

Hewlett-packard: the flight of the kittyhawk essay



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The first hard drive, a magnetic information storage and retrieval device for computers and other electronic products, was developed by IBM engineers in 1956 in San Jose, California. This hard drive was the size of two side by side refrigerators and could store 5 MB of information. Incredible technological progress ensued, and by the early 1990's, disk drives had decreased from their original bulky configuration to 2.5 square inches in diameter and had a four-fold increase in their data capacity to 20MB.

The disk drive business had grown into a multi-billion dollar industry marked by frequent innovation, rapid growth and intense competition amongst a few select firms such as IBM, Seagate, Conner, Quantum, and Western Digital. These technology manufacturers competed in the hard drive market by relentlessly pursuing two design improvements: reduction in physical size and increase of data storage capacity. These advances were required by their customers, who were in an analogous race to bring smaller, cheaper, and higher utility electronics to market.

At this time Hewlett-Packard's (HP) Disk Memory Division (DMD) held a small but profitable piece of the market with its high-performance, high-capacity 5.25- and 3.5-inch disk-drives. Wanting DMD to "become the next printer business for HP", the group's management seized the opportunity to grow by attempting to leapfrog the competition. In June 1992, twelve months after assigning the task to an autonomous project group, HP introduced the world's smallest hard drive. Named Kittyhawk, the 1.3-inch diameter drive had 20MG of storage, the durability to withstand a 3' fall, and low power consumption.

These advantages made the drive seemingly ideal for applications in the burgeoning mobile computing market as well as for increasingly thinner laptops, gaming devices and other new products. The HP project team established productivity and financial goals they deemed reasonable, but by mid 1994, device sales had failed to meet its targets. The team, and its project leader Rick Seymour, met to discuss and determine the future of the project and its technologically remarkable tiny hard drive. Question 1. How successful is HP's disk drive business (DMD) at the start of the case (1990-1991)? How important is the disc drive business to HP?

Is it getting more important or less important? The DMD business is not a successful unit in the eyes of Hewlett Packard, which prides itself on being the market leader for every product it enters. The revenue for this department, at the time of the case had been declining year over year, from a high of \$533 million in 1989 to \$280 million. The business is not important to HP revenue-wise, as it is a niche player in a very crowded field. On the other hand, the unit does allow for some level of halo effect as the leader in high-capacity, fast access drives which are used for high end engineering workstations and network servers.

The unit provided high profits for the division. The division is getting more important, at least from the case readings, as the company wishes to gain traction in the Hard Drive market, where competitors have 10x more revenue. HP was looking at the unit's profitability and technical expertise that would allow it to compete with Seagate and IBM, wondering why " don't we have 20% market share. " The organization believed in innovation fueling

growth, as it was able to do with RISC based processors in the UNIX market while other companies preferred the status quo.

Despite overall rising corporate and DMD revenues, DMD represented a decreasing percentage of HP sales (see linear trend line). [please note that DMD and corporate sales are scaled logarithmically, and the % DMD/Corporate is depicted on its own linear scale] Question 2. The Kittyhawk drive turned out to be a commercial failure. Never-the-less, HP did many things right in its planning and development. List and discuss what HP did right with Kittyhawk. HP did a number of things correctly in its planning and development of the Kittyhawk drive.

First and foremost, the Kittyhawk project had the full support of its senior management. Bruce Spenner, the DMD executive initially driven to expand DMD's market share, first sold the idea to Dick Hackborn, executive vice president of the entire Computer Products Organization. Hackborn agreed with the opportunity and chose one of the options Spenner presented. The case states that Hackborn had enough clout within HP for his approval to make "everyone...fall into line". Even Lew Platt, HP's CEO, frequently visited to check on progress which signaled to the Kittyhawk team, and the rest of HP, the special nature of this project.

Next, HP set up an autonomous group to specifically focus on the Kittyhawk project. The project team was set up physically and financially separate from the rest of the company. This was done because most of the R&D managers balked at supporting the project, despite the endorsements from upper management. The group was given complete freedom to develop the drive,

find the markets the drive would serve, and cultivate the customer base so the project would not be governed by HP's traditional developmental processes which would likely slow the process.

Autonomy allowed focus on the project at hand, dedicated resources, entrepreneurial flexibility of a smaller entity and a barrier from the distractions of working in a large corporate environment. The group had a heightened sense of urgency about the timelines for the project. Realizing that technology does not stand still and that the fierce competitive nature of the market, the group's rationale for delivering the project 6 months ahead of normal standards was very smart as lead times for new technologies were continuing to decline. The Team/Environment approach was clearly something that worked in the development process.

By choosing a program manager from Research & Development as overall team lead, Spenner clearly positioned Kittyhawk as an entrepreneurial and innovative venture. The subsequent cherry picking of the larger divisions' best and brightest "can do" people, screened for not being wedded to HP's cultural biases, further separated the team from the rest of the company. Finally, by asking everyone to first sign the creed "I am going to build a small, dumb, cheap disk drive!" established clarity of purpose (at least initially) and ensured team-member commitment. Those that were not committed were weeded out by this process.

The group also displayed Strategic Flexibility by being able to assess its team goals and reevaluate them as the project progressed. While fatal decisions were made at key junctures throughout the project, the team did

reassess its direction and purpose several times as they realized breakthrough innovations, engaged potential customers and learned new information, and received more stringent timing/financial expectations from Corporate. The team also employed a useable and simple strategy, kept at three bullet points with very succinct meanings and not much room for interpretation as to what the goals of the team were.

Technologically, the team was able to achieve significant innovations. First, a new glass disk substrate was incorporated into the product which had the potential to markedly increase storage space in the future. The newly developed drive required less power, was lightweight, had increased functionality and a new piezoelectric accelerometer allowed for physical drive protection in three foot drops. In terms of manufacturing, the group decided to out-source production to a Japanese company, Citizens Watch Corporation, which had proven expertise in miniaturized devices and available dedicated capacity.

And finally, the team was able to keep to its project schedule, and delivered the project on time and on budget. HP proved smart in attempting to find the potential markets for its product, sending Spenner and marketing teams to trade shows to ask on uses of the drive. Question 3. What do you think of the way the team went about finding a market for the Kittyhawk? What did they do right? What went wrong? If you think there were mistakes, why were they made? The team began looking for a market the right way which was to research the broad electronics industry, understand companies' future product plans and discuss Kittyhawk's vision with those companies.

They also correctly engaged with different, even new, markets from HP's usual customer set such as mobile computing and gaming. These were businesses that might more readily recognize the value of Kittyhawk's disruptive technology and, evolving themselves, might be in a better position to quickly incorporate the product in to their own design/manufacturing plans. DMD was able to segment the market and determine which areas were best suited for the Kittyhawk's drive and financial goals.

The team also gained input on additional requirements for the disk-drive from these discussions. Unfortunately, the team made many mistakes too. The group ignored desktop and notebook computer sections of the show. They pursued mobile computing, benefits being that the industry was new itself, so there were no established specific component standards. The issue here was a very uncertain time to market and consumer demand. The team decided against addressing the identified need from Nintendo, which was exactly Kittyhawk's original signed creed of " a cheap, small disk drive! as well as a listed strategy of the group, " sell you a drive for \$49. 95. " They did not listen to very market that needed them immediately, and instead tried to move even further upfield with a new and unproven market of PDAs, which themselves were beset by technical issues DMO hired a market research firm specializing in high-tech markets. This was the right thing to do, but the issue was that the product was so revolutionary that the research firm could not generate any leads or demands from customers.

The research firm then began talking more to the HP engineers, to find demands and usages for the product, which invalidated their results, since they were in essence rehashing the findings from the Consumer Electronics

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show. Another mistake was that DMD didn't realize this disruptive technology might have to wait for a market to develop. Existing and other traditional customers would be loathe to quickly adopt a disruptive technology due to their investments in sustaining technologies.

New and non-traditional customers might be interested but may not have either the capability/resources to initially use Kittyhawk or might serve niche markets themselves making them less attractive to HP. The biggest mistake DMD made was setting goals in a project charter for a disruptive technology. Without assessment of the potential market or understanding their customers, the team set about a goal of \$100 million revenue in two years and breakeven in less than 36 months, and to achieve revenue growth of 35%!

This is preposterous to do when you do not even know what your end product will look like. You pigeon hole yourself into decisions that may not prove fruitful outside of "making the numbers" which is what exactly happened here. Had the Kittyhawk team just used the initial creed, it would have produced a usable drive for the current market, and then been able to gain more traction as customers became aware of the product, and bring out new versions which could address other segments and markets.

With the numbers and growth rates listed, the team had to make big and risky bets on new technologies, expecting the new technologies to hit exaggerated growth rates, rather than take the volume leader that would not necessarily provide the revenue goals. The final straw was when the team decided in their minds that they could not build a disk drive for less than

\$130, which was the industry norm for manufacturer's costs. They lost sight of being the visionary product on the new hill because of this thinking.

Question 4. All engineers on the project signed a statement saying, " I am going to build a small, dumb, cheap disk drive".

Why didn't they? The development team was assembled specifically with the idea of bringing a product to the market that would not only be innovative, but competitively priced. The main motivation of the executives leading the project was to develop a product that would grow faster than the market and propel HP to the level of industry leader. Thus, Kittyhawk was to have been a disruptive technology. However, instead of ending up with a text-book disruptive technology that should have been priced at \$49. 95, the team instead positioned it as a sustaining technology at a \$250 price point.

The reason for this is fourfold. First, and foremost, pressure to meet financial goals of break-even in 36 months and a \$100MM revenue rate two years following launch was a huge contradiction with the concept of the cheap, dumb disk drive. Secondly, after performing their market research, the team chose the mobile computing market as its primary focus. This market segment is comprised of customers with upscale needs, such as the ability for the drive to survive a 3 foot drop without losing data, rather than a segment with basic disk drive needs that assure a cheap price.

Third, despite having taken " the oath", this should not have been particularly surprising inasmuch as the HP culture was high-end technology driven. Although the team was isolated from the rest of the DMD team physically, it was impossible to take the deeply rooted DMD culture out of its

employees. In addition, despite being dedicated to the credo philosophically, the team leaders at some point in the project lost focus on the ultimate goal and team oversight and direction suffered as a result.

Lastly, the team became jaded in thinking that a disk drive could not be produced for less than \$130, which they claimed was the “cost floor” and they did not want to pursue the research to move this floor down. Question 5. Near the end of the case the Kittyhawk team generated three alternatives for the future direction of the project. What were they? What were the pros and cons of each. Which if any would you have picked if you were a decision maker? As it turned out, HP chose to shut the project down altogether. Do you agree or disagree with that decision? Given the shutdown, predict HP’s future in the disk drive business.