Leading Business with Data

MA Nang Laik
Assistant Professor of Information Systems (Practice)
Programme Director, MITB (Analytics)
## The Curriculum in a Nutshell

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*Half module

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Learn analytics skills and industry best practices
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 Equip with innovation, IT and project management skills
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Develop business management skills

The Curriculum in a Nutshell
Acquire hands-on industry experience, with job attachment opportunities for full-time students.
MITB (Analytics) – at a glance

- First master program in Analytics in Asia
- Launched in Jan 2011
- 6th intake
- Largest ecosystem in Data & Decision Analytics related research
- Our case won TUN teaching innovation award
- SAS student Ambassador
Example of Analytics Capstone project

• Problem description:
• SMS appointment reminders
• High volume of “no shows”, as patients contacted via SMS do not turn up for their scheduled appointments
• “No shows” have a high impact on
  – longer appointment lead time for others
  – poor patient satisfaction
  – loss of revenue for hospital
Capstone project scope for “no show” appointment
Capstone project scope for “no show” appointment
Capstone project scope for “no show” appointment

- Bivariate Analysis
- Categorical Response Analysis
- Logistic Regression
- Decision Tree

Build statistical models to predict “no show”

- Training & Test Data (Sept 2011- Feb 2012)
- Validation Data (Jan 2012- Feb 2012)
- Logistic Regression
- Decision Tree
- Compare Models
- Decision Tree
- No Show Probabilities

- 6 Months Data (Sept 2011- Feb 2012)

School of Information Systems
Singapore Management University
3/5/2014
Rich industry-driven business case

- **Client:**
- Major Aviation Hub in South-East-Asia, **7000 flights** take off or land at Airport every week, Handles millions of passengers annually

53.7M  343.8k
Solving real-world problem in the classroom

**Business problem:**
- All airlines moved to main terminal building
- Use a fixed passenger load of 75% for all airlines
- How do we optimize the terminal resources using data analytics?

**Business objectives:**
- Increase revenue by accepting more airline slots while maintaining the service level agreements.
- Pax load information is required for better resource planning.
Methodology proposed

- Collect & analyze data
- Information & insight
- Advanced analytics methods applied to solve problem
- Strategy recommendation

Level of Complexity
Initial Analysis of data and insight

Pax load by Day Of Week for all destinations

- Sunday: 75%
- Monday: 69%
- Tuesday: 66%
- Wednesday: 66%
- Thursday: 71%
- Friday: 73%
- Saturday: 74%

Average of pax load by month

- Jan: 69%
- Feb: 76%
- Mar: 82%
- Apr: 80%
- May: 83%
- Jun: 85%
- Jul: 83%
- Aug: 76%
- Sep: 76%
- Oct: 72%
- Nov: 88%
- Dec: 85%

Top ten destination by pax load

- A1: 95%
- A2: 92%
- A3: 92%
- A4: 88%
- A5: 85%
- A6: 84%
- A7: 84%
- A8: 83%
- A9: 82%
- A10: 80%
Decision model for pax load based on historical data

Forecasted pax load, transfer load based on criteria

Simulation model to predict check-in counter Based on GOEM

Optimal number of check-in required, resource utilization

Past load, flight info, region

Pax arrival pattern, average service time, queue type

Time
Analytics complexity & journey of pax load analysis

- What has happened?
- How and why did it happen?
- Forecast what is going to happen and recommend.
- Anticipate what will happen and optimize the resource.

Past load data

Predict future load

Simulation to determine optimal resource

Airline allocation using optimization

Time

Complexity
# C & D Series Courses

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D.3  Finance for Technology & Operations Managers

D.4* HRM for Technology & Operations Managers
MITB – An Exciting Programme for You

KEEP CALM AND JOIN US