



REPORT

The 18th IIF Workshop **Forecasting New Products and Services** **Research and Applications**

Politecnico di Milano | Milano Bovisa
12 - 13 May 2016 Milan | Italy

The 18th IIF Workshop on **Forecasting New Products and Services**, held in Milan, May 12th and 13th 2016, attracted around 40 attendees.

This international workshop series, organised conjointly by the International Institute of Forecasters (IIF) with Mohsen Hamoudia (Orange), and Gaetano Cascini and Filippo Silipigni (Politecnico di Milano), aimed to bridge the gap between theory and practice by bringing together leading academics and practitioners.

The accurate forecasting of new products and services is crucial to the success of many organizations, but it has been a relatively neglected area of research. It's a topic that embraces many different types of problems. These include forecasting the likelihood that proposed new products can be successfully developed, forecasting the demand for new products before or shortly after their launch and identifying general trends and forces that may drive the development of innovative products and services. It is also an area where the application of a diverse set of forecasting methods is likely to be appropriate, including those based both on management judgment and quantitative models and those taking into account the latest developments in information technology such as social media and internet search tools. Not surprisingly, the presentations in this 18th IIF Workshop which focussed on "Forecasting New Products and Services" reflected this diversity.

Attendees data and origin.

38 participants registered to the event, also including 7 invited speakers and 6 students. Most of the attendees came from Italy (63%) with a significant number of participants from United Kingdom (16%) and Germany (13%).

Concerning the affiliation of attendees, we observed a general balance between University/Research and Industry. In detail:

- 53% of attendees belong to the Industrial Sector (Large companies, SMEs or Consulting companies);
- 45% of attendees belong to University and Research centers (University, Technology Transfer Office, Business Incubator).



The opening talk by **Larry Vanston** of Technology Futures Inc set the scene by outlining the huge changes that are taking place in the communications world. Robots are replacing humans, computation is taking on more human characteristics and 'things' are communicating with other 'things' leaving humans out of the loop. He argued that understanding the nature of the fundamental forces driving these changes can be invaluable in guiding a vision of long-term innovations and anticipating future products and services. Vanston's experience suggested that combining an analysis of the driving forces with more qualitative –judgment-based -ideation strategies could be an immense aid in forecasting individual products and services.



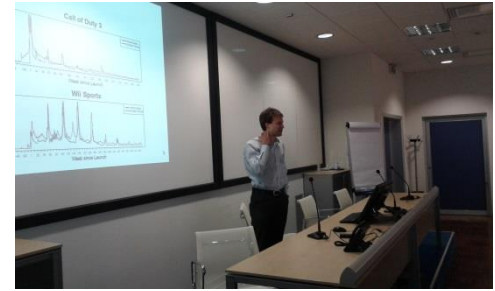
The role of judgment was the theme of **Paul Goodwin's** talk. He argued that management judgment has a particularly crucial role in new product and services forecasting because of the absence of historical data specific to the product or service being forecasted. But such judgment can be subject to a range of political, motivational and psychological biases that can be detrimental to the forecast accuracy. The talk aimed to identify these biases and ways of ameliorating them according to the latest research. These included methods for drawing on the combined expertise of groups of managers and the use of structured techniques for eliciting judgments. Goodwin argued that much more research is needed in this area. For example, Goodwin claims that there is little or no evidence to date to suggest that judgmental methods are effective in identifying analogous existing products that may have similar demand patterns to new products that have yet to be launched. Methods for integrating judgment with statistical techniques would also merit more research.



James Derbyshire of Middlesex University continued the emphasis on judgment. He highlighted the distinction between risk, where probabilities can be assigned to future events, and uncertainty where no such assignation is possible. In his presentation, joint with **Emanuele Giovannetti**, he argued that new product development (NPD) can, if successful, change the pre-existing set of potential events and hence negate the possibility of reliable forecasting and, by implication, render the estimation of probabilities for future events worthless. The use of scenario planning, which does not attempt to estimate probabilities is, he argued, appropriate in these circumstances. In particular, recent developments in scenario planning which are designed to take into account stakeholder motivations and the behaviour of competitors can yield valuable insights for those tasked with NPD decisions. However, Derbyshire did not rule out a role for forecasting in NPD. On the contrary, he argued that forecasting can yield an understanding of the potential behaviour of key variables that are subject to a measurable risk and which may have an impact on the outcome of alternative scenarios generated in the scenario planning process. Hence, combining forecasting with scenario planning can allow a broad and nuanced consideration of potential futures for a new product.



Oliver Schaer from Lancaster University presented findings from a recent experiment in which Google Trends information was used for estimating the market size within product generations. In the context of physical video games sales, market size determined by Google Trends have found to perform better, compared to benchmark models using analogy information from past generations values only. The results of this work, joint with **Nikolaos Kourentzes** and **Robert Fildes**, also hold with a longer lead time that takes into account real world setting in the supply chain.



The workshop continued with the presentation by **Yuri Borgianni**, from the Free University of Bozen, discussing several techniques tailored to manage the data resulting from customer surveys when designing products and services focussing on procedures based on Kano's theory of attractive quality to avoid severe customers' discontent and the possibility to make users excited. Yuri then focussed on the deficiencies of innovation tools based on customers' feedback, due to customer preferences' dynamics suggesting that some developments of Kano's theory, based on evolutionary models, try to address this problem but still lack empirical validation, besides providing substantially qualitative indications. Yuri's study examined the alteration of 176 product requirements and service attributes.



William Davies, from Anglia Ruskin University-IIMP, collected empirical evidence from 10,000 Kickstarter crowdfunding projects and focussed on the estimation of the drivers of success or failure of these funding campaigns. In this presentation, joint with **Emanuele Giovannetti**, the focus was on studying the impact of the events taking place in the very early stages of the funding campaigns on the probability of a project's final success or failure. Together with other proxies, capturing internal and external social capital, reputation, patience and altruisms the model showed a correct success/failure prediction rate of 87% for these 10000 crowdfunding campaigns.



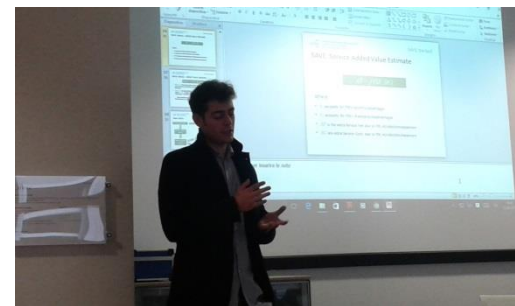
Mariangela Guidolin, from the University of Padova, presented her joint work with **Renato Guseo** and **Cinzia Mortarino** comparing the coupled dynamics of regular and promotional sales in new product lifecycle. Their study focussed on the case of a hazelnut cream produced in Italy recently commercialized in Portugal. Their inspection of weekly time series of regular and promotional sales highlighted the presence of a compensatory dynamics reinforcing the need to model the joint dynamics of these different type of sales, through a Lotka-Volterra system with churn effects (LVch) model estimating the key drivers affecting the new product life-cycle.



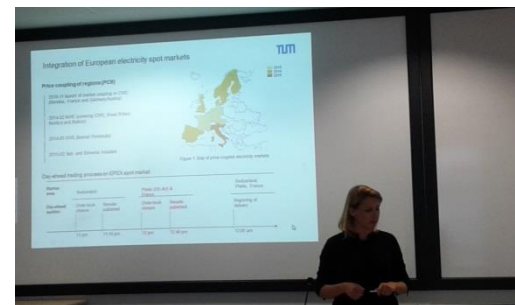
Marco Cantamessa, from I3P (Innovative Companies Incubator of Politecnico di Torino), gave a fascinating presentation on “Reconciling forecasting and lean development – open issues”. He focused on how the traditional approach to the development of new products and services uses forecasts of relevant factors, such as demand, price and cost data, technical performance indicators, often fed as “assumptions” into a business case or business plan for the purpose of evaluating the sustainability of the initiative. To this, he contrasted a now-emerging paradigm for innovation-related activities based on the so-called lean development approach, in which the new product or service emerges out of a lengthy, iterative and interactive experimentation with the technology and with the market. The presentation explored the role and nature of forecasting in the context of lean development, starting from a few preliminary case studies, discussing the key differences of perspectives between “finding the future” and “shaping the future”.



Alessandro Annarelli, from the Free University of Bozen, presented joint research with **Cinzia Battistella** and **Yuri Borgianni** on “Service Added Value Estimate: an original tool for forecasting the value of Product Service Systems”. This tool, Service Added Value Estimate (SAVE), provides a single reference value that supports decision-making processes connected to Product Service Systems (PSS) development and design. The presentation discussed the successful testing of the SAVE tool in cooperation with a B2B SME designing and manufacturing customized high-end white goods, which are purchased by dealers operating mostly in the European market.



Merlind Weber, from the Technische Universität München, gave a talk on “Recurrent and Error-Correction Neural Networks for Electricity Price Forecasting: Evidence from CWE Markets” prepared with **Ralph Grothmann**, from Siemens AG, Corporate Technology, Munich. They used ensembles of Recurrent Neural Networks (RNN) and Error Correction Neural Networks (ECNN) to simultaneously forecast day-ahead prices and loads of the EEX Phelix and French power markets. RNN incorporate a time-delayed information feedback that creates a memory. Their results showed that, overall, price dynamics are better captured in an hourly data set-up. Under atypical market conditions, such as in the event of high intermittent power production and low demand, they also showed that ECNN yield better price forecasts than RNN.

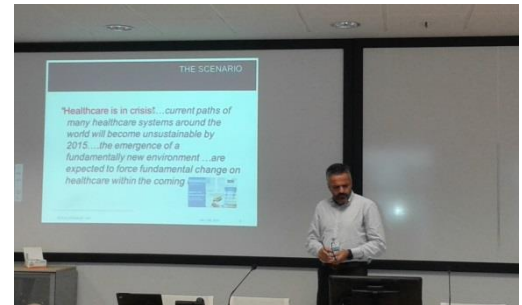


Emanuele Giovannetti, from Anglia Ruskin University-IIMP, presented a joint paper with **Mohsen Hamoudia**, Orange, focusing on the *time-varying* nature of the drivers of Mobile Social Networks adoptions. The key message was that the drivers of adoption for Mobile Social networks may have critically different effects in the initial from those in the later phases of the diffusion. The talk focused in particular on the time varying impact of price penetration strategies and of other indirect



network externalities in a multi-country context, whereby the early and later phases of the adoption process of Mobile Social Networks are determined by the country specific intensity of their direct network externalities. Again, forecasting early or later stages of new products' diffusion requires the estimation of their parameter changes, between early and late adopters, an aspect not to be overlooked when studying new product launches.

Marco Mattiuzzi, delivered a presentation entitled “Crystal-balling in healthcare, did you think of all the drivers? An industry perspective”. He emphasized how the Healthcare is one of the business segment with the slowest adoption of novelty and innovation, where the speed of changes are in synch with societal, political and economical long cycles and regulations and is difficult to predict. In his contribution, Mattiuzzi put together many business drivers and examples to present an overview of the pulling forces which need to be taken into account. The final focus was on current hypes on Internet of Things and Big Data and how these are impacting the way patients are treated and costs allocated in the Health Services.



Riccardo Apreda, from Erre Quadro srl, Pisa, presented a joint work with **Andrea Bonaccorsi**, **Donata Gabelloni** and with **Giacomo Tazzini** and **Gualtiero Fantoni**, from the University of Pisa, on “Evolutionary trajectories – a case study in the medical device industry”. Apreda described a Technology Foresight project commissioned by the Regional Government in Tuscany, for the analysis of the medical devices industry. The main goals of the investigation were to evaluate the emerging technologies, to identify the most promising products as well as the critical ones, and to try to foresee the scientific and societal inputs that will influence the evolution of this industry. They focused on 19 technologies pointed out by experts as particularly promising, and for each one of them they studied the evolution of inventions over times embedded in patents and scientific papers, correlating both behaviours to the overall trend and the degree of maturity of the various technologies.



The last presentation was given by **Peter Henley**, from the Financial Controlling and Statistics, European Patent Office, Munich. Henley discussed “*Forecasting the total numbers of filings at the European Patent Office: How useful are breakdowns by countries and technologies?*”, showing the extent to which the forecasts for Total Filings (TFs) benefit from data breakdowns. It was already established that it can be useful to take countries or blocs of residence of applicants into account. Their study suggested that a self-determining dynamic linear model fits best to data that are broken down monthly either by residence blocs or by the eight highest levels of the International Patent Classification (IPC) has been developed to assign technological descriptors to each application. Henley then described the results from a dynamic log linear model showing that the forecasts for TFs may be too high towards the end of the planning period. An extension of the original model was also studied, to improve the forecasts. Problems to be addressed however, included dependencies between parameter estimates;



comparative historical forecasting performance of the different models; and timeliness problems because the inputted proportions of Industrial Areas for the most recent years are based on incomplete data.

The final round table chaired by Professor **Robert Fildes** from Lancaster University highlighted that a practical impact can only be achieved with a clear forecast objective and the concluding remark that the area of judgment and new product forecasting remains under-researched topic in general. Most interestingly and entertainingly, the participants were invited to forecast the diffusion of driverless cars in Italy at two different dates in the future. The results presented to the entire audience showed some of the most relevant biases of this Delphi type of forecast at work and stimulated a lively debate on the possible correction methods.



Workshop evaluation and satisfaction

At the end of the workshop, participants have been asked to fill a satisfaction questionnaire consisting of 14 questions (score from 1-very *negative* to 4-very *positive*) related to the workshop organization, the program, the content and the overall utility of the workshop.

A total of 25 questionnaires were collected revealing a high degree of satisfaction on the initiative:

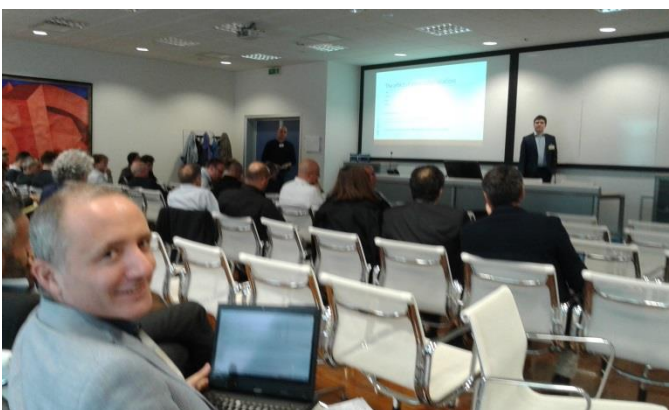
- Workshop Organization: 96% of attendees expressed a positive evaluation (score 3 or 4), with an average total value of 3,50;
- Workshop Program: 94% of attendees expressed a positive evaluation (score 3 or 4), with an average total value of 3,36;
- Workshop content: 81% of attendees expressed a positive evaluation (score 3 or 4), with an average total value of 3,05.

From collected comments, a general note appears concerning the coherence between presented contributions and the expected topics of the workshop, with particular reference to general forecasting techniques and forecasting techniques aimed to predict new products/technologies and services.

- Benefits and positive effects of the workshop: 84% of attendees expressed a positive evaluation (score 3 or 4), with an average total value of 3,11. Collected comments highlight that some contributions showed theoretical approaches rather than practical applications on industry technologies.

View all statistics in the Annex I.

Gaetano Cascini



Filippo Silipigni

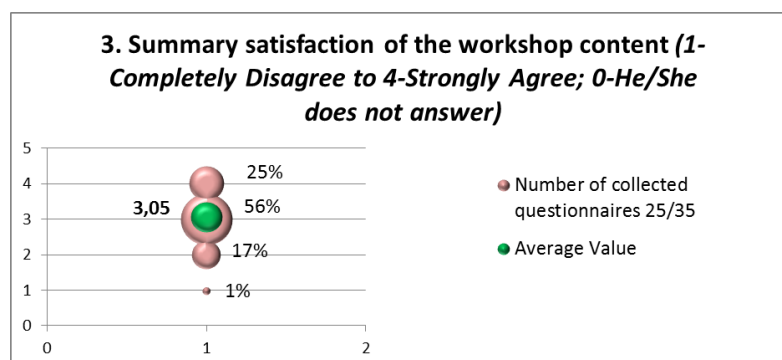
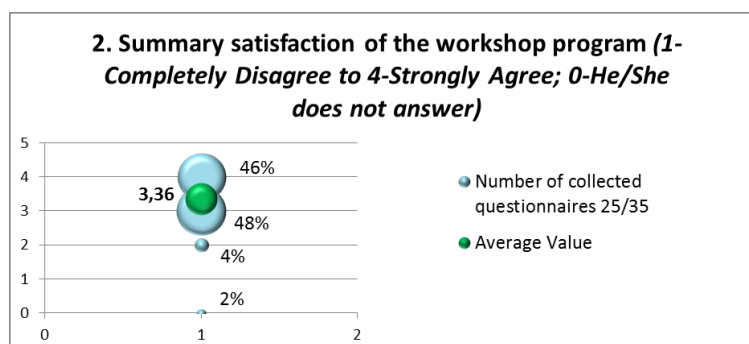
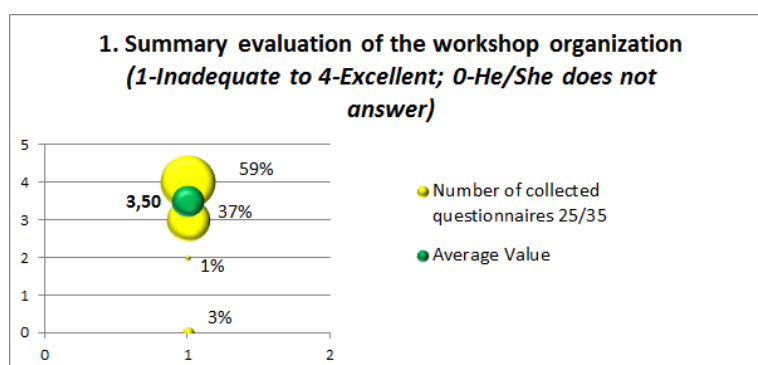


Annex I: Statistics

Total registrations	
Participants	20
Students	6
Invited speakers	7
Organizers	5
TOTAL	38

Origin Country		
France	1	2,6%
Germany	5	13,2%
Italy	24	63,2%
Singapore	1	2,6%
United Kingdom	6	15,8%
USA	1	2,6%

Institution/Company		
Consultant company	1	2,6%
Large Company	6	15,8%
SME	13	34,2%
Public Entities	1	2,6%
Technology Transfer Office/Business Incubator	2	5,3%
University	15	39,5%



4. Summary satisfaction of the benefits/positive effects of the workshop (1-Completely Disagree to 4-Strongly Agree; 0-He/She does not answer)

