations. This knowledge and function was at the heart of the accelerator. Most senior scientists stayed involved and maintained an ownership stake but had little interest in the daily management of the drug approval process. The lead scientist for Jortan Pharmaceuticals Inc. (JORTAN) was a good example of a researcher with limited interest in managing the drug approval process. He was 82 years old and had been working most of his career on regulatory enzymes involved in diseases such as diabetes. He had at one time managed a biotech startup, but at this point in his career, he did not want to play a direct role in managing JORTAN. The Accele Venture Partners One fund supported the four startups, and each startup paid a $30,000 management fee to Accele BioPharma.

JORTAN

JORTAN was based on technology from OMRF. Previous research had identified a key regulatory enzyme BACE-2 which affected the number of pancreatic beta-cells.

Beta-cells are critical in the body's manufacture of insulin and in preventing diabetes. JORTAN had identified novel chemical entities that were potent and selective BACE-2 inhibitors. One of their drug candidates was tested in mice and showed significant reductions in body weight and blood glucose supporting JORTAN's premise that their drug would control early diabetes. Despite the promising results, this startup faced the challenge of both proving the pathway as well as the efficacy of the chemical drug candidate. Although Dick and Clayton had concerns about the technical feasibility side of this venture, the market side was much clearer since JORTAN's drug would be used to treat type 2 diabetes before people develop insulin dependence.

As JORTAN required additional funding, Dick decided to apply for a Small Business Innovation Research (SBIR) grant. The Small Business Administration worked with NIH to select awardees and only gave out four grants in the biomedical area per year. In 2015, Accele BioPharma was successful in obtaining a $2,95,000 SBIR grant which also qualified JORTAN to apply for Phase II grants which can be up to $2m. JORTAN was not successful in Phase II of the grant.

Otologic

Otologic was founded by an ear, nose and throat specialist who spent the majority of his time practicing in his field of medicine. He also was President of Hough Ear Institute and oversaw their research programs. The founder had military background and had become interested in preventing and healing the damage done to the ear because of loud noises. Hearing loss was very common in the military. Up to 6,00,000 military personnel had been exposed to high noise environments in firing large guns, aircraft carriers, IEDs, etc. Another source of hearing loss was from chemotherapy treatments for cancer patients which occurred in 75% cancer patients. The founder had validated a drug pathway to treat hearing loss and had partnered with OMRF to conduct research on a combination of drug candidates. The combination had produced extensive and strongly positive results in multiple animal models of hearing loss. The Department of Defense had provided funding for the early research.

Accele BioPharma became involved when Otologic required funding to move the drug candidate into Phase 1 human clinical trials. To raise the four million dollars required, Accele BioPharma had to agree to take an active role in managing the drug approval process. To start, Accele BioPharma had to arrange for one of the drug candidates to be manufactured by Dottikon ES, a Swiss manufacturing firm, because the manufacturing process on any scale required equipment not available within Otologic. Another key resource was finding access to an animal testing lab. Clayton was able to lease an animal lab from the University of Oklahoma and hire two PhD biochemists to run the lab. Managing this lab was important because it improved scheduling of testing for the Accele startup companies, and it improved the feedback of results.

Part of moving the project forward was planning for the clinical trials, which included designing the clinical study and writing a protocol, finding a clinical trial organization, negotiating a contract and time schedule. Managing contracts and liaising with these vendors were part of Accele BioPharma's role.

Accele BioPharma also played a strategic role in the decision to license a second organic molecule. The first drug candidate treated damage to the ear immediately after the incident and treated noise-related damage. The second drug candidate treated other causes of damage to the ear, such as from chemotreatments for cancer. It also restored hearing when given at a later date. This drug candidate greatly expanded the number of people who could benefit from this treatment.

Synereca

The third biotech startup was Synereca Pharmaceuticals, founded by a professor at the University of North Carolina at Chapel Hill to address the growing problem of bacteria resistance to current antibiotics. There were two lead research programs working through different pathways, the first was to restore and increase the effectiveness of antibiotics and the second was to reduce or eliminate the transmission of antibiotics resistance by targeting the bacteria itself. The scientists were testing their lead compounds in-vito and in-vivo experiments. Accele BioPharma provided resources in terms of two chemists who helped produce the lead compounds. Accele BioPharma had contracted with two outside vendors. One was a lab in Michigan that could help characterize or test the compounds with a

broader range of bacteria and antibiotics. The second was a group of consultants in Ann Arbor, MI who had worked for Pfizer in their antibiotic division and were brought in to review the work being done at Synereca and provide feedback and recommendations. Accele BioPharma was also actively involved in writing and submitting grants to NIH and other funding organizations. Dick and Clayton attended an infectious disease conference in San Diego in 2015 to meet with life science venture capitalists and pharmaceutical companies, several of which showed an interest in Synereca's technology. The ongoing interaction with venture capitalists was a support function that Accele BioPharma did for all four startups in search for continued funding and feedback.

Pamlico

The fourth company was Pamlico BioPharma Inc. another startup that came as the result of walking around at OMRF and talking to lead scientists. The startup was working on fully human antibodies to treat infectious diseases. Pamlico was founded on technologies from both OMRF and Emory University to isolate fully human antibodies that arise from the body's natural immune response following a vaccination or infection. The lead scientist had left OMRF to relocate to Chicago, so the startup required direct management which Accele BioPharma provided.

Pamlico had licensed RAPEDmAb Technology platform based on a patented method for rapidly isolation and cloning fully human antibodies for infectious diseases. This technology made it possible for Pamlico to produce antibodies for influenza, rabies and other bacteria diseases such as pneumonia. This technology was better suited than older methods for the rapid development of a large library of useful antibodies. The value of fully-human antibodies produced by this technology over producing antibodies in other species such as mice was that humans tolerated the antibody more readily, which made this approach safer.

Accele BioPharma organization structure

There are four factors that are key determinants of organizational structure. Those factors are the organizational environment, the firm's strategy, the technology used and the firm's human resources. The more dynamic the environment, the more flexible the organization needs to be with decentralized authority that allows it to be agile. Different organizational strategies require different structures. A diversification strategy involving vertical integration requires a flexible structure, like a network organization. Technology makes it harder for managers to regulate the organization and makes it possible for geographically dispersed, virtual organizations. Finally, human resources can shape the organization's structure. Highly skilled workers, such as scientists and doctors require more autonomy and a flexible structure (Jones and George, 2020).

Though the drug development process averages 10–15 years, the pharmaceutical industry is plagued with tremendous amounts of uncertainty and rapid, constant change because of several factors, such as the extensive costs of research and development, ever-evolving physical environment creating new diseases and the accelerating rate of technological innovation. This environment creates the setting for value-added partnerships in the form of accelerators to enable small enterprises to network to exploit market opportunities through resource sharing and risk-sharing activities. Kasper-Fuehrer and Ashkanasy (Jones and George, 2020) would identify the network as an interorganizational virtual organization. These scholars posited a Weberian ideal type of virtual organization. The characteristics of this type of virtual organizational model are temporal, collaborative, independent, nimble, exploitive, value-adding, connected and united. This organizational form, the interorganizational virtual organization, is well-suited to thrive in the dynamic and interconnected global market. Firms of this type can pivot and innovate with more agility than traditional, physically constrained

organizations, giving them a competitive edge in these hypercompetitive industries (Kasper-Fuehrer and Ashkanasy, 2004).

Accele BioPharma was structured to be very capital efficient with a small management team (six people) and both full-time employees and contracted scientists carrying out the work of the four startup companies. An organization chart of the management team is shown below in Exhibit 2. Exhibit 3 highlights the experience of the management team, and Exhibit 4 illustrates how Accele's business units interface as a virtual organization.

Soliciting input on organizational plan for Accele BioPharma

Dick wanted to get the management team's input on the organizational plan. The board meeting was at the end of the month, so he scheduled the interviews as soon as possible. His first meeting was with the VP Finance. Dick explained that he and Clayton were thinking of raising funds for a second venture fund and finding one or two more startup companies.

Dick's first meeting with Vice President Finance

Dick: I know we are all working 60 to 70 hours a week, so I realize that we will need more resources if we add more startups but the question is what resources we need and how to structure them. Do you think your work is fairly common across all of the current four startups?

VP Finance: Obviously, the payroll is pretty standard, but we have outsourced most of the payroll. Paying the vendors varies with the contract but is fairly common. Adding two more startup companies would increase the workload of my function. I spend a lot of time tracking how the grant money is used and preparing reports to various grant agencies. Maybe some of this work could be shifted to the project managers, or there may be software that we both could use that would streamline and organize the grant administration. The other thing that keeps me up at night is who is really responsible for the relationship with our Contract Research organizations. I can pay them, but I am not verifying that they fulfilling their contract effectively.

Dick: We may need to clarify responsibilities because I do see the project managers responsible for tracking where grant money is used, but your function still needs to report how the time and money is spent against the budget. I also think the finance function will be more complicated with a new venture fund because we have to establish the value of the current startups to maintain the integrity of the Venture One fund investors. This requires a pretty specialized expertise.

VP Finance: I agree and that isn't something I have done before. I would appreciate the opportunity to learn this aspect of finance.

Dick's next meeting was with the Vice President Business Development and Operations

VP Business Development and Operations: You know that I have been with Accele BioPharma from the beginning, and we all used to pitch in and help with whatever was needed at the time. As we have added staff, we have divided up some of the responsibility, but I don't think we have sat down and made sure the division of responsibilities makes sense. I am clearly responsible for supporting you and Clayton in the preparation of the presentations to the investors and to the VCs that we are approaching for funding, and I enjoy this work.

Dick: Where do you feel the roles and responsibilities of the management team are not clear or overlap in a way that is not productive?

VP Business Development and Operations: I know we want to target more startups and it's going to take capital to make that happen. With grants being a significant funding source for us, should we have a more standardized process? It is a little unclear who is responsible for

the grant writing. When we add two more startups, grant writing will become even more important to help fund their research. Since I don't have daily interaction with each of the startups, it takes me awhile to get up to speed on their research to even help write a grant. Grant writing is an art, and maybe there is a way we could better share that expertise and standardize the process.

Dick: I believe the VP Research is doing most of the grant writing, but at times I take the lead. We have worked with an external grant writer who is very knowledgeable on NIH grants and the grant submittal process. But as you well know there is always a financial section of the grants that I look to you to help with. It is your experience with startups that is useful in adding a reality check on these grant proposals.

Dick's next meeting was with the Vice President Research

VP Research: I have only been with Accele BioPharma for a little over a year. I have found my role to be challenging but very exciting in terms of the science we are spearheading. The two startups that I serve as project manager for are very different. Otologic has a lot of support structure since it is connected to Hough Ear Institute and still has the guidance of the founder. You have been very involved with arranging for the external resources and the contract organizations running the clinical trials, so I haven't had to deal with those issues. So I see my role as coordination and project management with this startup. On the other hand, with Synereca, sometimes I feel like the lead scientist. We have excellent research scientists but not a clear leader ever since their founder's career track moved in a different direction and he closed his lab. I am much more involved with this startup on a daily basis. There are also the challenges of managing this group virtually since I am in Oklahoma and they are in NC. It is difficult to tell how they are feeling about the project and if there is any conflict growing among the team. It is frustrating at times when I call and need information from the group in Chapel Hill and they are slow in responding - or at least it feels that way. Are you thinking about hiring another person to manage the new startups?

Dick: You have a lot of experience with venture funding and startups in your past positions and you have been a fast study here at Accele BioPharma. I think we need to leverage your knowledge and experience.

VP Research: I am not sure I could take on responsibility for another startup, maybe, if there was a lead scientist and I was really only doing project management work. As you well know you recently gave me responsibility for managing the animal lab and the two biochemists who work in the lab.

Dick: Maybe we could shift some of your responsibilities. Otologic is so complex and is further along in clinical trials. Maybe it needs its own senior liaison person.

VP Research: There are so many players involved with Otologic, e.g. the Hough Ear Institute scientists and Chief Science Officer, and then there is the Department of Defense and the outside contract research organizations. It isn't easy keeping up with all the moving parts.

Dick's last meeting with the Vice President Chemistry

Dick: As we have discussed in last couple of weeks, Clayton and I are considering discontinuing the work at JORTAN. I realize the scientists still believe they have a very viable pathway for reducing diabetes type 2, but their last drug candidate did not show efficacy.

VP Chemistry: Yes, I know we have discussed this, and I will support your decision, but we need to be sure we document the progress and knowledge they have generated. We are not very good at capturing our intellectual capital.

Dick: I agree. We are all working hard to help these startups be successful, and there seems to be little time to write reports. Clayton and I are also planning to raise funds for an

Accele Venture Fund Two. We are hoping to raise enough money to fund two new startups. The two new startups will pay a management fee that will allow us to add resources, but in the interim without JORTAN's management fee, we will need to find a way to be more efficient. What are your thoughts about the management team and the resources needed?

VP Chemistry: Without JORTAN, I could take on the project manager's role for another startup. I hope we just don't get too compartmentalized. I also oversee our chemists, and one of them is working on compounds for Senereca. It helps me to know what is going on at that startup, but it seems like I have to go and ask the VP Research. I know the startup companies we are working with are very different, and their research base is different, but I still think we can learn from each other.

Dick: That is a good point, and we have seen that there are times when we have to either fill in for one another or help out on a grant for a startup with which we are less familiar. We have avoided trying to standardize reports and processes across the startups, but we probably should rethink that at this point in time.

Dick's post-interview thoughts

Dick gave a lot of thought to the input he received. The interviews were a good reminder of how Accele BioPharma had grown without a clear organizational plan. The interviews also pointed out opportunities to better integrate the work of the management team. Dick knew that Clayton would want to maintain a "capital-efficient" organization and not add resources until the new venture fund was fully funded. But Dick also knew that the Board of Directors would want to know how they planned to manage additional startup companies without adding a lot of expense. Since JORTAN was to be discontinued, even with two new startups, the budget for the management team would only cover adding four positions. Dick intended to put together a "straw man" proposal to help start the discussion with Clayton. The proposal would start with improvements to the current management team's way of operating and then move into where resources would be required to manage two new startup companies.

Note

1. According to the Tufts Center for the Study of Drug Development, the average drug cost is $2.6bn and the average time to market is 10+ years.

References

Conner, K.R. and Prahalad, C.K. (1996), "A resource-based theory of the firm knowledge vs", *Opportunism, Organization Science*, Vol. 7, pp. 477-501.

Drejer, A. (2001), "How can we define and understand competencies and their development?", *Technovation*, Vol. 21 No. 3, pp. 135-146.

Grabowski, H. (2011), "The evolution of the pharmaceutical industry over the past 50 years: a personal reflection", *International Journal of the Economics of Business*, Vol. 18 No. 2, pp. 161-176.

Grabowski, H.G. and Kyle, M.K. (2008), "Mergers and alliances in pharmaceuticals: effects on innovation and R&D productivity", in Klaus, G. and Yurtogiv, B. (Eds), *The Economics of Corporate Governance and Mergers*, Edward Elgar, Northampton, MA, pp. 262-284.

Jones, G.R. and George, J.M. (2020), *Contemporary Management*, 11th ed., McGraw- Hill.

Kamuriwo, D.S. (2009), "Timing in business model and product market strategy tradeoffs: performance implications", *Academy of Management Best Papers Proceedings*.

Kasper-Fuehrer, E.C. and Ashkanasy, N.M. (2004), "The interorganizational virtual organization", *International Studies of Management & Organization*, Vol. 33 No. 4, pp. 34-64.

McIntosh, D.M., Byron, M.J., Zhang, J., Kramer, R. and Kimmel, L. (2024), *Life Sciences 2024 Dealmaking Trends & Outlook*, Ropes & Gray, Boston.

Nicol, D., Liddicoat, J. and Critchley, C. (2013), "A role for virtual biotechnology companies in drug discovery and development?", *Journal of Commercial Biotechnology*, Vol. 19 No. 3, pp. 10-19.

Numerof, R. (2023), "The 2024 outlook for global pharma: a look ahead", Forbes.com, available at: www.forbes.com/sites/ritanumerof/2023/12/28/the-2024-outlook-for-global-pharma-a-look-ahead/?sh=2007e9f4ad1a

Otto, R., Santagostino, A. and Schrader, U. (2014), *Rapid Growth in BioPharma: Challenges and Opportunities*, McKinsey & Company, New York, NY.

Scherer, F.M. (1999), *New Perspectives on Economic Growth and Technological Innovation*, The Brookings Institution, Washington, DC.

Schramm, M.E. and Hu, M.Y. (2013), "Perspective: the evolution of R&D conduct in the pharmaceutical industry", *Journal of Product Innovation Management*, Vol. 30 No. S1, pp. 203-213.

Further reading

Galbraith, J.R. (1995), *Designing Organizations: An Executive Briefing on Strategy, Structure and Process*, Jossey-Bass, San Francisco, CA.

Martín-Rojas, R., García-Morales, V.J. and Bolívar-Ramos, M.T. (2013), "Influence of technological support, skills and competencies, and learning on corporate entrepreneurship in European technology firms", *Technovation*, Vol. 33 No. 12, pp. 417-430.

Mazzola, E., Perrone, G. and Kamuriwo, D.S. (2015), "Network embeddedness and new product development in the biopharmaceutical industry: the moderating role of open innovation flow", *International Journal of Production Economics*, Vol. 160, pp. 106-119.

McEvily, S.K., Eisenhardt, K.M. and Prescott, J.E. (2004), "The global acquisition, leverage, and protection of technological competencies", *Strategic Management Journal*, Vol. 25 Nos 8/9, pp. 713-722.

Mintzberg, H. (1979), *The Structuring of Organizations*, Prentice Hall, Englewood Cliffs, NJ.

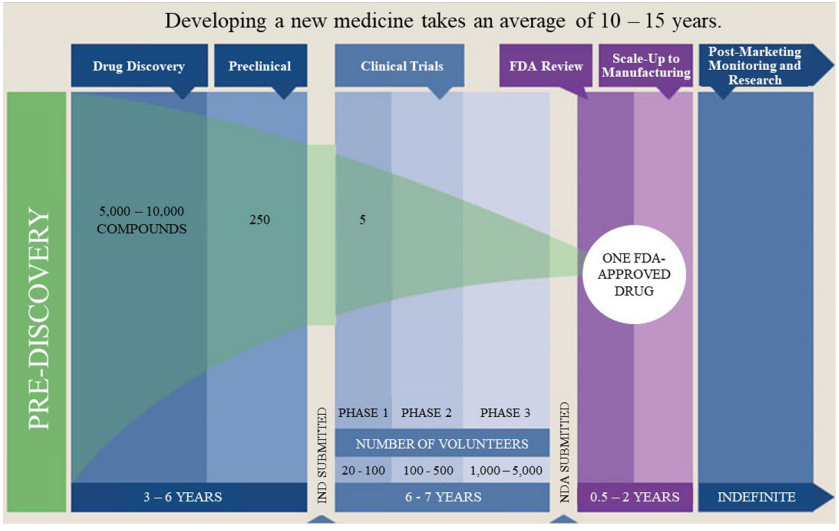
Srivastava, M.K. and Gnyawali, D.R. (2011), "When do relational resources matter? Leveraging portfolio technological resources for breakthrough innovation", *Academy of Management Journal*, Vol. 54 No. 4, pp. 797-810.

Wise, S. and Valliere, D. (2014), "The impact on management experience on the performance of startups within accelerators", *The Journal of Private Equity*, Vol. 18 No. 1, pp. 9-19.

Xu, Q., Chen, J., Xie, Z., Liu, J., Zheng, G. and Wang, Y. (2007), "Total innovation management: a novel paradigm of innovation management in the 21st century", *Journal of Technology Transfer*, Vol. 32 Nos 1/2, pp. 9-25.

Exhibit 1. Drug development process

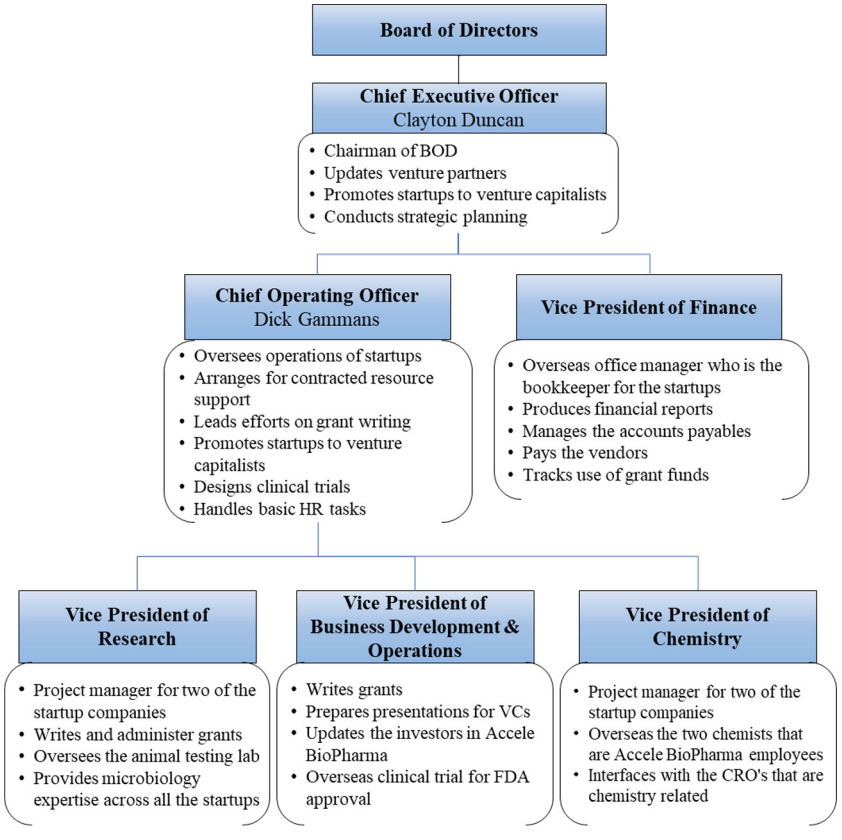
Figure E1



Source: Pharmaceutical Research and Manufacturers of America (2011)

Exhibit 2. Accele organizational structure and executive experience

Figure E2



Note: Experience comes from bios on www.accelebio.com

Exhibit 3. Management team's background

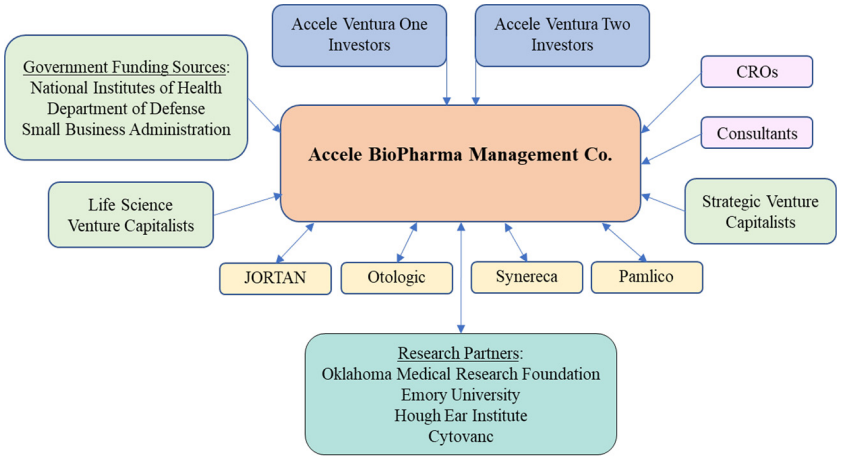
Table E1

Position	*Experience and education*
Chief executive officer (CEO) Clayton Duncan	■ Over 20 years of experience as a biopharmaceutical CEO ■ MBA and MA
Chief Operating Officer Dick Gammans	■ Over 30 years of experience in all aspects of drug development ■ MS, PhD ■ NIH postdoctoral fellowship ■ MS, management
VP Finance	■ Over 17 years of experience as an accountant and controller ■ BS bus admin, accounting ■ CPA
VP Research	■ PhD microbiologist ■ Experience in venture funding
VP, Business Development and Operations "Jason"	■ Over 10 years of experience in startup companies and new product development ■ BS biomedical sciences ■ MBA finance ■ Certified regulatory affairs professional
VP, Chemistry	■ MS and PhD in organic chemistry ■ 5 years of Post-Doctoral experience in chemistry and molecular modeling ■ 10 years of industry experience in medicinal chemistry and drug design

Note: Experience comes from bios on www.accelebio.com

Exhibit 4. The virtual organization's interfaces

Figure E3



Source: Adapted from an Accele BioPharma presentation

Corresponding author

Tyechia Veronica Paul can be contacted at: tpaul5@uncfsu.edu

Teaching notes

Jesse Lee Brown, III and Tyechia Veronica Paul

Case synopsis

This case is about a biopharmaceutical accelerator founded in 2011 by two senior executives with experience in both large pharmaceutical companies and running biotech startup companies. The founders were successful in raising capital to start their first venture capital fund which they used to invest in four biotech startups. All four startups were working in very different disease areas. For example, one developed a drug to help with hearing loss that the department of defense was funding. Another of the startups discovered drug candidates that attack antibiotic resistant bacteria. Biopharmaceutical accelerators were relatively new. They differed from business incubators because they invest in the startups and provide operational support, but the degree of support provided varies across accelerators. The Accele BioPharma accelerator operated in virtual, network type of organization, and Accele BioPharma provided primary strategic and operational management for the startups. The challenge in this case is to identify how the leaders managed the virtual network, and what additional resources were needed so that the management team could expand their ability to assist startups to get drugs approved by the food and drug administration.

Intended courses and learning objectives

This case is suitable recommended for undergraduate/graduate strategy, undergraduate/graduate organizational behavior, entrepreneurship and health care management courses. Students will achieve the following learning objectives:

1. assess the impact of external forces on the firm and its industry;
2. describe the role of industry dynamics and the evolution of the drug discovery process;
3. identify the challenges of managing a virtual organization and determine how a firm's structure can overcome barriers to growth;
4. identify coordinating mechanisms and their application to organizational structure issues;
5. apply strategic management concepts and theories to entrepreneurship, including the Weberian ideal-type of virtual organization, resource-based theory, Maslow's hierarchy, equity theory and resource-based theory;
6. discuss the advantages of job specialization; and
7. analyze the firm's organizational structure and make a recommendation about firm reorganization

Research methods

Case information was mainly acquired through interviews with Richard Gammans, chief operating officer (COO). Dr Gammans was a visiting professor at Fayetteville State University for a year and two of the case authors developed personal friendships with Richard. Interviews were conducted over a two year period as the accelerator got started. In addition, the one author conducted a team building session with the management team and one of the bio-startup researchers. An interview was also conducted with Clayton Duncan, CEO, to gain his agreement with developing the case.

The Accele website included a write up on each of the pharmaceutical startup companies. The write up included a company summary, description of the science (disease and cure), the size of the market, results from testing, regulatory considerations and intellectual property. A literature review was conducted as the basis for the information on the pharmaceutical industry.

There is no disguise in the names of the people in the case or the name of the accelerator.

The case was tested in two strategic management classes. Students found the background on the pharmaceutical industry very interesting. With the first version of the case, the students did not have sufficient information to answer one of the questions. With the second version, the students' answers were more complete, although the virtual nature of the organization was still a bit difficult for students to grasp.

The authors have not published any other case or article on Accele BioPharma. Richard Gammans has given permission for publication.

The case will include the following:

1. A description of the drug development process and diagram so students understand the different stages of drug discovery and development.
2. A recent history of the pharmaceutical industry and how the R&D structure of traditional pharmaceutical organizations have changed from being vertically integrated (conducting R&D and manufacturing internally) to a virtual network of CROs and small Accele BioPharma startups as partners.
3. Interviews with Accele BioPharma senior-level executives and top management team members and their input on what additional resources are needed so that the management team would be able to manage additional startup companies.
4. A history of the founding of Accele BioPharma and the background of the CEO and COO.
5. A description of the four Accele BioPharma startups and in what stage of the drug development process each of the startups were at the time of the case.
6. A list of management team members, their titles, backgrounds and responsibilities.

Theoretical linkages

The resource-based view (RBV) is a theoretical framework from the field of strategic management, used to identify the complex, intangible and dynamic resources of an enterprise and assess its competitive advantage (Barney, 1991; Penrose, 1959). Capabilities allow firms to change by combining or recombining resources. Distinctive competencies allow firms to perform value-added activities (Conner & Prahalad, 1996). Following Drejer (2001), the real source of competitive advantage is management's ability to consolidate corporate-wide technologies and production skills into competencies that empower individual businesses to adapt quickly to changing opportunities. The characteristics of being complex, dynamic and the ability to change or recombine resources are distinctively reflected in the Accele's virtual organizational structure.

Resource-based theory claims that complementary resources and competencies may result in synergistic performance impact (Teece, 2007). A complementary competency is an enhanced resource or asset that arises when a resource produces more value in the presence of another resource than by itself. Management capabilities are complimentary resources that help technology startups become successful.

Managerial capabilities include the perception of goals, attitudes and motives of individuals, knowledge of social structures (technological and social environment, organizational culture) and the effectiveness of reaching the objectives and social skills (communication, motivation, evaluation of team of employees, etc.) as well as the ability to apply knowledge in practice. Management capabilities minimize the competency gap of nascent entrepreneurs. The negative effects of lack of competence are usually manifested in faulty management, unsatisfactory quality, loss of competitiveness, customers and the market.

Critical to creating a competitive advantage is the manager's ability to fully exploit the firm's competitive potential of its resources and capabilities. Specifically, a firm must have an effective organizational structure and coordinating system to capture the value of its resources and capabilities. The organizational structure defines how jobs and tasks are divided and integrated, establishes reporting relationships and formal communication channels and guides the coordination of work activities. The challenges faced in the coordination of work activities are exacerbated in *virtual organizations*, because they are typically geographically dispersed (located at a distance from each other) and loosely tied (bound by non-binding partnership or funding agreements) to each other. Furthermore, in high-tech industries, such as biopharma, the organizations are typically composed of highly-skilled, specialized employees that prefer to work in isolation and discount hierarchical relationships. Thus, the managerial ability to provide coordinating mechanisms to overcome these impediments, becomes paramount to overall success.

There are four factors that are key determinants of organizational structure. Those factors are the organizational environment, the firm's strategy, the technology used by the firm and the firm's human resources. According to contingency theory, organizational structures are designed to fit the factors or circumstances that affect the firm and cause it the greatest uncertainty. Therefore, there is no one best way to structure an organization (Jones & George, 2019).

Though the drug development process averages 10–15 years, the pharmaceutical industry is plagued with tremendous amounts of uncertainty and rapid, constant change because of several factors, such as the extensive costs of research and development, ever-evolving physical environment creating new diseases and the accelerating rate of technological innovation. This environment creates the setting for value-added partnerships in the form of accelerators to enable small enterprises to network to exploit market opportunities through resource sharing of capital, managerial resources and knowledge and risk sharing activities. Kasper-Fuehrer and Ashkanasy (2003) identified the network as an interorganizational virtual organization. These scholars posited a Weberian ideal-type of virtual organization. This organization model has the characteristics of being temporal, collaborative, independent, nimble, exploitive, value-adding, connected through information and communication and united. This organizational form, interorganizational virtual organization, is well-suited to thrive in the dynamic and interconnected global market. They can pivot and innovate with more agility than traditional, physically constrained organizations, giving them a competitive edge in hypercompetitive industries (Kasper-Fuehrer and Ashkanasy, 2004).

Lee Bolman and Terrence Deal defined a frame as a mental model that helps individuals understand and navigate a certain territory or business situation. Their four-frame model provided perspectives, frames or lenses, through which every business situation can be analyzed. Those frames are the structural frame, the human resource frame, the political frame and the symbolical frame. The structural frame focuses on an organization's architecture, including the organizational chart, policies, rules, roles and goals. The human resource frame is centered around what organizations and their people do to and for one another. The political frame involves the processes of decision-making and resource allocation, while considering resource scarcity and divergent interests. The four-frame model specifically discusses organizations as political arenas where players or actors are involved in political contests for scarce resources. Finally, the symbolic frame focuses on how people interpret the chaotic, ambiguous environments in which they operate (Bolman & Deal, 2013).

Maslow's Hierarchy, depicted in Exhibit 5, is among the most well-known theories of motivation. It states that each person has five primary needs. The lower order needs are the physiological needs of food, water, shelter, etc.; the safety-security needs, which refer to protection from physical or emotional harm; and the belongingness needs, which involve the need for acceptance in social groups, affection and friendship. The higher order need of esteem includes both internal factors such as achievement, self-respect and autonomy and external factors such as recognition, status and attention. Finally, and highest on the hierarchy is the need for self-actualization, to become one's best self by fully using one's full talent and abilities to achieve one's maximum potential.

Maslow's hierarchy is generally illustrated as a pyramid, and according to this theory, the lowest unmet need on the hierarchy is the one that is dominant. Although no need is ever fully gratified, a need that is substantially satisfied, no longer motivates (Robbins & Judge, 2017).

Equity theory describes how individuals compare their job inputs and outputs to those of coworkers. This theory is based largely on perception. If one perceives an inequity, one seeks to correct it by either changing the inputs, changing the outputs, reassessing with distorted perceptions of oneself or others, choosing a different referent, or leaving the job altogether (Robbins & Judge, 2017).

Teaching plan

- Ask students if they know of anyone affected by a major disease, such as cancer or cardiovascular disease.
- Ask how their friend or family members' life has been improved by a drug. Students may share the condition, drug intervention and nature of the improvement.
- Ask if they know how long it took to discover that drug and bring it to market or how much it cost. [1] As an example, discuss the time it took the Covid-19 vaccine to come to market.

- Ask how many or what percent of new drug candidates ever make it to the market.
- Total time – 90 min
  - Case introduction – 10 min
  - Read case – 30 min
  - Review of organizational structure – 10 min
  - Case answers and discussion – 30 min
  - Review of epilogue – 10 min

Assignment/discussion questions

Q1. What are the key environmental forces impacting the pharmaceutical industry? Are these trends favorable or unfavorable to Accele BioPharma? Explain. (LO-1, LO-2)

Q2. What value does Accele BioPharma add to the startup companies? List the role or functions that the management team carries out for the startup companies? (LO-3, LO-4, LO-5)

Q3. What are the risks of managing a virtual organization such as the one Accele BioPharma has created both with its four startup companies and its external vendors? (LO-3, LO-5)

Q4. If you were Dick, how would you strengthen the management team? Where in the structure would you add the four new positions, and what would their titles and responsibilities be? (LO-3)

Q5. What coordination or integrating mechanisms would you implement to leverage the expertise of the current management team? (LO-4)

Q6. What type(s) of organizational structure(s) does Accele have, and how should the firm be redesigned to support its future growth and reflect internal alignment and equity? (LO-3)

Q7. How sustainable is it for employees to work their current schedules? What are the benefits and disadvantages of that workload? How might these changes affect employee motivation, burnout and satisfaction? (LO-6)

Analysis and responses to assignment/discussion questions

Q1. What are the key environmental forces impacting the pharmaceutical industry? Are these trends favorable or unfavorable to Accele BioPharma? Explain.

An organization is impacted directly and indirectly by its macro-environment. The macro-environment consists of the general environment and the organization's industry forces. There are six segments in the general environment: demographic, economic, political and legal, sociocultural, technological and global segments. These elements can indirectly influence the industry and firms within the industry. While each of the elements of the macro-environment are important, the challenge for managers is to determine what macro-environment changes are a strategic priority for their firm.

Analysis of the external environment identifies economic factors, legal factors and sociocultural factors that impact the biopharma industry, including Accele specifically. Inflation, coupled with increasing interest rates have caused firms to declare bankruptcy and increasingly explore mergers. However, the FTC has been more active in its antitrust actions. (McIntosh *et al.*, 2024) Additionally, society is less tolerant of exorbitant, predatory drug prices, which has led to the passage of the Inflation Reduction Act to cap prices of nonsubstitutable drugs. (Numerof, 2023)

These trends appear largely favorable to Accele. As an accelerator, it has a demonstrated competency of being agile, allowing it to leverage opportunities in the market. If Accele's leaders interpret the changes within the external environment as opportunities, they will be able to pivot to become low-cost leaders and compete with previously nonsubstitutable drugs and biotech devices. They will adjust their synergy and strategically navigate

opportunities for merger and acquisition to avoid antitrust lawsuits from the FTC. Doing so can allow them to remain profitable, nimble and temporal, key characteristics of virtual organizations and successful accelerators (Kasper-Fuehrer and Ashkanasy, 2004).

Firms in the biotechnology industry are also influenced by several other forces in the macro-environment. First, advances in technology promoted the tremendous growth in the biotechnology industry. New technologies in the areas of molecular biology and pharmaceutical drugs fueled the industry. The mapping of the human genome and related advances in fields such as bioinformatics led to an abundance of new disease targets and drug candidates. The rate of technological change is increasing, which will spur continued growth in the biotechnology industry. Managers must remain on the cutting-edge of technology to explore new disease areas and exploit the novel drug candidates being created. Second, social and demographic elements are continuously in flux and are impactful, particularly in this industry. An aging population and increased average life span will create opportunities from an increased demand for drug candidates. Furthermore, a "tiered" access to health care is anticipated with the continued rise in healthcare costs and increase in income disparity. This potential division between the tiers creates new customer market segments for their products. Additionally, legal and regulatory factors dictate the length of the drug development process, thus necessitating years of drug development expense before the product reaches the market.

Unlike the general environment, a firm can influence its industry environment. An industry is a group of firms producing products or delivering services that are close substitutes for each other. The industry has a more direct impact on strategic competitiveness and firm profitability. Using the competitive forces model, we can evaluate the forces within the industry to determine industry attractiveness. The elements of the competitive forces model are as follows: threat of new entrants, threat of substitute products, bargaining power of suppliers, bargaining power of buyers and intensity of firm rivalry.

Accele BioPharma's industry environment is extremely dynamic. Owing to the high revenue potential and low barriers to entry, many firms enter and exit the industry. The typical barriers to entry, such as economies of scale, switching costs and access to distribution channels are not relevant in a high technology industry, like the biotechnology industry. Also, the business funding models that have been created with the explosive growth of the industry, has reduced the impact of capital requirements for industry entry. The biotechnology industry is dominated by small entrepreneurial startups. These firms are typically founded by the lead scientist or by entrepreneurs with access to academic and public research foundations. These high risk, high growth potential, technology firms are prime targets for investment firms. As a result, early-stage, biotechnology firms need only small amounts of funds to navigate the drug discovery process to attract more investors or subsequent rounds of funding.

Owing to the low barriers to industry, there are a large number of firms competing for venture capital investment. The large number of competitors typically leads to intense competitive rivalry within the industry. However, the rapid growth of the industry mitigates the impact of the large number of firms. Furthermore, due to the virtual nature of the organizations, exit barriers are relatively low.

Q2. What value does Accele BioPharma add to the startup companies?

An innovation, whether it is a new product or service, is only a part of the entrepreneurial process. For the innovation to be successful, it must be brought to the marketplace and deliver value to consumers. Accelerators provides the resources necessary, such as financial capital and application expertise, to successfully begin the commercialization process.

Accelerators help:

- Identify and vet market opportunities
  - An innovation is successful only if it meets with an opportunity.
  - Managers must constantly scan the business landscape for voids in the marketplace.
- Managerial expertise
  - Managers must allocate scarce resources in the context of limited information efficiently and effectively.
  - Maximize returns of investors
  - Outsourcing components of the value chain

- Credibility
  - The biotechnology industry is evolving from an R&D orientation to product profitability. The demonstration of a proven track-record of generating value for investors is increasingly important to securing venture capital funding. Firms that generate consistently above industry average returns, demonstrate the company's ability to execute a business model, which in turn correlates highly with overall success.
- Leadership
  - Manage risk
- Financial resources
  - Biotechnology and other high tech industries typically require large amounts of capital to bring innovations to market
- Facilities
  - Biotech startups typically need lab space and advance analytical instrumentation.

Q3. What are the risks of managing a virtual organization such as Accele BioPharma? What risks has Accele's structure created both with its four startup companies and its external vendors?

Virtual organizations are composed of groups of people who work interdependently with shared purpose across space, time and organization boundaries using technology to communicate and collaborate. The biotechnology industry is a hypercompetitive environment with a constantly changing competitive landscape. Because of the challenges, large pharmaceuticals have outsourced several components of the value chain to reduce costs in the drug development process. This outsourcing has helped to create a virtual model of the new drug development process, which is characterized by knowledge centers and primary value chain functions being geographically dispersed. Members in these virtual organizations rarely meet face-to-face and typically manage one or more functions in the value chain with little duplication of work across virtual teams. Hence, managers in virtual organizations commonly face the following challenges:

- The lack of physical interaction (face-to-face) between members reduces the opportunity for trust to be gained through informal ties created by social interaction.
- Interactive learning gains may be limited because of the lack of face-to-face interaction with team members. Oftentimes new ideas and process improvements are produced in informal discussions that occur when team members are socializing.
- Some virtual team members may feel isolated and detached from the organization.
- Typical organization control structures are limited in a virtual organization. Contact with and direct supervision of subordinates is constrained because of geographic dispersion and organizational boundaries resulting in less opportunities for coaching and building relationships.
- In a high technology industry with highly specialized team members working in geographically dispersed locations, HR may overemphasize technical skills and underemphasize interpersonal and teamwork skills in hiring decisions. This overemphasis will further exacerbate the other issues created by virtual teams.

Q4. If you were Dick how would you strengthen the management team? Where in the structure would you add the new positions and what would be their responsibilities be? Justify your placement of these resources.

From the input Dick received from members of the management team, it is fairly obvious that certain resources need to be added to improve efficiency through job specialization. First, Finance will need an additional resource with expertise in managing investments from multiple venture funds and establishing the value of the startups at certain points in time. Some students, particularly those with more career experience may perceived inequity associated with having a vice president (VP) on the same organizational level as a chief-level officer and proposed new or retitled positions to create more organizational equity. Second, there appears to be a need for additional grant writing support. All of the startups

submit grants and several people currently work on grants. Some students may suggest that the grant writer should also be responsible for tracking the use of the funds, but Dick is pretty clear that he feels that is the responsibility of the project manager (VP Research or VP Chemistry). The project managers are much closer to the day-to-day activities and where the money is being spent. The third resource would be another project manager. This position could be the senior liaison with Otologic or the project manager of the new startups from the Venture Two funding. The fourth resource is more open to debate. One alternative is to add a person responsible for managing the relationships with the CROs, as the case implies that there is no one clearly responsible for that function currently. Students may also recommend adding another senior position to oversee all the project managers and consultants, such as a chief science officer.

The more difficult part of this question comes in justifying where these resources should report. We are providing two options. Some students will consider restructuring the organization which is Option 1 (see Exhibit 6). Where to incorporate the additional resources, Option 2 (see Exhibit 7). Both options create internal equity in terms of job title, by placing all VPs at the same organizational level.

The above structure creates a balanced top management team providing leadership in science, operations and finance. It also provides growth opportunities for some of the vice presidents and helps with succession planning. The senior liaison officer is a new position and would be used to manage Otologic. As the animal lab has been removed from under the VP Research, this position could take on an additional startup company. The VP Operations is a new position and this function would act as a shared service providing support to all of the startups and that is why the Grant Writer is part of this function. The final position is a Contract Research Organization administrator and reports to Finance to ensure these vendors are delivering on their contracts and are paid appropriately.

In Option 2, depicted by Exhibit 7, we would expect students to place the resources under the vice president who expressed concerns about needing more help. The VP Finance would get an additional resource with expertise in managing multiple investment funds and a contract research organization administrator to help manage the contracts and payments. The VP Research would be assigned a new project manager so that the VP could take on an additional startup. The Grant Writer could be assigned to the VP Business Development because he feels he does not have the time to get actively involved in grant writing. Some students may place the Grant Writer under the VP Research because this position is responsible for most of the grant writing.

With any organizational design there are positives and negatives. For example, placing the CRO Administrator under the VP Finance results in this VP having more accountability for the performance of the CRO's. The relationships with vendors and CRO's are two ways streets and require the cooperation and coordination with the project managers and scientists. Also, Finance does not typically have operational responsibility. Additionally, the Grant Writer is a shared resource but putting this resource under a VP that wants to distance himself from grant writing may not be the right fit.

When designing the organization, one must consider how to create and maintain internal wage equity. For instance, positions with similar levels of responsibility at similar levels in the organization, requiring similar knowledge, skills and abilities and possessing similar titles should compensate within a consistent pay range. The hierarchical aspect of equity theory and pay equity suggests that there should not be a manager that makes the same or less than their subordinate. If that were prone to occur in a proposed organizational design, it could be remedied by retitling the outlier role or adjusting wages to reflect their market value and value to the firm.

A RBV should be applied to organizational design to ensure that the firm is structured in a manner to optimize its unique core competencies, including the efficiency with which the firm operates in the R&D, production and distribution of its tangible resources as well as the retention and agile strategic application of its intangible resources (Reed, 2020).

In grading the work of students, their justification is very important. Have they considered the coordination between the position and other parts of the organization and to what degree the position is a shared resource? Boundaries between departments in an organization can be barriers to communication flow. Have they considered the similarity of function/expertise between the supervisor and subordinate so that the subordinate has good coaching? The project manager under the VP Research is a good fit because the VP

has been doing this function and can educate the new project manager on procedures. Another consideration is how tall or flat the structure is. With this organization being so small, there is not a big concern with too many levels of hierarchy.

Q5. What coordination or integrating mechanisms would you implement to leverage the expertise of the current management team?

In a virtual organization, the need to coordinate the activities of different functional groups is paramount to achieve strategic objectives. (Robbins & Judge, 2017) Direct contact between managers and members is the simplest integrating mechanism, but it rarely occurs in virtual organizations. However, there are several integrating mechanisms that Accele BioPharma could use to better leverage their managerial expertise:

1. Currently, there is little communication and information sharing between the project managers for the Accele BioPharma. This lack of communication will only grow with adding more startups under the Accele BioPharma umbrella. More frequent communication and information sharing is necessary to improve operational efficiency and increase decision-making effectiveness. Accele BioPharma could introduce a formal integration mechanism, such as a project management council. In this council, the project managers could establish regular mandatory meetings to exchange information and develop best practices. Sharing best practices is a good way to improve performance by replicating successes throughout an organization and avoid duplication of effort or "reinventing the wheel."
2. The lack of physical interaction (face-to-face) between members reduces the opportunity for trust to be gained through informal ties created by social interaction. This challenge could be overcome by the introduction of more interactive communication technology, such Skype, Google +, Facebook Live, Zoom. In lieu of communication through telephone or email, which employs only one dimension of communication, team members could communicate via Skype which uses both voice and visual communication or the company could form a Facebook community that uses Facebook Live for staff meetings.
3. Several team members felt isolation due to not being co-located with other members of the management team, because they would have to wait for a telephone response for needed information that was slow in coming. The management team should establish organizational norms or expectations regarding communication. For example, there could be a set minimum response time period or a time of day that every employee is scheduled to be at their desk. The establishment of response time norms or communication expectations will generate interpersonal trust based on performance consistency rather than social interaction. Any slight negative impact on efficiency caused by new communication policies or standards could be offset by improved accuracy of communication, and benefits associated with increased positive group dynamics and increased cohesion.
4. The management team could use a project management software. The software could track project progress, serve as a repository for project-related activity and data and provide access to project-related information to all pertinent personnel. Decision-makers would have the appropriate quantitative and qualitative data for the accurate assessment of project performance.
5. To overcome feelings of isolation, infrequent and problematic communication and sporadic collaboration caused by lack of physical interaction between members, the management team could employ regularly scheduled community gatherings or meetings. These regularly scheduled meetings could be on an annual, semi-annual or quarterly basis, depending on cost effectiveness and time constraints. At these meetings, employees would participate in teambuilding events that would help employees form those important social bonds and create informal networks that could overcome barriers to collaboration, build inter-organizational trust and teach members how to communicate with one another.
6. What type(s) of organizational structure(s) does Accele have, and how should the firm be redesigned to support its future growth, and reflect internal alignment and equity? (LO-3)

Accele's organizational structure currently combines characteristics of simple, functional and virtual structures. Positions are arranged based on their function, but the firm also operates as a virtual (also sometimes referred to as a network or modular) organization. As such, the firm maintains a small, core organization and outsources some common back office business functions, such as marketing, information technology (IT), payroll, etc. (Robbins & Judge, 2017).

Like many fairly new companies, the organizational reflects some of the key characteristics of Mintzberg's simple structure. There are no support staff members mentioned in the case or depicted on the organizational chart. Thus, it can be inferred that there are few, if any, support staff members. There's also a loose division of labor and some overlap in responsibilities among the VPs. For instance, the COO, the VP of Research and the VP of Business Development and Operations are all responsible for writing grants. The VP of Research and the VP of Chemistry both serve as project managers. The duplication of efforts among people with vastly different specialties makes it likely that work is being performed in an unformalized manner, which could lead to inefficiencies and inconsistency. With the simple structure, decision-making is centralized among the senior managers at the strategic apex. This simple structure is usually suitable for firms in their formative years when they find the general environment still dynamic, and the firm's future state cannot be predicted. However, Accele is at the point where it has achieved a measure of success that supports its future growth and an enhanced level of standardization. They are now able to predict and plan for the desired future state of the firm.

An adhocracy (also known as an ad-hoc structure) would be the most suitable organizational structure for Accele to adopt. This type of organizational structure is characterized by:

- little formalization of behavior;
- job specialization based on formal training;
- a tendency to group the specialists in functional units for housekeeping purposes but to deploy them in small, market-based project teams to do their work; and
- a reliance on liaison devices to encourage mutual adjustment, the key coordinating mechanism, within and between these teams (Bolman & Deal, 2013).

These structures tend to have functional managers that serve as members on project teams, but also numerous project managers that lead the projects' effort. Since Accele has duplication in of the project management function among VPs, they will likely need to hire at least one full-time project manager for existing and future projects. Adhocracies commonly thrive in dynamic, general environments, such as advertising agencies, the entertainment industry and think-tank consulting firms (Bolman & Deal, 2013). Some students may suggest that the firm apply a divisional structure where business units and project groups are established based the category of drug they are developing.

Additionally, in the redesign of the firm, all of the VPs should be at the same organizational level. In the case, the VP of Finance reports directly to the CEO and is on the same organizational level as the COO. Accele should either place the VP of Finance to report to the COO, such as their VP peers or change the job title to Chief Financial Officer to better reflect internal social, bureaucratic and compensation equity. Otherwise, one VP ranking more highly than the others in the organizational structure may create the perception of inequity. Additionally, the VP of Finance ranking more highly than their peers suggests that their compensation, power and influence may be at a higher level. When an employee perceives inequity, they may take action to correct the balance of inputs and outputs. They may look towards a different referent for comparison, or the perceived inequity may result in employee dissatisfaction. Such dissatisfaction can manifest in lower levels of job commitment, absenteeism and even turnover. To avoid such dissatisfaction, Accele should create and maintain internal alignment of job titles.

The planned expansion of Accele also relates to the political frame of Bolman and Deal's four-frame model. Accele had an equity stake in the start-up companies they managed, although not necessarily a controlling interest. This makes it challenging to accurately identify ownership of technical rights and intellectual property (IP), which can include patents. For example, Otologic was partially owned by the Huff Ear Institute, and they were using some technology from a Swiss pharmaceutical company. Accele having an equity stake in the company could also claim part ownership of the IP, which is most often owned by the firm where it was developed. Accele's desired expansion into more new technologies

would give it more power in the short-term but also expand their ownership interests in future IP in the long term. Internally, the expansion could reduce the amount of political influence that the existing start-ups had by dividing the power, influence and resources among a larger number of start-ups.

Q7. How sustainable is it for employees to work their current schedules? What are the benefits and disadvantages of that workload? How might these changes affect employee motivation, burnout, needs attainment and satisfaction? (LO-6)

Students should consider labor laws, and what it means to be exempt or non-exempt from overtime. This may need to be explained to them. Students should also consider whether the current schedules align to employee needs. The long-term effects of an excessive workload can result in burnout, including harmful physiological effects, which can be categorized as unsafe. According to American Psychological Association, workers who experience burnout are 57% more likely to be absent from work for over two weeks due to illness, and they are 180% more likely to develop depressive disorders. (American Psychological Association, 2023) Dick Gammans, the COO expressed an awareness that the employees are all working 60–70 h per week. Hiring additional employees to take some of the workload from the VPs and support the firm's future growth, should help the VPs conduct their work in a standard 40-hour workweek. The firm may also find added benefits in terms of increased employee satisfaction, more productive work hours, increased motivation and reduced stress among its leadership. Students can discuss how working a 60–70-hour standard workweek would impact them.

Research shows that working over 40 h per week is associated with increased consumption of alcohol and tobacco, unhealthy weight gain in men and depression in women. People who work more than 10 h a day as their normal schedule have a 60% higher than average risk of cardiovascular issues. There are also increased rates of injuries like carpal tunnel syndrome and eye strain for those who work long hours at office jobs. This risk of burnout-related injury and illness is associated with the safety need in Maslow's hierarchy. If Accele can preserve their employees' health and well-being by limiting their work hours, they may mitigate the risks of higher medical care costs, workplace accidents, turnover, etc. Additionally, research indicates that there is very little productive work that occurs after 50 h per week anyway (Popomaronis, 2016).

Satisfied, motivated employees are more likely to apply discretionary effort to their work. They tend to be more creative, innovative and more committed to their jobs long-term. As the employees are the primary source of firms' competitive advantage, they need to be protected against burnout. Students may suggest additional ways for the firm to provide flexibility, wellness benefits and work/life balance.

References

American Psychological Association (2023), "Employers need to focus on workplace burnout: here's why", *APA.org*, available at: www.apa.org/topics/healthy-workplaces/workplace-burnout#:~:text=According%20to%20leading%20scientific%20research,Ahola%20et%20al.%2C%202005

Bolman, L.G. and Deal, T.E. (2013), *Reframing Organizations*, 5th ed., John Wiley & Sons, San Francisco.

Jones, G.R. and George, J.M. (2019), *Contemporary Management*, 11th ed., McGraw-Hill.

Penrose, E.T. (1959), *The Theory Of The Growth Of The Firm*, Blackwell, Oxford.

Pharmaceutical Research and Manufacturers of America (2011), "PhRMA 2012 pharmaceutical industry profile", *PhRMA.org*,, available at: http://phrma-docs.phrma.org/sites/default/files/pdf/phrma_industry_profile.pdf

Popomaronis, T. (2016), "Science says you shouldn't work more than this number of hours a week", *Inc.com*, available at: www.inc.com/tom-popomaronis/science-says-you-shouldnt-work-more-than-this-number-of-hours-a-day.html

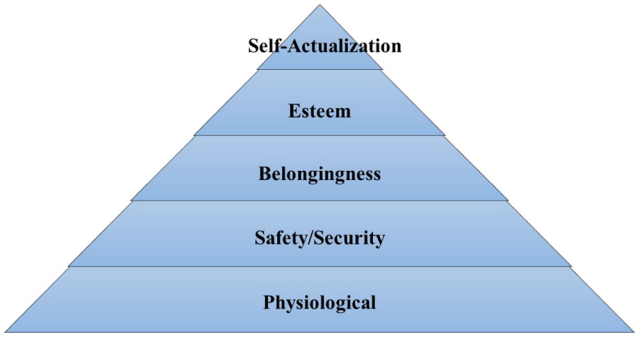
Reed, K. (2020), *Strategic Management*, Virginia Tech University, Blacksburg.

Robbins, S.P. and Judge, T.A. (2017), *Organizational Behavior*, 17th ed., Pearson, New York.

Teece, D. (2007), "Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance", *Strategic Management Journal*, Vol. 28 No. 8, pp. 1319–1350.

Exhibit 5. Maslow's hierarchy

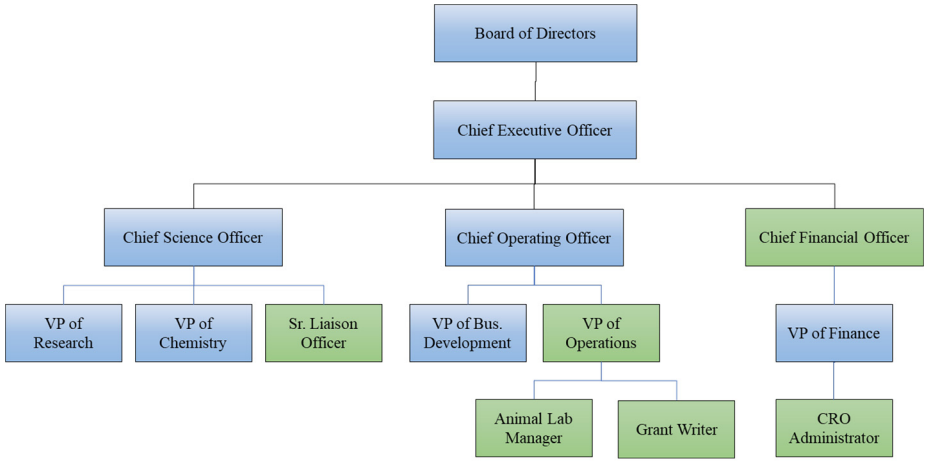
Figure E4



Source: Jones & George (2019)

Exhibit 6. Accele organizational structure: Option 1

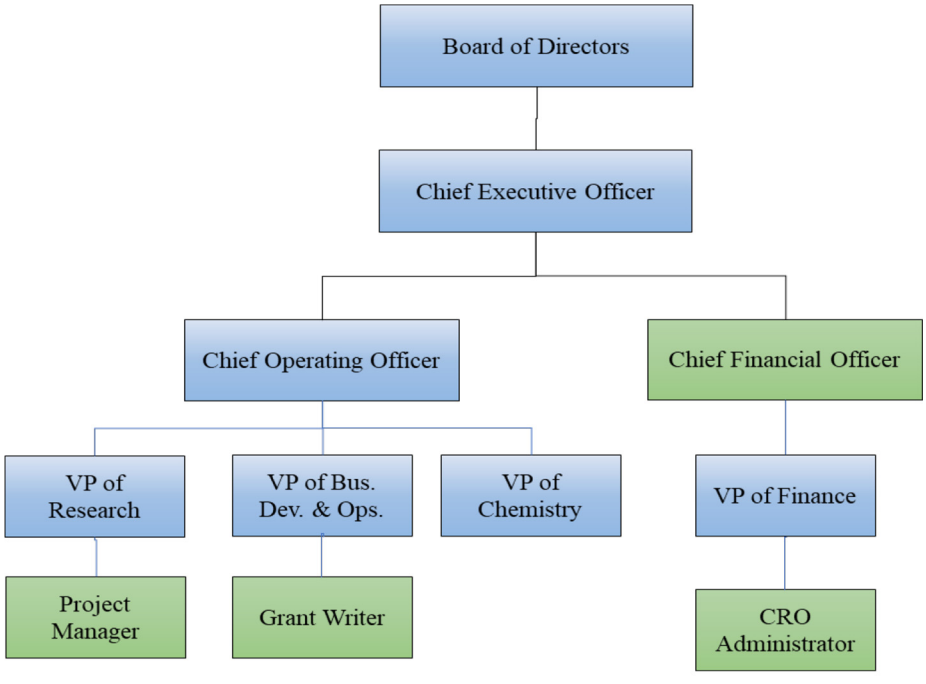
Figure E5



Source: Created by authors

Exhibit 7. Accele organizational structure: Option 2

Figure E6



Source: Created by authors

Abstract

Title – *Creating a capital-efficient organization: Accele BioPharma.*

Research methodology – *Case information was mainly acquired through interviews with Richard Gammans, chief operating officer. Dr Gammans was a visiting professor at Fayetteville State University for a year, and two of the case authors developed personal friendships with Richard. Interviews were conducted over a two-year period as the accelerator got started. In addition, one author conducted a team-building session with the management team and one of the bio-startup researchers. An interview was also conducted with Clayton Duncan, chief executive officer, to gain his agreement with developing the case.*

The Accele website included a write-up on each of the pharmaceutical startup companies. The write-up included a company summary, description of the science (disease and cure), the size of the market, results from testing, regulatory considerations and intellectual property. A literature review was conducted as the basis for the information on the pharmaceutical industry.

Case overview/synopsis – *This case is about a biopharmaceutical accelerator founded in 2011 by two senior executives with experience in both large pharmaceutical companies and running biotech startup companies. The founders were successful in raising capital to start their first venture capital fund which they used to invest in four biotech startups. All four startups were working in very different disease areas. For example, one developed a drug to help with hearing loss that the department of defense was funding. Another of the startups discovered drug candidates that attack antibiotic-resistant bacteria. Biopharmaceutical accelerators were relatively new. They differed from business incubators because they invest in the startups and provide operational support, but the degree of support provided varies across accelerators. The Accele BioPharma accelerator operated in virtual, network type of organization, and Accele BioPharma provided primary strategic and operational management for the startups. The challenge in this case is to identify how the leaders managed the virtual network, and what additional resources were needed so that the management team could expand their ability to assist startups to get drugs approved by the food and drug administration.*

Complexity academic level – *This case is suitable recommended for undergraduate/graduate strategy, undergraduate/graduate organizational behavior, entrepreneurship and health-care management courses.*

Keywords *Management science, Management theory, Organizational behavior, Entrepreneurship*