4

Business Strategy Development

Starting with this chapter, we will expand on the IBSP shown in Figure 3.1. Wherever applicable, we will draw upon the lessons developed in Chapter 2.

This chapter will address what is often the most difficult—and often short changed—part of the IBSP. An enthusiastic and genuinely fired-up team, full of entrepreneurial spirit, develops a concept or an approach and is extremely keen to start implementing it, lest the delay allow competition to enter the market first. Often, the founder team members may have left a safe-haven career in an established company and are in a hurry to vindicate their midlife risky decisions by quickly implementing their new project. In short, they are extremely keen to get out of their basement or garage office and make their dream company a reality!

So what is wrong with genuinely enthusiastic entrepreneurship? Nothing in principle; however, rushing to implementation (assuming there is funding, of course) can often be accompanied by a tendency to see only the positive external factors and to ignore the inevitable warning signs out there.

The portion of the IBSP that captures the critical activities prior to implementation starts with the mission and goes up to the development of business strategy. Figure 4.1 presents an expanded view of these elements, which are the subject of this chapter.

Mission

Mission is what the whole company or enterprise is about. Unfortunately, mission statements are often seen as some kind of window dressing for the top levels of an organization, to be pulled out of the drawer only when visitors come to

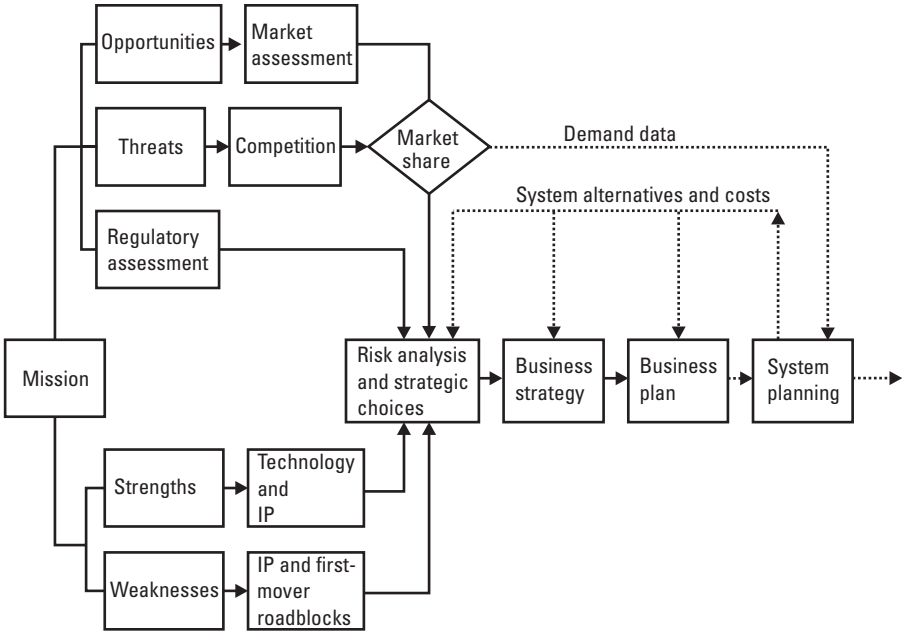

Figure 4.1 Strategy development process.

meet senior management and to be forgotten thereafter. Often, except for the core assistants close to the top management, most of the staff often does not even know what the company's current written mission statement is. This situation is often symptomatic of the lack of congruence between how the top management and the working level staff see where the organization is headed.

Even in well-run and tight-knit organizations, until recently, mission statements have deliberately been kept as general as possible, perhaps to give top management enough flexibility to make changes in the company's direction without having to coordinate every time with the different stakeholders in the company. However, this approach is gradually giving way to make the mission statement as clear and specific as possible. This is particularly true for new ventures directed at a specific market or designed to exploit a specific technology or intellectual property as a first entrant in the market.

According to Gray and Larson [1], "the mission identifies what we want to become or the *raison d'être*… a written mission statement provides focus for decision-making when shared with managers and employees. Everyone in the organization should be keenly aware of the mission."

Aaker [2] compares the need for a clear mission statement for a company with the types of questions we are all faced with in our childhood about our future, both in our own eyes as well as in the eyes of the society around us. He

advises that "the mission should be conceptualized as a dynamic rather than a static construct… with a dynamic focus the mission will be a better vehicle to generate and screen strategies." In other words, a mission statement has to capture the essential reasons why a company exists or wishes to exist.

Wickham [3] has put together in one place a large number of business case histories that cover practically the whole canvass of situations that businesses in different industries can expect to encounter. Accompanying these case histories are clearly developed summaries of the basic underlying principles for strategy development and decision making. According to Wickham [3], a mission statement should be a "simple, easily remembered, impactful statement which defines the business's role in the world and what it wishes to achieve in the way of success."

A good mission statement has to clearly recognize and demonstrate who the company management is working for. As the age-old saying goes, "the man who pays the piper calls the tune"—in other words, as long as you keep the investors happy (whether private investors or the stock market at large), the common perception is that you are fully responsive. However, investors are not the only principal stakeholders in the broader sense of the company's mission. It is also equally important to recognize the company's customers as well as the employees as critical stakeholders. Wickham [3] adds to this list the company's suppliers and the government and wider community in which the company carries out its operations.

So what should a good mission statement include? Here the references quoted earlier have a large degree of commonality. Gray and Larson [1] identify its traditional components as major products and services, target customers and markets, and geographical domain; frequently, these could also include organizational philosophies, key technologies, public image, and contributions to society. Wickham [3, 4] emphasizes the scope of the product and its markets, how the company intends to compete, and the company's overall aspirations and values.

These lists might give the impression that the mission statement should be long and wordy. That need not be the case in almost all situations. What is important is that such a statement should be specific, not vague, and should clearly summarize the management's unambiguous sense of defined goals and objectives as well as its commitment to achieve them.

A remarkably short, yet quite responsive, example of a good mission statement was provided recently by David Weaver, a student in the author's class on project management for his class project [5]:

> To increase MobileMemory's market value in the Americas by providing our industrial and government customers with simple, secure, mobile data repositories produced by a team of dedicated and satisfied employees.

Weaver went on to explain [5] that the mission statement addresses the shareholders by increasing MobileMemory's market value. It addresses the customers by mentioning new markets. It recognizes the employees' dedication as well.

Environment Analysis

A good mission statement and its goals and objectives set the stage for developing strategic choices from which a sound business strategy would emerge. In order to arrive at the applicable strategic choices for a particular mission, a series of critical analyses need to be carried out, as shown in Figure 4.1. Following the mission, on the top are shown what were collectively called in Figure 3.1 *external environment factors*, while at the bottom are typical *internal environment factors*. A careful analysis of each of these factors, *interactively with other IBSP functions*, should generally lead to a balanced set of strategic choices.

External Environment Factors

The external factors shown in Figure 4.1 are what could be called *micro-environment* factors. In addition to these, there are other broader sets of *macro-environment* factors related to the business, political, and social environment in which the company has to operate. The latter can vary quite a bit in different parts of the world and in their impact on different industry segments. They can of course also change as a function of time (e.g., as a result of government policies). Such policies can often change in the middle of major long-term projects, causing complications of varying degrees. For satellite-based systems, the more important macro-environment factors can include interest and exchange rates, taxation and tariff polices [3], and all shades of restrictions on the release of product documents for national security reasons. Many of these factors can impact the actual cost of the project. In some cases, they can favorably or adversely impact the market being targeted. For example, changes in import tariffs can significantly change the cost of the DTU consumer equipment, which may in turn impact the market forecast itself.

We will now consider the other external factors shown in Figure 4.1.

Market Assessment

In each field, some market segments are relatively steady and established. In many cases, they follow commonly accepted standards, which can give them a flavor of a commodity business wherein price, availability, and QoS become the main distinguishing factors between various suppliers. In such steady fields, the market analysis is also relatively static and may not materially change over

the duration of a project for a new entrant. This is true to some extent for the satellite transponder-lease business, although newer satellites can sometimes have a marketing edge via higher power and better performance.

At the other end of the spectrum are those market segments where either a brand new or at least relatively new service is planned to be offered. In a completely new market segment, it is not uncommon for each entrant to have his own proprietary equipment, partly because there is no industrywide standard yet. Once a new company has some success, it in fact resists any standardization because it might lose its marketing edge and wishes to avoid becoming a commodity. In general, the huge and fairly homogeneous market in the United States tends to favor such an approach, although the recent experiences with *wi-fi* wireless and the cable modem standards are convincing evidence of the long-term benefits of standardization through rapid expansion of the market size.

For a new entrepreneur, a proper and thorough market assessment is absolutely essential, preferably by a totally independent source in order to avoid any risk of the founding group even unwittingly biasing the results toward their own perceptions or desires. Such an assessment should try to define not only a possible market share but also its sensitivity to timeframes, particularly with regard to any concurrent developments underway in competing alternatives. It should also include estimates for the likely costs related to customer acquisition and associated churn rates.

A market that has been around long enough to provide some useful lessons is the home television market. In most regions, the market for domestic television first evolved through local VHF/UHF transmitters or through what is known in the United States as network television. When cable television systems enter such a market, they see the total market as the sum of the networks' market plus the new business they expect to bring in through a much larger number of television channels, in the process creating market segmentation for the first time through specialized channels. The cable systems' success depends on a minimum number of free over-the-air users who are willing to switch and pay monthly subscriptions for their cable service, primarily for the specialized channels and in many cases for better reception quality. If this process for the entry of the cable systems is reasonably successful, there is a net increase in the size of the overall market pie and the associated advertising revenues.

Taking this scenario one step further, let's now examine the impact of the entrance of a direct satellite broadcast system or DTU-TV into this hybrid market of network and cable television customers. After some marginally successful attempts, significant and measurable impact was made by satellite-based systems only when they could provide high-quality channels in sufficiently largely numbers, not only in underserved rural areas but also right in the markets dominated by cable systems. This has led to the current mature stage of the television

market wherein three different media—the networks, cable, and satellite systems—provide competitive services to largely overlapping audiences. How long will this plateau last? On one side, there is uncertainty about the future conversion of VHF transmitters to high-definition television (HDTV) or multiple digital channels; on the other, there is the real prospect of optical fibers eventually reaching most homes, thus unleashing huge bandwidth for a range of multimedia services. The satellite systems too are making big bets on Ka-band, hoping to hold on to their shares in the new mix of the future.

Apart from television, the other growth areas for the satellite medium are radio, broadband, and possibly mobile [6]. In all of these markets, there are competitive media, and the same basic principles for market assessment apply.

Growth Through Integration and Consolidation

We have so far considered the overall market size potentially increasing by the addition of new media and technologies. From the perspective of an individual entrepreneur, there is another way of increasing business. This is by expanding her activities in the overall value chain, as briefly touched on in Chapter 1. Such value chains can provide opportunities for growth through different types of integration and consolidation. Figure 4.2 shows a television value chain, adapted from a more generic value chain described by Wickham [3]. As he explains, in principle, there are two basic approaches for expanding the role in the value chain.

Horizontal integration means enlarging the size of the market share through the acquisition of a competitor. Assuming such an action is allowed by regulators (which generally means that there is still credible competition in the marketplace even after the proposed merger), such integrations are only successful if they create synergy of one kind or another. Synergy can be realized in a number of ways. It could mean pooling of capital-intensive resources (e.g., fewer satellites to procure). Or, it can enable standardization of equipment, thus lowering costs for all, including customers. While it is not always the case, too rapid an increase in size through acquisitions can create cultural problems within the organization, leading to widespread inefficiencies and demoralization.

Vertical integration can be of two types, as shown in Figure 4.2. Backward integration is when at least one supplier in the chain is acquired. Similarly, forward vertical integration refers to the acquisition of follow-on activities. Either type of such integration is beneficial if it makes the interfaces between successive blocks of activities more efficient. This process can, of course, be carried out as far as the ultimate one-stop shopping scenario, providing so to speak the *cradle-to-grave* service. One example could have been the recent merger of America Online (AOL) and Time Warner, wherein the largest Internet connectivity provider, AOL, merged with one of the largest content providers, Time Warner. Unfortunately, subsequent events unfolded quite differently, and the

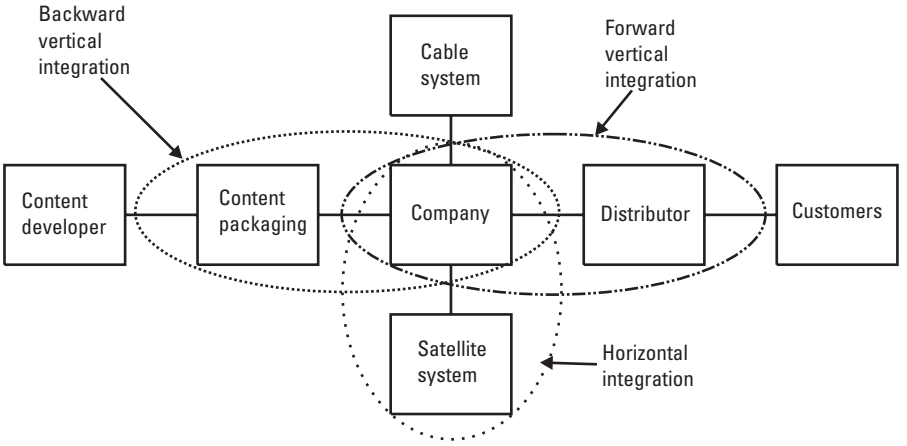

Figure 4.2 Horizontal and vertical integration. (*From:* [3]. © 2000 Pearson Education Ltd. Reprinted with permission.)

merger has not so far produced measurable synergy. In general, the key to success in such consolidations is the talent of the management team. If the top management team does not simultaneously broaden its talent, the chances of failure increase.

Closer to home, a good example is to review how the television services using satellites have evolved, as captured in Figure 4.3, which was adapted from Figure 1.2. For a considerable period, for a combination of regulatory reasons and technological limitations, the role of the satellites was limited to providing a pipeline from the content provider to the local transmitters. While such a *pipeline* role provides steady revenues with modest risks, it captures only a small portion of the overall end-to-end revenues of the value chain.

The first attempt to expand the value chain was to try only a forward vertical integration by leapfrogging the local transmitters and going directly to the eventual customers. This was not commercially successful, largely due to a limited number of channels and no control on the content provision. Once the number of channels was increased, commercial success is being achieved in two broad modes: forward vertical integration only, as in (b), and both forward and backward integration, as in (c).

Competitors

A thorough analysis of the competitive landscape should be based on all of the providers for the end services and not of only those entities within the same medium or technology being targeted. As an example, an enterprise planning to providing television broadcast via satellites has to look carefully at the strengths and weaknesses of all potential competitors providing such services and not just

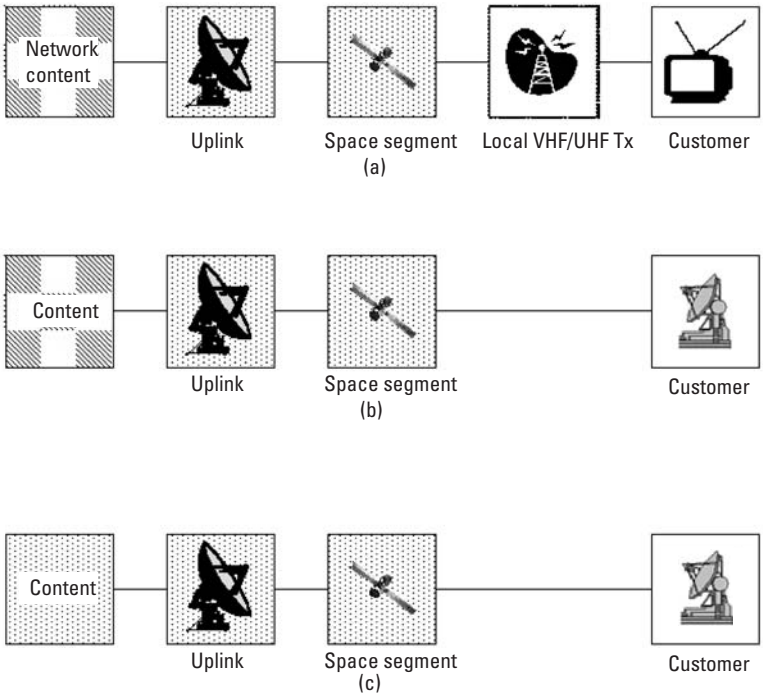

Figure 4.3 Progressive vertical integration in television services: (a) distribution mode, (b) direct broadcast without content control, and (c) direct broadcast with content control.

those using satellites. In an open and balanced marketplace, the consumers are only interested in the end service and generally have the savvy to weigh the relative merits of all providers across the different means of providing such services.

Once all of the competitors have been identified, a thorough and dispassionate analysis must be carried out to identify and confirm whether there is indeed room for another provider. A positive decision can be based on a combination of genuinely unfulfilled demand as well as on the attractiveness of the technology being offered by the new entrant. One common and often costly mistake new entrepreneurs make is to underestimate their own costs in comparison with the established providers. This can very often be due to incomplete appreciation of all costs involved in the early startup phases. Frequently, the founding members fail to recognize that once the project gets off the ground, several of the activities move from the basement/garage model to full-scale operations that involve significantly higher costs. Often there is a mindset that because their new technology is superior, other entities up and down in the value chain would be willing to absorb some of the costs in order to gain entry in

their teams. A safe and mature approach is to thoroughly identify all cost centers in a fair and totally unsubsidized manner, if necessary with the help of outside experts with operational experience.

What has been said for costs is even more applicable to potential revenues, as these are often largely beyond the direct control of the entrepreneur. Once again, it is very risky to assume that the competitors would be willing to "play dead" and let a new kid in the block eat their lunch with his fancy new technology. One of the most difficult periods for a company is the first months and years just after the service is introduced. More often than not, the revenue streams take longer to materialize, the costs are rising, the competitors are holding onto their share with fresh discounts, and the investment community is rushing to judgment—or so it seems!

Regulatory Environment

For all satellite-based systems, particularly for those starting a new enterprise, regulatory environment is often the first major hurdle to be crossed. Depending on the type of services planned, such assessments are often required in four categories: spectrum, service, ownership, and international systems.

Spectrum Considerations

Availability of the necessary spectrum over the market area is of course an essential requirement for any satellite-based project. It is not surprising, therefore, that competitors already in the field often resort to creating strong barriers to entry for new entrants by capturing as much of the available spectrum as possible and at the earliest opportunity.

The severity of spectrum-related hurdles a new entrant may encounter depends to a certain extent on the types of services planned and the preferred mode of operation. If the planned service can be provided via leased transponders, in most parts of the world it is feasible to obtain such space segment resources at competitive prices from multiple operators at C- and Ku-bands. To a certain extent, this may also be the case for television broadcast, except for the developed markets where all of the "planned" subbands or transponders for such services are already in use. If a complete satellite capacity is an absolute necessity, the options in most markets are either acquisition or merger with an existing C- or Ku-band operator or utilizing Ka-band if that is appropriate for the planned service.

For mobile services and digital radio, operating at L- and S-bands, the applicable constraints are somewhat different. For digital radio, the overall orbital capacity is relatively quite small in view of the extremely small user antennas with wide beamwidth. Therefore, the barriers to entry can begin to apply fairly quickly once one or two systems begin operations in a region. Mobile systems also operate in the same bands and hence have similar

constraints. However, they are resorting to a very high degree of frequency reuse in order to increase the overall capacity.

In summary, in the strategy-development process, the viability of most options is likely to be closely interlinked with spectrum availability over the target markets; such issues should therefore be tackled very early, bringing to bear all of the relevant technical knowledge and regulatory expertise.

Service Policies

Most countries have regulations that govern provision of services of different kinds. In the case of satellites, initial reservations about broadcasters directly reaching the homes, possibly with messages with political or religious implications, delayed the introduction of such services. In some countries, certain types of advertisements, such as for liquor or cigarettes, are not allowed. There can be also requirements for satellite systems to cover rural and other underserved areas.

Ownership

Most countries have restrictions of some kind on foreign ownership when it comes to practically any type of broadcasting. There can also be provisions to encourage part ownership by persons from certain specific segments of the society.

International Systems

All of these factors get multiplied severalfold for international systems, particularly if some kind of broadcast is involved. Fortunately for satellite systems, this difficulty was recognized almost at the outset of the evolution of this technology and viable legal frameworks were established. These led to the creation of INTELSAT and subsequently several other similar organizations, such as Inmarsat and Eutelsat. Member nations of such consortia provided what have come to be known as *landing rights* in their countries from the satellites owned jointly by these consortia. In exchange, all nations, big and small, were assured a responsible management of not only their investments but also the content beamed over their land masses.

The critical importance of these agreements was recognized by other private entities as they established similar links. Notwithstanding the value of such agreements, they have by now all been abandoned as part of the global privatization of telecommunication and related assets.

Internal Environment Factors

These are essentially the strengths and weaknesses of the company and its management team. For an existing company, a new enterprise can draw upon the resources throughout the company provided there is top-management support.

Often there are overt or covert rivalries between different divisions and groups, and it takes sustained effort to bring to bear the best possible resources on the new project.

For a new enterprise, the strengths and weaknesses are those of the management team and its financial and strategic backers. There can be a large variety here. On one extreme, the management team has the experience and wisdom to understand its limitations and acts accordingly. On the other extreme can be overenthusiastic entrepreneurs, who are so enamored by their "technology" that they only pay lip service to other aspects of the business. In fact, the classic saying seems to keep on proving itself in such situations: "they do not know what they do not know" and often their sense of hubris prevents them from searching for areas of their weaknesses in terms of understanding the business. Warren Buffet, one of the most successful investors of our times, drives home the importance of a good management team when he says, "Buying a retailer without good management is like buying the Eiffel Tower without the elevator" [7].

As we have already seen—and will continue to see throughout the book—success requires many disciplines working together in a coordinated manner. This is essentially the genesis of the IBSP. A team with the maturity and sense of responsibility to ensure that all of its components are adequately addressed has a much greater chance of success.

Intellectual Property

In the current highly competitive, and unfortunately overly litigious society, it is becoming increasing critical to protect the company's future through appropriate legal safeguards in the form of patents and copyrights. One of the worst situations a new enterprise can find itself in is that by the time it has obtained the funding and done successful field trials, an established company providing similar service and feeling threatened by the new venture has quietly put up legal barriers through patent applications.

A new enterprise in search of funding has to peddle its ideas to investors of all shades. In this process, it is not inconceivable that the ideas and approaches of the new company can be hijacked by others who have adequate funding to rush to the gate much earlier. It is therefore very prudent that the very first funding be devoted towards protecting the intellectual property.

Strategic Choices and Risk Analysis

With a well-defined mission statement in hand, and a good grasp of the environment in which the business has to operate, the management team is now equipped to identify a short list of viable strategic choices. Each of these choices is likely to have different sets of attributes—some obvious and others somewhat

latent. One of the temptations that the management team has to work hard to resist is to push personal favorites. Rather, a careful and dispassionate analysis should be carried out to pick the winner. A good way to start this pruning process is to carefully develop and profile relative risks involved in all options on the table.

Risk Factors in Satellite Systems

Ventures involving space technology have traditionally been considered riskier investments compared to other technologies in telecommunication and broadcasting. This is primarily due to the technical risks of launching a satellite or similar payloads into space—the satellites not only account for a major part of the capital investment, but under present-day technology, once the spacecraft are in outer space, they cannot be repaired or even serviced.

Because of this overriding and *visible* risk in satellite systems, it is not uncommon for all other risks to receive less attention than they also deserve. The fact remains that, like most other businesses, there are risks beyond technical risks for satellite-based systems. In fact, we can recall that several of the expensive lessons captured in Chapter 2 arose from nontechnical risks. What is needed is a balanced risk management discipline that permeates all activities in a coordinated fashion. The following paragraphs provide an overview of three major categories of risks: technical, market, and organizational/financial.

Technical Risks

Satellite and launch-vehicle engineers can justifiably claim to have developed sound principles and methodologies for identifying and retiring risks at all stages of such programs. Their painstaking efforts and procedures have progressively improved the reliability and availability of in-orbit assets. Once the satellites have successfully been launched in their appropriate orbit, most of them operate satisfactorily for extensive periods that are no longer controlled by hardware failures, but rather by the amount of consumable stationkeeping fuel onboard. Concurrently, the success rate of launch vehicles has also continued to improve.

This success in controlling and managing technical risks is even more credible when it is recognized that concurrently newer technologies have been introduced to enhance the in-orbit capabilities in a variety of ways. This has been essentially achieved through a judicious mix of rigorous qualification requirements at all stages and redundancy and other fail-safe features throughout their products. A single-point failure is an anathema for engineers of any stripe in this field.

An inherent component of technical risk is schedule risk, particularly for the space segment. Any new technical risk identified during the program often requires additional tests, delta qualifications, and sometimes new components,

materials, or designs. Of course, schedule risk can also translate to market and financial risks in a majority of cases.

However, several satellites have in recent years encountered in-orbit failures to a much larger extent than before. It is debatable whether this is a result of excessive cost cutting, pushing the envelope too far too fast in terms of spacecraft capabilities, or a combination of both factors. The net result has been an extraordinary increase in insurance rates. These issues are serious and are leading to major efforts for quality improvements and increased involvement by several customers in the monitoring of spacecraft programs.

Market Risks

As we have already seen in Chapter 2, market risks can be more critical for DTU systems than for the more traditional satellite systems. The salient points are recalled here:

- Transponder leasing still accounts for a sizeable part of the total global space segment. Thanks to a fair degree of standardization, such transponders can switch from one type of service to another. Therefore, once a particular orbital location has acquired a critical mass in terms of antennas accessed, the satellite operator tends to build space assets to fill the available spectrum at that location as efficiently as possible rather than to fit a certain demand model.
- For DTU consumer business, market data can be much more critical. Of course, its criticality plays out in different ways for different DTU services. In most of the DTU services, satellite systems are competing with other technologies. In such situations, the market share that can be captured is not only price sensitive but also time sensitive.
- For satellite broadcasting systems, the satellite size and cost do not increase with an increase in the number of viewers or listeners. Instead, it is entirely controlled by the number of satellite channels broadcast, receiver sensitivity, and coverage area size. In that context, market data can have a time sensitivity when seen in the context of what competition is providing. As new entrants come in, their content and extent of local channel broadcasting have to be matched. As cable systems switch to digital operation, for example, they begin to match qualities and start offering bundled services that cannot be easily matched.
- For the new and still evolving satellite radio broadcasting market, the successful emergence of competition and alternative technologies (e.g., IBiquity) can create new elements of market risk unless the system has enough agility to match the new offerings.

- For two-way broadband satellite systems, the capacity needs for the millions of return uplinks coming from small dishes, if not properly anticipated, can well become risk factors for the market share.

Financial Risks

To a degree, most technical and market risks translate into financial risks. Technical risk surprises can lead to increased material and manpower costs, ad hoc architectural changes, and schedule slippages, with some or all of which leading to increased financial risks. Even in fixed-price contracts, while the increased costs are to be borne by the contractor, the schedule slippages can translate to market risk for the customer.

Sometimes, the technical risks impacting the program can be completely out of the control of the customer and the spacecraft contractor. A common example is launch failure in a different program, which can often lead to schedule delays and increased insurance rates for all parties using the same launch vehicle series.

Market risks flow through to financial risks much more directly. If the target audience size is not realized according to the business plan time profile or the target market share is captured by another competitor, the resulting decrease in revenues can lead to serious financial problems.

Of course, there are risks within the financial management of a project as well. A common financial risk is overspending. This can arise from a variety of causes, such as unexpected inflation, poor or inadequate competition in procurement processes, and top-heavy administrative and monitoring functions. Financial risk can also arise from poorly structured financing terms, which are more susceptible to changes in external factors in the financial world.

Risk Profiling

Figure 4.4, adapted from [8], is a good example of bringing together different types of risk factors in order to develop the overall risk profile for a particular option. In this figure, organization risks are also included as part of the box on financial risks. The three boxes list some representative factors that may apply to typical options. However, different options can and often do have different sets of factors in different categories of risks. Such profiles, with as much quantitative backup data as possible, can be useful in comparing different strategic options and choices.

Narrowing Down the Strategic Choices

Once the external and internal environment analyses have been completed and the risk factors thoroughly analyzed, the stage is set for the formulation of a

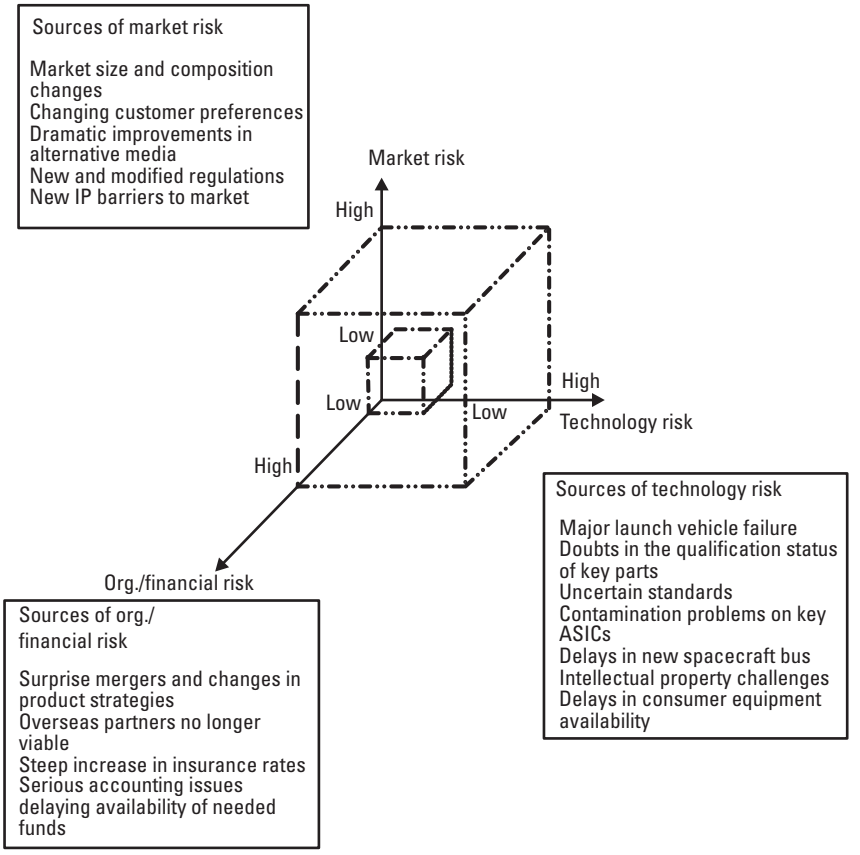

Figure 4.4 Risk profiling. (*From:* [8]. © 2000 John Wiley & Sons, Inc. Reprinted with permission.)

short list of strategic choices. These choices should be developed through a team process where no preconceived direction or favorite choice is imposed from the top. Rather, the process should let the chips fall where they may. In an extreme example, if the answer is that a satellite-based solution is not the right answer, that should be accepted and a mature decision made whether to exit the market altogether or to adopt an alternative solution.

After a short list of viable options is available, the top choices should be critically examined through a set of filters of the type suggested by Wickham [3]. The following paragraphs illustrate the use of these filters from the perspective of satellite-based systems wherever applicable.

- *Consistency.* The option should be consistent with the objectives of the mission statement. It should be challenged to deliver the planned set of services to the chosen market segment *at the target prices.* The

temptation to implicitly modify the objectives due to a fascination with a technology or market should in general be avoided. If what is learned in this process is indeed attractive as a business strategy, the mission should be revisited and revised.

- *Attractiveness.* Will it provide the minimum return on investment planned and within the total investment planned? Will the services offered attract the audience in the planned numbers?
- *Acceptability.* This filter goes beyond attractiveness. Will the current and future investors and stakeholders accept it as a viable business with which to be associated? Will it attract the right talent as employees? Will the suppliers in the value chain accept it as a basis for becoming a long-term partner?
- *Feasibility.* This includes not only technical feasibility, but also the limitations of the management team in terms of the depth and breadth of its capabilities. A positive score against this filter should be predicated on feasibility of building the system *within the market window time frame.*
- *Validity and vulnerability.* This captures the importance of underlying assumptions applicable to all aspects of the program. In essence, how sensitive are the chances of succeeding to the underlying assumptions? What happens if the market forecast turns out to be wrong? How fungible is the system to switch markets halfway through implementation and recover at least part of the investment? In the context of satellite systems, how dependent are the major components on the completion of another project (e.g., qualification of a new spacecraft bus, success of a new launch vehicle, or acceptable yields of advanced ASICs within the power consumption for the receivers).

Selected Business Strategy

The final outcome of the part of the IBSP discussed in this chapter should provide a plan of action to meet the objectives of the mission of the enterprise. That is what a sound business strategy is supposed to do. Obviously, there is no sure way to absolutely predict the future; however, a good management team minimizes the risks of failure by following a systematic process of the kind described in this chapter and by learning from past experiences, both good and bad.

The selected business strategy will form the basis of a business plan, which we will address in the next chapter. Before we do that, we list a few specific questions relevant to our industry that should have been conclusively answered by now:

1. How reliable is the market forecast? Is it likely to change downwards with time or with the emergence of alternative means of providing the same or similar service?
2. Is the market forecast quite sensitive to the price and subscriptions to be borne by the ultimate consumer? What is its sensitivity to higher prices in one or both of these categories?
3. Will your system meet the price targets? What is level of uncertainty in your cost estimates for the total infrastructure and operations?
4. Does the consumer equipment exist in the market? If not, will it be proprietary to your system? What is your confidence level that you can meet the price and schedule targets for this equipment?
5. What percentage of your satellite is based on available production lines, and how much has to be custom designed for you? What is your confidence level in the cost estimates and schedule reliability?
6. What percentage of your overall system is fungible and can be utilized for other services if your markets do not materialize to the extent planned? Do you have fallback options?
7. Are you planning to vertically integrate the entire operation from content to customer service? Will this be based on partnerships with established firms or are you planning to create the entire chain in house?
8. Are there any regulatory uncertainties still unresolved? Can they become show stoppers midway through the program?
9. What is the competence of your founder-management team? Is it overly satellite centric? Is there sufficient importance given to the ultimate consumer in your internal decision-making process?

Before closing, we present two case histories for discussions around the principles presented in this chapter. The first case history documents how sometimes a high risk pays off. However, its outcome was not known in the beginning. The second case history summarizes the background for a project that has been discussed for a considerable period. The summary poses some questions for discussion.

Case Studies

Case History 4.1: Rene Anselmo's Gamble

It was the early 1980s, and the world of international satellites was dominated in most parts of the world by Intelsat, an international consortium of nearly 100 countries at that time. Several nations and individual companies were

domestic systems; however, it was very hard to penetrate the international markets because the INTELSAT's owner nations were also generally its customers as well.

Rene Anselmo, a successful broadcaster, was determined to break what he considered to be a "market stranglehold" of treaty organizations and their signatories. He managed to get a license to operate a separate satellite system and risked his personal fortune to build it. Within the limited funds he had, he decided to start with a bargain basement single satellite and signed up to launch it at an equally low rate offered by a brand-new launch vehicle, Ariane. Fortunately for him, the launch was successful and thus was born Panamsat, currently the world's fourth largest international satellite system.

As a business strategy, Anselmo's was a high risk one from several considerations. The marketplace was largely controlled by government-owned telecommunication operators who had vested interests in INTELSAT through their long-term investments. It was equally risky to start with a single satellite and then launch it on an unproven launcher in exchange for a low promotional price. However, the payoff was that of a complete value chain from customer to customer rather than revenues from only part of the chain, such as leasing transponders.

Anselmo's strategy worked partly because he was lucky with his first launch. His dogged determination (pun intended with his Dog Spot letters and commercials!) did accelerate the opening up of the marketplace to private entrepreneurs all over the world.

Looking back, was the Anselmo business strategy correct or too much of a roll of the dice? Did he properly take into account all environmental issues? Were there other alternatives?

Case History 4.2: Iridium System

It was the late 1980s, and the first optical fiber cable TAT-8 had just started operating across the Atlantic, challenging the so-called complacency of the satellite systems market leaders, including INTELSAT and Inmarsat. The manufacturing side was also dominated by a few long-term incumbents led by Hughes Aircraft and a few others.

Motorola was a giant in the mobile phones field but had no visible presence in the satellite field. It was time for a bold entry, and Motorola did just that with a revolutionary proposal to build a global mobile satellite system using a large number of satellites in LEOs. The unique attribute offered was much smaller time delays and instant connectivity via mobile phones literally from anywhere to anywhere on the surface of the Earth.

The process of building the system was as historic and trail blazing as the system concept itself. Regulatory approval was obtained from the International

Telecommunication Union (ITU) after a major campaign at government levels and funds were raised internationally, with the dual benefit of gaining access and spreading the risks. The construction of the system with 66 satellites interconnected by direct links was begun in 1990.

After more than seven long years, the system was finally completed, establishing several novel advances in system design and satellite manufacturing in the process. The user equipment took a little longer to arrive, and, when it did arrive, it was unfortunately too bulky, very costly, and initially had serious performance issues.

The story from then on was all downhill—on a steep slope. The more than $5-billion, truly revolutionary system filed for bankruptcy in 2000. It is now operating on a much smaller scale, mainly for strategic government services. There are no public plans to build the replacement when the satellites begin to die around 2013.

So what went wrong? Most of the satellite community came with a quick diagnosis: LEO systems were no good and needed too much money to get started. This was chilling news indeed for the satellite and the launch industries, as they had expanded their capabilities severalfold in anticipation of additional new multisatellite nongeostationary systems. This excess capacity is even today haunting the industry, exacerbated by the more recent telecom meltdown.

The spectacular rise and fall of the Iridium system will obviously be debated for a long time to come. It is unlikely that there will be consensus on precisely why it failed. This is mainly because, for a complex system, failure just like success is very hard to pinpoint to just one or two factors. The teams that conceived and implemented the project were a group of dedicated and experienced individuals and companies around the world. In author's opinion, despite Iridium's failure, there are a lot of merits in LEO-system concepts. Discarding LEO systems would be equivalent to the proverbial "throwing the baby out with the bath water." The following questions are provided to stimulate a discussion in the context of this chapter:

- Was the system development process too satellite centric? Did it not give adequate importance to the consumer equipment first? Had it done so, would the outcome have been substantially different?
- When the Iridium project started, the cellular industry was still in its early stages of development. If the Iridium system had gone into service much earlier than it did, with competitive user handsets, would that have altered the final project outcome?
- Would a much lower cost of service have created a critical market niche for this system?

- Should future satellite mobile systems abandon the LEO approach due to its high starting investment?

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