

**How does Silicon Graphics Inc.**

**enter**

**South Africa market**

**successfully ?**

EES 283

Strategy Planning Models

by

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## **Executive Summary**

Silicon Graphics. Inc., has asked for our assistance in designing the strategy to be used by its operation which is opening in South Africa later this year. The main areas of concern for SGI are product line, markets sectors and channel strategies. Extraordinary changes have been occurring in South Africa in the recent past, resulting in a number of uncertainties, and therefore tremendous volatility. After going through a detailed study, we identified six key uncertainties that could have a major impact on South Africa as a nation, and subsequently to the business environment in which SGI would be operating. The major uncertainties that we zeroed in on were, 1) the economy, 2) national literacy rates, 3) leanings of government policy, 4) political stability, 5) intensity of competition and 6) market needs. After going through a detailed analysis of the uncertainties, market size projections and SGI's resource constraints, we were able to converge on a strategy that we believe is optimal for SGI in South Africa. We used several proven analytical tools, such as Decision Analysis and the Rangan Channel Decision Model, and supplemented those with some of our own before arriving at the recommendations.

### ***Recommendations***

We recommend that SGI focus on pushing their mid range computer workstations, of which their Indigo II is a representative product, priced around \$30,000. This is also the market in which SGI has perhaps the strongest brand recognition. We further recommend that they apply this focus through a direct sales effort in this market. An optimal sales force was computed to be around 28 for this segment of the market. The market sectors that we recommend focusing

their mid-range sales effort on are Manufacturing ISVs and Developers and R&D/Education in that order.

As for the High-End/Large Scale market, SGI must still use an “all direct Sales” approach. We recommend deploying a total of about 14 salespeople with a heavy accent on the manufacturing sector and supplementing it with the Public Sector and R&D/Education markets. SGI’s Challenge Servers play in this market and are priced at around \$120,000.

Finally, we recommend that SGI use South African distributors to take market share in the low-end/PC segment. SGI’s representative product in this segment is the Indy with a price tag of about \$8000. We recommend about 11 distributors that have influence in the manufacturing, development and R&D sectors.

## **Problem Statement**

Silicon Graphics. Inc., or SGI, has asked us to assist in designing its strategy for entering the newly emerging South Africa market. The newly elected government, the first multiracial government in the nation's history and the first in hundreds of years which honors the vote of all of the nation's people, opens opportunity not only for the nation's residents, but also for businesses worldwide.

SGI is the world's leading supplier of visual computing systems targeted at the technical, scientific and corporate marketplace. SGI has pioneered the development of color three-dimensional computing, transforming it into practical and affordable mainstream solutions that improve productivity and increase operational efficiency across a broad array of industries. Its products include a number of levels of workstations and client/servers, and have changed the face of the computer industry.

For hundreds of years, South Africa had been inhabited by an apartheid government, completely dominated by the nation's white population, which is less than 15% of its total population. Its apartheid government had prompted protest movements throughout the world, including trade boycotts, corporate divestitures and embargoes, until finally, earlier this spring, a truly democratic government had been elected by all facets of the population. The newly formed constitution, which will remain in force for five years after the general election, enshrines

traditional Western values. Including *multipartisme*, an independent judiciary, a bill of human rights, and a free press. Moreover, President Nelson Mandela's call for the removal of sanctions has received immediate response across the Western world.

South Africa, contrary to popular belief, is a tremendously wealthy nation, particularly rich in natural resources; it has, in fact, a GDP per capita which is seven times the average of the African continent. Because it already has a robust capitalist infrastructure already in place, which includes well-developed systems of industries like manufacturing, transportation, finance and communications, its economy stands out from that of other nations which could be considered “emerging.” Its largest industry is mining; South Africa is, for example, the world’s largest producer of platinum, gold and copper. Because of this unique situation, a wealthy nation with a well-developed capitalist infrastructure becoming immediately open to the world market, as opposed to a newly capitalized nation growing into the world market, there are tremendous amounts of new opportunity being made available.

SGI has already made the decision to enter South Africa to sell its products to potential customers throughout the sub-Saharan Africa geography. SGI’s business plan is to market its current product line, focusing on industries in which its existing software partners have applications. SGI also plans to leverage the use of its current distributor network and to staff the operation with a local multi-cultural team. Our project team has been asked to provide recommendations to assist in answering the following questions:

- How large is the market for SGI-type products?
- Which markets should SGI pursue?

- What should be the business model? Direct sales? Distributors? Or some hybrid?
- What financial models should SGI use?
- Who are the top competitors?
- Who are the top distributors in the geography?

In addition, we have been explicitly asked to consider the following current event factors:

- Political history and current changes;
- Market growth and potential;
- Economic climate; and
- Education levels of the labor force.

As SGI's Managing Director of South African Operations described to us, his status is one of "lots of ideas, but with no comprehensive operating plan."

## **Analysis Methodology**

### ***Probing (Data Collection) and Project Requirements Analysis***

The early stages of our analysis consisted of interviews with product managers, market managers, competitive analysts, legal counsels and finance officers, in order to get a broad overview of SGI's market focus, its corporate culture and its protocol for entering new markets. In addition, we requested both quantitative and qualitative information from each manager in order to build our assessment models. This included, for example:

- Economic, statistical and trade data on South Africa. including data regarding spending on information technology;
- Recent SGI sales data, both by product and by industry, for nations which house portfolios of industries comparable to that of South Africa (e.g., Australia and New Zealand);
- SGI's sales and operations budget for its first year in South Africa, and the parameters involved in these projections;
- Analysis of the status of competitors, in terms of competing products, market position, and competitive potential; and
- Descriptions of applications developed by software partners, from which to infer industries to which hardware is sold.

### ***Scoping the Size of the Project and Choice of Analysis Models***

After collecting adequate data and information about SGI and South Africa, we were able to understand SGI's real problem in greater details. We understand that SGI is facing very big problems and they are undoubtedly very complex. Our team reckoned that we must scope the size of the project, prioritize some important problem issues and estimate both SGI's and our area of interests. Finally, with consensus of the Managing Director of SGI's South Africa operation Mr. Neil McGowan, we decided to help them make three urgent decisions:

1. Distribution infrastructure
2. Product Focus
3. Market Focus

Since the problems are inherently very complicated, we realized that it is not possible to solve it by any individual analysis method and model. After some literature researches and consultation, we built a custom-made model using our knowledge in Economic Analysis, Decision Analysis, Optimizations, Statistics and Finance which can serve SGI's specific needs. Please refer to the Appendix A1-A3 and flow chart - Exhibit # 1

In the following sections, we will walk you through the arts our Strategy Planning Model.

### ***Analysis Model Overview***

Our analysis model is to systematically assemble scenario tables, mathematical (financial) models, distribution channels model and a decision analysis model into a specific decision making model which caters for SGI. It is structured in a modular fashion and those modules can be summarized as follows:

1. **Market Products Matrix:** consists of South Africa information technology (IT) projected spending of high-end, mid-range and low-end product lines by industry segments;
2. **Scenario Table:** includes considerations of uncertainties regarding the economy, literacy levels of the population, intensity of competition, the political climate, government policies (e.g., free trade vs. protectionist), and market needs. There are three major scenarios deduced based on our studies;
3. **Market Size Modifier Matrix:** allows for parameters that modify market size (Scenario Table Market Modifier) based on the estimated effect of each uncertainty;

4. **Playing Field:** determines SGI's "playing field" as a niche of the South Africa computer market within each product category;
5. **Rangan Channel Design Decision Model:** determines the optimal distribution channels and product focus by optimizing profits for each scenario;  
**SGI Strength Matrix:** indicates the market segments in which SGI has particular interests or relatively strong presence. This matrix, using the output of Rangan Model as an input, results in a Market Focus Indicator Table which shows the right products to push aggressively in the marketplace;
6. **Simplified Decision Analysis:** enters projections of three possible scenarios into the above mathematical models, we arrived at three distinct *product/market/channel* strategies which will be optimal for each scenario.

Now, we are in a position to deploy any of the three strategies. Using Decision Analysis, with "strategy" (with three alternatives ) as the decision node and the three distinct scenarios as chance node , the optimal strategy can be calculated. This strategy will be the best one for SGI under any event.

The following sections will attempt to take you in detail through the analysis process.

### ***Market Size Estimation Model***

The market size estimation statistics are extracted from market research data published by International Planning Service for IDC The following matrix breaks down the market in South Africa into six major market sectors which SGI interests:

<b>Market Sector</b>	<i>PC/Workstation Hardware Rev.</i>	<i>Mid-Range Hardware Rev.</i>	<i>Large-Scale Hardware Rev.</i>	<i>Total</i>
<b>Public Sector</b>	\$88.62	\$26.75	\$51.84	\$167.21
<b>Manufacturing</b>	54.89	86.75	35.41	177.05
<b>Transportation</b>	9.34	30.49	9.34	49.17
<b>R&amp;D/Education</b>	14.95	20.46	3.93	39.34
<b>Mining</b>	21.25	14.95	3.15	39.35
<b>Other/Individual</b>	80.56	39.64	7.67	127.87
<b>Total (in millions)</b>	269.61	219.05	111.34	600.00

Public Sector includes government and other public services. R&D/Education is mainly high-technology research and development. Mining has been categorized as a separate industry because of its importance in South Africa. Other/Individual includes, for example, independent software vendors. Our analysis has omitted industries in which SGI has had little or no market presence in other countries, including, for example, finance.

The market modifiers explained in the next section are tied to this estimation model. Based on each of the scenarios, the market size in the individual sectors can be estimated for each product range. The projected market size matrix for each of the three scenarios can be seen in Appendix A1, B1 and C1.

### ***Building the Scenarios and Market Size Modifier Matrix***

Three scenarios from this project were examined using six major uncertainties which comes out of our basic sensitive analysis. They are Economic Changes, Computer Literacy Levels, Market Competitions, Political Climate, Government Policies and Market Needs for information technology in South Africa. Please refer to the scenario table as follows:

## Scenario Table for South Africa

Economy	Literacy Levels	Competition	Political Climate	Government Policy	Market Needs
<b><u>1</u></b> Internal economy in recession. cautious foreign Investment. bear market continues	<b><u>1</u></b> Low levels of literacy in large section of population not likely to improve	<b>1</b> Intense competitive environment - level comparable to that in the US HP. IBM. SUN,DEC,BULL- all major players present	<b><u>1</u></b> Stable environment ANC forges effective alliances among factions, political rivalries at healthy levels	<b><u>1</u></b> High investment in industry and education attractive Rand rates to foreign investors Policies favor free trade	<b>1</b> Markets needs at the level of comparable developed economies e.g. Australia. New Zealand
<b>2</b> Economy recovers. fair growth projected. cautious initial investment but future investment potential bright	<b>2</b> Pockets of high literacy levels among professionals with a potential of pervasive literacy	<b>2</b> Marginal competition - tentative entry by HP. SUN etc.	<b>2</b> Manageable stability with potential for consolidation	<b>2</b> Conservative approach - protectionist tendencies, Mandela gas back on his commitment to open up the economy	<b>2</b> Segmented growth in selected industries - mining. manufacturing and R&D
<b>3</b> Rapid internal economic recovery, high growth protected. bull markets	<b><u>3</u></b> Sharp increase in literacy levels due to progressive government and corporate programs		<b><u>3</u></b> Political meltdown. Civil war	<b>3</b> Balanced. centrist policies, free trade with emphasis on internal industrial development. not aggressively favorable to foreign investment	<b>3</b> Stagnant markets

## Scenario 1: Road of Steady Progress [2-2-1-2-1-2]

This scenario encompasses several uncertainties which are most likely to happen in the upcoming future. We project economy recovery from the recession, fair economic growth and some potential in foreign investment. The computer literacy level is high only in professionals. Competition is high in South Africa; a large number of players have either decided to enter or already entered the South African market. In addition, SGI has decided to pursue aggressive marketing policy. The political climate is manageable with potential for consolidation. There is high investment in industry and education with attractive Rand rates for foreign investors like what Mandela committed during the election.

### Market Size Modifier Matrix: Scenario 1

Scenario Ref.	1	2	3	4	5	6	7	Net
Public	1.05	1.00	1.04	1.00	1.03	1.00	1.12	
Private	1.05	1.00	1.06	1.00	1.10	1.06	1.30	
Transport	1.01	1.00	1.00	1.00	1.02	1.00	1.03	
R&D/Manufacturing	1.02	1.05	1.02	1.00	1.15	1.05	1.32	
Marketing	1.06	1.00	1.04	1.00	1.06	1.10	1.29	
Other	1.05	1.00	1.10	1.00	1.02	1.00	1.18	

We have built a quantitative model to project the IT spending in South Africa, which is based on the IT spending in South Africa in fiscal year 1992 and the effects of those uncertainties mentioned above. Referring to the scenario matrix above, this is a matrix which incorporates a set of market size modifiers for different market sectors. These market modifiers are factors which represent the effect of the dynamic uncertainties on the expected IT spending for different market sectors. After a detailed study of different industries in South Africa and influences of those uncertainties on the South Africa economy, we come up with a set of market modifiers which are going to affect individual market sectors. For example, in the scenario, “Road of

Steady Progress,” we expect the recovery of South Africa’s already bearish market, fair economic growth and good investment potential. it would increase by 5% the projected IT spending in the public sector, and similarly, it would also increase 5%, 1% ,2%, 6% and 5% in manufacturing, transportation. R&D/education, mining and other IT spendings, respectively. By applying such a prediction on the effects of various uncertainties including computer literacy level, competition in the market, political climate, government policy and market needs, we could find the total effect of all of the uncertainties on different market sectors.

**Scenario 2: Rapidly Emerging Market - A Shooting Star [3-3-1-1-1]**

The rapid internal economic hyper-growth make South Africa a Shooting Star in the world. High investments in industry and education by foreign investors results from the rapidly emerging market in South Africa. Government policies will favor free trade in order to attract still more investors. The market needs will be great at the level comparable to developed countries such as Australia. However, there will also be intense competitive environment in most industries, including the computer industry with all of the major players. The literacy levels increase sharply due to corporate programs and progressive government programs.

**Market Size Modifier Matrix: Scenario 2**

Scenario Ref							Net
	1.10	1.10	1.10	1.03	1.03	1.20	1.69
	1.20	1.05	1.20	1.06	1.10	1.20	2.12
	1.08	1.00	1.05	1.08	1.02	1.15	1.44
	1.15	1.25	1.02	1.00	1.15	1.35	2.28
	1.15	1.03	1.12	1.02	1.06	1.15	1.65
	1.10	1.20	1.15	1.03	1.02	1.35	2.15

Similarly, the modifiers are determined by the same techniques as we described in Scenario 1.

**Scenario 3: A Typical African Story / Influence by Africa [1-1-2-2-2-3]**

A fundamental shift occurs in this scenario toward typical Third World African countries. There is little foreign investment because of the lack of confidence of foreign investors; this causes a recession in the economy. The literacy of most of the population remains low, as education is expensive. Although political stability is still manageable, the conservative approach is taken by protectionists. Also, due to stagnant markets in South Africa, competition with major companies like HP and Sun is marginal. This scenario implies that SGI has to be very cautious in investing into South Africa.

**Market Size Modifier Matrix: Scenario 3**

Scenario Ref.								Net
P	1.10	1.10	1.10	1.03	1.03	1.20		1.69
M	1.20	1.05	1.20	1.06	1.10	1.20		2.12
B	1.08	1.00	1.05	1.08	1.02	1.15		1.44
R	1.15	1.25	1.02	1.00	1.15	1.35		2.28
N	1.15	1.03	1.12	1.02	1.06	1.15		1.65
C	1.10	1.20	1.15	1.03	1.02	1.35		2.15

Similarly, the modifiers are determined by the same techniques as we described in Scenario 1.

**SGI Product Segments Niche**

SGI operates in a very dynamic industry. Their success is largely dependent upon their ability to introduce and position leading edge products at a rapid pace. So far, they have introduced three main product lines in high-end, mid-range and low-end, which span the range of platforms from high-performance, low-cost desktop workstations to powerful supercomputers.

On the other hand, according to IDC's current report on IT spending in South Africa. 44% of IT spending is in PCs/workstations (low-end), 8% in UNIX mid-range and 31% in high-end systems. Under our investigation in SGI's three main product lines, their market focuses, competitive positions and different industries in South Africa, we would be able to forecast the SGI's "playing field" in the country.

The competition in the low-end market is extremely high because there are so many products, e.g. 386,486, Pentium, PowerPC, Macintosh, portable PC's and low-end products from competitors including HP and Sun etc. We estimated that SGI can only compete in a very low portion, 5%, of this market.

Similarly, the competition in the UNIX mid-range market is also high; the number of players, though, is comparatively less, namely HP, Sun, IBM and DEC etc., with the bulk of the IT spending in this market sector in manufacturing, transportation (GIS) and R&D, where SGI has strong mid-range products, robust customer base and excellent customer supports. They are highly competitive in this market. We believe that they are able to compete with about 50% of that market.

Finally, we found that even though SGI has some high performance products, Onyx and Challenge, they are still not in the same league as supercomputers like Cray, MasPar, IBM,

Fujitsu and Convex etc. They can, however, compete with about 10% of the market because, compared with CRAY and IBM, SGI's high-end products are low-priced !

By taking these percentages into accounts, we are now able to forecast the the SGI's playing field. Please refer to Appendix A1, A2 and A3.

### ***The Rangan Channel Distribution Model: Analysis Structure***

Once we have got a precise forecast of SGI's "playing field" in South Africa, we can use these figures as input and apply Rangan Channel Distribution Model to determine the distribution infrastructure of SGI in South Africa. This distribution channel analysis basically applies two concepts. The first is to maximize the annual net profit based on the revenue from the market ~~share~~ of different market segment and the cost of different distribution channels as well as other fixed cost using the method of integer optimization. The second concept is the model of market-share response behavior influenced by SGI's efforts using different marketing elements. The market-share response model assumed that the aggregate effects of channel effort can be represented by the sum of the individual channel function components (i.e. salespersons and distributors). Using the notion of decreasing marginal returns, market-share responses model propose a concave response function for SGI's market share with respect to its channel effort.

#### **Assumptions:**

1. **In** our model, we assume there are only 2 types of distribution channels: direct and indirect. The direct channel means direct salespersons trained by SGI in South Africa. The indirect channel consists of different types of existing distributors South Africa. In

order to simplify the model. we also assume every salesperson is the same and there is no different between two distributors.

1. We also assume that the market segments in this cross-sectional data base are homogeneous (i.e.. market segments are mutually unrelated to each other), as well as mutually exclusive.
3. We ignore the non channel strategy (such as pricing effect) because we assume that there is a perfect competition. Our competitors are assumed to remain the same strategy within a year's time.

Our model is decision-oriented and it intends to address two dimensions.

1. **Distribution structure:** which types of intermediaries to include distributors, salesperson, etc., in each market segment ?
2. **Distribution intensity:** how many such intermediaries to include in each market segment ?

Our goal is to provide normative guidance to SGI in order for them to start implementing the marketing distribution channel in South Africa. The output of this model including the optimal channel deployment of each market segment will be used as a input into a decision analysis model described in next section.

## Input Variables:

This model required nine input variables from each market segment, including three market segments including low-end, medium, high-end product markets; the rest are explained below.

Altogether, there are 27 input variables:

1. **Actual -Market Size of low-end, medium, high-end** : These **3** variables are generated by **market modifiers** model as discussed above. Using the market modifiers model, the actual market size of different market segments will be changed according to different proposed scenarios.
2. **Max. Market Share of low-end, medium, high-end** : These 3 variables are the model parameters which are estimations of the maximum achievable market share of SGI in South Africa in low-end, medium, high-end market. This estimation is calculated based on the total revenue of information technology (IT) hardware of South Africa in 1992 and the position of SGI in Australia (which has similar characteristics to South Africa).
3.  **$\alpha$  of low-end, medium, high-end** : These are also model parameters which are used to estimate the practical minimum market share of each segment in South Africa (i.e., with zero salesperson and zero distributor, how much market share can SGI get). These parameters are achieved by managerial estimation.
4.  **$\beta_s, \beta_d$  of low-end, medium, high-end**:  $\beta_s/\beta_d$  are model parameters which is used to estimate the marginal effect on market share of each market segment by an additional salesperson and a distributor respectively.
5. **Gross margin of low-end, medium, high-end**: These variables are average of gross margin of each product of SGI in different market segments. Also these are provided by SGI documentation.

4. **Cost of a salesperson of low-end, medium, high-end:** These variables are the estimation of cost of maintaining a salesperson in South Africa. These estimation are based on the living standard in South Africa and the salary level of a salesperson provided by our competitor such as HP and IBM.
7. **Cost of a distributor of low-end, medium, high-end:** These variables are the same as the above except that we are considering the cost of maintaining a distributor rather than a salesperson.
8. **Fixed cost of low-end, medium, high-end:** These are the fixed cost **used** in developed a distribution channel in each segment in South Africa. These are also provided by SGI.

### **Output Variables:**

There are 10 output variables in this models. The outputs are explained below:

1. **Maximal Total profit: This** is the maximum profit SGI can get by optimizing the no. of salesperson and no. of distributor in each channel in South Africa.
2. **Optimal Market Share (in %) of low-end, medium, high-end:** These are the optimal market share (in %) SGI can obtain in each segment after optimizing the sales force in South Africa.
3. **Optimal Number of salespersons and distributors in low-end, medium, high-end:** These 6 outputs tell us that how many salespersons SGI should hire and how many distributors SGI should use in each channel. These are very important result because, besides telling us the actual number of salespersons and distributors, they **also** tell us which market segments (high-end, medium or low-end) should SGI concentrate in.

For further detail about the equation of the distribution channel model, please refer to Appendix D. For results of the optimization model, please refer to Appendix A2-C2, Appendix A3 and C3.

### Applying SGI Strength Matrix To Determine A Market Strategy

The objective of our model is made complete by multiplying the sales revenue values by a function we call the SGI Strength Matrix. This is an additional instrument that adds extra “weight” to the revenue values of, for example, product and industry sectors in which SGI has a proven track record and existing software partners.

<i>SGI Strength Matrix</i>			
	<i>PC/Workstation</i>	<i>Midrange</i>	<i>Large-scale</i>
Public Sector	0.1	0.3	0.4
Manufacturing	0.8	0.9	1.1
Transportation	0.4	0.6	0.6
R&D/Education	1	1	1
Mining	0.9	1.2	1
Other/Individual	0.6	0.75	0.5

A Strength value higher than 1.00 is an indication that, from a marketing perspective, SGI has a stronger-than-average presence in that segment of the market; likewise, a value of lower than 1.00 means that SGI has a lower-than-average presence. These values are driven by past history in similar marketplaces and market research, as well as by SGI’s comfort level with software partners that assist them in each segment of the marketplace and by product. Note, for example, in the matrix above, that in the market segment of R&D/Education in South Africa, SGI has values of 1.00 for each product range; this means that SGI considers its success chances to be good in that segment of the market.

Once the objective function is complete. We will use optimization functions to find the product/market/distribution strategy that maximizes SGI's Net Income for the period being assessed. When calculating the optimal Market Strategy. in each case three distinct optimal strategies are calculated for all three scenarios.

The results of the optimization and the implicit strategies that evolve from it are discussed below for one of the scenarios and the results for the others can be obtained from Appendix **A-B**.

Scenario 1: Road to Steady Progress

Result:	
Profit	\$6,161,239.74
Revenue	\$23,438,648.48
Market Share PC/Wkstn)	0.125790537
Market Share (Mid-Range)	0.139137465
Market Share (Large-Scale)	0.107295799
No. of Salesperson (PC)	0
No. of Salesperson (Mid)	0
No. of Salesperson (Large)	10
Total Direct Sales Force	10
No. of distributor (PC)	9
No. of distributor (Mid)	38
No. of distributor (Large)	0
<b>Total Distributors</b>	<b>47</b>

The optimization of the Rangan Model gives us a recommended channel strategy for deployment of distributors and salespersons for each of the three products segments. From the above table we can see that the optimal channel strategy for scenario 1 is to use 10 direct sales people focussing on the Large Scale segment. Further, SGI might want to use 9 distributors in the PC segment and

38 distributors ( and no direct sales) in the mid-range segment. The profits and expected market share if this scenario occurs (and SGI follows the recommended channel deployment) is also shown in the table.

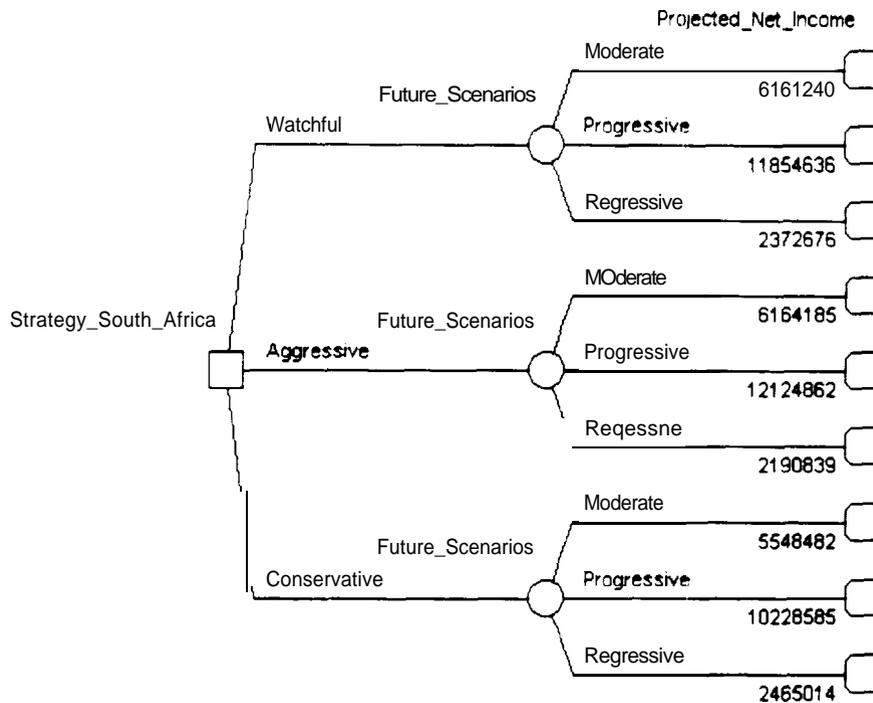
Once we have the channel and product strategy we can then decide what markets to focus on in each of these product segments. In order to facilitate this decision we devised the SGI strength matrix (explained in the last section) to modify the market size in dollars. This number can serve as a gross indicator of what markets to focus on - in each of the product lines.

<b><i>SGI's Market Focus Indicator</i></b>			
	<b><i>PC/WorkStat.</i></b>	<b><i>Midrange</i></b>	<b><i>Large-scale</i></b>
Public Sector	0.50	4.51	4.66
Manufacturing	2.85	50.66	10.11
Transportation	0.19	9.42	1.16
R&D/Education	0.99	13.49	1.04
Mining	1.23	11.53	0.81
Other/Individual	2.85	17.51	0.90

For scenario 1, the market focus indicator is shown above. We can clearly see that in the Large Scale segment, SGI must focus on manufacturing. In the mid-range again, it is manufacturing and ISV/Developers (Individual/Others). In the PC segment in addition to manufacturing, mining looks promising.

### ***Simplified DA Model For An Optimal Strategy***

In order to determine the true Optimal Strategy, the most straightforward way is to assemble a decision tree, with “strategy” as the decision node and designating the three alternatives as Watchful, Aggressive and Conservative.



Note that, the Projected Net Income of the Aggressive strategy is higher than that of the other strategies in both the Progressive and the Moderate scenarios; also note that, unless the probability of the Regressive scenario is determined to be nearly one-half, the Aggressive strategy is calculated to have the highest expected value. Otherwise, the probability value of each scenario is moot.

Please refer to Appendix E.

### ***Final Strategy Recommendations***

After running the DA model we determined that the optimal strategy is the “Aggressive” one for South Africa. This strategy is optimal for scenario 2: Rapid Growth and sub-optimal if any other

scenario occurs. After careful deliberation and consulting, we assessed probabilities of .5 to scenario 1, .3 to scenario 2 and .2 to scenario 3. Refer Appendix A-C for the certain equivalent. The tables below show the product, channel and market strategies.

	Result
Profit	\$12,124,862.06
Revenue	\$39,283,892.82
Market Share PC/Wkstn	0.133857843
Market Share (Mid-Range)	0.143181533
Market Share (Large-Scale)	0.122276032
No. of Salesperson (PC)	0
No. of Salesperson (Mid)	28
No. of Salesperson (Large)	14
Total Direct Sales Force	42
No. of distributor (PC)	11
No. of distributor (Mid)	0
No. of distributor (Large)	0
<u>Total Distributors</u>	<u>11</u>

### ***SGI's Market Focus Indicator***

	<i>PC/WorkStat.</i>	<i>Midrange</i>	<i>Large-scale</i>
Public Sector	0.75	6.80	7.03
Manufacturing	4.64	82.59	16.48
Transportation	0.27	13.14	1.61
R&D/Education	1.70	23.29	1.79
Mining	1.58	14.80	1.04
Other/Individual	5.20	32.00	1.65

We recommend that SGI focus on pushing their mid range computer workstations, of which their Indigo II is a representative product, priced around \$30,000. This is also the market in which SGI has perhaps the strongest brand recognition. We further recommend that they apply this focus through a direct sales effort in this market. An optimal sales force was computed to be around 28 for this segment of the market. The market sectors that we recommend focusing their mid-range sales effort on are Manufacturing, ISVs and Developers and R&D/Education in that order.

As for the High-End/Large Scale market, SGI must still use an "all direct Sales" approach. We recommend deploying a total of about 14 salespeople with a heavy accent on the manufacturing sector and supplementing it with the Public Sector and R&D/Education markets. SGI's Challenge Servers play in this market and are priced at around \$120,000.

Finally, we recommend that SGI use South African distributors to take market share in the low-end/PC segment. SGI's representative product in this segment is the Indy, with a price tag of about \$8000. We recommend about 11 distributors that have influence in the manufacturing, development and R&D sectors.