



Holy Quran - "*Laisa lil insana illa ma sa'a*" --
There is nothing for man except what he strives for (53:39)

INNOVATION AND ENTREPRENEURSHIP: REFLECTIONS OF A PHYSICIST

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Outlines of Talk



- ❑ **Entrepreneur – Coining of the Word**
- ❑ **Innovation & Entrepreneurship: Reflections of a Physicist**
- ❑ **INTERNET: Quiet Revolution**
- ❑ **Novel Health Aid Entrepreneurship : e-cigarettes**
- ❑ **New Economy: Rapidly Changing Global Scenario**
- ❑ **Bridging the Entrepreneurial Activity Gap & Building a Culture of Entrepreneurship**
- ❑ **Concluding Remarks**

Entrepreneur – Coining of the Word



- **“Entrepreneur”** is a loanword from French. **“Entreprendre”** (a verb in French) means **“to undertake”**
- In Sanskrit, **“Antha Prerna”** (sounds close to entrepreneur) means **“Self motivated”**; Bengali synonym **“Anta’stha Prerona”**
- **Richard Cantillon (1680-1734)**, an Irishman, who lived in France, **was the first person to use the term “entrepreneur” in an economic sense** in his book **“*Essai sur la Nature du Commerce au General* (Essay on the Nature of Commerce)”** [published in 1755 after his death].

In his words, “entrepreneur” is applied to anyone who bought or made a product at a certain cost to sell at an uncertain price.

- **Jean Baptiste Say (1767-1832)**, French economist, is **often believed to have coined the word “Entrepreneur”**.

What it means to be an 'Entrepreneur' legally ?



Before proceeding further we start by asking what it means to be an entrepreneur'

- There are ample definitions of 'entrepreneur'. But in some definitions the following situation may arise:

A Team of Social Entrepreneurs building innovative healthcare systems & a Criminal Gang creating illicit trading networks may both find themselves referred to as acting 'entrepreneurially'.

- We do not recognize both the activities as legal.

We should thus be careful to recognize what it means to be an 'entrepreneur'.

Entrepreneurs are simply those who understand that there is little difference between obstacle & opportunity & are able to turn both to their advantage.

- Niccolo Machiavelli

Entrepreneur of the year



Industrial Revolution (yielding products & services that business offers)

Industrial Revolution (IR) : Marked a major turning point in human history.

▣ **Period 1760 – 1840:**

IR Transformed human life circumstances in Britain, US, & Western Europe.

Technological innovations replaced human labor with mechanical work. As a result Society, Medicine, Economy, Education, & Culture all changed.

▣ **2nd IR (~1850): Steam-powered Ships, Railways**

Later-19th century : Internal combustion engine & Electrical power generation

- The use of electricity promoted growth on a large scale.
- Consumer goods were produced in bulk.

Electric Revolution → Technological & Economic progress gained momentum.



Innovation & Entrepreneurship: Reflections of a Physicist

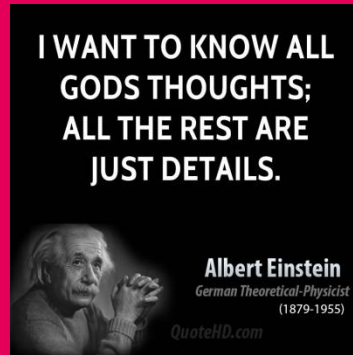
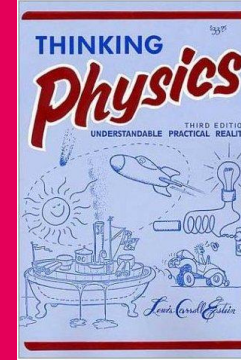


- ▣ I am a physicist - not connected directly with any business endeavour whatsoever.

When invited to present a Key Note Speech at this Conf. on “*Business innovation, entrepreneurship and engineering*” I kept thinking about my presentation.

I kept thinking about it . . . about whether physicists have anything to do with Business Entrepreneurship or not ?

My Reflections as a Physicist (contd.)



Answer to the question soon become apparent to me:

- ▣ **Physics is the most basic of sciences - its concepts & techniques underpin the progress of all other branches of science including ENGINEERING.**
- ▣ **Physicists are old hands at Entrepreneurship in the way that they played an important role in the first generation of technology-developing companies startups, e.g.**

California's Silicon Valley & Boston's Route 128 after WW-II.

- ▣ **Today, perhaps more than ever, Physicists are involved in startups either as founders or employees.**

So in the next few slides I will be talking about the ROLE OF PHYSICS to discovery, innovation & entrepreneurship.

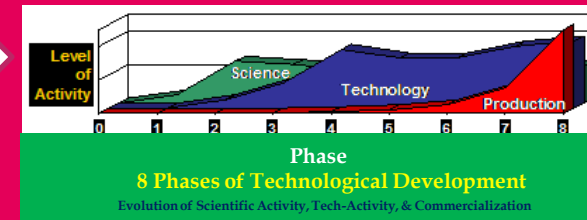
Discovery, Innovation & Entrepreneurship

-- Role of Physics

Discovery & Innovation in Physics Accelerated the Modern Day Entrepreneurship

▣ **Physics, Engineering & Technology** →

- **Linked -- Providing Innovation, Products & Services that so many business now offer**

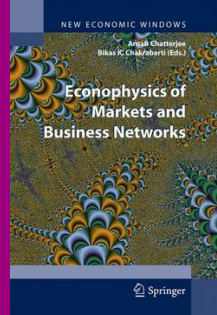


▣ **Health Physics** : Medical Imaging & Diagnostics (including image guided therapies) & more innovation.

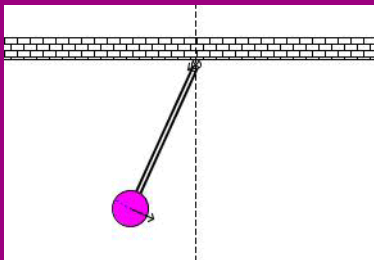
- **Physics based ICT**: Driver of business concepts, e-commerce, m-commerce, virtual enterprises, & mass customization

→ → **Commerce & Technology have become ever more integrated**

Econophysics - Application of ideas & concepts from physics to problems in finance & economics

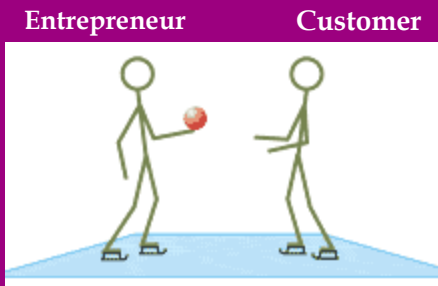


The term “econophysics” was coined by H. E. Stanley. Econophysics was started in the **mid-1990s** by several physicists. **Econophysics, also known as the physics of finance, is the study of the dynamical behavior of financial & economic markets.**



Econophysicists have recently been quite successful in modelling & analyzing various financial systems like trading, banking, stock & other markets. The statistical behavior of the underlying networks in these systems have also been identified & characterized recently.

Want to attract customers ? Marketing Analogy of Physics Principle



To explain how exchanging particles can attract two objects (it has to do with the Heisenberg Uncertainty principle), look at the picture.

This suggests an obvious **marketing analogy**.

Want to attract customers? Stay in close contact by exchanging valuable content. Every time you share useful, enjoyable content - & they engage with it - you are nurturing the relationship & bringing them closer.

Physics at the Root of the Modern Industrial Strategy: **Little Known Facts**



- **Greatest Inventions of the 20th century --- The Electronic Digital Computer, the Transistor, the Laser, & even the World Wide Web (WWW) were all invented by physicists. These inventions make up the foundation of modern technology.**
- **The first electronic digital computer was built in the basement of the **Physics Dep. at Iowa State Univ.** in 1939 by Prof. **J. Atanasoff** (theoret. Physics, Univ. of Wisconsin), & his **physics graduate student C. Berry.****
- Economists & laymen alike know that today's entire world economy is inextricably linked to these technologies. -- **The daily lives of the people would be substantially different were it not for these inventions.**
- **Economic Superpower:** America's **preeminence in computer & IT** is mostly responsible for this status.

The wealth of other nations such as Japan, Taiwan, Western Europe, etc. is also due to their participation & contributions to the information age.

IOP-2011- **Physics-based businesses** have long punched above their weight in the UK economy, accounting for as many jobs as the construction sector & as much gross value added as finance, banking & insurance.

How Physics Build the Concept of Entrepreneurship: The inside story

- Entrepreneurship, as most of us believe is not a recent phenomena but has a vast history of ideas, inventions & intersections **beginning from the early 19th Century World of Physics**.
- It all started when law of classical mechanics & thermodynamics had been established by the likes of Galileo, Newton, Boyle, Bernoulli, Cavendish, Franklin and Lagrange.

Just when these ideas of fundamental science of motion flourished, better ideas came through. As the horizontal base of the pyramid was set, vertical growth was imperative and inevitable.

- Era of Entrepreneurship, started with the invention of **Electric Battery (Voltaic Cell) by Italian Physicist Alessandro Volta (1799)**.



This invention led to more discoveries by **Ampere & Ohm** which gave the basis of electrodynamics.

Physics led to Application-based Engineering

-- Emergence of Inventor-Entrepreneur Philosophy

- An idea Faraday proposed regarding electromagnetic forces still forms the **dev. of electromechanical devices that ruled the 19th Century Engineering.**
Faraday built an electricity powered motor in 1821 & formed the basis of current through magnetism *i.e* electromagnetic induction.
Ideas evolved on the basis of other ideas. → Entrepreneurship in true sense.
- Heat & Mech. Energy: Joule & Mayer worked on their connection - needed for the **development of steam engines.**
Carnot captured these basic ideas to form the dynamics of idealized engines & these ideas led **Kelvin & Clausius** to formulate laws of **Thermodynamics.**
- Maxwell carried forward the ideas of electricity & magnetism; Hertz experimentally confirmed the theories & discovered the photoelectric effect, **which led to the invention of Radio & TV.**
- This is how Physics led to application-based Engineering in the time when **Technology was not mainstream.**

Physics led to Application based Engineering

- More inside story

- The inventor-entrepreneur philosophy emerged in early 20th Century, when a sizable no. of Physicists were forming companies to change the world.
- 19th Century's finest entrepreneurs, H. Ford & Thomas Edison emerged due to the existence of entrepreneurship culture of application based Engineering.
- During late 1870, **Ford** started working as a machinist in Detroit, dealing with portable steam engines.
- Edison formed his **Edison Electric Light Co.** patenting electric light bulbs. Ford left Edison's company to start **Detroit Automobile Co.**
- By then, **Edison** had already **invented phonograph & telegraph**, which changed the way world communicated. **Edison** also invented the **motion picture camera**.
- With his creation of the first ever industrial research Lab in New Jersey, Edison then quoted
"We will make electricity so cheap that only the rich will burn the candles".

This still holds true in our time, where candles are expensive than electricity.

Physicist Turned Entrepreneur- Example from India

- After the independence in 1947, **India was at the forefront of social & political havoc**. But despite this, the ideology among **Indian entrepreneurs did not change & they invested for a better future**.
- **One of those entrepreneurs was Vikram Sarabhai:**
 - Returned to India after studying at Cambridge to set up a research institution, **Physical Research Lab (PRL)** in Ahmedabad.
 - **Founder of ISRO** & pursued Indian govt to start a Space Research Program, when Russia just launched Sputnik into the space.
- Founding member of the premier institute in India, **Indian Institute of Management (IIM)**, Ahmedabad.
- **He was thus a Physicist turned Entrepreneur.**
- India is highly indebted to him for what his vision has given to the country. Idea of Entrepreneurship by then had already been established by the pioneers **G.D Birla and J.R.D Tata**.

Semiconductor Revolution

- Proved Vital to the Economy



- ❑ Semiconductor Chip is an essential enabling technology for many tools, gadgets, & devices
- ❑ - Hallmark of modern life that provided inexpensive, fast computing power for e-devices ranging from children's toys, digital wristwatches, household appliances, mobile phones, & automobiles to complex medical & industrial sensors & Communication Satellites.
- ❑ Physics also proved to be vital to the economy of the some of the Advanced countries.

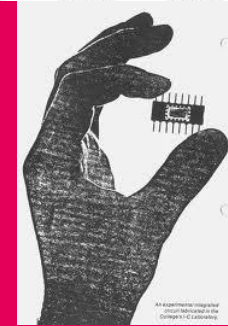
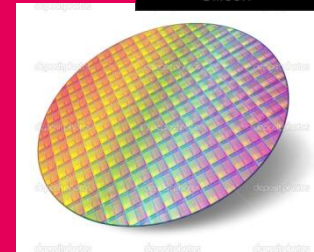
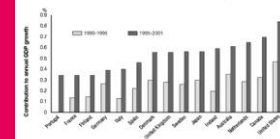


Figure 3: Contribution of ICT Investment to GDP Growth (selected countries)



* Countries for which data are available. Growth accounting estimates show that ICT investment typically accounts for a higher (and positive) contribution to growth in average annual GDP. The US, as measured by the Department of Commerce, is an outlier.

Example: Physics-based businesses contribute 8.5% of the UK's economic output & employ > 1 m people.

Contributions of Physics to the Information Age



- ▣ **Modern IT begins with the invention of Transistor** (a semiconductor device that acts as an electrical switch & encodes information in binary form).

First Transistor, made of the semiconductor Ge, was constructed at Bell Lab. in 1947 & won the **Nobel Prize in Physics in 1956 for the inventors** – John Bardeen, Walter Brattain, & William Shockly.

- ▣ **Next major milestone in IT was the co-invention of IC (Integrated Circuit)** by **Jack Kilby** of Texas Instruments in 1958 & **Robert Noyce** of Fairchild Semiconductor in 1959.

Kilby was awarded Nobel Prize in Physics in 2000 for the discovery of IC; regrettably Noyce died in 1990.

- ▣ **The *contributions of physics* to the information age is huge.**

Trillion \$ Commerce with WWW

- In the 1980s, the thousands of **physicists at CERN Particle Physics Lab Geneva** needed a better way to exchange information with their colleagues working in different universities & institutes all over the world.

Tim Berners-Lee, a graduate from Oxford University **with 1st class Honors in Physics**, invented the WWW at CERN in 1990 to meet this demand.

Between **1990 & 1993**, the Web was mostly used by scientists to collaborate their research. In 1993 it began to spread to the rest of the world. Now ~ **634 m websites & 2.4 b users.**

Now over a **trillion dollars** worth of commerce takes place over the Internet every year !

Much of the e-commerce is done over the WWW.

What began as a better way for physicists to manage information & communicate -- the WWW -- is now a vast "Global Information Superhighway," accessible to all.

In 1999 Time magazine dubbed Berners-Lee one of the 100 greatest minds of the century. In 2004, he won the first annual Millennium Technology Prize, an "international acknowledgement of outstanding technological innovation that directly promotes people's quality of life," with an award of \$1.2 m.

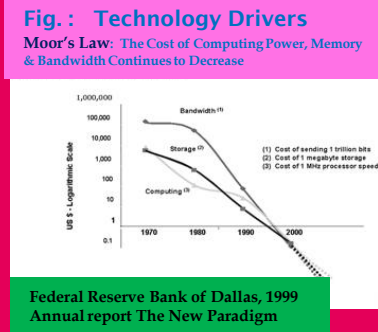


65 b public web pages on the Web today



Faster Chips, Higher Productivity, More Data at Our Fingertips

Contribution of Physics, Computer & Engineering



- ❑ Disk-drive costs have plummeted from **\$ 20,000 per gigabyte** in 1988 to less than **50 cents** today.
- ❑ **Nanotechnology breakthroughs** such as “colossal magneto-resistance” promise to increase data storage.
- ❑ Further S&T research in magnetic materials, thin films, & electronics keeps pushing data-storage limits.
- ❑ Worldwide PC, Tablet & Mobile Phone Total Shipments to Reach **2.4 b units in 2013** (source: Gartner).
- ❑ Digital Computer → Quantum computer > **speed !!**

INTERNET: Quiet Revolution - Least to Spend & Most to Gain

Practically no barriers to global trade

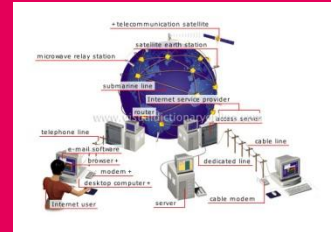
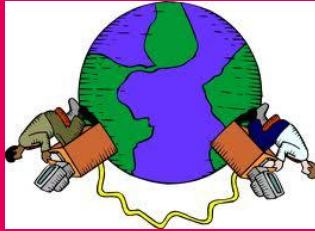
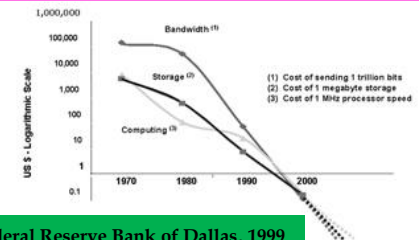


Fig. : Technology Drivers

Moor's Law: The Cost of Computing Power, Memory & Bandwidth Continues to Decrease

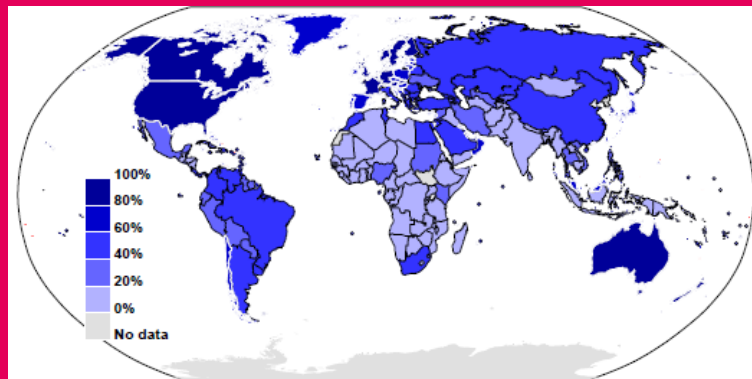
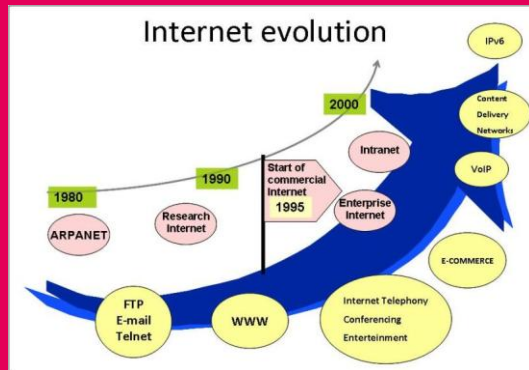


Federal Reserve Bank of Dallas, 1999
Annual report The New Paradigm

- **Internet:** "A quiet revolution is underway, led by the world's most rapidly developing economies – with **the least to spend & the most to gain**" – Jonathan Schwartz.
- Higher productivity with falling cost of tech. is **leading to a world of plenty.**
- 90% of the world's companies in 2013 - using **open source software** - **barriers to global trade have never been lower**, nor has communication ever been simpler.
- Driving political reform, cultural transparency, social progress & a tidal wave of wealth creation – **all driven by the internet** but actually more than that – driven by an endorsement of **technology freedom** – **without royalties or risk or patent litigation.**

Potential of ICT sector for Low Income Countries

World Internet Usage & Population Statistics



Now it's time for low-income countries

World Regions	Population, m (2012 Est.)	Internet users, m Dec. 31, 2000	Internet user, m Latest data	Penetration (% population)	Growth 2000-2012 (%)
Africa	1,073	4.5	167	15.6	3,607
Asia	3,922	114	1,077	27.5	842
Europe	821	105	519	63.2	393
Middle East	224	0.0033	90	40.2	2,640
North America	348	108	274	78.6	153
Latin America / Caribbean	594	18	255	42.9	1,311
Oceania / Australia	36	7.6	24	67.6	219
WORLD TOTAL	7,018	361.0	2,406	34.3	566

World INTERNET usage & Population statistics: June 30, 2012

Physics & Sustainable Development

Health Physics:

Medical Imaging & Diagnostics (including image guided therapies) is a **highly innovative Physics** -- not limited to products but also includes services & cycle of more innovation.

Asia's Diagnostic Imaging Market :

Growth 11 %,
c.f. **7%** globally.

2012: Market
\$ 8.1 b
(global \$ 24.1 b).



Big Ideas of the Ground-breaking Variety

From Dreamers to Doers : *Some Inspirational Examples*

Amazon.com

Jeff Bezos



When **Jeff Bezos** came up with the idea for what would become Amazon.com, he went on a stroll in Central Park (NY) with his boss in **1992** to share his feeling.

Bezos described his dream to his boss to create a company that would sell **books on the Internet**.

His boss listened intently before offering a bit of advice: "*That sounds like a really good idea, but it would be an even better idea for someone who didn't already have a good job.*"

It took Bezos all of **48 hours to decide to quit his job & get started**. Some **18 years later**, he's still at the helm of Amazon.com, which has redefined the way people buy almost everything, employs **56,200 people**, & is valued at **> \$ 80 b.**

M. Zuckerberg



Born May 14, 1984



An American Computer Programmer & Internet Entrepreneur. He is best known as one of five co-founders of the social networking site.

The Harvard drop out had barely any experience in business & hardly any money to start his entrepreneurial venture.

In those times he relied completely on his gut & believed in the people around him.

Now with a **multi billion tech IPO**, Zuckerberg stands to be one of the **youngest successful entrepreneurs ever**.

Big Ideas of the Ground-breaking Variety

From Dreamers to Doers -- *Some Examples:*

W. Hewlett & D. Packard



Vision: To make electronics a household term

In 1939, a toss of coin started the company for a mere \$ 538 right in the middle of garbage.

The duo then moved on from designing electric appliances to semiconductor based products & now their company is one of the biggest tech companies in the world.

What was once envisioned by William & David, electronics & allied appliances is now a house hold term.

Larry Page and Sergey Brin

Google



Vision: The whole web at the fingertips

Larry's dream to have the whole web saved on a hard drive pushed the duo of Stanford PhDs to build what is now the greatest search engine in the world.

Started in a garage with nothing more than ideas & passion, the team faced lots of issues in the early days.

Google (founded in 1998) is now one of the most successful tech companies and has produced many products with a goal of changing the face of the world.

Novel Health-aid Entrepreneurship: e-cigarettes

(Alternative Smoking Device)

Booming sales attract big-time marketing

□ E-cigarettes (China ~2004), or electronic cigarettes:

The device emits doses of vaporized nicotine that are inhaled. It is battery-operated & can also emit non-nicotine vaporized solutions.

□ At least 250 companies sell them in the US, many over the Internet.

□ Annual sales growth ~30% ; sale will rise to ~\$1.8 b this year & surpass cigarette use by 2023 (CNBC 28 Aug 2013).

□ FDA (USA) once banned the importation of e-cigarettes, but a federal appeals court overruled the agency in 2010.

□ Britain is to regulate e-cigarettes as non-prescription medicines from 2016 in an attempt to improve quality.

(Reuters: Wed Jun 12, 2013 10:05am EDT)

□ Italy & Spain:

"They are electronic, alternative smoking devices that simulate the sensation of smoking. They do not expose the user, or others close by, to harmful levels of cancer-causing agents and other dangerous chemicals normally associated with traditional tobacco products." -- Craig Youngblood, president of InLife, an e-cigarette company.

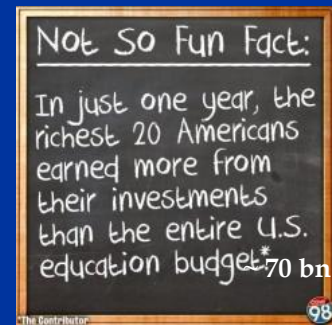
London (AFP) - 12 Nov 2013: Switching to e-cigarettes could save millions of smokers' lives, reported in a conf. on the rapidly expanding use of the devices.



New Economy: Rapidly Changing Global Scenario

Rapidly Changing Business Environment:

- ICT-powered revolution of 21st C will transform all aspects of economic, social, cultural & political life on a global basis.
- **Renewed Emphasis on Innovation:**
 - Shift to the new knowledge-based economy.
 - To face relentless global competition, need to radically change the way of doing business.
 - Innovation is everything that helps enterprise adapt to rapidly changing business environment.
- The new economy is led by those who innovate – create, find and/or combine knowledge into new products, services, & distribution methods – faster than their competitors.



**'It's not the big that eats the small;
it's the fast that eats the slow.'**



Bridging the Entrepreneurial Activity Gap & Building a Culture of Entrepreneurship



Today, different parts of the World are at different stages in Entrepreneurship with some of the countries most behind in terms of development.

- The West had initial advantages of Industrial Revolution & **now locked into the infrastructure of an earlier technology**. New discovery, Innovation, ICT, Govt policy raised the status of the countries further.
- The **activity in the SE Asian regions fell behind due to late entry into effective enterprise activities**.

In order to catch up, promotion of Entrepreneurial attitudes & skills through Education is required.

- **Raising students' awareness of self-employment as a career option** (message: *become not only an employee, but also an entrepreneur*)
 - **Providing the business skills** needed to start a new venture.
- ➔ **Efforts to bridge the gap are described in the next few slides**

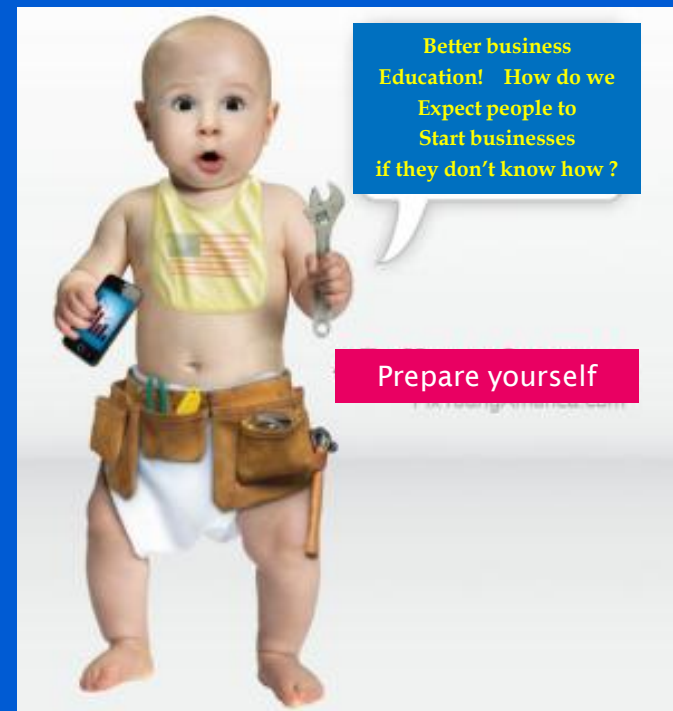
Key Aspects of Education for Entrepreneurship



To develop personal qualities of the would-be-entrepreneur, objectives of Education (up to tertiary level) : (Forum on 'Training for entrepreneurship' in Nice/Sophia Antipolis in Oct 2000)

- ▣ Management Competence
- ▣ Field of Social Competence
- ▣ Personal Fields of Competence
- ▣ Entrepreneurial Qualities

Further relevant technical & business skills need to be provided to those wishing to be self-employed &/or to start their own venture.



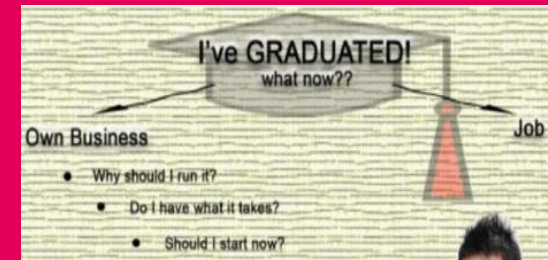
World Economic Forum's Global Education Initiative

Initiative to help build entrepreneurial capacity :

(<http://www.weforum.org/issues/education>)

A. Promote Entrepreneurship & its Integration into Education

- **Build Greater Awareness**
- **Embed into Education**
- **Put Entrepreneurs in the Classroom**
- **Teach using Project-based Learning**



B. Build Political Commitment for Entrepreneurship-education

C. Ensure Appropriate Metrics & Incentives

Entrepreneurship Program at University

-- Master of Science in IME

Beyond technical expertise, today's Engineers must possess an entrepreneurial mindset in order to be the innovators of tomorrow.

- **M.S. in Innovation Management & Entrepreneurship, with a concentration in Engineering Management.**

Similar types of Master programs are available in many US & European Universities.

The IME degree could concentrate on:

Innovation Management, Entrepreneurship, Engineering Management.

- **The Engineering Management** -- for students with a technical background who seek the relevant management skills to increase their impact inside their organizations as they look to move into leadership positions.

This program will also provide its students a competitive advantage in the marketplace by preparing them to drive & manage innovation in existing companies & establish new entrepreneurial business ventures.

- Further it is targeted to tech. graduates who hope to become leaders in R&D companies, managers in tech-rich organizations, project managers in consulting or project management companies, or successful professionals in tech. or science based jobs.

School of Business Innovation and Technopreneurship (PPIPT) at UniMAP

It is encouraging that Malaysia has started exposing graduates to the world of entrepreneurship. *Example:*

UniMAP has introduced in Jan 2011 MBA in Engineering Management – First program in Malaysia (both Part- & Full-time)

Higher Education Institutions in Malaysia are ready to impart essential entrepreneurial knowledge in the syllabus to equip future entrepreneurs with necessary skills.



MBA (ENGINEERING MANAGEMENT) COURSE STRUCTURE	
Core Courses	<ol style="list-style-type: none">1 BFT501 Business Research Methodology2 BFT503 Business Ethics & Corporate Social Responsibilities3 BFT505 Financial Statement Analysis4 BFT507 Leadership & Strategic Human Resource Management5 BFT509 Accounting Of Business6 BFT511 Management Consulting7 BFT513 Managerial Economics8 BFT515 Marketing Management
SPECIALIZATION AND ELECTIVE COURSES	ENGINEERING MANAGEMENT
Specialization Courses	<ol style="list-style-type: none">1 BFT556 Emerging Engineering Technologies2 BFT561 Engineering Management, Organization And Strategies
	<ol style="list-style-type: none">1 BFT558 Energy Management2 BFT563 Engineering Principles, Application And Product Design3 BFT526 Project Management4 BFT565 Seminar In Engineering And Industrial Development5 BFT528 Quality And Productivity Management
Dissertation	BFT666 Business Research Project/Field Project

Viable Youth Livelihood Opportunities

Opportunities Exist in 3 Sectors : ICT, Agriculture, & Health

▣ Addressing the Un-banked

Delivery of affordable banking services to a population contributes towards nation's crucial economic & social goals.

➔ Providing financial services draws credit into the banking system, **leading eventually to GDP growth.**

This reduces start-up costs & service prices; delivers the banking products that meet the particular needs .

This incredible innovation is transforming lives by providing access to financial services & the ability to pay & be paid electronically.

- In South Asia, mobile money transfer networks, the two service providers – **bKash (bikash means "growth" in Bengali)** in B'desh & **BEAM in India** – offer money transfers that can be executed on any wireless network.

- More in B'Desh : **Islami Bank MCASH, UCash, MobiCash** (Service by Bank & Agents)



bCASH in a remote Bangladesh village

Promote Social Entrepreneurship

The World Awaits Green Business



- **In DC: Fossil fuel consumption subsidies = \$ 630 bn (2012) rarely benefit the poor, despite being justified as necessary to provide energy access to those without electricity.**



1.2 billion People Worldwide lacks access to electricity:

Implementation of Green Technology is necessary to push local social & economic innovation in the alternative energy sector.

Social Entrepreneur needs to invest little working capital to bring solar electricity to community.

Small-scale Solar, Wind & Geothermal devices are especially useful in remote locations because of the excessive cost of transporting electricity from large-scale power plants.

Entrepreneurs & Startups in Malaysia to Benefit from new Silicon Valley's BootstrapLabs Launch

- ▣ **Silicon Valley-based BootstrapLabs, & Malaysia-based MAD Incubator announced on 8 May 2013 the formation of BootstrapAccelerator Asia.**

This will form the **first SEAsia-focused Tech Startup Accelerator with a Silicon Valley Fast Track™** for promising Startups in Malaysia, with opportunities to gain access to incubation opportunities, funding & networking for business growth.

- ▣ **MAD Incubator & Bootstrap Labs** share the philosophy of *“Making a Difference”* by empowering entrepreneurs to build global startups & believe that SEAsia will be the hotbed for disruptive startups in the future.

SEA is the third-largest-growing economic zone in the world with a population of 1 bn & a market potential of US\$ 30 trillion by 2020.

Entrepreneurs especially Startups in Malaysia are going to benefit from this program.

Concluding Remarks



- The global challenge ahead is **UNEMPLOYMENT**. Most of the world, specially the developing countries, must accelerate job creation.

== → This means Entrepreneurial Vision



Accelerating it would provide economic opportunity to DC.

"The only thing worse than being blind is having sight but no vision."

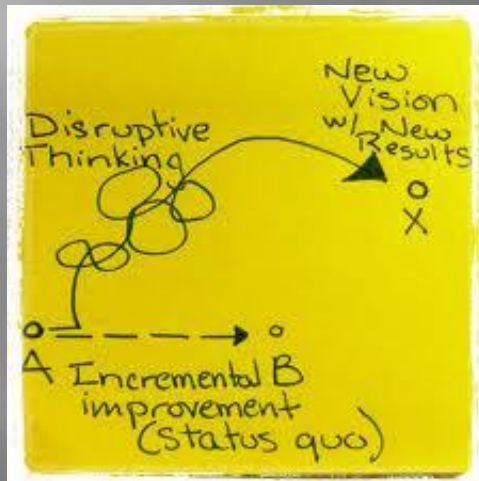
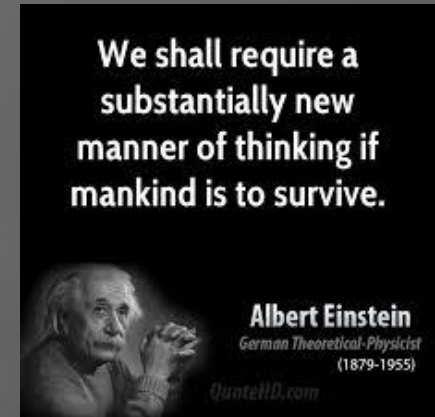
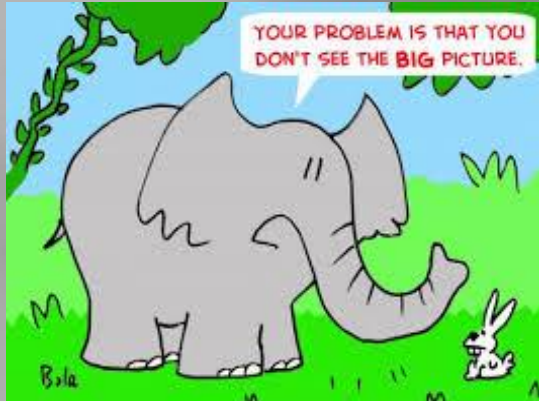
(Helen Keller)

'Capital isn't scarce, vision is'

'If opportunity doesn't knock, build a door'



Disruptive Thinking in Entrepreneurship Helps



A disruptive innovation is an innovation that helps create a new market & value network, & eventually goes on to disrupt an existing market & value network, displacing an earlier technology.

The man who follows the crowd will usually go no farther than the crowd.

He who walks alone is likely to find himself in places no one has ever been before.

A Better Future through Innovation & Entrepreneurship

‘It's time to stop looking at the past & start looking at the future, & start looking at what are the next opportunities.’

-- it's about looking at the future in the new revolution that the internet is bringing.



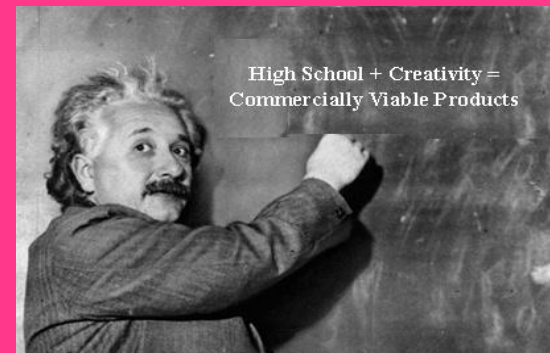
Physicists' Quote

▣ Freeman John Dyson FRS (born Dec. 15, 1923)

English American theoretical **physicist** and mathematician famous for his work in quantum electrodynamics, solid-state physics, astronomy & nuclear engineering.



"To answer the world's material needs, technology has to be not only beautiful but also cheap."



Holy Quran - "*Laisa lil insana illa ma sa'a*" --

There is nothing for man except what he strives for (53:39)

Thank You All



Terima kasih **UniMAP**

