Newsletter
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In This Issue

News & Events from CfBA

Global experts will join some of Australia's biggest CEOs to explore how AI is redefining the future of business this August.

With guest speakers from Coles, REA Group and the Wharton School, McGill University, and Amazon Web Services, this year's Melbourne Business Analytics Conference will bring the best of business research and practice together to discuss the theme of "redefining the future of business with AI".

Hosted by the Centre for Business Analytics, the conference will be held at The Grand Hyatt Melbourne on Thursday, 15 August 2024. Attendees will explore the integration of artificial intelligence into core business processes, learning from industry leaders about the transition from AI as a standalone tool to a fundamental, integrated business capability.

Professor Yalçin Akçay, Director of the Centre for Business Analytics, said the theme was designed to build on last year's conference, which equipped leaders with the knowledge and tools necessary to navigate the complexities of data and digital transformation in the age of AI and automation. "AI has evolved from a collection of bespoke tools to a fundamental ingredient of business strategy, driving innovation, efficiency, and competitive advantage," he said.
"As such, many businesses find themselves at a crossroads, where they have adopted AI and are now uncertain of the next steps in their strategic evolution. "We want to equip Australian organisations with the knowledge they need to move beyond the implementation stage and begin integrating AI capabilities into their business models and across entire business operations. "It's critical that Australian businesses embrace the transformative opportunities that AI presents, otherwise we risk being left behind."

The conference will offer insights into the strategic embedding of AI technologies for enhanced decision-making, efficiency and innovation, highlighting the ethical considerations and transformative potential of AI in shaping future business landscapes. "This is a particularly special event this year, as we are celebrating 10 years of the Centre for Business Analytics," Professor Akçay said. "We have spent a decade helping Australian businesses to gain a distinctive competitive advantage through harnessing the insights of business, mathematics and technology. The integration of AI is simply the newest opportunity we want to help companies embrace."

Gad Allon is the Jeffrey A. Keswin Professor and Professor of Operations, Information and Decisions, and the Director of the Management and Technology Program at the University of Pennsylvania. His research interests include operations management in general, and service operations and operations strategy in particular.

How AI is levelling the playing field

Professor Gad Allon from the Wharton School of the University of Pennsylvania will speak at this year's conference on topics including how AI has broken down the barriers to entry to analytics and data.

"The barrier to entry has really come down because large language models are now available to people with much more limited skills through platforms like OpenAI," he said. "In the past, you needed a ton of data to actually build good models and this is no longer the case. "Now, you can piece together three to four different things through OpenAI to develop a data solution that would have taken 10 people two years to develop."

Professor Allon said that as well as levelling the playing field, AI also raised new risks for businesses to consider. "Firstly, there are major privacy issues," he said. "There's also concerns around GenAI hallucinations. This is the notion that the more we begin to rely on fake articles, and fake research being written by generative AI, the more they will simply become part of our reality.

"It's the same way that now, if you don't get served on the first page of Google, you basically don't exist. And unlike Google which serves you 10

answers, Open AI just serves you one, so if you don't ask any follow up questions you will just accept its answer as truth."

Quality and quantity of data still important

Professor Maxime Cohen from the Bensadoun School of Retail Management at McGill University, who is also booked to speak at this year's conference, said that while AI did allow people to create models with less data, there was still an advantage to having more.

"The more data you have, the better AI can be, and it's not only the quantity of data you should consider, but also the quality," he said. "Firstly, it enables companies to predict better. If you have a lot of data, if you have a lot of AI capabilities, you can potentially pre-empt and predict those types of Black Swan events – like the pandemic – before they occur. You can be better prepared."

Professor Cohen said the quality and quantity of data made a difference to personalisation services in particular. "If you have a lot of data about a lot of different individuals, you can personalise the recommendations, the decisions and the actions at the customer or the individual level," he said. "A good example is in healthcare, where we see that AI can really enhance the patient experience. We can really understand each patient based on their medical history."

The ability of AI to enhance productivity is another opportunity Professor Cohen believes organisations should be looking to embrace, especially where it can also lead to positive social outcomes. "If we look at healthcare again, if you use AI properly, you can automate all the administrative tasks that are very low value and therefore allow physicians to spend most of their time in very high value tasks, such as doing better diagnostics and seeing more patients – and in doing so, increase access to healthcare."

Maxime Cohen is a Professor of Retail and Operations Management, the Director of Research, and the Scale AI Chair in Data Science for Retail at the Bensadoun School of Retail Management at McGill University. He is also the Chief AI Officer of ELNA Medical and the Scientific Director of the non-profit MyOpenCourt.org.

Hear from Australia's top executives

Conference attendees will also have the opportunity to attend sessions led by industry experts on a range of topics including building AI-enabled organisations, ethical considerations of AI in business and how to find the right technologies and partners for your company.

"The opportunity to hear first-hand from leading Australian businesspeople has always been a highlight of the conference," said Anita Arbogast, Executive Director of the Centre for Business Analytics.

"Attendees will have the opportunity to engage with leaders from top Australian organisations and hear case studies that exemplify the practical application of AI and AI-integrated business strategies. "The knowledge exchange that takes place in these sessions is invaluable."

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SAS Practice Prize

The conference will also feature the announcement of the third Practice Prize winner. The annual competition was established to celebrate outstanding applications of business analytics with significant organisational impact, with the winning team taking home $10,000.

Last year, a team from Downer was awarded the top honour for creating an innovative software tool that cuts planning time and carbon emissions during road maintenance.

At this year's conference, Practice Prize finalists will present their findings and field questions from the audience.

"Having the finalists present at the conference gives them the opportunity to share with a wider audience their effective solutions, methodologies and initiatives that can potentially have broader applications," Professor Akçay said.

This year's Practice Prize judging panel will include:

- **Craig Jennings**, Vice President and Managing Director at **SAS** ANZ
- **Brooke Miller**, President at **Lineage Logistics**, APAC
- **Kelly Brough**, Managing Director, Data & AI Lead, ANZ **Accenture**
- **Feryal Erhun**, Professor of Operations & Technology Management at **Cambridge Judge Business School**
- **Gabriel Weintraub**, the Amman Mineral Professor of Operations, Information & Technology at **Stanford Graduate School of Business**
- **Tinglong Dai**, the Bernard T. Ferrari Professor at the **Johns Hopkins Carey Business School**

Welcome to the Master of Business Analytics, Class of 2024

Over the recent months, the Centre has been bustling with activity as we embark on several new initiatives. We are enthusiastically planning an array of programs and projects that promise to enhance our offerings and expand our impact in the field of business analytics.

Our MBusA program continues to flourish, with the 2024 class (68 full-time students) commencing in January. As part of their Orientation program, students met our alumnus and recent Forethought Roberts prize recipient Junze Li who provided them with some thought-provoking personal and professional advice on how to get through the tough study year and period.

Other Updates

The Centre also warmly welcomed Danielle Malone as the new Executive-In-Residence. With over two decades in Data and AI, spanning various sectors globally, Danielle brings a wealth of expertise to our Centre, focusing on developing new business opportunities and forming strategic partnerships.

We are also excited about the advancements in our Executive Education offerings, including the new course on " Generative AI: Strategy & Business Transformation" set to launch in October 2024.

Should Social Media Platforms Collect User Data? Where to Draw the Line?

Young-San Lin
Assistant Professor, Melbourne Business School
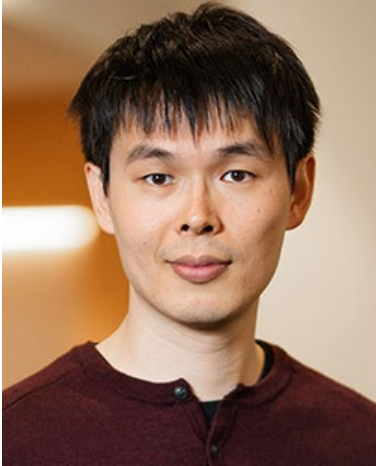
About the Author: Young-San Lin is an Assistant Professor of Operations/Management Science at Melbourne Business School. He completed his PhD in the Department of Computer Science at Purdue University.

His research interests are in the interdisciplinary field of theoretical computer science, economics, and operations research, with a focus on market design, revenue management, resource allocation, and online algorithms.

During my Ph.D. studies in the Midwest of the U.S.A., I decided to surprise my former roommate, who was working and living in San Jose, with a set of fitness resistance bands for his birthday. I believed the gift was thoughtful, especially considering his commitment to fitness and well-being. Shortly after he received the delivery, he called me with an amusing anecdote. "Hey, mate! Thank you for your gift! It's funny because I was browsing online for resistance bands just a few hours before the package arrived. I was so surprised when they showed up at my door. I even thought my data had been hacked and someone was playing a prank on me!"

Later, we delved into a discussion about social media companies gathering user browsing data for their business purposes. Despite our transition to search engines or web browsers like DuckDuckGo, which offer protection against web tracking, we still encountered advertisements and recommendations, albeit in reduced numbers. My former roommate expressed his frustration with this persistent stream of ads and suggestions. He even thought about quitting, and perhaps his only reason for still using it was to stay connected to friends and family. Our conversation also touched upon the potential for users to be manipulated through exposure to recommendation articles.

Amidst these personalized experiences, social media companies nowadays possess an unprecedented ability to gather vast amounts of information about their users. From browsing habits to personal preferences, every click, like, comment, and share leaves a digital footprint that these platforms eagerly harvest for targeted advertising and algorithmic recommendations. Users would find themselves bombarded with advertisements and recommendations immediately after browsing the internet, triggered by their browsing history, leading to feelings of anxiety and insecurity. As the line between data collection and customer privacy blurs, concerns about the ethical implications of data usage and collection have been brought to the forefront.

Better user experience? Perhaps not quite.

Social media companies argue that gathering user data allows them to provide a more customised user experience. With the aid of data-driven approaches including artificial intelligence, machine learning, and predictive analytics, these companies can tailor content, recommendations, and advertisements to "better suit" individual interests by analysing user behaviour and preferences. Studying user trends yields valuable business insights, informing product development and innovation, while also generating commercial profit.

However, the collection and usage of user data has significantly raised concerns about security, privacy, and other ethical considerations. Many users are uncomfortable with the idea of their online activity being tracked and monitored, fearing potential breaches of privacy and misuse of their personal information. The extent of data collection by social media companies can

sometimes feel invasive. This has led to calls for better transparency and accountability from social media companies regarding their data practices, as well as the demand for stronger data protection regulations to safeguard user privacy.

In contrast to traditional media sources like newspapers and magazines that offer uniform content to all readers, social media platforms curate customised content for each user. Consequently, as users engage with recommended content, they are directed towards related material, resulting in a snowball effect. Over time, users become increasingly immersed in specific materials and restricted to their echo chambers while growing disconnected from materials and communities beyond their comfort zone. This pattern of selective exposure could be exploited maliciously to manipulate users' mindsets and shape polarisation.

Ultimately, we should be mindful of the impact of our data being collected and used, and the content presented to us on social media platforms. It's crucial to regularly reflect on a variety of questions: Are we consciously sharing the information we wish to disclose with social media companies? Are we comfortable with the recommendations or advertisements being presented to us? Are we encountering materials that may be biased due to our browsing history and personal preferences?

Where to draw the line?

It comes down to finding the balance between the legitimate interests of companies in gathering data for business purposes and the rights of individuals to privacy and data protection.

One approach is to impose stricter regulations on social media companies to ensure that user data is handled ethically and responsibly. This could include laws requiring companies to obtain explicit consent from users before collecting their data, as well as imposing penalties for data breaches and misuse of personal information.

Another approach is to give users better control over their data. Users should have autonomy in determining what information to share and with whom. An enhanced and more granular privacy setting would facilitate this control. Additionally, granting users the ability to opt out specific types of data collection would further empower them to protect their privacy.

While the line between data collection and user privacy remains blurry, there are steps individuals can take in the meantime to safeguard their data. Using search engines and web browsers that prevent web tracking is an ideal option. Raising awareness about this issue among the public and government officials can also drive the development of policies that regulate data collection practices.

Striking the right balance between customer privacy and information usage is a complex and multifaceted topic that requires careful consideration of the interests and rights of all stakeholders involved. By adopting a proactive and transparent approach to data privacy and protection, social media companies can help build trust with users and ensure that platforms remain secure and respectful of user privacy.

Leveraging AI for Sustainable Business Success: A Guide for Senior Executives

Dr. Gregory Hill
Adjunct Professor, Melbourne Business School
Member of Industry Advisory Board, Centre for Business Analytics

About the Author: Dr. Gregory Hill has been leading data analytics teams since 2009. He has designed teams and roles while hiring and managing the full spectrum of data analysts, scientists and engineers in Australia, the UK, US, Malaysia and China.

His expertise lies in applying advanced analytics capabilities to solve commercial problems in marketing, supply chain, product management and pricing for retailers, telcos and financial services firms. Greg's passion is developing data practitioners of all stripes in their careers, so that their intellectual and technical capabilities have an outsized impact on organisations. He was a founding member of the Industry Advisory Board at MBS' Centre for Business Analytics, where he helped develop the curriculum for the flagship Masters degree. He holds a PhD in analytics from the University of Melbourne.

In a rapidly advancing technological landscape, the adoption and integration of Artificial Intelligence (AI) is becoming a critical pivot around which the future of enterprise strategy revolves. As we stand on the brink of this transformative era, it is essential for senior executives to understand not only the potential of AI but also the robust governance frameworks required to harness its capabilities.

AI technologies, particularly in the enterprise sphere, are developing at an unprecedented rate, promising significant advancements in operational efficiency, customer engagement and decision-making processes. However, these opportunities also come with substantial responsibilities, especially in terms of ethical considerations, risk management and regulatory compliance.

Immediate Action, Not Delay

First and foremost, organisations should not wait for legislation to dictate their AI Governance model. The pace at which AI is evolving will likely outstrip the speed of regulatory frameworks. Because the technology is so new, and constantly evolving, many executives and Boards wrongly assume that completely new methods are needed for AI Governance. However, in reality, the risks and matters which need to be addressed with AI Governance are the same ones boards have been dealing with for years – issues around ethics, privacy, transparency and fairness. They are not new AI-created risks or concerns. Australia is unlikely to have a single catch-all piece of AI legislation like the European Union. Enterprises must establish their own governance model that aligns with their existing legal obligations and ethical standards. This approach not only mitigates risks but also positions companies as leaders in responsible AI adoption.

Preserving Social License to Operate

The concept of a 'social license to operate' is becoming increasingly relevant in AI. Public trust in AI technologies is fragile and can be easily undermined by high-profile missteps. To maintain this trust, companies must commit to transparency and engage in continuous dialogue with stakeholders about how AI systems are used, the benefits they offer, and the measures in place to protect privacy and ensure fairness.

Comprehensive AI Governance

AI Governance should be comprehensive and structured around four key dimensions: Strategic Alignment, Value Creation, Operational Performance, and Risk Management. Each of these dimensions requires thoughtful consideration and deliberate action:

- **Strategic Alignment:** AI initiatives must be in harmony with the organisation's broader strategic objectives. This alignment ensures that AI

contributes positively to the business direction and does not divert resources from critical areas.

- **Value Creation:** It's crucial to articulate and measure the value generated by AI systems. This goes beyond financial metrics to include enhancements in customer satisfaction, innovation, and competitive advantage.

- **Operational Performance:** AI systems should enhance operational efficiencies and productivity. Continuous monitoring and fine-tuning of these systems are essential to maintain performance standards and adapt to changing conditions.

- **Risk Management:** Effective AI governance involves identifying potential risks—both technical and ethical—and establishing protocols to control these. Risk management strategies should be developed in anticipation of possible AI failures or breaches, ensuring that AI systems do not compromise the organisation's integrity or the security of its data.

Forward-Looking Leadership

The role of senior executives is crucial in navigating this AI-driven transformation. Leaders must be open-minded, informed, and proactive. They should foster a culture of innovation and learning within their organisations, promoting a culture where ethical AI development is a shared responsibility.

Engage and Educate

Finally, education is pivotal. Senior executives must ensure that their teams are equipped not only with the technical skills required to implement AI but also with the understanding necessary to anticipate the broader implications of AI technologies. This dual focus will be crucial in steering their companies through the complex landscape of AI transformation.

As we advance further into the AI Age, the onus is on senior executives to lead with foresight and responsibility. By establishing robust AI Governance frameworks and maintaining an ethical compass, businesses can leverage AI not just for economic gain but as a catalyst for broader societal benefits.

Further Reading and Resources

For those seeking a more in-depth exploration of these concepts, a comprehensive guide in the form of a whitepaper titled "Enterprise AI Governance for Senior Executives" was published recently by the Centre for Business Analytics. This resource delves deeper into the nuances of AI Governance, offering detailed insights and actionable strategies tailored for senior executives and board directors. The whitepaper is available to download and share through the Centre for Business Analytics website.

It's 2024, Where Are Our AI Products?

Meiji Tran
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Student Fellow, Centre for Business Analytics

About the Author: Meiji Tran is currently a student in the Master of Business Analytics program at Melbourne Business School and a Student Fellow of the Centre for Business Analytics.

Meiji Tran brings her deep fascination with numbers and analytical rigor to solve practical business challenges. With a foundation in Actuarial Science and professional experience in the life insurance industry, she has sharpened her skills in valuation metrics, system optimization, and cross-functional teamwork. At the Centre for Business Analytics, Meiji is dedicated to leveraging her data-driven insights to effectively tackle real-world business challenges.

The conversation about Artificial Intelligence (AI), once a niche topic for tech team huddles, has now become a widespread subject of discussion in organisational meetings and conferences. Like the technological innovations that preceded it, such as cloud computing and blockchain, AI brings with it a mixture of opinions. However, one thing is for sure: AI is set to stay and will disruptively transform how businesses operate. While there's excitement about the opportunities AI presents, there's also anxiety regarding its impact and fit within the company culture. Unfortunately, these concerns are not always openly communicated in the workplace. In this article, I'll explore the different attitudes towards AI across organisational levels, the challenges they face in using AI, and what the AI strategy should include to ensure a unified approach towards a future where AI is an asset rather than a concern.

Senior Executives: What is AI?

At the corporate helm, senior executives are leading the charge towards embracing AI, driven by genuine enthusiasm and a fear of missing out in the tech race. This urgency has increased significantly in the past 18 months, spurred by the global fervour with OpenAI and ChatGPT that repositioned AI as a must-have asset far beyond realms of the tech industry. Traditional sectors, including public services, airlines, and banking, have started implementing AI to maintain a competitive edge.

However, this omnipresent arms race is not merely strategic but also a reaction to investor pressure, suggesting that companies without AI might face obsolescence. Consequently, there's been a rush to invest heavily in AI technologies, often prematurely without considering if these technologies align with the organisation's core values or whether the organization is ready for such a technological leap [Source: https://www.ey.com/en_pt/ai/five-generative-ai-initiatives-leaders-should-pursue-now]. The commendable enthusiasm sometimes overlooks what "AI" truly is: extensions of technologies already within their portfolio, such as machine learning models, recommender systems, or chatbots.

Middle Managers: Why is AI?

Middle managers in data and technology roles juggle between translating strategic AI visions into tangible ROI outcomes and driving the quintessential digital transformation to enable AI adoption. Regardless of their industries, these managers share a common narrative: everyone knows that returns on AI investments are critical to the business, but these ROIs cannot be achieved without significant digital transformation.

The journey toward leveraging data more proactively, shifting from retrospective analyses to predictive, data-driven decision-making, is critical. True business impact from AI doesn't emerge until an organisation reaches a sufficient level of data maturity where data underpins business process optimization and dynamic strategisation. Prior to this, AI endeavours are more likely to be stuck at mere proof-of-concepts. Regrettably, few managers feel

empowered to raise a simple question: "Why is AI the investment focus when we lack the tools to use AI properly?"
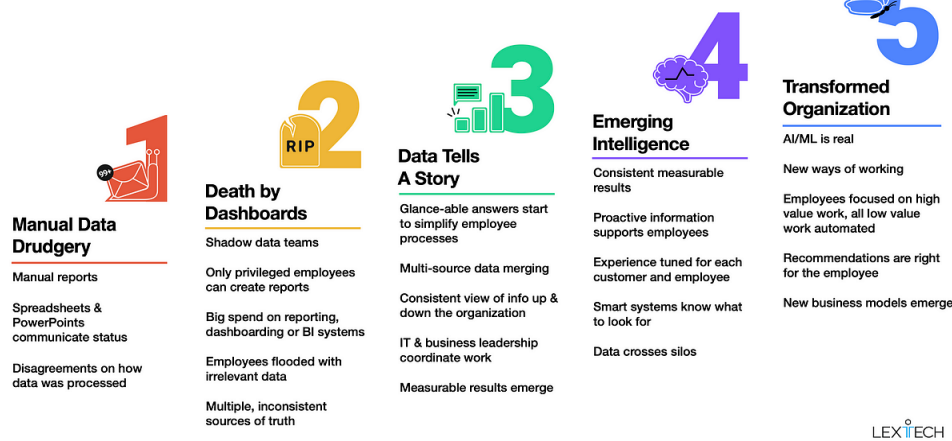

Figure 1. Source: Alex Bratton (TDS) https://towardsdatascience.com/how-to-measure-your-organizations-data-maturity-2352cbaf1896

Currently, many organisations are still finding themselves transitioning to cloud-based systems to enable data-driven processes, while others are struggling to define clear, data-driven business metrics. Without these, the team might not be able to deliver on the AI promises. Unfortunately, middle managers find themselves in a difficult position advocating for this foundational work to the executives, as this effort is apparently less tangible, marketable, and immediately rewarding than the allure of quick AI wins.

The Staff: How is AI?

Naturally, the AI conversation extends beyond just the management level, significantly affecting the largest demographic within an organisation: the staff. The adoption of AI often requires these teams to re-allocate their limited resources away from essential functions to focus on developing new AI-driven initiatives. This shift not only burdens the teams but also demands the acquisition of new skills, particularly in organisations at the far left of the data maturity curve. Moreover, while traditional data tasks are guided by established strategies that ensure regulated use, these guidelines may not yet extend to this area. This often results in bureaucratic delays in development as developers must seek approvals from various departments like legal or IT security before implementing AI technologies.

For the non-data staff, organisation-wide AI initiatives can be met with scepticism and concern, often due to fears of job displacement and doubts about the motives and effectiveness of these technologies. Yet, for AI products to be truly competitive and valuable in the market, they require a substantial contribution of domain knowledge from these very staff members. This situation highlights the need for a collaborative culture that integrates human expertise with machine capabilities. To reduce resistance and address these concerns, organisations should implement a comprehensive management strategy that emphasises education, transparency, and engagement. Such a strategy aims to demystify the role of AI, and clearly answer the question: "How is AI going to benefit my work, not replace me?"

Besides offering competitive new products, staff across the industries are increasingly using generative AI to enhance internal productivity through tools like virtual assistants and coding aids such as Copilot. However, early adoption of these cloud-based services can pose risks to data privacy and confidentiality, highlighted by incidents like Samsung's in 2023 [Source: https://www.forbes.com/sites/siladityaray/2023/05/02/samsung-bans-chatgpt-and-other-chatbots-for-employees-after-sensitive-code-leak/?sh=286e78de6078]. This caution extends to non-technical departments increasingly using AI tools for tasks such as document drafting or data analysis, urging the pre-emptive education of robust security measures to prevent data breaches.
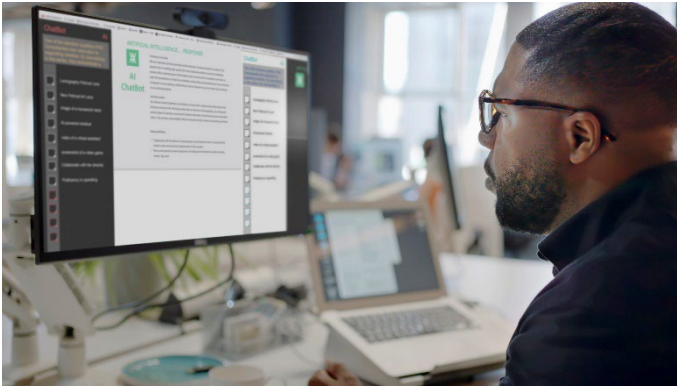
AI strategy: The one voice

In times of new developments and uncertainty, people often look for guidance on how to act and what will enable them to embrace these changes. This is especially true for AI, where a comprehensive action plan should be established before we start considering its potential benefits. I believe that this strategy shouldn't come from just one individual; but rather crafted collectively by people from different levels within the organisation. The strategy should address critical issues like privacy, confidentiality, ethics, engagement, and outline the necessary technical and legal requirements. Moreover, the organisation should consistently review its readiness and capability in dealing with AI, ensuring that every team member is equipped to work with AI technologies in the near future.

In a rapidly advancing technological landscape, the adoption and integration of Artificial Intelligence (AI) is becoming a critical pivot around which the future of enterprise strategy revolves. As we stand on the brink of this transformative era, it is essential for senior executives to understand not only the potential of AI but also the robust governance frameworks required to harness its capabilities.

AI technologies, particularly in the enterprise sphere, are developing at an unprecedented rate, promising significant advancements in operational efficiency, customer engagement and decision-making processes. However, these opportunities also come with substantial responsibilities, especially in terms of ethical considerations, risk management and regulatory compliance.

Pricing Conundrum: Personalised vs. Non-Personalised

Gerardo Berbeglia
Associate Professor of Operations, Melbourne Business School
Academic Fellow, Centre for Business Analytics

This article provides a non-technical summary of the forthcoming research paper in Management Science titled "Bounds and Heuristics for Multiproduct Pricing," authored by Gerardo Berbeglia in collaboration with Guillermo Gallego.

Abstract: For a large class of demand models that allow for multiple consumer types, we present performance guarantees for simple nonpersonalized pricing heuristics relative to optimal personalized pricing. Our results demonstrate that in a general setting, the effectiveness of pricing along a positive vector depends on how the price vector aligns with optimal personalized price vectors. We propose two positive direction vectors: the "economic" and "robust" directions. The economic direction is a convex combination of the optimal personalized price vectors and aims to do well on average. The robust direction offers the best worst-case performance guarantee. By judiciously selecting pricing directions, our results also provide performance guarantees of simple pricing strategies relative to more sophisticated pricing strategies. In particular, we provide performance guarantees for nonpersonalized, optimal linear pricing relative to optimal nonlinear, personalized pricing. Our research also examines the performance of common heuristics for bundle pricing relative to optimal, personalized, bundle-size pricing. Our experiments show that performance often improves when consumer types are clustered and each cluster is offered a price direction. We compared the performance of the k-means clustering heuristic and the farthest point first clustering heuristic. Our findings indicated that k-means clustering has significantly superior performance on average. This suggests that businesses could potentially benefit from implementing k-means clustering in their pricing strategies. In conclusion, our study offers valuable insights and performance guarantees for various pricing strategies and their relative effectiveness. These findings could inform pricing decisions and potentially lead to improved outcomes for firms.

About the Author: Gerardo Berbeglia has a PhD in Operations Research from the Université de Montréal, and a Master in Computer Science from the University of Buenos Aires. Prior to joining MBS, Gerardo was a Senior Scientist at ExPretio Technologies Inc and, later, a Postdoctoral Fellow at McGill University.

Gerardo's research has been published in leading journals and conference proceedings, including Management Science, Transportation Science, INFORMS Journal on Computing, European Journal of Operational Research, Operations Research Letters, Algorithmica, Journal of Mathematical and Economics, ACM conference on Economics and Computation (EC), Conference on Web and Internet Economics (WINE) and the International Joint Conference on Artificial Intelligence. His recent research focuses on revenue management and quantitative models that account for social influence in online markets.

In the age of data-driven decision-making, pricing remains one of the most critical yet complex elements for businesses. While personalized pricing, tailored to individual consumer preferences, has gained traction, it's not always feasible or ethical. So, how can companies optimize their pricing strategies without diving into the deep end of personalization? A recent academic study by Gerardo Berbeglia from the Melbourne Business School and Guillermo Gallego from The Chinese University of Hong Kong offers some intriguing insights that could revolutionize your pricing game.

Personalized pricing is the Holy Grail for many businesses. With the advent of big data and analytics, companies can now segment their customer base into micro-categories and offer prices that maximize profits. However, this approach has its challenges. It's not just about the technical complexity; there's also the ethical dimension. How fair is it to charge different prices for the same product based on a customer's willingness to pay?

On the flip side, non-personalized pricing, where everyone pays the same price, is easier to implement but often leaves money on the table. The study delves into this conundrum and offers a middle path that combines the best of both worlds.

The Magic of "Positive Direction Vectors"

The researchers introduce the concept of "positive direction vectors" in pricing. Imagine you have multiple products, and you're trying to figure out the best price for each. Instead of personalizing prices, you can use these vectors to find a general pricing direction that works well across your customer base. The study identifies two types of vectors: the "economic" and the "robust" directions.

- **Economic Direction:** This is a weighted average of what would be the optimal personalized prices. It aims to perform well on average across all customer types.

- **Robust Direction:** This direction offers the best worst-case performance. In other words, even if things go south, following the robust direction ensures that the losses are minimized.

Performance Guarantees

One of the most exciting aspects of the study is that it provides performance guarantees for these pricing strategies. It means that businesses can have a certain level of confidence that following these strategies will yield results that are close to what could be achieved with optimal personalized pricing.

Bundle Pricing and Clustering

The study also delves into bundle pricing, a strategy where multiple products are sold together at a discounted rate. It provides performance guarantees for simple bundle pricing policies relative to the optimal personalized bundling pricing strategy. Interestingly, the study also found that performance often improves when consumer types are clustered and each cluster is offered a price direction. Among clustering methods, k-means clustering outperformed others, suggesting that businesses could benefit from implementing k-means clustering in their pricing strategies.
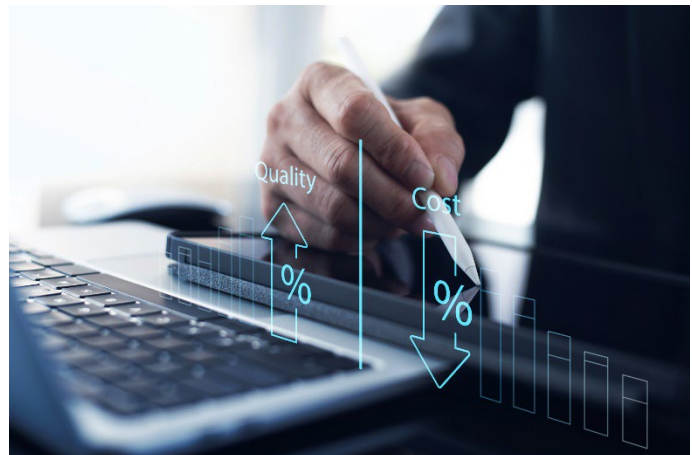
Practical Implications

So, what does this all mean for your business?

- **Simplicity and Effectiveness:** You don't have to go all-in on personalized pricing to maximize profits. Simple pricing strategies can be almost as effective if they align with these properly defined direction vectors.

- **Risk Mitigation:** The robust direction vector acts as a safety net, offering a level of risk mitigation that is often missing in other pricing strategies.

- **Data-Driven:** While the approach is less complex than full-blown personalized pricing, it's still rooted in data analytics. It allows for a more nuanced understanding of customer behavior without the ethical dilemmas associated with personalized pricing.

- **Flexibility:** The approach is versatile and can be applied to various pricing problems, including bundle pricing and even non-linear pricing models.

- **Competitive Edge:** In a market where everyone is either guessing prices or spending a fortune on personalized pricing algorithms, this could be your secret weapon for a more balanced, ethical, and profitable pricing strategy.

In conclusion, the study offers a fresh perspective on the age-old problem of pricing. It provides a mathematical foundation for strategies that are not only effective but also ethical and easy to implement. In a business landscape where every penny counts, these insights could be the difference between thriving and merely surviving.

So, the next time you're grappling with pricing decisions, remember that you don't have to choose between complexity and fairness. There's a middle path, and it's backed by science.

Navigating the Murky Waters of Mobile Ad Fraud: A Cautionary Tale for Brands

Ping Xiao
Associate Professor of Marketing, Melbourne Business School
Academic Fellow, Centre for Business Analytics

About the Author: Ping Xiao is an Associate Professor at Melbourne Business School. She holds a Ph.D. from Washington University in Saint Louis and a bachelor's degree from the University of Science and Technology of China.

Her main substantiative research interests are strategic interactions in business expansion, information nudges in digital contexts, big data analytics and policy evaluation, pricing, social network and consumer analytics, sustainable consumption, smart product consumption, corporate social responsibility, empirical Industrial Organization.

Her work has appeared in Marketing Science, Management Science, Journal of Marketing Research, Journal of Econometrics, Production and Operations Management, Journal of Management Information Systems, International Journal of Research in Marketing, Journal of Retailing, Decision Sciences, European Journal of Operation Research, and Journal of Industrial Economics. She was the Finalist of the 2015 John D.C. Little Best Paper Award.

This article provides a non-technical summary of the forthcoming research paper in the International Journal of Research in Marketing, titled "Mobile ad fraud: Empirical patterns in publisher and advertising campaign data," authored by Ping Xiao in collaboration with Yitian (Sky) Liang, Xinlei (Jack) Chen, Yuxin Chen, and Jinglong Zhang.

Abstract: Ad fraud has serious consequences for brands. It also contaminates academic research if scholars neglect a significant level of ad fraud in their data. However, only limited theoretical work has addressed this topic, and empirical research is scarce. In this article, we take a first step to document empirical patterns of mobile ad fraud using two datasets. The datasets are commonly available to buyers of advertising services, and the types of ad fraud studied are significant in the advertising market. We identify some app and campaign characteristics correlated with ad fraud, and uncover methods used by fraudsters to conceal the fraud. They often make the ad fraud proportional to the daily traffic but lowering the ratio of ad fraud on high-traffic days. However, when traffic is unstable, they change strategy to use ad fraud to smooth out the traffic. Meanwhile, in advertising campaigns, the fraudsters allocate most part of fraud during the middle of campaign period, an attempt to reduce the risk of being detected. These findings not only help practitioners and academic researchers determine the extent of ad fraud in the data but also provide stylized facts for future research on theoretical modelling of ad fraud.

In the digital age, mobile advertising has become the new frontier for marketers, with spending hitting a staggering $223 billion worldwide. But there's a dark underbelly to this booming marketplace: mobile ad fraud. It's a high-stakes game of cat and mouse, where fraudulent activities are siphoning off billions from marketing budgets—over $35 billion in 2020 alone. As brands pour money into mobile ads, fraudsters are licking their chops, devising ever-more sophisticated schemes to pilfer from the digital ad feast.

Enter the scholarly work of Ping Xiao, an Academic Fellow of the Centre for Business Analytics at the Melbourne Business School, whose recent study published in the International Journal of Research in Marketing shines a spotlight on this pressing issue. Professor Xiao and her co-authors' investigation is a wake-up call to the industry, revealing the cunning tactics of fraudsters and the alarming prevalence of ad fraud in mobile campaigns.

The researchers dove into two rich datasets—one tracking click fraud within apps, and another capturing fraudulent app installations. These aren't just numbers; they're the breadcrumbs leading to a deeper understanding of the fraud epidemic. The study found that fraudsters are crafty, adjusting their level of deceit to blend in with legitimate traffic. On days when app usage spikes, they dial back the fraud, hiding in the shadow of genuine activity. But when the traffic is erratic, they strike, smoothing out the inconsistencies with fraudulent actions to avoid raising alarms.

What's more, these digital con artists are strategic about timing. They unleash the bulk of their fraudulent activities mid-campaign, flying under the radar of detection systems and vigilant eyes. It's a calculated effort to maximize their ill-gotten gains while minimizing the risk of getting caught.
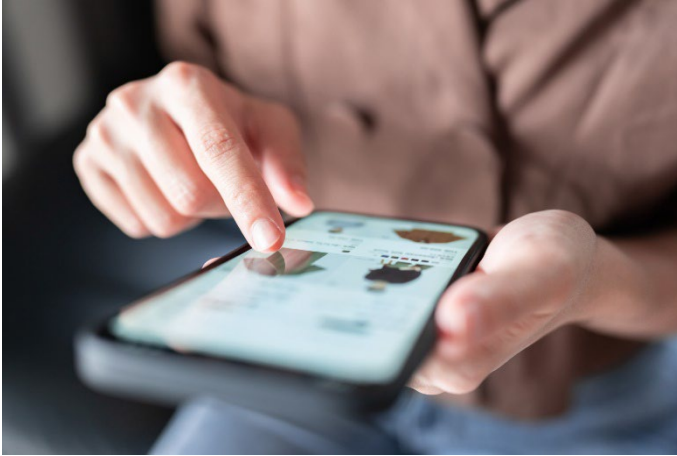
For business leaders, this isn't just an academic concern—it's a bottom-line issue. The study's insights are a clarion call for brands to be more vigilant and for the industry to bolster its defenses against these invisible thieves. The researchers aren't just pointing out problems; they're providing a roadmap for future studies and theoretical models to combat ad fraud.

This isn't just a tech problem; it's a business problem. The implications of mobile ad fraud are far-reaching, affecting everything from marketing ROI to consumer trust. As executives, the onus is on us to demand transparency and accountability from our advertising partners. We must push for advanced fraud detection methods and refuse to let our marketing dollars fuel the pockets of fraudsters.

In the grand tapestry of digital marketing, mobile ad fraud is an unsightly stain that can't be ignored. It's time for brands to take a stand, to protect their investments, and to ensure that their messages reach real people, not bots. The study by Professor Ping Xiao and colleagues isn't just a piece of academic literature; it's a manifesto for change in the digital advertising ecosystem.

As we sail into the uncharted waters of mobile marketing, let's navigate with our eyes wide open. The threat of ad fraud is real, but with the right knowledge and tools, we can steer clear of the dangers and capitalize on the vast opportunities of the mobile revolution.

The Centre for Business Analytics was founded by Melbourne Business School to address the worldwide demand for analytics research and knowledge.

The vision of our multi-disciplinary centre is to 'transform decision making through business analytics'. The Centre investigates how data of any size can drive organisational success through fact-based, data-driven, proactive decision making.

The Centre also manages educational programs and provides opportunities for students, faculty and industry leaders to come together to deliver both academic and business impact.

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