ESSEC BUSINESS SCHOOL

The International Institute of Forecasters

The Second Workshop on ICT and Innovation Forecasting

From Theory to Practice & Applications

ESSEC Business School, La Defense Campus
Paris, France

May 27th & 28th, 2015

Lancaster University Management School

Quantum-Web Telecoms, Internet and Media Research and Consulting

TECHNOLOGY FUTURES INC.

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Report

The 14th IIF workshop "***ICT and Innovation Forecasting: from theory to practice and applications*"** organized by Mohsen Hamoudia (Orange) and Jeroen Rombouts (ESSEC), was held in Paris, 27-28 May 2015. This was the second workshop in this area following on from the successful first workshop in London last year and was fully supported by the ESSEC Business School of Paris.
One of the main questions was whether there any novel innovations to be forecasted? Around 25 participants shared their current research in the area. The opening presentation by Nigel Meade (Imperial College Business School) was of his most recent review paper on ICT forecasting literature showing that while the diffusion of mobile telephony has been among the most heavily published research topics in recent years a number of outstanding issues remain even when focussing only on mobile. The paper is joint with Towhidul Islam and was just published in the IJF. James Alleman (University of Colorado at Boulder) examined the evidence of the effects of regulation in OECD countries. He highlighted that while potential customers may wish to adopt a new service such as very fast broadband, this might not become an option unless the investment has been made. Lawrence Vanston (Technology Futures, Austin, Texas) examined this topic arguing there was some stability in the relationship between adoption and availability.

One area where academic researchers have shown little interest is in B2B modelling. Ismael Rebaï from Orange Business Services showed how predictive modelling of churn could be used as an effective management tool to lessen its damaging effects.

The afternoon sessions moved into fresh territory: the analysis of video games and social media. These often neglected topics (at least by ICT researchers) have implications, not just for the suppliers, but also for the network operators. Paulo Albuquerque (INSEAD) examined the effects of innovations in the massively multi-player on-line role playing games (MMORG) raising interesting questions as to how to optimize participation. Oliver Schaer (Lancaster University) looked at the link between on-line searches and game sales. This work is still in development, although the managerial question of launch date is clearly important. Michael Ward (U. Texas) using 'big data' looked at the effects of social networks and word of mouth on the adoption of video games. By the end of the day, the discussion centred on these new areas, their importance and the research challenges they set.

The opening session of the second morning was presented by Robert Fildes (Lancaster Centre for Forecasting) who picked up on this 'new areas' theme: he explored the boundary areas of ICT forecasting where, by definition, there is still little research being done. His clear message was that while the problems are often new, the methods are not. In particular, for most problems there is a need to estimate long term (5 years plus) market potential and consumer surveys and analogies with similar services remain the basis of forecasting methods. Fildes argued that a greater emphasis on understanding shifting consumer tastes was fundamental to making progress.

The second paper was presented by Emanuele Giovannetti (co-author with Mohsen Hamoudia). They modelled the externalities associated with mobile social networks (MSN). Professor Giovannetti noted that smartphone, tablets and other mobile devices have allowed a variety of new MSN applications. The success of the applications depends critically on externalities. That is the application becomes more valuable as additional people join the application. The success of the application depends on reaching a critical threshold because of the externalities impact. For example, I cannot share a photo with a friend if my friend is not a member of my photo sharing app. They developed a two-stage approach to estimation: first focusing on the direct externalities. The second stage estimated the diffusion based on the first stage which included pricing, usage, and market penetration as arguments to determine the indirect diffusion impacts. They used panel data analysis at this stage.

A joint presentation by Nidhir Maudgalya and Henry Bah on the challenges of forecasting in ICT or as it is commonly referred to in Europe as technology, media and telecommunications (TMT) was the third paper. In particular they were concerned with an over-the-top (OTT) case study – OTT initially

referred to the movement away from traditional broadcasting distribution to a variety of internet media; now the reference includes the general internet disruptive technologies such as Skype, Snapchat, WhatsApp, etc. The change is dynamic, uncertain, and difficult to predict.

The Workshop finished with a very entertaining and thoughtful discussion of “Fore-acting” by Nicolas Curien. He noted that:

Big data has drastically changed the methods of forecasting. In the field of marketing, for instance, short … cycles generate adaptive feed-back and real time response of action to measure. … [T]he intermediary step of forecasting is skipped here, as the process directly transforms observation into strategy.

He reviewed the philosophy and history of forecasting, but emphasized that often, forecasts are needed for action. Consider the policy community who designs legislation or regulation in which certain outcomes are desired. They need fore-acting estimations. The talk was a useful reflection and a great ending for the Workshop.

Organizing Committee

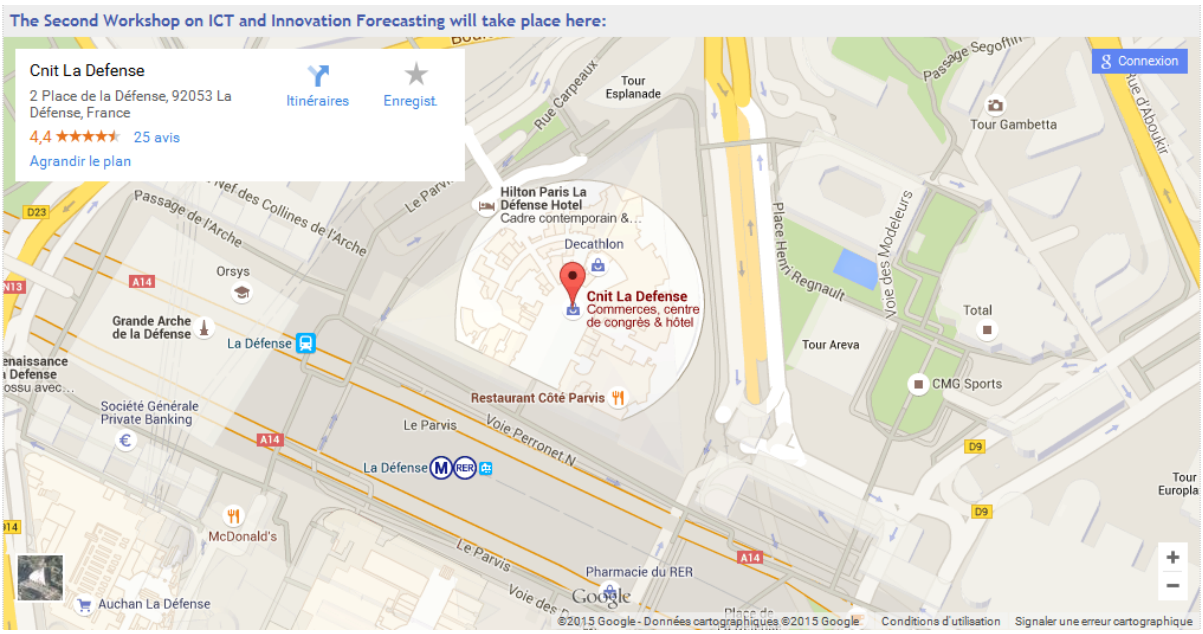
Mohsen Hamoudia - Orange - France Telecom Group, Paris – France
Jeroen Rombouts - ESSEC Business School, Paris – France

Scientific Committee

James Alleman - University of Colorado, Boulder, CO – USA
Albert Bemmaor - ESSEC Business School, Paris – France
Robert Fildes - Lancaster Centre for Forecasting, Lancaster - UK
Jean Pierre Indjehagopian - ESSEC Business School, Paris – France
Patrick Luciano - Orange Business Services, Paris - France
Gary Madden - Curtin University, Perth – Australia
Nigel Meade - Imperial College Business School, London – UK
Paul Rappoport - Temple University, Philadelphia, PA – USA
Qmars Safikani - Quantum-Web, London – UK

Venue

ESSEC Business School, La Defense Campus
Paris, Room #203



Useful Links

Aeroport de Paris : www.aeroportsdeparis.fr/
RATP : www.ratp.fr/
SNCF : www.voyages-sncf.com/
Office de Tourisme : www.parisinfo.com/
Guide Touristique Paris : www.unjourdeplusaparis.com/
Centre Pompidou : www.centrepompidou.fr
Tour Eifel : www.tour-eiffel.fr
Notre Dame Paris : www.francetourisme.fr
Sacré Cœur : www.sacre-coeur-montmartre.com
Hotels in Paris : www.hotels-paris.fr/ and www.hotelaparis.com/

Program Schedule

DAY ONE:

8:45 - 9:30 Registration and coffee

9:30 - 9:40 Introduction by Mohsen Hamoudia and Jeroen Rombout

Chair of Morning Session: Robert Fildes

9:40 - 10:20 Forecasting in Telecommunications and ICT - A Review – Nigel Meade

10:20 - 11:00 Regulation of ICT Sector: An Empirical Analysis of OECD Countries – James Alleman

11:00 - 11:30 Coffee Break

11:30 - 12:10 Forecasting Communications Services: Technology Deployment and Customer Adoption - Lawrence Vanston

12:10 - 12:50 Increasing loyalty using predictive modeling in Business-to-Business Telecommunication – Ismael Rebai

12:50 - 14:00 Lunch in L'**Atrium**

Chair of Afternoon Session: Nigel Meade

14:00 - 14:40 Predicting the Impact of New Content, User Communities, and Reward Programs on Product Usage with Applications in the Video Game Industry - Paulo Albuquerque

14:40 - 15:20 Can product sales be explained by internet search traffic? The case of video games sales – Oliver Schaer

15:20 - 15:40 Coffee Break

15:40 - 16:20 Susceptibility and Influence in Social Media Word-of-Mouth - Michael R. Ward

16:20 - 16:50 Rountable - Chair Robert Fildes

16:50 – 17:00 Concluding Remarks Day 1: Nigel Mead and Jeroen Rambouts

DAY TWO:

Chair of Morning Session: James Alleman

9:30 - 10:10 The Boundaries of ICT Forecasting – Robert Fildes

10:10 - 10:50 The role of direct and indirect network externalities for Mobile Social Networking diffusion: A Panel Approach – Emanuele Giovannetti

10:50 - 11:20 Coffee Break

11:20 - 12:00 Challenges of forecasting in TMT – An OTT case study - Nidhir Maudgalya and Henry Bah

12:00 - 12:40 From Forecasting to Fore-acting – Nicolas Curien

12:40 – 12:50 Concluding Remarks Day 2: Robert Fildes and Mohsen Hamoudia

12:50 - 14:00 Lunch in **Le Patio**

All sessions are in Room #203
For Coffee Breaks and lunchs, place will be indicated in the meeting room.

Invited Speakers

Paulo Albuquerque	INSEAD – Fontainebleau -France	paulo.albuquerque@insead.edu
James Alleman	University of Colorado – Boulder - USA	James.Alleman@Colorado.edu
Henry Beh	OVUM, London - UK	Henry.Beh@ovum.com
Nicolas Curien	CSA – Paris - France	nicolas.curien@csa.fr
Robert Fildes	Lancaster Centre for Forecasting, Lancaster - UK	r.fildes@lancaster.ac.uk
Emanuele Giovannetti	Anglia Ruskin University, Cambridge Campus – UK	emanuele.giovannetti@anglia.ac.uk
Nidhir Maudgalya	OVUM, London - UK	Nidhir.Maudgalya@ovum.com
Nigel Meade	Imperial College Business School - London, UK	n.meade@imperial.ac.uk
Ismaïl Rebaï	Orange Business Services – Paris - France	ismail.rebai@orange.com
Oliver Schaer	Lancaster Centre for Forecasting – Lancaster, UK	o.schaer@lancaster.ac.uk
Lawrence Vanston	Technology Future Inc – Austin - USA	lvanston@tfi.com
Michael R. Ward	University of Texas in Arlington - USA and ZEW Mannheim - Germany	mikeward@uta.edu

Forecasting in Telecommunications and ICT - A Review

Nigel Meade - Imperial College Business School - South Kensington Campus - London - UK
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Abstract

In 2002, the International Journal of Forecasting published a review edited by Fildes of telecommunications demand forecasting, although our brief is wider, we use this review as a baseline. Since 2002, the literature on forecasting in telecommunications and ICT has expanded dramatically. Our objective is to critically review this literature; identify potentially useful themes and identify areas of research that warrant more investigation. We identify three main themes in the literature: diffusion models; time series models and technological forecasting. These themes are listed in order of the relative level of activity measured by numbers of publications. The diffusion of mobile telephony is the largest area of interest; this is studied both on a national and multinational basis. Several homogenous clusters of ICT data are identified that are sufficiently similar to benefit from being modelled and forecast together. The relatively sparse literature on forecasting ICT technology is reviewed.

Regulation of ICT Sector: An Empirical Analysis of OECD Countries

James Alleman, University of Colorado – Boulder - USA
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Paul Rappoport, Temple University - USA
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Abstract

Thirty years ago, virtually the entire telecommunications sector was state owned, managed and controlled. Government intervention was usually justified on the basis of monopoly/oligopoly power – a market failure. Without state intervention prices would be too high, demand would be restricted and excess profits (beyond the normal return on investment) would be obtained, which creates inefficiencies and leads to high social costs and loss of welfare. Because of the large fixed cost of provision of the services, it was felt a monopoly could provide the services at the lowest possible cost. The sector was perceived as a public utility. More recently, network externalities have been suggested as a rationale for intervention in this sector – that is the more people connected to the network, the more valuable it will be. Its public value is greater than its private value. Thus virtually all of the telecommunications systems have been owned, managed and controlled by the state since their inception.

However, in the mid-1980s a movement towards privatization, liberalization and de-regulation took hold, pushed by President Reagan's administration in the United States and Prime Minister Thatcher's administration in the United Kingdom. Now the sector has been privatized in most countries and subjected to regulatory reform of one sort or another: liberalization, competition or "light-handed" regulation. The major reform occurred in the late 1990s (Estache et al. 2006). Since then the internet and cellular-mobile industries have advanced significantly. Mobile service has exploded, particularly, in the developing world. This has changed the dynamics of the industry dramatically.

The paper updates and expands the work on the efficacy of regulation using cross-country analysis of selected Organization for Economic Cooperation and Development (OECD) countries. It follows the frameworks of Röller and Waverman (2001); and Waverman et al. (2005); and Czernich et al. (2009). It is in the spirit of Estache et al. (2006) in that it examines outcomes after privatization and regulatory reform. It examines the metrics of success (or failure): increased penetration of the mobile telephone service. Related to these metrics is the requirement that investment incentives are maintained or enhanced.

The paper is organized as follows: A Literature Review following this Introduction/Overview. It reviews the economic literature on ICT's impact on economic growth and development and the research on the effectiveness of regulation. The third section describes the countries under review: their descriptive statistics. The fourth section describes the methodology and the sources of the data; the results are in the fifth section. The final section presents Conclusions and Recommendations

Forecasting Communications Services: Technology Deployment and Customer Adoption

Lawrence Vanston - Technology Futures, Inc. Austin – USA
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Abstract

Communication services are unlike most products and services because availability can play a major role in customer adoption within a given population. For example, a family cannot subscribe to a wireline broadband service if their home is not passed by a cable that can provide that service. The relationship over time between adoption (the percentage of the population that have adopted the service, availability (the percentage to which the service is available), and the take-rate (adoption/availability) is an interesting one and worthy of study.

In our practice we have mostly used this relation to forecast availability (or more precisely, minimum availability) from a forecast of adoption (or more precisely, latent adoption) which is, for various reasons, easier to forecast. The resulting availability forecast provides a target for service operators to deploy the technology needed to provide the service.

A number of factors make availability forecasts more complicated than we would like. These include population density, other demographic factors, the presence of aerial vs underground/buried infrastructure, the level of competition, and regulatory factors. We will discuss how these factors have influenced the availability and adoption of various broadband services in the U.S. and briefly discuss their implication for the deployment of Gigabit services.

Increasing loyalty using predictive modeling in Business-to-Business Telecommunication

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Vincent Lemaire – Orange Labs – Lannion – France
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abstract

Customer Relationship Management (CRM) is a key element of modern marketing strategies. One of the most practical way to build useful knowledge on customers in a CRM system to produce scores to forecast churn behavior, propensity to subscribe to a new service... In AMEA zone (Asia, Middle East and Africa zone), the context of fierce competition may represent a higher percentage, and particularly in B2B market.

But by contrast, to our knowledge, no scientific papers were dedicated and published to detail the way to improve loyalty in B2B Telco market. If we can assume at low segments similarities between B2B and B2C, some research is required in order to model B2B user behavior versus B2C behavior. This problematic stands actual as ``Bring Your own Device'' (BYOD) becomes more and more trendy. Answering business requirements, our team applied some B2C predictive tools with adapting them to B2B in an AMEA country Orange affiliate.

Predicting the Impact of New Content, User Communities, and Reward Programs on Product Usage with Applications in the Video Game Industry

Paulo Albuquerque – INSEAD – Fontainebleau - France
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Abstract

We propose quantitative methods based on economics and psychology to explain why people use products or consume content and measure how firms can influence demand through new content, user communities, and reward programs. Once these different motivations are estimated, we are able to predict product usage for a number of future or hypothetical settings: a future introduction of new content, a change in innovation scheduling, a reduction of costs to join user communities, or an increase in offered rewards from usage.

We illustrate our model using two data sets in the online gaming industry. We observe daily content consumption, product innovation, and group membership. The results show that we can predict the patterns of the data well. We find that usage of simpler features is primarily motivated by enjoying the interaction with the products (intrinsic preferences), while a user community becomes much more important to explain consumption of more complex content.

We also find that an early innovation schedule leads to predictions that show more engagement in initial stages of the product lifecycle, while providing incentives to be part of a user community leads to predictions of demand that are significant higher in later stages.

Can product sales be explained by internet search traffic? The case of video games sales

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Nikolaos Kourentzes - Lancaster Centre for Forecasting - UK
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Abstract

One way to observe interest in technologies and products is reflected in the online search behaviour of consumers. With public availability of search engine (SE) data by leading search engines, the popularity of any search string can be obtained. Intuitively one may expect SE data to be leading product sales. Many customers nowadays research product online prior to purchase. Little research has been done to demonstrate the dependency of product sales on search traffic and almost no attention has been given at the dependency that can be observed for mature and end-of-life cycle products. Moreover, the precise causal relationship between them has not been investigated in detail. We typically assume that search traffic leads to sales, but it could also be that once a product is sold, it causes search traffic. Thus the direction of causality is not clear, as well as whether SE information is leading, contemporaneous or lagging. As a case study we consider the video games industry. Video games sales usually observe the peak sales within the first weeks after their launch and are characterised by relatively fast lifecycles. This allows us to investigate the use of SE date on various phases of the game lifecycle and in particular whether and when such data are useful for predictive modelling. Better understanding the connection between sales and SE data is crucial for building models for short- and long-term forecasting. We conclude with guidelines how to best incorporate SE data for forecasting video game sales.

Susceptibility and Influence in Social Media Word-of-Mouth

Michael R. Ward - the University of Texas at Arlington USA and Zentrum für Europäische Wirtschaftsforschung (ZEW) - Germany
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abstract

Peer influence through word-of-mouth (WOM) plays an important role in many information systems but identification of causal effects is challenging. We identify causal WOM effects in the empirical setting of game adoption in a social network for gamers by exploiting differences in individuals' networks. Friends of friends do not directly influence a focal user, so we use their characteristics to instrument for behavior of the focal user's friends. We go beyond demonstrating a large and highly significant WOM effect and also assess moderating factors of the strength of the effect on the sender and receiver side. We find that users with the most influence on others tend to be better gamers, have larger social networks, but spend less time playing. Interestingly, these are also the users who are

least susceptible to WOM effects.

The Boundaries of ICT Forecasting

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Oliver Schaer - Lancaster Centre for Forecasting - UK
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Abstract

Almost all research in ICT forecasting in recent years has concentrated on analysing the adoption of mobile. Relatively little attention has been given to the many diverse problems arising from the blurring of boundaries between mobile computing, entertainment and leisure activities and the consequential changes placed on mobile design and platform functionality. Such changes not only affect user behaviour but challenge the providers of ICT infrastructure and influence demand for equipment and components. This presentation discusses the reliance of the providers of the different platforms and their business models on forecasts of such changing behaviour. Using examples of this diverse set of problems offers insight into possible approaches whilst the lack of evidence on the resulting accuracy suggests a multi-method approach focussing on the range of probably outcomes.

The role of direct and indirect network externalities for Mobile Social Networking diffusion: A Panel Approach

Emanuele Giovannetti - Institute for International Management Practice, Anglia Ruskin University, UK Cambridge and DSE University of Verona - Italy
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Mohsen Hamoudia - Orange (France Telecom Group), Paris and ESDES Business School, Lyon - France
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Abstract

The diffusion of Smartphones and of reliable and fast mobile internet access such as 4G LTE has allowed the rapid adoption of Voice, Pictures and Music over IP applications supplied by OTT companies such as Snapchat, Skype, WhatsApp or Spotify. These companies succeeded in overtaking *critical thresholds* in the number of customers adopting their applications because of the direct and indirect network externalities arising from to the possibility of sharing and transmitting videos, pictures and music through Mobile Social Networks. These developments have redesigned the present and are sketching the future evolution of the ICT markets and are accompanied by a significant shift in profitability across operators, service, contents and infrastructure providers. Our paper develops a two stage estimation strategy: in the first stage, by focussing on the presence of direct network externalities in the process of diffusion of MSN in a set of seven countries in across Europe, North and South America. In the second stage we use the predicted diffusion levels, obtained in the first stage, to assess the impact on diffusion of indirect network externalities, due to the pricing,

usage, and market penetration of smart mobile devices. The second stage is estimated first by comparing separate reduced form models for the different countries and, then, through a panel data analysis, to obtain a joint analysis of the indirect determinant of diffusion. Interestingly, the diffusion of MSN seems to be inversely correlated with the average minutes per connection highlighting the substitution between time and multimedia modality of mobile connections.

Challenges of forecasting in TMT – An OTT case study

Nidhir Maudgalya – OVUM – London - UK
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Henry Beh – OVUM – London - UK
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Abstract

This presentation is split into two interrelated parts. The first section focuses on the many challenges forecasters face when trying to predict the development of markets in the dynamic ICT/TMT industry. Key challenges will be identified along with various solutions that have been implemented to address them. The second part of the presentation will focus on a specific forecast that Ovum have recently produced, “Over the top” (OTT) Video. The popularity of OTT video services is rising fast and growing numbers of consumers are finding the flexibility and convenience of OTT video offerings preferable to traditional broadcast services. As a case study, this presentation discusses our forecasting methodology spanning a range of sub services including: EST, TVOD and SVOD, across key metrics, such as revenues, transactions and average price

From Forecasting to Fore-acting

Nicolas Curien – French Regulatory Body for Radio and Television – Paris - France
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abstract

Big data has drastically changed the methods of forecasting. In the field of marketing, for instance, short programmation cycles generate adaptative feed-back and real time response of action to measure. In a way, the intermediary step of forecasting is skipped here, as the process directly transforms observation into strategy. This major characteristic of modern data analytics denotes a more general shift from predicting the future towards shaping the future, a shift which invites us to revisit the duality between determinism and free will. In this regard, the famous Newcomb's paradox provides a useful theoretical basis to unsderstand the mutation of forecasters into fore-actors. Finally, an application of theory to the current context of a collective invention of the digital society will be sketched out.

Biographies

Only speakers bios are presented here after.

Paulo Albuquerque

Paulo Albuquerque is an Associate Professor of Marketing at INSEAD. He holds a Ph.D. in Management from the UCLA Anderson School of Management. Before joining the Ph.D. program, Paulo worked for 3 years at Warner Lambert Portugal, as product manager and trade marketing manager, involved with the management of brands such as Listerine, Trident, and Halls. He was an Associate Professor of Marketing and the Faculty Director of the MBA program at the Simon Business School, University of Rochester, where he lectured the marketing core and the distribution channels elective class for 8 years. He was in the teaching honor roll multiple times and won the best teaching award twice, in 2012 and 2013.

Paulo's research interests include several marketing areas, including firm decisions to introduce new products, how products are adopted and sales spread over different markets, and consumer decisions to search and purchase products online. This diverse research has appeared in several top marketing academic journals, such as Marketing Science, Journal of Marketing Research, and Management Science. His recent projects used data from some of the most known firms and products, for example, Amazon.com and Hewlett-Packard. He is currently studying the role that social media has in political races and how much and for how long consumers use products, using data from the online games industry and the popular game World of Warcraft as an example.

James Alleman

James Alleman is Professor Emeritus at the University of Colorado – Boulder and a Senior Fellow and Director of Research at Columbia Institute of Tele-Information (CITI), Columbia Business School, Columbia University. He was recently awarded a Senior Fellowship at Institut Barcelona d'Estudis Internacional (Barcelona, Spain) to research regulation of Information and Communications Technology (ICT) in Latin America. Dr. Alleman was a Visiting Senior Scholar at IDATE in Montpellier, France in the fall of 2005 and continues his involvement in IDATE's scholarly activities. During calendar years 2001 and 2002, he was a Visiting Professor in the Economics and Finance Division at Columbia Business School, Columbia University.

Dr. Alleman was previously the Director of the International Center for Telecommunications Management at the University of Nebraska at Omaha, Director of Policy Research for GTE, and an economist for the International Telecommunication Union. He has conducted research in the area of telecommunications policy, with emphasis on pricing, costing, and regulation as well as on interconnection, international telephony settlements, communications in the infrastructure and related areas. More recently, he has been researching the application of real options valuation techniques to network industries and issues of income and wealth inequality. He provides litigation support in these areas.

Henry Beh

Henry is a Forecast Manager with Ovum. He focuses predominantly on managing the forecasts for some leading consultancy projects and is also responsible for the production and development of a selection of Ovum's forecasts covering the telecommunications and media industries.

Before joining Ovum, Henry was a Senior Quantitative Analyst at GTECH S.p.A. (a leading interactive gaming software and services provider) for five years, where he responsible for producing forecasts and analytical frameworks to aid senior management teams in both tactical and strategic decision making. Prior to that, he worked in investment bank for two years.

Henry holds a PhD in Management Science from Manchester Business School, UK.

Nicolas Curien

Graduated from École Polytechnique and Telecom Paris, Nicolas Curien, a member of Corps des Mines, currently sits at the board of the French Regulatory Body for Radio and Television. He is Emeritus professor at Conservatoire National des Arts et Métiers, where he held the chair "Telecommunications Economics and Policy" (1992-2011), before becoming a member of the French Regulatory Body for Telecommunications and Post (2005-2011). He started his career as an assistant professor at Telecom ParisTech (1977-1978). Then he was in charge of economic studies at the Telecommunications Governmental Directorate (1978-1986), before he joined the Department of Defense as chief economist and then as deputy-director of the Division for General Studies (1986-1988). Within the Department of Economics and Finance, he was deputy-director of the National School for Statistics and Economic Studies (1989-1992). Nicolas Curien taught economics at École Polytechnique (1985-2007). He is a founding member of the French National Academy of Engineering. He wrote a number of scientific articles and several books in the field of networks' industrial organization and digital economics.

Robert Fildes

Robert Fildes is Distinguished Professor of Management Science in the School of Management, Lancaster University and Director of the Lancaster Centre for Forecasting. He was co-founder in 1981 of the *Journal of Forecasting* and in l985 of the *International Journal of Forecasting.* His current research interests are concerned with the comparative evaluation of different forecasting methods, the implementation of improved forecasting procedures in organizations and the design of forecasting systems. His has published a number of papers on models of ICT adoption showing the importance of segmentation, and worked extensively with the industry in analyzing its problems. He has also recently published on the validation of climate models.

Emanuele Giovannetti

Emanuele Giovannetti, Ph.D. (Cantab), is Professor in Economics at Anglia Ruskin University. His research focuses on competition policy in network industries. Emanuele has published in various leading journals including The Economic Journal, Environment and Planning, International Economic Review, International Journal of Industrial Organization, Journal of Industrial Economics, International Journal of Production Economics, Journal of Economic Surveys, Information Economic and Policy, Spatial Economic Analysis, and Journal of Competition Law and Economics. He edited the special issue of Telecommunications Policy on ''Peering and Roaming in the Internet'', and co-edited ''The Internet Revolution: A Global Perspective'' for Cambridge University Press.

Nidhir Maudgalya

Nidhir is a Principal Forecaster with the Forecasting team at Ovum. He manages the production of forecasts for WCIS+ and WBIS, Ovum's industry-leading database products. He also focuses on building and maintaining forecasting models for the mobile, media and broader telecoms market.

Nidhir works closely with both the topic and regional analyst teams of Industry Research to provide forecasts for mobile subscriptions and devices factoring in the key market and technological developments. He recently modeled the average selling price for mobile handsets from the bill of material data and he has worked on forecasts for mobile operating systems and broadband devices in collaboration with the handset and devices team.

Nidhir has over eight years of experience as an analyst and forecaster. Before joining Ovum, Nidhir worked as a Telecoms Analyst at Visiongain focusing on mobile network technologies.

Nidhir has a degree in Electrical & Electronics Engineering and holds a masters degree in Telecommunications from London South Bank University.

Nigel Meade

Nigel Meade is Emeritus Professor of Quantitative Finance, Imperial College Business School, London, UK. He is an experienced statistical modeller with a background in operational research and statistics applied to innovation diffusion and finance. He is an associate editor of the International Journal of Forecasting and the European Journal of Finance. He has published over 50 papers and eight book chapters, and successfully supervised more than 20 Ph.D. students.

Ismaïl Rebaï

Ismaïl Rebaï has an industrial engineer diploma from Ecole Nationale d'Ingénieurs de Tunis (1991), a Master of Innovation Management (1992) and an Operations Research PhD, both from Ecole Centrale Paris (1996). He gave courses in various universities and engineering schools in France before working as consultant in Information Systems. He integrated Orange Telecommunication company and worked mainly on CRM and Business intelligence in B2C and B2B market, for different countries affiliates. He applied theoretical methods from project management and datamining allowing costs optimization and revenues increase.

Oliver Schaer

Oliver is a first year PhD student at the Lancaster Centre for Forecasting supervised by Nikolaos Kourentzes and Robert Fildes. His research focuses on the integration of web and social media platform data into forecasts with particular interest in its application on the diffusion of online videos. He obtained a MSc in Marketing Analytics and Management Science at Lancaster University and a BSc in Business Administration from Lucerne University of Applied Sciences. Previous to this, Oliver, worked three years as a Web Project Manager for a global medtech company.

Lawrence Vanston

Dr. Lawrence Vanston is an internationally recognized authority on technology forecasting for the communications industry. As president of Technology Futures, Inc., he has conducted and managed future-looking studies of the communications and other high-tech industries for over thirty years. His current research and consulting interests include broadband, wireless, IP video, and convergence. Dr. Vanston's research reports and forecasts are used and referenced extensively by executives and professionals worldwide. An expert on the impact of technology change on equipment depreciation and valuation, Dr. Vanston has frequently served as an expert witness in regulatory, tax, and other proceedings.

Dr. Vanston has been the director and principal author of numerous reports commissioned by government agencies, industry organizations, and individual companies including every major U.S. cable television company and every major U.S. wireline and wireless carrier. The *Communications Technology Forecasting Group* (CTFG), currently comprised of AT&T, Charter, Comcast, Cox, Time Warner Communications, and Verizon, has been actively supporting TFI research since 1985.

Dr. Vanston is a popular speaker on the future of communications and on forecasting methods. Some of the prestigious programs he has spoken at include the *Broadband Tax Institute Conference, the International Institute of Forecasters International Symposium*, *the Society of Depreciation Professionals Conference, and the Wichita Program for Appraisal for Ad Valorem Taxation.* Dr. Vanston also directs the popular *TFI Asset Valuation Conference* and the seminar, *TFI Technology Forecasting for Valuation.*

Dr. Vanston's views and the results of his research have been cited by general business and industry publications including *Telephony, America's Network, Fiber Optic Technology, Lightwave Wired,* and *Broadband Properties. The Wall Street Journal* featured Dr. Vanston in an in-depth interview entitled "Consultant's Call: Lawrence Vanston Makes Some Pretty Bold Predictions for the Future of Telecommunications. He Has Been Right Before." Notably, the predictions therein have come true as well.

Before joining Technology Futures in 1984, Dr. Vanston spent four years with Bell Labs and Bellcore in network planning where he proposed and evaluated potential new long distance, billing, access, and data services. His academic achievements include a B.A. in government (1975) and an M.S. (1977) and Ph.D. (1979) in operations research and industrial engineering, all from the University of Texas at Austin.

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