Dynamic programming: path analysis

Finance

DYNAMIC PROGRAMMING Executive summary Once companies are faced with a number of strategic plans that aim at developing their organisations, it always becomes important to have monitoring and evaluation techniques to arrive at making the right selection with regards or reference to the best and most feasible line of strategy to tow. In this report, this finance company is presented with a broad objective of achieving 60% growth over a five (5) year period. To do this, there are some major benchmarks of strategies and programs to put in place. These bench marks are centralisation of information system, human resource expansion, infrastructural expansion, profit investment and publicity system enhancement. Each of these benchmarks have sub coordinate programs that fall under them. From the current position of the company, the company want to get to a destination of 60% growth in five (5) years. The report therefore presents a technique under the basis of dynamic programming to bring out the path to trend to come to a successful destination under the different variables and programs. Musama (2003) explains that path analysis program always leads to a conclusive shortcut and financial prudence in selecting a line of strategy to tow. In the conclusion, it was established that the most useful path to two is system networking – to – on campus hiring – to – branch expansion – to – company merger – to – social networking. Introduction The global economic climate that is being experienced currently makes it imperative on corporate organisations, especially finance companies to put in place strategies that will ensure the eventual growth of their companies. Without any doubt, once finance companies grow, the entire economy of immediate local businesses and populace are sure to grow as well. This is because finance companies have most often than not become the source of funding for other companies

and businesses whose individual successes bring about economic growth. This not withstanding, such strategic plans for growth cannot be undertaken in isolation. It has always been important to have techniques that monitor and evaluate the successful implementation of the strategies. In this report, the dynamic programming idea has been used to come up with a simple technique for monitoring the achievement of the strategic plan of this finance company over a period of five (5) years. The basis of the technique has been structured around the need for time and financial prudence. Major Points The allocated technique for selecting the best path analysis for the intended strategic plans to bring about 60% growth changes in the company over the next five years is the dynamic programming technique. This technique has been identified as very useful in situations that include objective functions to be achieved and where the objectives can be sub divided into stages and states (Brobbey, 2007). Considering that there are five major objective points with one input and output end; making a total of six (6) stages, the dynamic programming cannot be described in any other words than ' best' for the current situation. It will be noted that even though each of the five objectives must be achieved, there are four (4) specific goals under each objective. This means that to move from the input to the final output, there would be over two hundred thematic points to cross. Without any doubt, trying to achieve each of the thematic points would demand a lot of resource (money) and time. Meanwhile, the company does not have that much to give out. Through the dynamic programming therefore, a simple routine is going to be identified for use. This means that thematic points that do not fall within the path will be ignored for that particular objective. For clarity, the targeted objectives and specific goals are given in a table form.

Under each objective, only one specific goal will be selected. The function of the dynamic programming would therefore be to point to which of the specific goals to select depending on calculations and factors that take into consideration the amount of company budget to put into each specific goal. The table is given as follows: Objectives Centralised information system Human resource expansion Infrastructural expansion Profit investment Publicity system enhancement Goal 1 External system networking (J1) Internal placement (K1) Opening new branches (L1) Acquisition (M1) Event sponsorship (N1) Goal 2 Wide area networking (J2) On campus hiring (K2) New market destination (L2) Share purchasing (M2) Print advertisement (N2) Goal 3 Internal system networking (J3) External placement (K3) Existing market expansion (L3) Company merger (M3) Social networking (N3) Goal Peer to peer networking (J4) Internship (K4) Existing branch expansion (L4) Initial public offer (M4) Global branding (N4) Table 1: Goals and their Codes Despite the advantages, it should be noted that using the dynamic programming to come to conclusions may be very strenuous and demands a lot of dedicated time to avoid oversight mistakes. Conclusions and Recommendations As would be seen in the appendix, each objective puts a relatively different weight of financial demand on the budget of the company. It was therefore found that the path analysis conducted by the use of dynamic programming resulted in coming up with the most cost effective but result oriented goals to pursue under each objective. It is strongly recommended that the conclusions drawn from the path analysis as seen in the appendix should be adhered to religiously so that the company's expected growth will be achieved. Appendices The technique adopted, which was the use of dynamic programming for arriving at the strategic path has

been elaborated in detail below. In the following appendix, the code for each goal is used. The numbers corresponding to the lines represent the percentage of the company's budget that will be spent from moving from one goal to the next. After the diagram, a breakdown calculation of the best goals to opt for according to the most cost effective paths has been done below. Due to space and for the sake of representation, only the concluded figures are shown. Stage 6 Stage 5 Stage 4 Stage 3 Stage 2 Stage 1 Information System Human Res. Expansion Infrastructural Exp. Profit Investment Publicity 7 1 3 3 4 3 From the diagram, the following calculations for the shortest path (less budget involving path) can be made as follows. The calculation explains why the final path was selected. Stage 1 Input nodes Arc chosen Output nodes Shortest distance (budget percentage) N1 N2 N3 N4 N1 – O N2 – O N3 – O N4 - O O O O O O 7 6 3 5 Stage 2 Input nodes Arc chosen Output nodes Shortest distance (budget percentage) M1 M2 M3 M4 M1 – N2 M2 – N1; M2 – N3 M3 – N3 M4 – N4 N2 N3 N3 N4 12 7 8 9 Stage 3 Input nodes Arc chosen Output nodes Shortest distance (budget percentage) L1 L2 L3 L4 L1 – M4 L2 – M4 L3 – M2 L4 – M1 M4 M4 M2 M1 12 10 13 15 Stage 4 Input nodes Arc chosen Output nodes Shortest distance (budget percentage) K1 K2 K3 K4 K1 – L1 K2 – L1 K3 – L2 K4 – L3 L1 L1 L2 L3 19 15 17 18 Stage 5 Input nodes Arc chosen Output nodes Shortest distance (budget percentage) J1 J2 J3 J4 J1 – K3 J2 – K2 J3 – K2 J4 – K1 K1 K1 K2 K3 19 15 17 18 Stage 6 Input nodes Arc chosen Output nodes Shortest distance (budget percentage) I I – J3 J3 22 Concluding Path I to J3 to K2 to L4 to M3 to N3 to O From the table 1, this implies the goals to be achieved will be Present Growth > internal system networking > on campus hiring > company merger > social networking > 60% growth REFERENCE LIST Ben-

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