



AIM

LEADER  PEAK

A stylized white city skyline is integrated into the letters of the word 'BIG DATA'. The 'B' contains a skyscraper, the 'I' contains a tower, the 'G' contains two trees, the 'D' contains a skyscraper, the 'A' contains a person standing on a pedestal, the 'T' contains a skyscraper, and the 'A' contains a skyscraper.

BIG DATA

**How Analytics Has Changed the Landscapes
of Business and Development**

Analytics Arrives at the Asian Institute of Management

An Introduction

There is a tidal wave of data that is at our disposal at the click of a finger. This data can mean increased productivity rates and profitability for businesses, governments, and civil societies, but the question of how to effectively manage and contextualize these data to useful information is the most crucial one yet.

In fact, the International Data Corporation reports that from 2.8 trillion gigabytes in 2012, the total worldwide data will expand to 40 trillion gigabytes by 2020. The need to curate and analyze information and data requires an urgent need for skilled manpower and sophisticated technology to create tangible and profitable business results. Business schools like New York University and University of Texas at Austin, for example, have run successful analytics certificate programs with highly advanced analytics labs. More schools are following suit with Babson College launching undergraduate and graduate concentrations in business analytics, the Massachusetts Institute of Technology offering its first online professional course called “Tackling the Challenges of Data”, and a number of others like London Business School, Fordham University, George Washington University, Northwestern University, Illinois Institute of Technology, and the University of Virginia recently adding big data to their curriculum.

The Asian Institute of Management, as the pioneer in international management education in Asia, is sensitive to these emerging needs in the global market. AIM took on analytics from two sides of the spectrum: one from business, and one from the development angle. For analytics in the business sector, The Washington SyCip Graduate Business School, together with IBM, held the Transforming Business with Analytics forum at the Meralco Caserom last July 10, 2014. The two subtopics highlighted were Digital Reinvention: Trust, Transparency and Technology in the World of Tomorrow, and Becoming Data Driven – Transforming Industries with Data Analytics. The speakers included AIM Trustee and IBM Philippines’ President and Country General Manager, Mariels Almeda-Winhoffer; IBM Partner and Vice President for Strategy and Analytics and Leader for Asia-Pacific, Simon Thomas; IBM Technical Lead for Big Data and Chief Technology Officer, Chris Howard; IBM Vice President for Big Data, Aurelio Ricart; and IBM Philippines’ R&D Executive, Delfin “Jay” Sabido IX.

For analytics in the development sector, the Stephen Zuellig Graduate School of Development Management hosted the Big Data for Development forum last July 14, 2014 at the First Philippine Holdings Caserom. Leading the discourse on analytics in development was speaker Dr. Erik Wetter, Assistant Professor at the Stockholm School of Economics and Co-founder and Chairman of Flowminder Foundation, a non-profit entity based in Sweden that seeks to improve public health outcomes by working with governments and NGOs in collecting, aggregating, and analyzing data through anonymous mobile phone and satellite data.



Setting the Groundwork

The Philippines as a Global Center for Analytics

Starting off the Transforming Business with Analytics forum were opening remarks from Mariels Almeda-Winhoffer wherein she focused on how the Philippines could be poised to become the global center for analytics. “What we’re forging here, as IBM, and in partnership with the academe and government, is not how to teach how to use the tools, but how to build the competencies so that our country and our people are prepared for what’s to come,” she said to the packed Meralco Caseroom. Analytics, she said, is something that is yet to come in the Institution, and is something to look forward to.

The research firm Gartner predicts that smart analytics will create 4.4 million jobs by 2015, but only a meager 30% can be filled because of the lack of skilled workers. The Philippines is well positioned to capture about 10% of the \$232 billion global analytics industry by 2015.

To address this need, IBM, together with eight founding members, created the new consortium ANALITIKA which will pave the way for the Philippines to become the prime destination for smarter analytics by 2015. ANALITIKA is comprised of members from leading industry players, with advisory support from government and academe. The founding members are IBM, Bank of the Philippine Islands, ABS-CBN Corp., Smart Communications Inc., Pilipinas Shell Petroleum Corp., Sun Life Financial, Inc., SM Retail Inc., Integrated Microelectronics, Inc., and Manila Electric Co. The government advisors are The Department of Trade and Industry, The Department of Science and Technology, and the Commission on Higher Education. ANALITIKA positions itself as the institutional body that would develop, enhance, and monitor analytics as an industry in the country. Moreover, ANALITIKA is also planning to create a Smarter Education Consortium that will act as an advisory council for elementary school through college. AIM is a proud member of the consortium, and is dedicated to creating leaders who are adept at the changing waves of new technologies.

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Mariels Almeda-Winhoffer
AIM Trustee and Country General Manager,
IBM Philippines

How Has Big Data Changed Businesses?

According to IBM, big data is “the digital convergence of structured data found inside databases, and unstructured data flowing from new sources like social networks, mobile devices, sensors, RFID, smart meters and financial systems. Today, organizations capture and analyze any data, regardless of what type, how much, or how fast it is moving, and make more informed decisions based on that information.” The annual growth rate of big data, both structured and unstructured, is at 60%. In social media alone, every 60 seconds there are 600 newly published blog posts, and around 34,000 tweets sent into cyberspace. The proliferation of big data, then, would cause ripples in the business world.

Before the influx of big data, for instance, industries used to be separated into three segments: agricultural, industrial, and services. While agriculture is land-driven, industrial is asset-driven, and services are human capital-driven. “But now there are those that do not fit within these criteria,” IBM’s Aurelio Ricart explained. Industries are shifting, he emphasized, and data appears to be the fourth segment.

“A bank used to be an institution that loaned and managed assets, but today, everything is virtual,” he said, “It’s about risk management and how you control the information.” The same goes for retailers whose business 20 years ago used to revolve around a physical store and its management of inventory;



IBM Vice President for Big Data, Aurelio Ricart, stresses that industries are shifting.

today, however, a retailer is an entity that manages information. It's important for businesses these days to not only realize the importance of big data, but also to take advantage of it.

Ricart addressed four major trends that have unfolded in the past few years in the business sector. "We've been managing businesses thinking that they are lineal, that they are fragmented," Ricart said. But these days, the lines between industries are being blurred. Second, business is not fixed and 80% is moving. There will be no single formulaic solution to sustain long-term growth – it is integral to constantly innovate and be one step ahead of the curve. Third, opportunities for industries are hidden; to not properly use data is to only see the tip of the iceberg. People have often misconstrued data and business as two different things, but business process is just a different type of data, or a "metadata of the other." The last trend is that industries are shifting, especially with banking entering telco, or banking entering retail. "If you don't do it," Ricart cautioned, "You are isolated."

Insights from IBM's C-Suite Study:

The Disruptive Force of Technology

Because of big data, there is a new space that opened up for technology to help ease a seamless transition for industry shifts, or to help businesses in being proactive in the changes to come. It would seem that the C-suite have caught on, as well. In Simon Thomas' presentation, he explained the results from IBM's

latest global C-suite study where they culled data from 884 Chief Executive Officers, 576 Chief Finance Officers, 342 Chief Human Resources Officers, 1,656 Chief Information Officers, 524 Chief Marketing Officers, and 201 Chief Supply Chain Officers from both public and private sectors across 67 countries. He noted that CEOs considered technology as the single most important external force affecting their companies in both 2012 and 2013. It is the disruptive impact of new technologies that now challenge the way businesses are being run.

"You cannot expect that your competition is going to come from within your own industry," Thomas said, noting that the study reveals that 41% of CEOs expect new competitors to come from other industries. For example, Amazon now finds itself in the Top 10 of all retailers in the United States, along with Wal-Mart, Costco, and Target. "An online operator with no physical structure is now a major competitor," Thomas said. With a heightening sense of competition, it becomes even more important for businesses to understand what their consumers want. Thomas further stated that the area in which CEOs expect to see customer influence grow most is business strategy development. Today, it's at 43% but it will climb to 60% in three to five years. It is all about creating a "segment of one," the identification of one customer at the right time, and giving them an offer that they would purchase.

But how are CEOs supposed to make sense of the vast amount of data to create this “segment of one”?

This is where IBM Watson comes into the picture. Boasting a win against Jeopardy’s top champions Ken Jennings and Brad Rutter, IBM Watson defeated the show’s top runners by a wide margin (\$77,147 as opposed to \$21,600 and \$24,000). Cognitive computing, as Ricart explained, “is similar to how our brains work. It makes decisions based on hypotheses, not on statistical methods.”

In short, these are analytic systems that can learn. The supercomputer IBM Watson can collate massive amounts of data and give quick answers. By using cognitive computing, CEOs can find out what the customers want even before they create the products.

How Data Transforms Industries

In his presentation, Chris Howard explained how analytics has transformed industries spanning from healthcare, insurance, telco, and the government. In healthcare, for instance, from having persistent interruptions, analytics is able to transform that into proactive intervention. In insurance, retroactive analysis is changed to predictive behavior.

“[Analytics] democratizes the information,” Howard said, and noted that proper analytics of big data gives businesses “the ability to make better decisions.” Among many things, analytics can spur transformation by redefining the business experience and deepening business relevance.

But it is important to stress that it is not merely big data that can make industries leaner and more efficient. “It’s all about the technique, or the analytics that we apply to the data,” Howard emphasized. Having a plethora of data, he said, does not necessarily equate to having the solutions at hand.

He also discussed the Four Vs of big data: volume, variety, velocity, and veracity. Big data is first of all, is all about volume. According to an IBM infographic online, the digital universe will swell to 8zb in 2015. Big data is also about variety because 80% of data is not structured – they come in audio, video, and textual formats. Most companies only make use of 20% of the data present, which is akin to using only one of our five senses in our daily lives. Big data is about

velocity in the sense that it moves very quickly and that the responses that businesses need to give to it is equally as urgent. The fourth V is about veracity, or being certain that the data is free from untruthfulness or errors. It poses the question of whether or not businesses can act upon the data at hand.

All this being said, Howard emphasized the importance of putting security and governance systems in place as well.

Leveraging Big Data in the Philippines

To shed light on the use of big data in the Philippines, IBM Philippines’ Delfin “Jay” Sabido spoke about the ongoing analytics projects in the country, in weather forecasting, agriculture, and healthcare. The main focus of his talk, however, was on the use of analytics in weather forecasting with subtopics on wind speed forecast and rain occurrence, especially during typhoons. The importance of weather research, according to his presentation, was that there are about 20 typhoons that enter the country each year. Typhoon deaths are prevalent because of wind debris, floods, storm surges, and landslides. At the moment, it’s currently about asking how the government can be better prepared, or how it can improve its use of analytics in order to prevent another Yolanda disaster. As Sabido said, it is about “addressing the gaps” that are currently in the system so that the government can respond quicker and altogether be more efficient.

Sabido also discussed about recommendations on how to use analytics. The first recommendation is that businesses should focus on the biggest and highest value opportunities. It is about maximizing what a

“[Analytics] democratizes the information... Proper analytics of big data gives businesses the ability to make better decisions.”

Chris Howard
IBM Technical Lead for Big Data

business already has. The second recommendation is that within each opportunity, it is acceptable to start with questions, and not data. “You can’t afford to wait for the perfect solution,” Sabido advised, “Don’t be afraid to jump into it or lead with connections.” This is also because a lot of data come in an unstructured form. He said that it’s understandable to start with the question and then eventually go back and dig for more data.

Other recommendations he mentioned are to embed insights to drive actions and deliver value, to keep existing capabilities while adding new ones, and to use an information agenda to effectively plan for the future.

Summary

1. The Philippines is poised to become the global center for analytics. With its participation in the consortium ANALITIKA, AIM is a partner in seeing this goal through. In 2015, only 30% of 4.4 million jobs will be filled, and it gives the Philippines the chance to address these needs.

2. Industries are shifting. Whereas before, industries were separated into three main segments: agriculture (land-driven), industrial (asset-driven), and services (human capital-driven), there emerges a new sphere: big data. In fact, in IBM’s most recent Insights from the Global C-Suite Study, it revealed that more than 2 in 5 CEOs see threats coming from new sources, or new industries. This implies a greater demand to use data analytics to understand what customers want, and when they need it so businesses remain relevant and stay competitive.

3. Big data is the new natural resource. There’s no stopping the rapid growth of big data in the digital universe. It is permeating every industry, and the need for skilled workers is becoming even more urgent. According to IBM, organizations that apply the right analytics to data for competitive advantage are 2.2 times more likely to outperform their industry peers.

4. There are four business paradigms that have surfaced in the digitally-charged world today. Businesses are no longer lineal or fixed. Opportunities for businesses are hidden, as well, and the line between industries is being blurred. Because

businesses are in a constant state of flux, using data analytics allows them to be a step ahead of the curve.

5. Every industry can leverage big data and analytics. The Philippines is an example of a developing country that has used big data and analytics, for weather forecasting, traffic management, and to promote smarter agriculture. Even SMEs can find data analytics useful; regardless of the scope and scale of business needs, there is a right type of analytics programs that are suitable for each.

Big Data in Development

Focusing on the impact of big data in development was Dr. Erik Wetter, a seasoned professional in both the development sector and the academe. Known for spearheading Flowminder Foundation, Wetter discussed his non-profit organization’s projects in using “anonymized” mobile and satellite data particularly in Bangladesh and Haiti.

Flowminder Foundation, created in lieu of the fact that 30 million people are displaced every year by natural disasters, with millions more due to famines and conflicts, sought to use data to track IDPs and create a more systematic way of bringing them relief and aid .

“Having a lot of people move [from one place to another] creates policy problems for governments,” Wetter said. He showed the case study of the catastrophic Haiti earthquake in 2010, where it hit the town Leogane, 16 miles west of Port au Prince. Wetter’s group used satellite and mobile data to help effect a faster and more efficient way to get IDPs relief and aid. “Where are all the people? Where should we send the food, or the medicine?” He said, explaining that in times of disasters, people move so frequently and rapidly that agencies and governments often have a hard time tracking them down.

Using satellite data, the group was able to compare and contrast the different imageries of before and after the earthquake hit. With the earthquake hitting in January, by February the satellite images showed that



The use of mobile data in development is brimming with potential. It's not however, a 'magic potion' that solves everything—there has to be a level of expertise needed to sift through the data in a large set.

Photography by Nikki Victoriano. Ten Photos to Shake the World by ASSIST.

the area was turned into an official UN refugee camp. As weeks rolled by, the area slowly became a “full-blown city.”

Although the use of satellite data was very helpful, Wetter said that there remained major drawbacks to this technology. First of which is that while they were able to see the tents being propped up, they did not see the people inside. “You make an estimate as to how many are inside,” Wetter said. Second is that a lot of these people had to register to receive food in these camps. This doesn't make for having an accurate number because it would mean that some people could register again in other camps to get more food, which would then muddle the statistics. The third drawback, which could arguably be the most challenging one, is that in camps, agencies and governments are able to track the number of people who are receiving food and other forms of aid, or those who arrived in the camp sites. In disasters, though, most people do not go to camps. “The UN estimates that in a population of 3.5 million, only 350,000 go to camps – that's only 10 percent,” Wetter stated, “Some people go somewhere else like a friend's family's, or other similar places.”

Aside from these drawbacks, there remains another issue: getting accurate numbers for the stock and flow of people. Getting to see these numbers is crucial, especially in times of disasters. Wetter gave the example of the population of Manhattan at noon, compared to Manhattan at midnight in the same day; the population could balloon to about 8 million in the middle of the day, but drastically deflate by midnight because the people would have traveled back to their homes either in New Jersey, or in various other neighboring cities or states nearby. “You get a snapshot of the stock, but you don't know the flow,” he said. The same goes for Metro Manila; given that it's an earthquake zone, it matters a lot for agencies and the government to know when an earthquake could happen. Will it hit during noon on a Wednesday, or during midnight? The problem that Wetter espouses then, is rooted in the fact that satellite data can only give an educated hypothesis, but not a concrete set of statistics.

With mobile data, Wetter and his team worked with Digicel, a Haitian mobile provider to help track mass movements of the displaced people. Digicel

helped in giving access to their call data records (CDR), the information that all mobile operators have – everything from call, text, data text, and data volume, that is transmitted to the nearest cell towers. They made sure, however, that these CDRs were “anonymized”. “Everyday you see which tower is used,” Wetter said, “You can see if someone was inside the city or outside the city; you get to see movement patterns.”

For example, in the wake of the earthquake in October that year, UN camps from all over the world entered Haiti, a number of which were Nepalese camps. Because cholera occurs in Nepal, some fell ill when there was sewage that was dumped in a nearby river. A strong cholera epidemic broke out, and the Haitians, who previously never experienced cholera, caught the disease.

“If you’re an aid agency, you would send to this particular area [where the cholera outbreak took place], but a lot of people were leaving that area,” Wetter said. He said that the data showed that people were moving to Port au Prince, but there were also some moving to another island up north. “You want to know where people are going, not where they were coming from,” Wetter said.

When the mobile data was compared with that of UN agencies, they found that there were discrepancies in the numbers. They did realize, though, that mobile data proved to be more thorough in giving estimates. Wetter moved on to explain the two major fallacies with big data. The first is that of the “magic potion” fallacy. “Quantity is not the same thing as quality,” Wetter stressed, “When people talk about big data, they talk about billions of data points but just because you have 1 billion data points doesn’t mean that the data is any better. Big data is just a lot of data.” He explained that just because a set of numbers come from a database, it doesn’t mean that they’re perfect. The data must also be the correct data that corresponds to what it will be used for. Big mobile data is also not a magic potion that solves everything – there has to be a level of expertise needed to sift through data in a large set. “If you want to solve the outbreak of cholera in Haiti, you need to know about cholera,” Wetter said.

With their case study in Haiti, it turned out that Digicel mobile subscribers were a good sample of

“The data is useful if you know how to use it... But it is useless on its own.”

Dr. Erik Wetter
Assistant Professor, Stockholm School of Economics and Co-founder and Chairman of Flowminder Foundation

the population. But when it comes to other situations, the question that must be asked is: who is my target audience? Who are my customers and are they represented in this sample?

In Bangladesh, for instance, and other parts of India, while they may have access to phones, a large number do not have access to personal phones. Less than 30% in Bangladesh have personal phones, while others rely on their neighbor’s phones and the like. One sim card in Bangladesh could be used by a family of eight people, compared to Sweden where one sim is equal to one person. How would this affect the big data study? It would then mean that the use of mobile data in Bangladesh might not be as reliable as the use of mobile data in Sweden.

“The data is useful if you know how to use it,” Wetter said, “But it is useless on its own.” An agency can make use of the mobile data, but it is not enough. They would have to also cross-check with other sources of information like UN numbers, or government numbers to derive a safe estimate.

The second important point that Wetter made is the “Star Trek” fallacy that involves the impact of big data. Data, he said, is just the tool and not the solution. He also mentioned that no remote data could replace actual field work. “You also have to know what’s



going on,” Wetter said. Being out in the field and experiencing what is going on trumps a large volume of data accessed in a computer.

Wetter explained as well that mobile data is very complex and sensitive in terms of privacy. He warned against data exhaust because wanting all the data is “akin to going to a hospital and asking for all the medical records.” There has to be a sophisticated way of analyses and curation of data.

Another point with mobile data is that while real time data analyses are possible, it is not always scalable, cost-effective, or value-adding. The data would still need to be validated against ground data, medical data, and a range of other information. Having quick information, then, would not mean having a quick solution. It would always need to be supported by other data.

Summary

1. In development, the sphere of big data, specifically mobile data, is brimming with potential. Especially in Flowminder Foundation’s case study, they were able to leverage mobile data with Digicel Haiti to help alleviate the conditions of the IDPs. They were able to see the movements of the people, and were able to deliver relief and aid to those who needed it the most.

2. Big data is not without its drawbacks. Although it has potential, it also has its own share of obstacles.

For example, the satellite data that Flowminder Foundation used also lent itself to possible miscalculations. While there were tents, they could not see the people inside. While they are able to see the movement of people using mobile data, they are only given an idea of the stock, but not the flow of the people.

3. Field work trumps big data. There is no replacing field work in development. While satellite and mobile data can be very useful especially in delivering relief and aid, it is integral to know the people, their conditions, and the geography. It is not enough to know data on where the cholera most likely started in Haiti, it is also important to know the disease, how it spreads, why it spreads, and the preventive measures to take.

4. There has to be a sophisticated set of analytics applied to big data for it to be useful. Having big data is literally what it is – it’s having big data. But it doesn’t immediately translate to having the solutions, or the cure for a cholera outbreak. It needs systematic analysis and curation, and the big data must represent the people that the agencies or governments are trying to help. It is not a “magic potion” that offers a “Star Trek” ending – big data requires big analyses. ♦