



## Luxor Technologies

Between 1992 and 1996, Luxor Technologies had seen their business almost quadruple in the wireless communications area. Luxor's success was attributed largely to the strength of its technical community, which was regarded as second to none. The technical community was paid very well and given the freedom to innovate. Even though Luxor's revenue came from manufacturing, Luxor was regarded by Wall Street as being a technology-driven company.

The majority of Luxor's products were based upon low cost, high quality applications of the state-of-the-art technology, rather than advanced state-of-the-art technological breakthroughs. Applications engineering and process improvement were major strengths at Luxor. Luxor possessed patents in technology breakthrough, applications engineering, and even process improvement. Luxor refused to license their technology to other firms, even if the applicant was not a major competitor.

Patent protection and design secrecy were of paramount importance to Luxor. In this regard, Luxor became vertically integrated, manufacturing and assembling all components of their products internally. Only off-the-shelf components were purchased. Luxor believed that if they were to use outside vendors for sensitive component procurement, they would have to release critical and proprietary data to the vendors. Since these vendors most likely also serviced Luxor's competitors, Luxor maintained the approach of vertical integration to maintain secrecy.

Being the market leader technically afforded Luxor certain luxuries. Luxor saw no need for expertise in technical risk management. In cases where the technical

**Exhibit I. Likelihood of a technical risk**

Event	Likelihood Rating
• State-of-the-art advance needed	0.95
• Scientific research required (without advancements)	0.80
• Concept formulation	0.40
• Prototype development	0.20
• Prototype testing	0.15
• Critical performance demonstrated	0.10

community was only able to achieve 75–80 percent of the desired specification limit, the product was released as it stood, accompanied by an announcement that there would be an upgrade the following year to achieve the remaining 20–25 percent of the specification limit, together with other features. Enhancements and upgrades were made on a yearly basis.

By the fall of 1996, however, Luxor’s fortunes were diminishing. The competition was catching up quickly, thanks to major technological breakthroughs. Marketing estimated that by 1998, Luxor would be a “follower” rather than a market leader. Luxor realized that something must be done, and quickly.

In January 1999, Luxor hired an expert in risk analysis and risk management to help Luxor assess the potential damage to the firm and to assist in development of a mitigation plan. The consultant reviewed project histories and lessons learned on all projects undertaken from 1992 through 1998. The consultant concluded that the major risk to Luxor would be the technical risk and prepared Exhibits I and II.

Exhibit I shows the likelihood of a technical risk event occurring. The consultant identified the six most common technical risk events that could occur at

**Exhibit II. Impact of a technical risk event**

Event	Impact Rating	
	With State-of-the-Art Changes	Without State-of-the-Art Changes
• Product performance not at 100 percent of specification	0.95	0.80
• Product performance not at 75–80 percent of specification	0.75	0.30
• Abandonment of project	0.70	0.10
• Need for further enhancements	0.60	0.25
• Reduced profit margins	0.45	0.10
• Potential systems performance degradation	0.20	0.05

Luxor over the next several years, based upon the extrapolation of past and present data into the future. Exhibit II shows the impact that a technical risk event could have on each project. Because of the high probability of state-of-the-art advancements needed in the future (i.e., 95 percent from Exhibit I), the consultant identified the impact probabilities in Exhibit II for both with and without state-of-the-art advancement needed.

Exhibits I and II confirmed management's fear that Luxor was in trouble. A strategic decision had to be made concerning the technical risks identified in Exhibit I, specifically the first two risks. The competition had caught up to Luxor in applications engineering and was now surpassing Luxor in patents involving state-of-the-art advancements. From 1992 to 1998, time was considered as a luxury for the technical community at Luxor. Now time was a serious constraint.

The strategic decision facing management was whether Luxor should struggle to remain a technical leader in wireless communications technology or simply console itself with a future as a "follower." Marketing was given the task of determining the potential impact of a change in strategy from a market leader to a market follower. The following list was prepared and presented to management by marketing:

1. The company's future growth rate will be limited.
2. Luxor will still remain strong in applications engineering but will need to outsource state-of-the-art development work.
3. Luxor will be required to provide outside vendors with proprietary information.
4. Luxor may no longer be vertically integrated (i.e., have backward integration).
5. Final product costs may be heavily influenced by the costs of subcontractors.
6. Luxor may not be able to remain a low cost supplier.
7. Layoffs will be inevitable, but perhaps not in the near term.
8. The marketing and selling of products may need to change. Can Luxor still market products as a low-cost, high quality, state-of-the-art manufacturer?
9. Price-cutting by Luxor's competitors could have a serious impact on Luxor's future ability to survive.

The list presented by marketing demonstrated that there was a serious threat to Luxor's growth and even survival. Engineering then prepared a list of alternative courses of action that would enable Luxor to maintain its technical leadership position:

1. Luxor could hire (away from the competition) more staff personnel with pure and applied R&D skills. This would be a costly effort.
2. Luxor could slowly retrain part of its existing labor force using existing, experienced R&D personnel to conduct the training.
3. Luxor could fund seminars and university courses on general R&D methods, as well as R&D methods for telecommunications projects. These programs were available locally.

4. Luxor could use tuition reimbursement funds to pay for distance learning courses (conducted over the Internet). These were full semester programs.
5. Luxor could outsource technical development.
6. Luxor could purchase or license technology from other firms, including competitors. This assumed that competitors would agree to this at a reasonable price.
7. Luxor could develop joint ventures/mergers with other companies which, in turn, would probably require Luxor to disclose much of its proprietary knowledge.

With marketing's and engineering's lists before them, Luxor's management had to decide which path would be best for the long term.

## **QUESTIONS**

1. To whom, and how should you communicate the assessment by marketing and engineering?
2. What additional information would you need to evaluate the strategic options?
3. Would you side with marketing or engineering? What should Luxor do at this point?