

GUIDANCE MATERIALS

BATCH 1

Dean McKeown

Associate Director, Masters Programs
Queen's School of Business

I am very excited to see this competition come to fruition! A strong group of hard-working individuals has pulled together to make this a reality and I am extremely proud of their dedication and drive.

Equally important is the connection among the programs in Goodes Hall. This is the first time we have a coordinated effort between three diverse business programs – the full time QMBA, Management Analytics and Commerce students. Each group of students brings a unique perspective to the competition and these different perspectives enrich data analysis in ways we cannot even think of today.

Here lies the strength of management analytics (small caps) and this competition. Participants with different backgrounds will converge and identify business problems in the retail sector. I am a big believer in consultation, thinking outside the box and collegiality. This competition will bring out the best of our students and provide industry leaders with a special view of the retail sector – a vision spurred by entrepreneurship and innovation. Concepts that are the foundation of Queen's School of Business.

I look forward to working with each of you as we build the competition into an annual event and have an impact on Canadian business. The data-wave increases in velocity, veracity and volume each and every day – climb aboard, it will prove to be an exciting ride!

Dean McKeown

Pavel Abdur-Rahman

Senior Manager, IBM GBS Business Analytics & Strategy

https://ca.linkedin.com/in/pavelrahman

Hi everyone,

My name is Pavel Abdur-Rahman, and I am a Senior Manager at IBM's Business Analytics & Strategy Consulting service line. I am passionate about combining Management Consulting, Operations Research, and Advanced Analytics expertise to drive data monetization and operational excellence for my clients. Some of my recent engagements included delivering complex planning & scheduling optimization models for Utilities, predictive models for accounts receivables in Finance, workforce optimization for Public Sector and Geology & Geophysics reservoir modelling for Oil & Gas. I have an Industrial Engineering background from University of Toronto, and currently completing my Masters in Management Analytics at Queen's University.

In order to be successful in this competition, I would recommend the teams to approach it from 3 perspectives to maximize their learning and chances to win the top prize ($5,000):
(1) The Competition Rubric
(2) Top 5 Business Problems for Canadian Retailers in Merchandizing, Marketing, Operations & Finance
(3) Story Telling using Advanced Analytics

For (1), you will quickly realize this competition is more about 'finding the best Retail analytics business value case & ROI' and less about data crunching or use of fancy algorithms. If you are the CEO of a Retail company, which advance analytics project should you invest for a quick win? What are the anticipated business values that justify such investment?

For (2), you should research to prioritize the top 5 Canadian Retail business problems. Out of those, which ones are best suited to be solved with advanced analytics? What types of data, technology and methods will you require to extract insight and enable decision making?

For (3), how would you present your analysis and tell a story to convince C-suite senior executives and motivate mid-level management to embrace Analytics driven culture?

For the Canadian analytics community, these are some of our biggest adoption challenges of today. This competition enables a collaborative environment for all of us to come together to learn and compete in order to make real progress. Here are few suggestions for additional reading: IBM Retail Analytics Blogs, IBM Retail Analytics Case Studies, Kaggle Retail Use Cases, Retail Council of Canada, WRC, NRF, etc. I look forward to meeting you during the competition and wish you all the best!

Pavel
@pavelrahman

Prof Ceren Kolsarici

Associate Professor & Ian R. Friendly Fellow in Marketing
Queen's School of Business

Hi Everyone, my name is Ceren Kolsarici. I have been a faculty at Queen's School of Business since 2009. I have a Ph.D. in marketing from McGill University, an M.B.A. and a B.Sc. in industrial engineering. My involvement in analytics dates back to my engineering days during which I got interested in dynamic optimization and capacity allocation problems. Throughout my M.B.A., I started developing a passion for marketing and consumer behavior. Now as a faculty member and a researcher I have the opportunity to integrate both my passions: marketing and analytics. I develop methods and models to understand how markets respond to firms' marketing activities with an aim to improve the managerial decision-making process and increase marketing productivity. A critical focus in my research and consulting is to approach marketing productivity from an integrative perspective, rather than investigating issues in silos which allows me to tackle the complexities of the real-world business environment such as dynamics, uncertainty, competition and spillovers.

I would encourage students to focus on projects that will lead to data-driven actionable insights. It is important to use descriptive analytics to understand the market, competition, consumption related factors, and acknowledge trends. While this alone will not help the firm improve strategic and tactical decisions, it will help you identify the right questions to ask and the gaps to concentrate on. However, the real charm of analytics lies in its ability to link performance measures to firm decisions which enables firm to run policy simulations to gain more insights into the optimal decision. Lastly, an analytical insight is only as strong as the data that feeds it. Therefore, a strong infrastructure to collect, manage and transform marketplace data to update the analysis and fine tune the insights on a continuous basis would be a key competitive advantage.

There are various resources for the opportunities of analytics in the retail sector. I would recommend checking Marketing Science Institute, Wharton Customer Analytics Initiative, Yale Center for Customer Insights and Kaggle for some retail specific analytics project ideas and implementations. It is also worth familiarizing yourselves with the global success stories of retail analytics applications for inspiration such as Macy's, Tesco and Delhaize etc.

Ceren Kolsarici

Andrew Keats

Senior Consultant, IBM GBS Business Analytics & Strategy

I was trained in data analysis during my Engineering studies (PhD 2009) and work as a Data Scientist in IBM's Global Business Services. I've worked on several advanced analytics engagements in various fields involving fraud detection, sales pipeline optimization, and equipment failure analysis and triage.

A typical Advanced Analytics engagement follows a path of data gathering, followed by analysis, modelling and finally reporting; however, equally important is the parallel process of *information* gathering and business understanding. Model predictions need to be delivered in such a way that they can be easily consumed by business users, and these same users will often ask the modeler why a particular model recommendation is being made.

The retail sector offers a host of interesting problems to the analytics practitioner, such as churn modelling, supply chain optimization, purchase recommendation systems, and tailoring promotions through mobile devices. In addition to the technical challenges involved in implementing these types of systems, it must be possible to quantify the dollar value generated by the system to various business stakeholders. The links above describe the types of business problems that can be solved in retail; sample data can be obtained from many places on the internet such as datahub.io and bigdatanews.com. For insight into your own habits as a consumer, you can even mine your own credit card statement data if your bank provides a merchant category code (MCC) along with each transaction.

Andrew

Prof Yuri Levin

Distinguished Professor and Director, Master of Management Analytics
Queen's School of Business

My name is Yuri Levin and I am the QSB Distinguished Chair of Operations Management and the inaugural Director of Master of Management Analytics programme at Queen's School of Business. I teach analytical decision making, strategic analytics, and pricing analytics courses in MBA, MMA, and Executive Education programmes. I have a Ph.D. in Operations Research from Rutgers University in the US where I taught in different MBA programmes for 3 years before joining Queen's in 2002.

Here are some considerations for students to win this competition:

- Originality: Is it genuinely new, or just a variation on existing practices?
- Importance: e.g. approximate revenue base for improvement, market size
- Feasibility:
    - Technology needed (major system, or off-the-shelf office tools such as Excel, R, Python, open-source software, cloud solutions, etc.)
    - Technological expertise required
    - Affordability (who can afford it: large corporations versus small businesses)
    - External funding potential (e.g. government matching grants for innovation)
    - Impact
    - Profit lift
    - Improvements for potential businesses/clients, market share
    - Potential for job creation
    - Visibility (as stimulus for future analytics undertakings)
    - Sustainability, Social Impact

Here are some resources / sources student should research prior to working on the case competition:

- Technology available (statistical, optimization, simulation, etc.)
- Availability of technical expertise
- Existing solutions and vendors that provide them (e.g., check INFORMS software reviews)
- Prior art, US/Canadian patents
- Potential funding sources (venture capital, government stimulus grants)

Yuri Leven

Nicki Mossavarrahmani

Senior Consultant, IBM GBS Business Analytics & Strategy

I started working at IBM early 2013 after completing my Masters of Arts, in Economics from University of Toronto. My role is currently Strategy and Analytics Senior Consultant within IBM's Global Business Services. I have worked on advanced analytics engagements involving branch productivity, business investments, asset optimization, cyber threat intelligence and dynamic route optimization.

Analytics and statistical modeling is the basis of a good strategy and can solve a variety of retail business problems, such as inventory optimization, selecting store locations based on accessibility, population density and competition. Furthermore, retails store can optimize the delivery routes for their products to customers and they can optimize the route from the warehouse to the retail store. Analytics can also be used to enhance the customer experience and focus on up-selling and cross-selling using targeted marketing.

To successfully compete in this case competition I would suggest teams to focus on the following key aspects:

- Build a balanced team with different backgrounds and strengths
- Know your industry trends
- Impress with your research
- Be able to justify all of your assumptions
- Have strong presentation skills across the team
- Make sure the presentation has a logical flow and looks polished
- Choose a solution that you think will be unique and stand out from other teams
- Realistic solutions trumps master plan
- Back up your recommendations with analytics
- Find good data to support your argument
- Choose who will answer which types of questions in the Q&A.

For research regarding retail specific case studies, you may visit:

http://www.ibm.com/big-data/us/en/big-data-and-analytics/case-studies.html

Nicki M

Prof Jim Hamilton

Adjunct Professor, Marketing and Sales
Queen's School of Business

Type Big Data into Google and the # of search results borders on a billion. It is more than an understatement to say the world is awash with data. The challenge for executive is no longer with finding data, but rather finding the kind of people who have the skills to organize the data, analyze it and derive management insights. The students in the Queen's Master of Management Analytics (MMA) are these kind of people. And to demonstrate their skills and to engage the wider QSB audience in this exciting field of management analytics they are putting out a case challenge. A challenge to all of the QSB family (Commerce, MBA, MIB,...) to prove just how good you are. This challenge begins in a couple of weeks and as a faculty member who teachers in the Commerce, MBA, MIB, GDB and MEI programs I was compelled to voice my support for it.

Thanks to the folks at IBM and a great group of students from the MMA program the first ever IBM Case Competition will be help over the fall semester. More details can be found here (include link to website), but suffice it to say that this is a great opportunity to network with colleagues and professionals in the field, test and differentiate yourself in an area of study that is in very high demand. And who knows you may even win some big prizes.

The competition rubric will be available shortly, but here are the key components:

(i) Create Business Value for a Retailer (Creative, Significant Value, and Implementation Ready Use Case)
(ii) Identify Data Requirements & Sources (public / dummy data)
(iii) Create and Test Hypothesis
(iv) Demonstrate Data Visualization using IBM Analytics
(v) Articulate Component Breakdown of the Business Case
(vi) Present the Story
(vii) Q&A / Dialogue

Jim Hamilton

Paul Raso

Associate Marketing Analytics Manager,
Boston Pizza International

Hi, my name is Paul Raso and I am the Associate Marketing Analytics Manager at Boston Pizza International. I am also a student in the Masters of Management Analytics (MMA) program, class of 2016. As part of the IBM Case Competition, I wanted to share my thoughts on the Top 5 Retail Analytics Projects, so that you may have a better understanding of where to focus your efforts in the competition. Today's retail environment is very competitive among all channels, and driving growth is becoming increasingly challenging. Many organizations have turned to data to help solve their problems, but the real challenge is deriving value from the data. The purpose of this post is to give you a direction of what the main 'pain points' are within the retail industry, and to hopefully provide insights on what to focus on for your cases. Alas, here are the Top 5 Retail Analytics Projects:

1. Purchase Behaviour: In today's retail environment, less focus is being placed on demographic information, and more on psychographic information. Retailers no longer what to know just your age, gender, and annual income, but they also want to know what you're interested in, what drives you to purchase a product, and what might prevent you from purchasing something else. Focussing on understanding the behaviours of your customers will allow you to better target them in the future.
2. Customer Loyalty: Retaining a customer is significantly cheaper than acquiring a new one. Most retailers are trying to achieve ultimate success through extensive loyalty programs that provide rewards and incentives for customers. The key, however, is that these programs also provide immense data around behaviours that can help provide better offers for future visits.
3. Promotional Analysis: The best part about analytics is the ability to try and test. Many retailers these days use multiple different promotions to increase sales of certain items, but are finding it difficult to evaluate each against each other. Did they drive traffic? Sales growth? Were the merchandising displays affective at increasing awareness? These are answers that can be found within the data, and can help determine what works and what doesn't work.
4. Customer Satisfaction: A lot of times customers are lost because they did not have a good experience within a store and never came back. What's worse is that there was no one there to understand why the customer left, so that they can prevent it from happening again. Retailers are looking for creative ways through data to understand what customers love about their stores, and what their pain points are. Data can help unravel specific scenarios so that store representatives can be better trained on how to handle these situations.
5. Shrinkage: A major way to increase profits is by decreasing costs. Shrinkage, or theft, is responsible for millions of dollars in losses in the retail environment each year. Retailers are constantly looking for better insights and predictions on shoplifters, while also understanding the higher risk items in the store and within their own staff. Retailers are looking for ways to sue data to be more pre-emptive in mitigating these losses.

Paul Raso

Alexandra Sanders

Retail Operations, Le Château

My name is Ally, and I am part of the Queen's MMA Class of 2016. I currently work in Retail Operations for Le Château, a fashion retailer, and am excited to apply what I am learning to retail analytics. My particular area of interest is customer insights and loyalty. I believe that the customer-centricity that comes with retail analytics is the perfect match to today's hypercompetitive, globalized retail market. Customers are more sophisticated and discerning than ever, and data-driven strategy provides a means for retailers to provide value to these customers while streamlining their operations and reducing their costs. For this reason, I jumped at the chance to get involved in the IBM Analytics Case Competition given its retail industry focus.

When selecting a retail analytics use case for the competition, it is important to consider feasibility, and consistency with the culture and strategy of the retail organization in question. Behind every successful retail analytics project, there is a strong business case. To build a convincing business case, the results of the analytics project should be clear and measurable. The "why" is just as important as the quantitative and technological components. The ability to gain buy-in from internal stakeholders within the retailer, and customers (if they are impacted) is crucial for success. In the retail industry, bear in mind that internal commitment to an analytics project doesn't always end within the walls of head office – store employees are the front lines of a retailer, and their compliance can make or break a corporate initiative. For instance, a loyalty program is only as effective as the number of times that a loyalty card is scanned at the POS system.

As you embark upon this case competition, you will likely find that it is challenging (but not impossible!) to find publicly available data sets. Data is becoming a valuable asset that many companies are not willing to part with. Start by asking your team members' organizations whether they would be willing to contribute a masked data set. If this is not possible, there are several helpful websites to consult:

• Kaggle Competitions – Kaggle is a website that posts data science competitions. The data from current and previous competitions on a wide variety of topics is available for download. https://www.kaggle.com/
• University California Irvine Machine Learning Repository – Hundreds of free data sets relevant to many different disciplines (business, science, healthcare, etc.) http://archive.ics.uci.edu/ml/
• BigML– Free data sets and corresponding models (for reference) are posted on this website. https://bigml.com/gallery/datasets
• The World Bank – Data on development issues for countries around the world (e.g. education, healthcare, economic growth, etc.). http://data.worldbank.org/
• Queen's Library Sources – http://library.queensu.ca/

Keep in mind that it may be useful to merge elements of different data sets if a single data set does not provide all of the variables that you would like to look at. It may also be helpful to use a proxy for particular information if the data that you are looking for is hard to obtain. With a little bit of creativity, you may be surprised at the insights that you can derive from what may initially seem to be a limited data set. Good luck in the competition! I can't wait to see all of your presentations.

Ally Sanders

Andrea Wood

Digital Project Manager, Zync Agency

Hi everyone,

My name is Andrea Wood and I am currently completing the Master of Management Analytics program at Queen's University. I also represent the class of 2016 as the VP, Marketing and External Affairs on our student council. I have a Master of Communication from Bond University in Australia, and a Bachelor of Business Management & Organizational Studies from Western. My work background is in health marketing and web/social media policy for the Government of Canada, as well as more recently working in the marketing/advertising agency world in Toronto.

Despite the amazing retail data sets we have slowly started to get public access to, I'd like to give students a huge tip for the competition --- take advantage of Data Services at the Queens U library and get in touch with librarian Jeff Moon directly if you need help with statistics, data, surveys and research data management. He is extremely knowledgeable and can guide you in the right direction.

The Open Data initiative from the Government of Canada is another huge hidden bonus. Even if you have already found a strong dataset from Kaggle or direct from a company, you can enhance your case analysis with supplementary datasets. Some examples below:

Weather data:

http://open.canada.ca/data/en/dataset/81f6c8e6-ffee-4c20-8cbf-c06dc2b233e6

Monthly Survey of Large Retailers:

http://open.canada.ca/data/en/dataset/449f9ca1-1df0-4a2f-8797-4146e317226a

http://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&lang=en&db=imdb&adm=8&dis=2&SDDS=5027

Consumer Price Index:

http://open.canada.ca/data/en/dataset/e5ed9119-20f4-4065-8b64-4b400168f320

My final piece of advice is "know your audience". Make sure you are looking at the business problem from the judges' perspective and come ready with relevant insights.

I wish you all good luck!

Andrea Wood
MMA 2016
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Analytics Competition Rubric

			Evaluation Criteria	Score in a Scale of 1-10	
Use Case	(i)	Create Business Value using IBM Analytics for a Retailer (Creative, Significant Value, and Implementation Ready Use Case)	1. Reflection of content discussed on September 26th boot-camp.		**20%**
			2. Demonstrate broad understanding of Retail Industry, references from articles, new clippings, academic journals etc. are strongly encouraged.		
			3. Statement on issue identification and current gaps. (Teams are NOT expected to present facts from the case)		
Data + Analytics	(ii)	Identify Data Requirements & Sources (public / dummy data)	1. Validity of data - why the data has been selected. Teams should be able to comment on limitation of the data or any anomalies (if applicable).		**10%**
			2. If using dummy data- Data generation technique must be clearly explained.		
			3. Comment on data processing in the pre-modelling stage.		
	(iii)	Create and Test Hypothesis	1.Establish one or more hypothesis.		**10%**
			2. Short comment(s) on why/how the hypothesis was established.		
			3. Robust methods to statistically prove or dis-prove the hypothesis.		
			4. Screen output of statistical tests in the appendix. (Teams are free to choose any tool for Statistical testing)		
	(iv)	Demonstrate Data Visualization using IBM Analytics	1. Visualization should add value to the case (Teams should NOT add visualizations that are not necessary).		**10%**
			2. KPI's OR critical case related values are presented in the visualizations.		
			3. Innovative ways to display munti-dimentional/Cross sectional data. Dynamic visualizations are strongly encouraged.		
Business Value	(v)	Articulate Component Breakdown of the Business Case	1 Coherent flow of information which incorporates, all the facets of the case.		**20%**
			2. Comprehensive diagnosis of key challenges/ issues		
			3. Clear understanding of limitations.		
			4. Demonstrate how analytics can add value.		
			5. Commentary on implementation (include Change and Risk Management initiatives).		
	(vi)	Present the Story	1. Language and vocabulary use aligned keeping the end users in mind.		**10%**
			2. Impact of the proposed solution and its relevance to Industry/Sector an/or Company.		
			3. Feasibility of recommendations (cost, tactical and operational etc.)		
			4. Synergy among team members in presenting.		
	(vii)	Q&A / Dialogue	1. Logical explanation of ideas, supported by materials (both inside and outside the case).		**20%**
			2. All team members are equally participative and demonstrate synergy.		
			3. Ability to drive conversation by engaging audiences.		
			4. Ability to intertwine best practices of analytics with the Retail Sector		
		Total			**100%**