Leveraging Analytics Anywhere

Presented by
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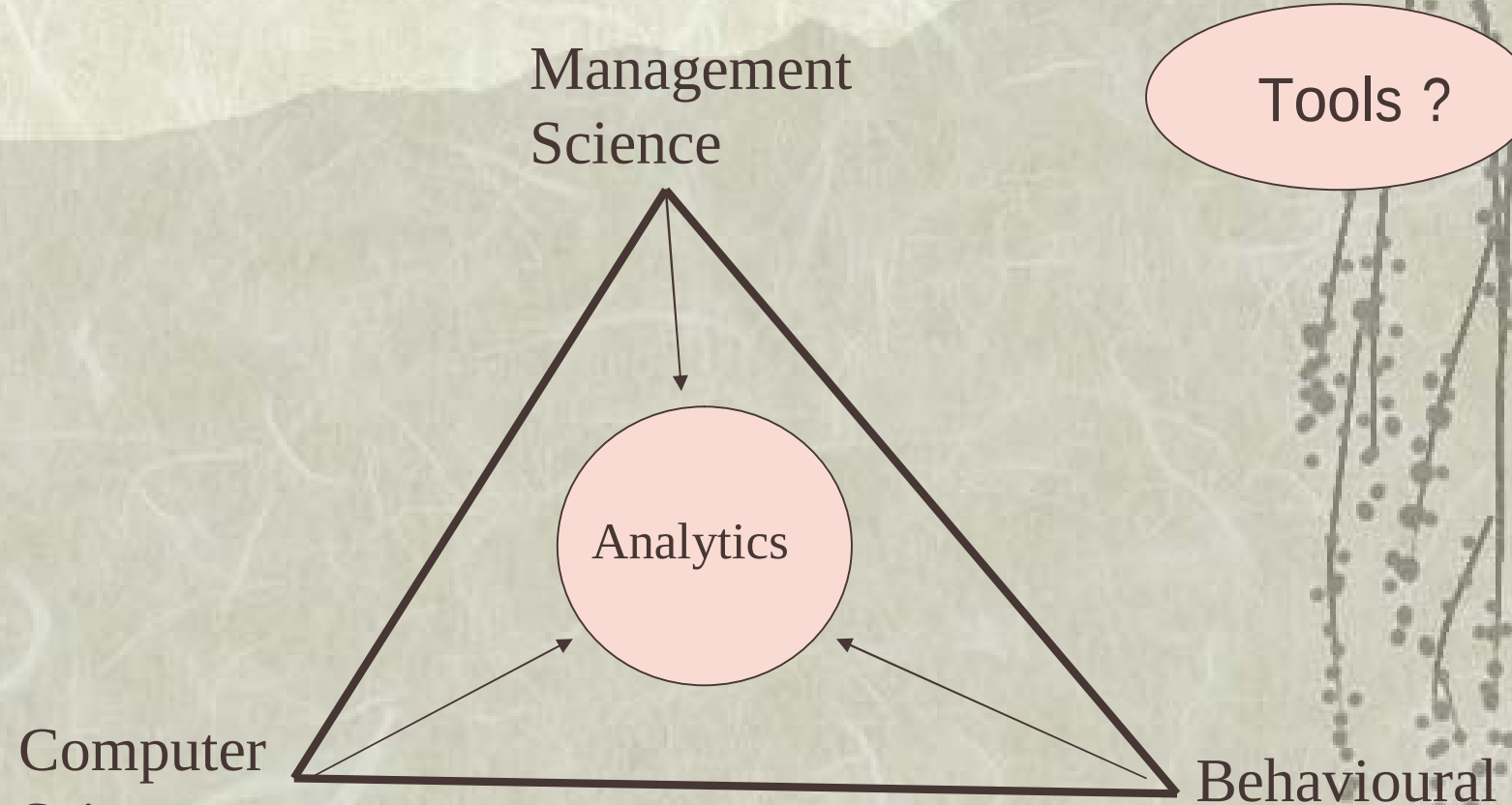
Leveraging Analytics Anywhere

Analytics Defined. It is..

- Data Analysis
- Placing information in context
- About model building to simulate reality
- Assessment of alternatives to pick the best
- A means for knowledge (wisdom !) extraction

Its significant challenge lies in integrating inferences about interaction among inanimate objects and human behaviour : It is the best platform for dealing with diversity and tool for innovation

Leveraging Analytics ...



Leveraging Analytics Anywhere

Duckworth / Lewis Method

Game of cricket in any format	❖ To be fair in goal setting to both teams. ❖ Be able to accommodate interruptions at unknown time periods. ❖ Data Based.

D/L Resources Available Table

Wickets Lost

Remaining Overs ↓	0	2	5	7	9
50	100	85.1	49	22	4.7
40	89.3	77.8	47.6	22	4.7
30	75.1	67.3	44.7	21.8	4.7
25	66.5	60.5	42.2	21.6	4.7
20	56.6	52.4	38.6	21.2	4.7
10	32.1	30.8	26.1	17.9	4.7
5	17.2	16.8	15.4	12.5	4.6

Leveraging Analytics … Tools

Management Science

- Statistical Analysis
- Time Series Modeling
- Regression
- System Dynamics
- Optimization
- Simulation

Computer Science

- Data Base Technology
- Expert Systems : AI
- Data Warehousing
- Data Mining
- Pattern Recognition
- Knowledge Management

Behavioural Science

- Motivation Theory
- Group Behaviour
- Learning modes

Bring diverse concepts together to innovate

Optimization Models : relevance and utility

- Traditional concepts: Use of inventory models to determine optimal lot sizes
- Contemporary thoughts: Inventory is evil and a liability. many components lose 0.5 % to 2.0 % of value per week in the high tech industry. Hence **Minimize inventory** using JIT and TQM.

Optimization Models : relevance and utility

- O.R. expertise was called for in improving the Forecasting Techniques earlier. Forecasts were fundamental to many capacity planning and utilization decisions.
- With the ability to contact end user directly, firms have embraced mass customization methodologies and choose to count each order than forecast.
- In other words

  Minimal Forecasting is in.

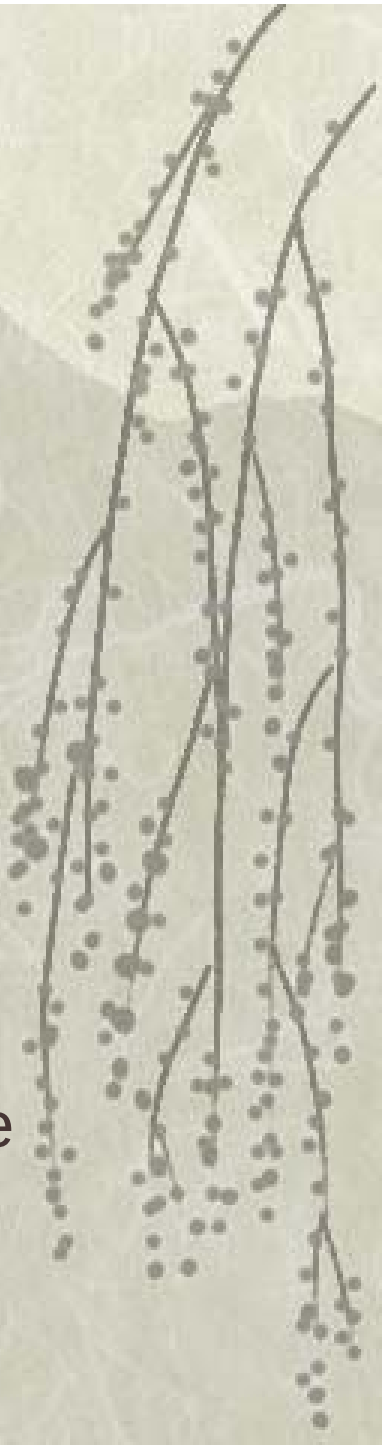
Optimization Models : relevance and utility

- Decisions that were considered strategic once have become operational now.
- The **revenue management** principle originated in the airline industry is a prime example. The allocation of seats to different price segments was strategic earlier. It is totally operational now and is embedded into the real time order processing systems.
- This practice has spread to many other service industries such as hospitality, cruise lines and rental cars.

Exploring e Business paradigms

e Business has been defined as
Conduct of business on the internet.

1. Internet includes intranet and extranet
2. Conduct envelops interaction with all stakeholders, viz Customers, Suppliers, Partners and Employees
3. All types of transactions ,viz, information sharing, buying, selling are covered.
4. Brick and Mortar as well as Virtual Stores are included

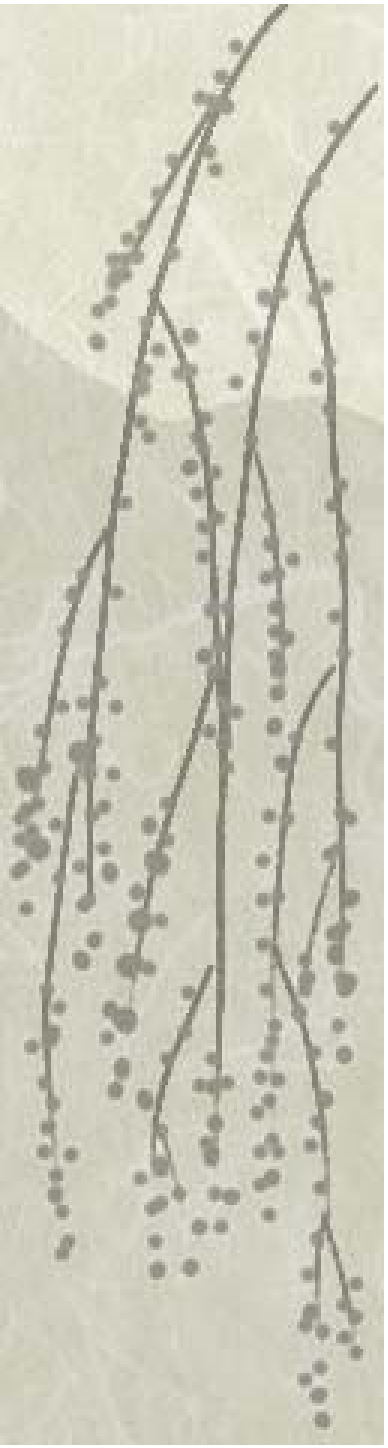


Exploring e Business paradigms

e Business has been defined as
Conduct of business on the internet.

e Business is everybody's business. It applies to both products and services.

- Internet includes intranet and extranet
- Conduct envelops interaction with all stakeholders, viz Customers, Suppliers, Partners and Employees
- All types of transactions ,viz, information sharing, buying, selling are covered.
- Brick and Mortar as well as Virtual Stores are included



Exploring e Business paradigms

e Business has been defined as
Conduct of business on the internet.

More over…

The term " e Business" has to be interpreted in a broader framework.

It is not restricted to commercial transactions alone.

non commercial, not for profit and service activities are all included in this definition.

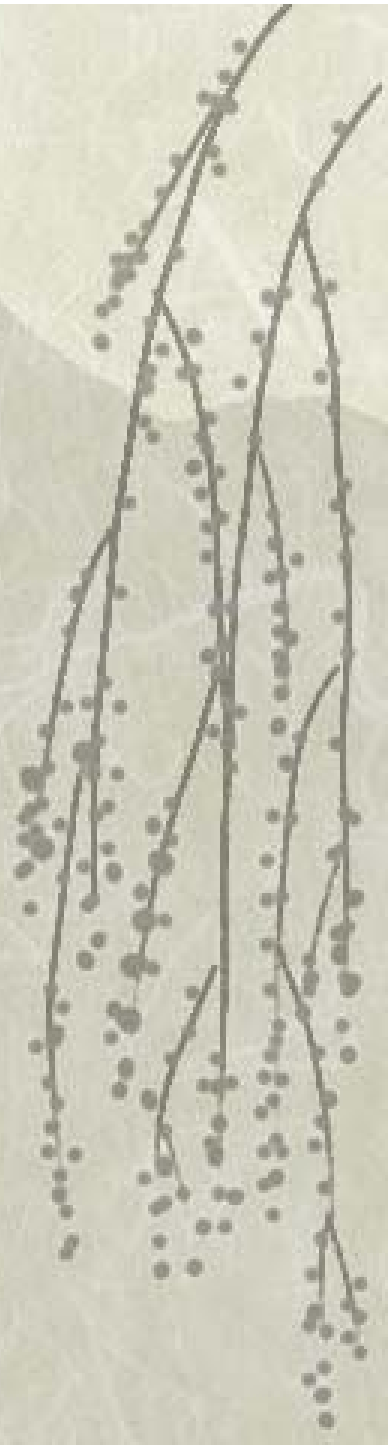
Exploring e Business paradigms

internet is a …

channel for reaching out to stakeholders.

Medium for interaction.

delivery medium for certain goods and services



Exploring e Business paradigms

e Business Innovations

- Auctions : have brought in transparency; no respect for distance or time zones.
- Virtual Shopping carts : real time count of money spent
- Search engines: page ranking; Speed and relevance as the criteria
- Location aware services

Leveraging Analytics ...

- What is the DELL innovation ?
- Is that a Supply Chain revolution ?
- Is it a Marketing magic ?

Financial Assets of an Organization :

- cash
- Inventory
- Accounts Receivable

Where are two of these assets gone ?

Exploring e Business paradigms

e Business innovators

Dell	❖ Direct reach to end customers . ❖ Elimination of the Accounts Receivable function. ❖ Met specific needs of each customer.

Exploring e Business paradigms

e Business innovators

Bhoomi	❖ Pioneering use of internet in e Governance. ❖ Malpractices killer

Exploring e Business paradigms

e Business innovators

ICICI Bank	❖ Internet as a channel defines the Market Segment & its Marketing Strategy

Exploring e Business paradigms

e Business innovators

Air Deccan	❖ Agent less Sales leading to 20 % reduction in costs. ❖ Elimination of paper and paper work

Exploring e Business paradigms

internet is also a disruptive technology

- it is an interactive medium like a telephone but can facilitate asynchronous communication.
- it has no respect for distance and hence intermediaries
- it creates a level playing field for established and the new
- Manufacturing, Planning and Market Research functions are severely impacted

Exploring e Business paradigms

Can lead to rewriting business paradigms

- Do away with a complete function such as Accounts Receivable & collections
- Eliminate non value adding intermediaries
- Reduce finished goods inventory dramatically
- Meet the expectation of every customer
- Cross sell effectively
- Improve operational efficiency and effectiveness by leaps & bounds
- Reach current information swiftly to stakeholders for their optimal use
- Be a fair and impartial judge
- Improve transparency
- Reduce/ eliminate leakages

Optimization Models : relevance and utility

- **Product Portfolio Optimization**

- Banks, Savings and Loan associations, insurance firms and mutual funds constitute the financial services sector.
- Customer segmentation, product structuring, pricing and credit worthiness assessment are issues tackled through sophisticated O.R. applications since the seventies in this sector.
- The concept of multi layering of risk and treating each layer as a distinct market segment is inherent to insurance and reinsurance lines of business. Product portfolio optimization for a given level of capital and risk appetite is mission critical
- Internet and online systems have enabled firms to gather product, customer segment and channel specific data on costs, margins and risks. Extending the product mix optimization applications from the manufacturing area to financial services is an exciting and emerging opportunity.
- Formulating cost effective programs to minimize identity thefts and fraudulent claims without alienating genuine customers are industry challenges where O.R. professionals can play significant enabler roles

Optimization Models : relevance and utility

- **Distribution Channel Design**

- Communicating with customers and potential customers on time and in a cost effective manner is the dream of every enterprise.
- internet and phone based customer reach /distribution channels have emerged, as customers seek to interact in multiple modes with an organization,
- optimal channel design in terms of segments, activities within a segment and balancing of direct versus indirect reach partners shall assume criticality. Channel cannibalization or channel conflicts are issues to contend with.
- Channels such as internet, kiosks and telephone have been around for a decade or more. However data on channel efficacy is either sparse or too macro. Over time a higher level of sophistication in channel usage will emerge as a key competitive edge.
- O.R. has enough tools and concepts to help out in such decisions for different segments in the financial services sector..

Optimization Models : relevance and utility

- **Trade off Issues**

- **Economic Development versus Ecology Preservation and Environment Protection**
  (Kyoto protocol)
- **Penalties versus Incentives**
  (tightening ship design standards to prevent oil spills)
- **Preventive Management versus Breakdown Management**
  (the BPO sector safety issue of women employees)

  (Avian Flu spread)

  Innovative measures to monitor, test and isolate birds and fowls that move across national borders through legitimate trade, illegitimate routes and natural migration are needed in many countries. Formulating detection, prevention and treatment measures call for spending enormous sum judiciously. Cost effectiveness of each of these measures and their region wise efficacy need to be determined and alternatives chosen.

Optimization Models : relevance and utility

- **Issues of Fairness**

- Selecting employees for random drug tests.
- The issue of selection is entwined with concerns for protection of employee privacy, confidentiality as well as fairness.
- Post 9/11 similar situations have occurred in the airline industry with passengers being selected randomly for personal search.
- The alternative of covering the entire population is cost prohibitive.
- How does one be fair to all concerned and at the same time maximize the search effectiveness for a given budget? Or what is an optimal budget in such cases?
- Service Level Agreements for customer segments

Innovations in Indian IT industry

The significant problems we face can not be solved at the same level of thinking we were at when we created them .

Albert Einstein

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Thanks and Best Wishes

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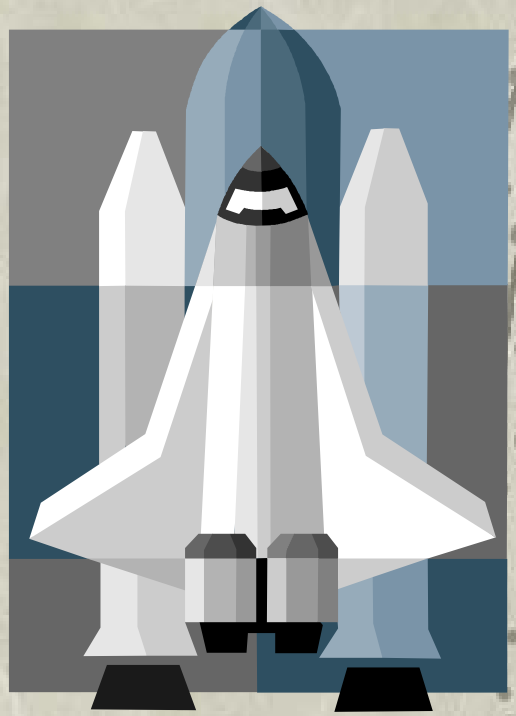

Theme Work Analytics

Birth of O.R. as a Discipline

- 1937 can be considered to be Base Year as this was the year the term Operational Research [O.R.] was coined.
- During WW II ,the Royal Coastal Command [RCC] of the British Armed Forces wished to protect the royal merchant ships in Atlantic ocean from being decimated by the German U Boats, to enhance the ability of royal air force to sight U Boats in time and to improve the effectiveness of patrol of coast with a given aircraft fleet size.
- RCC constituted a special team of Henry T. Tizard, Professor P.M.S.Blackett, and A.V. Hill.They were specialists in Chemistry, Physics and Anatomy respectively. They worked with many others in military operations with background in a variety of other disciplines.

Birth of O.R. as a Discipline

- Time was of essence here. Solutions had to be found quickly, often in days or weeks but not in months. Proposed solutions could not be simulated for verification of effectiveness yet any wrong solution could spell doom for the entire operation.
- Blackett and the team relied on available but limited data to study each of the stated problems and to give it a focus
- They were lateral thinkers who asked for painting the aircrafts white to reduce their visibility against a light sky
- They converted the coast patrol problem into one of effective maintenance of aircrafts.
- They suggested that the size of convoy of merchant ships be increased to minimize damage to them against enemy attacks.

Birth of O.R. as a Discipline

- The team was interdisciplinary in skills.
- It understood the time criticality of the problem and evolved timely solutions.
- It took an objective , data based approach for situation analysis, solution construct and evaluation of solution effectiveness.
- The researchers were capable modelers as they knew the concepts and their applicability.
- They were innovative.
- They had management support from start to end.
- Above all, they were tackling real world problems.

Should we ever wonder why they succeeded ?