Business Feasibility and Decision Support Expert System

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A

Project Report

on

Business Feasibility and Decision Support Expert System

Submitted in partial fulfillment of the requirements for the award of the degree of

Bachelor of Technology

in

COMPUTER ENGINEERING

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6 May, 2012

Malaviya National Institute of Technology
Department of Computer Engineering

Certificate

This is to certify that the work contained in this report entitled "Business Feasibility and Decision Support Expert System" is a bonafide record of work done by Anugrah Saxena (2008UCP106), Arpit Bhatnagar (2008UCP108), Anurag Singh (2008UCP906) and Lorho Emeo (050833) has been carried out under my supervision in partial fulfillment of the requirements for the award of degree of Bachelor of Technology in Computer Engineering.
The project is hereby approved for final submission.

_____

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Declaration

We hereby declare that this project report on "Business Feasibility Study and Decision Support Expert System" which is being submitted in partial fulfillment of the award of degree of Bachelor of Technology in Computer Engineering, is the result of the work carried out by us under the guidance of Dr. Girdhari Singh (Associate Professor, Department of Computer Engineering, MNIT Jaipur).
We further admit that this project work has not been submitted to the MNIT before or for any other purpose.
May, 2012

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Abstract

Automation and intelligent system towards business decision support has been a constant and highly potential area of research. Using the high computation power of computer and precisely utilizing the artificial intelligent of Prolog engine, efforts are made to transform the business knowledge into an expert system via algorithm implementation.

The System can compute high amount of data efficiently and can deduce intelligent decisions based on them, that can result in highly profitable and prudent business decisions saving precious time and high amount of capital investment in business feasibility study and decision support.

System utilizes knowledge database in form of facts for its computation, while algorithms are implemented in form of set of rules utilizing these facts as parameters for calculations.

Output generated by system is converted into logical textual and graphical reports.

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Chapter 1

Introduction

1.1 What is Business Feasibility Study?

A Business Feasibility Study can be defined as a controlled process for identifying problems and opportunities, determining objectives, describing situations, defining successful outcomes and assessing the range of costs and benefits associated with several alternatives for solving a problem.

The Business Feasibility Study is used to support the decision-making process or project viability. The feasibility study is conducted during the deliberation phase of the business development cycle prior to commencement of a formal Business Plan[6].

1.2 Importance of Feasibility Study?

It is estimated that only one in fifty business ideas are actually commercially viable. Therefore a business feasibility study is an effective way to safeguard against wastage of further investment or resources. If a project is seen to be feasible from the results of the study, the next logical step is to proceed with the full Business Plan.

The research and information uncovered in the feasibility study will support the business planning stage and reduce the research time. Hence, the cost of the business plan will also be reduced. A thorough viability analysis provides an abundance of information that is also necessary for the Business plan. For example, a good market analysis is necessary in order to determine the business concepts feasibility. This information provides the basis for the market section of the Business Plan. Finally, A feasibility study should contain clear supporting evidence for its recommendations.

The strength of the recommendations can be weighed against the study

ability to demonstrate the continuity that exists between the research analysis and the proposes business model. Recommendations will be reliant on a mix of numerical data with qualitative, experience-based documentation. A business feasibility study is heavily dependent on the market research and analysis. A feasibility study provides the stake holders with varying degrees of evidence that a business concept will in fact be viable.

1.3 Evaluate Alternatives

A feasibility study is usually conducted after enterprenuers have discussed a series of business ideas or scenarios. The feasibility study helps to frame specific business alternatives so they can be studied in-depth. During this process the number of business alternatives under consideration is usually quickly reduced. During the feasibility process we may investigate a variety of ways of organizing the business and positioning our product in the marketplace. It is like an exploratory journey and we may take several paths before we reach our destination. Just because the initial analysis is negative does not mean that the proposal does not have merit if organized in a different fashion or if there are market conditions that need to change for the idea to be viable. Sometimes limitations or flaws in the proposal can be corrected.

1.4 Economic Analysis

Economics is the study of costs- and- benefits. In regard to the feasibility of the study the entrepreneur is concerned whether the capital cost as well as the cost of the product is justifiable vis-a-vis the price at which it will sell at the market place. This cost-benefit analysis goes into financial calculations for profitability analysis that we discussed under financial analysis. At this stage it is also useful to distinguish between the economic and commercial feasibility; whereas economic feasibility leads one to the unit cost of the product, commercial feasibility informs whether enough units would sell. Apart from the cost-benefit analysis as above, that we also refer to as private cost benefit analysis, it is also useful to do what is known as social- cost-benefit-analysis (SCBA). For example, the entrepreneur may be getting subsidized electricity in that case private cost would be less than social cost. Likewise, exporting units earn precious foreign exchange resulting into social benefits being more than private earnings. Many a time, a project that is worthy on SCBA may find greater favor with the support agencies.

The objective of financial analysis is to ascertain whether the proposed

project will be financially viable in the sense of being able to meet the burden of servicing debt and whether the proposed project will satisfy the return expectations of those who provide the capital. While conducting a financial appraisal certain aspects has to be looked into like:

1. Investment outlay and cost of project
2. Means of financing
3. Projected profitability
4. Break- even point
5. Cash flows of the project
6. Investment worthiness judged in terms of various criteria of merit
7. Projected financial position

1.5 Market Analysis

A market, whether a place or not, is the arena for interaction among buyers and sellers. From seller's point of view, market analysis is primarily concerned with the aggregate demand of the proposed product/service in future and the market share expected to be captured. Success of the proposed project clearly hinges on the continuing support of the customers. However, it is very difficult to identify the market for one's product/service. After all, the whole universe cannot be our market. We have to carefully segment the market according to some criteria such as geographic scope, demographic and psychological profile of the potential customers etc. It is a study of knowing who all comprise our customers, for this we require information on:

1. Consumption trends.
2. Past and present supply position
3. Production possibilities and constraints
4. Imports and Exports
5. Competition
6. Cost structure
7. Elasticity of demand

8. Consumer behavior, intentions, motivations, attitudes, preferences and requirements

9. Distribution channels and marketing policies in use

10. Administrative, technical and legal constraints impinging on the marketing of the product

1.6 Technical Analysis

The issues involved in the assessment of technical analysis of the proposed project may be classified into those pertaining to inputs, throughputs and outputs.

1. Input Analysis: Input analysis is mainly concerned with the identification, quantification and evaluation of project inputs, that is, machinery and materials. We have to ensure that the right kind and quality of inputs would be available at the right time and cost throughout the life of the project. We have to enter into long-term contracts with the potential suppliers; in many cases we have to cultivate our supply sources. When Macdonald entered India, they developed sustainable sources of supply of potatoes, lettuce and other ingredients for their burgers. The activities involved in developing and retaining supply sources are referred to as supply chain management.

2. Throughput Analysis: It refers to the production/operations that we would perform on the inputs to add value. Usually, the inputs received would undergo a process of transformation in several stages of manufacture. Where to locate the facility, what would be the sequence, what would be the layout, what would be the quality control measures, etc. are the issues that we would learn in greater details in subsequent lessons.

3. Output Analysis: this involves product specification in terms of physical features- colour, weight, length, breadth, height; functional features; chemical material properties; as well as standards to be complied with such as BIS, ISI, and ISO etc.

Chapter 2

Technologies Used

The software designed critically depends on Prolog and PHP for its computation and input output processes while connecting the two language has been a difficult and invinsible part of implementation.

For the generation of graphical results various PHP libraries is extensively and efficiently used along with the code to dynamically generate graphs and reports according to data computed by prolog engine with each instance prolog engine is provoked.

2.1 Prolog

Prolog was invented in the early seventies at the University of Marseille. Prolog stands for PROgramming in LOGic. It is a logic language that is particularly used by programs that use non-numeric objects. For this reason it is a frequently used language in Artificial Intelligence where manipulation of symbols is a common task. Prolog differs from the most common programmings languages because it is declarative language. Traditional programming languages are said to be procedural. This means that the programmer specify how to solve a problem. In declarative languages the programmers only give the problem and the language find himself how to solve the problem. Although it can be, and often is, used by itself, Prolog complements traditional languages when used together in the same application[7].

2.1.1 Utilizing Prolog Engine

Prolog forms the backbone of software with its capability to perform logical interpretation based on rules and facts it seem ideal choice for feasibility and decision support system.

Data required by system to work is stored in various data modules in term of facts, while according to the requirement the computation is done by writing extensive prolog rules in modules, while all these modules are complied using a makefile to ensure low error rate.

While coding various modules effort has been made to get low coupling and high level of cohension.

For input and output purpose PHP has been used as an interface.

2.2 PHP

PHP is a general-purpose server-side scripting language originally designed for Web development to produce dynamic Web pages. It is one of the first developed server-side scripting languages to be embedded into an HTML source document, rather than calling an external file to process data. Ultimately, the code is interpreted by a Web server with a PHP processor module that generates the resulting Web page. It also has evolved to include a command-line interface capability and can be used in standalone graphical applications. PHP can be deployed on most Web servers and also as a standalone shell on almost every operating system and platform free of charge. A competitor to Microsoft's Active Server Pages (ASP) server-side script engine and similar languages, PHP is installed on more than 20 million Web sites and 1 million Web servers[8].

2.2.1 Utilizing PHP

PHP serves as an interface to interact with intended customer using various user friendly and highly interactive forms and images.

The customer can fill up his details that is saved in database for knowledge database and future purposes also the information is stored in $Session variable at each step of data filling,while user can choose the kind of customized feasibility study he wants to conduct and decision support option.

Once the customization is done the information saved in $Session variable is used to trigger various queries directed to the prolog engine.

After the Computation of result by the prolog Engine PHP is again utilized to collect all the output, reading data from text files generated by prlog engine.

Lastly it is used to display the result in a organized way to customer, while using various Libraries and manual code it is used to generate the graphs and charts for efficient understanding of customer.

Figure 2.1: Biz-Guide Front Interface

2.3 Connecting PHP and Prolog

We offer our special thanks to Prof. Jocelyn Ireson-Paine [1] whose website has been of great help for understanding prolog and PHP communication. The basic step is to make system call to initiate Prolog main file and then consult our *.pl file and calling method to execute at first.

$cmd = "nice -n15 /software/bin/pl -f /home/popx/cgi-bin/test.pl -g test,halt"

2.4 Using PHP graph Libraries

PHP 5 comes with embedded graphical library :GD Library with supporting various graphs.

While various other libraries have been exploited along with GD library for the generation of final reports.

Output is generated from Prolog engine into a text file according to the type of graph to be generated.

Once the generated data is written in text file PHP read the data recursively to generate various arrays, while for the final graph generation these arrays are combined using function, that is being passed to the code for creation of graph.

2.4.1 Jgraph Library

Basic supported graphs following list shows what core plot types are supported by the current JpGraph. In addition most plots also have several sub-types.

- Line / Area Bar
- Pie Scatter
- Impulse Field
- Spline Geo
- Maps Stock
- Polar Error
- Balloon Radar

In addition to the "normal" plots JpGraph also support the easy creation of Anti-Spam images. This is an image contains (some random) text that is very hard for any OCR program to decipher but easy for a human to read. This is used to prevent automatic signup to mailing lists and various on-line services[9].

2.4.2 GD Library

PHP is not limited to creating just HTML output. It can also be used to create and manipulate image files in a variety of different image formats, including GIF, PNG, JPEG, WBMP, and XPM. Even more convenient, PHP can output image streams directly to a browser. We will need to compile PHP with the GD library of image functions for this to work. GD and PHP may also require other libraries, depending on which image formats we want to work with.

We can use the image functions in PHP to get the size of JPEG, GIF, PNG, SWF, TIFF and JPEG2000 images.

With the exif extension, we are able to work with information stored in headers of JPEG and TIFF images. This way we can read meta data generated by digital cameras. The exif functions do not require the GD library[10].

Chapter 3

Methodologies and Implementation

For an expert system the most important part lies in its ability to convert human logic or intelligence into the system which we tried our best to depict the system.

Once we are sufficiently comfortable and understood the project goals and implemented the four big steps as earlier stated in chapter 2.

We focused only on our prolog part of programming and implementing logic correctly and efficiently in the system.

We divided the bigger task into modules while these modules are splitted into various submodules and sub-submodules, each of these sub-submodule basically consist of set of rules for calculation and decision purposes.

The value deduced by these sub-sub modules are passed upward to module chain reaching sub-module where all the values from all sub-submodules are again used for calculation purposes and finally these calculated values are passed upward to modules.

Based on values generated by various modules and using precise algorithm the final calculations are made for the Decision to be made.

While at each stage from bottom to top the generated result are also used to create graphs and reports according to requirement and type of user customization. Other than consulting experts from companies, we also referred to business plan paper by Frank Moyes and Stephen Lawrence of the Deming Center for Entrepreneurship, Leeds College of Business University of Colorado Boulder, Colorado[11]. Link to Frank Moyes page is http://leeds-faculty.colorado.edu/moyes/bplan/.

To get genuine data we referred to foreign trade website for GDP and FDI's in various countries[2], census india website for rural/urban population distribution[4] and literacy rate of various states[3], states and cities data

at wikipedia for basic amenitites availability and for various locations for suggestions to be made for IT and Manufacturing firms.

3.1 Methodologies

The bigger problem for conducting the feasibility study for the whole business classification is divided into 3 big modules namely :

1. Geographical analysis
2. Economical analysis
3. Market analysis

While each of the corresponding module is still divided into various sub - modules, efforts are made to ensure low coupling and high cohesion.

3.2 Algorithm Implementation

While each of these module is designed to perform a specific task, efforts have been made to ensure that each module work independently.

Also the same is being ensured by testing each with sub goal at every stage before integrating it with the bigger module.

Bottom up testing methodology is used during the whole testing phase.

Further each of these serve as a logic implemented in the form of algorithms.

3.3 Geographical Analysis

While conducting any feasibility study, the geographical analysis of the location forms a very important and unavoidable part in deciding the parameters for the success of business.

Location requirements changes with different kinds of industry, so the following algorithm is used by our system :

1. The system first imperative is to understand the kind of business, that is being implemented in given software by making various categories and subcategories through which the exact or most nearby model of business is identified.
2. Once the specific type is recognized the customized query is passed to the Geographical analysis module.

3. The basic geographical module is further categorized into various sub-modules so the query reaching the main geographical module is again divided into various sub queries and passed into sub modules.

4. In these sub-modules calculations are done according to the logic and algorithm implemented and the calculations parameters are calculated.

5. For each of the user provided / system analyzed location the geographical analysis is recursively done, adding calculated paramters for each sub module to a output file.

6. Finally that output file is pipelined into the main geographical analysis algorithm generating final location value for every location.

7. These points are computed as value out of hundred or grades given to each location.

8. Due to presence of difference between various factors, Scaling needs to be done for each factor before passing them to graph generation algorithm.

9. Finally for each sub module and main module graph is generated along with the corresponding reports.

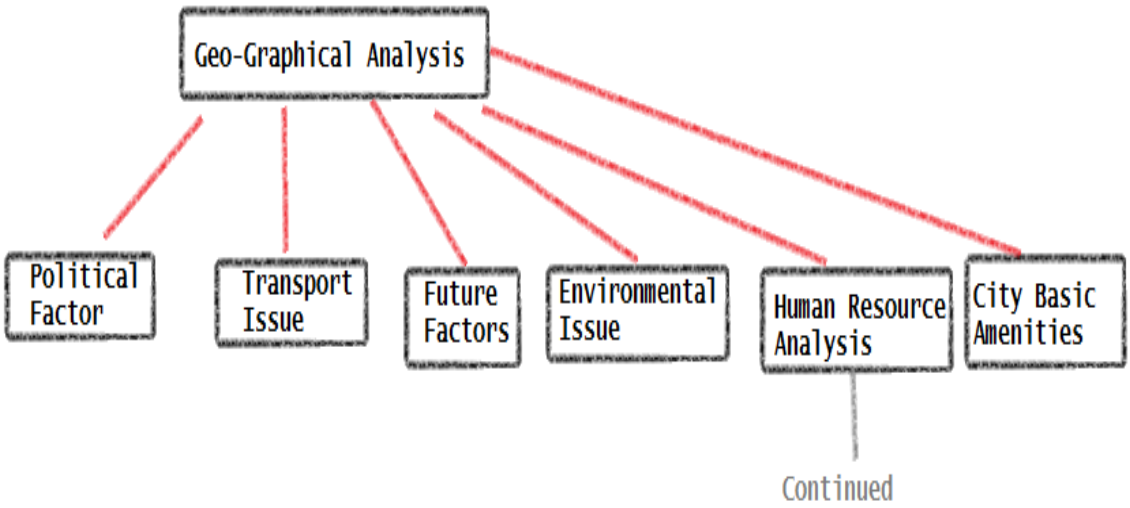


Figure 3.1: Geographical Analysis Chart

3.3.1 City basic amenities

http://leeds-faculty.colorado.edu/moyes/bplan/ In this algorithm city is analyzed for basic amenities in comparison with each other, basic facilities consisting of factors like modernization forms an integral part in location decision and effects other factors like staff satisfaction and human resource cost, skill and population.

Various Factors on which the algorithm works are :

1. City Electricity supply
2. City Water supply
3. City Transport score
4. City Modernization.
5. Airport type, Metro availability and other issues.

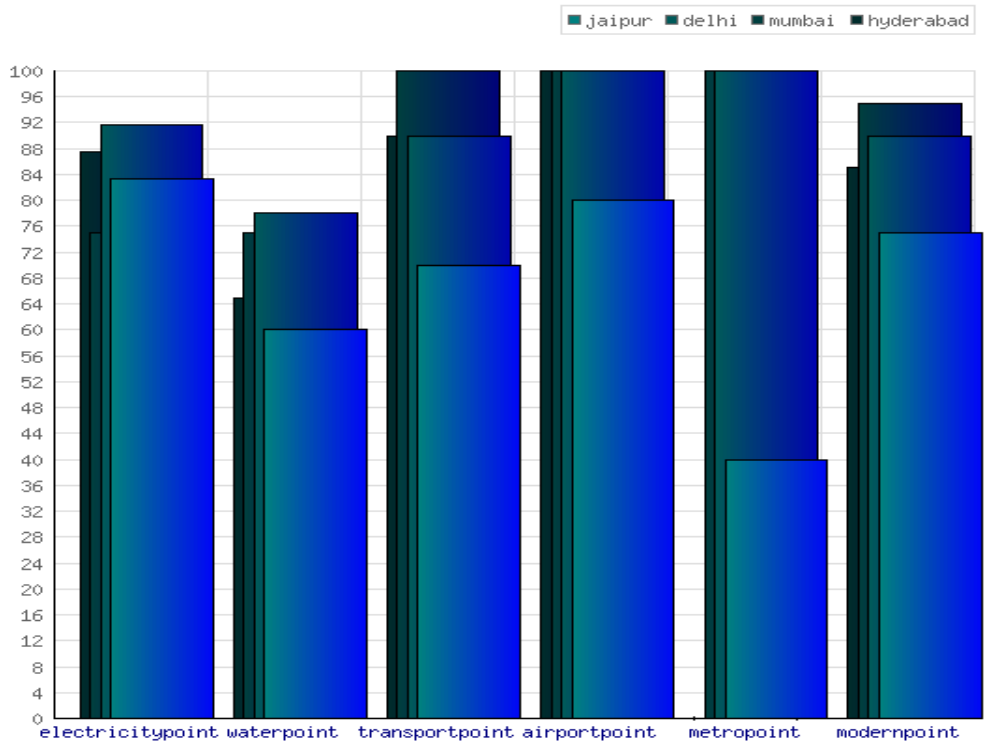


Figure 3.2: Sample City Basic Amenities graph generated by system

3.3.2 City human resource analysis

Human resource also makes an part of location decision, and has been addressed specifically in the system.

According to the various categories identified in the earlier classification algorithm, seperate functions have been called with required parameters.

Different needs for various type of industries have been identified and calculations are done correspondingly.

The staff is categorized in 3 classes for all the calculations

1. Labour
2. Technical Staff
3. Management Staff

While from the data available cost, skill and population for each has been

extracted, all these factors together form the parameters for the main algorithm. for computation.

Final factors and graphs are generated like above.

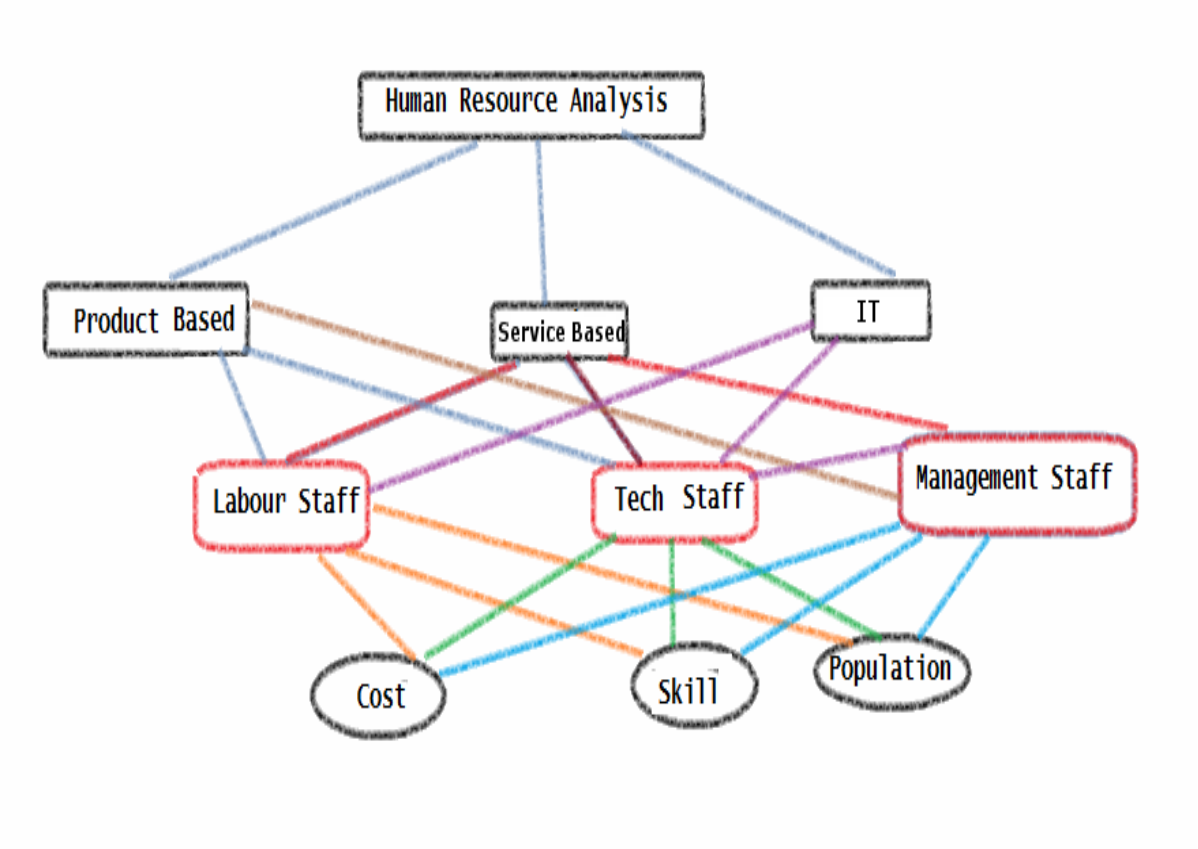


Figure 3.3: City Human Resource Analysis

3.3.3 City future analysis

Future factors are also analyzed by system to some extend making the decision prudent and favorable.

Efforts are made to predict few factors likely to change in future based on the data of past years and current trends.

Based on these factors, prediction parameters are find, algorithm utilizes following factors for its calculations

1. Population Growth Rate.
2. Literacy Growth Rate.
3. Government Proposed Policies and Plans.

3.3.4 City political analysis

Before making the final decision for location selection, political factors needed to be addressed to ensure the favorable business conditions and smooth functioning in future.

The system based on various factors calculate the political score for the country for the business location and also for the state of business location.

These factors together comprise of the final value for each location under the analysis.

Various factors are taken into consideration while implementing the algorithm :

1. Government Type
2. Government Policy
3. Country GDP
4. State Business Favourability
5. State and Country Environmental Issues
6. Government stability

3.4 Economical Analysis

Economic analysis is vital part of business feasibility algorithm implemented by system, economic analysis is implemented as an independent module in the system.

The following algorithm is implemented for economical analysis.

3.4.1 Understanding the Market

Firstly based on certain parameters:

1. Type of industry
2. Scale of industry
3. Type of product

System utilizes a classification algorithm to identify the industry based on system facts.

3.4.2 Finding the Competition

Knowledge about business competitors is must before conducting any kind of feasibility study.

So once the type of industry is identified the type of competition for that industry is identified based on knowledge base.

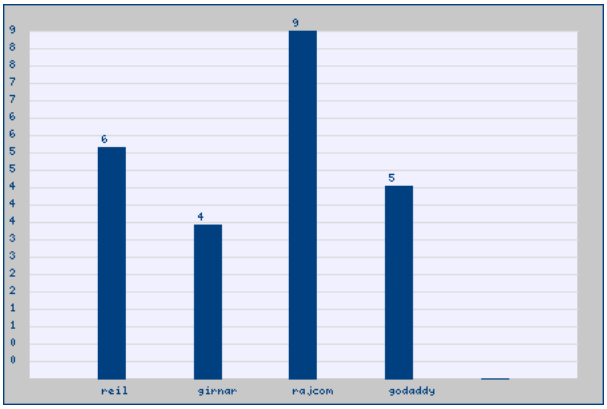
3.4.3 Researching the competition

Data available for competitors is analyzed in the system in comparison with the customer business, later on those graphs will be formed to depict the comparison in efficient manner.

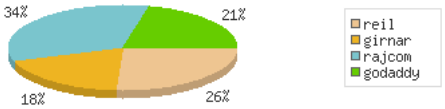
3.4.4 Comparing against competitors

For each competitors identified in step 2 and analysis in step 3 the following analysis is done :

1. Competition credibility analysis

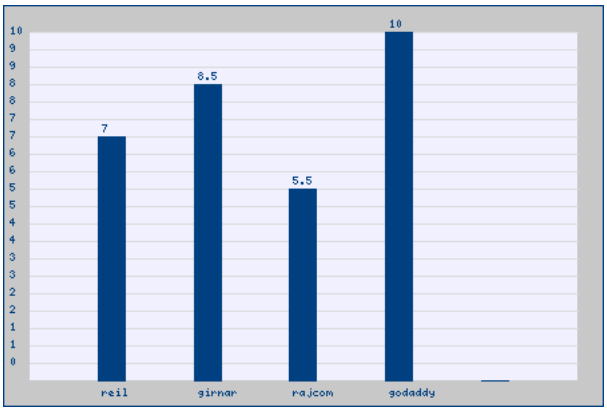


Sample Credibility Graph

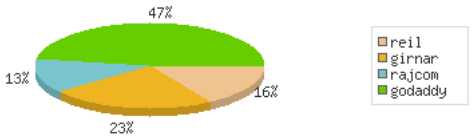


Sample Credibility PieChart

2. Competition financial analysis



Sample Finance Graph



Sample Finance PieChart

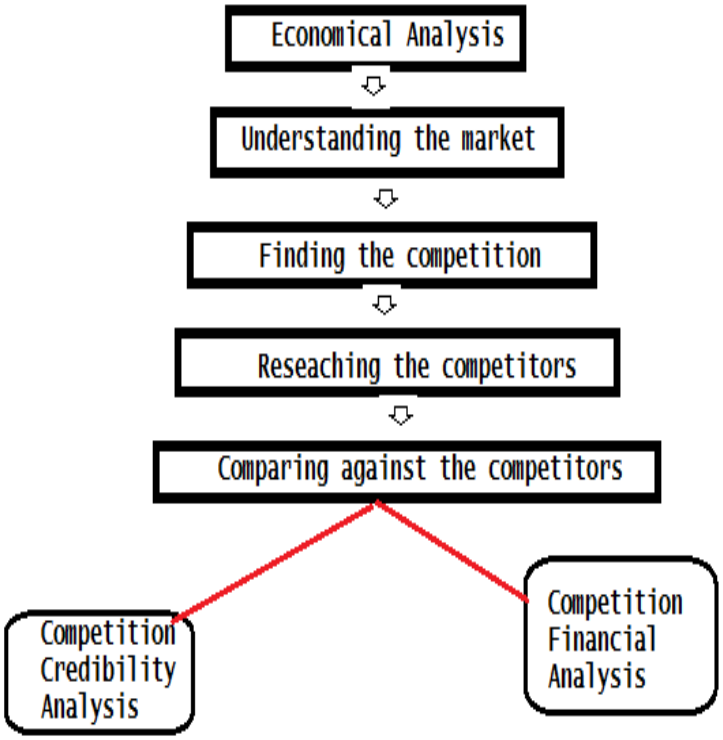


Figure 3.4: Economical Analysis Chart

3.4.5 Budget Analysis

For a company, analysis of its budget in comparison to its competitors who are already prevailing in the market. System rates our Budget taking out budgets from various factors:

1. Consider Companies from the same country
2. Consider Companies in the same scale of industry
3. Identify the Companies in the given type of market
4. Analyze the competitors budget and generate a bag for all the budgets.
5. Partitions are generated based on the values from bags.
6. Comparing the budget according to partitions and passing the calculated parameters to graph generation function.

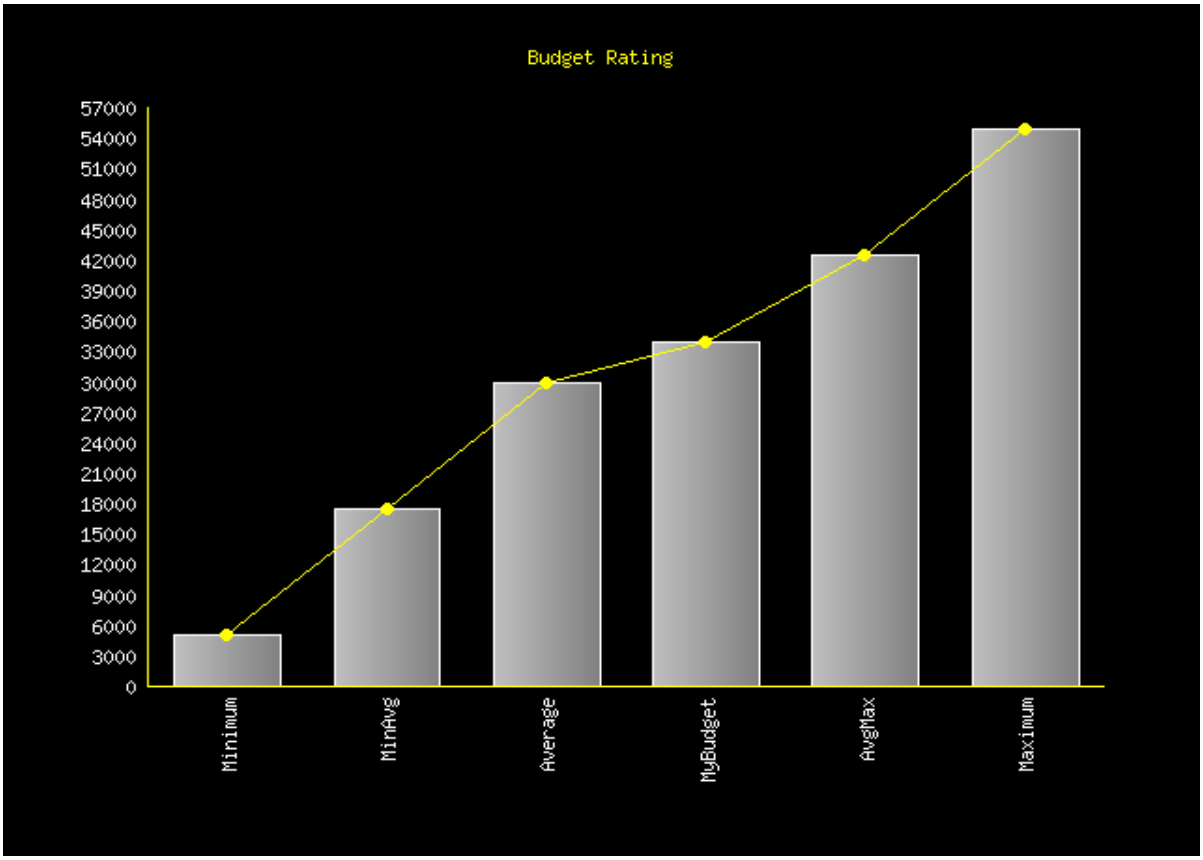


Figure 3.5: Sample Budget Rating Graph generated from our system

3.5 Location Finder algorithm

The following steps are implemented for location finder algorithm :

1. City is already decided based on previous algorithms and passed to this algorithm as an input parameter.
2. Location from knowledge based on kind of industry and other parameters are passed in the form of list.
3. For each of such location analysis is done on the final parameters :
   (a) Location rating
   (b) Location cost
   (c) Availability

(d) Transport parameters according to kind of industry.

4. System generates graphs on the basis of these algorithms and recommends the best options to user.

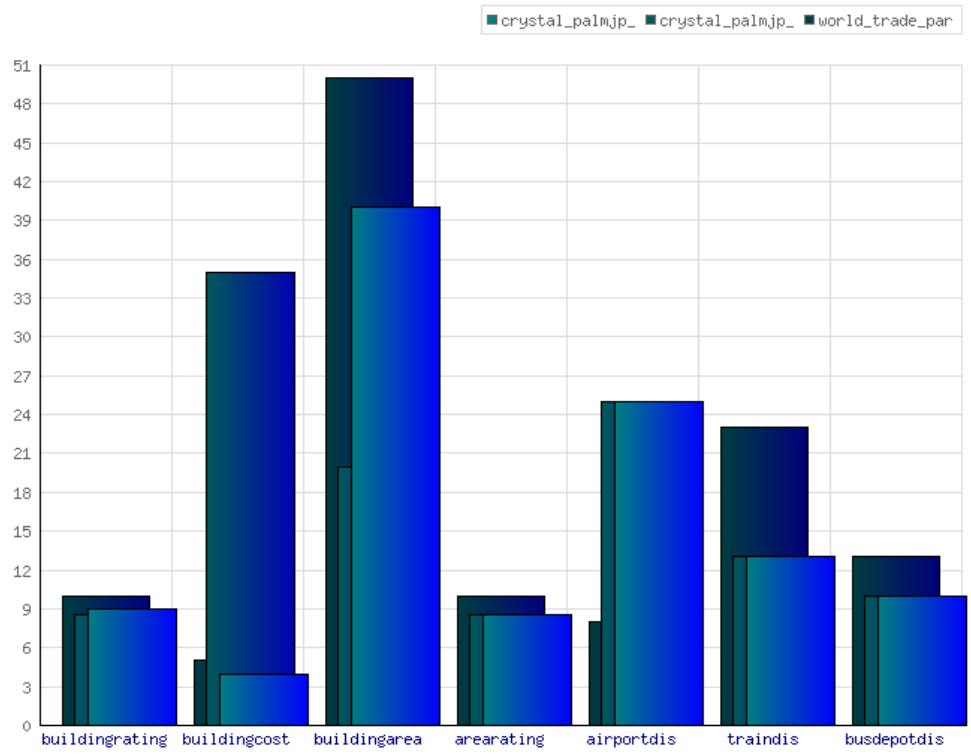


Figure 3.6: Sample Location Finder Graph generated from our system

3.6 Market Analysis

After geographical and economical analysis, market analysis is done by system while user can also customized between the three according to his requirements.

3.6.1 Identifying the Distribution Chain

Based on another classification algorithm the distribution chain is identified and financial calculations are done based on them. Various type of products are categorized into set of class based on similarity between their distribution mechanism.

3.6.2 Calculating the Financial Projections

Still a part on implementation, while basic efforts are made in this direction also to highlight the financial data and perform business and break even analysis.

3.7 Publicity Decision support

While all the implemented algorithm implemented above require user to pass on all parameter and based on them calculations and analysis is performed, whereas in publicity decision module only parameters as:

1. targeted audience
2. targeted language
3. Region targeted
4. Publicity budget

Are passed to system and system automatically performs all the logic to generate result for user in terms of :

- Type of advertisement medium
- Capital invested on each kind
- Best choice of time, cost and audience in the selected medium.

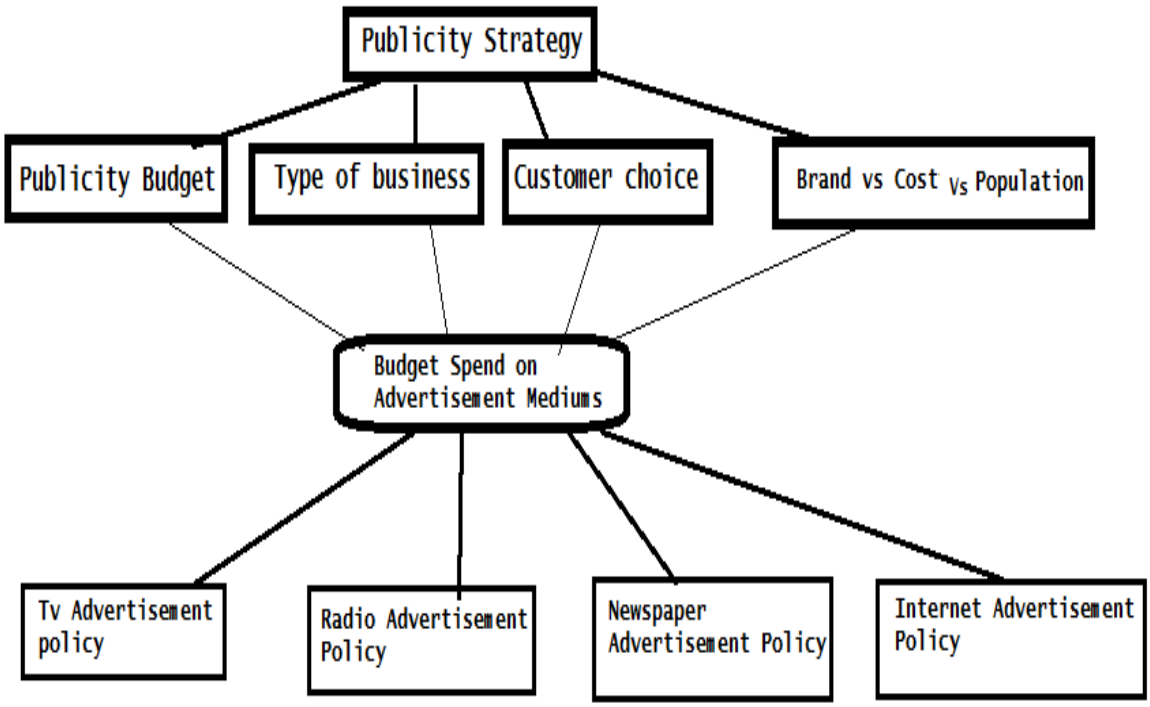


Figure 3.7: Publicity Strategy Chart

Chapter 4

Results and Conclusion

While the software computes a lot of details but for the purpose of human readability and better understanding only meaningful and important information is extracted for the final output.

For every type of analysis done system generated a summary of important calculations done and final recommendations.

Along with that corresponding graphical reports are also generated for fast and better understanding.

4.1 Case Study

Mr. XYZ from Sydney, Australia, graduated in Computer Engineering from Curtin Institute of Technology, Australia, is planning to start a website creation business in India.

While he has all the sufficient knowledge about technical knowledge required to create websites, but has no knowledge about the market, conditions, political factors, government policies, kind of staff he can employee for his company, remuneration for staff and other factors.

Also he has no knowledge about how to advertise to the targeted buyers or create a brand in the market.

So he contacted a frim Biz guide, performing feasibility study and decision support using an intelligent prolog engine, while for his comfort he can perform the complete study before starting the business or even coming to India online.

4.1.1 Input to system

Mr XYZ interacts with the system and fills the following detail:

1. Name of company : Webmonster
2. Budget : 34000 $
3. Industry Scale: Small Scale industry
4. Industry Type :Product Based
5. Product Type: Websites
6. Location to Decide :
   (a) jaipur
   (b) delhi

   User Choice Weightage :

   (a) Modernisation and facilities : very high
   (b) Staff Skill and Cost : medium
   (c) Political Factors : Low
7. Country : India

4.1.2 System analysis

After filling the basic details system runs all the algorithm based on data provided, while most of calculations is done based on system knowledge base.

Data provided by user is splitted into various queries and passed to prolog engine, while queries move from top to bottom module in system, calculation parameters bubbles from bottom to top.

4.1.3 Output

The following output is given to Mr. XYZ on payment for services, according to the type of study or decision performed by system:

Budget Rating

According to industry competitors:
Partition Classes are :

- 5000
- 17500
- 30000
- 42500
- 55000

Budget rating B+

Competition Financial

COMPETITION FINANCIAL RATING

1. the current equity of the company :reil is 55000
2. the current fiscal growth rate of the company :reil is 1
3. calculated financial factor is :55000
4. Financial condition of reil is : B
5. the current equity of the company :girnar is 5000
6. the current fiscal growth rate of the company :girnar is 15.5
7. calculated financial factor is :77500
8. Financial condition of girnar is : B
9. the current equity of the company :rajcom is 30000
10. the current fiscal growth rate of the company :rajcom is 1.5
11. calculated financial factor is :45000
12. Financial condition of rajcom is : B
13. the current equity of the company :godaddy is 45200
14. the current fiscal growth rate of the company :godaddy is 3.5

15. calculated financial factor is :158200
16. Financial condition of godaddy is : A
17. GRAPH generated by System supporting the Competition Financial

Competition Credibility

1. the functional years of the company :reil is 10
2. the current Reputation point of :reil is 63
3. The calculated rating score for company reil is :65.5
4. Credibility Rating of company is B
5. the functional years of the company :girnar is 3
6. the current Reputation point of :girnar is 45
7. The calculated rating score for company girnar is :45.75
8. Credibility Rating of company is C
9. the functional years of the company :rajcom is 20
10. the current Reputation point of :rajcom is 80
11. The calculated rating score for company rajcom is :85.0
12. Credibility Rating of company is AAA
13. the functional years of the company :godaddy is 10
14. the current Reputation point of :godaddy is 50
15. The calculated rating score for company godaddy is :52.5
16. Credibility Rating of company is C
17. GRAPH generated by the System supporting Competition Credibility

Political analysis

1. City :jaipur
2. State :rajasthan
3. Calculated STATE BUSINESS FAVORABILITY points :43
4. Calculated ENVIRONMENT STRICTNESS points :85
5. Calculated STATE POLITICAL STABILITY points :70
6. Calculated FINAL CITY STATE points are:70.5
7. City :delhi
8. State :ncr
9. calculated STATE BUSINESS FAVORABILITY points :82
10. calculated ENVIRONMENT STRICTNESS points :44
11. calculated STATE POLITICAL STABILITY points :96
12. calculated FINAL CITY STATE points are:76.3333

Human Resource Analysis

1. City : Jaipur
2. Calculated Skill cost factor for Labour staff is :18.9655
3. Final system generated value for Labour in cityjaipur is 3.24483
4. Tech Graduate Skill of city :jaipur is 56 Tech Graduate Cost of city :jaipur is 20000
5. Calculated Skill cost factor for Tech staff is :2.8
6. Final system generated value for Tech Satff in city :jaipur is 2.475
7. Management Graduate Skill of city :jaipur is 44
8. Management Graduate Cost of city :jaipur is 30000
9. Calculated Skill cost factor for management staff is :1.46667

10. Final system generated value for Management Staff in city :jaipur is 1.9275
11. City : Delhi
12. Calculated Skill cost factor for Labour staff is :12.2951
13. Final system generated value for Labour in citydelhi is 2.84426
14. Tech Graduate Skill of city :delhi is 86
15. Tech Graduate Cost of city :delhi is 40000
16. Calculated Skill cost factor for Tech staff is :2.15
17. Final system generated value for Tech Satff in city :delhi is 3.2375
18. Management Graduate Skill of city :delhi is 84
19. Management Graduate Cost of city :delhi is 65000
20. Calculated Skill cost factor for management staff is :1.29231
21. Final system generated value for Management Staff in city :delhi is 3.06635
22. Final Recommendation section : Software FINAL STAFF SYSTEM GENERATED POINTS ARE :jaipur 2.38518

Amenities Analysis

1. calculated FINAL AMENITIES points are City Delhi :91.2735.
2. calculated FINAL AMENITIES points are City Delhi :67.23

Final Geographical

1. Jaipur : 57.82
2. Delhi : 83.71

4.1.4 Publicity Decision

Television

1. OUR SOFTWARE HIGHLY RECOMMENDS CHANNEL : zeenews
2. WITH SCORE POINT: 40
3. CURRENT PRICE ALLOWS YOU TO BUY AIR TIME IN SECONDS:102

Radio

1. OUR SOFTWARE HIGHLY RECOMMENDS
2. FM:crazyfmhindi
3. FOR THE TIMING : drivehours
4. WITH SCORE POINT :1.76

Newspaper

1. SOFTWARE RECOMMENDATION IS pioneer With score points 13386
2. Buy page of the newspaper :magzine

Chapter 5

Advantages and Limitations

While coding the software efforts are kept always in mind to compare the software in real life scenarios. Following observations are honestly made regrading the utility, functionality and working of software.

5.1 Advantages

1. The PHP interface is able to provide user friendly and requirement specific interface to the customer.
2. All the logic has been successfully implemented in form of algorithms and tested thoroughly during the testing phase.
3. The Prolog engine computes a very large set of database and concludes its decision based on these calculations, thus offering a broader approach and more prudent towards decision making.
4. The end results provided by system are in form of summarized report and graphical representations for better understandability and fast decision support of customer.
5. The system is designed in a modular format making it easy to add new features without compromising with previous functionality.
6. Most of the functions are dynamic and can support any kind of query, until the required database is provided to system.
7. Besides the complete functionality, the system also provides options for customized study and decision support according to user requirement.

5.2 Limitations

1. For its proper functioning the system utilizes knowledge base in form of facts stored in various modules but even an instance of missing fact can cause the corresponding module to fail, so data should always be present in knowledge base.

2. Besides majority of algorithm work for any kind of industry decision but to support specific decision or very particular issue addition rules is required to be written for that particular decision.

3. Besides every effort to maintain the authenticity of data, few assumptions are made due to unavaibility of data source contributing to error proneness.

4. The system relies on rating and rankings from the various survey done by expertised companies, adding dependency factor to system.

Chapter 6

Future Work

Despite every possible effort to make it par the real industry requirements due to numerous reasons like shortage of time, difficulty in implementing mathematical calculations in prolog and much to lack of Business knowledge among coder and still a lot of work needs to be done in various fields to make it potentially successful software and serve its real purpose.

With due time and constant guidance we aim to develop it into a commercially successful venture.

Few things needed to be addressed more accurately and precisely.

6.1 Database

As mentioned earlier system relies on its database heavily and fails completely in case of missing database, to make it functional for all kind of industries database needs to be filled up for each respectively.

Also efforts in the direction of data authentication is very important from the original sources like forbes.

Rating and ranking done by various genuine survey agencies also form an integral part of database, in future we like to make our database more organized in various data modules, more authentic for accurate results and better output.

6.2 Logic

During the whole coding phase efforts have been made to implement human intelligence into the system using various algorithms, but the algorithms lack the complex calculations, and beside most of our logic are based on genuine references still logic from business experts is needed to make it a successful software.

In future we like to implement more rules with required expertise thus making it more featured and accurate.

6.3 Graphics

The system generates graphical reports in form 2-D graphs and charts besides efforts have also been made in directions of 3-D graph generation using SV graph library. In future, we like to work in the directions of better output in terms of more and meaningful reports and adding third dimension to graphs for better visibility.

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