

SHARE MARKET OPTIMIZATION

**“A WEB BASED SYSTEM TO PREDICT SHARE MARKET USING DIFFERENT
KINDS OF ECONOMIC FACTOR”**

A Thesis

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of

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DECLARATION

I hereby declare that this thesis is based on the results found by myself. Materials of work found by other researcher are mentioned by reference. This thesis, neither in whole nor in part, has been previously submitted for any degree.

ACKNOWLEDGMENTS

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Finally I pay my deepest respect to ALLAH the beneficial and the merciful and thank him for the successful completion of the report.

Abstract

We are going to develop a web based system which will work as share market assistance software. This software will determine which Share is to buy or hold and which one is to sell considering different kinds of social and economical factors. This will reduce the possibilities of getting loss for the share holders due to trading based on wrong predictions.

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1.0 Introduction:

Stock market is one of the main economical sectors for developing country like Bangladesh; whose economy is currently progressing rapidly due to the economical boost on South Asian region. Due to low labor cost and skillful manpower sectors like textile, garments, manufacturing, investments and banking had made a tremendous progress for the last decade which successfully influenced the trading on stock market investment. There are several factors which are directly or indirectly related to stock prices. Bangladesh has two Stock Exchanges: Dhaka Stock Exchange and Chittagong Stock Exchange. Dhaka Stock Exchange is the main stock exchange of Bangladesh. It was incorporated in 1954. Dhaka Stock Exchange (DSE) is registered as a Public Limited Company and its activities are regulated by its Articles of Association rules & regulations and bye-laws along with the Securities and Exchange Ordinance, 1969, Companies Act, 1994 & Securities & Exchange Commission Act, 1993 (DSE(2006)) .

2.0 Objective:

Due to the asymmetric information community, most of the people who are involved in share Market are not aware of the information for Trading. As a consequence, most unaware investors fall in problems after investing on a company by guessing. Our main goal of this development is to design the software in such a way that it can predict the value of the share (whether it is increased or decreased) by perception from the business environment.

Our another goal is to design the website in such a way that the user becomes more informed about the terms and regulations of current share market which they failed to get from the existing website of Dhaka Stock Exchange.

3.0 Background Research:

At the initial point we were totally unaware of the entire system of share market. So at first what we had to do is to collect information's regarding buying and selling stock. For that purpose we had to take the following steps:-

3.1 Information Collection:

Collecting all possible resources that contain the needed information of Dhaka stock exchange. That includes Books on stock market trading systems, DSE website, and other share market websites, downloaded research paper that is directly or indirectly related to stock market prediction method.

3.2 Consulting:

Consult with the Faculties of different departments like Economics and social science, Business administrations to get ideas about the tools which are used for predictions.

We also have downloaded a research paper which was done on "Share Market Analysis Using Various Economical and Social Determinants to Predict Decision for Investors" in 2006 by Dr. Md. Jahangir Alam Associate Professor, Institute of Business Administration, Dhaka University where he tries to develop six major hypotheses in Dhaka Stock Exchange (DSE), in Bangladesh and tried to prove the hypothesis by collecting data from the fields on six sectors: exchange rates, oil prices, turbulence, bank interest, gold price and call money rate.

4.0 Methodology:

As Mr Jahangir Alam finished his research mentioning that the factors for the fluctuation of share values are Dollar price, oil price, turbulence, bank interest, gold price and call money rate, from this point our work begins.

In this section, we have discussed about the overall process of the research work performed by Dr. Jahangir Alam. The figure below shows the step by step working methodology of his analysis process.

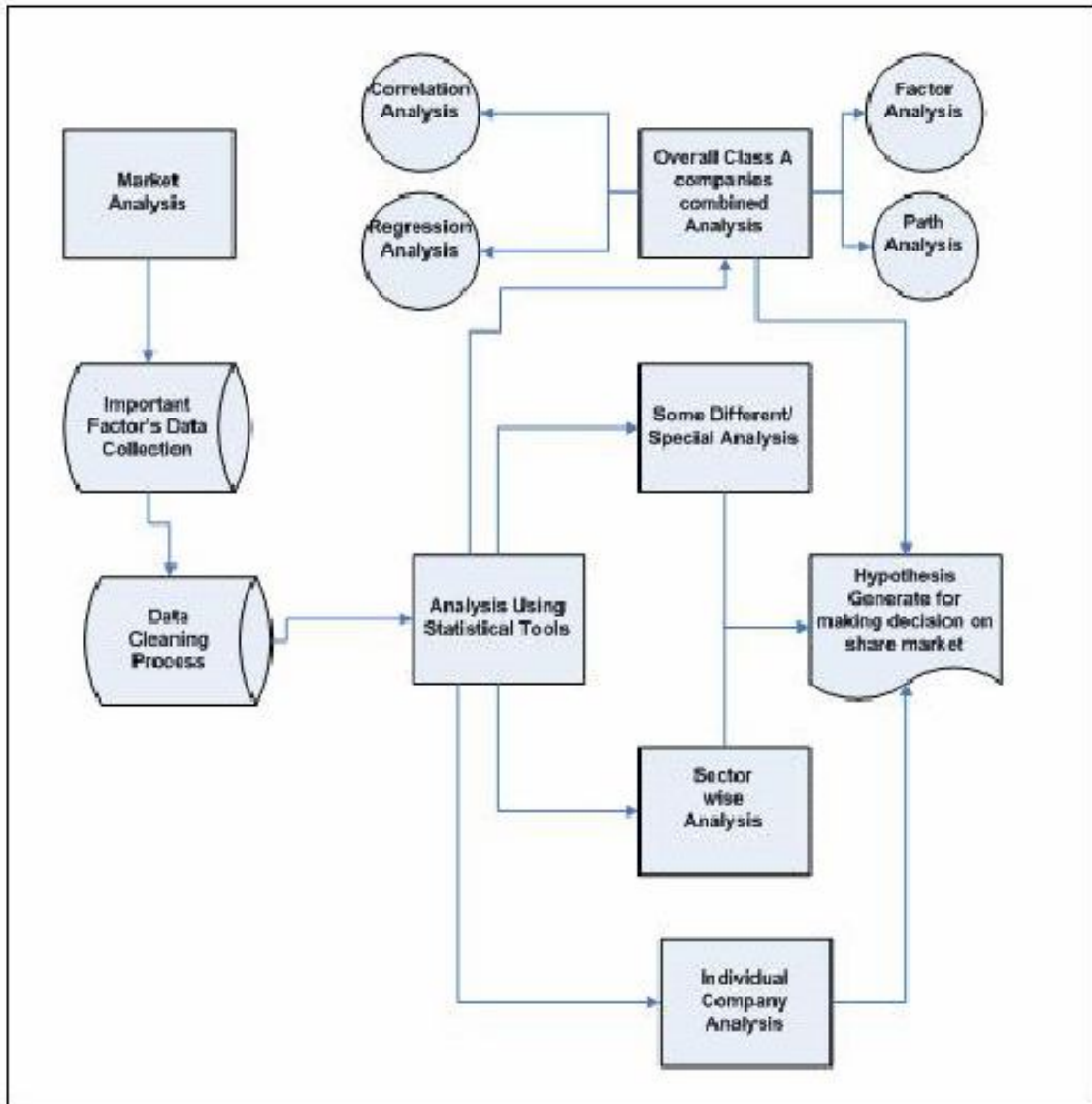


Figure 1: Research Model Used for analysis

At first, he has done the market analysis to find out which sectors are related to share market most and also tried to mark those factors which are effecting on share price in Bangladesh. For that he had talked to several personal of different sectors like share broker, share holder, banker, investors etc and analysis their suggestions. Then he finds out eight factors in primary level that those can be a good factor to make a change on share price in a systematic way. And those factors are: Dollar price, oil price, crime, gold price, bank deposit Bank deposit Bank deposit Interest and call money rate.

After that he had collected each sector's five years database on daily basis from specific sources. Then he had to do huge data cleaning process to make it prepare for final analysis. There are some holidays which didn't match in both share market & bank or exchange office. So he had to take previous day's closing price as those days share price.

He had to calculate all types of social and political crime and added them to get a total happened crime per month. To verify accurate gold price, he had to convert international price rate (which was in dollar) into BDT.

Then after data cleaning process, he used some famous statistical tools to do several statistical analysis based on the database of several factors. SPSS, Statistica and Lisrel software are mainly used to do several data and graphical analysis.

On the contrarily, he has divided the analysis process into several ways. At first he has done the analysis on all the A graded companies of DSE individually. Then he divided all the companies into several sectors according to their criteria and done the analysis on sector wise. After that he has done research on the basis of whole DSE (including 104 Class A companies) to find out some useful hypothesis which is related to share price.

Hypothesis 1: Share price does not depend on dollar price

Hypothesis 2: Share price does not depend on oil price.

Hypothesis 3: Share price does not depend on turbulence.

Hypothesis 4: Share price does not depend on deposit interest.

Hypothesis 5: Share price does not depend on call money rate.

Hypothesis 6: Share price does not depend on gold price.

Generally the efficient market hypothesis states that markets are efficient if prices fully reflect all available factors. His analysis was based on some strong statistical methods like correlation analysis, regression analysis, multiple regression analysis, path analysis etc.

4.1 Correlation Analysis:

Correlation analysis is used to find out if those economical and social factors really have a significant relationship with share price changes. This analysis allows to investigate the relationship between two or more sets of variables. It varies from 0 (random relationship) to 1 (perfect linear relationship) or -1 (perfect negative linear relationship). There are several types of correlation analysis. (G. David Garson (2003))

Here Pearson correlation analysis was used. It assumes that the two variables are measured on at least interval scales, and it determines the extent to which values of the two variables are "proportional" to each other. Proportional means linearly related; that is, the correlation is high if it can be "summarized" by a straight line. This analysis checks out the value of Pearson correlation /Correlation coefficients (r) which is a measure of the relation between two or more variables. Correlation coefficients can range from -1.00 to +1.00

The value of -1.00 represents a perfect negative correlation while a value of +1.00 represents a perfect positive correlation. A value of 0.00 represents a lack of correlation. . (G. David Garson (2003))

To measure the Pearson correlation coefficient (r) there are four Computational Steps:

(Pearson correlation analysis (2003))

$$SP \text{ (sum of products)} = XY - (fnXfnY)/N \text{ (1)}$$

$$SSX \text{ (sum of squares for X variable)} = X^2 - (fnX)^2/N \text{ (2)}$$

$$SSY \text{ (sum of squares for Y variable)} = Y^2 - (fnY)^2/N \text{ (3)}$$

$$r = SP / \sqrt{(SSX)(SSY)} \text{ (4)}$$

In Eq. (1-4) Y = dependent variable (here share price)

And X = Independent variable (dollar price, oil price, political turbulence, gold price, bank deposit interest and call money rate)

Here he found that dollar price, oil price, bank deposit interest and gold price are negatively related to share price changes where turbulence and call money rate has a positive relationship with share price changes.

Correlations	
Pearson Correlation Method	
Share Price	1.000
Dollar Price	-0.044
Oil Price	-0.032
Turbulence	0.004
Bank Interest	-0.035
Call Money Rate	-0.028
Gold Price	-0.038

Figure 2: Pearson Correlation Method

But from this analysis it is not possible to take the decision whether this relationship is really meaningful or not. For that he has done regression analysis to check this relationships significance.

4.1 Regression Analysis:

Regression analysis to justifies the relation's strength or weakness like as it is found that there is a significant relation between share price and other specific factors but we don't know how strong the relationship are. So by this analysis he has tried to figure it out. Regression analysis is a method of modeling the relationships among two or more variables. It is used to predict the value of one variable given the values of the others. It can establish that a set of independent variables explains a proportion of the variance in a dependent variable at a significant level. (Computer Desktop Encyclopedia (2006))

In statistics, regression analysis is used to model the relationship between random variables: One or more response variables or dependent variables (usually named Y), and the predictors (also called input variables, independent variables or explanatory variables, usually named X1, Xp). The most typical type of regression is linear regression (meaning we use the equation for a straight line, rather than some other type of curve), constructed using the least-squares method (the line we choose is the one that minimizes the sum of the squares of the distances between the line and the data points). It's customary to use "a" or "alpha" for the intercept of the line, and "b" or "beta" for the slope, (Richard I. Levin and David S. Rubin (2004)) so linear regression gives us a formula of the form:

$$y = bx + a \quad (5)$$

Where b is the slope and a is the intercept (the point where the line crosses the y axis) (Correlation and regression analysis for curve fitting (2003))

For Eq. (5), we can calculate b as:

Then we can calculate a from this equation:

$$a = - b (7)$$

A linear regression equation is usually written as $Y = a + bX + e$. (8)

Where Y is the dependent variable, a is the intercept, b is the slope or regression coefficient, X is the independent variable, e is the error term in Eq. (8) The equation will specify the average magnitude of the expected change in Y given a change in X. The regression equation is often represented on a scatter plot by a regression line. (Valerie J. Easton & John H. McColl, Paired Data (2003))

In this analysis we need to check out the value of Statistical significance (Sig. F change /p-value): The statistical significance of a result is the probability that the observed relationship (e.g., between variables). One could say that the statistical significance of a result tells us something about the degree to which the result is "true". In many areas of research, the p-value of .05 is usually treated as a "border-line acceptable" error level. The process of calculating this sig. F change is described below:

The coefficient of determination R² (R square) is also considered in this analysis. It is used to interpret the Values of Correlations. If the correlation coefficient is squared, then the resulting value R² will represent the proportion of common variation in the two variables.

Another way to measure the contribution of x in predicting y is to consider how much the errors of prediction of y can be reduced by using the information provided by x. The sample coefficient of determination is developed from the relationship between two kinds of variation: the variation of the y values in a data set around:

1. The fitted regression line
2. Their own mean

The term variation in both cases is used in its usual statistical sense to mean “the sum of a group of squared deviations”. The first variation is the variation of y values around the regression line, i.e., around their predicted values. This variation is the sum of squares for error (SSE) of the regression model (Correlation analysis (2002))

The second variation is the variation of y values around their own mean

The coefficient of determination is

It is easy to verify that

Where r is the coefficient of correlation in Eq. (12)

Therefore, usually we call R^2 the coefficient of determination.

F change is another variable which we need to know in order to measure the relationship's strength. The F -statistic is a ratio of two numbers, the mean square (or average variation) associated with the regression and the mean square associated with the residuals or errors. In other words, the F -statistic represents a ratio of explained variance to unexplained variance.

The F test is used to test the significance of R , which is the same as testing the significance of R^2 , which is the same as testing the significance of the regression model as a whole. If $\text{prob}(F) < .05$, then the model is considered significantly better than would be expected by chance and we reject the null hypothesis of no linear relationship of y to the independents. F is a function of R^2 , the number of independents, and the number of cases. In SPSS, the F test appears in the ANOVA table, which is part of regression output. Here the value of F is calculated by this equation:

$$F = \text{M.S. (regression)} / \text{M.S. (Residual)} \quad (13)$$

In Eq. (13) M.S. stands for Mean square and residual means error occurs in the analysis.

This is the coefficients table of regression analysis to check the significance level of the relationship between share price and dollar price.

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	2103.050	185.386		11.344	.000	1739.689	2466.411
Dollar price	-23.237	2.838	-.042	-8.187	.000	-28.800	-17.674

Figure 3: coefficients table of regression analysis of different variables

Here, If the null hypothesis is $H_0: \beta_1 = 0$,

$$t = b_1 / \text{Std. Error } (b_1) = -23.237 / 2.838 = -8.18 = t \text{ value of coefficients table}$$

$$P(t = -8.18) = 0.000$$

So we can say that dollar price and share price has a significant relationship that means if dollar price changes, share price also change at the same time.

Using these two methods we have tried to figure out that our research hypothesis are accepted or rejected.

This table's data is based on DSE's 104 companies 5 years' data on daily basis using correlation and regression analysis.

All class A companies
All class A companies

	Pearson correlation (r)	Sig. F change (p)	R square	F
Dollar price	-0.042	0.000	0.002	67.024
Oil price	-0.030	0.000	0.001	33.927
Turbulence	0.004	0.436	0.000	0.607
Deposit Interest	-0.033	0.000	0.001	41.853
Call Money Rate	0.026	0.000	0.001	25.922
Gold price	-0.036	0.000	0.001	48.297

Figure 4: Overall analysis table of all Class A companies of DSE

Here he used correlation analysis to check If there is any relationship exists between share price and other factors. After that we has done regression analysis to analyze how strong or weak the relationship is.

Hypothesis 1: Share price does not depend on dollar price

Hypothesis is rejected. ($F = 67.024$, $p = 0.000$).

From the analysis it is observed that share price is highly significantly depends on dollar price. If dollar price increases, share price decreases significantly ($r = -.042$). Around .2% of the variation of share price is due to variation of dollar price. (R square change = 0.002). Here the value of unstandardized coefficients B is -23.237. It means for 1 unit of dollar price change, share price decreases 23.237 units.

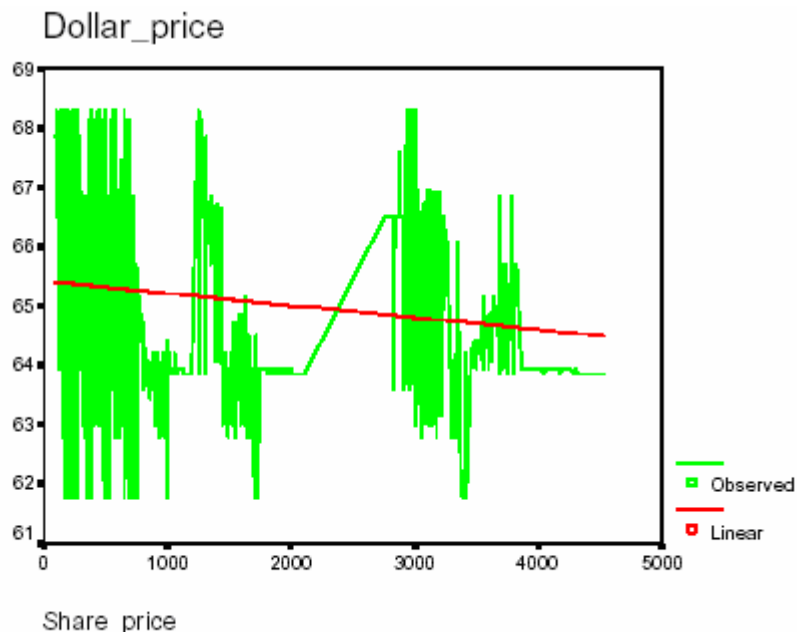


Figure 5: Curve fit of share price Vs dollar price

From curve fit graph, we can check also that dollar price and share price has an inverse relationship.

Hypothesis 2: Share price does not depend on oil price.

Hypothesis is rejected. (F = 33.927, p = 0.000)

It is observed that share price is significantly depends on oil price. If oil price increases, share price decreases significantly ($r = - 0.03$). Around .1% of the variation of share price is due to variation of oil price. (R square change = 0.001).

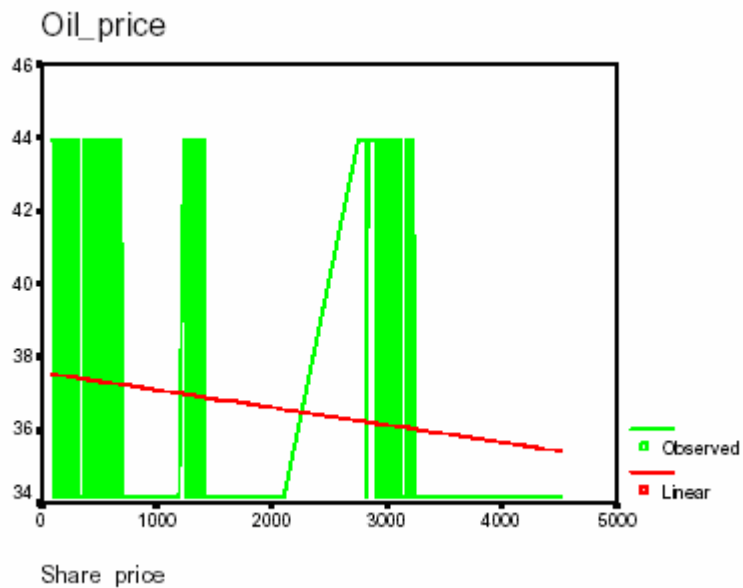


Figure 6: Curve fit of share price Vs oil price

From curve fit graph, we can check also that oil price and share price has an inverse relationship.

Hypothesis 3: Share price does not depend on turbulence.

Conclusion: Hypothesis is accepted. ($F = 0.607$, $p = 0.436$)

From the analysis it is observed that share price is not significantly depends on turbulence. If significance level is less then 0.05, relationship is meaningful. Here significance level is approx 0.436, so the relationship is not significant.

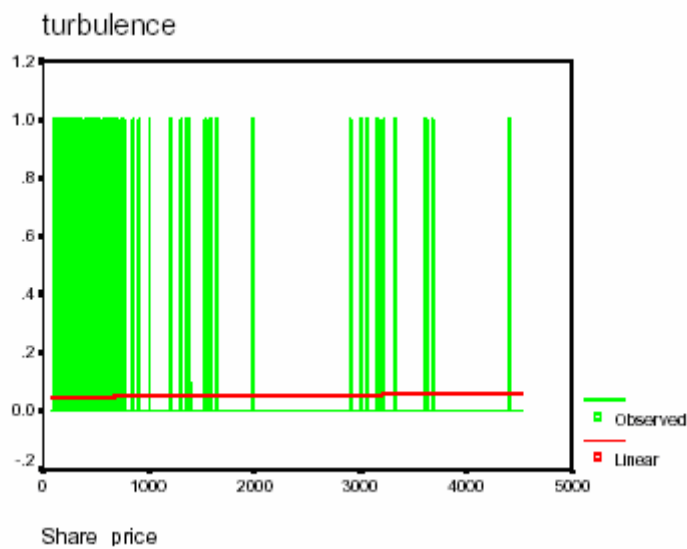


Figure 7: Curve fit of share price Vs turbulence

Hypothesis 4: Share price does not depend on deposit interest.

Conclusion: Hypothesis is rejected. (F = 41.853, p = 0.000)

It is observed that share price is significantly depends on deposit interest. If deposit interest increases, share price decreases significantly ($r = - 0.033$). Around .1% of the variation of share price is due to variation of deposit interest. (R square change =0.001)

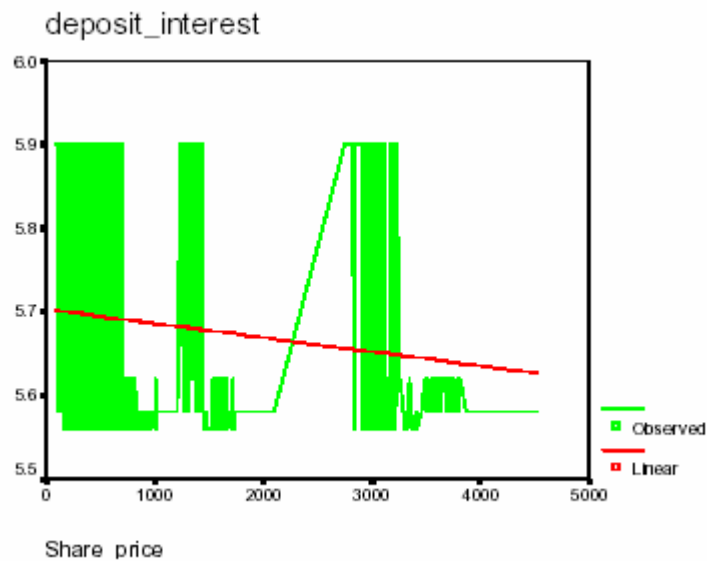


Figure 8: Curve fit of Share price vs. bank deposit interest

From curve fit graph, we can check also that bank deposit interest and share price has an inverse relationship.

Hypothesis 5: Share price does not depend on call money rate.

Conclusion: Hypothesis is rejected. ($F = 25.922$, $p = 0.000$)

It is observed that share price is significantly depends on call money rate. If call money rate increases, share price increases significantly ($r = 0.026$). Around .1% of the variation of share price is due to variation of call money rate. (R square change = 0.001).

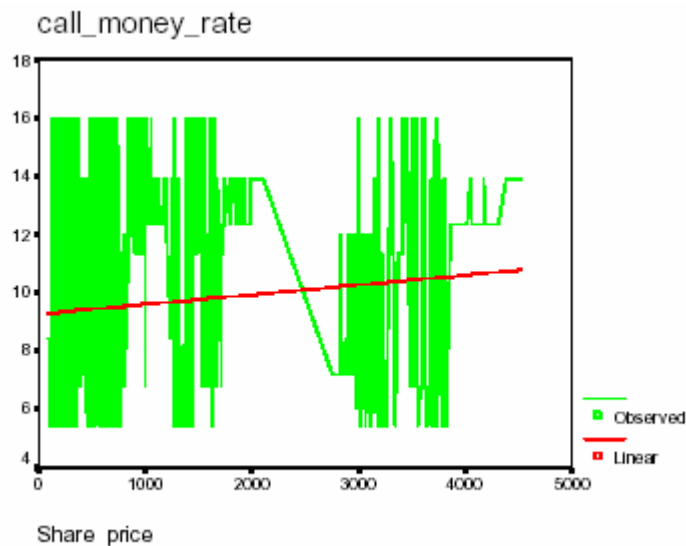


Figure 9: Curve fit of Share price vs. bank deposit interest

From curve fit graph, we can check also that call money rate and share price has a positive relationship.

Hypothesis 6: Share price does not depend on gold price.

Conclusion: Hypothesis is rejected. ($F = 48.297$, $p = 0.000$)

It is observed that share price is significantly depends on gold price. If gold price increases, share price decreases significantly ($r = -0.036$). Around .1% of the variation of share price is due to variation of gold price. (R square change = 0.001).

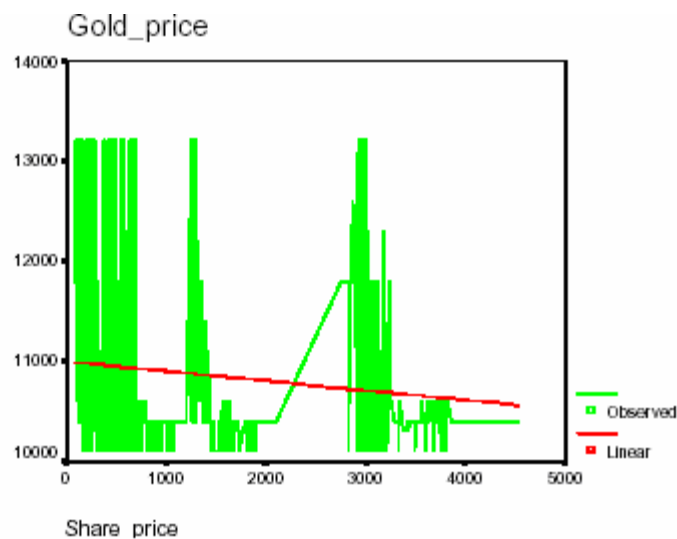


Figure 10: Curve fit of Share price vs. gold price

From curve fit graph, we can check also that gold price and share price has an inverse relationship.

4.3 Multiple regression analysis:

Multiple regression analysis is done to check multiple variables effect on share price changes. Multiple regression is used to account for (predict) the variance in an interval dependent, based on linear combinations of interval, dichotomous, or dummy independent variables. Multiple regression can establish that a set of independent variables explains a proportion of the variance in a dependent variable at a significant level (through a significance test of R²), and can establish the relative predictive importance of the independent variables (by comparing beta weights). Power terms can be added as independent variables to explore curvilinear effects. Cross-product terms can be added as independent variables to explore interaction effects. One can test the significance of difference of two R²'s to determine if adding an independent variable to the model helps significantly. (G. David Garson (2003))

In general, multiple regression procedures will estimate a linear equation of the form:

$$Y = a + b_1 \cdot X_1 + b_2 \cdot X_2 + b_3 \cdot X_3 + \dots + b_p \cdot X_p \quad (14)$$

In this Eq. (14) the regression coefficients (or B coefficients) represent the independent contributions of each independent variable to the prediction of the dependent variable. (Multiple Regression (2003)) Another way to express this fact is to say that, for example, variable X₁ is correlated with the Y variable, after controlling for all other independent variables.

Here X1= dollar price, X2= oil price, X3 = turbulence and so on according to our analysis. The values of b1, b2 are coming from multiple regression methods coefficient table. From this analysis we got that X1 and Y, X2 and Y has a highly significant relationship where as X3 and Y doesn't have any significant relationship.

He has done multiple regression analysis also to check multiple variables effect on share price changes. Multiple regressions can establish that a set of independent variables explains a proportion of the variance in a dependent variable at a significant level (through a significance test of R^2).

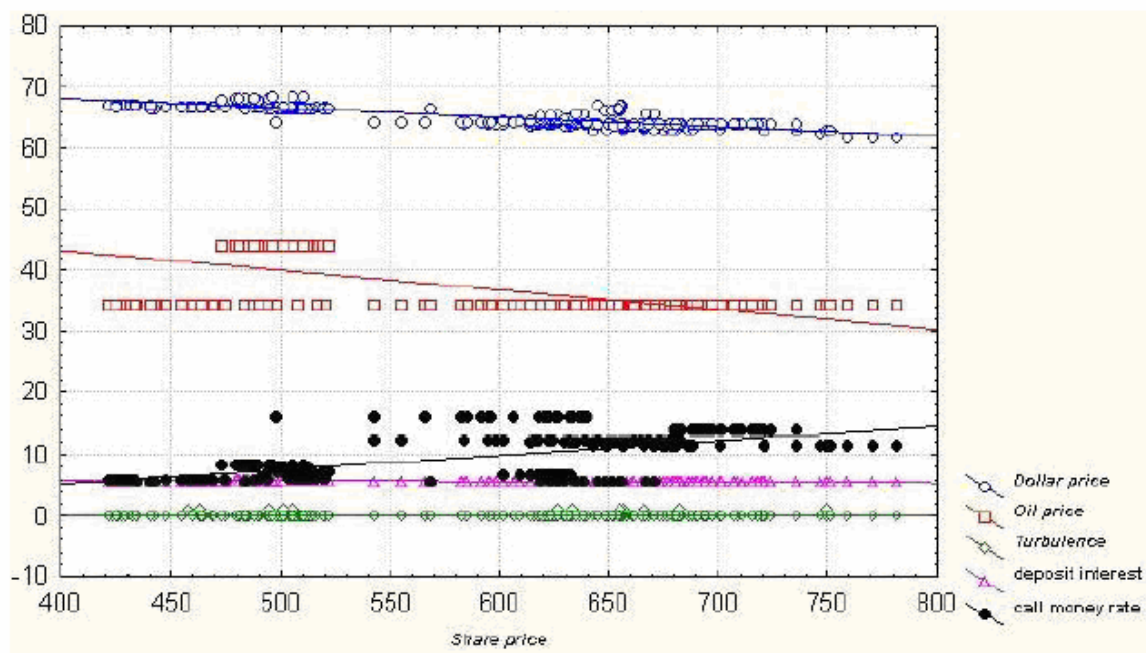


Figure 11: Multiple regression analysis

From this single graph we can check each of the variables or factors effect on share price at a glance.

4.4 Path analysis:

Path analysis was done to investigate that if these factors are internally related to each other or not. If all the chosen factors which we used in regression analysis are strongly interrelated to each other, then a problem could occur that, though we find a significant relationship between any two variables, but one factors variation or effect on another become weak. Path analysis is an extension of the regression model, used to test the fit of the correlation matrix against two or more causal models which are being compared by the researcher. The model is usually depicted in a circle-and-arrow figure in which single arrows indicate causation. A regression is done for each variable in the model as a dependent on others which the model indicates are causes. On the basis of these analytical methods result, we have tried to draw some strong hypothesis which is related to share market.

Though we have got some factors relationship with share price is really significant but their variance on share price is low, so we have done path analysis to find out the reason of this occurrence and saw that most of the factors which we have chosen for our research are also internally related to each other. That's why their variation on share price becomes low. But that does not effect on their significant relationship with share price changes.

Overall markets path analysis diagram

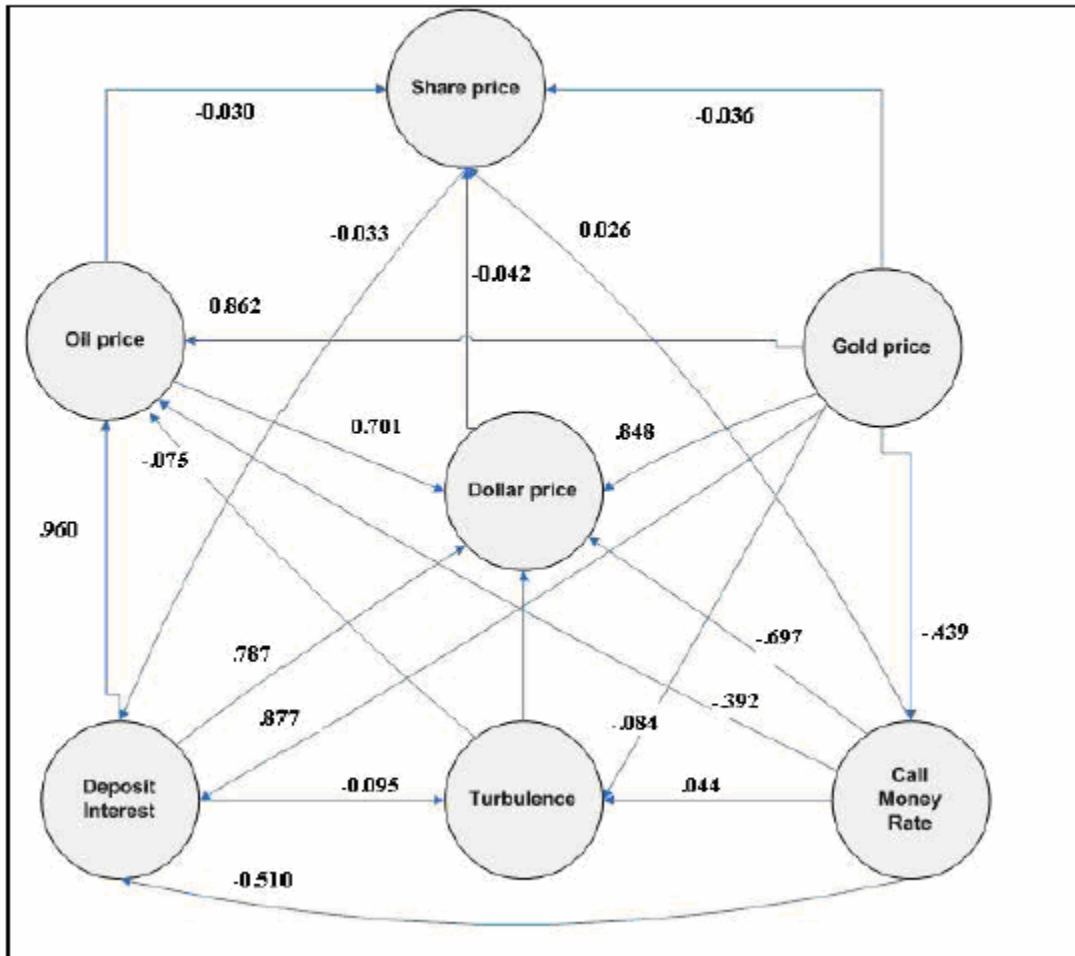


Figure 12: Path analysis diagram of overall market

5.0 Development:

We have divided our software development lifecycle into following phases:-

5.1 Requirement analysis:

In this Part, we determined to set to functionalities

For the system. One belongs to the user and the other is moderator.

User:

1. Sign up:

A user is required to sign up for the first time to access our site. We recommend our site restricted to the others as personal investment is a subject matter to different market risk factors. To sign up

He has to fill his credentials (personal information) and register to get informed from us.

2. Sign in:

After the sign up process he can log on to our site using his user_id and password.

3. Select company:

Information of different companies according to the possible status of share value will be shown. He can select one or more companies as he prefers. Thus he can build his own investment portfolio.

4. Delete company:

If he finds any company whose economic situation is very critical and there is a possibility to fall in his share value he can remove it from his own portfolio.

Moderator:

1. Set company information:

A moderator is allowed to create a company by using some information such as company_id, company name, Industry, dependent factors etc.

2. Set factors rate:

He can also set the todays and yesterdays rate according to the factor name.

The role of these two characters is shown in our use case analysis.

5.2 Conceptual design:

Here we have mainly considered three entities in our design. These are User (who has the attributes id, name, password, address, birthdates and address), company (id, name, industry, weight), factors (name, todays_rate, yesterdays rate). And these three attributes are some how have a relation with each other. This is shown in our ER diagram.

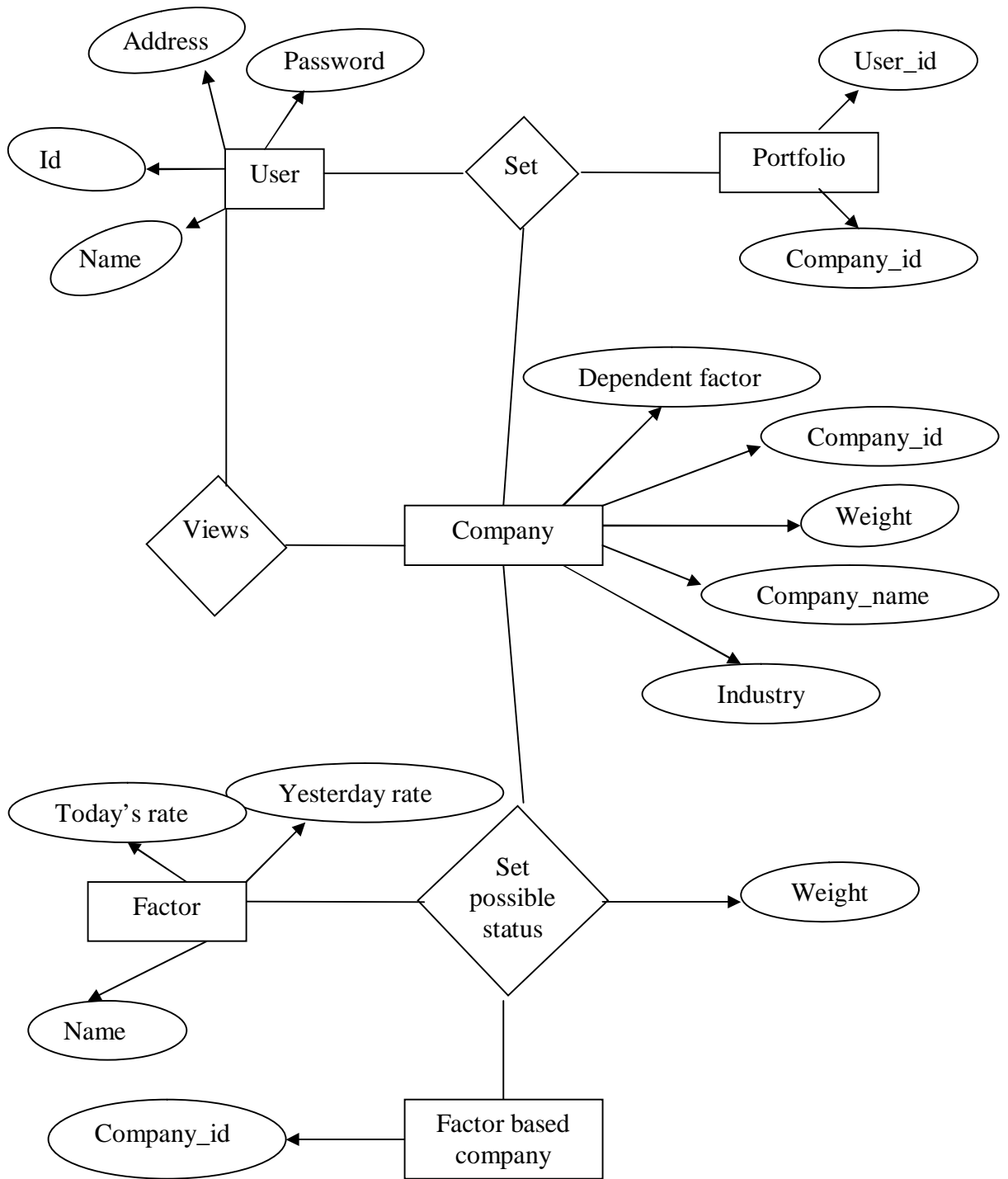


Figure 13: E-R Diagram of our system

5.3 Logical design:

In this phase, we have translated the ER into DBMS data model by creating table for individual Entities using their attributes.

User:

User_id	User_name	Password	Address	Emails
---------	-----------	----------	---------	--------

Company:

Company_id	Company_name	Industry	Weight
------------	--------------	----------	--------

Factors:

Factor_name	Today's_rate	Yesterday_rate
-------------	--------------	----------------

Exchange_rate_table:

Company_id

Inflation_rate_table:

Company_id

Bank_loan_rate_table

Company_id

Bank_intetrest_rate_table

Company_id

Figure 14: Logical design of our software

5.4 Interface design:

This design consists of developing different pages on different purposes. Following is a list of the pages.

Home page: It works as a welcome page whenever a user hits the site.



Figure 15: Home page of our web based system

User Page: This page asks the user to sign in or get registered.

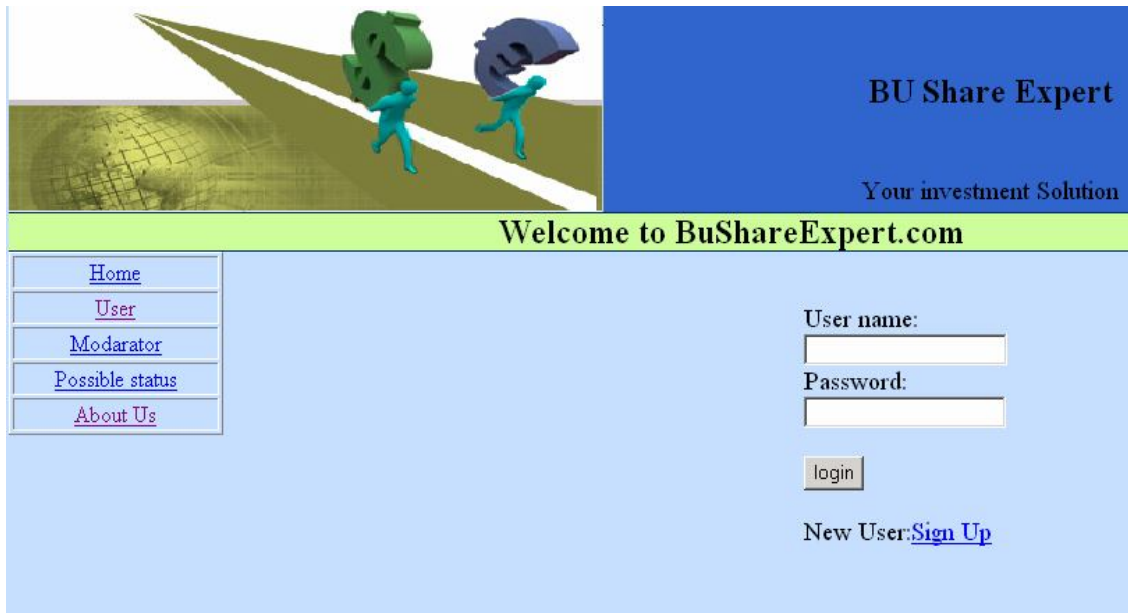


Figure 16: User page of our web based system

User Signup page: This page contains several input field to save the user information to database.

Home	Register	
User	User Name*	<input type="text"/>
Moderator	Password*	<input type="text"/>
Possible status	Confirm Password	<input type="text"/>
About Us	Name	<input type="text"/> <input type="text"/>
	First	Last
	Email	<input type="text"/>
	Phone	<input type="text"/>
	Gender	<input type="radio"/> Male <input type="radio"/> Female
	Birth Date	<input type="text"/> <input type="text"/> <input type="text"/>
		MM DD YYYY
	Terms and Conditions: Personal investment are subject to the market risk. The authority is not responsible for any kind of loss in the share market. Do you agree?	

Figure 17: Sign up page of our web based system

Post login page: After the user signs in, a list of companies stating their possible status is shown. The check box indicates that the user can select a company to his own portfolio by clicking it.

Welcome to BuShareExpert.com

Home	Check to Select	Company Id	Company Name	Industry	Weight	Possible Status
User	<input type="checkbox"/>	exbl	exbl	banking	-1	Down
Moderator	<input type="checkbox"/>	ex	ex	banking	-1	Down
Possible status	<input type="checkbox"/>	in	in	banking	-2	Down
About Us	<input type="checkbox"/>	bd	bd	banking	-1	Down
	<input type="checkbox"/>	bl	bl	banking	-2	Down
	<input type="checkbox"/>	blbd	blbd	banking	1	Up
	<input type="checkbox"/>	blin	blin	banking	-1	Down
	<input type="checkbox"/>	blex	blex	banking	-3	Down
	<input type="checkbox"/>	bdin	bdin	banking	-1	Down
	<input type="checkbox"/>	bdex	bdex	banking	-2	Down
	<input type="checkbox"/>	inex	inex	banking	-2	Down
	<input type="checkbox"/>	ex1	ex1	banking	-1	Down
	<input type="checkbox"/>	ম৭	ম৭	banking	0	
<input type="button" value="My portfolio"/>						

Figure 18: Post login page of our web based system

User portfolio page: This page shows the company listing in a tabular format which the user has chosen. The link delete gives the option to delete that company from his portfolio.

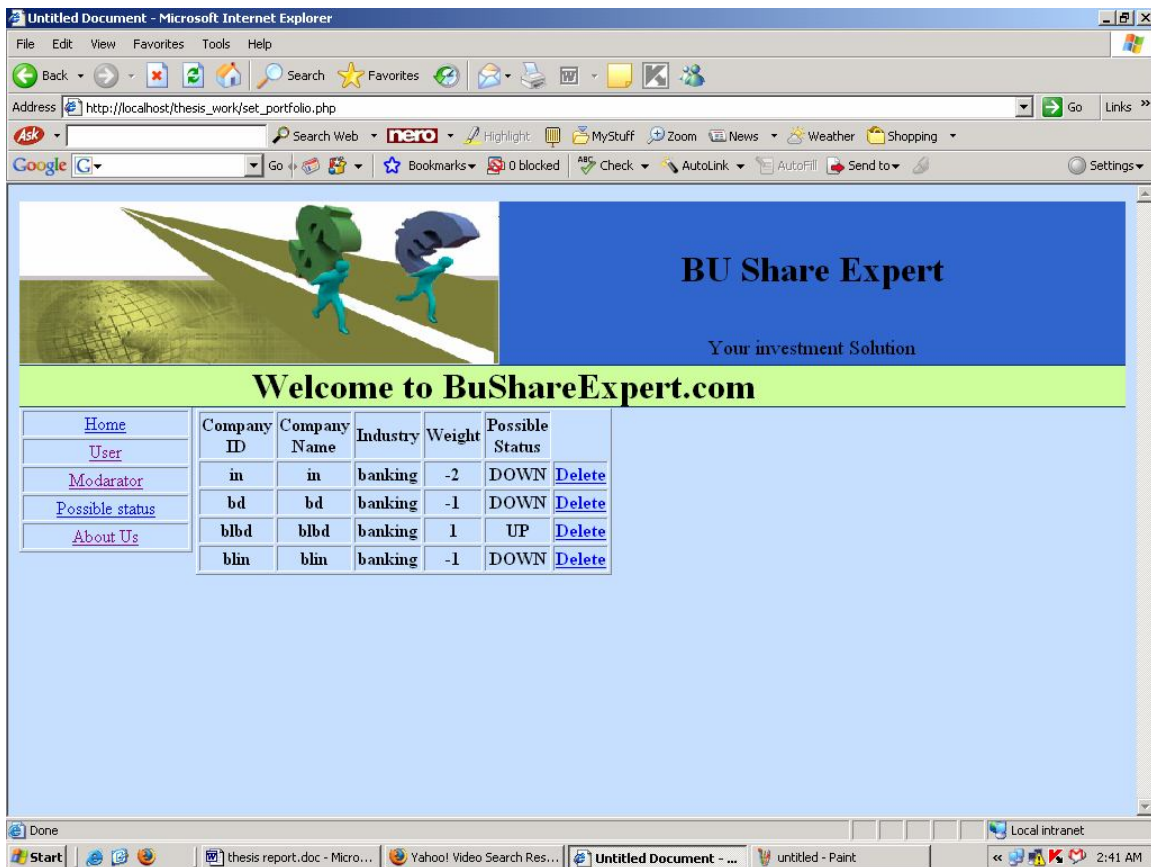


Figure 19: User portfolio page of our web based system

Set company page: The moderator is allowed to enter the company and select the dependent factor based on individual company fundamentals.

Please enter the following information:

Company ID:

Company name:

Industry:

Dependent Factors:

- Exchange Rate
- Inflation Rate
- Bank Deposit Rate
- Bank_loan_rate

Figure 20: Set company page of our web based system

Set factors page: In this page the moderator sets the factors update whenever any changes occur in the selected economic factors.

Exchange rate: Inflation rate:

exchange_rate	1
inflation_rate	5
bank_deposit_rate	0
bank_loan_rate	1

Bank deposit rate: Bank loan rate:

Figure 21: Set factor page of our web based system

View possible status page: In this page the updated status due to change in the factors described is shown.

The possible status:

Company ID	Company Name	Industry	Weight	Future status
exbl	exbl	banking	-1	DOWN
ex	ex	banking	-1	DOWN
in	in	banking	-2	DOWN
bd	bd	banking	-1	DOWN
bl	bl	banking	-2	DOWN
blbd	blbd	banking	1	UP
blin	blin	banking	-1	DOWN
blex	blex	banking	-3	DOWN
bdin	bdin	banking	-1	DOWN
bdex	bdex	banking	-2	DOWN
inex	inex	banking	-2	DOWN
ex1	ex1	banking	-1	DOWN
ম৭	মাহ	banking	0	----

Figure 22: Possible status page of our web based system

5.5 Implementation: We have implemented our software using the following tools:

Programming Tool:-

PHP: It is a server side language that is used to develop dynamic web pages. Here we have used PHP5. Now a days it is one of the powerful tools to develop WebPages.

Database Tool:-

Mysql: The Database tool to store or retrieve the information's needed that was discussed earlier.

Server Tool:-

Apache web server: A server was setup to respond the user requests.

5.6 Testing:

The most sensitive part of our system was the calculation of weight where after updating the data's in factors table, according to each factor we had to compare current rate with the previous rate. If the current rate is greater then the previous rate, we had to find out whether this change of rate impacts on the company's share value on positive or negative aspects. The code for the judgment of share value is given below:-

According to above algorithm we had to build several test cases:-

- a. We had to set the company's dependency on multiple factors to see whether they response at any of the changes in our economic factors.

- b. A company depending on multiple factors shows the accurate result according to the factors change. Say if the dollar price change has the positive effects and Bank loan rate has a negative impact, for the increase in dollar price should increase the weight of the of the company's weight and increase in bank loan rate should decrease the weight of that company.

6.0 Conclusion:

We have developed our software based on the economic factors of our country and one thing is very clear that if share investor doesn't have proper knowledge about our economical sector and its various factors, they have to invest only by guessing looking after some previous share prices of their chosen company. But that's not enough to take the decision that, that particular company's share price will increase or decrease in a natural flow. Predicting based on economic factors our software can help our investors to take the right decision on a specific company or sector. This will save his/her time and at the same time it will increase our gross domestic product and foreign direct investment as new industry will grow in our country by the mass investment. That is how it optimizes our share market.

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