Highlights of *Global* Bihar Meet
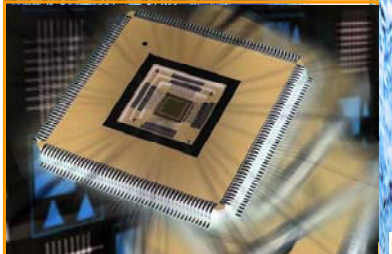
Emerging Chip Design
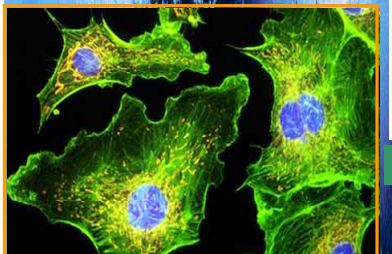
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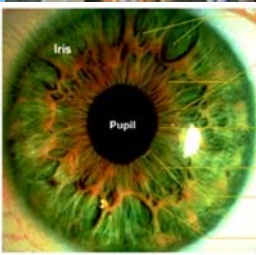
Editorial Board Members

C o n t e n t s

Message from Editor's Desk

The world is digital and small is trendy in modern era of electronics. The trend of convergence of technologies where many technologies, hardware, software etc combines for unique application of our interest, goes from smaller to smallest, good performing to the best performing into single IC chip which may perform many works at the same time and interestingly that made our life very easy and wonderful. The application of Internet technologies, Mobile applications, real time video conferencing and tele conferencing, laptops with all multimedia applications, webcams, Biotechnology (Bio medicines, Bio chips, DNA Chips), Robotics application, Satellite communication, etc are instances which have revolutionized the industry to change the life style of even a common man.

Biotechnology and genetic engineering is one emerging area where many advancements have been made, many surprising things are coming out.

The third issue of this magazine has an exclusive coverage of it in the science & Technology section.

Recently, a big event was organized in the land of Pataliputra, the ancient capital of India where around 500 intellectuals from India and overseas gathered to take participation in the discussion on development perspectives of this backward state of Indian Union. The important thing was musings of the HE President of India and his 10 points formula for the development of the state in a very high tech manner in the inaugural function. The development section of this issue has coverage on this global meet.

The other section of Manthan for this issue is also almost remains same as that of second issue. We solicit your reactions, comments and suggestions in the mailbox and expect that with your help and support in future this magazine will grow into a versatile platform.

For details you are free to visit our website (www.biharbrains.org).

Bibhuti Bikramaditya

Biometric Security System

Jyothi Raju Kanike, Hyderabad, India

Authentication is any process by which you verify that someone is who they claim they are. This usually involves a username and a password, but can include any other method of demonstrating identity, such as a smart card, retina scan, voice recognition, or fingerprints.

In security terminology, a biometric security system is an authentication technique that relies on a computer system to electronically validate a measurable biological characteristic which is physically unique and cannot be duplicated. Biometrics security systems are gaining importance because of the increase in the accuracy and reliability of identification and authentication functions. Biometric is the most secure and convenient authentication tool. It can not be borrowed, stolen, or forgotten and forging one is practically impossible. Biometrics measure individual's unique physical or behavioral characteristics to recognize or authenticate their identity.

Figure 1 Biometric Security System

Various types of biometric security systems are being used for real-time identification; the most popular are based on face recognition and fingerprint matching, iris and retinal scan, speech, facial thermograms, and hand or palm geometry. Behavioral characters characteristics include

signature, voice, keystroke pattern, and gait. Of this class of biometrics, technologies for signature and voice are the most developed.

Retinal scans and iris scans:

Retinal scans are based on the presence of the fine network of capillaries supplying the retina with oxygen and nutrients. These vessels absorb light and can be easily visualized with proper illumination. Retinal scans require close contact of user and scanner, a perfect alignment of the eye with a scanner, and no movement of the eye. The examiner is required to keep the subject's eye within half an inch of the instrument. The subject must focus on a pinpoint of little green light (to properly align the eye) and avoid blinking. A low-intensity coherent light is then transmitted through the eye and the reflected image of the retinal capillary pattern is recorded by the computer.

Retinal scans are considered to be too intrusive for a general security use and the prolonged exposure to light emitted by the scanners might be harmful to the eye. As a result a strong competition to the retinal scans was launched by iris scanning technology**.**

The colored part of the eye appears to be as unique as fingerprints and retina.

There is only a chance of one in 10^{78} that two irises will be identical.
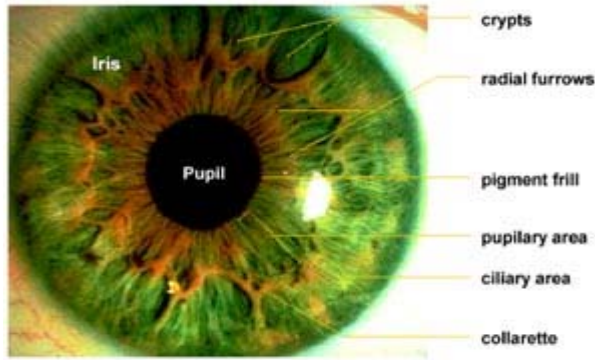
Figure 2: Retinal and iris recognition

Facial recognition:

Facial recognition is one of the newer biometric technologies, with systems only recently showing the accuracy necessary for commercial application. Facial recognition records the spatial geometry of distinguishing features of the face.
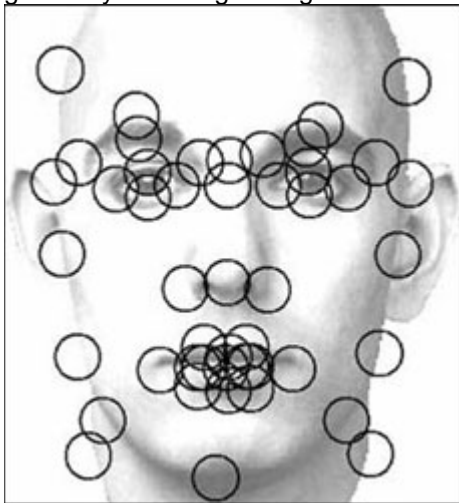
Figure 3. Facial recognition

It compares the dimensions of different facial attributes like eyes, nose, ears, etc., and their positions in relation to each other. However, in dim or varying light conditions, the result may not be very accurate. Last year also saw the launch of world's first face recognition technology for mobile phones.

Five steps to facial recognition are

1. Capture image
2. Find face in image
3. Extract features
4. Compare templates
5. Declare matches

Unlike other biometric systems, facial recognition can be used for general surveillance, usually in combination with public video cameras.

Finger Print:

Fingerprint recognition is one of the oldest biometric technologies and its application in criminal identification, using the human eye, has been in use for well over 100 years.

Now a days computer software and hardware can perform the identification significantly more accurately and rapidly. Finger scanning has several methods such as optical, ultrasound and silicon sensors, which work in different ways.

The technology is one of the most developed of all biometric technologies as also the most affordable, due to which it is beginning to make inroads into the mass market.
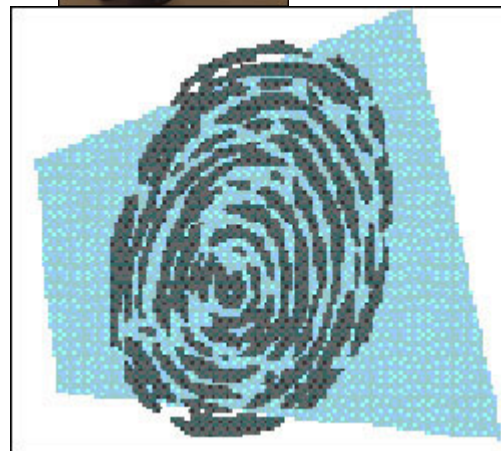
Figure 4: Finger Print

Signature Recognition:

Electronic Signature Recognition is another biometric technology that has been worked on for some years and the dynamic recognition of

3

relative pen speeds and pressures has significantly improved the accuracy.

Figure 5: Signature Recognition

Voice Recognition

Voice Recognition is a technology which allows a user to use his/her voice as an input device. Voice recognition may be used to dictate text into the computer or to give commands to the computer (such as opening application programs, pulling down menus, or saving work).

Older voice recognition applications required each word to be separated by a distinct space. This allowed the machine to determine where one word begins and the next stops. These kinds of voice recognition applications are still used to navigate the computer's system, and operate applications such as web browsers or spread sheets.

Newer voice recognition applications allow a user to dictate text fluently into the computer. These new applications can recognize speech at up to 160 words per minute.

Figure 6 : Voice recognition

Hand geometry:

Hand geometry involves the measurement and analysis of the shape of one's hand. It is a fairly simple procedure and is surprisingly accurate. Though it requires special hardware to use, it can be easily integrated into other devices or systems. Unlike fingerprints, the human hand isn't unique.

Individual hand features are not descriptive enough for identification. However, it is possible to devise a method by combining various individual features and measurements of fingers and hands for verification purposes.

Figure 7: Hand Recognition.

Selecting a Biometric Technology:

1. **Ease of use** - some biometric devices are difficult to handle unless there is proper training.

2. **Accuracy** - Vendors often use two different methods to rate biometric accuracy: false-acceptance rate (FAR) or false-rejection rate (FRR). Both methods focus on the system's ability to allow limited entry to authorized users. However, these measures can vary significantly depending on how one adjusts the sensitivity of the mechanism that matches the biometric. There may be instances where FAR decreases and FRR increases. Thus we have to be careful to understand how the biometrics vendors arrive at quoted values of FAR and FRR. Because FAR and FRR are interdependent, we can draw a plot, which can facilitate to determine the crossover error rate (CER). The lower the CER, the more accurate the system

3. **Error incidence** - Time and environmental conditions may affect the accuracy of biometric data. For instance, biometrics may change as an individual becomes old. Environmental conditions may either alter the biometric directly (if a finger is cut and scarred) or interfere with the data

collection (background noise when using a voice biometric).

There are some other vital ingredients to be analyzed:

1. **Cost** - biometrics devices and their related things, such as installation, connection, user system integration, research and test of the biometric system, system maintenance, etc.

2. **User acceptance** - certain user groups reject biometric technologies on various grounds because of privacy concerns.

Some application-specific requirements like security level, which can be low, moderate or high. This decision will greatly impact which biometric is most appropriate for this kind of applications.

Finally organizations should consider a biometrics' stability including maturity of the technology, degree of standardization, level of vendor and governmental support, market share and other support factors. Mature and standardized biometric technologies usually have stronger stability.

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Emerging Chip Design Trends

Bibhuti Bikramaditya, Daejeon, South Korea

ABSTRACT*: Paradoxically, in this big and labyrinthine world, the use of tiny devices is trendy. These devices are high powered in delivering good quality output, has feature of portability and has many storage capacity with more speed. The widespread use of world of mobile phones integrated with all multimedia facilities, pen cameras, laptop and palm-top computers, widespread use of real time video conferencing and teleconferencing systems, webcams are the instances which have not only revolutionized the electronics consumer industry but also has changed the life style of even common mass. The trends of embedding many technologies, many software & hardware for the many defined application with greater performance into single silicon chip have opened the door for unpredictable advancement in chip design technology. But the physics behind the implementation of these devices are too complex that needs infinite knowledge to implement into one single silicon chip. The trend towards specializing system design and manufacturing outsourcing - such as fabless design house, wafer foundry, design automation tool/software house, and semiconductor processing tool supplier - created the needs for individuals with multi-discipline technical skills for collaborations and association and more than that it needs huge investments which underdeveloped and developing countries can not simply afford to establish chip design manufacturing industry. This article describes the recent chip design trends and advancements made by chip design industry.*

Overview: After the invention of Transistors in 1947-48, the trend towards "miniaturization of integrated circuit" (the technology of putting many no of ICs into single silicon chip) opened the door of modern electronics on the wider scope in a lesser space. If we go the whole hog, we find that the journey chip design technology right from SSI (<12 gates) to VLSI (>10000 gates) is remarkable and its rate of growth is unbelievable & and some times becomes unpredictable. Let us have overlook on the development in IC technology from the start of modern era of electronics (1948) to present in statistical facts and figures.

A. IC Design Technique from layout level to system level

(Fig 1)

The introductions of HDLs have made possible the design of complete System on Chip (SOC), with the complexities rising from 1 million to 10 million transistors. Recently System C has been introduced for 100 million to 1000 millions of transistors.

B. IC Design Growth at frequency level
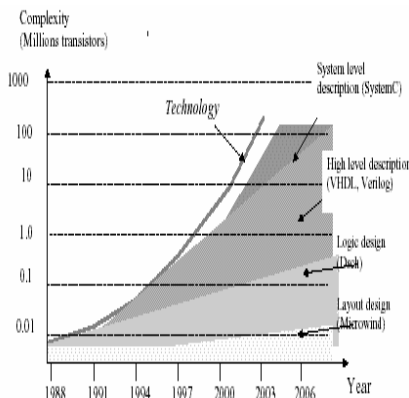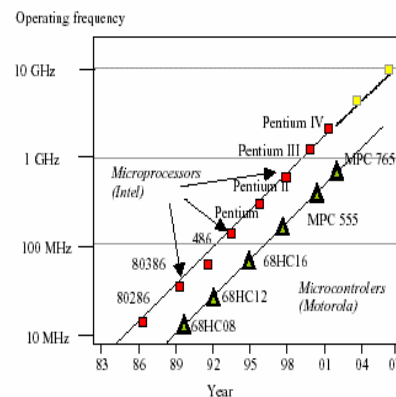
(Fig 2)

The clock frequency increased for high performance micro processor and industrial micro controllers with the technology scale down. Here Motorola micro controller has been taken as the example used for high performance automotive industry applications.

C. Evolution of Memory Size

The First 1 kb memory was produced by Intel in 1971. Later on Semiconductor memories have advanced both in density as well as performances. With the production of 256 Mb memories in 2000 and 1 GB in 2004, it has revolutionized the computer and telecommunication industry. According to the estimates, it is expected to increase up to 16 GB in 2008.
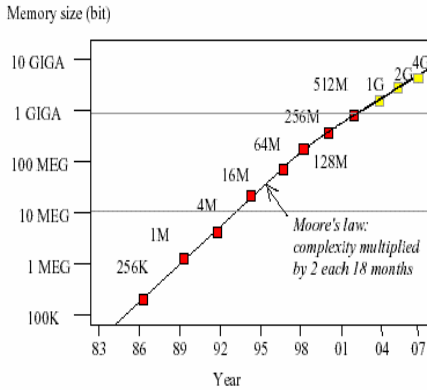
(Fig 3)

D. Evolution of Lithography

Trend towards the smaller dimension has been accelerated since 1996.In 2007, the Lithography is expected to decrease down to 0.07 um. Fig 4 depicted below gives the picture of lithographic revolution.
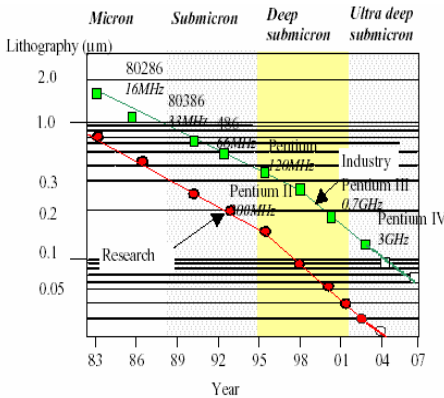
(Fig 4)

E. Technology Generation Forecast:

Moore's law says that Minimum transfer of feature size must decrease by factor of 0.7 every year but trends are more than that. It can be clear by the graphical data given below in fig 5.
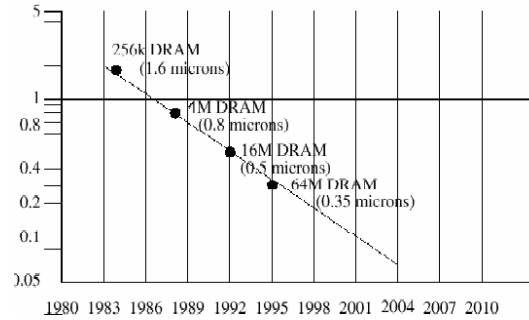
(Fig 5)

F. Evolution of Programmable Devices and its trend
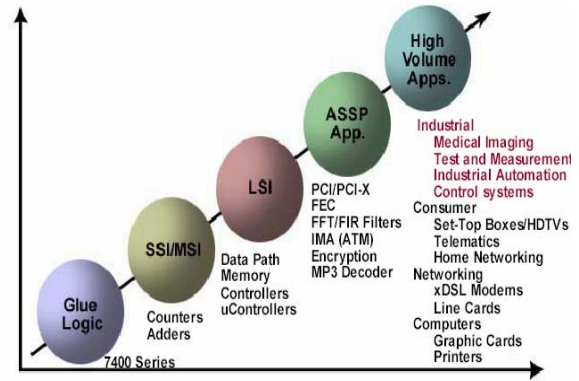
(Fig 6)

F.1 FPGA Architecture:

The fig 6 depicts and describes the fast journey of miniaturization of integrated circuit from Glue logic to High volume ASICs along with its large volume of application. As per trend, the use of Programmable ASICs i.e FPGAs are growing by leaps and bounds at least for their implementation into medium to higher end design products which give the best possible solution in terms of less time to market, portability, less design complexities and reliable quality.

Xilinx is one of the best companies in the world for producing programmable ASICs. Its percentage share in the production of FPGA is highest.

The basic element of the FPGA is Configurable Logic Block which consists of programmable gates, flip flops and muxes etc along with BLOCK RAMs. The major advancement of FPGA over CPLD, Complex

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Programmable Logic Devices is that interconnects of CLBs are also programmable and it has in built Block RAMs which are not available with CPLD. All the basic differences between ASIC and FPGA has been depicted below (Fig8) and can be easily understood.
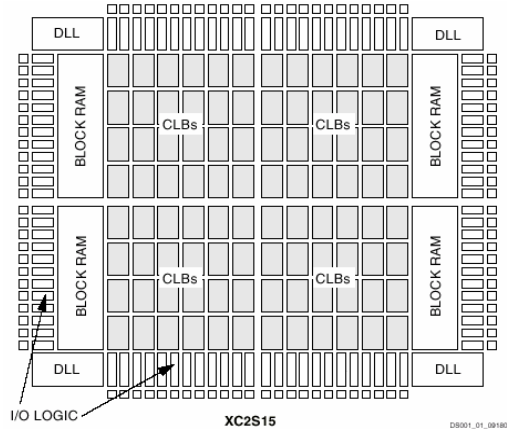
Figure 1: Basic Spartan-II Family FPGA Block Diagram

(Fig 7)

F.1.1 ASIC VS FPGA
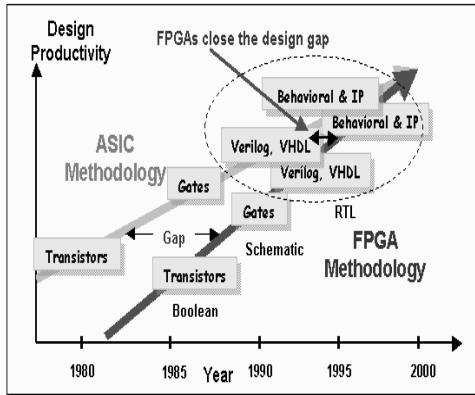
(Fig 8)

F.1.2 New FPGA Price Revolution:

Price wise also programmable ASICs are more advantageous. The considerable decrease in their prices has opened space for even smaller companies and design houses to work with technologies for their medium to high level products whose gate counts is up to around 5 million gates. The new Vertex 5 FPGA by Xilinx has this capacity and it is expected to increase by 10 million gates in the near future.
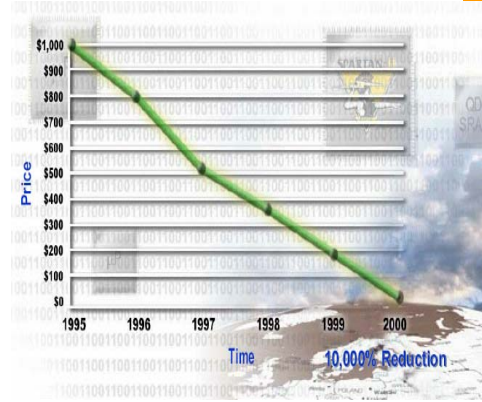
(Fig 9)

F.1.3 Cost Management through System Integration.

The sharp decline in the prices of FPGA with its improved facility, better performance, and greater density of gates made the task of system integration easy. Because of this even large systems can also be designed and implemented into FPGA chip that gives cost effective and reliable solution to the customers. Fig 10 describes how Spartan 3 FPGA integrates with many other ICs and hardware components.
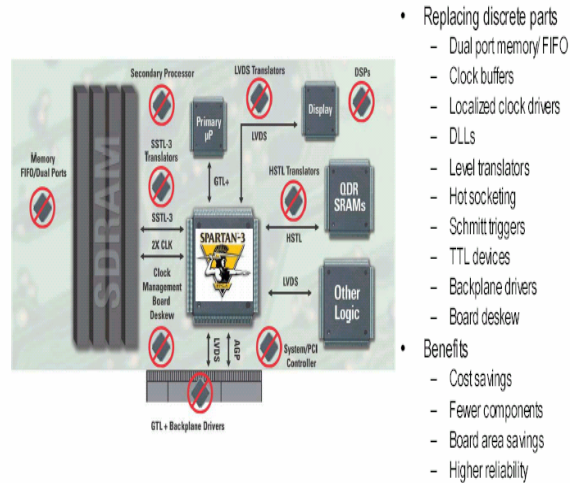
(Fig 10)

G. Chip Design Productivity and complexity:

As chip size is shrinking, the logic of its design and technology of their production going to be more complex. The factors of the total engineering effort (fig 11) affect the chip design productivity and also the manufacturing productivity which is much more complex and unpredictable.

It is given below:

General Design Productivity

= output produced /labor expended

= output per unit worker hour

Manufacturing productivity

= value added/labor expended

= value added per unit worker hour.

= (end product selling price- material cost of the Product) worker hour

= dollars per worker hour

Chip design productivity

≠ Transistor /gate per unit engineering effort.

Chip design productivity

= chip design complexity/ engineering effort.

= complexity per unit engineering hour.

= normalized transistors per person-hour.
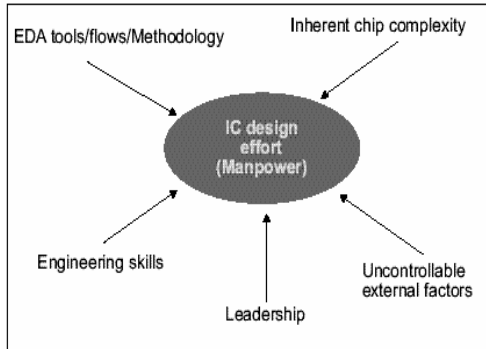
Fig 11*: Factors Influencing IC Design Effort*

Because of the complexities in Chip design productivity as it is defined as chip design complexity per unit engineering hour not as transistors /gate per unit engineering hour (as in the general case), It takes much time to come to market and also it requires sound knowledge of all manufacturing cycles, otherwise it may cause huge cost to the production loss.

H. Latest Chip Design Trend:

The trend for whole systems design, now a days is embedded i.e the use of hardware and software for the specific applications because of the disadvantages of only hardware or software solution. In that because of the programmable and re configurable, re –usable nature of FPGA, the widespread use of FPGA has been become real trend. FPGA are widely used in Networking (PCI, Ethernet, USB), DSP & Communication, Speech Processing & Image processing, Tele mobile communication, Micro processor & Micro controller Based System., Home appliances etc. sectors which has played significant role in

revolutionizing chip design and manufacturing industry. In addition to these mentioned application areas, some of the areas given below which have been given most attention by corporate world as these are few of the latest trends in Chip Design Industries.

H.1 Real Time Audio and Video Processing:

The reconfigurable FPGA systems design and re-use of FPGA chip is basically good example for real time image processing systems. The real time image stabilization problem caused due to jittering images will be solved by the use of this reconfigurable system design.

The use of high powered handy cam, Webcam and the use of efficient jittering algorithm in it are more appropriate example. High quality handy cams are now jitter free images which occur due to hand shakes or the internal shift in the image axis.

The use of FPGA system in Noise cancellation and Noise reduction has also gained momentum. This has been already implemented in Railway station in Korea, Japan etc countries. Now efforts are being made to implement it on Airports. The scientists are working in the direction of 100% cancellation of noise which is practically looks impossible but if it is implemented it will have capacity to revolutionize this industry in many ways. Samsung Electronics, IT Magic (www.itmagic.co.kr) and other companies in Korea, Japan and USA are working on for complete cancellation of Noise.

H.2 Auto motive Sector

The FPGA solution for the car with all multimedia system is the latest trend in the market in the automotive sector. The use of GPS system as tool for communication, information's, safety and collision avoidance mechanism along with all accessories of entertainment with great extent of comfort has gained momentum in the developed to developing countries. It is the need of time also when your kid has to come back to home from school without help of any driver or parents. Mean to say, high powered robot will do all the works. Scientists are working to make robotic systems inside the car for this purpose. Presently In the market, car multimedia system has been implemented but this is without robotic system. Let us hope, it will come very soon.
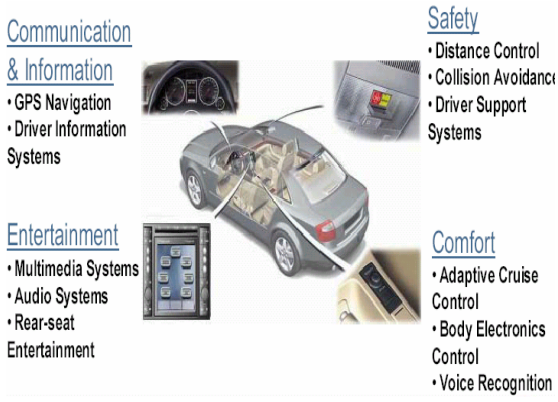
(Fig 12)

H.2.1 Automotive Networks:

The Car multimedia system basically uses to interface with Xilinx FPGA which consists of CAN, VAN, LAN, MOST, IEEE1394, and USB & PCI etc given below (Fig 13).
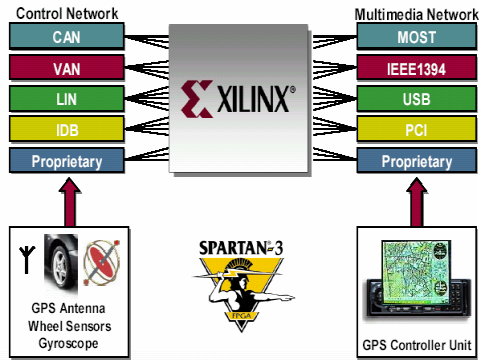
(Fig 13)

H.2.2 other issues and challenges before automotive sector

a. Integrating different standards
   Networking: MOST, CAN
   Video: LVDS
   System Interface: PCI
b. System control and peripherals
c. Micro controller and microprocessor obsolescence
d. Offloading hardware intensive blocks from host CPU
e. Software defined Radios
f. High performance memory support(DDR/SDR)
g. Interfacing to Various Flash types(CF+,MMC/SD)
h. EMI Signal Management
i. Display Control

j. Content protection/encryption
k. Industrial temp parts
l. Overall cost management
m. Dynamic nature of products

H.3 Biometric analysis for Security

The implementation of Biometrics security systems by using best encryption and decryption algorithms into VLSI FPGA technology is a challenge for the scientists. This is the best possible solution for the security particularly in defense, military, aerospace centers and other important govt and private offices where identification of incoming and outgoing people are required.

H.4 System on chip with virtual component:

In the recycling age, designing for reuse sounds like a great idea but with increasing requirements and chip sizes, it is not an easy task. System on Chip may contain both a system bus connect and Peripheral bus connect custom I/O block that provide functions not commercially available, may also be included.

H.4.1 Adv. of System on Chip

1. Increased levels of design reuse.
2. More effective hardware-software Co-design.
3. Better trade-offs between general Purpose vs. domain-specific architectures and algorithms.
4. Greater integration of functionality on-chip (hardware-software, analog-digital).

H.5 Neural network & Artificial intelligence for Medical Expert system:

Recently using Artificial Neural Networks (ANN), Medical Expert System (MES) has been introduced which will be used for diagnosis of pulmonary diseases. This is based on the cascade of three layers of artificial neural networks that process disease symptoms and other inputs data, and provide as outputs the possible pulmonary diseases with accuracy 90%. The third layer of structure, which has not yet been designed and implemented, may suggest possible medical treatments and medicines, according to the result of the previous layers.

H.5.1 Overall MES Design

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Basically the medical expert system (MES), given in Fig 14, is composed of FPGA, the RAM for intermediate store of artificial neural networks output, and the memory that contains the weights. The input MUX is used to select inputs for the FPGA module either from previous results or from the user and the configurations RAM that holds the configuration bit stream for the FPGA. The weight and configuration RAM's are loaded externally which allows the easy update of the system.
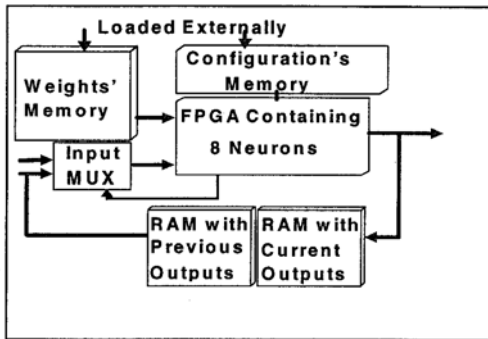
Fig 14

This system is very much of use in the detection of pulmonary diseases like Physical exams, cough, fever, chest pain, haemoptysis, dyspenia, wheezing, sputum, and other historical data etc.

H.6 Bio Chips: A Medical Revolution

The development of Bio chips to sequence unknown genes and to study gene expression is great idea. But the working principle suggests that they can be used for engineering applications that require parallel processing. DNA chips are proposed here as the physical substrate to store and evaluate a set of rules for knowledge based systems.
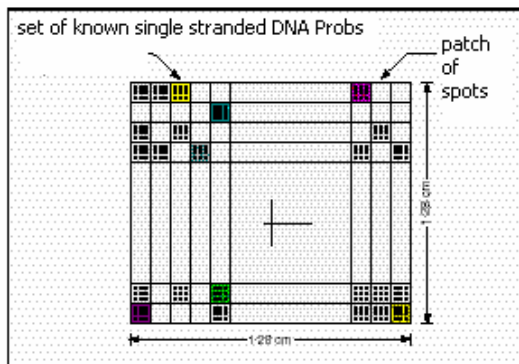
(Fig 15)

H.6.1 Bio Chips: Design Steps
Following are the steps involved in designing Bio chips

1. In DNA chips, each cell uses millions of copies of DNA sequence called probes. The colors indicate that probes are different between cells
2. DNA sequence tagged with the quantum dots. Small dot is the quantum dot.
3. Complementary probes and target bind to fluorescent DNA helix. In practice, there are millions of probes per cells, so millions of targets are required to produce Fluorescent cell after hybridization
4. Plant states are sampled and A/DNA Converter produces millions of two tagged DNA sequences. Small dot is quantum dot used to identify helix
5. DNA chip is injected with millions of tagged DNA strands. After scanning the chip and processing the rules o/p is produced
6. DNA chip can be used to detect faults in the plant. State variables are sampled, converted into DNA target and injected into chip. The green cells are fluorescent probes after being excited with UV light
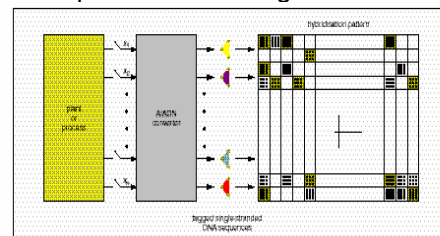
(Fig 16)

H.6.2 Look up tables as DNA Chips: Rule Based System for Plant Analysis

Basically, look up table is derived from the past experience and it can be used to improve the performance of the closed loop with an existing controller (fig 17).

The rules are stored on the chip and the evaluation of the complete rule base at each sampling instant is carried out in parallel using the hybridization of DNA strands
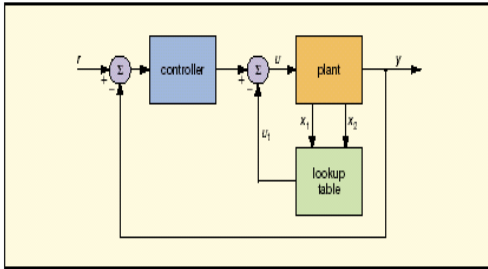
(Fig 17)

H.6.3: DNA Scanner for Human Diseases

Now efforts are being made to use DNA chips to test dreaded disease into human body. Few companies of USA and South Korea including Vidar Systems.Inc (www.vidar.com) and StarVRay co.,Ltd (www.starvray.com) have recently developed DNA scanner which will be very much of use in detecting dreaded diseases like Cancer, AIDS, TBs etc. As per design, chip will be fitted inside the DNA scanner module, which will exam DNA test of the individual and it will compare with all the test properties inside chip. Then automatically disease will be pointed out by this DNA scanner and can be shown on PC screen too. One of the good things in this product is that you can put at most 4 chips at a time.

H.7 Neuro Chips

Recently revolutionary Invention of Neuro Chip wondered the world: The beauty of this neuro chip is, if it is inserted into our nervous system, it will control Brain's nervous system and then according to the program one can control on his thinking ability too. This is the excellent product, will be used for many medical and other purposes. Can we say that designing dreams are also not impossible?

H.8 Control systems for Robotics Applications

Now a day, Robotics application has gained momentum in a very wide area of scope. Technically this requires applications of convergence of many technologies to perform multiple tasks at the same time. General controller has very little scope where as FPGA chips as controller has much more to play which can be re-used, and re-configured by multiple numbers of times. The reconfigurable architectural properties of FPGA has opened the door for much more things to be added for the controlling applications of robotics which offers highest efficiency, high

speed, high density, low cost and low power solution.

(Fig 18)

H.8.1 Glimpse of Dancing Robot:

Recently a small-sized humanoid robot, HanSaRam, Fig 18, made by Robot Intelligence Technology (RIT) Lab of Professor Kim, Jong-Hwan in Korea Advanced Institute of Science and Technology (KAIST) has made great contribution in the field of robotics in association with six Robonovas, made by Mini ROBOT Corp. They formed a heterogeneous robot team, RoboBees; which exhibited "robot dance", a new genre of robotics technology. Mr. Naveen Kuppuswamy, a MS Student from India in RIT Lab who was deeply involved with this project admits that, FPGA Technology has major role to play in the improvement in his Dancing Robot and for all other robotics applications.

I. Challenges before Chip Design Industry

Instead of many revolutionary design outputs given above, many issues which are left, has to be paid more attention and it have become challenge for the designers. These issues require close interaction and collaboration for trade-off and optimization by all design, device, and process fields. These are

- Design/device/process optimizations and trade-off for leakage current, power consumption, & noise issues in mixed-signals, large scale IC devices, or design re-use.

- Incorporation of new materials (i.e. dual gate, multi-material active layers, etc.) in IC cell library and design of advanced transistor structures (i.e. Double Gate FDSOI, FinFET, etc.).

- Implementation of IC design and manufacturing process of new device structures (i.e. PDSOI, FDSOI, MRAM, etc.).

- Reduction of process & plasma induced damage or reduction of device/process parameter fluctuation through the optimization of circuit design & layout, device structure, manufacturing process, and semiconductor processing.

J. Concluding Remarks:

As technology grows, many more problems usually come for the solution which helps industry to grow and finally customers get benefited as result of the practical implementation of those technologies and solution of those problems.

In the field of chip design and development, the rates of advancements are unpredictably fast.

Its very tough to conclude here because many unknown facts which I missed here, many known examples of recent trends which I could not mention, many technological changes which have already taken place in the fast changing world of Chip design which I don't aware of .

I can not conclude as it is an unfinished journey!

About The Author: The author is Technical Chip Architect working in the field of medical imaging and DNA scanner based chip design and development with Korean chip design company "StarVRay Co., Ltd (www.starvray.com) at Daejeon city of South Korea. The author is also the chairman of BiharBrains (www.biharbrains.org) and chief editor of Manthan.

Note: This article is based on the author's lecture in IEEE, PTC chapter, Pune, India in Dec 2003 on the topic "Chip design Trends and Fabrication Prospects in India". This article with few updates and modification has been divided into two parts, i.e (1) Emerging Chip design Trends and (2) Fabrication prospects In India.
*The Detailed information about Fabrication Prospects in India will be published in the next issue of the Manthan on the titled "**Indian Chip design Industry"**.*

Blue Ray Technology

Shashwat Shriparv, Trivendrum, India

What is Blu-ray?

Blu-ray, also known as Blu-ray Disc (BD) is the name of a next-generation optical disc format. The format was developed to enable recording, rewriting and playback of high-definition video (HD), as well as storing large amounts of data. The format offers more than five times the storage capacity of traditional DVDs and can hold up to 25GB on a single-layer disc and 50GB on a dual-layer disc.

A current, single-sided, standard DVD can hold **4.7 GB** (gigabytes) of information. That's about the size of an average two-hour, standard-definition movie with a few extra features. But a **high-definition movie**, which has a much clearer image takes up about **five times more bandwidth** and therefore requires a disc with about five times more storage. As TV sets and movie studios make the move to high definition, consumers are going to need playback systems with a lot **more storage capacity**.

- A **single-layer Blu-ray disc**, which is roughly the same size as a DVD, can hold up to **27 GB of data** -- that's **more than two**

hours of high-definition video or about **13 hours of standard video**.

- A **double-layer Blu-ray disc** can store up to **50 GB**, enough to hold about **4.5 hours of high-definition video** or **more than 20 hours of standard video**. And here are even plans in the works to develop a disc with twice that amount of storage.

Blu-ray discs not only have more storage capacity than traditional DVDs, but they also offer a new level of **interactivity**. Users will be able to **connect to the Internet** and instantly download subtitles and other interactive movie features.

Blu-ray Advantages

- Record high-definition television (HDTV) without any quality loss
- Instantly skip to any spot on the disc
- Record one program while watching another

  on the disc
- Create playlists
- Edit or reorder programs recorded on the disc
- Automatically search for an empty space on the disc to avoid recording over a program
- Access the Web to download subtitles and other extra features.

Parameters	Blu-ray	DVD	
Storage capacity	25GB	(single-layer)4.7GB	(single-layer)

	50GB (dual-layer)	8.5GB (dual-layer)
Laser wavelength	405nm (blue laser)	650nm (red laser)
Numerical aperture (NA)	0.85	0.60
Disc diameter	120mm	120mm
Disc thickness	1.2mm	1.2mm
Protection layer	0.1mm	0.6mm
Hard coating	Yes	No
Track pitch	0.32µm	0.74µm
Data transfer rate (data)	36.0Mbps (1x)	11.08Mbps (1x)
Data transfer rate (video/audio)	54.0Mbps (1.5x)	10.08Mbps (<1x)
Video resolution (max)	1920×1080 (1080p)	720×480/720×576 (480i/576i)
Video bit rate (max)	40.0Mbps	9.8Mbps
Video codecs	MPEG-2 MPEG-4 AVC SMPTE VC-1	MPEG-2 AVC -
Audio codecs	Linear PCM Dolby Digital Dolby Digital Plus Dolby TrueHD DTS Digital Surround DTS-HD	Linear PCM Dolby Digital DTS Digital Surround -
Interactivity	BD-J	DVD-Video

Discs store digitally encoded video and audio information in **pits** -- spiral grooves that run from the center of the disc to its edges. A **laser** reads the other side of these pits -- the bumps -- to play the movie or program that is stored on the DVD. The more data that is contained on a disc, the smaller and more closely packed the pits must be. The smaller the pits (and therefore the bumps), the more precise the reading laser must be.

Unlike current DVDs, which use a **red laser** to read and write data, Blu-ray uses a **blue laser** (which is where the format gets its name). A blue laser has a **shorter wavelength** (**405 nanometers**) than a red laser (650 nanometers). The smaller beam focuses more precisely, enabling it to read information recorded in pits that are only **0.15 microns** (µm) (1 micron = 10^{-6} meters) long -- this is more than twice as small as the pits on a DVD. Plus, Blu-ray has reduced the **track pitch** from 0.74 microns to **0.32 microns**. The smaller pits, smaller beam and shorter track pitch together enable a single-layer Blu-ray disc to hold more than 25 GB of information -- about five times the amount of information that can be stored on a DVD.

Each Blu-ray disc is about the same thickness (**1.2 millimeters**) as a DVD. But the two types of discs store data differently. In a DVD, the data is sandwiched between two polycarbonate layers, each 0.6-mm thick. Having a polycarbonate layer on top of the data can cause a problem called **birefringence**,

DVD Vs. Blu-Ray Construction
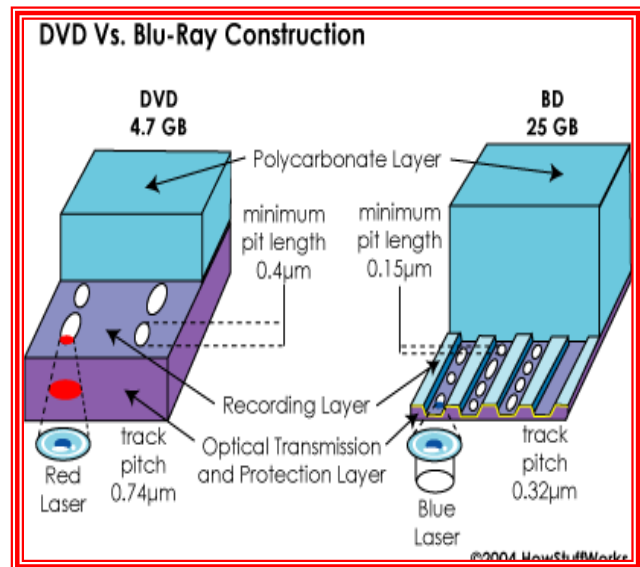
in which the substrate layer refracts the laser light into two separate beams. If the beam is split too widely, the disc cannot be read. Also, if the DVD surface is not exactly flat, and is therefore not exactly perpendicular to the beam, it can lead to a problem known as **disc tilt**, in which the laser beam is distorted. All of these issues lead to a very involved manufacturing process.

The Blu-ray disc overcomes DVD-reading issues by placing the data **on top of a 1.1-mm-thick polycarbonate layer**. Having the data on top prevents birefringence and therefore prevents readability problems. And, with the recording layer

sitting **closer to the objective lens** of the reading mechanism, the problem of disc tilt is virtually eliminated. Because the data is closer to the surface, a hard coating is placed on the outside of the disc to protect it from scratches and fingerprints.

The design of the Blu-ray discs saves on manufacturing costs. Traditional DVDs are built by injection molding the two 0.6-mm discs between which the recording layer is sandwiched. The process must be done very carefully to prevent birefringence.

1. The two discs are molded.
2. The recording layer is added to one of the discs.
3. The two discs are glued together.

Blu-ray discs only do the injection-molding process on a single 1.1-mm disc, which reduces cost. That savings balances out the cost of adding the protective layer, so the end price is **no more than the price of a regular DVD**.

Blu-ray has a **higher data transfer rate -- 36 Mbps** (megabits per second) -- than today's DVDs, which transfer at 10 Mbps. A Blu-ray disc can record 25 GB of material in just over an hour and a half.

Formats

Unlike DVDs and CDs, which started with read-only formats and only later added recordable and re-writable formats, Blu-ray is initially designed in several different formats:

- **BD-ROM** (read-only) - for pre-recorded content

- **BD-R** (recordable) - for PC data storage
- **BD-RW** (rewritable) - for PC data storage
- **BD-RE** (rewritable) - for HDTV recording

The advantage to HD-DVD is that it uses the same basic format as the traditional DVD and can therefore be **manufactured with the same equipment**, saving on costs. The disadvantage is that it **can't match the storage capacity of Blu-ray**. A rewritable, single-layer HD-DVD can hold 15 GB of data; a double-layer disc can hold 30 GB (that's compared to 27 GB and 50 GB for Blu-ray). The read-only versions hold slightly less data. Also, HD-DVD **doesn't offer the interactive capabilities** of Blu-ray, although it will probably be less expensive

than its competitor.

It seems that the future holds a whole lot more than 25 to 54 GB on a single disc. According to T3: Pioneer goes beyond Blu-Ray, **Pioneer** is developing an optical disc that will blow away the hard disc in most of our PCs in terms storage capacity, holding **500 GB** of data. How so? Pioneer's lasers are **ultraviolet**, which have an even shorter wavelength than the blue.

There are also **professional versions** of the blue laser technology. Sony has developed **XDCAM** and **ProData** (Professional Disc for Data). The former is designed for use by broadcasters and AV studios. The latter is primarily for commercial data storage (for example, backing up servers).

When Will Blu-ray Become Available?

Blu-ray recorders have been available in Japan for some time, where more consumers have access to HDTV than in the United States. Outside of Japan, however, it has been a bit of a waiting game. Until

June 2006, the format had been available in the United States only for home recording, professional recording and data storage. In a press release dated June 15, 2006, Samsung Electronics America, Inc. announced the shipment of the industry's first Blu-ray disc player to retailers in the U.S. market. The Blu-ray disc players will be available for purchase on June 25th. (Sony's Blu-ray compatible VAIO VGN-AR190G PC is also geared to hit the streets.) And, just so you won't be without something to play in your new machine, Sony Pictures Home Entertainment is making some of its titles available in the high-definition format, including popular titles "50 First Dates," "The Fifth Element," "Hitch" and "House of Flying Daggers."

Blue Ray Players

Just as with most new technologies, Blu-ray equipment will be pricey at first. In 2003, Sony released its first Blu-ray recorder in Japan with a price tag of around $3,000. The Samsung player hitting the U.S. market in June, the BD-P1000, has an MAP of $999.99. Of course, prices are expected to drop as the format gains popularity.

Even when the new video standard begins to replace current technologies, consumers won't have to throw away their DVDs, but they will need to invest in a new player. The industry is planning to market **backward-compatible** drives with both blue and red lasers, which will be able to play traditional DVDs and CDs as well as Blu-ray discs. In fact, here's what Samsung had to say about the BD-P1000:

The Samsung BD-P1000 plays Blu-ray software titles at the highest resolution available via a native 1080p HDMI output for films digitally mastered in 1920 x 1080p. The BD-P1000 also up-converts conventional DVDs to 1080p through the HDMI digital interface so the picture quality of any traditional DVD will look noticeably more detailed when used with the disc player. The BD-P1000 is backwards compatible and plays both standard DVDs and CDs in addition to supporting all DVD formats including, DVD-RAM, DVD-RW, DVD-R, DVD+RW, and DVD+R.

Information collected: From Net and magazines.

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Ubiquitous Robotics: An Overview

Naveen Suresh Kuppuswamy, Daejeon, South Korea

Imagine a future. Your day begins with a pet robot playing an intelligent alarm system consisting of your favorite piece of music. As you get dressed, it comes up with today's newspaper and the schedule for today. During the day you can keep tab on the security of the home, monitoring the security robot, through your mobile phone/personal digital assistant. While you are away, cleaning robots unobtrusively go about cleaning your home. Fresh orders for food items are automatically made over the internet to the local supermarket based on your desired food schedule. As you return, your assistive robot then aids you for a wide variety of tasks including cooking. You then later go to bed, relaxed with the knowledge that these electromechanical servants shall ceaselessly work towards enhancing your quality of life.

No, this intriguing vision is not from a Speilberg movie, and is far closer than you think. The key technology realizing these dreams is the radical new field of Ubiquitous Technology. Ubiquitous technology is poised to radically change our lives. In this coming era, it is not difficult to envision highly advanced robot systems, providing us with a variety of services, at any place, by any device, and whenever needed. Ubiquitous robotic systems are emerging and hold great promise for offering integrated services. These systems negate the necessity for the conventional notion of a stand-alone robot platform. They incorporate three forms of robots, i.e. the software robot (Sobot), embedded robot (Embot) and mobile robot (Mobot). This tripartite decomposition is the key to harnessing this new paradigm. This can be conceptualized as a networked cooperative robot system. The core intelligence of this system is constituted by software robots. Distributed Embot embedded robot sensors ensure that the Sobots possess context aware perceptive capabilities. Lastly, the mobile Mobots act upon the service requests in the physical domain. Networking technology such as the IPv6 format and Broadband wireless systems shall constitute the key leveraging these advancements.

Ubiquitous robots will thus be able to understand what the user needs, even without the issuance of a direct command, and be able to supply continuous and seamless service. Key to its efficacy is that each component subsystem has a uniquely defined role. The Sobot, can be visualized as a 3D virtual pet, can connect to and be transmitted to any device, at any time and, at any place within the u-space, by maintaining its own unique IP address. It is context aware and can automatically and calmly provide services to the user. Embots collect and synthesize sensory information through the detection, recognition and authentication of users and other robots. Mobots proceed to act by providing the general users with integrated services. Middleware enables the Ubibot to interact and manage data communication reliably without disrupting the protocols in the u-space.

A number of research teams world over, including the robotics group at KAIST, Republic of Korea are working to take the lead in this rapidly emerging field. The consumer robotics industry itself though, is still in its infancy, but its potential is vast. It is but a matter of time before ubiquitous robotics delivers the killer app, just as the computer industry did so few decades earlier. The popular mythological tales, the Arabian Nights, spoke of a mythical creature, the *Genie*, emerging from within a magical lamp, which would satisfy all of our desires. Future systems, such as those based on the Ubibot, may very well realize this ancient dream through its immense capabilities of context-aware, calm, networked service available, at anytime, anyplace and whenever desired. Without a doubt, this technology is poised to completely transform our lives, permanently for the better in the years to come.

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Fluorescence Microscopy

Dr. Mohammad Abul Farah, Seoul, South Korea

British scientist Sir George Gabriel Stokes first described the phenomenon of fluorescence in 1852. He coined the term when he observed that the mineral fluorspar emitted red light when it was illuminated by ultraviolet excitation. He found that fluorescence emission always occurred at a longer wavelength than that of the excitation light. Early investigations in the 19th century showed that many specimens (including minerals, crystals, resins, crude drugs, butter, chlorophyll, vitamins, and inorganic compounds) fluoresce when irradiated with ultraviolet light. However, it was not until the 1930s that the use of fluorochromes was initiated in biological investigations to stain tissue components, bacteria, and other pathogens.

What is fluorescence?

Fluorescence is the property of some atoms and molecules to absorb light at a particular length and to subsequently emit light of longer wavelength. In other words, if you shine light on some molecules, you may see light of a different color emitted from that molecule. This is known as fluorescence. The molecule absorbs high energy light (blue, for example). This increases the energy of the molecule, represented as the top grey line in the Figure 1 (an "excited" molecule). Some of the energy from the blue photon is lost internally (represented by the red squiggly arrow in the figure 1). The molecule then emits a photon with less energy, green in this example. Fluorescein is a common dye that acts in exactly this way, emitting green light when hit with blue excitation light. The color of light emitted is material dependent, and likewise the excitation light wavelength depends on the material. (There are other forms of inelastic scattering; fluorescence is particularly strong.)

The advantage of fluorescence for microscopy is that you can often attach fluorescent dye molecules to specific parts of your sample, so that only those parts are the ones seen in the microscope. You can also use more than one type of dye. By changing the excitation light, you can cause one type of dye to fluoresce, and then another, to distinguish two different parts of your sample.

How does a fluorescence microscope works?

In the figure 2 below, it is supposed that the excitation light needs to be violet, and the emitted light is red. The microscope uses a special dichroic mirror (or more properly, a "dichromatic mirror"). This mirror reflects light shorter than a certain wavelength, and passes light longer than that wavelength. Thus your eye only sees the emitted red light from the fluorescent dye, rather than seeing scattered purple light. The purple and red bars next to the dichroic mirror represent additional filters to help prevent the different wavelengths of light from going the wrong directions.

This particular style of fluorescence microscopy is known as epi-fluorescence, and uses the microscope objective to illuminate the sample (rather than illuminating the sample from the other side, which would be trans-fluorescence).

Figure 1. Principles of fluorescence
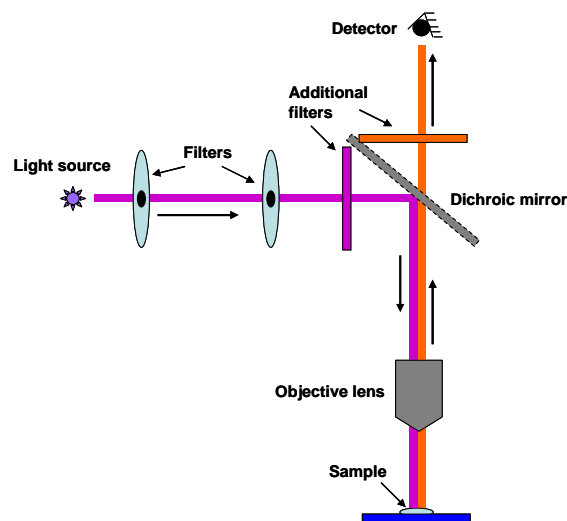
Figure 2. Working principle of fluorescence microscope
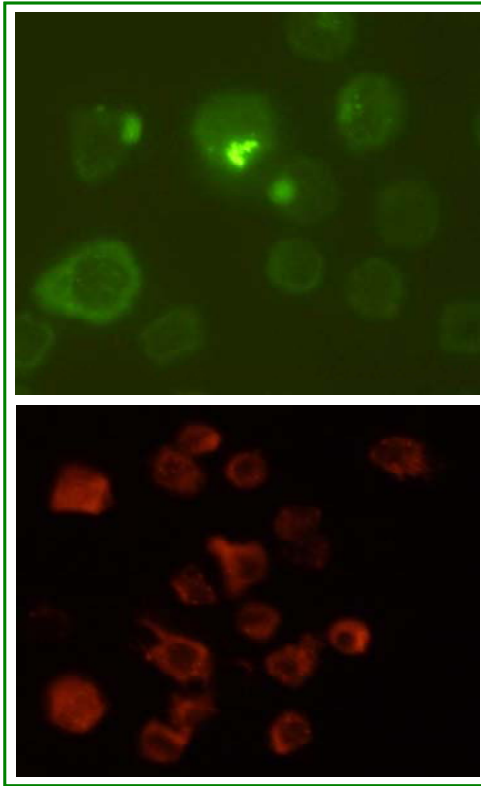
Figure 3. An example of fluorescence technique showing the receptor-ligand binding. Fluorescein (green) and rhodamine (red) labeled insulin was applied to the cultured cells which expresses insulin receptor on its surface. After certain incubation period and subsequent processing, cells were observed in fluorescent microscope. The rounded staining pattern shows fluorescein (green) and rhodamine (red) labeled insulin is bound to the insulin receptor on the cell membrane. (Images are captured in Olympus Fluorescence Inverted Microscope, magnification-600)

Principles of Excitation and Emission

The basic function of a fluorescence microscope is to irradiate the specimen with a desired and specific band of wavelengths, and then to separate the much weaker emitted fluorescence from the excitation light. The difference between the exciting and emitting wavelengths, known as Stokes shift is the critical property that makes fluorescence so powerful. By completely filtering out the exciting light without blocking the emitted fluorescence it is possible to see only the objects that are fluorescent. In a properly configured microscope, only the emission light should reach the eye or detector so that the resulting fluorescent structures are superimposed with high contrast against a very dark (or black) background. The limits of detection are generally governed by the darkness of the background, and the excitation light is typically several hundred thousand to a million times brighter than the emitted fluorescence.

Fluorescence Detection

There are four essential elements of fluorescence detection systems:
1) an excitation source, 2) a fluorophore, 3) wavelength filters to isolate emission photons from excitation photons and 4) a detector that registers emission photons and produces a recordable output, usually as an electrical signal or a photographic image. Regardless of the application, compatibility of these four elements is essential for optimizing fluorescence detection.

Fluorescence instruments are primarily of four types, each providing distinctly different information:

Spectrofluorometers and microplate readers measure the average properties of bulk (µL to mL) samples.

Fluorescence microscopes resolve fluorescence as a function of spatial coordinates in two or three dimensions for microscopic objects (less than ~0.1 mm diameter).

Fluorescence scanners, including microarray readers, resolve fluorescence as a function of spatial coordinates in two dimensions for macroscopic objects such as electrophoresis gels, blots and chromatograms.

Flow cytometers measure fluorescence per cell in a flowing stream, allowing subpopulations within a large sample to be identified and quantitated.

Other types of instrumentation that use fluorescence detection include capillary electrophoresis apparatus, DNA sequencers and microfluidic devices. Each type of instrument produces different measurement artifacts and makes different demands on the fluorescent probe. For example, although photobleaching is often a significant problem in fluorescence microscopy, it is not a major impediment in flow cytometry or DNA sequencers because the dwell time of individual cells or DNA molecules in the excitation beam is short.

Fluorescence microscopy has become an ideal microscopy technique for the examination of all biological specimens, fixed or alive, because it allows the selective and specific detection of molecules at small concentrations to good signal to background ratio. The modern fluorescence microscope combines the power of high performance optical components with computerized control of the instrument and digital image acquisition to achieve a level of sophistication that far exceeds that of simple observation by the human eye. Microscopy now depends heavily on electronic imaging to rapidly acquire information at low light levels or at visually undetectable wavelengths.

In this post genomic era, the information of complete genome sequences and the identification and systematic cloning of human cDNAs are providing us with the challenging opportunity to analyze the complexity of biological processes on a large scale, with the goal of reaching a more complete description of their molecular regulation. For this purpose, many high-throughput techniques have been developed and successfully applied to diverse biological questions. However, despite their great usefulness, those techniques cannot provide adequate temporal or spatial resolution and, most importantly, they do not directly show whether the identified molecules have a functional role in the cellular process that is under investigation.

Fluorescence-based imaging assays in intact living cells overcome these limitations because they can probe the function of macromolecules in their natural environment with exquisite and ever increasing spatial and temporal resolution.

The description of new imaging modalities such as confocal and two photon microscopy, the creation of new fluorescent molecules and the discovery and exploitation of fluorescent proteins have triggered revolution in fluorescent microscopy techniques. Understanding excitation of and emission by fluorophores, principle of fluorescence microscopes and ways of optimization of fluorescence process are now prerequisite for taking advantages of many of these developments.

About the Author: Mohammad Abul Farah attended Aligarh Muslim University in India where he received his M.Sc. and Ph.D. in Zoology with specialization in Genetics. He also served as Senior Research Fellow of Council of Scientific and Industrial Research, India. At present, he is working as a Research Scientist in Proteonik Inc., a biotechnology venture company based in Seoul, South Korea, on Diabetes research focusing on insulin signaling pathway. He can be reached at: farahkorea@yahoo.com

Development of Bihar: A Case Study From Civil Engineering Perspective

Anurag, Sumit, Shailesh, Patna, India

INTRODUCTION

Bihar, the heritage state of India today stands at the cross roads, crippled by several disabilities. Although bestowed with natural resources and human resources, brass the stigma of sixth most underdeveloped region of the world (HDI Report). The dream of developed India by A.D. 2020 will never be realized without the development of Bihar.

Bihar poses several unique and challenging problems, which needs Civil Engineering solution and guidance.

So, here we present before you those constraints impairing the development of Bihar which needs Civil Engineering perspective and as a special report, we would like to present before you proposals for the development and urbanization of Patna.

CONSTRAINTS AND PROPOSED CURES

1. **The physical Infrastructure**: The infrastructural poverty of Bihar is the most severe constraints and cures are as follows under different headings.

   (a) The Housing Infrastructure:
   There is a complete haphazard growth in the housing and settlement patterns in today's Bihar. The numbers of multistories are multiplying each day with simultaneous proliferation of slums, thanks to the growing population.
   Intensive town planning is of course needed. But much needed is the urbanization of regions such as Bethiah, Kaimur, Nawada, Rohtas, and Jehanabad etc. Growth of these districts as an urban center and a satellite town to Patna is most needed.

   (b) The Transportation Network:
   Transportation Network in the state is outdated and inadequate; this has lead to over crowded traffic, congestion and jam.

Infact the road density per lakh of population is lowest in Bihar viz. 90.1 km, compared to national average of 256.7 km.

Not only this fact but also the road construction annual growth rate to national growth rate of 3.5 %

As transformational system is the central nervous system of the development, apart from improving the existing roads, we propose the introduction of Mass Rapid Transport System. Such as the introduction of Trams, Metro rail in the state of these will not only ease the purpose but will also lead to rapid urbanization of Bihar. As for example, by the introduction of Metro Rail between Patna and Gaya, the distance will be covered only in 1 hour compared to 4-6 hours by normal train. And we need not to assert how much this will boost the Bihar's tourism sector. Bihar's bridges are also in need of rapid maintenance; even Gandhi setu is in dilapidated condition. Construction of new bridges in the area of Sitamarhi, Darbhanga, Seohar, Muzaffarpur is immediately required.

(c) Water resources and flood management
Bihar receives a good rainfall (mean annual rainfall: 1230 mm, source: Bihar state irrigation commission) and is also blessed by several rivers but still a great disparity exists in northern and southern Bihar in availability of water. North Bihar available water is 63.4% of total water resources whereas in South Bihar it is only 10.89% (source: Bihar state irrigation commission). So ironically North Bihar is flood prone and South Bihar is drought prone.

Now of course for flood management the ultimate solution is providing a series of dam/reservoirs with multi functional nature i.e. they should be designed to augment lean period discharge in rivers and also for the production of hydro electricity.

For areas neighboring Nepal, anti flood embankment may prove effective solution.

Bihar till date is ignorant of water harvesting techniques. Here both in-situ and ex-situ water-harvesting techniques need to be implemented.

(d)   Water logging area management

The "chaurs" (sauces like depression) and the "mauns" (deep horse shoe type depression) are scattered through out Bihar, for eg. The Kawar jheel maun in Begusarai district etc.

The areas are most neglected by government body indeed they are used for crops, but for one season only for remaining year is water logged and inaccessible.

Here proper site investigation, survey is needed to design out proper drainage system

(e)   Environment and sanitation:

Bihar's drainage system is old and worn out and it needs rapid re designing and re-construction. Construction of water treatment plant is imperative as drinking water of some districts such as Nawada showed the presence of poisonous Arsenic.

Bihar's forest and environment has are also on a downfall as there is no plan to save water, land and air.

Obviously for checking water quality, establishment of treatment plants is required.

Similarly for checking air pollution plantation should be encouraged, parks should be developed in entire state.

Re-induction of Sulabh international in State is highly recommended and infact much needed for the betterment of sanitation.

DEVELOPMENT OF PATNA: A SPECIAL CASE STUDY FROM CIVIL ENGINEERING PERSPECTIVE

Patna, the capital of Bihar is the next important city in eastern India, after Kolkata. It is blessed by good water resources, human resources and has all potentials to develop into a great urban center of the nation.

My group and I extensively studied Patna and our proposals are as follows:

(1)   To meet the constraint of space and to counter the growing populations, under utility properties are needed to be recognized and better to transform them into blocks of flats to provide more dwelling units.

As example: the Khas mahal area surrounding the museum at Buddha marg, this is owned by government, with its present dwelling pattern it is almost useless. This area as it lies in the heart of Patna, and can be developed into a great residential and commercial center.

(2)   Introduction of **MASS RAPID TRANSIT SYSTEM** is imminent and needs to be introduced as soon as possible.

(3)   Drainage and sewerage system of Patna is age old and is faulty and requires immediate revision and reconstruction.

More dedication is required from the service personnel of the municipal body.

Or some alternative arrangement in the form of involvement of N.G.O.s and private agencies may be sought.

What's most important is the re-induction of "Sulabh International" in the city is needed to update the city's sanitation.

(4)   To reduce the pressure on Patna, we need to develop Danapur, Khagaul, Bihta, Patna city on an urban scale

So that they may serve as satellite cities to Patna.

(5)   Beautification of city in the form of developing parks, gardens has never been done. We found out several government land pieces, supposed to be used for the above purpose are waiting to be developed as parks.

For example the sanjay ghandhi park in Kidwaipuri, the piece of land in Sri Krishna nagar (road no.8), in BSEB colony, in Kankerbagh, in patel nagar and so on, there are numerous examples.

Work has never been done in this area, but the development of the parks and garden will not only give the city aesthetic look but will also counter pollution.

CONCLUSION

There is no reason that Bihar cannot develop or urbanized. All needed is proper planning and will of the people of the state.

We outlined features needing civil engineering perspective and proposed possible cures. Further feasibility studies may be carried out and our proposals or alternative may be implemented.

About the Authors: Mr. Anurag, Sumit and Shailesh are fourth year B. E. civil engineering students at NIT, Patna, India.

By Ranjeet Kumar (New Delhi) & Bibhuti Bikramaditya (South Korea)

1. Abstract

Patna, the ancient Patliputra witnessed large gatherings of Non Residents Indians and Non Resident people of Bihar who came here all the way to attend First global Meet for the resurgent Bihar at Hotel Maurya, Patna on Jan 19-21, 2007 and discussed on the development perspectives of the state which has gone at nadir in almost all the fields in a modern India. This meet was of very importance as the development of Bihar has become sole issue of the central govt as well as the state govt. Many a times the reports of world bodies, statistical analyst also showed very pathetic situation of this sorry state of India.

To initiate the process of development, the new govt in Bihar has taken several steps to improve infrastructure, education and overall brand image of Bihar in national and international fora. Organising Global Meet at Patna was one of the major steps in this direction.
The credit goes to The Institute for Human Development (www.ihindia.org) and Bihar Times (www.bihartimes.com) who made this event successful in collaboration with Govt of Bihar, Asian Development Research Institute (ADRI, Patna), A.N. Sinha Institute of Social science & studies, Patna along with many Overseas Coordinators and Participation associates.
This Article presents exclusive report on Global Bihar Meet, 2007.

2. Global Meet Need and Objectives

In 1952 Dr. Paul H. Appleby, a US scholar presented a document on Indian States to the Prime Minister Jawaharlal Nehru which suggested that Bihar was the best administrated state in the country at that time. He used various criteria and interviews with hundreds of specialists across the country for his study. After independence, the situation became deteriorating because of ill will of politicians and their non performance for the development of the Bihar. In over 50 years of independence, the state has got all bad names in his basket in the name of hooliganism, arsons, Violence and center of bad politics and politicians etc.

With a land mass larger than France and population more than five times that of Australia, Bihar somewhere lost its glorious past and admirable socio-cultural ambience which was once the paradise for the intellect, and center for learning religious values& cultural ethics , until someone, a year ago, dared to see the whole picture by stepping out of the frame. The new government in Bihar took great initiatives to bring state economy on track, give prosperity to the people of state that was warmly welcomed by all section of the society by giving all heartiest support to the govt. Because of these initiatives by the new govt, eyes of the every Indian, particularly People of this state living in different parts of India and abroad got rays of hope. They started giving his opinions and experiences to flourish the state to bring it to national strata.

To share the experiences, examine the exclamations, explore the new ground and search the Cartesian light Global Meet was called at Patna between 19-21 January' 2007 by Bihar Times & Institute for Human Development, New Delhi.

The overall objective of the Meet was to bring together on one platform, leaders of industry and trade, policy makers, scholars, development practitioners, and social activists to explore opportunities and partnerships for playing effective roles towards the development of Bihar. The Meet had enabled individuals and organisations, concerned with development, to appreciate the situation and forge partnerships for undertaking various initiatives for the development of the state.

3. The Event

The event was organized for three days from Jan 19-21, 2007 at Hotel Maurya, Patna.

The Hon'ble Chief Minister of Bihar: (Sri Nitish Kumar was the Chief Patron and (Hon'ble) Deputy Chief Minister, Sri Sushil Kumar Modi was Chairman of Steering Committee. The function was inaugurated by Hon'ble President, Dr. A.P.J. Abdul Kalam at S. K. Memorial Hall on January 19, 2007.

More than 500 persons including 70-80 NRIs from various parts of the world were Participated in the Meet .The prominent among those who participated are Former RBI Governor and Chairman of PM's Economic Advisory Council, C. Rangarajan, Lord Meghnath Desai, Professor of London School of Economics, Famous economist Sri Abhijit Sen., Sri Y. C. Alagh of National Planning Commission, Noted Film maker Sri Prakash Jha, and famous industrialist Prabhu Goel, Chairman of Indian Tobacco Company, ITC Sri Y. C. Deveshwar, Prof Jean Derez, of Delhi School of Economics, Dr. Gerry Rodgers, Director ILO (Internal labor organization, Geneva), and Prof Ravi Srivastava of National commission of Enterprises for unorganized sector etc. The technical sessions was also attended by representatives from the World Bank, Asian Development Bank, UNICEF and Bihar Industries Association.

4. Inaugural Function & the Musings of Hon'ble President of India

(Fig 1: Dr. Kalam Hon'ble President of India inaugurating the event. Hon'ble DY CM Hon'ble Governor, Hon'ble Chief Minister in the inaugural function)

The last moment acceptance of arrival of Hon'ble President of India, Dr. Kalam was the major break through of this event and gave boost to the organizers as well as made attention to the national media. Dr. Kalam has always shown soft corners for Bihar in the past and has given his road map for the development strategies for Bihar. He readily accepts that development of Bihar is synonymous to the development of India.

(Fig 2: Front view of Historic S.K memorial Hall for Inaugural Function)

(*Fig 3: Inner view of Inaugural Function: Huge gathering at S.K Memorial Hall, Patna*

Following are some of the excerpts from his typical style of inauguration in a high tech way by giving power point presentation on his mission to the progress of Bihar and 10 points formula to develop the state.

4.1 Agriculture and Agro Food processing

While inaugurating, he stressed the need for Increasing the agriculture production, activating the sugar industries, dairy development, food processing and horticulture etc. This will lead to empowerment and enrichment of 27 million farmers which involves production of 57 million tones of food grains, fruits and vegetables by the State. Also it will lead to a business of Rs. 100,000 crores for processed

food items in a decade. He clearly indicated Mission for Agro food industry, Mission for sugar Industry, Mission for Horticulture and Mission for PURA (Providing Urban Amenities in Rural Areas) will sharp boost to the economy of the state. The below given chart clarifies all the points for the same.

4.1.1   Mission: Agro Food Processing
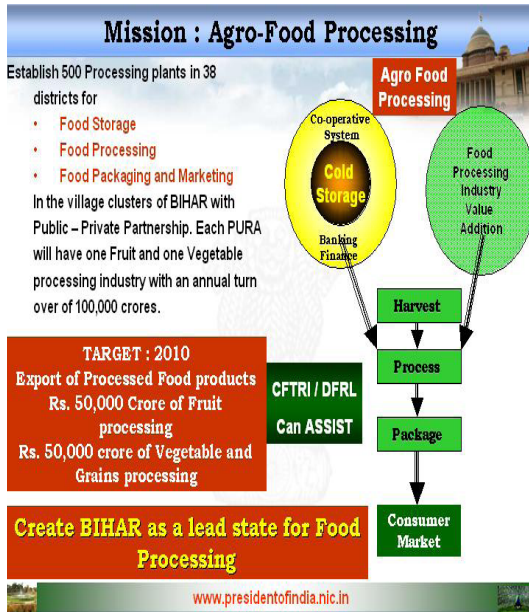
4,1,2 Mission: Sugar Industry
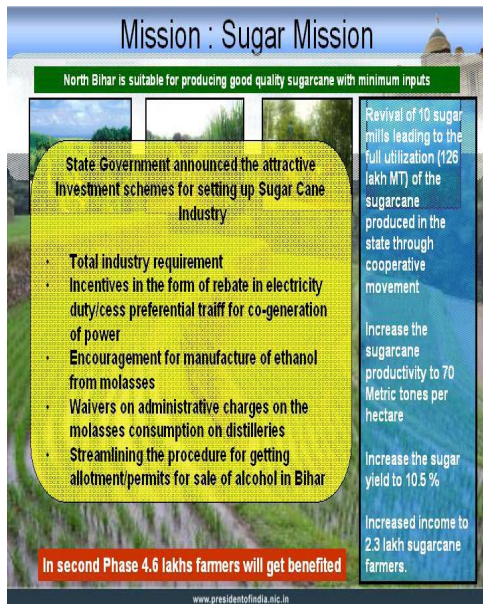
4.1.3 Mission: Agro: Horticulture

4.1.4 Mission: PURA (Providing Urban Amenities in Rural Area)

All the above mentioned Mission of Bihar will pave the path for good financial boost as well as generate millions of employment in the state.

4.2. **Education and entrepreneurship:**   Dr. Kalam suggested Bihar to improve its literacy rate and achieve it by 75% literacy by 2010 and 100% by 2015.   He also stressed the need for integrated education and entrepreneurship from the secondary to higher education segment.

He advocated that *Bihar should also aim at IIT and Indian Institute of Science*

Education and Research (IISER).

4.3 Global Human resource cadre: He said that youth is strength of the Bihar. He advised govt to prepare 2 million youth for high value employment in IT, ITES and BPO sector and allied sector before 2010.

4.4. Renaissance - Nalanda International University: He strongly recommended re-establishing Nalanda International University with international partnership with an outlay of Rs. 500 crores ($100 million).

The focus of the university is the evolution of world of peace and prosperity, devoid of crime, terrorism and war. It should be a place for meeting of minds from the national and international arena to do research on unity of minds linking human welfare, science, technologies, economics and spirituality with reference to ancient and modern thinking.

4.5. Healthcare Mission: In Health care too, Bihar has to progress a lot. According to him, it can be done through mobile clinics; tele-medicine, corporate hospitals and health benefit schemes that are essentially needed.

4.6. Flood and Water management: He suggested there is a need of water management in Bihar by creation of waterways in southern Bihar to manage the flood will increase irrigated land for about 5 million hectares and generate over 1000 MW of Hydel power and thereby it will provide employment for 9 Million people.

4.7. Infrastructure Development (PURA): He stressed the need to focus on Rural Roads condition and convert 35,500 km length of rural roads to all weather roads and improve the maintenance of national and state highways to international standards. This is essential for all the missions discussed. Creation of 500 PURAs for the rural economic prosperity with at least two agro, food and fruit processing rural enterprises in each PURA. One nuclear Power Plant of 1000 MW capacity is suggested, apart from the large scale use of solar power and modernization of thermal power stations and creation of super critical thermal station of 1980 MW capacity.

4.8. Tourist destination of the world: Bihar can be the best destination of tourism and it has potential to Increase international tourist arrival of 1 lakh to 1 million and domestic tourist of 7 million to 30 million. It may generate minimum of 4 million jobs with reference to international tourist arrival alone. It will lead to US $10 million additional revenue to the state. Road, communication and proper hotel accommodation will be a necessary condition for enabling such a tourist growth.

4.9. Exclusive economic zones: Creation of 10 exclusive economic zones will give a mission to industries such as leather, silk, sports goods, sugar and IT, ITES and BPO and special tourist products. It can provide large scale employment for each region and it should aim at a turn over of at least Rs. 5,000

crores per year based on our experience in the country.

Mission : BIHAR Exclusive Economic Zone

Focus: Employment Generation and Generate Wealth

www.presidentofindia.nic.in
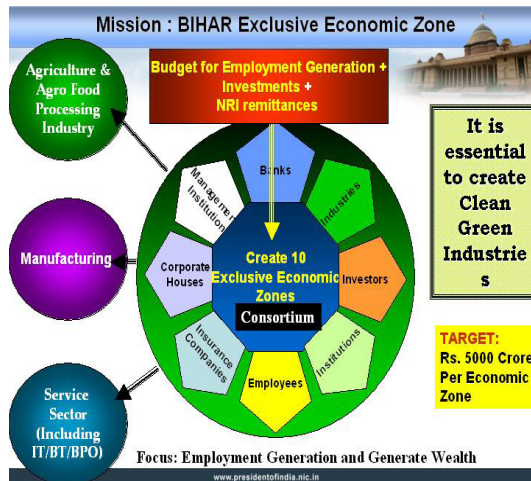
4.10. **E-Governance for Bihar:** For carrying out all the 9 missions the most important driving force is implementation of e-governance coupled with administrative reforms and mission mode management is the necessary requirement. This will accelerate the process of socio economic development.

5. Ten Point Formula for Prosperity through smart Governance

The hon'ble President of India presented his 10 points formula for the development of the state. Those are:

1. Fiscal correction, enhancing the revenue, controlling the expenditure and restructuring the debt and borrowings.
2. Restructure the Public sector corporations, undertakings and turn the focus towards providing quality of services to people at the same time made competitive.
3. Creating the export led economy in the state.
4. Reviving the Cooperative societies with new management structure, state-of-the-art technology value addition, export oriented market linkages, coupled with state-of-the-art training.
5. Reviving the Agriculture sector by diversification, efficiency in water management and alternate cropping, Agro-food processing and create a market chain.

6. Encourage cultivation of commercial crops with market advantage while ensuring food security with the stabilization of food grains cultivation and increase the food production.
7. Accelerating the growth momentum in Manufacturing and Services sector with attractive investment climate, single window clearance, creating special economic zones, deregulation, better monitoring instead of control
8. Delivering Quality of Service to the people through smart governance using G2G, G2C and G2B e-governance GRID across the state in Civil Administration, Police Administration, and Institutional Administration thus creating transparent administration.
9. Establishment of PURA to remove the Rural Urban Divide and improving the Rural Economy with? One PURA Cluster - One Product? as the focus.
10. Evolution of leadership for the mission mode operation from planning to execution to the performance.

6. Meetings and Discussions in the Meet

6.1 JAN 19: Lunch at CM House

Because of the visit of the Hon'ble President of India, Schedule of the global meet was shrinked from three days to two days. This time was very well used by Hon'ble Chief Minister. He invited all the Guest NRIs/NRBs at his residence for lunch where they got chance to interact with CM and DY CM of Bihar and try to know his vision for Bihar. Both were taking care of guest hospitality in a very good manner. All the guests were satisfied to this bonhomie.

In the evening at 6.45 PM, the inaugural function was held in a very tight security arrangement on the arrival of Hon'ble President of India, Dr. APJ Abul Kalam. His musings has been mentioned above.

6.2 Jan 20, 2007: The actual session started on Jan 20 and the major attraction was Sri Lord meghnad Desai, member of the House of Lords and noted economist, also the director of the Centre for the Study of Global Governance at London School of Economics. Speaking on "Development of Bihar in

globalizing world" he first thanked the chief minister, Nitish Kumar, for being in the audience and said "now when people say Bihar is passing through a phase of resurgence, a sense of optimism develops within him". In his speech at the conclave he observed that social equality beyond caste and creed was more important for a real turnaround of Bihar.

(Fig 4: Lord Meghnad Desai (left), London School of Economics with Prof V.S Vyas(right), Institute of Human Development, New delhi)

The Chairman of ITC (The Indian Tobacco Company) Sri YK Deveshwar announced the company's decision to invest Rs. 300 crore in various schemes, including primary education and health care in Munger district.

(Fig 5: Sri Y.C. Deveshwar, Chairman, ITC)

Dr. Rajay Narayan, NRI of UK and one of the overseas coordinators of the Global Bihar Meet showed power point presentation for improvement in health care units in Bihar. He has planned to invest in this sector in Bihar.

(Fig 6: Dr. Rajay Narayan, UK one of Overseas Coordinator, Global Bihar Meet)

(Fig7: Shri Prabhu Goel, Duet Corporation Inc, USA)

Prabhu Goel, Chairman of iPolicy Networks and founder of Duet Corporation, gave impressive speech for the industrialization of Bihar. The presence of Sri Goel who was also Division President and Director of Cadence Design Systems, Inc. and CEO/Chairman of Gateway Design Automation Corporation and also held management and technical positions at IBM and Wang Labs, may pave path for starting chip design center in Bihar. All other speakers spoke and discussed mainly on issues given below

6.2.1 Brand Image Building for Bihar: As Mentioned, this global meet was aimed for the building good image of Bihar. People discussed and decided to become brand ambassador of Bihar in the national and international fora which is needed for attracting investment in the state.

6.2.2. Sugar Industry: Discussions were held on the improvement of sugar industry and

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there was unanimous view that sugar industry of Bihar should be revived.

6.2.3 Tourism sector: Bihar can be the best tourist spot. They all discussed about improvement in this sector and measures to be followed and adopted by the Govt of Bihar. One Mr. Naveen Sharma showed presentation in which he compared Gaya with Jerusalem as both the places have religious importance for three religions : Judaism, Christianity and Islam for Jerusalem as much Buddhism, Hinduism and Jainism has for Gaya. The income levels of the religion holders were compared to arrive at the tourism potential of Gaya.

6.2.4 Entrepreneurship: Bihar lacks real entrepreneurship. People discussed on building entrepreneurship in people are a need of hour to create jobs and employment problems to fill in. One innovator Raghav Mahto who built a community radio centre at Raghopur in Bihar with virtually no capital and started earning a living for him while propagating socially useful messages on his community radio was the center of attraction.

6.3 Jan 21, 2007

6.3.1 Plenary session: In a plenary session chaired by the CM, he mentioned about the difficulties he faces to improve the situation of the state .He made a brief opinion of the various achievement of his government - innovative steps like involving well trained retired employees of the army and the CBI in dealing with law and order, highly improved conviction rate of the criminals and the fact that criminals do not enjoy the patronage of the political classes any more.

On the investment in Bihar, he said that the govt will ensure that the investment process in Bihar is made as smooth as it can be and we are also ready to implement suggestions made by you. Now is the time to start investing in the state and that would be the true measure for the success or failure of this conclave.

(Fig 8: Hon'ble Chief Minister Sri Nitish Kumar on Jan 21, 2007)

He declared that Bihar got Rs 27,000 crore of private investment since the new government has come into power. This is good sign for the others who want to take interest for the investment in the state. He also declared that now all information will be uploaded and updated on Bihar govt several website concerning those departments.

6.3.2 Panel discussion: In the panel discussion, many economist including C Rangarajan former Governor of Reserve Bank of India, Sri Abhijit Sen, a member of planning commission, World Bank Chief Economist (South Asia) and PM Economic Advisory Council Chairman Shanta Devarajan gave their opinion on the subject.

(Fig 9: C. Rangarajan, Former Governor, RBI)

Sri Rangarajan made a positive reference to the improved utilisation of funds by Bihar. Sri Abhijit Sen stressed the need for ameliorating primary education in Bihar.

Planning Commission member Prof. Abhijeet Sen, during his speech, said talent-wise Bihar was among the top 5 states in the nation. "Sadly, Bihar is also among the top few states when it comes to dropping out of the school," Sen said emphasizing the need for children to stay in school.

(Fig 10: Prof Abhijit Sen, Member Planning Commission)

Shri Uday shankar, CEO of Star News Network, India also made his points for the development of state.

(Fig 11: Shri Uday Shankar, CEO Star News on dias)

6.3.3 Valedictory session: In a valedictory session of the Global Bihar Meet Hon'ble DY CM of Bihar, Sri Sushil Kumar Modi who was deeply involved and instrumental for this meet thanked all delegates who came to attend the meet. He also announced that Bihar Foundation formed by the govt of Bihar will encourage investment in the state and all NRIs and NRBs will invest through Bihar Foundation. Bihar foundation will have many units in all over the world.

(*Fig 12: Hon'ble DY CM, Sri Sushil Kumar Modi on Jan 21, 2007*)

Sri Prakash jha, noted film maker and now entrepreneur stole the show. He talked about the challenges and opportunities in Bihar and stressed need to develop entrepreneurship within each one of us. His mission to build malls at places like Bettiah and Samastipur besides Patna and Jamshedpur are a business proposition, not as charity. Indeed Bihar does not need charity; it needs empathetic business oriented thinking. This session was chaired by Mr SP Sinha, the MD of Maurya hotel

(Fig 13: Noted film maker and entrepreneur Sri Sri Prakash Jha)

7 Role of coordinators & Participation Associates:

For the successful completion of any big event, collective effort matters. Organizing Global Meet in Bihar was very tedious task to be performed .Many people played important role and took it as challenge. In the

discussions, organizers had identified the role of overseas coordinators who may work for brand ambassadors for this meet in outside India. They appointed six key people as Overseas Coordinators for the meet were involved themselves in organizing conference meet and to decide about the strategies for the global meet. The name of those were Sri Ramesh Yadav, (California, USA), Sri Ravi Verma (California, USA), Dr. Rajay Narayan (Manchester UK),Sri Birendra Kumar (President, Bajana), Sri Bibhuti Bikramaditya, (Chairman ,BiharBrains Daejeon, S. Korea) and Sri Shakeel Ahmad Kakvi, (President Indian Association of Bihar and Jharkhand, IABJ DOHA –Qatar) . They held many rounds of conference Talks on conference where coordinators and many more representatives took part to give their opinion and contribution. In the conference they decided following thing to be advertised:

1: It is not an investment conference. The mission of the conf is to

1.1: Improve Bihar Image

1.2: Communicate Opportunities in Bihar

1.3: Convince participants to take the roll of Ambassador of Bihar

2: There are four Internal and two external constituents to this:

2.1: Local Businessmen and Entrepreneurs

2.2: Academician, Economists, Reformists and resident of Bihar

2.3: Non Resident Bihari's(NRBs)

2.4: Government of Bihar.

2.5: Government of India (External)

2.6: World Bank etc (External)

All coordinators and organizers through conference call decided on many other issues too even about functioning of Global Meet and work distribution.

Sri Ravi Verma (CEO, Telecommand software, California) and Sri Ramesh Yadav, California, USA took key role in calling conference meet and coordinating with all coordinators and organizers.

Sri Ravi Verma has his own company at California, USA who started one engineering college in Bihar at Katihar. He also started the unit of his company at Katihar which is itself one bold decision taken by him.

Sri Ramesh Yadav, California, USA who wants to develop chain of hotels in Buddhist circuit of Bihar. While giving interview to Telegraph, he showed his willingness to Invest Rs. 100-crore venture with Signet Hotels to open hotels in Patna, Rajgir and Bodh Gaya. He took key role in organizing meet. He is also part of the American Organisers for Development of Bihar, which has 200 non-resident Biharis as its members. It promotes hygiene, education and has held several eye camps in Bihar over the past 10 years.

Sri Dr. Rajay Narayan is from UK and going to invest in health care sector in Bihar and his role in coordinating with members were laudable.

Sri Bibhuti Bikramaditya, **Chairman BiharBrains** called press meet at Patna to request all industrialist from Bihar to attend the global meet which was very much publicized by local media. Hon'ble DY CM, Bihar Sri Sushil Kumar Modi also called him on telephone and both were discussed on making this event successful. Later BiharBrains sent four members Delegation to meet Hon'ble DY CM.

(Fig 14: Sri Bibhuti Bikramaditya, Chairman, BiharBrains meeting Press at Hotel Rajasthan, Patna)

Sri Shakeel Ahmad Kakvi, President of IABJ met Sri Shushil Kumar Modi to extend his active support for the global meet and demanded separate ministry for NRBs. He also invited DY CM & CM to visit UAE to bring investment in Bihar.

(Fig 15: Shri Shakeel Ahmad Kakvi (Center), President IABJ and team of UAE with Hon'ble CM)

Other members who involved himself were Sri Dayanand Prasad USA, Ms. Anita Prasad USA, Sri. Pankaj Prasad USA, Sri RK Dubey Delhi.

In addition to this , Some organization were chosen as Participation associates for this meet , the name of those are : Bihar and Jharkhand Association of North America, Bajana(www.bajana.org),BiharBrains (www.biharbrains.org), Indian Association of Bihar & Jharkhand (DOHA-Qatar) & Maithili. net. They all sent their team of delegates in the said meet.

9 BiharBrains as Participation Associate and Coordinator

On this event, BiharBrains as a group/organization was selected as "**Participation Associate**" and given responsibility to work as **"overseas coordinator**" with objectives to spread mission of the conference among all NRIs and NRBs for their participation in the global meet. **Sri Bibhuti Bikramaditya**, Chairman of BiharBrains was one of the overseas coordinator of six member's coordinators team from all over the world who played significant role in organising the said event.

Bihar Brains formed 18 member delegates (largest among any group/organisation representation) from different parts of India and abroad, comprising members from scientific community, corporate world and academics etc for the global meet. The said delegation was led by **Dr. B. K. Sharma,** President BiharBrains, & HOD Electronics, NIT, Patna and this was coordinated by **Sri Ravindra Kishore**. CEO of MV Industries, Patna (BB Patna Representative)

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(Fig 16: BB delegates meeting with Hon'ble CM on Jan 19, 2007 at Lunch session)

The names of the delegates who participated in the team were Dr. O.P. Mishra (Japan), Dr. Harishankar Sharma (Sweden), Sri Jagjot Singh (UK), Sri Nandan Kumar (UK), Sri Amaresh Shankar (Patna), Dr. B. K. Sharma (Patna), Prof J. Thakur, Patna, Prof Mujeeb (Patna), Sri Satya Kumar (Patna), Sri Parimal Madhup (New Delhi), Sri Ranjeet Kumar (New Delhi), Sri Alok Kumar Bihari (New delhi), Sri Chandan Singh (Patna), Sri Sudhir Kumar (Jamshedpur) etc.

During whole session BB Delegates were active in presenting ideas and discussing projects to NRIs and govt officials. They presented projects proposal to Hon'ble CM and Hon'ble DY CM of Bihar (See figures 14 & 15)

(Fig 17: BB delegates with Hon'ble DYCM, Bihar)

BB delegates in presentation

(Fig 18: BB delegates at Global Meet)

On this occasion, BiharBrains Presented proposals to Govt. of Bihar and were involved in many activities during global meet. Below are just a brief

9.1 **Proposal of Development of Scholastic center, Gyan Kendra at Patna**:

BiharBrains proposed the Establishment of BiharBrains Scholastic center to Bihar Govt which is similar to Gyan Kendra, Vision of Bihar Govt at Patna, and the total investment is expected to be around Rs 4 crore in this project.

The main objectives of this project are to establish unique scholastic center where students, Professors, Researchers, scientist of all the streams will get all basic infrastructure like computers, Internet with unlimited accessibility and all multimedia facility, free online international and national journals and free consultancy for higher studies and employment in abroad. This scholastic center will also establish Training, design and development center in the field of science and Technology, Finances and personality development. The placement and Consultancy center will be established for giving educational consultancy and help in getting employment in India and abroad to the needy aspirants.

This scholastic center will also be the development project execution center where all ideas of any individuals or group will be executed in Bihar. The details about this project can be seen on our website www.bbscindia.com .

In a brief, for setting up complete scholastic center, we need to establish following centers

A. To establish CDAC authorized Centers in IT related Training ,design & development
B. To establish Center for learning, discussions, seminars, worshops, orientation programs with all basic infrastructures.
C. To establish Development projects Execution Center
D. To establish Center for Personality Development (CPD) and Human resources.
E. To establish Placement and consultancy center
F. To establish Center for Unique Online Library
G. To develop "Manthan" a world class online and printable magazine
H. To open and promote R&D center/Institute/Company under BiharBrains society or in association with Govt or any other groups or individuals.
I. To work for infrastructural development of the schools/colleges in India.

Visit website www.bbscindia.com to know the details of the Project.

9.2 **Chemical Industry in Bihar:** On Behalf of Dr. Kartik, BiharBrains proposed Dr. Kartik plan to establish Chemical industries in Munger dist of Bihar. He is Vice President of

his own company ACI PHARM.inc www.acipharm.com and head of steering committee of BiharBrains.

9.3 Water Harvesting Project Model:

Sri Alok Kumar Bihari, a Delhi member Presented Water Harvesting Project, a complete new theme for Nala system in India was presented to Bihar Govt and also many channels has taken his interview. DD1 is going to show documentary on his demo in the national Level. He was in the news in Aaj Tak/ZEE news and Ankho Dekhi for his project model earlier too.

(Fig19: Open Demonstration of Water Harvesting Project by Sri Alok Kumar Bihari)

 He presented his model in front of **four member Review committee of BiharBrains led by Prof. Santosh Kumar,** former HOD, Central water Research Board, a wing of NIT, Patna at the corridor of Maurya Hotel in Global Meet.

(Fig20: Alok Kumar Bihari with the expert Team Led by Prof Santosh Kumar)

The committee submitted their report and recommended that his idea is superb but he needs some more training to present and proof in front of national level team.
He may come to Patna for his training and then we will go for pilot project where his model will be functional.

11. Outcome of the event
In a three days hectic discussion**,** at least three major decision have been taken

11.1 Formation of Bihar Parishad:
In a corridor of Maurya Hotel, coordinators of the global meet were engaged himself in the formation of what is called Bihar Parishad.

The main objectives of this Parishad are to explore investment possibility in the state and give active hand to the govt. Many interest groups have been formed and in each and every group, people have been given responsibility to work with. The names of these interest groups are
a. Primary education b. higher education c. technical education d. health care e. agro based industries f. tourism and hospitality g. entertainment h. media i. mentoring. Members have sent their confirmation to contribute him for the above mentioned interest groups and also it is still in the progress.

The coordinators who were contributing for the formation of Bihar Parishad, Sri Ravi Verma, Sri Ramesh Yadav , Sri (Dr.) Rajay narayan, Dr. Raj Dubey and Shri Shakeel Ahmad Kakvi in Patna. They announced this in the press conference for formation of Bihar Parishad. One coordinator, Sri Bibhuti Bikramaditya was absent in the global meet because of his personal reason.
This is to be mentioned here that Bihar parishad will work as active force for the Bihar Foundation established by Bihar Govt for which DY CM and CM are the mentors.
The details can be seen on www.biharparishad.org

11.2 Announcement of Investment by
 ITC in Munger:
The announcement of ITC to invest Rs. 300 crore in various schemes, including primary education and health care in Munger district was a major decision and breakthrough turnout from Global Meet.

As per plan, they are adopting Munger for developmental purpose and will encourage others too to take similar steps for their own home town or village.

11.3 Investment through Bihar Foundation

The decision about Investment through newly formed Bihar Foundation was one of the major step taken by Bihar Govt. Govt also announced that This will have many centers around the world and NRIs/NRBs can directly approach for the investment process.
Bihar Foundation will now organize next Global Bihar meet in association with Institute for Human Development, Delhi

11. Investment possibilities in Bihar

Though the common perception about opportunity in Bihar is completely negative because of the environment made by the past all governments in Bihar but there are many opportunities where industries, Investors can show their interest. Following are region wise opportunities which were either not identified by govt or not given much attention to it.

A. Patna Region: Patna has great potential in Finance, Trade & Commerce, Entertainment & Media, Tourism, Dairy Technology, IT and R&D Companies where Patna can be the best choice of investors. Magadh stock exchange at Patna should be immediately revived. Patna can be the city of education and higher learning along with center for R&D. In Dairy Technology, Patna and Muzaffarpur have shown its potential and this is the only industries in Bihar which has excellent track record in terms of profits. Many more diaries industries should come forward to invest in this sector. There are potential in opening Film city, shopping malls, and hub of tourism industry at Patna.

B. Vaishali & Muzaffarpur bound areas: Hajipur can be the good place for Tourism (Vaishali), Manufacturing Industries and also electronic city of Hajipur should be immediately revived and reinstalled. Because of nearness from the state capital, the area from Patna to via Hajipur Muzaffarpur will be good destination for the investment in Education, Manufacturing industries and food processing industries. In fruits exports (Litchi, Mango and Banana), both city can be developed as center and there are large possibility of opening export –import company in this area where investment from private sector is required.

C. Sitamarhi & Raxaul: Sitamarhi can be the best destination for tourism and can attract Hindu religious people as it is the birth place of Hindu Goddess Sita. The govt and private agencies should come forward to develop this city and bound areas. This district is also good in Sugar Industry. Riga Sugar Factory, near Sitamarhi is well known which should be given more importance and revived by govt. Other non govt agencies should come for the investment in sugar industries in this district. In Litchi production, Sitamarhi is second best after Muzaffarpur. Raxaul can be developed for the international trade with India and Nepal.

D. Darbhanga: This region can be developed as good place for floriculture and horticulture. Pan, Makhan and Machhali (fish) are three important things for the people in Mithila region. People of whole Mithila are known for their brilliancies since ancient times. There are opportunity to develop this city as center of education and research.

The forts of Darbhanga Kingdom can be used for the tourism purpose. The forts of Darbhanga in all over the state can be used for the spot for the tourist attraction.

As whole Darbhanga, Madhubani, Saharsha and Supaul has large no of ponds, fishery industries can be developed. There is immediate need of Establishment of Branch of Central Fishery Research Institute (CFRI, Mumbai) at Darbhanga.

E. Madhubani: is Famous for **Mithila Paintings** in all over the world. It needs to be spread to all villages of Mithila and other districts of Bihar as one of the industries. Presently only few village women are working. Govt should declare it as industry. There are huge scope for private sector and NGOs to come forward & help to grow this industry in the state.

F. Samastipur: This dist is famous for Famous for Khaini (Tambaku) production and wheat. This needs to be more advertised as it is cash crops. The establishment of sugar industry in this dist will be good option for the investors.

G. Bhagalpur Region: Bhagalpur has great potential in Silk Industry, Textile, Handloom & Handicraft, Gems & Jewelry, and Furniture & Artifacts etc. This city should be popularized and advertised as **"Silk city of India"** .This region is also be developed for tourism as same as Nalanda. Vikramshila can be the good spot for the tourist.

H. Begusarai: Begusarai district in known for the industries in the field of petroleum, chemical, petrochemical integrate complex including upstream & downstream industry. Presently only govt has its own industry in this field but this dist needs more investment by private sector.

I. Purnia and Katihar Region: This dist is good in agro based industry like Jute, Leather and allied products, animal products, fisheries, poultry. The entrepreneurship can be developed in the youths of this district so as they can earn huge amount of Money from this sector.

J. Munger Region: can be developed Electrical & Mechanical Hardware Industry, and Heavy Industry etc.

K. Gaya, Nalanda & all Budhist Cicuit Regions: No need to say much about this Buddhist circuit. Because of internal terrorism this dist has got bad name.

Because of tourist attraction, there are plenty of opportunities in hotel industry. Gaya, Rajgir, Pawauri, Nalanda, Patna, Fatuha should come under special category for Bihar where govt can get much from the foreigners.

In addition to tourism and hotel industry, these whole region are also good in Cement, Stone Slabs, Prefab Structure, Power Plants other Mineral Based Industry.

Jehanabad can be the center of the production of wheat and rice.

L. Bhojpur Region: Bhojpur Region of Bihar can be developed as the center agriculture .if govt pays attention; this has potential to produce wheat and paddy as Punjab and Haryana produces.

Concluding Remarks

Bihar is in the phase of economic reforms and started process of improving law & order and infrastructure including roads and electricity which has been given prime importance by govt as this is needed for not only for attracting private sector but also for overall development of the state. Bihar has great potential in many fields as mentioned above where investors if can give a thought to invest may get huge benefit. This Global meet were organized to see and explore those opportunity and reality in state.

Though large no of NRIs/NRBs and other potential investors participated in the global meet, most of them didn't turn up for the investment in the state, very few investment proposals were announced during the global meet; The sole reason for this was that many of them visited just to know the reality and to explore the business opportunity in the state.

But certainly this meet has given good impact on investors which has helped to improve its brand image and other to know about Bihar and its improved conditions in the national and international forums.
 In this way the objectives Global meet was satisfied.
 If the pace of progress continues, then certainly Bihar will be developed by 2015 as predicted by Hon'ble Chief Minister Sri Nitish Kumar. The developed of Bihar will lead to the fulfillment of dream of making whole India a developed nation by 2020 as Dr. Kalam says.

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SciTech Fest: August 2007

Pratyush Kumar, London, UK

A first ever state level SciTech Fest is going to be organised by Bihar Brains Scholastic Centre (BBSC)*, Patna with the collaboration of Ministry of Science & Technology, Bihar and Ministry of Industry, Bihar in Patna from 1st to 3rd August 2007.

In this unique SciTech Fest, a large no. of prominent Industrialists, Entrepreneurs, Achievers, Academicians, Students, Professionals, Businessmen, Corporate Houses and Policy Makers are going to participate actively.

This would be an exciting and life time opportunity for the people of Bihar & Jharkhand not only to demonstrate their hidden talent, original ideas, unique innovations and indigenous work but also an occasion to share the same dais with each other and to get a first hand feedback from a very intelligent and interactive set of audience who can help them further to reach out to a greater audience and heights of success.

Major Events are divided into two following categories:

1.   For Young Scientists & Researchers:

a.   Two days Project Model demonstration.

b.   One day review & assessment by experts from Academics and Corporate world.

2.   For Industries and R&D Companies:

a.   Three days open interaction with Visitors and Product demonstration.

b.   Open Interview Session.

Key topics which are going to be main focus areas of the discussion and presentation are mentioned below:

1.   Electrical & Electronics Engineering
2.   Mechanical Engineering & applications of CAD/CAM Technologies
3.   Computer Science & Information Technology
4.   Astronomy & Astrophysics
5.   Physical Sciences
6.   Chemical Sciences & Engineering
7.   Industrial Waste management, Water Pollution and its control
8.   Life sciences
9.   Environmental Pollution and its control
10.   Spectroscopy & laser physics
11.   Chemical Engineering & Chemical Sciences
12.   Bio Technology and Genetic engineering
13.   VLSI, DSP, Embedded Systems.
14.   Biological sciences
15.   Non Conventional Energy sources & its implementation
16.   Internet Technology and Demonstration of its innovative use
17.   Digital Photography and Kiosk set up Process
18.   E-commerce and online Banking Technology
19.   Telecommunication and its technologies
20.   Showcase of new ideas and opportunities for entrepreneurship
21.   Travel & Tourism Chain Set up. Requirements and its benefits
22.   Supply Chain Units/Warehouse set up process
23.   Civil and Architecture engineering
24.   Agriculture and Agro- Business

In this fest, various case studies highlighting the use of latest technology and its application in our daily life would be demonstrated in a very simplistic manner.

SciTech Fest – Aug'07

Emerging Areas of Growth and Development by using new technologies would be put forward for further discussion and thereafter their suitable adoption in various parts of the state.

Use of Internet and Science in Agriculture, E-Commerce and its various applications on our day to day life, Online Internet Banking & E-Shopping, Innovative use of Digital Camera Technology, Internet based Job Search & Application Process, Non Conventional Sources of Energy are bound to be some of the interesting areas which people

of Bihar & Jharkhand are going to explore during this innovative fest.

Some of the high potential areas for reaping the benefits of entrepreneurship like Internet Kiosk Set-up, Digital Photo Studio Set-up, Immense opportunities in the field of Travel & Tourism, Ware house or supply chain for upcoming Retail Industry, forever demanding Medical and Nursing Colleges & Institutes, future opportunities in the area of Banking & Financial Services must not be missed out by the people of Bihar & Jharkhand who are trying hard to establish themselves in the time of cut throat competition in traditional areas of businesses. They can explore some new and unexplored areas of businesses to get the maximum benefit from the minimum investment.

SciTech Fest is open for Graduates, Post Graduates, PG Diploma, Ph.D. Students, Post Docs, other researchers, etc. of all areas of Engineering, Science & Technology for Bihar & Jharkhand states.

BBSC has made arrangements to provide all infrastructures in terms of space for stalls, electricity connections and other required accessories for Project demo. Even limited accommodations would be made available on demand and after the payment of nominal charges. One can contact them directly for more details on this or for any further query.

Contact for more details:

Bihar Brains Scholastic Centre
Maitri Shanti Bhawan, BM Das Road, Patna 800004
Tel: (+91) 612-3958716

Web: www.bbscindia.com/SciTechFest

Email :bbsc_patna@yahoo.com;
scitechfest@yahoo.com

* Bihar Brains Scholastic Centre (BBSC) is a division of Bihar Brains which is a well known and reputed non profit organisation which works towards providing right direction to the youths of Bihar and Jharkhand.

In past, Bihar Brains has successfully organised or has been instrumental in organising various significant events, debates, discussions and workshops to present an active forum for ever valuable interaction between various important strata of our society including students, academicians, professionals and policy makers of our state.

About the Author: Pratyush Kumar works as Asst. Manager in HCL Technologies Ltd., at Bangalore, India. Currently he is working with Investment Banking Division, Deutsche Bank AG, London. He can be reached at: pratyush102@rediffmail.com; pratyush.Kumar@hcl.in

Why and How to Pray

Gyan Rajhans, Toronto, Canada

During my 26 years of Vedic Religion Radio Broadcasting in the Greater Toronto Area and on our web site *www.bhajanawali.com,* I have had several occasions of producing special programs on prayer and meditation. My extensive research has revealed that most people are confused about the underlying philosophy of prayer. Consequently, their prayers are not answered. In this article I am attempting to provide some insights into the success of prayer. To begin with we must understand as to why do we pray? There are basically 12 reasons for prayer:

1. We pray to depend on God for help in distress.
2. We pray for asking God for enlightenment.
3. We pray for communion with God through single-minded devotion.
4. We pray for asking for peace from God when the mind is restless.
5. We pray for surrendering ourselves to God completely.
6. We pray to God for giving us the ability to comfort others.
7. We pray for thanking God for his blessings.
8. We pray for expecting God to decide what is best for us when we are in a dilemma.
9. We pray for making friendship with God.
10. We pray for melting the mind and ego in silence in God.
11. *We pray for requesting God to give strength, peace and pure intellect e.g. Gayatri Prayer.*
12. We pray for asking God to purify the heart and make us abide in Him forever.

In essence, what the above 12 reasons convey to us is that a prayer has two parts: one is soliciting a favour from the Almighty and the other is surrendering ourselves to His will. While the first part is practiced by most of us on a daily basis, the second part is the real and ultimate goal because it implies dedication.

Dedication means feeling the light of God within your heart. If your heart is devoid of divine light, you will not be happy, cheerful and successful in your lives. Remember, your success depends on the inward state of your mind. Your mind will create hindrance in your work if it is not in communion with God because He alone is the permanent abode of peace. Yes, I agree that most of us want to have riches, healthy lives, nice children and prosperous future. But if we always approached God with a begging attitude then we are treating Him as our bearer to supply the things required by us at once. This is no devotion to God but devotion to our own selfish desires.

My extensive research of the scriptures indicates that there are seven (7) techniques of successful prayer:

1. When you pray just talk to God as a little boy would to a father or mother whom he loves and with whom he feels in harmony. Tell Him everything that is on your mind and in your heart.
2. Talk to God in simple everyday speech. He understands every language. It is not necessary to use an exaggerated formal speech. You would not talk to your father or mother that way, would you? God is your heavenly father (or mother). Why should you be formal to Him or Her? This will make your relationship with Him more natural.
3. Tell God what you want. You might as well be factual. You want something. Tell Him about it. Tell Him you would like to have it if He thinks it is good for you. *But also say and mean it that you will leave it to Him to decide and you will accept His decision as best for you.* If you do this regularly it will bring to you what you ought to have, and thus fulfill your own destiny. It will be possible for God to give you things that you should have-wonderful things. It is really unfortunate, the marvelous things we miss, things God wants to give us and cannot because we insist upon something else, something only a fraction as fine as He wants to give us.
4. Practice praying as many times during the day as possible. For example, when you are driving your car, instead of the aimless thoughts that go through your mind, talk to God as you drive. If you have a companion in the front seat, you would talk to him or her. Would you not? Then, imagine the Lord is there and in fact He is, so just talk to Him about everything. If you are waiting for the

subway train or bus, have a little chat with Him. Most importantly say little prayer before you go to bed. If it is not possible, get into bed, relax and then pray. God will lull you to a wonderful carefree sleep.

5. It is not always necessary to say words when you pray. Spend a few moments just thinking about Him. Think how good He is, how kind He is and that He is right by your side guiding and watching over you.

6. Don't always pray for yourself. Try helping others by your prayers. Pray for those who are in trouble or are ill. Whether they are your loved ones or your friends or neighbors, your prayer will profoundly affect them. And

7. Last but not the least whatever you do, do not make all prayers into the form of begging God for something. The prayer for *thanksgiving* is much more powerful. Make your prayer consisting of a listing of all the fine things you possess, or all the wonderful things that have happened to you. Name them over, thank God for them and make that your whole prayer. You will find that these prayers of thanksgiving grow.

In the final analysis, please do not pray to God to run after you to satisfy your selfish desires. You are supposed to do your work as efficiently and skillfully as possible. With faith in God and using the above techniques of prayer you will have success in every walk of life.

About the Author: Gyan Rajhans*, an internationally recognized heath & safety professional has been broadcasting the only non-commercial Vedic religion radio program in North America since 1981 & worldwide web cast on www.bhajanawali.com since 1999. Mr. Rajhans has published extensively on religious and spiritual matters. Some articles are available on the Bhajanawali web site. He has translated Sri Mad Bhagvad Gita in English for the younger generation. Mr. Rajhans has been conferred various titles, including that of Rishi by Hindu Prarthana Samaj of Toronto Hindu Ratna by Hindu Federation of Toronto. He received Canadian Journalists' and Writers' Club (CEJWC) award for 2005 in the Internet category - Opinion - for his Spirituality columns in South Asian Outlook e-Monthly.

Less Stressful Life verses Retaining the Drive

Amit Singh, Singapore

"I'm sorry, but it's time someone finally spoke the truth. It's time someone waded in on behalf of the ultimate underdog. It's time someone shook free of the shackles of contemporary convention and proclaimed loud and clear, "Stress is good." For too long has stress been demonised, vilified and made to feel totally unwanted. But the truth is, it's just misunderstood. It's the victim of dodgy PR. It's only crime is to have fallen foul of a conspiracy of pamby, new age do-gooders."

> *-- Rohan Candappa, author of the "Little Book of Stress", writing in the Financial Times, Oct 17, 1998*

Preamble

1. This is supposed to be the report of the work of a committee. But to be less formal about it, it is actually the story of why a group of 15 otherwise sane, and fully-employed Singaporeans, all with enough commitments at work and at home, decided to add to their personal stress levels by taking up the challenge of looking into the above dilemma, namely, how to reduce stress while making sure that Singapore continues to do well?

2. We spent a total of more than a dozen meetings, more than 2 hours each time, deliberating the problem, sometimes in a conference room at the Ministry of Community Development building, other times at various government offices around Singapore. Wherever space permitted.

3. As everyone had their own bosses to answer to at the same time, these meetings were kept strictly to schedule. We became collective clock watchers, even when absorbed in heated debates as to the causes of stress in Singapore.

4. And we gave stress to other Singaporeans as well. Over a period of 14 months, from Oct 97 to Dec 98, we met with a total of over 300 other Singaporeans to get their inputs. They were students, office workers, unionists, managers, lawyers, volunteers, housewives, CEOs, etc... You will hear some of their voices in this report.

5. Not surprisingly, everyone had a view on this very important issue, which is: How to cope with stress, while not compromising success.

6. Isn't it strange how the two words sound so alike? Isn't it strange too that in the dictionary, the word "stress" comes before the word "success"?

7. Anyway, now that the deliberations are over, here are our findings.

These, in summary, are:

8. There is a consensus among Singaporeans that there is, without a doubt, much stress in Singapore. From the time a Singaporean is born, to the time he dies, there is much in the social environment that generates stress within the individual. That is a constant. The variable in the equation is how to deal with it, as a country and as individuals.

9. Singaporeans also agree that, while some forms of stress are bad, not all are. Stress is like a pot of boiling water. To prevent it boiling over, you have to lower the heat, loosen the lid, add more water, or creative combinations of the above. Singaporeans know that without heat, water will never boil. Then they can never have turtle soup.

10. At the same time however, every Singaporean will now and then yearn for the chance to sit back, take his or her foot off the pedal, and simply relax. This in itself is no bad thing. All Singaporeans can do that some of the time, perhaps even some Singaporeans can do that all the time. But if all Singaporeans do that all the time, then Singapore is dead. As a nation, we have to ensure that that does not happen. We must, in other words, find a balance between reducing stress while keeping the drive.

11. Singaporeans agree that the root of the problem – the nub of the issue – is the way we define success in Singapore. Over the years, we have come to define success too narrowly. It does not take a genius to know that the way success is defined in Singapore means largely two things: academic and material achievements. These are

not necessarily bad in themselves, but they are too restrictive, too narrow. It is time to widen the definition. And doing that calls for creative approaches, from every one who forms a part of Singapore society, from the Government to employers to parents and the individual.

12. Singaporeans also agree that Singapore must retain the drive. As individuals, we all yearn for the opportunity to sit back and relax, but no one wants a country whose standard of living starts to decline. So, even if we moan and groan about it, we know it is all up to us, the individuals, if we do not want Singapore to start sliding. We are, after all, a country with limited resources. The competition from other countries will only get more intense in the coming years.

13. So how do we do that? The nature of Singapore's economy is changing. We are becoming a knowledge-based economy. We are now competing not with third world countries, but with more developed ones. When we fight to get a semiconductor factory to locate in Singapore, the countries we are up against are not your emerging economies, but established ones like Germany or Finland.

14. The car that can race from Tuas to Changi in 30 minutes is not necessarily the car that can conquer uphill slopes. Success in one league does not guarantee success in another.

15. We do not pretend to offer answers that will make the problem disappear. We cannot work miracles. What we can offer are only ideas and suggestions, for Singapore and Singaporeans to consider, chew on, and hopefully act upon.

16. But first, an elaboration of what the problem is all about.

What makes us so stressed?

17. We now live in an era of intense competition and rapid changes, all due to globalisation and advances in information technology. These create much stress. Many of us complain of information overload. We also complain of the sense that we are losing control. These phenomena are increasingly common.

18. We often couch our complaints of stress in terms of pressures on time. The child has no time to cope with all the homework he gets at school. The adult has no time to relax or to pursue hobbies. The worker has no time to catch up on the latest management books or to upgrade his skills.

19. The overlay to all these complaints however, and in many cases the root cause of the perceived pressure of time, is the pressure of expectation. The pressure comes from parents, peers and society at large. Indeed, so pervasive is the pressure that most Singaporeans take it as a fact of life, a given, and make no attempt to break free.

20. The individual Singaporean who feels the pressure is sometimes able to articulate it, sometimes not. Generally, the better-educated and more articulate person is able to express the stress he feels in terms of a burden of expectation, but the less educated is not always able to. And because he feels a burden he is unable to articulate, it adds all the more to his stress.

21. The pressure of expectation is not merely the expectation to succeed, but to succeed within given moulds. Success is measured against clear academic, economic and material benchmarks.

22. Added to this narrow definition is the fact that many Singaporeans play multiple roles, as parents, workers and citizens. The competing demands of these often aggravate the stress levels. Most try to cope, while some simmer in silent resentment. Others vent their frustrations openly. Some speak with their feet, and migrate.

Stress in school

23. Students in Singapore face constant reminders to excel academically. These reminders come from parents, teachers, peers and society at large.

24. While this is, in itself, not a bad thing, what is insidious is that in recent years the pressure is extending further downward to ever lower education levels, to the extent that even kindergarten children are being subjected to the feeling of pressure. One five-year-old in a kindergarten was made to feel left out because she did not have tuition teachers!

25. In some kindergartens, parents are told that if their children are not enrolled in certain classes, they will lose out. Many parents pile their children with extra tuition and enrichment classes, creating strain not only on the child's time, but also on their

own pockets.

26. Extra-curricular activities, which ideally should be a way to de-stress, is viewed by some students as additional work. Parents add to the stress when they pressurise their children into taking up ECA not to their inclination.

Stress at work

27. As for the adult, there is stress both as a worker, and as a parent. Added stress comes from having to juggle these roles within time and energy constraints.

28. Stress also comes from what some people call "the system" in Singapore. These include a tendency to equate staying late with working hard, a preference for paper qualifications over work experience, and older workers feeling threatened by younger ones.

29. Some unionists note that it is unfair to compare younger workers, who have no family commitments and better paper qualifications, with older ones, many of whom have limited education, and are less familiar with technological advances.

30. For some workers, the Government's policy of attracting foreign talent is also felt to be a source of stress. While Singaporeans can appreciate the need for foreign talent at the national level, they cannot help but feel threatened at the individual level. Some fear there will be glass ceilings for locals once the import of foreign talent becomes a norm.

31. Less educated Singaporeans fear lower-priced, better-educated foreigners taking away their jobs. An example: graduates of Indian universities taking up jobs here as clerks, competing with less educated locals.

32. Some Singaporeans see foreign nurses here as in it for the money, rather than a commitment to nursing. They complain that instead of lightening the burden of local nurses, they add to it instead because they need close supervision and guidance.

33. For the Singaporean who goes regional, added stress comes in the form of having to re-align family commitments and schedules, and adapting to an alien culture. These, however, are not necessarily harmful, as long as the individual is sufficiently prepared. The stress becomes debilitating only if the individual has not been sufficiently prepared, either through his own negligence, or his company's failure to give him adequate information.

Stress at home

34. The pressure to succeed being what it is in Singapore, oftentimes the pressure faced by school-going children translates into pressure on the parent as well. Exam fever nowadays afflicts parents as much as it does the child, if not more.

35. On the material front, the Singaporean adult faces the pressure of keeping up with the Joneses, and making sure that his children keep up as well, matching Osh-kosh with Osh-kosh, Nike with Nike, and Montessori with Montessori.

36. Parents tend to vest in their children the hopes they themselves were unable to attain in their own lives. While this is natural and not undesirable, the danger is a vicious cycle of overly high expectations. Parents of today have far higher expectations than the parents of 20 years ago, and the pressure on children is consequently greater.

Stress as a citizen

37. The stress that the Singaporean faces as a citizen of this country is that of being subject to high expectations from the state itself. Constant exhortations from the Government to excel, which are reported prominently by the local media, are cited as a source of stress.

38. It is a rather unique stress, in that citizens of few other countries face the same situation.

39. A university student at Imperial College, London, puts it this way: "The government seems constantly trying to get more out of people. Students have to take more examinations, workers have to take up more skills, and everyone has to push for higher productivity. There seems no end to this continual drive to improve."

40. While people understand that there is a need to increase productivity, stress comes from the feeling that the individual Singaporean is being pushed into prescribed moulds. The Imperial College student said: "There is a general feeling that the government has created a model of an ideal Singapore society, and is trying to make

everyone fit in. This reinforces the sense of helplessness among some Singaporeans."

41. Singaporeans, especially younger ones, clamour for a sense of control in their lives, and a sense of choice. They argue that if they have a sense of control, they will feel less stress. Indeed, if Singapore is a pressure cooker, the individual Singaporean asks himself this question: "Am I the cook or the cooked?"

42. Singaporeans feel that they are just economic digits in the Government's overall plans for the economy. Exhortations are oriented overwhelmingly towards the economic. The state, it is argued, provides little sense of the individual as a total being, with social, psychological and spiritual dimensions.

A narrow definition of success

43. Stress is defined very narrowly in Singapore, according to academic, material and economic benchmarks. And as individuals derive their sense of self-worth from these benchmarks, stress results. The narrow boundaries of these benchmarks cannot accommodate many people.

44. A narrow sense of self-worth has helped to maintain Singapore's competitive edge, by feeding the desire or hunger to excel in the academic sphere and the workplace. It has resulted in a society that places high achievers on a pedestal. But at the same time, it has also damaged the self-esteem of those with average ability.

45. On the academic front, a student at Stanford University in the US puts it poignantly: "Pressure comes from watching other Singaporeans take the same classes I do, doing better in them than me, and knowing that the difference will be used against me some day, simply because paper qualifications are so relied upon in Singapore."

46. For the Singaporean whose paper qualifications are less than impressive, the alternative route to success is through material wealth. A student at the University of California at Berkeley comments wryly: "A friend with a 2.4 GPA is considered somewhat of an outcast. Fortunately for him, those who commented on his GPA also had the opportunity to comment on his new car."

47. Because of the emphasis on economic benchmarks, Singapore is a good place to live *and* work, but not a good place to live alone. "To live without working in Singapore is like putting a 35-year-old into a retirement home," the Berkeley student says.

48. Singaporeans have been told that to stay economically relevant, the country must provide competitive services. This message has been driven home so well that some Singaporeans, when asked to describe Singapore, describe it in purely economic terms, such as having the best airport, or second busiest container port.

49. These same Singaporeans would also measure themselves using purely economic yardsticks – the five Cs. And when they have obtained the five Cs, they turn their attention towards upgrading components in them -- their cars and condos.

Ill effects of a narrow definition of success

An unforgiving society

50. Singaporeans have become so accustomed to narrow definitions of success in their own lives that unconsciously they apply the same narrowness to other people. When asked what he would think if the Singapore team climbing Mount Everest did not make it to the top, one junior college student said they would have failed. He said, "How can they take money from the President's Star Charity and not make it?"

51. The student's remark highlights the danger of Singapore turning into an unforgiving society, one that gives "no second chance" to people who fail to make it according to prescribed yardsticks. If widespread enough, this trait also makes for an ungracious society.

Culture of risk aversion

52. At the national level, the same trait encourages a culture of risk aversion, as people fear to venture beyond the tried and tested for fear of failing. This is contrary to the dynamic risk takers Singapore needs.

53. At the personal level, the fear of failure is an unnecessary source of stress and a waste of time. "We spend too much time stressing out over the risk of failure," said an Imperial College student.

Social stigmatisation

54. Some people consider Singapore's narrow definition of success as a form of social snobbery. Inflexible social norms, it is argued, encourages social stigmatisation.

55. This is worth further study as too much social stigmatisation can have a debilitating effect on society and be a drain on individual productivity. The person who feels stigmatised is less inclined to put his best foot forward.

56. By and large, society does not accord achievement in the arts and sports with the same level of recognition it gives to academic and economic achievements. Like the saying "a prophet is not recognised in his own country", Singaporeans who are talented in music and drama often have to go abroad to be recognised first, before Singapore society will recognise them as such.

57. Singaporeans who are inclined towards pursuits like poetry or dance often suppress these inclinations for fear of being stigmatised or ostracised. Someone with a passion for astronomy may for instance be compelled by societal pressure to take up economics instead.

Loss of buzz

58. Singaporeans who feel that they have to fit into roles prescribed by society feel stressed because it is like trying to fit square pegs into round holes. Stress stems from the suppression of individuality. Creative energy that could be channelled into creative and constructive pursuits is instead spent on suppression of the self, to conform to society.

59. It takes energy to conform. It is debilitating to the individual and an expensive price society pays for the conformity of its members. In fact, it could be argued that Singaporeans' famous apathy is the direct result of energy used up in conforming.

60. The more serious consequence to society is the loss of dynamism and the death of "buzz". Singapore recognises loss in the form of people, especially talented individuals, who migrate, but a less obvious form of loss is people who "switch off".

61. Singer Bob Dylan once said: "What's money? A man is a success if he gets up in the morning and goes to bed at night and in between does what he wants to do."

62. There is no passion without freedom of choice. Whoever heard of a passionate love affair between a match-made couple?

Why do we need to redefine success?

63. American composer Irving Berlin once said, *"The toughest thing about success is that you've got to keep on being a success."* How true this is for Singapore! If Singapore had not been successful in its first 33 years as an independent sovereign nation; there would not have been a need for our committee today, because the dilemma would simply not exist.

64. However, to keep on being a success is easier said than done. Sometimes the very things that have contributed to success can themselves lead to stress. Anthony Storr, a famous British psychiatrist, once said: *"It is a tragic paradox that the very qualities that have led to man's extraordinary capacity for success are also those most likely to destroy him."* His comment concerned individuals, but it applies equally to societies. In Singapore, affluence can threaten to lead to a divide between the haves and the have-nots. This could then lead to a society that is uncohesive. Lack of cohesion brings about a higher level of stress. Singapore cannot afford such a society.

65. Singapore focused mainly on economics in its early years. This was, as it should be, because Singapore is a small nation, tied inextricably to the global trading system. We could survive as a nation only because we made ourselves useful to the world. In the years to come, economics will continue to dominate Singapore's agenda, for that is the reality: compete or perish.

66. In such an environment, it is natural for Singaporeans to associate self-worth with economic success. We measure ourselves and each other by material achievements. However, now that Singapore is moving into more advanced phases of development, these criteria may have become too narrow. We need now to have a wider definition of self-worth.

67. A good example of a society that that has managed to be economically competitive yet encompassing a broader sense of self-worth is Silicon Valley. In many ways, the competition there is even more intense, but people do not treat the pursuit of material wealth as an end in itself. They are less likely to be stressed over a

desire to keep up with their peers materially.

68. Singapore is fortunate in that the cultural underpinnings of our society are such that there is a genuine desire to do well. There has always been a strong drive to succeed. Now, on the threshold of the 21st century, as Singapore looks forward to becoming a developed nation, the challenge is how to make sure that we do not become totally stressed out by that drive.

69. And for that, these are some key ideas we hope to share with Singaporeans:

I. At the individual level:

Stress and drive are not opposite ends of a spectrum

70. We have to get rid of the idea that all stress is bad. Stress is like cholesterol: there is good and bad. We should optimise good stress, and minimise the bad. We will learn to de-stress, not fall into distress.

71. In America, people do not care whether you drive a Suzuki or a Saab. In fact, there is a type of car that is a lot more fashionable than the simple family saloon, and that is the four-wheel drive. In terms of looks, this is a lot less sleek, but it is considered a lot more "cool". Why? Because it is built to take stress. It can conquer far more difficult terrain. It connotes ruggedness. And that may be what Singapore needs for the next century.

Take responsibility for ourselves

72. Despite the stress we feel, we are, after all, still masters of our own destiny. What we make of our lives depend on ourselves alone.

73. That involves setting our own goals in life, and having the determination and perseverance to realise them. We stand or fall by our own efforts. We may choose to travel the way many people have gone before, or we may choose the road less travelled. Either way, we choose. Each has its potholes; each has its hazards and obstacles. We must embark on our chosen paths with open eyes.

74. We should avoid the dependency syndrome, expecting the Government to step in and help at every turn. That may have been fine when

Singapore was still relatively young as a nation, and there were huge obstacles to overcome. But Singapore is now 33 – and that is an age old enough to become independent of paternal protection.

75. We have to be passionate about pursuing our goals. We must believe in our talents, and have the courage to forge our own way. We will continue trying, even if we do not succeed at first.

Be the best that you can be

76. Every one of us matters. Every single one, regardless of education, income or occupation. We care that every Singaporean feels himself a worthy being and a worthy citizen. In the Singapore of the future, we would like to see a society that recognises talents and abilities at all levels, beyond economic and academic achievements.

77. For the individual, it means "being the best that you can be". This involves making the best use of the abilities and talents that nature has endowed us with. This is actually not as easy as it sounds, because first we have to know ourselves. We have to have self-knowledge. And after that, sometimes in being the best that we can be, we run up against the expectations placed on us, by parents, peers or society.

78. As a society, we should become more broad-minded in the way we define success. We should cease being so seized by the five Cs.

79. We should still aim, as a nation, for excellence in things like having world class universities, hospitals, or the world's best airport. These are tangible goals, which once attained, does the nation proud. As Singaporeans, we can bask in the nation's success. But we are not mere digits in the nation's grand plan; we are individuals, each with talents and capabilities, and we must strive for individual excellence of our own.

80. As Singaporeans, we will become "active citizens", not mere passive ones. We all have a stake in this country. It is our home, and we will do all that is necessary to make it good. We will keep ourselves well-informed of issues and challenges facing the country, instead of leaving it to the Government to do all the thinking for us. We will offer well-thought out ideas and suggestions, and insightful feedback. Where need be, we will offer criticisms that are founded on

thoughtful consideration, with the aim of making things better, for the country and for ourselves.

II. At the family level

Support one another

81. We now live in an era of unprecedented change, and we need all the mutual support we can get to help us cope. One immediate source of support is our families. Many of us are liable to see them as a source of stress, but we can try seeing them in a different light. We can all help to make our families a haven of support, a source of strength, and a fount of growth.

82. When parents spend time with their children, it is a chance to switch channels, do something different, and thus refresh their minds. When adults spend time with aged parents, it is equally a chance to reflect, to look at life from a different perspective, and thus to recharge.

83. Many of our forefathers faced daunting challenges when they first came to Singapore from their homelands. They turned to their families and clans for help. We can do the same.

III. At the community level

Socialise to relax

84. Beyond our families are our social circles – our friends, religious groups, community organisations, clans, and other social groupings. Many of us probably see them as adding more stress to our lives. But think again: are they not also opportunities to relax? Too often, social events are seen as occasions to network, to build contacts for the bigger cause – which is, what else, Work with a capital W. Is this not self-imposed stress? The same occasions can be times for us to unwind, in the company of people with shared interests. Are we not depriving ourselves if we do not avail ourselves of these opportunities to share in human warmth?

IV. At the national level

Every Singaporean matters

85. Our society as a whole must broaden our concept of success. We need to recognise a variety of talents and skills beyond academic or material success. We need to maximise potential not just of the most able, but of every Singaporean. We must give everyone a second chance.

86. We do not run but one race in life. We run multiple races, and some we lose, others we win. We have to learn to forgive those who do not win; equally importantly, we have to learn to forgive ourselves, and try again. The spirit of marathon, and the belief that we can triumph against the odds, are fundamental values we must reinforce in Singapore society. In this, everyone has a part to play. Every Singaporean matters.

Conclusion

87. We do not claim the above ideas to be all original Many Singaporeans, concerned about Singapore's future, have already voiced many of these ideas. They are ingredients towards creating the ideal society we hope for Singapore, which will result in this island being our best home. By putting them together, we hope to play the role of menu planner. The ultimate role of chef is up to you, our fellow Singaporean.

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Baba Baidyanath Temple, Deoghar
A Unique Spiritual Experience

Gyan Rajhans, Toronto, Canada

Gyan Rajhans, scientist, author and broadcaster, relates his true-life experience of receiving the ever-elusive 'true bliss' at the Shiva temple of Baba Baidyanath at Deoghar in Eastern India, thousands of miles away from his home in Canada.

In the winter of 2005, I left for India, accompanied by my wife Nilu, for a 15 day trip to visit the Hindu temples of South India. On our arrival in Delhi we learned that the entire south India was experiencing heavy flood situation and that we may have to either postpone our trip or cancel it. So, we decided to go to Mumbai to visit the Siddhi Vinayak Temple, but that plan did not work out either.

Call of Baba Baidyanath

On my birthday, when I was chanting 'Mahamrityunjay Mantra,' it suddenly dawned on me that Baba Baidyanath, one of the 12 Jyotirlingams of Lord Shiva located at Deoghar is calling me to worship Him and that is why He is creating all these problems with our planned trips.

After convincing Nilu about my inner voice, we departed for Deoghar in the Eastern Indian state of Jharkhand. When we reached the following day, Nilu and I did the 'Abhishekam' of Baba Baidyanath Jyotirlingam and planned to do the 'Abhishekam' again before leaving. But, Baba had planned something else for me.

About the Temple

The temple of Baba Baidyanathdham is situated in a spacious courtyard bounded by stone walls. In the temple complex are 22 other temples. The Baidyanath temple faces east. The top of the original Shiva Lingam was slightly broken, keeping with the legend that it chipped away when Ravana tried to uproot it. The Lingam has since been rebuilt. Near the temple is the Shivaganga Lake. The Chandrakoopa well, near the main entrance is said to have been built and consecrated with water from several pilgrimages by Ravana.

The Touch of Shiva

As soon as I touched the Lingam, unique feeling overpowered me and forced me to promise Baba Baidyanath to do his 'Abhishekam' every day of my stay in Deoghar. Consequently, I ended up doing the 'Abhishekam' every morning at 7 am. My daily Abhishekam continued for five weeks culminating on January 14, Makar Sankranti day.

Invoking the Lord: Shakti Abhishekam

Although I had originally planned to do the Abhishekam of only the Jyotirlingam, I was convinced by the priests in the shrine to do the Abhishekam of Lord Ganesh and Ma Kali also on a daily basis. Instructions to worship Lord Ganesh (also my 'Ishta Devta' - household god) were in line with the Hindu tradition but why the Abhishekam of Ma Kali. That was because of the Tantrik links of the temple.

A Power Center: Shakti Peetha

I was told by one of the old priests that Baidyanath is also considered as one of the 52 Shakti Peetha shrines of Sati. It is believed that the heart of Sati fell here, when her half burnt body being carried by Shiva at the end her sacrifice at Daksha's Yagna, was chopped to pieces by Vishnu's discus.

Tantrik Links

Baidyanathdham is a popular Tantrik seat for Sadhakas. Famous scholar and Tantric Gopinath Kaviraj has mentioned Baidyanathdaham as a seat of Tantric Sadhana. There is also one ever flaming Kund where tantrik rituals are being performed for Shakti Sadhana. Tantric Sadhana is the crux to worship Lord Shiva and Shakti.

My Unique Spiritual Experience

Every day after touching the Baidyanath Jyotirlingam I felt the kind of bliss and tranquility I had never felt before in my 64 year old life. The unique and blissful experience I had during this trip is beyond description. I felt truly blessed. It was so intoxicating that I could not wait to go to the temple every morning. Nothing seemed to bother me; bare feet, cold wave, the massive crowd, the mud in the courtyard, long lineup and the persistence of the Pandas.

Experiencing True Bliss

I have never been happier in my life. I kept asking myself: Is this the "true bliss" the scriptures and saints have talked about? Why else, I am not complaining about the unruly crowd, and lack of amenities that I used to during my previous visits. My relatives and friends tried their best to persuade me to visit them but I would not go. I got to have Baba's darshan every day. Mentally I was in a totally different world. Everything and anything I wished for in those five weeks appeared before me without any effort on my part.

As much I want to describe to you how I felt, I can't. All I can say "Experiencing is believing." I had heard in the past that Baba Baidyanath fulfils desires of devotees and hence the number of pilgrims is increasing exponentially every year, especially during the Shravan month. However, I must admit Baidyanath Jyotirlingam is a great power, gracing great effects.

The Ravana Legend

The Puranas speak of the Baidyanath Jyotirlingam. According to the Shiva Purana, it was in the Treta Yuga that the demon Ravana, king of Lanka, felt that his capital would not be perfect and free from enemies unless Lord Shiva stays there forever, he paid continuous meditation to Lord Shiva.

Finally, Shiva was pleased and permitted him to carry his lingam with him to Lanka. Lord Shiva advised him not to place or transfer this lingam to anyone. There should not be a break in his journey to Lanka. If he deposits the lingam anywhere on the earth, in the course of his journey, it would remain fixed at that place forever. Ravana was happy as he was taking his return journey to Lanka.

His fate willed otherwise. The gods took it ill. They never liked to see Lord Shiva as his protector. They devised a plan for outwitting Ravana. They requested Varuna (the god of water) to enter into the belly of Ravana. So, on his way Ravana felt a severe urge to release water. He began looking for a man to whom he could temporarily entrust the lingam.

Lord Vishnu appeared before Ravana in the guise of a Brahmin. Unaware of the mystery, Ravana handed over the lingam to the Brahmin. Unfortunately, Ravana could not ease himself soon.

Meanwhile, the Brahmin placed the lingam at this place which was and which is now Baidyanathdham.

Ravana tried hard to remove the lingam from the spot where it had been placed. He could not turn out the lingam even an inch. This made him frustrated. He used violence but he only succeeded in pushing the lingam by thumb. Later on he felt guilty of his doings and begged for forgiveness.

He returned to Lanka but visited daily to worship the lingam. This continued forever. The place where Ravana descended on the earth is identified with the present Harilajori about four miles north of Baidyanathdham. The place where the lingam was kept is now Deoghar and the lingam itself is known to all as Baidyanath Jyotirlingam.

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Korean Blanket

Dr. Manis Kumar Jha, Daejeon, South Korea

It was much exciting moment for Dr. Ram Lochan Pandey when he was selected for going abroad to join the job. Dr. Ram Lochan Pandey joined his job in S. Korea. It was the matter of prestige and proud for himself, his family and relatives too. Due to the children's education his wife is living with her father and mother. Once the time came when Dr. pandey's wife visited to Korea for a short trip to expend the summer vacation and purchase some thing from here. One item was Pasmina Blanket. She returned to her home town and after reaching, she asked and explain very much about the quality of that blanket. Relative also motivated psychologically that this pasmina blanket is really excellent and more cheaper than India. As I believe in India there are also high quality blankets available and, may be in cheaper price comparison to Korea.

We are from Bihar as you know. We have to show some thing especially in SASURAL that I am some thing. In this case wife also support her husband in many manner that my husband is so & so. His living style is so and so. In India there is nothing …in abroad every thing is excellent and fine like that…

After few month, when Dr. Pandey visited India, he got much importance especially on the topic of blanket. There was one order from his relative father-in laws (MAUSA SASUR) to send a blanket from Korea. After reaching Korea Dr. Pandey started exercise to search a more good blanket shop. But price was not supporting when he tried for much good quality. Any way this was the matter of SASURAL so after spending 10 days for this work, he finally compromise and purchased that blanket in 50 USD. Dr. Pandey knows that the same thing is available in Delhi and in Kashmir in 20 USD, but the matter was from SASURAL with special recommendation of his wife. So there was no way to retrieve the promise of Blanket as gift.

After purchasing the blanket the matter came how to send this as soon as possible. He went post-office for parcel the same. The blankets weight was 5 kg and its packets weight was 1.5 kg. So, total cost for its parcel was 50 USD. The matter related to SASURAL so he paid it and sent to MAUSA SASUR. Then he started to calculate how much the price of blanket. He concluded 100USD. In this price anyone can purchase at-least 3 or 4 blanket in India.

After some time Dr. Pandey asked his SASUR in telephone "How is that blanket?". He replied it is very good but please purchase at least 3 pieces more as my sister-in-law taken that blanket with her. And there are two three more demand inside family. Everyone wants this excellent Korean blankets. Last week Dr. Pandey also got some frequent phone calls from his close relatives about that blanket to send as gift. The relatives think the blanket is very small thing for Dr. Pandey as he is living in South Korea. He can send it as gift. Then Dr. Pandey understood, he simply told *"Due to the loss in business now the Korean blanket factory closed".*

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The BIG Keyboard Shortcut List

Lalit Chowdhary, New Delhi, India

What is the allure of keyboard shortcuts? Do they really save time? Why bother since my mouse is permanently attached to my hand?

I like to use keyboard shortcuts, especially if someone is watching me, because they make me look like a pro. With just a few key strokes I can leave a mouser spinning his wheel! Whatever your motivation, here's a big list of keyboard shortcuts:

GENERAL SHORTCUTS

ALT- F4 - Quit a program / Shut down
ALT-TAB - Hold down the ALT key and hit tab to cycle through open windows.
CTL-ESCAPE - Display the Start menu
SHIFT - TAB - tab backwards through a form
CTRL - X - Cut
CTRL - C - Copy
CTRL - V - Paste
F1 - Help menu
CTRL - Z - Undo
SHIFT & Restart - To restart just windows and not your whole computer, hold down the shift key when you click the OK button on the shutdown screen. Saves lots of time. (not for XP)
CRTL-TAB - Navigate tabs on a tabbed screen

FILE & DESKTOP SHORTCUTS

Hold SHIFT while inserting a CD - Prevents the CD from "autorunning"
If an item is selected:
CTRL while dragging a file - Copies the file
CTRL - SHIFT while dragging a file - Creates a shortcut to the file
SHIFT - DELETE - Deletes an item without sending it to the recycle bin.
ALT-ENTER - Display a file's properties.
F2 - To rename the file
In Windows Explorer:
LEFT ARROW - Collapse the current selection if it is expanded
NUM LOCK-MINUS SIGN (-) - Collapse the selected folder

RIGHT ARROW - Expand the current selection if it is collapsed -Or- Select the first subfolder
NUM LOCK- * Expand all folders below the current selection
NUM LOCK- PLUS SIGN (+) - Expand the selected folder
F6 - Switch between left and right panes
In My Computer:
BACKSPACE - View the folder one level up
ALT- RIGHT ARROW - Move forward to a previous view
ALT- LEFT ARROW -Move backward to a previous view

INTERNET BROWSER SHORTCUTS

For Internet Explorer 6 and Netscape 7 (may work in older versions)

Open History Window	Ctrl+H
Reload	Ctrl+R
Back (Previous Page)	Alt+Left Arrow or Alt+Backspace
Forward (Next Page)	Alt+Right Arrow
Stop	Esc
Home	Alt+Home
Go to Bottom of Page	End
Go to Top of Page	Home
New Window	Ctrl+N
Close WIndow	Ctrl+W
Go Up one Line	Up Arrow
Go Down One Line	Down Arrow
Full Screen (toggle)	F11
Find on Page	Ctrl+F

Add Current Page to Favorites	Ctrl+D
Print Current Page or Active Frame	Ctrl+P
Organize Favorites (IE)/ Manage Bookmarks (NS)	Ctrl+B
Maximize a Window	Alt+Space+x
Minimize a window	Alt+Space+N
Scroll page up	Alt+Up Arrow
Scroll page down	Alt+Down Arrow

Internet Explorer ONLY

Open Favorites Bar	Ctrl+I
Select text in address bar	Alt+D
Force Reload (not from cache)	Ctrl+F5

A faster way to type in addresses with IE is to just type in the name of the site: worldstart
and hit CTRL + Enter. The "http://www. " and ".com" will be added for you!

Netscape ONLY

Open / Close Sidebar Panel (toggle)	F9
Select text in Location Bar	Ctrl+L
Force Reload (not from Cache)	Ctrl+Shift+R
Zoom Text Smaller	Ctrl+- (minus)
Zoom text larger	Ctrl+= (plus sign)

WINDOWS KEY SHORTCUTS

The Windows key can be used in conjunction with other keys to act as a keyboard shortcut for faster access to menu commands. Now, while the Alt key tends to open program menus (ex: Alt+F opens the File menu and Alt+E opens the Edit menu) and the Ctrl key performs actual operations (ex: Ctrl+C will copy and Ctrl+V will paste), the Windows key will open various Windows tools...

Win key + R will open the Start menu's Run box

Win key + F will open the Start menu's Find window

Win key + E will quickly launch Explorer

Win key + Pause/Break will open the System Properties window

Win key + M will Minimize all windows

Win key + Shift + M will undo Minimize all windows

Win key + D will switch between minimizing all open programs and showing them all

Win key + Tab will cycle through items on the taskbar

Win key by itself will open the Start menu

You can also open programs or folders on your desktop by pressing the Windows key + the first letter of the program/folder/shortcut + Enter . Sounds kinda tedious, but if you're in a bind with your mouse, it can come in quite handy.

ARROW TRICKS

Here's a cool little arrow trick to try with word processing programs. Next time you're using your arrow keys to go from one area of a sentence to another (left and right arrows), hold down your CTRL key. Instead of moving one space at a time, you'll go one word at a time.

If you're using the up and down arrows to go from line to line, holding down the CTRL key will make your cursor jump from paragraph to paragraph (well, from carriage return to carriage return anyway).

One last thing, if you hold down the SHIFT key while you do this (i.e. hold down SHIFT + CTRL at the same time), you select text as you arrow along.

I've tested this in MS Word and Wordpad, but it *should* work no matter what word processing program you use.

HOME / END KEY FUN

Do you ever find yourself scrolling through a huge folder ? Well, if you need to get to the beginning or the end quickly, just press **Ctrl+Home** . If you want to get to the end, click **Ctrl+End**.

Speedup your work by using keyboard more and mouse less.

Useful Shortcut:

Start + M: Minimizes all open windows
Start + Shift + M: Maximizes All Windows
Start + E: Runs Windows Explorer
Start + R: Open the RUN Dialog Box
Start + F: Open the Search Results Dialog box
Start + CTRL + F: Opens the Search Results-Computer dialog Box (if the computer is connected to a network)
Start + Pause (Break): Opens the System Properties Dialog Box

Windows System Key Combinations:

F1: Help
CTRL + ESC: Open Start menu
ALT + TAB: Switch between open programs
ALT + F4: Quit program
SHIFT + DELETE: Delete item permanently

Windows Program Key Combinations:

CTRL + C: Copy
CTRL + X: Cut
CTRL + V: Paste
CTRL + Z: Undo
CTRL + B: Bold
CTRL + U: Underline
CTRL + I: Italic

Mouse Click/Keyboard Modifier Combinations for Shell Objects:

SHIFT + right click: Displays a shortcut menu containing alternative commands
SHIFT + double click: Runs the alternate default command (the second item on the menu)
ALT + double click: Displays properties
SHIFT + DELETE: Deletes an item immediately without placing it in the Recycle Bin

General Keyboard-Only Commands:

F1: Starts Windows Help
F10: Activates menu bar options
SHIFT + F10: Opens a shortcut menu for the selected item (this is the same as right-clicking an object

CTRL + ESC: Opens the Start menu (use the ARROW keys to select an item)
CTRL + ESC or ESC: Selects the Start button (press TAB to select the taskbar, or press SHIFT+F10 for a context menu)
ALT + DOWN ARROW: Opens a drop-down list box
ALT + TAB: Switch to another running program (hold down the ALT key and then press the TAB key to view the task-switching window)
SHIFT: Press and hold down the SHIFT key while you insert a CD-ROM to bypass the automatic-run feature
ALT + SPACE: Displays the main window's System menu (from the System menu, you can restore, move, resize, minimize, maximize, or close the window)
ALT +- (ALT + hyphen): Displays the Multiple Document Interface (MDI)child window's System menu (from the MDI child window's System menu, you can restore, move, resize, minimize, maximize, or close the child window)
CTRL + TAB: Switch to the next child window of a Multiple Document Interface (MDI) program
ALT + underlined letter in menu: Opens the menu
ALT + F4: Closes the current window
CTRL + F4: Closes the current Multiple Document Interface (MDI) window
ALT + F6: Switch between multiple windows in the same program (for example, when the Notepad Find dialog box is displayed ALT + F6: switches between the Find dialog box and the main Notepad window)

Shell Objects and General Folder/Windows Explorer Shortcuts For a selected object:

F2: Rename object
F3: Find all files
CTRL + X: Cut
CTRL + C: Copy
CTRL + V: Paste
SHIFT + DELETE: Delete selection immediately, without moving the item to the Recycle Bin
ALT + ENTER: Open the properties for the selected object
To Copy a File: Press and hold down the CTRL key while you drag the file to another folder.
To Create a Shortcut: Press and hold down CTRL+SHIFT while you drag a file to the desktop or a folder.

General Folder/Shortcut Control:

F4: Selects the Go To A Different Folder box and moves down the entries in the box (if the toolbar is active in Windows Explorer)
F5: Refreshes the current window.
F6: Moves among panes in Windows Explorer
CTRL + G: Opens the Go To Folder tool (in Windows 95 Windows Explorer only)
CTRL + Z: Undo the last command
CTRL + A: Select all the items in the current window
BACKSPACE: Switch to the parent folder
SHIFT + click + Close button: For folders, close the current folder plus all parent folders

Windows Explorer Tree Control:

Numeric Keypad *: Expands everything under the current selection
Numeric Keypad +: Expands the current selection
Numeric Keypad -: Collapses the current selection.
RIGHT ARROW: Expands the current selection if it is not expanded, otherwise goes to the first child
LEFT ARROW: Collapses the current selection if it is expanded, otherwise goes to the parent

Properties Control:

CTRL + TAB/CTRL + SHIFT + TAB: Move through the property tabs

Accessibility Shortcuts:

Press SHIFT five times: Toggles StickyKeys on and off
Press down and hold the right SHIFT key for eight seconds: Toggles FilterKeys on and off
Press down and hold the NUM LOCK key for five seconds: Toggles ToggleKeys on and off
Left ALT + left SHIFT+NUM LOCK: Toggles MouseKeys on and off
Left ALT + left SHIFT+PRINT SCREEN: Toggles high contrast on and off

Microsoft Natural Keyboard Keys:

Windows Logo: Start menu
Windows Logo + R: Run dialog box
Windows Logo + M: Minimize all
SHIFT + Windows Logo+M: Undo minimize all

Windows Logo + F1: Help
Windows Logo + E: Windows Explorer
Windows Logo + F: Find files or folders
Windows Logo + D: Minimizes all open windows and displays the desktop
CTRL + Windows Logo + F: Find computer
CTRL + Windows Logo + TAB: Moves focus from Start, to the Quick Launch toolbar, to the system tray (use RIGHT ARROW or LEFT ARROW to move focus to items on the Quick Launch toolbar and the system tray)
Windows Logo + TAB: Cycle through taskbar buttons
Windows Logo + Break: System Properties dialog box
Application key: Displays a shortcut menu for the selected item

Microsoft Natural Keyboard with IntelliType Software Installed:

Windows Logo + L: Log off Windows
Windows Logo + P: Starts Print Manager
Windows Logo + C: Opens Control Panel
Windows Logo + V: Starts Clipboard
Windows Logo + K: Opens Keyboard Properties dialog box
Windows Logo + I: Opens Mouse Properties dialog box
Windows Logo + A: Starts Accessibility Options (if installed)
Windows Logo + SPACEBAR: Displays the list of Microsoft IntelliType shortcut keys
Windows Logo + S: Toggles CAPS LOCK on and off

Dialog Box Keyboard Commands:

TAB: Move to the next control in the dialog box
SHIFT + TAB: Move to the previous control in the dialog box
SPACEBAR: If the current control is a button, this clicks the button. If the current control is a check box, this toggles the check box. If the current control is an option, this selects the option.
ENTER: Equivalent to clicking the selected button (the button with the outline)
ESC: Equivalent to clicking the Cancel button
ALT + underlined letter in dialog box item: Move to the corresponding item

Compiled **by Sri Lalit Choudhary, Web Master BiharBrains.**

A Fuel Tank Full of Water
An Interesting Article from New Scientist

Posted by Dr. S. G. T. Bhat, Daejeon, South Korea

FORGET cars fuelled by alcohol and vegetable oil. Before long, you might be able to run your car with nothing more than water in its fuel tank. It would be the ultimate zero emissions vehicle. While water, plain old H2O, is not at first sight an obvious power source, it has a key virtue: it is an abundant source of hydrogen, the element widely touted as the green fuel of the future. If that hydrogen could be liberated on demand, it would overcome many of the obstacles that till now have prevented the dream of a hydrogen-powered car becoming reality.

Producing hydrogen by conventional industrial means is expensive, inefficient and often polluting. Then there are the problems of storing and transporting hydrogen. The pressure tanks required to hold usable quantities of the fuel are heavy and cumbersome, which restricts the car's performance and range.

Tareq Abu-Hamed, now at the University of Minnesota, and colleagues at the Weizmann Institute of Science in Rehovot, Israel, has devised a scheme that gets round these problems. By reacting water with the element boron, their system produces hydrogen that can be burnt in an internal combustion engine or fed to a fuel cell to generate electricity.

"The aim is to produce the hydrogen on-board at a rate matching the demand of the car engine," says Abu-Hamed. "We want to use the boron to save transporting and storing the hydrogen." The only by-product is boron oxide, which can be removed from the car, turned back into boron, and used again. What's more, Abu-Hamed envisages doing this in a solar-powered plant that is completely emission-free.

Simple chemistry

The team calculates that a car would have to carry just 18 kilograms of boron and 45 litres of water to produce 5 kilograms of hydrogen, which has the same energy content as a 40- litre tank of conventional fuel. An Israeli company has begun designing a prototype engine that works in the same way, and the Japanese company Samsung has built a prototype scooter based on a similar idea.

The hydrogen-on-demand approach is based on some simple high-school chemistry. Elements like sodium and potassium are well known for their violent reactions with water, tearing hydrogen from its stable union with oxygen. Boron does the same, but at a more manageable pace. It requires no special containment, and atom for atom it's a light material. When all the boron is used up, the boron oxide that remains can be reprocessed and recycled.

Abu-Hamed and his team are not the first to investigate hydrogen-on-demand vehicles. The car giant DaimlerChrysler built a concept vehicle called Natrium (after the Latin word for sodium, from which the element's Na symbol is drawn), which used slightly more sophisticated chemistry to generate its hydrogen. Instead of pure water as the source of the gas, it used a solution of the hydrogen-heavy compound sodium borohydride. When passed over a precious-metal catalyst such as ruthenium, the compound reacts with water to liberate hydrogen that can be fed to a fuel cell. It was enough to give the Natrium a top speed of 130 kilometers per hour and a respectable range of 500 kilometers, but DaimlerChrysler axed the project in 2003 because of difficulties in providing the necessary infrastructure to support the car in an efficient, environmentally friendly way. Ingenuity, an Israeli start-up company run by Amnon Yogev, a former Weizmann Institute scientist, is working on a similar strategy, but using the reaction between aluminum wire and water to generate hydrogen. In Ingenuity's design, the tip of the metal wire is ignited and dipped into water to begin splitting the water molecules. The liberated hydrogen is piped into the engine alongside the resulting steam, where it is mixed with air and burnt. Ingenuity is looking for investors to pay for a prototype, and claims it will be able to commercialize its idea "in a few years' time". The US company Power Ball Technologies envisages a hydrogen-on-demand engine containing plastic balls filled with sodium hydride powder that are split to dump the contents into water, where it reacts to produce hydrogen.

Abu-Hamed says the generation of hydrogen for his team's engine would be regulated by controlling the flow of water into a series of tanks containing powdered boron. To kick-start the

reaction, the water has to be supplied as vapor heated to several hundred degrees, so the car will still require some start-up power, possibly from a battery. Once the engine is running, the heat generated by the highly exothermic oxidation reaction between boron and water could be used to warm the incoming water, Abu-Hamed says. Alternatively, small amounts of hydrogen could be diverted from the engine and stored for use as the start-up fuel. Water produced when the hydrogen is burnt in an internal combustion engine or reacted in a fuel cell could be captured and cycled back to the vehicle's tank, making the whole on-board system truly zero-emission.

Hydrogen-on-demand, whether from water or another source, could address two of the big problems still holding back the wider use of hydrogen as a vehicle fuel: how to store the flammable gas, and how to transport it safely. Today's hydrogen-fuelled cars rely on stocks of gas produced in centralized plants and distributed via refueling stations in either liquefied or compressed form. Neither is ideal. The liquefaction process eats up to 40 per cent of the energy content of the stored hydrogen; while the energy density of the gas, even when compressed, is so low it is hard to see how it can ever be used to fuel a normal car.

"Hydrogen-on-demand does not need costly infrastructure and makes cars safer"

Hydrogen-on-demand would not only remove the need for costly hydrogen pipelines and distribution infrastructure, it would also make hydrogen vehicles safer. "The theoretical advantage of on-board generation is that you don't have to muck about with hydrogen storage," says Mike Milliken, who monitors developments in alternative fuels for the Green Car Congress website. A car that doesn't need to carry tanks of flammable, volatile liquid or compressed gas would be much less vulnerable in an accident. "It also potentially offsets the requirements for building up a massive hydrogen production and distribution infrastructure," Milliken says.

There is a potentially polluting step that has to be tackled. "You'll need an infrastructure to produce and distribute whatever the key elements of the generation system might be," Milliken warn. While Abu-Hamed's scheme still requires a distribution network and reprocessing plant, he has devised an ingenious plan that will allow the spent boron oxide to be converted back to metallic boron in a pollution-free process that uses only solar energy (see Diagram). Heating the oxide with magnesium powder recovers the boron, leaving magnesium oxide as a by-product. The

magnesium oxide can then be recycled by first reacting it with chlorine gas to produce magnesium chloride, from which the magnesium metal and chlorine can then be recovered by electrolysis.

Solar source

The energy to drive these processes would ultimately come from the sun. The team calculates that a system of mirrors could concentrate enough sunlight to produce electricity from solar cells with an efficiency of 35 per cent. Overall, they say, their system could convert solar energy into work by the car's engine with an efficiency of 11 per cent, similar to today's petrol engines.

Experts are skeptical that we'll be seeing cars running on water any time soon. "It's not the kind of thing you're going to see appearing in a car in five or even ten years' time," says Jim Skea, research director at the UK Energy Research Centre in London. For example, DaimlerChrysler is now focusing its efforts on cars running on compressed hydrogen because filling stations that supply it already exist in some places.

Proponents of cars that run on water are banking that long term the idea will win out. Engineuity's Yogev claims the running costs will be comparable to those of today's petrol engines and expects to have a prototype built within three years. My other car runs on water? Don't bet against it.

About the Author: "This article by David Adam, Reed Business Information, UK" appeared in July 29 issue of New Scientist, and posted by Dr. SGT Bhat, working at KIER, Daejeon, South Korea as Visiting Scientist. He was formerly with Indian Petrochemicals Corporation Ltd. Baroda, India as Vice President (R&D). He can be reached at: bhatsgt@yahoo.com

Time to Change, Time for You, Time for Manthan

Pratyush kumar, London, UK

Manthan is going to be launched and with its debut, we all, have to begin a new thinking process to explore our own inner self to help ourselves. We must realize our own strengths and limitations if we want to go beyond them to realise our wonderful dreams.

Believe me my friends; YOU can do it if YOU really want to do it.

We can go beyond our limitations to achieve our dreams of having a wonderful life and a fantastic career but how and when?

This is where most of us get stuck and we go back to our favourite cocoon to remain there as what we were yesterday and are today but is it what we want to remain even tomorrow? Do YOU want to be the same person for whole your life or YOU want to explore further to help yourself to get ahead in life?

Choice is indeed only YOURS…….

Have YOU ever tried really hard to reflect deep and explore further for YOUR own life, career and challenges you deal with on daily basis.

Let us reflect on some Eternal Questions – which start with very simple and well known concept of 5 W's and 1 H - What, When Where, Why, Who, and How.

It has been time and again well proved that answers of above mentioned questions can help anyone not only to define the real problem but also to find out the right solution for it.

Let us try it out for ourselves. Let's think and discuss with your friends and relatives in order to find out the real reasons behind our deprivation and the right approach to get the best solution for it.

This theory is applicable to everyone – Me, You or Our State.

What are the real problems which we are facing? What is there which stops me and YOU to go ahead in our life? What can we do? How can we do? When should we do? Why should we do?

Let us think and think again till the time we get right answers for such eternal questions…

Is it only due to the nexus of some Criminals, crooked Politicians and inept Bureaucrats or is it YOU who is actually behind your failures in life or is it much more than that?

1. Do YOU know what your real problem is?
2. Have YOU ever thought about it?
3. Is it your Education which stops YOU to go ahead in life?
4. Is it the limitation of your Language skills?
5. Is it the lack of Information on the subject YOU want to study?
6. Is it lack of good Soft Skills?
7. Is it lack of Money or Resources?
8. Is it something else?

It's your time to think and to think deep. It's time to explore. It's time to change for good, for your own self, for your family and for your society and only YOU have to do it.

Think about the real problem, find the problem and then think again to get the solution for it.

Let us take some examples to understand this process to find out a problem and then to explore further to get its right solution.

Do YOU have any problem?

If yes, what is the real problem?

1. Is it your Education?

If Yes,

a. What are YOU doing to upgrade your skill set? Are YOU studying further? If not, why?
b. Have YOU joined any course / certification? Can YOU complete it faster? Can YOU be the best in what YOU are studying?
c. If not what is stopping YOU to do so?
d. Do YOU really want it?

e. Rethink.

2. Is it the limitation of your Language or Soft skills?

If Yes,

a. Is English Speaking / Presentation Skills, etc. your problem?
b. What can YOU do to improve it?
c. Can YOU join a professional course to improve your skills?
d. Do YOU have access to TV / Radio? Do YOU watch TV / listen to Radio?
e. Do YOU practice enough and regularly?

3. Is it your lack of Information / Knowledge on the subject?

If Yes,

a. What are YOU doing to get this?
b. Are YOU talking to friends, teachers and others about it?
c. Are YOU searching on Internet / in Libraries?
d. How soon YOU want to get it?
e. Are YOU trying hard enough to get it?

4. Is it lack of Money or Resources?

If Yes,

a. What are YOU doing to get it?
b. Are YOU taking any initiative to get that extra buck? Are YOU doing some part time job?
c. Have YOU checked with all your relatives and friends?
d. Have YOU checked with the organisations, schools and colleges which offer scholarships?
e. Have YOU checked with banks for loans?

In order to continue your journey on the path of excellence, positive thinking and repeated success, YOU have to raise, time and again above mentioned questions in order to find out their answers, and to get their answers YOU have to keep Reading, Surfing, Observing (not watching), Discovering, Writing and Speaking.

Keep moving…. on and on…..till the time OPPORTUNITY knocks at your door.

Once it knocks at your door, grab it strongly and then go all out to create opportunities for others.

Create Opportunities to change and to make a difference wherever YOU are and whatever YOU are doing so that we all grow together - today, tomorrow and forever.

Time has come now. It's the Time to Explore, **Time to Change, Time for YOU, Time for Manthan.**

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Desktop fabricator may kick-start home revolution

A cheap self-assembly device capable of fabricating 3D objects has been developed by US researchers. They hope the machine could kick start a revolution in home fabrication – or "rapid prototyping" – just as early computer kits sparked an explosion in home computing.

Rapid prototyping machines are already used by designers, engineers and scientists to create one-off mechanical parts and models. These create objects by depositing layer upon layer of liquid or powdered material. These machines typically cost from $20,000 to $1.5 million, says Hod Lipson from Cornell University, US, who launched the Fab@Home project with PhD student Evan Malone in October 2006.

The standard version of their Freeform fabricator – or "fabber" – is about the size of a microwave oven and can be assembled for around $2400 (£1200). It can generate 3D objects from plastic and various other materials. Full documentation on how to build and operate the machine, along with all the software required, are available on the Fab@Home website, and all designs, documents and software have been released for free.

Many hands

"We are trying to get this technology into as many hands as possible," Malone told **New Scientist**. "The kit is designed to be as simple as possible." Once the parts have been bought, a normal soldering iron and a few screwdrivers are enough to put it together. "It's probably the cheapest machine of this kind out there," he adds.

The machine connects to a desktop computer running software that controls its operation. It then creates objects layer-by-layer by squeezing material from a mechanically-controlled syringe. A video shows a completed machine constructing a silicone bulb (16MB, wmv format).

Unlike commercial equipment, the Fab@Home machine is also designed to be used with more than one material. So far it has been tested with silicone, plaster, play-doh and even chocolate and icing. Different materials can also be used to make a single object – the control software prompts the user when to load new material into the machine. Malone and Lipson hope Fab@Home will grow into a community of enthusiasts who share designs for 3D objects and even modify the machines for themselves. This will prompt the emergence of widespread personal fabrication, Lipson hopes.

"We think it's a similar story to computers," he explains. "Mainframes had existed for years, but personal computing only took off in the late seventies." A cheap self-assembly computer called the Altair 8800, launched in 1975, sparked the rapid development of personal computing, he notes: "We hope Fab@Home can do the same for rapid prototyping."

Copy cat

Adrian Bowyer, who is also working on rapid prototyping machines at Bath University, in the UK, agrees that the technology could have mass appeal once the equipment is cheap enough. One of his own machines can even make some of its own parts (see *3D printer to churn out copies of itself*).

"Fab@Home is an interesting idea; it should be easy for anyone in the world to build," Bowyer says. "Once you've used one you never want to go back, it's liberating and enormously fun." Bowyer believes the technology could one day even replace traditional models of manufacturing.Bowyer adds that the Fab@Home machine could probably already be used to make many cheap injection-moulded products already on the market: "I can imagine people swapping plans of things to make online, or paying to download them instead of going to the shop.

Source:http://www.newscientisttech.com/article/dn10922?DCMP=NLC-nletter&nsref=

Blame for global warming placed firmly on humankind
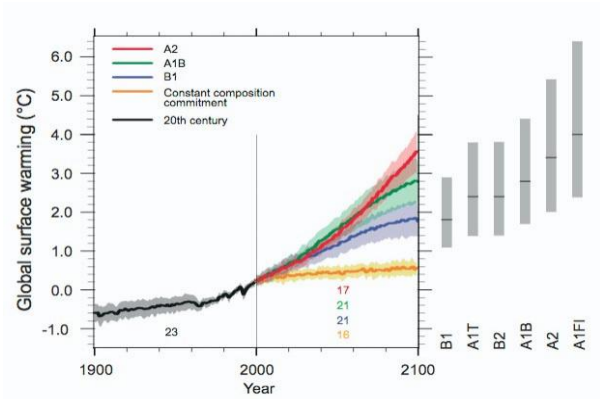
Figure 1. The predicted temperature rise by 2100 is between 1.8 and 4.0°C. This is based on models representing a variety of emissions scenarios and an uncertainty of one standard deviation (grey shading). The orange line is a model where greenhouse gas concentrations were held constant at year 2000 values (Graphic: IPCC)Enlarge
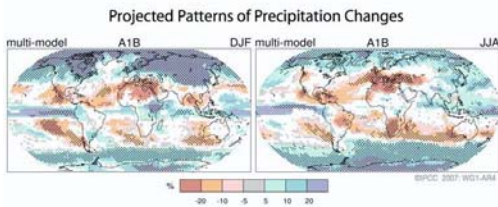
Figure 2. Precipitation is predicted to rise markedly at high latitudes and drop significantly in the tropics. The figure shows the predicted change in precipitation (in percent) in the decade 2090 to 2099, compared to the period 1980 to1999. Precipitation for December to February is on the left and for June to August on the right. In the coloured areas more than 90% of the models agree precipitation will increase or decrease. In the white areas, less than 66% of the models agreed.Enlarge

The 2nd of February 2007 will one day hopefully be remembered as the day the question mark was removed from the debate on whether human activities are driving climate change, said the head of the UN Environment Programme at the launch of the most authoritative scientific report on climate change to date.

The new Intergovernmental Panel on Climate Change report says there is 90% certainty that the burning of fossil fuels and other human activities are driving climate change. Read the global reaction to the report here.

"The word unequivocal is the key message of this report," said Achim Steiner, executive director of UNEP, adding that those who have doubts about the role of humans in driving the climate "can no longer ignore the evidence".

The IPCC report says the rise in global temperatures could be as high as 6.4°C by 2100. The report also predicts sea level rises and increases in the intensity of hurricanes. It is the work of 1200 climate experts from 40 countries, who have spent six years reviewing all the available climate research. It was released in Paris, France, on Friday (read the 21-page summary here, pdf format). Listen to audio from today's press conference.

The last IPCC report, issued in 2001, predicted that temperatures would rise by 1.4°C to 5.8°C by 2100, relative to 1990 temperatures.

But the new report says temperature rises by 2100 could, in the most extreme scenarios, range from 1.1°C and 6.4°C. The most likely range is 1.8°C to 4.0°C (see figure 1, right), with the report predicting that 4°C is most likely if the world continues to burn fossil-fuels at the same rate (read the *The impacts of rising global temperatures*).

Melting, moving ice

Rises in sea levels are predicted by the new report, threatening low-lying areas of land around the world. As the oceans warm, their waters expand, while rising temperatures also increase the melting of the ice sheets that cover Greenland and Antarctica.

In 2001, the IPCC predicted that sea levels would rise by between 9 and 88 centimetres by 2100, relative to 1990 levels. The new report says rises could range from 18 cm to 59 cm. The top end of the range corresponds to a fossil-fuel intensive future (see A1F1 scenario in *Modelling the future climate: the baseline scenarios*).

But predictions of sea level rise are one of the most contentious areas of the report - very recent research has suggested that rises of up to 140 cm are possible (see *Shorelines may be in greater peril than thought*).

The problem is that the understanding of how warming affects Greenland and Antarctic ice sheets remains limited, and they are predicted to be the most important contributors to change. Estimates of the straightforward melting of ice are incorporated in the IPCC report. But warming may also accelerate the movement of ice in glaciers into the ocean, perhaps by meltwater lubricating the undersides of ice streams.

Susan Solomon, one of the report's lead authors, said there was no published research that quantified this effect, and so it was not included. But she added: "If temperatures exceed 1.9°C to 4.6°C above pre-industrial temperatures, and were to be sustained for thousands of years, eventually we would expect the Greenland ice sheet to melt. That would raise sea level by 7 metres."

Climate change is also expected to affect the frequency and strength of tropical storms and hurricanes. The latest IPCC report says the activity of tropical cyclones is "likely" to increase over the 21st century. It says "likely" indicates a probability of more than 66%. This is a bolder statement than the World Meteorology Organisation issued in January.

Precipitation patterns will change too by 2100, according to IPCC predictions (see figure 2, right). Mid- to high-latitude regions will see up to 20% more rain and snow, while the tropical regions will see less.

Humans to blame

Considering the human role in causing climate change, the IPCC report is damning: "The understanding of [human] influences on climate has improved since the [2001] report, leading to a very high confidence that human activities" are responsible for most of the warming seen since 1950, says the report's summary for policymakers. "Very high confidence" is described as "at least a 9 out of 10 chance of being correct".

Before the industrial revolution, human greenhouse gas emissions were small, and the atmospheric concentration of carbon dioxide – the main greenhouse gas – was about 280 parts per million (ppm).

Thanks largely to the burning of fossil fuels and changes in land use, such as agricultural exploitation and deforestation, the atmospheric concentration of carbon dioxide reached 379 ppm in 2005, says the IPCC.

Gold standard

The IPCC draws together the world's leading climate experts to review and assess all available research, under the auspices of UN Environment Programme and the World Meteorology Organization.

The result of their assessment, which is done every five to six years, establishes what is considered the gold standard of consensus on climate change science.

The latest IPCC report was written by hundreds of experts and reviewed by hundreds more, from 113 countries. It is being released in stages during 2007. The first chapter, released on Friday, deals with the scientific basis for climate change.

The next two parts of the IPCC's 2007 assessment, plus a synthesis, will be released throughout the year. Part 2, dealing with the impacts of climate change and our vulnerability to those impacts, will be released in April. Part 3, to be released in May, deals with how we might mitigate these impacts.

Source:http://environment.newscientist.com/article/dn11088-blame-for-global-warming-placed-firmly-on-humankind.html

For Milky Way's black hole, it's feast or famine

The giant black hole at our galaxy's centre ate something about as massive as Mercury 60 years ago, new results from the Chandra X-ray Observatory suggest. The finding adds to previous evidence that the black hole, which is currently starved, does in fact devour things from time to time.

Our galaxy harbours a black hole called SgrA* that weighs nearly 4 million Suns, based on studies of the motion of stars and gas around it. But it does not appear to be gaining any weight at the moment, since it is not flaring up in X-rays, as happens when it sucks matter towards it.

There are signs that it has had larger meals in the past, however. Astronomers can infer the black hole's dietary history by looking for signs of its X-ray flares reaching and heating up gas clouds nearby. By measuring their distances from the black hole, they can tell how long it took for the X-rays to get there and thus when the flares occurred.

Several studies have shown evidence of past outbursts, including one in 2005 suggesting that SgrA* ate a large meal 350 yeas ago that made it a million times brighter than it is now (see *Violent past of Milky Way's black hole revealed*).

Now, a study employing the same technique suggests the black hole had another outburst that would have been visible just 60 years ago, had there been any X-ray observatories around to watch it.

Steady rain

Michael Muno of Caltech in Pasadena, US, and colleagues made the discovery, using Chandra to monitor gas clouds near the black hole that glow in X-rays. Until now, no one was sure whether the glow was due to a previous SgrA* outburst or simply a steady rain of charged particles called cosmic rays hitting the clouds.

Muno's team found that the brightness and shape of the glow associated with the clouds changed between 2003 and 2005. Such rapid changes are not consistent with a steady rain of cosmic rays, the researchers say.

Instead, they argue that 60 years ago, SgrA* brightened by a factor of 100,000 when it swallowed something - probably a cloud of gas and dust - of about Mercury's mass. (Because of the time it takes light to travel to Earth from the galactic centre, the event actually occurred about 26,000 years ago, but it would not have been visible from Earth until 60 years ago.)

Wolf down

As this short blast of X-rays expands from the vicinity of the black hole, it hits different parts of the surrounding gas clouds. This causes the changes in the shape and brightness of the X-ray glow seen by Chandra, they say.

Combined with earlier results, the new findings are helping to piece together a picture of SgrA*'s feeding habits. "We have evidence that maybe every 100 years, the black hole gets bright," Muno says.

This suggests it wolfs down clumps of matter from time to time, rather than just steadily feeding on the wind from nearby stars, as was once believed, he says. Watch an animation of a black hole feeding frenzy.

Although scientists would be excited to see a new outburst of this size from SgrA*, it is safer to observe the echoes from past ones. A directly observed outburst would be very bright. "We wouldn't really want to look at it with Chandra because it might damage the detector unless we took some special precautions," Muno says.

The results were presented on Wednesday at a meeting of the American Astronomical Society in Seattle, Washington, US.

Source:http://space.newscientist.com/article/dn10935?DCMP=NLC-nletter&nsref=dn10935

Invention: Personal TV censor

Personal TV censor

Worried about your kids watching the wrong stuff on TV? Don't trust the official suitability ratings either? An inventor in Salt Lake City, Utah, thinks he has the answer.

A computer connected to a TV set or Personal Video Recorder (PVR) simply monitors electronic programme guides along with the closed captioning text that accompanies programmes for hard of hearing viewers. Software then searches for dubious key words and the computer decides – based on the user's preferences – whether to block the entire programme or simply mute the sound for a short while.

Inventor Matthew Jarman gives some examples. If the programme uses the words "serial killer", the system could block a programme altogether. The same could go for anything that promises an appearance by Pamela Anderson.

The word "damn" could be acceptable on the Discovery Channel, but muted on all movie channels. And the word "bitch" might only be permitted during a programme about pets, and never if preceded by "you". Of course, parents could override everything with a password.

Radio tyre warnings

Checking tires for tread wear is a dirty job, and not easy to do accurately. But drivers need to know when a tyre tread has worn down to 3 millimetres or less, at which point road holding starts to suffer. IBM has a neat way for a car to monitor itself and display a warning on the dashboard when its tyres need changing.

Passive RFID tags are moulded into the tire tread, or stuck into the grooves. While the tags are still in place they reply to a trigger signal continually beamed from an antenna mounted beneath the car. But, as the tread wears out some of the tags are shed and stop responding. So the car automatically "knows" when its tires are getting dangerously thin.

A vehicle could also tell which tire is needs changing because the radio antenna is mounted off centre and thus at unequal distances from all four wheels. So the reply signals received from each tyre has a slightly different delay. The same system could work with trucks and aircraft tires too, IBM says.

Deep fried detector

Here's an idea for anyone who's felt sick after eating greasy fried food. Honeywell, based in New Jersey, US, has come up with an acoustic wave sensor that fits inside a deep fryer and constantly monitors the quality of cooking oil.

Fatty acids build up as oil is used in a fryer and eventually becomes deposited on food cooked in this way. Ultimately, this can cause indigestion for those who eat deep fried foods, Honeywell warns. Its acoustic sensor could detect this build up and warn a chef that the oil needs changing.

The system consists of an antenna that generates acoustic waves and a transducer made from a piezoelectric component, which picks up the acoustic wave and converts it into an electrical signal. The sensor is coated with material that reacts with fatty acids.

The acoustic waveform is damped and modified as fatty acids attach. A connected computer analyses this waveform signal and issues a warning to change the oil when it builds up too much.

Source:http://www.newscientisttech.com/article/dn11054?DCMP=NLC-nletter&nsref=dn11054

Breakthrough of the Year: The Poincare Conjecture Proved

Previous year's Breakthrough salutes the work of a lone, publicity-shy Russian mathematician named Grigori Perelman, who was at the Steklov Institute of Mathematics of the Russian Academy of Sciences until 2005. The work is very technical but has received unusual public attention because Perelman appears to have proven the Poincaré Conjecture, a problem in topology whose solution will earn a $1 million prize from the Clay Mathematics Institute.

Grigori Perelman's proof of the Poincaré conjecture qualifies at least as the Breakthrough of the Decade. But it has taken them a good part of that decade to convince themselves that it was for real. In 2006, nearly 4 years after the Russian mathematician released the first of three papers outlining the proof, researchers finally reached a consensus that Perelman had solved one of the subject's most venerable problems. But the solution touched off a storm of controversy and drama that threatened to overshadow the brilliant work.

Perelman's proof has fundamentally altered two distinct branches of mathematics. First, it solved a problem that for more than a century was the indigestible seed at the core of topology, the mathematical study of abstract shape. Most mathematicians expect that the work will lead to a much broader result, a proof of the geometrization conjecture: essentially, a "periodic table" that brings clarity to the study of three-dimensional spaces, much as Mendeleev's table did for chemistry.

While bringing new results to topology, Perelman's work brought new techniques to geometry. It cemented the central role of geometric evolution equations, powerful machinery for transforming hard-to-work-with spaces into more-manageable ones. Earlier studies of such equations always ran into "singularities" at which the equations break down. Perelman dynamited that roadblock.

In fact, Perelman was already well on his way to a solution. In 1995, the 29-year-old St. Petersburg native had returned to Russia after a 3-year sojourn in the United States, where he had met Hamilton and learned about Ricci flow. For the next 7 years, he remained mostly incommunicado. Then, in November 2002, Perelman posted on the Internet the first of three preprints outlining a proposed proof of the geometrization conjecture.

To experts, it was immediately clear that Perelman had made a major breakthrough.

Source: Science, 22 December, 2006