

# UTTARANCHAL BUSINESS REVIEW

A Bi-Annual Journal of Management & IT

- ❑ Uttaranchal Business Review Anatomy of GDP Growth Rate: India  
**Dr. Shweta Arora**
  
- ❑ An Analytical Study on Work Life Balance of Women Employees Working in a Private Technical Institute and its Impact on their Job Satisfaction Level  
**Mrs. Shilpi Kulshrestha**
  
- ❑ Six Sigma - Transforming Higher Education  
**Mr. P. G. Dangwal**
  
- ❑ Importance of Data Warehousing in Decision Support System for Higher Education  
**Md Masud Alam and Dr. Md Aslam**
  
- ❑ Search Engine Optimization Techniques for Organic Search: A Theoretical Approach  
**Mr. Nitin Duklan and Dr. Himanshu Bahuguna**



**CHIEF PATRON**  
**Shri Jitendra Joshi**

Hon`ble Chairman  
UIM, Dehradun

**PATRONS**

**Prof. (Dr.) Pradeep Suri**

Director  
Uttaranchal Institute of Management, Dehradun

**MANAGING EDITOR**

**Mr. A. K. S. Chauhan**

**EDITORS**

**Mr. V. K. Tangri**

**Dr. Himanshu Bahuguna**

**ADVISORY BOARD**

|  |   |
|--|---|
| <b>Prof. Harish Chaudhary</b><br>Deptt. Of management Studies<br>IIT, Delhi                            | <b>Dr.Ravendra Singh</b><br>Professor (Computer Science and Engineering)<br>Rohilkhand University, Bareilly |
| <b>Prof. Jagdish Prakash</b><br>Ex Vice Chancellor<br>University of Allahabad, Allahabad               | <b>Dr. Rajesh Verma</b><br>Professor (Computer Science and Engineering)<br>RBMI, Bareilly                   |
| <b>Dr.Ranjana Mittal</b><br>Head(HR)<br>NTPC, NOIDA  | <b>Dr. Riktesh Srivastava</b><br>Professor(IT)<br>Skyline University, Dubai                                 |
| <b>Prof.Bhagwati Prasad</b><br>Ex Director<br>KIMS- Karnataka University                               | <b>Dr.V.K.Srivastava</b><br>Professor(Management)<br>RKGIT, Ghaziabad                                       |
| <b>Dr.Durgesh Pant</b><br>Director-School of Computer Science<br>Uttarakhand Open University, Haldwani | <b>Dr. Aftab Rizvi</b><br>Professor (Management)<br>Sharjah University                                      |
| <b>Prof. H.S. Dhami</b><br>Pro Vice Chancellor<br>Kumaun University, Nainital                          | <b>Dr. Sumanjeet Singh</b><br>Asstt. Professor<br>Deptt. Of Commerce<br>Ramjas College, University of Delhi |

## **From the desk of Managing Editor.....**

*It is my pleasure and pride to present before you the Dec, 2012 issue of UTTARANCHAL BUSINESS REVIEW - A journal of Uttaranchal Institute of Management, Dehradun. It is a bi-annual research journal of Management and IT. The aim of journal is to disseminate knowledge and information in the areas of Management and IT and to provide a forum for discussion on advancement in these areas. The journal focuses on theoretical, applied and interdisciplinary research in Management and IT.*

*Dr. Shweta Arora discusses GDP growth in India. Work-Life balance has been elaborated by Ms. Shilpi Kulshrestha. In Six-Sigma-Transforming Higher Education Mr. P.G. Dangwal emphasises on importance of Six – Sigm., Importance of Data warehouses has been stress by Md. Masud Duklan and Dr. Md. Aslam. Mr. Nitin Duklan and Dr. Himanshu Bahuguna talked about search engine optimization techniques in their paper.*

*The journal welcomes research papers and reviews focused on current issues in management and IT.*

*The success of a publication depends on co-operation of contributors, reviewers, editorial and advisory board, and the printing house. I acknowledge their kind support in providing their help whenever it was sought.*

*I hope the journal becomes an essential reference tool for the corporate executives, academicians, students and research scholars.*

*I would like to thank all the authors who have contributed towards this journal. I also extend my heartiest gratitude to several experts who helped us by ways of assessing research papers and making critical comments and suggestions. I look forward for your valuable suggestions and contribution.*

*Wishing you a very happy reading.....*

**A.K. S. Chauhan**  
aks21jan@gmail.com

---

| <b>Contents</b>  | <b>Page No</b> |
|--|----------------|
| ANATOMY OF GDP GROWTH RATE: INDIA<br>Dr. Shweta Arora  | 1              |
| AN ANALYTICAL STUDY ON WORK LIFE<br>BALANCE OF WOMEN EMPLOYEES WORKING<br>IN A PRIVATE TECHNICAL INSTITUTE AND<br>ITS IMPACT ON THEIR JOB<br>SATISFACTION LEVEL<br>Mrs. Shilpi Kulshrestha | 19             |
| SIX SIGMA - TRANSFORMING<br>HIGHER EDUCATION<br>Mr. P. G. Dangwal  | 29             |
| IMPORTANCE OF DATA WAREHOUSING IN DECISION<br>SUPPORT SYSTEM FOR HIGHER EDUCATION<br>Md Masud alam and Dr. Md Aslam  | 39             |
| SEARCH ENGINE OPTIMIZATION TECHNIQUES<br>FOR ORGANIC SEARCH: A THEORETICAL APPROACH<br>Mr. Nitin Duklan and Dr. Himanshu Bahuguna  | 45             |

# ANATOMY OF GDP GROWTH RATE: INDIA

**Dr. Shweta Arora**

Assistant Professor, Ideal Institute of Technology,  
Govindpuram Ghaziabad

## ABSTRACT

Global growth is likely to slow to approximately 3% per year on average—a rate somewhat below the average of the last two decades. A recovery in advanced economies will be more than offset by a gradual slowdown in emerging ones as they mature, with the net result that global growth will slow. The greatest challenge for the global economy in this slow growth environment is to raise productivity without losing job opportunities for the millions who are looking for reasonably paid jobs to support their living standards. The paper analyses World Economic Growth and existence of India in it. The paper is divided into 5 phases: first phase introduces the World Economic Growth including Developed and Emerging Economies and a glimpse of several Economic indicators, second phase mentions the reasons of slow Growth, third phase elaborates the Vicious circle of Slow Growth and how Economy operates in various situation, fourth phase includes suggestions to bounce back Economy from severe situation of Slow growth and finally fifth phase concludes which shows a different picture of India's Economy.

Keywords: Middle East and North Africa (MENA), sub-Saharan Africa (SSA), Economic and Monetary Union (EMU) and Gross Domestic Product (GDP)

## 1. Introduction

The world economy has changed dramatically since September 2011. European growth has slowed sharply, and many economies in the region are now in or close to recession. In the MENA, unrest has spread, further depressing the outlook for the region even as some economies rebuild after earlier conflicts. In other regions, however, developments have been more positive. The United States has seen a spate of encouraging economic news, with growth increasing and unemployment falling. Asia has weathered the global slowdown well and looks headed for a soft landing. Latin America has shown resilience to the swings in risk aversion flowing from European developments over recent months. SSA has been surprisingly resilient to the European slowdown, reflecting an ongoing redirection of its economic linkages toward Asia.

What went wrong in the Euro Area: The euro area crisis is the product of the interaction among several underlying forces. As in other advanced economies, these forces include mispriced risk, macroeconomic policy misbehavior over many years, and weak prudential policies and frameworks. These interacted with EMU-specific flaws, accelerating the buildup of excessive public and private sector imbalances in several euro area economies, which were exposed in the aftermath of the Great Recession. The resulting crisis has had drastic consequences. Recessionary conditions are deepening through the region, as evidenced by the slide in manufacturing and service activity as reported by purchasing managers, and the continuing rise in unemployment, now at 11% and still climbing. Intensifying banking sector problems in a number of the peripheral nations are exacerbating the economic slump and undercutting confidence. Deteriorating conditions in the euro zone will have an even greater impact on trade and credit flows internationally, reverberations that are contributing to a further moderation in global growth.

**Before moving further let us understand few terms:**

What is GDP: it represents the total value of all goods and services that are produced within a country's borders in a particular time period, typically a year or quarter. Nominal GDP is calculated at current prices and does not factor in inflation, while real GDP is adjusted for prices. At Rs 52 lakh crore, India's real GDP grew 6.5% in 2011-12, while nominal GDP grew 15 % to cross Rs 82.3 lakh crore. GDP is a purely economic measure and does not say much about qualitative aspects. A greater GDP could also! mean that much of the growth may! have been driven by the rich.

**What is Slowdown:** meaning of slowdown is different for various economic entities.

**For Employees:** sluggish industrial growth which means lesser growth opportunities and smaller pay hikes as hiring slows down.

**For Investors:** weak corporate profitability is hurting investor sentiments. Foreign investors are pulling out from India.

**For Government:** a slowing economy has yielded lower tax collections, limiting public spending on welfare schemes, upsetting fiscal plans.

**For Companies:** shrinking demand has hit firms which are looking for options to keep revenues high and maintain profits.

**Fiscal Policy:** To generate revenue and to incur expenditure, the government frames a policy called budgetary policy or fiscal policy. Fiscal

policy is the means by which a government adjusts its levels of spending in order to monitor and influence a nation's economy. It is the sister strategy to monetary policy with which a central bank influences a nation's money supply. These two policies are used in various combinations in an effort to direct a country's economic goals. Thus, it is, Government spending policies that influence macroeconomic conditions. These policies affect tax rates, interest rates and government spending, in an effort to control the economy.

**Inflation:** Inflation rate refers to a general rise in prices measured against a standard level of purchasing power. The most well known measures of Inflation are the CPI which measures consumer prices, and the GDP deflator, which measures inflation in the whole of the domestic economy. Thus, it is the rate at which the general level of prices for goods and services is rising, and, subsequently, purchasing power is falling.

**Headline Inflation:** A measurement of price inflation that takes into account all types of inflation that an economy can experience. Headline inflation also accounts changes in the price of food and energy. Because food and energy prices can rapidly increase while other types of inflation can remain low, it may not give an accurate picture of how an economy is behaving. Headline inflation is more useful for the typical household because it reflects changes in the cost of living.

**Core Inflation:** A measure of inflation that excludes certain items that face volatile price movements. Core inflation eliminates products that can have temporary price shocks because these shocks can diverge from the overall trend of inflation and give a false measure of inflation. Core inflation is most often calculated by taking the Consumer Price Index (CPI) and excluding certain items from the index, usually energy and food products. Other methods of calculation include the outlier's method, which removes the products that have had the largest price changes. Core inflation is thought to be an indicator of underlying long-term inflation. It is used by central banks as core inflation is less volatile and shows the effects of supply and demand on GDP better.

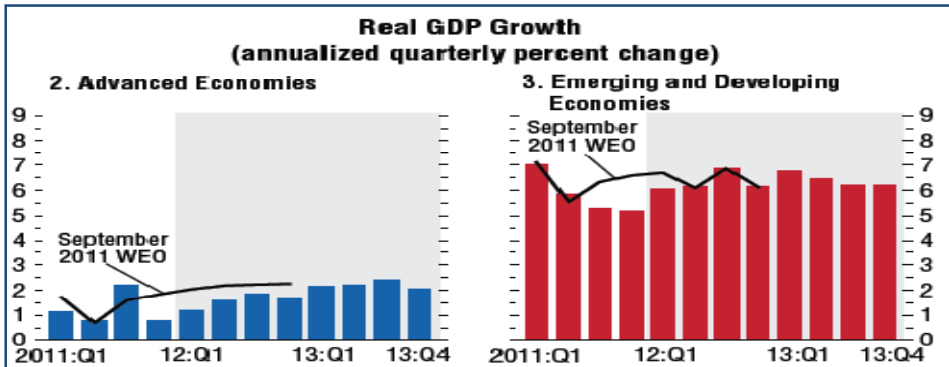
### **Global Picture of several Economic Indicators**

Real GDP- In many emerging and developing economies Real GDP was somewhat weaker than expected, but growth surprised on the upside in

the advanced economies. However, activity took a sharp turn for the worse during the fourth quarter.

**FIGURE – 1**

**Global Real GDP Growth**



Source: IMF staff estimates.

2. Australia, Canada, Czech Republic, Denmark, euro area, Hong Kong SAR, Israel, Japan, Korea, New Zealand, Norway, Singapore, Sweden, Switzerland, Taiwan Province of China, United Kingdom, and United States.
3. Argentina, Brazil, Bulgaria, Chile, China, Colombia, Hungary, India, Indonesia, Latvia, Lithuania, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Romania, Russia, South Africa, Thailand, Turkey, Ukraine, and Venezuela.

The outlook for the global economy is slowly improving again but is still very fragile. Real GDP growth should pick up gradually during 2012–13 from the trough reached during the first quarter of 2012 (Figure-1). Improved financial conditions, accommodative monetary policies, a similar pace of fiscal tightening as in 2011, and special factors (reconstruction in Japan and Thailand) will drive the reacceleration. However, the recovery will remain vulnerable to several major downside risks. Regarding risks from Europe, the WEO projections assume that policymakers will prevent a Greek-style downward spiral from taking hold of another economy on the euro area periphery. However, it is assumed that additional support will be forthcoming only in the event of reintensified market turmoil. Thus, sovereign spreads and euro area banking system stress are expected to remain volatile and come down only gradually.



**TABLE – 1**Global Outlook for Growth of Gross Domestic Product, 1996-2012 (January 2012)<sup>†</sup>

|  | Distributi<br>n of World<br>Output<br>2011 | 1996 - 2005       |   | 2006 - 2011                        |   | 2011                            |   | 2012                               |   |
|--|--|-------------------|---|------------------------------------|---|---------------------------------|---|------------------------------------|---|
|  |  | GDP<br>Growt<br>h | Contrib<br>ution to<br>World<br>GDP<br>growth**<br>** | Project<br>ed<br>GDP<br>Growt<br>h | Contributi<br>on to<br>World<br>GDP<br>growth**<br>** | Projecte<br>d GDP<br>Growt<br>h | Contributi<br>on to<br>World<br>GDP<br>growth**<br>** | Project<br>ed<br>GDP<br>Growt<br>h | Contributi<br>on to<br>World<br>GDP<br>growth**<br>** |
| US   | 18.6%                                      | 3.3               | 0.7   | 0.9                                | 0.2   | 1.8                             | 0.3   | 1.8                                | 0.3   |
| EU-15*   | 17.9%                                      | 2.3               | 0.5   | 0.8                                | 0.2   | 1.4                             | 0.3   | 0.2                                | 0.0   |
| Japan  | 5.7%                                       | 1.0               | 0.1   | 0.2                                | 0.0   | -0.5                            | 0.0   | 1.5                                | 0.1   |
| Other advanced**                               | 8.2%                                       | 3.8               | 0.3   | 2.9                                | 0.2   | 3.2                             | 0.3   | 2.8                                | 0.2   |
| Advanced<br>Economies                          | 50.4%                                      | 2.7               | 1.6   | 1.1                                | 0.6   | 1.6                             | 0.8   | 1.3                                | 0.7   |
|  |  |                   |   |                                    |   |                                 |   |                                    |   |
| China  | 15.8%                                      | 8.1               | 0.6   | 10.9                               | 1.3   | 9.2                             | 1.4   | 8.0                                | 1.2   |
| India  | 5.7%                                       | 6.5               | 0.2   | 8.3                                | 0.4   | 7.5                             | 0.4   | 6.9                                | 0.4   |
| Other developing<br>Asia                       | 5.1%                                       | 3.9               | 0.2   | 5.1                                | 0.2   | 5.1                             | 0.3   | 5.0                                | 0.3   |
| Latin America                                  | 7.8%                                       | 2.8               | 0.2   | 3.8                                | 0.3   | 4.1                             | 0.3   | 3.6                                | 0.3   |
| Middle East                                    | 3.5%                                       | 4.5               | 0.1   | 4.8                                | 0.2   | 4.8                             | 0.2   | 4.0                                | 0.1   |
| Africa   | 3.3%                                       | 4.5               | 0.1   | 4.9                                | 0.2   | 3.8                             | 0.1   | 4.8                                | 0.2   |
| Central & Eastern<br>Europe                    | 3.9%                                       | 3.8               | 0.1   | 3.3                                | 0.1   | 4.2                             | 0.2   | 2.5                                | 0.1   |
| Russia and other<br>CIS***                     | 4.4%                                       | 4.0               | 0.2   | 4.0                                | 0.2   | 4.4                             | 0.2   | 4.2                                | 0.2   |
| Emerging Market<br>and Developing<br>Economies | 49.6%                                      | 4.9               | 1.9   | 6.5                                | 2.9   | 6.2                             | 3.0   | 5.6                                | 2.7   |
| World  | 100.0%                                     | 3.6               |   | 3.5                                |   | 3.9                             |   | 3.5                                |   |

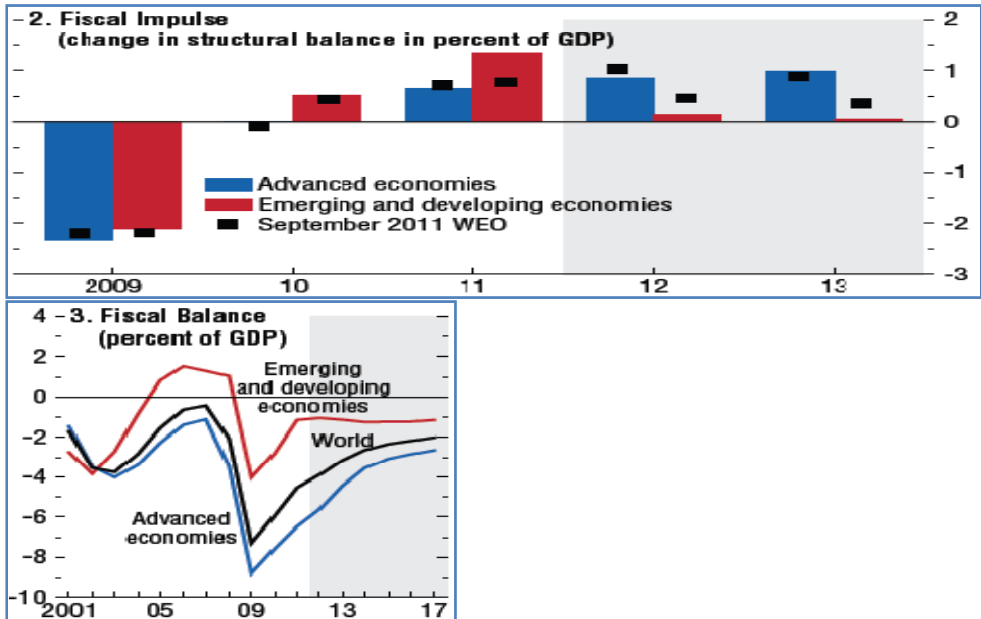
\*EU-15 refers to states that joined the European Union before 2004. \*\*Other advanced economies include Canada, Switzerland, Norway, Israel, Iceland, Cyprus, Korea, Australia, Taiwan Province of China, Hong Kong, Singapore, New Zealand and Malta. \*\*\*CIS is Commonwealth of Independent States which includes all former republics of the Soviet Union, excluding the Baltic states.\*\*\*\*The percentage contributions to global growth are computed as log differences and therefore do not exactly add up to the percentage growth rate for the world economy. Source: The Conference Board Global Economic Outlook, January 2012 † due to a calculation error in our November 2011 release for the estimates for some of the major emerging economy regions, the 2012 and 2013 are adjusted in January 2012

Fiscal policy- At the global level Fiscal Policy will tighten in 2012 by slightly less than in 2011, mainly because of reconstruction efforts in Japan and substantially less tightening in emerging market economies. The tightening will be concentrated in the advanced economies (Figure-2). In

the euro area, the fiscal withdrawal in 2012 is projected to amount to about 1½% of GDP, up from about 1% of GDP in 2011. In the United States, the projected tightening for 2012 is about 1¼% of GDP, up from less than ¾% of GDP in 2011. In Japan, earthquake-related reconstruction spending (equivalent to ¾% of GDP) will contribute to raising the structural deficit by about ½% of GDP. In 2013, the pace of tightening is expected to drop off in the euro area but pick up in the United States and Japan. In emerging and developing economies, the pace of fiscal tightening is projected to drop from about 1¼% of GDP in 2011 to less than ¼% of GDP in 2012, primarily as a result of less ambitious fiscal restraint in some major emerging market economies (for example, China, India, Russia).

**FIGURE – 2**

### Fiscal Policy at Global Level



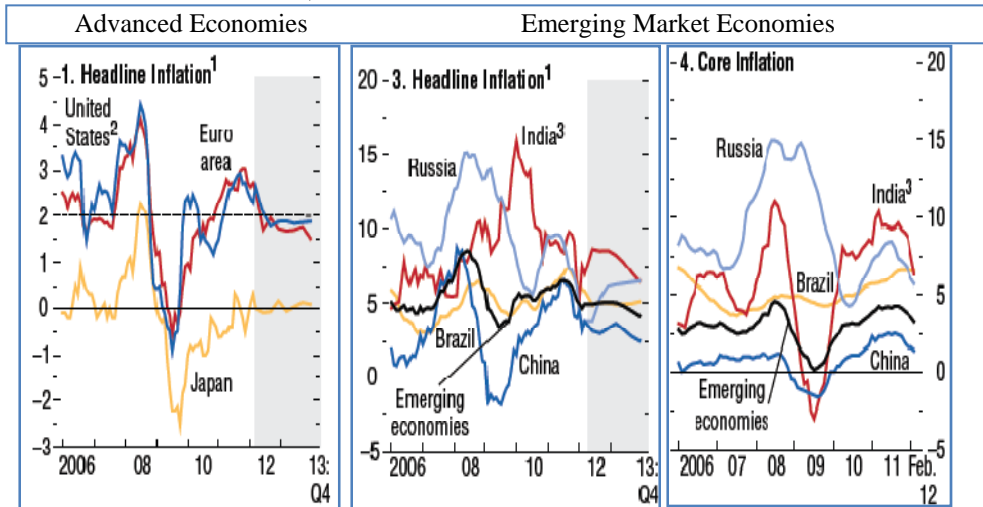
Sources: Bloomberg Financial Markets; and IMF staff estimates.

**Inflation-** Despite appreciable slack in the major advanced economies, other economies will operate close to or above full capacity, and thus inflation dynamics will vary (Figure 1.9). Commodity price hikes have held up headline inflation in major advanced economies. At the same time, core inflation and wage gains have remained low. In the United States and the euro area, unit labor costs have receded or stagnated, respectively, over the

past few years. As labor markets improve only very gradually, headline inflation in the United States is projected to fall to about 2% in 2013 (Figur-3). The projection for the euro area is about 1½% for 2013. Prices in Japan are projected to move broadly sideways. Inflation prospects are more diverse across emerging market economies (Figure-3).

**FIGURE – 3**

Global Inflation (Twelve-month change in the consumer price index unless noted otherwise)



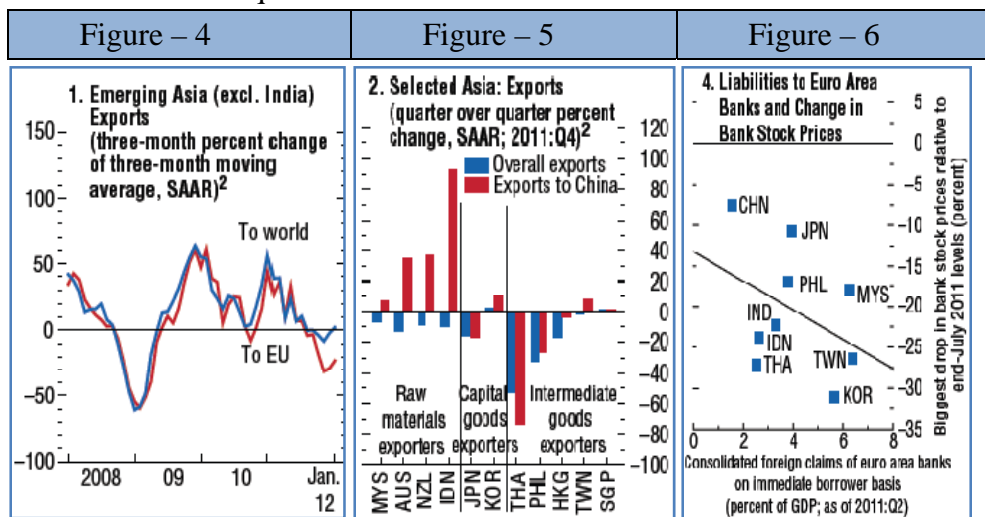
Sources: Haver Analytics; and IMF staff estimates.

1. Historical data are monthly, and forecasts are quarterly. 2. Personal consumption expenditure deflator. 3. Consumer price index for industrial workers for headline inflation; wholesale price index excluding food and energy for core inflation.

## Asia

Activity across Asia slowed during the last quarter of 2011, reflecting both external and domestic developments. The effect of spillovers from Europe can be seen in the weakness of Asia's exports to that region (Figure-4). In some economies, such as India, domestic factors also contributed to the slowdown, as a deterioration in business sentiment weakened investment and policy tightening raised borrowing costs. The historic floods that hit Thailand significantly curtailed that country's growth in the last quarter of the year, shaving 2 percentage points off annual growth in 2011, and led to negative spillovers on other economies (for example, Japan). In some other Asian economies, however, robust domestic demand helped offset the drag on growth of slowing exports.

Investment and private consumption remained strong in China, buoyed by solid corporate profits and rising household income (Figure-5). Moreover, the rebound from the supply-chain disruptions caused by the March 2011 Japanese earthquake and tsunami was stronger than anticipated. While financial turmoil in the euro area spilled over to Asian markets late last year, the effects were limited. Portfolio flows turned sharply negative in late 2011, equity prices fell sharply, sovereign and bank credit default swap (CDS) spreads increased and regional currencies depreciated. Overall, however, market movements in late 2011 were smaller than the gyrations observed during 2008–09. The movements had limited economic impact and were partially reversed in early 2012. In emerging Asia, adverse market developments were correlated with countries' reliance on euro area banks (Figure-6) and euro area banks have already begun reducing their cross-border lending. Asian banks are generally in good financial health, and many large Asian banks have sufficient capacity to step up lending further but euro area banks handle a substantial share of trade credit in the region and often specialize in complex project financing, for which it could be difficult to find quick substitutes.



Sources: Bank for International Settlements; CEIC; Consensus Economics; IMF, *Direction of Trade Statistics*; and IMF staff calculations.

1. Advanced Asia (Adv. Asia): Australia (AUS), Japan (JPN), New Zealand (NZL); ASEAN-5: Indonesia (IDN), Malaysia (MYS), Philippines (PHL), Thailand (THA), Vietnam (VNM); CHN: China; IND: India; Newly Industrialized Asian Economies (NIEs): Hong Kong SAR (HKG), Korea (KOR), Singapore (SGP), Taiwan Province of China (TWN).

2. SAAR: seasonally adjusted annual rate.

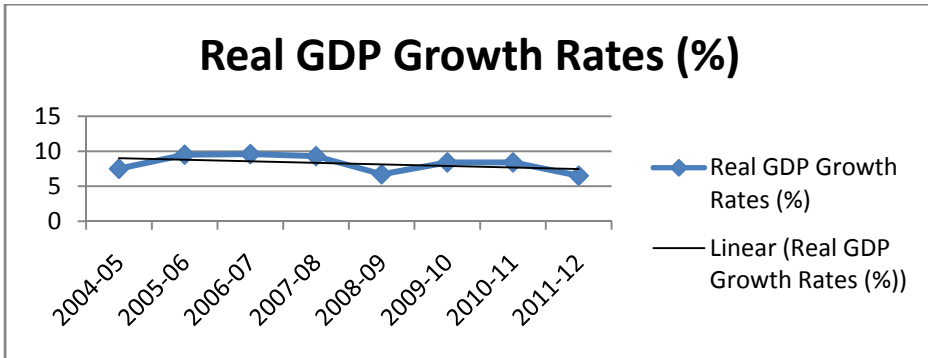
## India

India's economy has performed far worse than most expectations. New fourth quarter GDP numbers out on Thursday seem to confirm the greatest fears among economists. They show an unexpectedly small GDP growth of 5.3% for the March quarter. That brings the overall GDP growth for the full fiscal to a mere 6.5%. The poor GDP numbers were caused primarily by a dismal performance from manufacturing. That sector saw a 0.3% contraction for the quarter. Other sectors also fared badly, with electricity growing just 4.9%, and construction going up by 4.8. Agriculture did worse, with a growth of just 1.7%. All in all, this is the worst set of quarterly GDP figures since 2003. The GDP growth for 2011-12 stands at 6.5%, lower than the 6.8% growth in 2008-09, the year of the Lehman crisis. The surprise is that while the world GDP growth in 2011 was much higher than that during the year of the Lehman collapse, growth in India and China is now lower.

Table – 2

India's Real GDP Growth Rate

| Year    | Real GDP Growth Rates (%) | Reasons   |
|---------|---------------------------|---|
| 2004-05 | 7.5                       | Manmohan Singh takes over as the new Prime Minister of India, after congress forms the United Progressive Alliance (UPA) with outside support from Left parties in a surprise election victory. |
| 2005-06 | 9.5                       | Parliament passes the National Rural Employment Guarantee Act, India's largest rural job guarantee scheme and introduces Value Added Tax (VAT) across the country                               |
| 2006-07 | 9.6                       | Sensex crosses the magical figure of 10,000 on the back of a frantic buying spree by foreign institutional investors and well supported by local funds as well as retail investors.             |
| 2007-08 | 9.3                       | India's GDP crosses \$1 trillion while Tata Steel acquires Anglo-Dutch metals giant Corus for \$11.3 billion  |
| 2008-09 | 6.7                       | The collapse of Wall Street icon Lehman Brothers pushes the world into the worst recession in 80 years prompting the government and RBI to slash taxes and interest rates                       |
| 2009-10 | 8.4                       | Pranab Mukherjee presents budget after 25 years   |
| 2010-11 | 8.4                       | Scams rock the government during a year when US President Barack Obama visits India.  |
| 2011-12 | 6.5                       | Rupee hits a new low as political compulsions Coerce the government to bottle up reforms.   |

**Figure – 7**

Moreover, the macro picture makes commentators and economists raise their brows, the pertinent question for us is what do these numbers mean for individuals? A sharp slowdown in the economic growth at a time when inflation continues to remain high could lead to serious dislocation—both at the macroeconomic and individual level. A higher-than-real-growth inflation simply means that the real income in the country is declining. This will have implications on consumption, savings and investment patterns.

At the macro level, the numbers have started reflecting that private consumption has begun to come off and saving and investment is also showing signs of deceleration. A lower savings and capital formation means that growth will continue to suffer in the short to medium term. Lower growth would again mean lower income growth. At the individual level, declining real income will make choices more and more difficult for individuals, both in terms of consumption and savings. Lower savings, combined with volatile market conditions will make future planning seriously difficult for households.

Things are not going to improve in the stock market anytime soon either. Falling growth, falling currency, rising government expenditure and sustained high inflation is not something that markets would find comfort in. That's not all. Markets will continue to live under the constant threat of a possible shake up in Europe.

## 2. Why Slow Growth?

Slow consumption: private consumption estimated to moderate 58.1% of GDP (in constant prices) against 58.1% last year. Moreover, people are putting off planned purchases due to high interest rates and costly products.

**High prices:** almost every day products and services – from food to footwear, movie tickets to medicines have turned dearer in the last 12 months hitting family budget hard. This shows the government inability to control household inflation, partly stoked by a falling rupee.

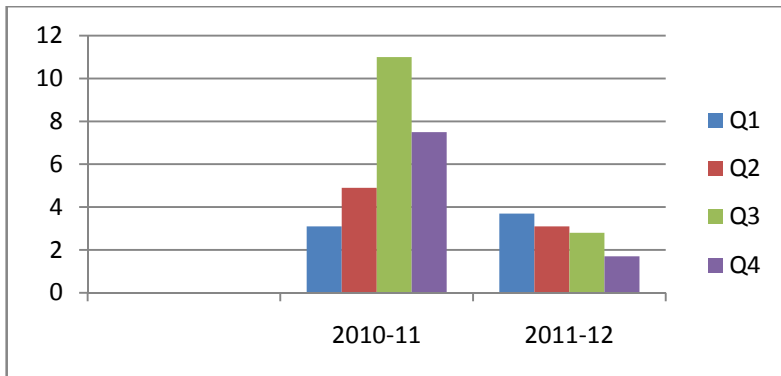
**Weakening investment:** tight monetary conditions, high inflation and a policy logjam have hurt investment activity. Adding to the same Gross Fixed Capital Formation, a proxy for investment activity, has slowed down to 29.5% of GDP (at current prices) against 30.4% last year.

**Industrial sluggishness:** Manufacturing sector, which accounts for 80% of India’s industrial output, has slowed down considerably. Apart from this, companies are seeking to cut corners to stay afloat, as rising input costs and costlier borrowing force firms to defer capacity expansion plans and offer lesser number of jobs.

**Falling rupee:** the rupee has slid 12% in last 3 months, hitting a record low of 56.52 intra-day on May, 31, 2012. This weak rupee is making imports costlier.

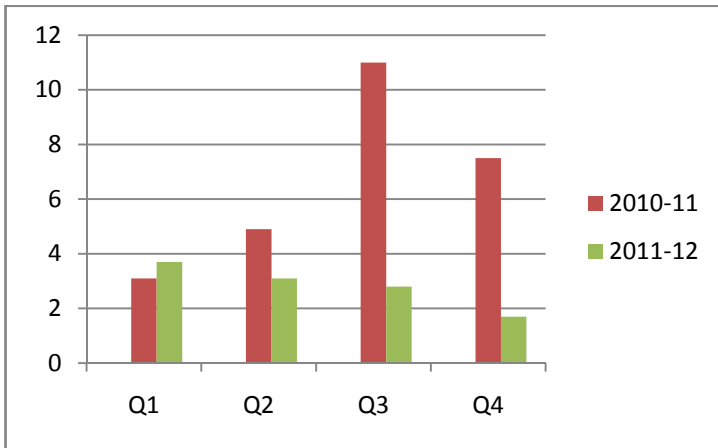
**Weak service sector:** the service sector fell to 7.9% in Q4 2011-12 as against 10.6 % in Q4 2010-11.

Figure – 7  
**India’s Service Sector**



**Disappointing Agriculture Sector:** it has been expected that increase in agriculture production will compensate for manufacturing and service sector, but unfortunately it wasn’t adequate to cover the shortfall.

Figure – 8  
**India's Agriculture Sector**



### 3. Understanding the Economics of Slow Growth

Now the question arises what makes economic growth go up and down. If it were simple market forces of demand and supply, the answer would be simple – extra demand will pull prices up and the converse is also true. But what makes demand go up and down? Other than specific reasons, there are bunch of macro indicators, which are as follows

Inflation & Interest rates

Government spending and finances

1. Currency
2. Just to make more complicated, unfortunately they all are interlinked; let's see HOW?
3. Inflation and Interest Rates

Markets like low and stable inflation since fast-paced price rise hurts both investor sentiments and the balance sheet of companies. Higher inflation raises input costs and many companies, due to highly competitive markets, are not able to pass these to consumers and are forced to take a hit on the margins. Lower margins, other things remaining equal, hurts profitability, and lower profits naturally lead to lower growth. High inflation also dents the purchasing power of households which affects demand adversely. However, the biggest downside of higher inflation is that it is normally followed by higher interest rates. This cuts the ability of



the firm to make higher profit as they now have to pay more in terms of interest on their borrowings. Higher interest rate also affects the ability of a firm to invest in building capacities as some of the projects become unviable at higher borrowing cost. Also, high interest rates move money from stocks to bonds further reducing demand. The uncertainty on demand front and higher cost of money lead to lower investment and lower growth. All this translates into uncertainty and lower economic growth.

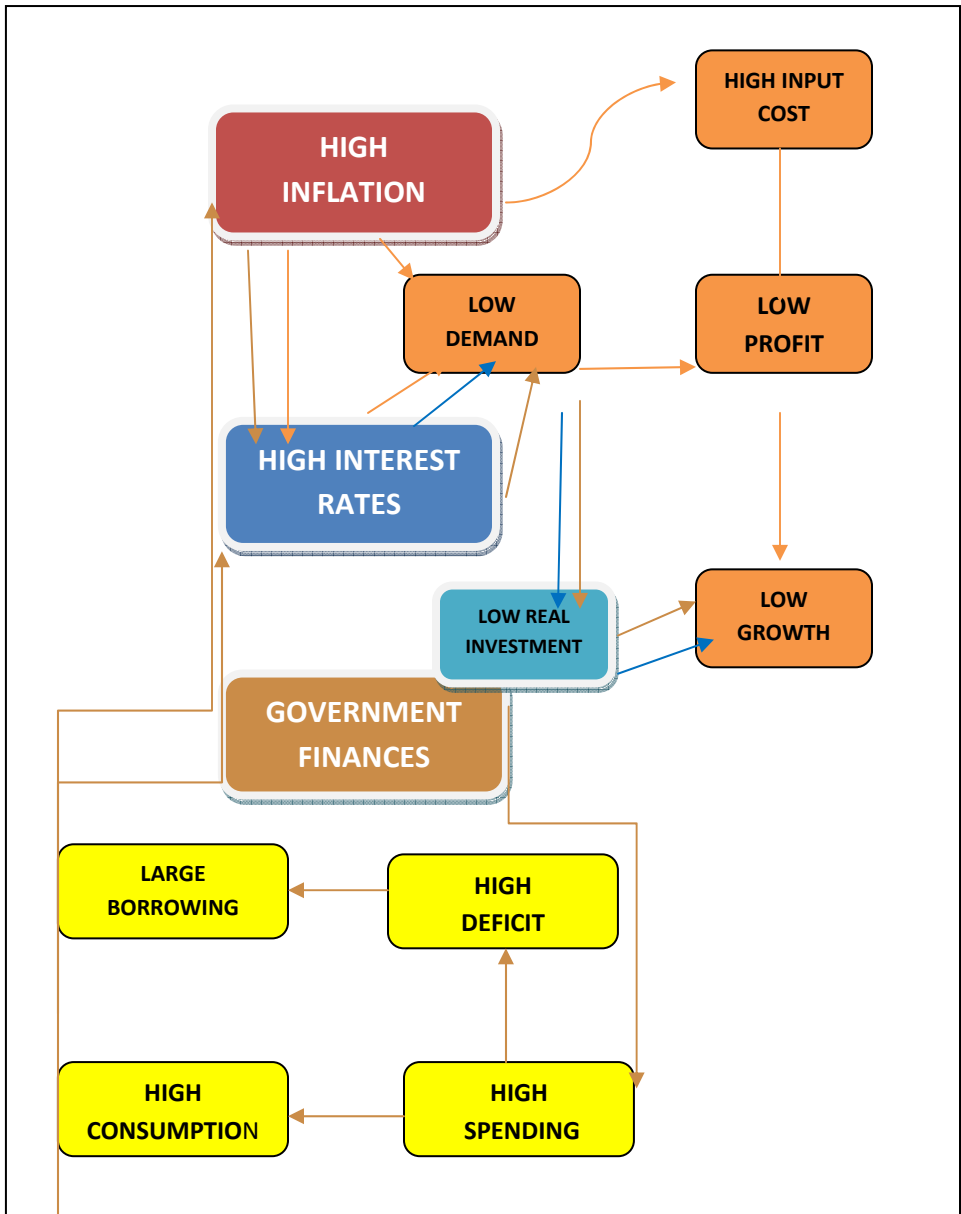
#### **4. Government Finances**

Discipline in management of government finances is extremely important for investor confidence in the financial market. A government that runs high deficits has to borrow more and more from the market. Government borrowing, on the one hand, affects expansion and private investment, while on the other hand, higher government spending leads to higher demand, which becomes inflationary if production is not matched.

Government borrowings crowd out the private sector borrowings by guzzling up all the money putting pressure on interest rates. For example, if there is Rs 100 in the financial system and government borrowing is at Rs 50, it will leave only Rs 50 for the private sector to borrow. If the borrowing needs of the private sector are above Rs 50, it will push up interest rates, resulting in some companies not being able to fund expansion, leading to lower future earnings. Government of India, for example, in the current year is expected to run a fiscal deficit to the tune of 5.1% of the GDP and net borrowing is expected to be at Rs 4.79 trillion. The borrowing number can easily overshoot as it did in the last fiscal. In the fiscal 2011-12, the fiscal deficit shot up by 130 basis points of the GDP from budget estimates. One basis point is one-hundredth of a percentage point.

As a result, the market borrowings also shot up from the estimated Rs 3.43 trillion to Rs 4.36 trillion. If government was running a balanced budget, or a minor deficit, large part of this amount would have been available to companies for investments, which would have led to better earnings prospects and higher share prices. Higher deficit and the inability of the government to restrict expenditure also hurt investor's sentiments.

**Figure – 9**  
Impact of Inflation, Interest Rates and Government Finances



## **5. External Factors and Currency**

The Indian rupee has depreciated about 25% against the dollar in the past one year because of a combination of internal and external factors. The current account deficit, the difference between import and export of goods and services, reached an alarming level of 4.3% of the GDP in the third quarter of 2011-12 and as the inflow in the capital account, which is used to bridge the gap in the current account, has slowed due to an increase in risk averseness in the global financial system there is pressure on rupee. Large current account deficit combined with high fiscal deficit is a serious negative for the capital market. It not only creates complications in the macroeconomic management, but works as serious disincentive for investors due to possibility of economic instability in the country. Currency depreciation also puts strain on balance sheets in case companies have borrowed abroad. The unhedged interest liability of such companies in rupee terms would have gone up 25% because of slide in the rupee, which would have had serious implications on profits. Further, sliding rupee affects returns for foreign investors.

## **6. Suggestions to Revive the Economy**

Leadership crisis: change of guard in key roles, Sonia Gandhi and UPA government Bill to ensure tax efficiency; two Direct Taxes Code Bill, that will end all uncertainty on taxes; and three, allow foreign large retailers to come in by opening the sector to foreign direct investment (FDI); free the farmer from the tyranny of middlemen, by reforming the rent-seeking, anti-farmer mandi system, at least in states governed by the UPA Alliance, thereby creating a demonstration effect.

Creation of Employment Opportunities: Put politics behind the Land Acquisition Bill and convert it into a Law which allows those losing their land to get a more than – fair and long term compensation, companies to create jobs and wealth.

Infrastructure Development: to prevent allegations of corruption, establish an independent PPP regulator who's also effective and not merely a sinecure for ageing bureaucrats.

Control Fiscal Deficit: speed up AADHAR Pilots, use study results to shift to direct transfer of subsidies across India. Promote subsidies for scrap diesel and urea and decontrol diesel.

Control current account deficit: restore distribution margins on financial saving products, to curb demand for gold moreover, controlling fiscal deficit will curtail current account deficit.

Manufacturing a policy push: put out the rural people out of agriculture and create an atmosphere where entrepreneurs are encouraged to set up units that serve the world, which can absorb the surplus labour – agriculture contributes 14% to GDP but 60% Indians are dependent on it.

Energy security: play diplomatic cards for advantage, not for any superpower and ensure long-term energy security which is an essential component for a double-digit growth.

Control Inflation: ease supply constraints by removing APMC Act and opening up retail sector to FDI.

Interest Rates: strong commitment to fiscal consolidation will help the Reserve Bank cut rates, so financial costs don't deter companies from expanding and households from continuing to drive the GDP growth through India's famed consumption story.

Rise in investments: clarity on coal can kickstart power investments. Moreover, get cash rich PSUs to fast track plans, switching from subsidy to investment can prove well again and finally investing in roads, towns and broadband infrastructure will work out towards improvement.

Power sector: supply coal to plants coking at sub-optimal capacity. Moreover revamp state electricity boards to ensure power producers can sell to them without payment worries.

Global capital: reserve the right to make retrospective tax laws – as all nations do – but don't use it until India achieves a scale where it can afford to, a GDP of \$5 trillion.

Portfolio inflows: allow employees to migrate from EPF to NPS for long-term savings to be deployed in stocks.

Better governance: finally, let not the greed of the few overshadow the needs of the many and make corruption a zero-tolerance zone.

## **7. Conclusion: A Flip Side**

An economy's potential to grow is determined by the quantity of capital and labour and their productivity. This is influenced by provision of quality infrastructure, education and good governance, among other factors. Thus, an economy's potential growth refers to the rate at which it can expand per year without putting undue pressure on inflation. If demand in the economy exceeds its potential to supply, then the economy starts

facing capacity constraints, restraining further growth and contributing to inflation. In contrast, if demand grows at a slower rate, it reduces pressure on prices.

To estimate potential growth, one needs to eliminate short-term fluctuations in GDP to reflect changes in the economy's productive capacity. The most commonly used statistical smoothing methods, however, are heavily influenced by data at the end of the sample period. A smoothening method called the Hodrick-Prescott filter used on GDP data from June 2000 to December 2012 estimates the potential growth towards the end of the period closer to 7% from nearly 8.8% at the end of 2008.

Instead, if we look at India's decadal growth, the average growth rose to 7.2% in the 2000s from 5.8% in the 1990s. It appears that while the economy's potential growth during the 2000s did rise as compared with 1990s, it had perhaps increased to only around 7.5% and not 8.5-9%. It is possible that GDP growth rates of over 9% between 2005-06 and 2007-08 were the result of a cyclical upturn, driven largely by stronger exports of software services, which by raising disposable incomes, in turn had a positive effect on sectors such as automobiles.

Let understand economy's potential growth via inflation in non-traded sectors. Now, what are non-traded sectors, it consist of goods and services wherein international trade—exports and imports—plays a relatively minor role, therefore, their prices are influenced more by domestic capacity and productivity. Non-traded sectors in the Indian economy include agriculture, construction and services (excluding communication). In 2006-07, the second consecutive year when GDP growth crossed 9%, non-traded inflation also crossed 6% and then surged to nearly double-digit levels for the next two years. Such high inflation suggests that demand in the non-traded sectors was consistently surging ahead of the supply capacity. This was in stark contrast with inflation in traded sectors, namely, manufacturing and communication, where imports could add to domestic capacity and also raise the efficiency of domestic producers. In these sectors, inflation stood at 4.4% in 2006-07 and declined to an average of 3.6% in the following two years.

This evidence suggests that earlier projections which had pegged India's potential growth around 8.5% were an overestimation, inconsistent with inflation of 4-4.5%. In fact, it is nearly impossible to raise India's potential growth rate above 7.5% without raising average agriculture growth. While RBI recently lowered the repo rate with an aim to stimulate

investment, the central bank is well aware that changes in interest rates have only a temporary impact on fixed investment and little impact on availability and quality of labour. A sustainable increase in the quantity and quality of capital and labour, especially in the non-traded sectors of the economy, requires government policy support; in its absence, India's potential growth rate is unlikely to improve.

## 8. References

- Chaudhary P 2012, "Demand dip punches GDP", HT Business Hindustan Times, 1 June, P. 23.
- Chikarmane G 2012, "10 Ideas to get Economy back on Track", HT Business Hindustan Times, 1 June, P. 23.
- Global Recovery Stalls, Downside Risks Intensify by World Economic Outlook: an update of the key WEO projections, Washington, January, 24, 2012.
- Global Economic Research: Global Forecast Update by Scotia Economics, Scotiabank, June, 6, 2012.
- International Monetary Fund: Growth Resuming, Dangers Remain by World Economic Outlook, April 2012.
- Rangarajan C 2012, "Growth below Expectations" The Economic Times", 1 June, P. 13.
- Subramaniam H 2012, "India has got a number of negative factors currently", Livemint.com, The Walstreet Journal, 1 June, P.12.
- Triparna 2012, "Economic Gloom Deepens", The Economic Times", 1 June, P. 13.
- <http://www.hindustantimes.com/business-news/WorldEconomy/Growth-slows-to-9-year-low-govt-scrambles-for-options/Article1-863804.aspx>
- [http://www.hindustantimes.com/Images/Popup/2012/6/01\\_06\\_slowdown.pdf](http://www.hindustantimes.com/Images/Popup/2012/6/01_06_slowdown.pdf)
- <http://www.conference-board.org/data/globaloutlook.cfm>

# **AN ANALYTICAL STUDY ON WORK LIFE BALANCE OF WOMEN EMPLOYEES WORKING IN A PRIVATE TECHNICAL INSTITUTE AND ITS IMPACT ON THEIR JOB SATISFACTION LEVEL**

**Mrs. Shilpi Kulshrestha**

Assistant Professor- MBA, JIET Group of Institutions,  
Jodhpur

## **ABSTRACT**

The objective of this research is to study the work life balance of working women in a Private Technical Institute of Higher Education. The research has been conducted among Women working in a Private Engineering College with special reference to Jodhpur city. Work life balance entails attaining equilibrium between professional work and other activities, so that it reduces friction between official and domestic life. Work life balance increases efficiency and thus, the productivity of an employee increases. It enhances satisfaction, in both the professional and personal lives. The ultimate performance of any organization depends on the performance of its employees, which in turn depends on numerous factors. These factors can be related to work or family or both. The relationship between personal and professional life can also be achieved through emotional intelligence. Better emotional management is necessary in order to accomplish day-to-day objectives of life. The findings of this study reveal the level of satisfaction in working females in a Private Technical Institute and reasons for low satisfaction at work performance due to disturbed work life balance. The Primary data was collected through questionnaire survey and analyzed with the help of related statistical tools. This paper attempts to identify the various factors & its subsequent consequences and suggestions related to work life balance among women employees in a Private Technical Institute of Higher Education

**KEYWORDS:** work life balance, personal life, professional life, work pressure, Emotional balance, Job Satisfaction.

## **1. Introduction**

Historically, women's employment participation has been more in the area of Education Sector. Females with high levels of academic

qualifications are also finding it difficult to make balance between professional life and private life. It is important for every organization to take necessary steps to maintain a healthy balance between work and their private lives so that both employees and the organization can be benefited in the long term.

Work life and personal life are the two sides of the same coin. According to secondary data obtained through various work life balance study surveys, more than 60% of the respondent professionals surveyed said that are not able to find a balance between their personal and professional lives. They have to make tough choices even when their work and personal life is nowhere close to equilibrium. Traditionally creating and managing a balance between the work-life was considered to be a woman's issue. But increasing work pressures, globalization and technological advancement have made it an issue with both the gender, all professionals working across all levels and all industries throughout the world. Achieving "work-life balance" is not as simple as it sounds. Work life and personal life are inter-connected and interdependent. Spending more time at work place, dealing with clients and the pressures of job can affect the personal life, sometimes making it impossible to even complete the household chores. On the other hand, personal life can also be demanding if you have a kid or aging parents, financial problems or even problems in the life of a dear relative. It can lead to Absenteeism from work, creating stress and lack of concentration at work. Work-personal life conflict occurs when the burden, obligations and responsibilities of work and family roles become incompatible. Obligation of one can force an individual to neglect the other. Work life balance can be understood as the balancing point on the seesaw, one side of which is work, while the other side is domestic and personal life. Emotional intelligence is also simultaneously required to maintain a balance between private and professional life. Emotional intelligence is required in order to accomplish day-to-day objectives of life which is a challenge to everyone to achieve it. It is the key to achieve the desired balance between work and life, which ultimately leads to success in the professional as well as personal life.

## **2. Review of Literature**

According to Marcinkus et al. (2007), Work based support to women is positively associated with job satisfaction, organizational commitment and career accomplishment. As per study by Messmer in 2006, flexible



scheduling is the benefit valued most by employees. However, increased flexibility, if implemented without conditions and used to facilitate business ends without provision for worker consent, could compromise instead of enhance work life balance. Valcour and Hunter (2005) revealed that the home working can lead to greater flexibility and independence, but it can make people work for longer periods of time, including weekends and evenings. Home environment also plays a very important role in maintaining the quality of work life & creating work life balance. Burke (2002), observes that both women and men prefer working in organizations that support work-life balance. Men appeared to benefit more than women. Men feel more satisfied when they achieve more on the job even at the cost of ignoring the family. On the other hand, women stress that work and family are both equally important and both are the sources of their satisfaction. For them the former is more important. When work does not permit women to take care of their family, they feel unhappy, disappointed and frustrated. They draw tight boundaries between work and family and they do not like one crossing the others. Summer and Knight (2001), securely attached individuals experienced positive spill over in both work and family. Hochschild noticed in (1997), there is an inevitable temptation to use the promotion of work-life balance policies to enhance commitment to the organization. If the pressure to attract more women into work lessens, will the concern for work-life balance also diminish? Still a Question to ponder upon.

### **3. Objectives of the Study**

1. To examine the job satisfaction level of women employee's with reference to a Private Technical Institute of higher Education.
2. To analyze the Challenges associated with managing balance between professional and personal life.
3. To suggest strategies to maintain a healthy work life balance

### **4. Need for the Study**

The objective of this research is to study the work life balance of working women in the Private Technical Educational Institution. It has major influence on maintaining equilibrium between professional life and the personal life responsibilities. The research was conducted among working Women in a Private Technical Educational Institute in Jodhpur

city. Work life balance reduces friction between official and domestic life. The concept of balancing work and life is important in more than one way. There can be many factors affect the balance of work and life, which may be social factors, psychological factors, Working Environment, Type of job, Job satisfaction, Family background, schedule at home and life stage. The employee who is able to maintain balance between private and professional life can contribute more to success of the organization.

## **5. Research Methodology**

**DATA COLLECTION** The research is based on both empirical and analytical study. The study uses both primary and secondary data.

**PRIMARY DATA** For the purpose of study, well structured questionnaire was used as an instrument to collect the date

**SAMPLE SIZE & TECHNIQUES** The sample size is 50. The respondents were chosen from a Private Engineering Educational Institute.

Convenience sampling technique has been adopted to collect the data.

## Data Analysis and Interpretations

| Demographic Variables                           | Character  | Frequency | Percentage% |
|---|--|-----------|-------------|
| Age   | 20-30yrs   |           |             |
|   | 30-40  | 29        | 58          |
|   | 40-50  | 9         | 18          |
|   | 50-60  | 2         | 4           |
| Designation                                     | Jr. Lecturer                                       | 25        | 50          |
|   | Sr. Lecturer                                       | 15        | 30          |
|   | Professor  | 10        | 20          |
| Having Children                                 | yes  | 35        | 70          |
|   | no   | 15        | 30          |
| Children taken care by                          | spouse   | 8         | 16          |
|   | In -laws   | 20        | 40          |
|   | Own Parents  | 12        | 24          |
|   | Servants   | 10        | 20          |
| Working Hrs in a day                            | 7-8 hrs  | 35        | 70          |
|   | 9-12 hrs   | 15        | 30          |
|   | More than 12 hrs                                   | none      |             |
| No. of hrs spend with family                    | 2-4  | 18        | 36          |
|   | 4-6  | 20        | 40          |
|   | 6-10   | 12        | 24          |
|   | None of the above                                  |           |             |
| Job Satisfaction Level in Institute             | Happy with present salary ( out of 50 respondents) | 23        | 46          |
|   | Superior support                                   | 18        | 36          |
|   | Mental stress in The job                           | 25        | 50          |
|   | Physical stress in The job                         | 22        | 44          |
|   | Over all Job satisfaction Level (out of 100%)      | 57%       | 57%         |
| Sense of missing life due to disturbance in WLB | Strongly agree                                     | 29        | 58          |
|   | agree  | 21        | 42          |

| Demographic Variables  | Character             | Frequency | Percentage % |
|--|-----------------------|-----------|--------------|
| Options for managing stress  | Yoga                  | 10        | 20           |
|  | Meditation            | 10        | 20           |
|  | Entertainment         | 25        | 50           |
|  | Other source          | 5         | 10           |
| Awareness regarding various WLB Policies   | Flexible working time | 8         | 16           |
|  | Paid holidays         | 35        | 70           |
|  | Working in Shifts     | 7         | 14           |
| Diseases like hypertension, obesity, diabetes, frequent headaches obtained from disturbing WLB | Strongly agree        | 38        | 76           |
|  | agree                 | 12        | 24           |
|  | neutral               | 5         | 10           |
|  | disagree              | 5         | 10           |
| Feeling of more balance life in Academics Institutes than other Service sector industries      | Strongly agree        | 33        | 66           |
|  | agree                 | 10        | 20           |
|  | neutral               | 10        | 20           |
|  | disagree              | 7         | 14           |
| Satisfaction Level in % figure while working in Academics Institutes.                          | 30-40%                | 5         | 10           |
|  | 50-60%                | 31        | 62           |
|  | 60-70%                | 9         | 18           |
|  | 70-80%                | 5         | 10           |
|  | More than 90%         | none      |              |
| Organization will be more effective if Work life balanced is maintained                        | Strongly agree        | 41        | 82           |
|  | agree                 | 6         | 12           |
|  | neutral               | 3         | 6            |
|  | disagree              | 0         |              |
|  | Strongly disagree     | none      |              |

## 6. Findings

The main findings of the study are that mostly female workers though were not absolutely satisfied from the work life balance out of their professional lives but seemed to be satisfactory. Approximately 66 %, if compared to lives lead by females in other service sector industries like Private Banking, Insurance, and Hotel Industries etc. 76 % female employees feel that disturbed work life balance lead to many diseases like hypertension, B.P. , diabetes etc. 82 % People believe that people and

organization would be more productive if employees feel that they are enjoying Quality Life & their work life balance is not getting hampered.

## **7. The Future of the Individual Approach Towards Work Life Balance**

The solutions to these questions have begun to materialize. Over a decade of research by the Ford Foundation, WorkLifeBalance.com, and others shows exciting results from advancing a “dual agenda” of improving organizational effectiveness and enabling managers and individual contributors to integrate work and personal life more fully and positively.

Various Researches has shown that the relational skills needed for better interactions with family and friends and the skills called for in increasingly team-oriented work environments are very similar. Developed, on-the-job skills in dealing more effectively with internal and external customers are transferable to off-the-job relationships and vice versa. Similarly, time-, project-, and activities-management skills learned on the job are transferable to accomplishing family, personal and community objectives as well.

Put another way, developing great off-the-job skills can result in great on-the-job skills. This is true both for leaders and individual contributors. Managers and supervisors who develop skills that work for them as individuals are better equipped to respect the importance of their employees’ work-life choices and to advise their employees on those choices. The dual agenda of better organizational effectiveness and better personal work-life balance is made possible by the win-win process of dual-purpose work and life learning.

## **8. Suggestions:**

Work-life balance is a broad concept including proper prioritizing between Professional life which includes career, challenges, pressure, achievement and ambition on one hand and private life which includes pleasure, leisure, family and spiritual development.

- Specific Counseling programmes on Work Life Balance can be conducted.
- Well designed flexible working hours.
- An ideal work culture can be created to achieve work life balance
- Family welfare programmes and family counseling programmes can be conducted

- Employees' social gathering programmes and public contact programmes will be the better option to reduce the mental pressure in the work place as the study reveals more mental pressure for the Women employees.
- Regular exercises, mediation and other soft skill practices can improve the emotional balance of the employees.
- Reward and recognition system should be fair and objectively to be adapted to each and every employee in the Organization to maintain sustainable work life balance.

Some of the solutions proposed by The Work-Life Council included:

- Draw from different organizations and departments representing different perspectives to identify key work-life issues, the next “big thing,” and future best practices.
- Identify the new trends--which might not be visible now and develop strategic responses.
- Create a new language for the work-life field.
- Maximize the beneficiaries of work-life efforts.

## **9. Conclusion**

Educational sector is one of the fastest growing sector it provides opportunity for employment of more number of women. The secret to work-life balance will vary depending on field of work, family structure and financial position. Personal life and professional work are two sides of coin, it is difficult to separate and form a source of conflict. Organizations must strive to develop a special bond with its people, so that they will put in more into their jobs and contribute positively. The philosophy of work life balance for the people/employee of the organization is a very progressive and encouraging concept.

Finally, self-management is important; people need to control their own behavior and expectations regarding work-life balance.

## **10. Bibliography**

Blaskovich, Sarah, Scaling life back to get more done. May 1, 2009 1771

Finding Balance between Making Money and Being Happy Kevin T. Smith Jun 22, 2008 686

- Green, F. (2001). "It's been a hard day's night: The concentration and intensification of work in the late 20th century". *British Journal of Industrial Relations*
- Hochschild, J. (1997). *The Time Bind: When Work Becomes Home and Home Becomes Work*. New York: Henry Holt and Co.
- Hochschild, A. and Machung, A. (1989). *The Second Shift: Working Parents and the Revolution at Home*. New York: Viking.
- Jobs Bridge Think Again on Work-Life Balance, May 6, 2009 914
- Johnson, Mike; Chadwick, Andrew Cover story Today's workplace is about flexibility. Apr 1, 2009 3489
- Morgan, M. Goldsmith, R. Gandossy, and M.Effron. New York: WileyH. 2003. The challenges of a global marketplace. In *Human resources in the 21st century*, New York
- R.J.Burke, "Organizational values, job experiences and satisfaction among managerial and professional women and men: Advantage men?" *Women in Management Review*, Volume.17, Issue.No.5, 2002, pp.5 & 6.
- Work-life balance should suit everyone. Jan 13, 2009 215
- Work-Life Balance: Policies & Initiatives in Irish Organizations - Out Now. Jul 8, 2008 532
- Work-Life Balance Is Possible! Joie Charles Jun 6, 2008 652

# SIX SIGMA – TRANSFORMING HIGHER EDUCATION

**Mr. P. G. Dangwal**

P. G. Dangwal – Assistant Professor , Shri Guru Ram Rai Institute Of Technology & Science – Dehradun , UK

## ABSTRACT

Competition in today's higher education market place is fierce. Higher Education Colleges, Universities are all vying for same students and the revenue they represent. To find success, institutions for higher education must demonstrate that they can offer what others can not. Providing a quality , affordable education is of the utmost importance to students and their families. These institutions can improve their chances of attracting students by improving the levels of service they offer in every student facing interaction which often necessitates improving internal work processes. Six sigma is a disciplined data driven approach to delivering high levels of student satisfaction for maximizing and sustaining institutions success. This paper tries to explore how Six sigma can be applied to higher education and transform it for the benefit of all its stakeholders.

Key words: Six Sigma, Higher Education

## 1. Introduction

Innovation is the key to survival for most organizations. For the majority of organizations, long-term success depends on how innovative are their products and processes. The Six Sigma process is increasingly used in corporate sector ranging from manufacturing industry to service and Ecommerce industry. Many big businesses such as GE and Motorola have successfully implemented Six Sigma, but the adaptation by Higher Education institutions have been extremely low or negligible. To monitor the quality of Higher education, the process of accreditation has been introduced. NBA (National board of accreditation) under AICTE (All India council of technical education) has been constituted to do accreditation process. But NBA concentrates more on the system development and overlooks the aspect of customer satisfaction as a means of evaluating the quality level. In higher education sector, there are many stakeholders like students, management, government, industries, parents etc. and this makes the system very complex.. Raised expectations by academicians, educationists, policy planners and the society have threatened the



sustainability of these higher education institutions in the present competitive life. In Higher education, Six Sigma pertains to improving the quality of matter taught, the character building of students, and the quality of study and students life. Bringing Six Sigma efficiency and performance improvements to education sectors raises new challenges for quality managers. Six Sigma provides exact tools needed to improve this costly, critical - and highly inefficient business. Focused on procedures that can be put to work immediately in education industry, Six Sigma demonstrates how to quickly ensure gains in key measures of quality improvement. Properly applied, Six Sigma is a powerful management technique generates process excellence. It is activated as an approach of aiming at a target by changing the culture of a company, involving everyone in the company, not just the Quality Leaders. The concept of Six Sigma is to identify the problem in a process, charter a project to specifically address the process, evaluate the process and work through the project in order to improve the process in totality. In the words of Jack Welch, past-Chairman of General Electric, Six Sigma is "The only program I've ever seen where customers win, employees are engaged in and satisfied, shareholders are rewarded, and everybody who touches it wins" . In education Six Sigma can be used to improve the quality of study and students life.

The education industry exhibits some distinct features that are not found in the manufacturing industry. Education is intangible; the features are not things like hardware. Education is perishable; the features cannot be inventoried. Education often produces heterogeneous output. Education often involves simultaneous production and consumption. However, behind these apparent differences, there are also many similarities between the manufacturing and education industries like, education organization has a profit oriented business operation model and has educational products to be offered to customers (students ).

The implementation of Six Sigma in the Higher educational arena requires the faculty to be considered 'employees', or the workforce in general. The customers tend to be the parents who pay the fees and want quality in return of the good result of their wards and/or students itself. Six Sigma puts the customer first and uses facts and data to drive better solutions. Six Sigma efforts target three main areas , Improving customer's satisfaction , Reducing cycle time and Reducing defects. Six Sigma is not merely a quality initiative - it is a business initiative. Achieving the goal of Six Sigma requires more than just small, incremental improvements; it

requires breakthroughs in every area of an operation. In statistical terms, "reaching Six Sigma" means that your process or product will perform almost no defects. But the real message of Six Sigma goes beyond statistics. Six Sigma is a total management commitment and philosophy of excellence, customer's focus, process improvement, and the rule of measurement rather than good feeling. Six Sigma is about making every area of the organization better able to meet the changing needs of customers, markets, and technologies - with benefits for employees, customers, and shareholders .

Six Sigma is customer focused. It's almost an obsession to keep external customer's needs in plain sight, driving the improvement effort. External customers are mostly those who buy your business's products and services. Six Sigma projects produce major returns on investment. General Electric's CEO, Jack Welch, wrote in the annual report that in just three years, Six Sigma had saved to the company more than \$2 billion .Six Sigma changes how management operates. Six Sigma is much more than improvement projects. Senior executives and leaders throughout a business are learning the tools and concepts of Six Sigma: new approaches to thinking, planning, and executing to achieve results. In a lot of ways, Six Sigma is about putting into practice the notions of working smarter, not harder.

## **2. Six Sigma DMAIC Methodology**

Sigma is the Greek letter used in mathematics to denote standard deviation, or the amount a process varies from the mean. Six- sigma is quality matrix that counts the number of defects per million opportunities (DPMO) at six levels. A three Sigma organization achieves 66,807 defects per million, whereas a true Six Sigma organization achieves just 3.4 defects per million. The same signifies that it is possible to continually stretch the capability of process by systematically eliminating and changing the process deterrents and environment. This has to be driven by a high degree of creativity and innovation in the organization. It is important to realize that perfect six sigma may not be achieved, but that even a rise from one sigma level to the next will produce significant benefits.

Six Sigma's DMAIC Methodology Define (D) is the first step of the Six Sigma methodology where leaders are expected to select projects, set initial goals or targets, and develop a project charter or statement of work (SOW). Costs of poor quality associated with the new or existing process being analyzed are estimated. Improvement targets are set often in terms of

sigma and cost .leadership selects the appropriate team members. The team then determines more precisely the criteria that are critical to the customer. Run charts, interviews, or surveys, for example, are utilized to obtain leads and useable figures. A high-level process map of the existing process is to be developed with start and end-points clearly illustrated. Strategic deliverables are a process map, a working project charter, a team roster, and the costs of poor quality. A progress report to leadership normally concludes each step.

Measure (M) is the second step of the Six Sigma methodology and is denoted by the capital letter M. This is where a baseline measure is taken using actual data. The measure then becomes the origin from which the team can gauge improvement. The team develops measures or utilizes existing ones, such as SPC data or database information, and pairs them accordingly with critical customer criteria. Pareto diagrams and controls charts as well as methods mentioned above in the define step are possible data sources for baseline measures. Testing repeatability and reproducibility (R&R) of a measurement system is recommended throughout a Six Sigma project wherever critical measures are taken. A data gathering plan or sampling plan can be followed for greater accuracy. The project charter or SOW should be refined based on the data gathered in the measure step. The process map can be revised based on new discoveries of value added or non-value added steps in the existing process. Strategic deliverables for the measure step are baseline figures, R&R results, process capability, an improvement goal, a refined process map, and a refined project charter.

The third step is Analyze (A). Here teams identify several possible causes (X's) of variation or defects that are affecting the outputs (Y's) of the process. One of the most frequently used tools in the analyze step is the cause and effect diagram . A Six Sigma team explores possible causes that might originate from sources, such as people, machinery and equipment, environment, materials, and methods. Another highly effective technique to expose root cause is asking “why” to a possible cause at least five times. Team member suggestions may need clarified before proceeding further, so each and every team member has a clear understanding of the cause being presented. The resulting list should be reduced to the most probable root causes. Causes can be validated using new or existing data and applicable statistical tools, such as scatter plots, hypothesis testing, ANOVA, regression, or design of experiments (DOE). Experts warn not to assume

causation or causal relationships unless there is clear proof. Furthermore, validating root causes can help teams avoid implementing ineffective improvements and wasting valuable resources. Root cause is the number one team deliverable coming out of the analyze step,

The team then enters the Improve (I) step. Here a team would brainstorm to come up with countermeasures and lasting process improvements that address validated root causes. The tool most preferred for this process is the affinity diagram, which is a brainstorming technique where a topic or issue is presented to a small team who then quickly list ideas or solutions. The team should narrow the list to one or two potential improvements that are step deliverables for small scale implementation. Improvements should be selected based on probability of success, time to execute, impact on resources, and cost. If newly gathered data indicates the small-scale implementation is a legitimate success, teams should proceed to full-scale implementation.

The final step for the team members is Control (C), which is signified by the capital letter C. At this point devices should be put in place to give early signals when a process is heading out of control. Teams may develop poka-yokes or mistake proof devices that utilize light, sound, logic programming, or no-go design to help control a process. The ultimate goal for this step is to reduce variation by controlling the inputs and monitoring the outputs. In approximately three to six months, the sigma levels or process capability figures, that should be routinely measured and documented by workers, are then checked by the process owner to make certain that the installed improvements are lasting. Any documentation and project reports should be finalized. With a control plan in place, the project is delivered to the rightful owner who is usually the project champion or a sponsor from leadership. It is the owner's duty to then manage the new or improved process. If Six Sigma was not achieved, a separate project can be kicked off in the future to address any residual root cause.

## Applying Six Sigma in Higher Education

Higher Education institutions are involved with three primary functions i.e: teaching, research and service. The administrative function(s), a supporting activity, of the institution helps to coordinate support the three primary activities. Both the primary and secondary

functions involve multiple activities and operations that help in the smooth functioning of the institution. Each of these operations is comprised of processes that define the nature of work flow in the institution. As the objective of implementing Six Sigma is to improve operational performance, it becomes pertinent to identify the relevance of implementing the six sigma methodology in the institution.. Further the institution needs to provide evidence of financial gains resulting from implementing Six Sigma. Teaching involves multiple activities such as program design, curriculum development, aligning learning objectives of individual courses to program learning objectives, classroom instruction, and student learning assessment etc. The Six Sigma methodology can be utilized in all the above listed activities to improve the teaching function.

### **DMAIC Principles Applied to a Higher Education Program**

- D Define the program & curriculum, student learning objectives
  - M Measure student learning and employability
  - A Analyze student learning and employability
  - I Improve student learning and employability based on data analysis
  - C Control plans that institutionalize the improvements for the future to ensure that student learning and employability stays at a desired level
- Measure the Parameter "Lecture Quality" by surveying a group of students over a period.

| No. | Question   | Answer   |
|-----|--|--|
| 1   | Did the Lecture meet your expectations? (1-not at all, 5-absolutely)   |  |
| 2   | Lecturer's proficiency (1-poor, 5-excellent)                           |  |
| 3   | Quality of the content taught (1-poor, 5-excellent)                    |  |
| 4   | How was Lecturers Time management of the lecture (1-poor, 5-excellent) |  |
| 5   | How can the Lecture be improved?                                       | Higher quality material<br>Better time management<br>Lecturer's further training |
| 6   | Are you motivated to attend the lecturer's next class.                 | Yes<br>No<br>Maybe   |

The data acquired from the survey may seem sufficient for analysis and decision-making but first one must ascertain their validity. That is, if the participants' evaluations of a parameter correlate, the possibility exists that the questionnaire results are suitable for further analysis. Analysing the answers "No" to question 6 is critical as this indicates whether the lecturing process is in control or not and will have severe impact on the future of the institution.

### **Analyse**

The analysis of an activity's results is done by determining the evaluation criteria and investigating the defect causes. In this case, one has to plot an Ishikawa diagram (a cause and effect diagram). Other kinds of studies are possible as well, such as FMEA (Failure Modes and Effects Analysis) - the analysis of a defect and its cause used for investigating the technological aspects of a process.

### **Improve**

The obvious goal here is to perform the activities planned during the analysis of defect causes.. When solving technological issues, one can use the DOE methodology (design of experiments) The function of this statistical instrument is to determine the optimum factor ratio to achieve top quality.

### **Ways to Improve Lecture Quality**

|  |
|--|
| Staff  |
| Carry out lecturer's certification   |
| Teaching   |
| Conduct methodological lessons   |
| Conduct pre-market training (lecture) tests                                  |
| Process  |
| Compile job descriptions in accordance with the process description project. |

### **Control**

At the final stage of the DMAIC sequence, one develops a plan of controlling the process improvement by repeating the statistical studies, and determining and fiscally evaluating the efficiency of the measures that

have been taken. In this case, the survey has to be repeated and the negative answer distribution should be analysed by plotting a control chart.

## **Six Sigma Professionals Set Up in Higher Education Institution**

### **Governing body**

1. Members of Management/Management Committee
2. Proposes the Six Sigma plan to management

### **Principal/Head of institute**

1. Sets up a goal for improving project
2. Finds resources for the team.
3. Advocates for the team efforts in management

### **Head of departments**

1. Communicate with principal and management.
2. Deals with resistance to implement Six Sigma.
3. Help to resolve team and other conflicts
4. Gathers and analyses data about team activities.

### **Professor in charge**

1. Reviews/revises/clarifies the project.
2. Works with team members.
3. Selects the project team members.
4. Identifies and finds resources for team
5. Documents final project results.

### **Student advisory committee**

1. Carries out instructions for data collection and analysis
2. Carries out assignments.
3. Reviews the efforts of the team itself.
4. Learns new data-driven ways to manage the operation

### **Process owner**

1. All faculty members and staff of the technical institute.
2. They are responsible for continuous improvement and

### 3. Conclusion

The present paper has treated DMAIC, one of the sequences of the Six Sigma methodology, and provided an overview. The efficient application of this methodology undoubtedly requires one to either invite qualified professionals or invest sizeable sums in training one's own. Therefore, the owners must understand the array of tasks solved in Six Sigma projects and the list of requirements to the participants of such projects, while also keeping in mind the specifics of the higher education.

The example provided illustrates the effectiveness of Six Sigma optimisations for nearly any type of process, provided that its goals and techniques of key parameter measurement are defined properly. While Six Sigma approach to program design focuses on improved design of educational programs which will not only meet but also exceed all stake holders/customers' expectations. Six Sigma approach to processes improvement involves process capability analysis to determine the capability of the process for offering good quality educational programs conforming to the needs and expectations of the stake holders. This involves faculty and staff development through improving faculty and staff, encouraging and investing on education, research, and training. Thus, Six Sigma approach to processes improvement focuses on achieving higher standard for quality of faculty and staff, and delivery facilities such as class rooms, libraries, and educational technology. Six Sigma approach to program design and process improvement may be successfully implemented for continuous quality and productivity improvement by institution of higher educations.

This paper tends to stimulate a deeper inquiry into the methodology and its practical applications in higher education.

### 4. References

- P. Kaushik , D Khanduja (2010), “Utilising six sigma for improving pass percentage of students: A technical institute case study” , *Educational Research and Review*, Vol. 5 (9), pp. 471-483
- M Holmes , A Kumar , L O Jenicke (2005),”Improving the effectiveness of the Academic Delivery process utilizing Six Sigma”, *Issues in Information Systems*, Vol 6 No. 1 pp 353-359
- V Chlaidze , I Linde (2006),”Six Sigma method application to the perfection of teaching effect”, *Information Teaching Technologies* , Vol 10 No. 2 pp 7-14



- A Quinn , G Lemay, P Larsen , D M Johnson (2009),”Service Quality In Higher Education’, *Total Quality Management* , Vol 20 No. 2 pp 139-152
- B Srinivasu , G S Reddy , V S Rao , S R Rikkula (2010),’The Contributions of TQM and Six Sigma in the organizations to achieve success in terms of Quality”,*International Journal Of Reviews in Computing* , pp 8-19
- P Pande , L Holpp (2003), “What Is Six Sigma?”, McGraw-Hill, London
- J Bandopadhyay , R Lichtman (2007), “Six Sigma Approach to Quality and Productivity Improvement in an Institution for Higher Education in the United States”, *International Journal of Management* , VoL 24 No. 4 pp 802-807

# IMPORTANCE OF DATA WAREHOUSING IN DECISION SUPPORT SYSTEM FOR HIGHER EDUCATION

**Md Masud Alam**

Assistant professor, IT Dept. Gaya College, Gaya (Bihar)

Alam\_masud@rediffmail.com

**Dr. Md Aslam**

Associate Professor, HOD of Mathematics Deptt.

J.J College, Gaya (Bihar)

## ABSTRACT

Database management systems are widely used by organizations for maintaining and processing data in different operations and decision making. However, with the emergence of data warehousing, Decision Support System and Management Information System (DSSMIS) have evolved to its best. At the core of these warehousing system lies a good Database Management System (DBMS). It is generally accepted that data warehousing provides an excellent approach for transforming the vast amounts of data that exist within an organization into useful and reliable information for getting answers to their query in order to facilitate the decision making process. A data warehouse provides the base for the powerful data analysis techniques that are available today such as data mining and multidimensional analysis, as well as the more traditional query and reporting. Making use of these techniques along with data warehousing can result in easier access to the information you need for more informed decision making.

**Key Words:** Data Warehouse, Decision Support System and Management Information System, Database Management System.

## 1. Introduction

A data warehouse is all about modeling data into information and storing these data based on the subject rather than application. According to W. H. Inman, the father of data warehousing, “a data warehouse is a subject oriented, integrated, non volatile and time variant, collection of data in support of management’s decision”.

Data warehousing is the design and implementation of processes, tools, and facilities to manage and deliver complete, timely, accurate, and understandable information for decision making. It includes all the

activities that make it possible for an organization to create, manage, and maintain a data warehouse or data mart.

The concept of data warehousing has evolved out of the need for easy access to a structured of quality data that can be used for decision making. It is globally accepted that information is a very powerful asset that can provide significant benefits to any organization and a competitive advantage in the business world. Data warehousing implements the process to access heterogeneous data sources; clean, filter, and transform the data; and store the data in a structure that is easy to access, understand, and use. The data is then used for query, reporting, and data analysis.

## 2. Characteristics

The data warehouse has specific characteristics that include the following:

**Subject-Oriented:** Information is presented according to specific subjects or areas of interest, not simply as computer files. Data is manipulated to provide information about a particular subject. For example, the data is not simply made accessible to end-users, but is provided structure and organized according to the specific needs.

**Integrated:** A single source of information for and about understanding multiple areas of interest. The data warehouse provides one-stop shopping and contains information about a variety of subjects.

**Non-Volatile:** Stable information that doesn't change each time an operational process is executed. Information is consistent regardless of when the warehouse is accessed.

**Time-Variant:** Containing a history of the subject, as well as current information. Historical information is an important component of a data warehouse.

**Accessible:** The primary purpose of a data warehouse is to provide readily accessible information to end-users.

**Process-Oriented:** It is important to view data warehousing as a process for delivery of information. The maintenance of a data warehouse is ongoing and iterative in nature.

## 3. Significance of the Study

The value of information has increased dramatically globally and across all sectors. The credit of which could be attributed to recent advancement in Information and Computing Technology. Data

warehousing is the basis of an efficient and cost effective DSSMIS. As we are aware that evaluation of problems lead to invention and innovation, the indispensable requirement to store enormous amount of data been response for generation of idea for data warehousing. The decision making based on huge diversified data has become too critical. This has created a lot of issues which must be resolved on the priority basis as the more organised the data base is- the better the performance of the organisation. This calls for betterment of server operating system, explosion of internet and web based application.

#### **4. Methodology**

The first phase of the study would primary aim to study existing MIS System of Magadh University and its constituent colleges in Gaya District within the frameworks of their Strength and Weakness. This would facilitate identification of grey area and exploring potential. This process would facilitate generation of ideas for the development of data warehousing model for effective data mining. We will study the existing models and applications of data warehouse to compare the different approaches used in the development of the decision support system. Here we are presenting the basic methodology for developing a data warehouse for the higher education. The process of developing a data warehouse is similar in many respects to any other development project. Therefore, the process follows a similar path. What follows is a typical and likely familiar, development cycle with emphasis on how the different components of the cycle affect your data warehouse modeling efforts. It is certainly true that there is no one correct or definitive life cycle for developing a data warehouse. We have chosen one simply because it seems to work well for us. Because our focus is really on modeling, the specific life cycle is not an issue here. What is essential is that we identify what we need to know to create an effective model for your data warehouse environment.

The methodology presented in this paper is a general guideline for the development of an institutional data warehouse. However, it should be noted that in today's world of enterprise resource planning systems (ERP), many vendors, such as SAP or PeopleSoft provide data warehouse support of their own transactional data systems. Installation of a turnkey system including data warehouse support is also a viable option for obtaining the necessary data and reporting to support decision-making. The turnkey approach assumes all necessary data for the data warehouse are contained in the institution's student information system, which may not be the case

when an institution's student information system does not accommodate all of the needs of the operational functions of a complex university. The method we propose allows the data warehouse implementation team to accommodate 'renegade' databases that may appear throughout a campus if the selected data warehouse software platform accommodates the integration of numerous data sources (MS Access, institutional student information system, financial information systems, or other homegrown systems). Furthermore, the development process we propose provides total institutional ownership. The structure of this paper is intended to facilitate varied institutional, organizational, and resource situations. Using this general methodology to develop a specific model for an individual situation will increase the likelihood for success. To illustrate the use of the model, two scenarios and individual model applications are discussed.

### **5. Single Pass Model**

The first scenario is that of a large and financially stable institution. It has significant financial, technological and personnel resources available for the development of a data warehouse. It also has significant data ownership as well as administrative control issues. In this scenario the most likely application would be the single pass model with heavy emphasis on the initial organization to overcome political and organizational obstacles. When the project is approved, outside expertise and software development tools can be obtained to facilitate the fast and comprehensive development of the data warehouse. This scenario would be very similar to the methodologies utilized in the business environment.

### **6. Iterative Model**

The second scenario is that of a smaller institution with limited financial, technological and/or personnel resources. In this scenario, the champion will most likely be responsible for the entire project. The most likely application of the model is an extensive use of iteration. The size and amount of work completed in any single iteration will be small because of the lack of key resources. The first iteration may simply include the creation of an initial data warehouse based on a standard set of known reports with no special user interface. This would support the basic requirements of a small office of institutional research. Subsequent supplementary iterations would expand either the user interface or data sources supplying the data warehouse. If an iterative process is utilized, the

development team should design the initial data warehouse with the possibility of expansion in mind.

## 7. Conclusion

The purpose of this paper was to facilitate an understanding of an effective methodology for data warehouse development in an institutional environment. We identified several major issues that institutions face relative to the development of data warehouses. We also discussed the SDLC approach to system development and how it could support the development process of a data warehouse in an institutional environment. We then proposed a methodology that provides the necessary flexibility to support the various institutional structures and their available resources in the design and construction of a data warehouse. We concluded the paper with two small cases illustrating how the methodology could be used to guide and support the development of an institutional data warehouse. Given that the methodology of data warehouse development was identified as one of the top three concerns of data warehouse managers (Griffin, 1997), we hope this paper provides institutional researchers and the larger institutional community a greater foundation for addressing this important obstacle to success. This paper addresses the methodology for developing an institutional data warehouse; however, currently there is no clear research describing the methods institutions

are using to develop a data warehouse. We think this is an area ripe for further research.

## 8. References

- Alaa el-Halees (2009) Mining Students Data to Analyze e-Learning Behavior: A Case Study
- Aouiche, K., Darmont, J., & Boussaïd, O. (2005). Automatic selection of bitmap joins indexes in data warehouse. In A. Min Tjoa & J. Trujillo (Eds.), *International Conference on Data Warehousing and Knowledge Discovery (LNCS 3589)*, pp. 64-73). Springer Verlag.
- Codd, E.F.; Codd, S.B.; Salley, C.T.: Providing OLAP (On-line Analytical Processing) to User Analysts: An IT Mandate, White Paper, Arbor Software Corporation, 1993.
- Erdogan and Timor (2005) A data mining application in a student database. *Journal of Aeronautic and Space Technologies* July 2005 Volume 2 Number 2 (53-57).

- Furtado, P. (2004). Workload-based placement and join processing in node-Partitioned data warehouses. In Y. Kambayashi, et al. (Eds.), International Conference on Data Warehousing and Knowledge Discovery (LNCS 3181, pp. 38-47). Springer-Verlag.
- Lehner, W.; Ruf, T.; Teschke, M.: Data Management in Scientific Computing: A Study in Market Research. In: Proceedings of the International Conference on Applications of Databases (ADB'95, Santa Clara (CA), Dec. 13-15), 1995, pp. 31-35
- Tasleem Mustafa, Ahsan Raza Sattar(2010), Department of Computer Science, University, of Agriculture, Faisalabad, Pakistan. European Journal of Scientific Research, ISSN 1450-216X Vol.43 No.1 (2010), pp.24-29 © Euro-Journals Publishing, Inc. 2010 <http://www.eurojournals.com/ejsr.htm>.
- McBroom, J.R., Wierschem, D., and McMillen, J. (2001). The intricacies of Data Warehouse Development in an Academic Setting. Presentation at the Syllabus Annual Conference, Boston, MA.

# SEARCH ENGINE OPTIMIZATION TECHNIQUES FOR ORGANIC SEARCH: A THEORETICAL APPROACH

**Mr.Nitin duklan**

Lecturer , UIM Dehradun

**Dr. Himanshu Bahuguna**

Assoc. Prof. , HOD Computer Application,

UIM Dehradun

## ABSTRACT

Search Engine Optimization (SEO) is often about making small modifications to parts of the website. When viewed individually, these changes might seem like incremental improvements, but when combined with other optimizations, they could have a noticeable impact on site's user experience and performance. Search Engine Optimization technique is basically used to improve organic search results rather paid results. Search Engine Optimization is a collection of strategies that improve the level at which a web site is ranked, and the results returned when a user searches for a keyword or a phrase.

In particular, this paper provides a number of illustrations on how Search Engine Optimization strategies can be best understood and then introduces the new website building concepts and design concepts. Also as a vehicle intended to support in an effective way of Organic search for a website.

**Keywords:** Search engine optimization (SEO), Organic search, page rank

## 1. Introduction

Search Engine Optimization (SEO) can be defined as an aggregate of all the work necessary to produce a high volume of referral hits from search engines, web directories, and other websites, with the ultimate goal of making the website popular.

SEO is a technique which helps search engines find and rank site higher than the millions of other sites in response to a search query. SEO thus helps to get traffic from search engines.



SEO involves internal and external website analysis, including link building, proper website architecture and development, competitor analysis, keyword research, content development, and many other tasks.

The goal of all search engines is to find and organize distributed data found on the Internet. Before search engines were developed, the Internet was a collection of File Transfer Protocol (FTP) sites in which users would navigate to find specific shared files. As the central list of web servers joining the Internet grew, and the World Wide Web became the interface of choice for accessing the Internet, the need for finding and organizing the distributed data files on FTP web servers grew. Search engines began due to this need to more easily navigate the web servers and files on the Internet.

The first search engine was developed as a school project by Alan Emtage, a student at McGill University in Montreal. Back in 1990, Alan created Archie, an index (or archives) of computer files stored on anonymous FTP web sites in a given network of computers (“Archie” rather than “Archives” fit name length parameters – thus it became the name of the first search engine). In 1991, Mark McCahill, a student at the University of Minnesota, effectively used a hypertext paradigm to create Gopher, which also searched for plain text references in files.

Archie and Gopher’s searchable database of websites did not have natural language keyword capabilities used in modern search engines. Rather, in 1993 the graphical Mosaic web browser improved upon Gopher’s primarily text-based interface. About the same time, Matthew Gray developed Wandex, the first search engine in the form that we know search engines today. Wandex’s technology was the first to crawl the web indexing and searching the catalog of indexed pages on the web. Another significant development in search engines came in 1994 when WebCrawler’s search engine began indexing the full text of web sites instead of just web page titles.

While both web directories and search engines gained popularity in the 1990s, search engines developed a life of their own becoming the preferred method of Internet search. Major search engines found in use today originated in development between 1993 and 1998.

Some examples are:-

Excite – Born in 1993

Yahoo! - Born in 1994

WebCrawler – Born in 1994

Lycos – Born in 1994

Infoseek – Born in 1994

AltaVista – Born in 1995

Inktomi – Born in 1996

Ask Jeeves (now Ask) – Born in 1997

Google – Born in 1997

MSN Search (now Windows Live) – Born in 1998

## 2. How search engine works

Basically search engines are text driven, search engines crawl the Web, looking at particular site items (mainly text) to get an idea what a site is about. Search engines perform several activities in order to deliver search results – *crawling, indexing, processing, calculating relevancy* and *retrieving*. First, search engines **crawl** the Web to see what is there. This task is performed by a piece of software, called a *crawler* or a *spider* (or Googlebot, as is the case with Google). Spiders follow links from one page to another and index everything they find on their way. **Crawling** is the process by which Crawler discovers new and updated pages to be added to the index.

There is a online tool through which we can check that a website is crawled or not, the link is <http://www.webconfs.com/search-engine-spider-simulator.php>

After a page is crawled, the next step is to **index** its content. The indexed page is stored in a giant database, from where it can later be retrieved. Essentially, the process of **indexing** is identifying the words and expressions that best describe the page and assigning the page to particular keywords. Sometimes *crawler* might not get the meaning of a page right, here comes the role of Search Engine optimization (SEO) Technique. By using optimizing techniques one can classify his pages correctly– to get higher ranking.

When a search request comes, the search engine processes it – i.e. it compares the search string in the search request with the indexed pages in the database. Since it is likely that more than one page (practically it is millions of pages) contains the search string, the search engine starts

**calculating the relevancy** of each of the pages in its index with the search string.

There are various algorithms to calculate relevancy. Each of these algorithms has different relative weights for common factors like keyword density, links, or meta tags. That is why different search engines give different search results pages for the same search string. The last step in search engines' activity is **retrieving** the results. Basically, it is nothing more than simply displaying them in the browser – i.e. the endless pages of search results that are sorted from the most relevant to the least relevant sites.

### 3. Significance of Search engine optimization

**Search engine optimization (SEO)** is the process of affecting the visibility of a website or a web page in a search engine's "natural" or un-paid ("organic") search results. Search Engine Optimization (SEO) is the key tool for the website owners to get more traffic to the website. Optimization of a website is crucial to get traffic and maintain the level over the search engine. The main aim of the search engine optimization is to get more traffic from diverse sources and to get repetitive visitors.

1. SEO plays a crucial role in online business websites as well as other interactive sites. With regular update of content on website, SEO helps to get more traffic.
2. Based on the specific keywords SEO can generate good traffic and ultimately affect the revenue for e-commerce site
3. It is vital to maintain the position on the search engines like Google, yahoo and others.
4. A Search Engine Optimizer needs to look for the new keywords and work on specific key words to get new traffic
5. The ultimate goal for the website owner and SEO is to get the traffic and appears in first five pages of the search engine and maintain the positing online and also to get the repetitive users on their website.

Most search engines offer two types of search results: **paid results** (typically at the top or on the side) and **organic or natural** results. Paid results can get your Web site to rank higher for a specific keyword phrase (because you've paid to be high in the results).

An organic search is a search that generates results that are not paid advertisements. **Organic search results** are listings on search engine results pages that appear because of their relevance to the search terms,ie

these results are a more accurate reflection of what they might want when searching for a specific phrase, because they are generated by popularity and common usage.

When we do SEO or search engine optimization we are attempting to adjust the content of the web pages so as to rank well in the organic search results.

**Also Known As:** natural search

#### **4. Techniques involved for optimization**

There are several optimization techniques by the help of which Website appears high in search query results for a specific keyword. Currently there are no tools or softwares that will put all the elements of SEO in place .Instead we have to build a website with SEO in mind , Some of the techniques that can be used are discussed below :

The first thing that attracts a search engine crawler is the actual design of site. Tags, links, navigational structure, and content are just a few of the elements that catch crawlers' attention.

##### **Text**

Text is one of the most important elements of any web site of particular importance are the keywords within the text on a page, where those keywords appear, and how often they appear.

Keywords make all the difference when a search engine indexes site and then serves it up in search results. Keywords must match the words and phrases that potential visitors will use when searching for a site (or for the topic or product that's listed on site). To ensure that keywords are effective, you'll need to spend some time learning which keywords work best for a site. That means doing keyword research and testing the keywords that we do select to see how effective they really are.

##### **Use unique, accurate page titles**

A title tag plays a vital role since it tells both users and search engines about the topic of a particular page. The <title> tag should be placed within the <head> tag of the HTML document. Ideally, we should create a unique title for each page on a site. Page title contents are displayed in search results If a document appears in a search results page, the contents of the title tag will usually appear in the first line of the results.

For example: - Google search engine



baseball cards

Google Search

I'm Feeling Lucky

[Brandon's Baseball Cards - Buy Cards, Baseball Card Prices](#)

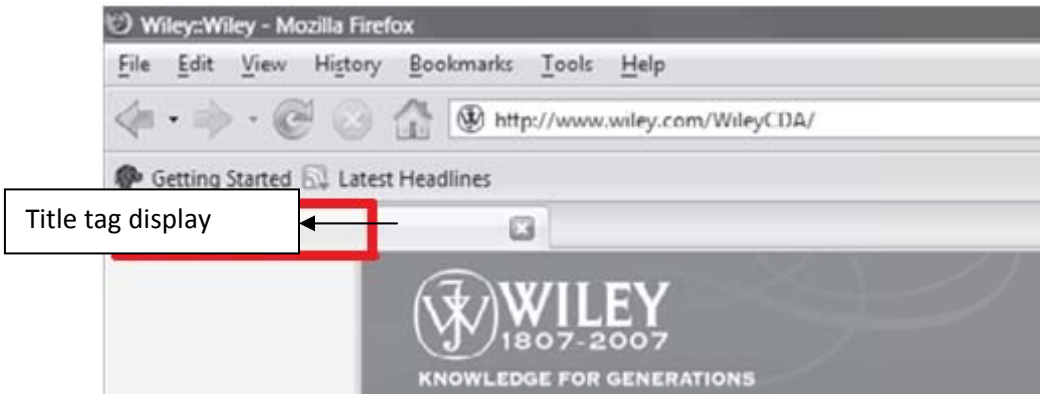
Brandon's **Baseball Cards** provides a large selection of vintage and modern **baseball cards** for sale. We also offer daily **baseball** news and events in ...  
[www.brandonsbaseballcards.com/](http://www.brandonsbaseballcards.com/) - Cached - Similar

Words in the title are **bolded** if they appear in the user's search query. This can help users recognize if the page is likely to be relevant to their search.

This tag will appear like this:

```
<Title>Your Title Here</Title>
```

Once we have tagged site with a title tag, when a user pulls the site up, the title that you entered will appear at the very top of the page as shown in Figure 4.2



**Figure 4.2: Displaying the position of title tag in a Firefox browser**  
 Make use of the "description", "Keyword" meta tag

In search engine optimization, two kinds of tags are important on web site: Meta tags and HTML tags. Technically, Meta tags *are* HTML tags, they just appear in very specific places. The two most important meta tags are the keyword tag and the description tag. The keyword tag occurs at the point where you list the keywords that apply to your web site. A keyword tag on a search engine optimization page might look something like this:

```
<meta name="keywords" content="SEO, search engine optimization, page rank">
```

The description tag gives a short description of a page. Such a tag for the search engine optimization page might look like this:

```
<meta name="description" content="SEARCH ENGINE OPTIMIZATION TECHNIQUES">
```

### **Some other important tags**

Not all search engines take meta tags into consideration. For that reason, site should use both meta tags and other HTML tags. Some of the other HTML tags that should include on web site are the top (or H1) heading tags, and the anchor tags. High-level headings (H1s) are also important when a crawler examines your web site. Important keywords should appear in your H1 headings, and in the HTML tags you use to create those headings. An H1 tag might look like this:

```
<h1>High-Level Heading</h1>
```

Anchor tags are used to create links to other pages. An anchor tag can point users to another web page, a file on the Web, or even an image or sound file. Here's what an anchor tag might look like:

```
<a href="http://www.targetwebsite.com/">Text for link</a>
```

### **Focus on the structure of URLs**

Simple-to-understand URLs will convey content information easily. Creating descriptive categories and filenames for the documents on website can not only help keep the site better organized, but it could also lead to better crawling of documents by search engines. Also, it can create easier, "friendlier" URLs for those that want to link to the content. Visitors may be intimidated by extremely long and cryptic URLs that contain few recognizable words.

URL's can be confusing like Fig 4.5 Since URLs are displayed in search results so they should contain relevant words, as they provide users and search engines with more information about the page rather than an ID or oddly named parameter would.

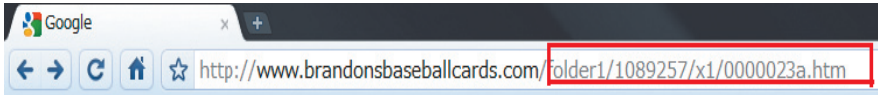
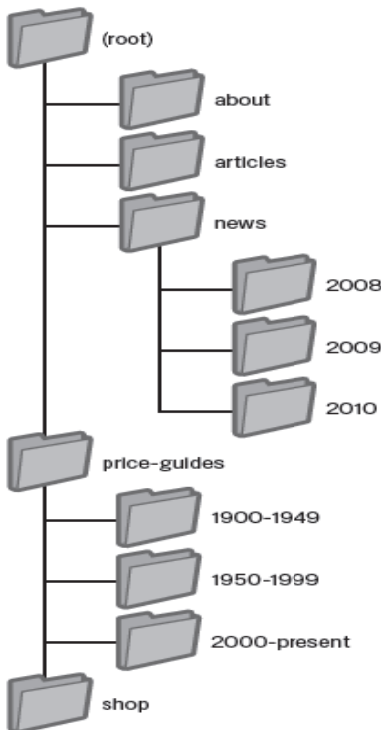


Fig 4.5 : Representing a unfriendly url

#### 4.6 Make site easier to navigate

Navigation is very important for search engines. Using a directory structure that organizes your content well and makes it easy for visitors to know where they're at on a site. The navigation of a website is important in helping visitors quickly find the content they want. It can also help search engines understand what content the webmaster thinks is important.



The sample directory structure for small website

## Use of page redirects

Using Redirect Pages in SEO Strategy is very important, whether we're changing entire site or simply retiring outdated or unneeded pages, the importance of choosing the correct redirect strategy shouldn't be underestimated. Consider a website having good rank but we opted to change a few file names, add a number of new pages and delete a handful of pages and old news items. This is potentially the most dangerous time as risk of losing both site visitors and hard earned rankings if the correct redirects haven't been implemented.

The majority of site harvest their traffic from search engines. So, when visitors find an older page listed in the search engine results and try to visit that destination URL, which are no longer there then the visitor will receive a **404 File Not Found error message**. So the users are forced to go back to the search engine and try another listing or manually type in the home page URL based on the address of the missing page and thus damages the site reputation.

This damage to a site's reputation also extends to the standing of the site in the eyes of the search engine. If the spiders try to access a page that has been removed or renamed, information held about that page (including its page rank and position) is lost. This can have a knock on effect on traffic numbers and rankings, ultimately leading to a lower online profile and the loss of years of hard work avoiding both of these worst case scenarios is possible with an effective redirect strategy. Depending on the situation we have a number of redirect options – choosing the most appropriate one for a situation will help direct visitors seamlessly to new pages and retain important page rank and inbound link counts in the eyes of the search engines.

If we need a permanent redirect we will implement a 301 redirect. It appears to users as the webpages are transferred from one site to another or, from one page to another. A 301 redirect is the most efficient method of ensuring site visitors arrive at the correct page and the most effective redirect option for SEO purposes.

A 301 redirect is implemented with a .htaccess file. The server side document contains instructions for specific tasks such as IP exclusion, the use of alternate index files, creating custom error pages and changing file extensions. A simple text document, the file can be created in notepad and should include a command similar to 'redirect 301 /oldsite/oldpage.htm http://www.mynewsite.com/newpage.htm'. The file is then saved and uploaded to



the server. When the search engine spider next visits the site and accesses the file, it is educated as to the new site structure and which new page replaces which old page.

If we need a temporary redirect we implement a 302 redirect. This is a temporary solution to shift traffic to a specific new area for a short period of time. It may be used for example if we have a seasonal micro-site only used for the Christmas holiday period; rather than changing entire site, we would simply redirect incoming traffic to the festive themed micro site using the 302 redirect. When the holidays are over, removing the 302 redirect will channel users straight back through to the main site. Using the 302 code tells the search engines that the move is only temporary and instructs them not to update their index records.

### **Limitations of search engine optimization**

1. No search engine optimization technique guarantee that using that particular technique will leads to the high rank on the search engine. Rather by implementing different SEO techniques we focus on the way a website should be, so that it is easier for the crawler to crawl and index the site.
2. SEO is not only about making sure that all the technical aspects of search-engine are correct, it's about marketing too. This might just be the most important concept to grasp about how a search engine functions. We can build a perfect website, but the content on it might remain invisible to engines unless we promote it.
3. Search engine optimization focuses on Limited targeted keywords

### **Suggestions**

It was found during the study that some areas of Search engine optimization techniques could be analyzed further. Some of the related topics are:

1. Off page and on page Search engine optimization
2. Link exchange Strategies for Search engine optimization
3. Pay per click Techniques
4. Impact of Paid search on the natural or organic search

### **5. Conclusion**

It can be concluded from the study of the Search engine optimization techniques that the popularity of a website and its rank on search engine

can be increased by using SEO techniques. We have to take certain considerations while optimizing a website they are as follows:

1. Importance of Text
2. Use of Page titles
3. Make use of Meta tags
4. Use of heading tags
5. User friendly URL's
6. Create site easier to navigate
7. Effective use of page redirects

## 6. References

Meng Cui, Songyun Hu, 2011” *Search Engine Optimization Research for website promotion*”, International Conference of information technology, Computer Engineering and management Sciences

Eric Enge, Stephan Spencer , *The Art of SEO* . O'Reilly

Jerri L. Ledford , *SEO Search Engine Optimization Bible* .Wiley Publishing, Inc

John L. Jerkovic, *SEO Warrior* .O'Reilly

Aarron Walter, *Building Findable Websites: Web Standards, SEO, and Beyond*. New riders

Google's Search Engine optimization Guide

Websites : <http://support.google.com/webmasters/bin/answer.py?hl=en&answer=70897>  
[http://www.thehistoryofseo.com/Theindustry/Short\\_History\\_of\\_Early\\_Search\\_Engines.aspx](http://www.thehistoryofseo.com/Theindustry/Short_History_of_Early_Search_Engines.aspx) <http://john.do/seo-limitations/>

## GUIDELINES FOR THE AUTHORS

We invite unpublished novel, original, empirical and high quality research work pertaining to recent developments & practices in the area of management and information and emerging paradigms in allied subjects. The above mentioned tracks are only indicative, and not exhaustive.

**INTRODUCTION:** Manuscript must be in English prepared on a standard A4 size paper setting. It must be prepared on a single space and single column with 1” margin set for top, bottom, left and right. It should be typed in 12 point Calibri Font with page numbers at the bottom and centre of the every page.

**MANUSCRIPT TITLE:** The title of the paper should be in a 12 point Calibri Font. It should be bold typed, centered and fully capitalised.

**AUTHOR NAME(S) & AFFILIATIONS:** The author (s) full name, designation, affiliation (s), address, mobile/landline numbers, and email/alternate email address should be in 12-point Calibri Font. It must be centered underneath the title.

**ABSTRACT:** Abstract should be in fully italicized text, not exceeding 250 words. The abstract must be informative and explain background, aims, methods, results and conclusion.

**KEYWORDS:** Abstract must be followed by list of keywords, subject to the maximum of five. These should be arranged in alphabetic order separated by commas and full stops at the end.

**HEADINGS:** All the headings should be in a 10 point Calibri Font. These must be bold-faced, aligned left and fully capitalised. Leave a blank line before each heading.

**SUB-HEADINGS:** All the sub-headings should be in a 8 point Calibri Font. These must be bold-faced, aligned left and fully capitalised.

**MAIN TEXT:** The main text should be in a 8 point Calibri Font, single spaced and justified.

**FIGURES & TABLES:** These should be simple, centered, separately numbered & self explained, and titles must be above the tables/figures. Sources of data should be mentioned below the table/figure. It should be ensured that the tables/figures are referred to from the main text.

**EQUATIONS:** These should be consecutively numbered in parentheses, horizontally centered with equation number placed at the right.

**REFERENCES:** The list of all references should be alphabetically arranged. It must be single spaced, and at the end of the manuscript. The author (s) should mention only the actually utilised references in the preparation of manuscript and they are supposed to follow

**Harvard Style of Referencing.**

The author (s) are supposed to follow the references as per following:

- ❖ All works cited in the text (including sources for tables and figures) should be listed alphabetically.
- ❖ Use (**ed.**) for one editor, and (**ed.s**) for multiple editors.
- ❖ When listing two or more works by one author, use --- (20xx), such as after Kohl (1997), use --- (2001), etc, in chronologically ascending order.
- ❖ Indicate (opening and closing) page numbers for articles in journals and for chapters in books.
- ❖ The title of books and journals should be in italics. Double quotation marks are used for titles of journal articles, book chapters, dissertations, reports, working papers, unpublished material, etc.
- ❖ For titles in a language other than English, provide an English translation in parentheses.
- ❖ Use endnotes rather than footnotes.
- ❖ The location of endnotes within the text should be indicated by superscript numbers.

**PLEASE USE THE FOLLOWING FOR STYLE AND PUNCTUATION IN REFERENCES:****Books**

- ❖ Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- ❖ Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio," Ohio State University.

**Contributions to books**

- ❖ Sharma T., Kwatra, G. (2008) Effectiveness of Social Advertising: A Study of Selected Campaigns, Corporate Social Responsibility, Edited by David
- ❖ Crowther & Nicholas Capaldi, Ashgate Research Companion to Corporate Social Responsibility, Chapter 15, pp 287-303.

**Journal and other articles**

- ❖ Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

**Conference papers**

- ❖ Chandel K.S. (2009): "Ethics in Commerce Education." Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

**Unpublished dissertations and theses**

- ❖ Kumar S. (2006): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

**Online resources**

- ❖ Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

**Website**

- ❖ Kelkar V. (2009): Towards a New Natural Gas Policy, Economic and Political Weekly, Viewed on February 17, 2011

<http://epw.in/epw/user/viewabstract.jsp>

I take the opportunity to extend an invitation to you to contribute your paper in area of your specialty. The editors, can be contacted at

E-mail: aks21jan@gmail.com, anil21jan@rediffmail.com & vktangri@yahoo.com

M: +91 9457112958, 9319925872

All articles should be sent by e-mail or by post on the following address.

**Address:**

**A.K. S. Chauhan**

Managing Editor, Uttaranchal Business Review

Arcadia Grand, PO; Chandanbari, Premnagar, Dehradun-248007

**V.K. Tangri**

Editor, Uttaranchal Business Review

Arcadia Grand, PO; Chandanbari, Premnagar, Dehradun-248007

# Uttaranchal Business Review

## Subscription Form

To  
 Editor  
**Uttaranchal Business Review**  
 Uttaranchal Institute of Management  
 Arcadia Grand, PO; Chandanbari,  
 Premnagar, Dehradun-248007  
**E-mail**aks21jan@gmail.com, anil21jan@rediffmail.com & vktangri@yahoo.com

Subscription Charges:

| Period     | Issues | Rate (Domestic) | Rate (International) |
|------------|--------|-----------------|----------------------|
| Single     | One    | 280             | US\$ 25              |
| One Year   | Two    | 400             | US\$ 40              |
| Two Year   | Four   | 700             | US\$ 70              |
| Three Year | Six    | 900             | US\$ 90              |

Payment Details:

Amount (INR): .....Demand Draft/Cheque No. ....Dated  
 ...../...../.....Bank Name: .....Branch .....

In favour of Uttaranchal Institute of Management, Payable at Dehradun.

Subscriber Details:

Name: .....

Address: .....

.....Pin Code: .....

Email id: ..... Mobile: .....

Contact Details: (Telephone). ..... (Fax) .....

## About UIM

UIM has been setup under the aegis of SUSHILA DEVI CENTRE FOR PROFESSIONAL STUDIES & RESEARCH.

UIM was established in June 2006 by a dedicated group of educationists and philanthropists to create management professionals who can dynamically explore the new avenues of entrepreneurial and managerial heights.

The rapid strides taken in the field of information technology, has made the business environment highly complex. This has led to the tremendous demand for trained management professionals.

## About the Journal

The objective of journal is to disseminate knowledge and information in the areas of Management, IT and allied subjects and provide a forum for discussion on advancement in the areas of Management and IT. The Journal Focuses on theoretical, applied and interdisciplinary research in Management and IT. The journal publishes research papers, articles, book reviews and case studies.



## Uttaranchal Institute of Management

Arcadia Grant, P.O. Chandanwari, Prem Nagar, Dehradun, Uttarakhand, INDIA

Tel.: +91 135 2772154, 2771929, Fax: +91 135 2772231

Email: [uim\\_dehradun@rediffmail.com](mailto:uim_dehradun@rediffmail.com), [info@uimdehradun.com](mailto:info@uimdehradun.com), Website: [uimdehradun.com](http://uimdehradun.com)