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The Influence of Managerial Forces and Users' Judgements on Forecasting in International Manufacturers: a Grounded Study

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Abstract

Despite the improvements in mathematical forecasting techniques, the increase in forecasting accuracy is not yet significant. Previous research discussed various forecasting issues and techniques without paying attention to users' forces and behaviours that influence the construction of forecasts. This research investigates this gap through examining the managerial forces that influence the judgements of different users and constructors of forecasts in international pharmaceutical companies. A qualitative research applying Grounded Theory methodology is used to explore the concealed forces in forecasting processes by interviewing different constructors and users of forecasts in international contexts. Using the Coding Matrices, the research identifies the forces which induce users' judgements, and consequently lead to conflicts. The research adds value by providing assessment criteria of forecasting management in future research.

Introduction

The managers' decisions within organisations are usually based on forecasting events and the different outcomes of their predictions (Wilson and Gilbert, 2003; Loewenstein et al., 2003). Forecasting the future is very critical in decision making process (Lawrence et al., 2000); it gives management the ability to plan, budget and control performance, in addition to sharing knowledge and justifying managers' decisions (Önkal et al., 2008). Therefore, forecasting must not be studied in isolation, but in the context of a policy making process, as forecasting is the basis of many decisions that need to be taken such as capacity planning, inventory management, purchasing control and investment decisions (Haloub, 2013).

The expectation from the forecasters, or constructors of the forecasts, within the firm is to use the mathematical techniques to predict the future demand of certain products or services, however, in practice the constructors or producers of forecasts "have eschewed statistical *methods of forecasting and depend instead on human expertise"* (Brown, 2011, P. 77). The subjectivity of human expertise is mixed with human values and expectations which might increase the possibilities of producing a fragile forecast. Moreover, low humans' capabilities to process large amount of information (Hogarth and Makridakis, 1981) and human mind's limitations (Lawrence et al., 2006) increase the biasness in the produced forecasts. Goodwin and Wright (1993) defined judgments as the different peoples' visual illusions which might be part of subconscious mental involvedness and cognitive limitation.

According to Dan and George (2013), the biases in human judgements in predicting the future are caused, unwittingly and routinely, by emotional interference and how the projected forecasts make one's emotional state in the future, which is defined in psychology as "Affective Forecasting" (Wilson and Gilbert, 2003). The biasness in affective forecasting is also seen a threat to subjective well-being, because of its effect on decisions, preferences and behaviour (Dan and George, 2013). According to Halpern and Arnold (2008), *"*people make different projections about their future well-being when they are in positive versus *negative emotional moods"* (P.1710), consequently highlighting that emotional moods affect people judgements and decisions.

Yet, human judgement could be an important source of improving the forecasting accuracy in the future, notwithstanding the limitations of human judgements. Authors like Collopy and Armstrong (1992), Armstrong (2003) and Fildes (2006) mentioned that judgment is an important part of the forecasting process, even when using the statistical approaches, because it involves the choice of the forecasting method and the selected data.

This research explores the effect of users' judgements integration on forecasts and conflicts initiated within the forecasting process and management. These conflicts arise because of the variations in judgments and perceptions of forecasts. Smith and Mentzer (2010) highlighted that these variations in judgements and perceptions of forecasts *"may influence* forecast utilisation*"* leading to *"*a gap in our understanding of the forecasting-operating *performance connection"* (P. 159). Fildes et al. (2006) and Lawrence et al. (2006) agreed with this and highlighted that the values and beliefs of users of forecasts are originally generated as a result of inseparability of human judgement from the forecasting process. This research responds to Fildes et al. (2009) who highlighted the need to *"use interpretive* research methods to establish, at a deep level, the beliefs and values of managers engaged *in forecasting … to explore both the psychological processes* that individual managers employ and the effects of interactions between managers within organisational contexts*"* (P.

20). This research addresses this gap in literature by identifying the *"*beliefs and values of *managers"* (Fildes et al., 2009) which affect their judgements in the forecasting management process.

In practice, judgemental adjustments of the produced forecasts are very common processes (Fildes et al., 2006; Goodwin et al., 2006), in reflection to different organisational goals and objectives. The use of both statistical models and managers' judgments could provide the ability to add domains of knowledge and time series information (Lee, 2007), while recognising that *"different heuristics and biases may be involved"* (P. 39).

Sanders and Manrodt (1994) explained the use of judgments in the forecasting process within organisational settings in different ways. These could involve adjustments of the produced forecasts, adjustments of the forecasting statistical procedure, or adjustments of the initial data used in producing the forecasts. The variations among researchers' views about judgmental integration might have an effect on the pattern of results obtained in research, which might have some implications in practice (Harvey and Harries, 1999).

Willemain (1989) mentioned that if the forecasts that were produced statistically were suboptimal, judgemental adjustments would improve the accuracy of the produced forecasts. The improvement of accuracy also happens when domain knowledge is available; this was also supported by Turner (1990) and Donihue (1993) in macroeconomics researches, and by Wolfe and Flores (1990) and Flores et al. (1992) who conducted their researches on the earnings forecasting, as well as Sanders and Ritzman (2001) and Nikolopoulos et al. (2007) who conducted their research on the demand forecasting process, taking into consideration that bias results might be present in the final forecasts. Judgemental adjustments to forecasts provide a clear improvement to the forecasts accuracy; however, Mathews and Diamantopoulos (1992) raised the conflicts in amending the non-adjusted forecasts due to the flexibility of the forecasting system used in organisations.

Many organisations revise their forecasts not their plans as shown in Figure (1) (adapted from Armstrong, 2001), if the forecast results are satisfactory, it will be handed and processed to implement the plans and monitor the results that will be part of the data bank for other future plans. If the forecast results are still not satisfactory; then forecasts will be revised, and forecasting process will be repeated again until reaching satisfactory outcomes to match with the plans (Armstrong, 2001). In the forecasting process, the forecasters usually formulate the problem and obtain information in order to select the appropriate forecasting method to implement and finally evaluate the method used on the forecasting process.

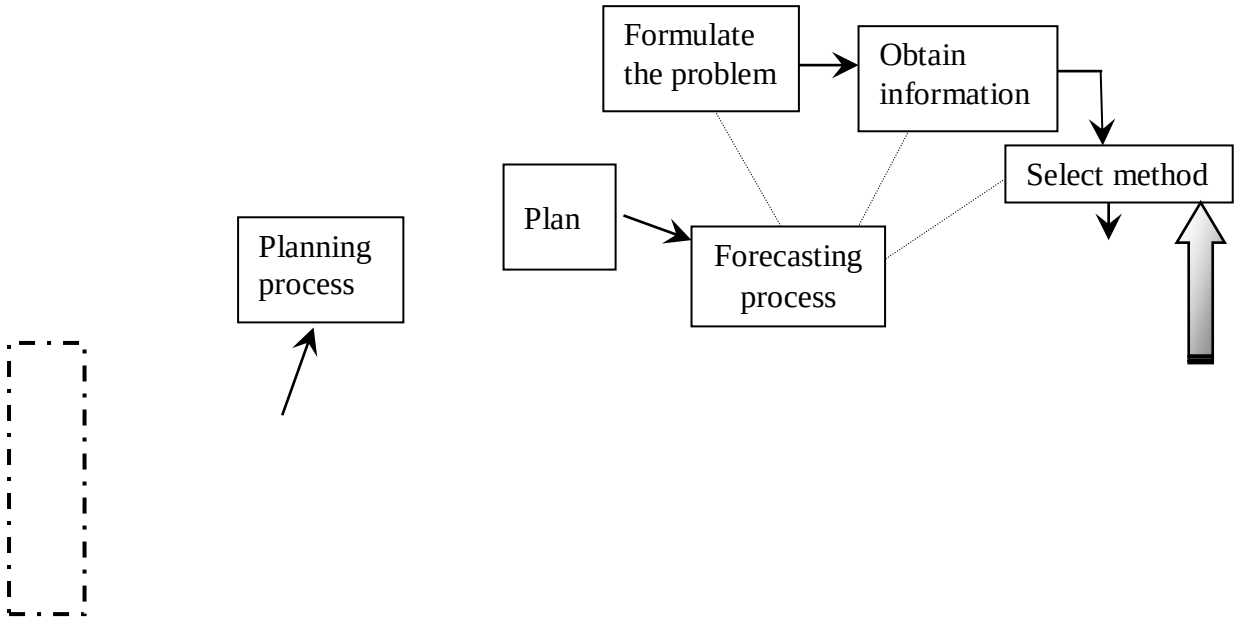

Figure 1: The scope of forecasting - the relationship between the forecasting components and forecasting process (adapted from Armstrong, 2001)

Forecasts can change the employees' behaviour and objectives, which will consequently change the organisational environment, culture and create conflicts in interdepartmental communication that are linked to the process of decision-making (Harris et al., 2008). The change in behaviour could add some complexity of this research is that forecasts change the behaviour (Kremer et al., 2011) and attitudes of the users, thus, leading to an increase in the areas of conflict between different departments.

This research is exploring the users' stimulus that affects their contribution, behaviour and influences toward the constructed forecasts. What are these forces? What are the impacts of these forces on the constructed forecasts? This article will provide a brief literature review about the users' involvement in the forecasting process and judgemental integration of forecasts, followed by the conceptual framework, the methodology, discussion and conclusion. This research will use the international pharmaceuticals companies as an example of large enterprises with a high volume manufacturing in forecasting management.

Literature Review

Forecasting is "*the driving force behind all forward planning activities"* (Lambert and Stock, 1993, P. 559), which contribute in the decision making process and operation performance (Smith and Mentzer, 2010).

Previous literature about the forecasting process and its impact on the companies' performance discussed the inventory and cost effect on the manufacturing systems and logistic performance (Kalchschmidt and Zotteri, 2007; Danese and Kalchschmidt, 2011). Through evaluating the forecasting useful knowledge that is published in journals, Armstrong (2003) found that "journal papers relevant to practice [in forecasting] are difficult to find... *Once found, the papers are difficult to interpret"* (P. 1). Flides (2006) also supported the availability of gaps practice and the literature as the forecasting experts pay most attention to what they publish between themselves and ignore the main important part of its real application. In practice there are *"many* companies have no forecasting capability at all because *they feel it's not necessary at their companies"* (Dilgard, 2009, P. 4), and managerial judgements are enough.

Önkal and Bolger (2004) mentioned the forecasters or the forecast providers (or constructors) might be the users as well in different departments. Moreover, the shared forecasts (Mentzer and Bienstock, 1998) are translated in different departments into different processes and decisions; such as manufacturing plans, budget preparations, promotional activities, investments, profits, resources allocation and performance appraisal. The shared forecasts will provide the opportunity to combine data and share information (Chen et al., 2000), and share data from different resources and functional integration within organisational departments (Moon et al., 2003) will reduce the uncertainty of the future events. Forecasting accuracy is one of the main interests to researchers in the field of forecasting. The relationship between the adoption of various forecasting techniques (quantitative or qualitative forecasting techniques) and accuracy is debatable (Mentzer and Bienstock, 1998).

Some managers do not believe in giving attention to improving forecasting processes, and in some cases, companies might even need the latest forecasting capabilities that might not be fully leveraged or properly understood. Furthermore, companies refuse to overhaul the necessary major changes in existing forecasting processes (Dilgard, 2009).

The forecasting process was discussed by different authors and each author viewed the forecasting process in different direction, for example, Armstrong (2001) views forecasting process from data bank (environment), cost of losing opportunity or investment (Johnson, 2005), the forecasting techniques, competitors' actions, profits and market share. In this paper, the forecasting process that will be considered in the literature review is conducted by Fildes (2010) as explained in Figure (2).

The framework about the organisational forecasting process starts from the forecasting support and information system, which provide the decision makers with the predictions, after considering the proposed set of plans or planning guidelines. Forecasters use selected information about the environment that is available through formal Management Information System (MIS) or on an informal basis. Forecasters will choose the certain forecasting procedure based on the cost, the deadlines and the expected accuracy of the forecasts, taking into considerations that the forecaster should take into account the value of improving forecast accuracy (Fildes, 2010).

If the forecasting output is not as expected, the forecasters can modify the results by using alternative sources of information to produce new forecasts (working forecast). The working forecast may not meet the decision makers' expectations and objectives. At this point, decision makers and forecasters would revise the planning guidelines and the assumptions that lead to the initial forecasts (Fildes, 2010).

The main initiator of the conflict between participants in the forecasting process, i.e. the forecaster and the decision maker, is that the interrelationship between the two protagonists is not included in the organisational framework, but it is affected by the organisational culture. Another reason for the conflict between participants in the forecasting process is due to the different managerial views of random variables evaluations between departments within the same organisation, where these variables are affected by hidden assumptions that are affected by different types of pressures and experiences. This means that the same data used by different departments may produce contrasting forecasts with different forecast errors.

The forecasters and decision-makers are both affected by their own values, professional expertise and their personal career goals, which do not necessarily match or differ at all times, but they both affect each other in different directions. In fact, the forecasters' and corresponding decision-makers' views of the problem are often in substantial conflict (Wheelwright and Clarke, 1976). This conflict might be because the managers see forecasters as too technical people, who deal with data and forecasting formulas, without understanding and sometimes ignoring the managers' problems. Forecasters, on the other hand, view decision makers as people who have little understanding about the technical aspects of forecasting. Among the suggestions to evaluate the organisation's forecasting performance is to examine how forecasts are used, not just how they are produced (Fildes and Hasting, 1994; Wheelwright and Clarke, 1976). This is important, especially that forecasting techniques alone do not necessarily improve the forecasting accuracy; managers should also consider other issues associated with the forecasting process management (Mentzer and Cox, 1984)

In some organisations, the forecaster who is responsible for forecast creation is also the user of the forecasts, and in this case the forecast is likely to be applied without adjustment (McCarthy et al., 2006). In some cases where separate individuals may be involved in forecast creation and utilisation, the direct relationship should be directed through the management policies and mandate application (Schultz, 1987).

The forecasting process is affected by the management and organisational approaches (Mentzer and Kahn, 1997; Moon et al., 1998; Mentzer et al., 1999) because of its ability to define priorities relevant to organisational strategic objectives (Modell, 2012) and minimise conflicts in the construction of final or shared forecasts. This research will not consider the organisational approaches in the process of construction forecasts.

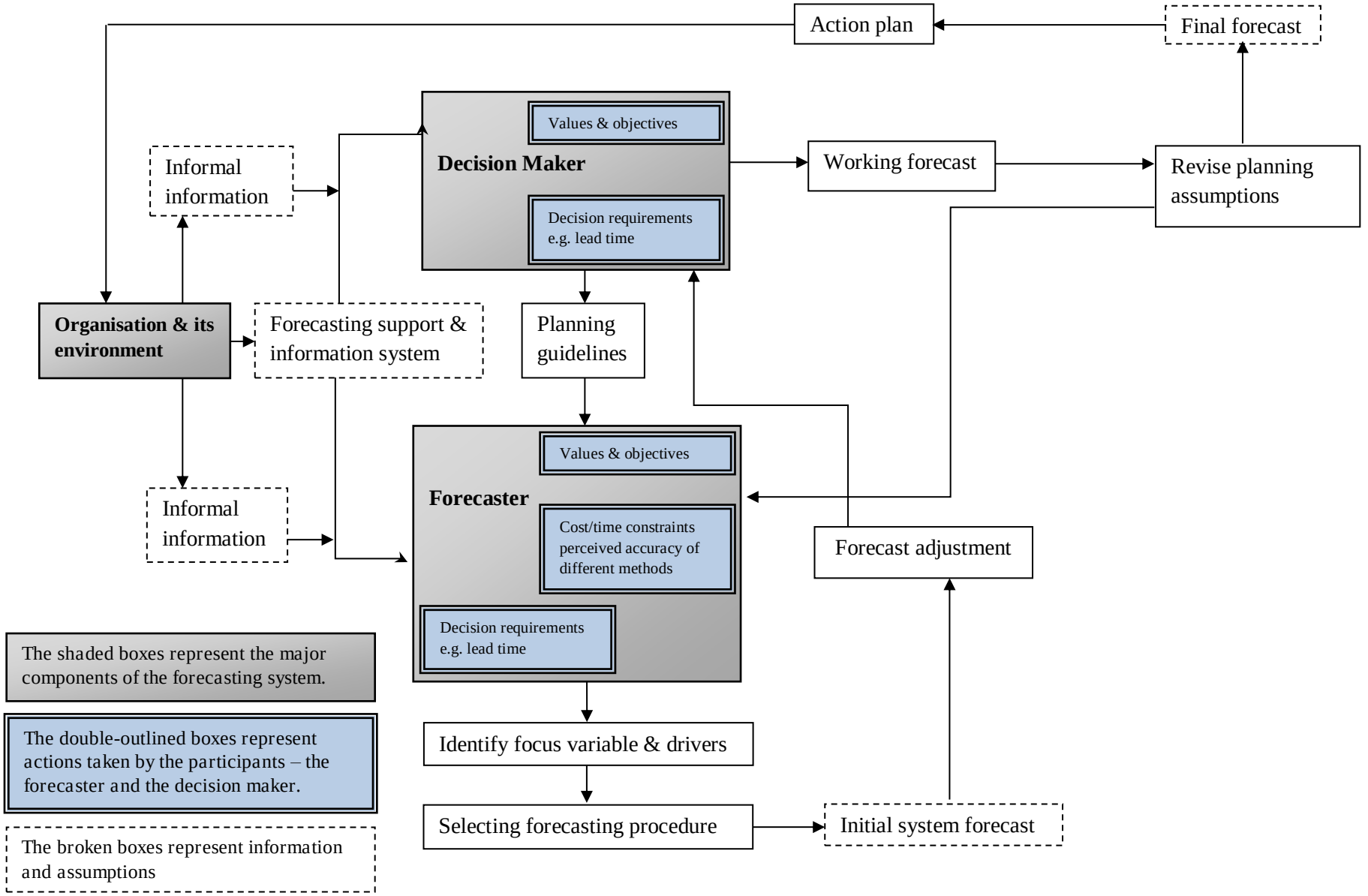

Figure 2: Framework in the organisational forecasting process (Fildes, 2010)

Judgemental integration of the produced forecasts

Sanders and Manrodt (1994) explained the use of judgments in the forecasting process within organisational settings in different ways. These could involve adjustments of the produced forecasts, adjustments of the forecasting statistical procedure, or adjustments of the initial data used in producing the forecasts. The differences created by integrating judgemental and statistical methods lead to conflicts between scholars in their evaluation of the judgemental integration into the forecasts. In some cases, managers make preliminary forecasts based on their judgments and then send them to another source to make the final forecasts; however, in some cases, the combination of the judgements within the forecasting process to produce the final forecasts can lead to less accurate forecasts. The variations among researchers' views about judgmental integration might have an effect on the pattern of results obtained in research, which might have some implications in practice (Harvey and Harries, 1999).

The integration of judgements into statistical forecasts was criticised by Sanders (1992), Harvey (1995) and Goodwin and Fildes (1999), as the integration of judgements into statistical forecasts would decrease their accuracy due to confusion between statistics and managers' judgements that are based on the reality of the marketplace (Goodwin, 2002).

From another point of view, Willemain (1989) mentioned that if the forecasts that were produced statistically were suboptimal, judgemental adjustments would improve the accuracy of the produced forecasts. The improvement of accuracy also happens when domain knowledge is available; this was also supported by Turner (1990) and Donihue (1993) in macroeconomics researches, and by Wolfe and Flores (1990) and Flores et al. (1992) who conducted their researches on the earnings forecasting, as well as Sanders and Ritzman (2001) and Nikolopoulos et al. (2007) who conducted their research on the demand forecasting process, mentioned that bias results might be presented in the final forecasts. Judgemental adjustments to forecasts provide a clear improvement to the forecasts accuracy; however, Mathews and Diamantopoulos (1992) raised conflict in amending the non-adjusted forecasts due to the flexibility of the forecasting system used in organisations.

From the other hand, Harvey and Fischer (1997) and Lim and O'Connor (1995, 1996) studied the received forecasts from another perspective, and they found that users of the forecasts fail to make adequate adjustments to the forecasts due to low understanding of the forecasting techniques and their low market knowledge. Goodwin and Wright (1994) and Webby and O'Connor (1996) studied the combination of judgments with statistical methods through mechanical averaging between both methods, and found that it would reduce the forecast errors, but it should be based on simple average forecasts. The organisation has an impact on the integration process of judgements with statistical forecasts, and it also affects the forecasting process and outcome (Harvey and Fischer; 1997).

Affective Forecasting

Many researchers explained the affective forecasting and its consequences on the shaping decisions and choices for the future (Wilson and Gilbert, 2005). The feeling about affect experiences in emotions and moods (Dan and George, 2013) which could be a threat for subjective well-being (Kermer, et al 2006). The biasness could result from the *"salient information"* (Gilbert and Wilson, 2007) which could be part of the feelings' prediction output the future events (Levine, et al 2012).

Dan and George (2013) connect the affective forecasting to ubiquitous in the current organisational projects. The affective forecasting will affect the people's engagement in various projects. Managers' experience might contribute in the forecasting of the future as they "remember the past to envision the future" (Bucker and Carroll, 2007: 55). The emotions, feeling and uncertainties might influence managers to predict the future. On the psychological forces that this research explore these factors from various forecasting contributors from marketing, finance and supply departments.

The Conceptual Framework

This research aims to identify the impact of managerial and psychological factors on forecasts users and constructors. Mentzer, et al (1999) identified the users of forecasts are usually three departments which are marketing/sales, finance and supply chain (or logistics).

The individual behaviours and management have an impact on the forecast application (Fildes, 2006; Armstrong, 2001; Lawrence, 2000) and different theoretical grounding has emerged that explain the management role in the development of forecasts like Davis and Mentzer (2007), Winklehofer and Diamantopoulos (2003) and Mentzer et al. (1999). Lack of empirical evidence that explain the impact of the users' actions and perceptions on the utilisation of forecasts lead to conflicts in finding the relationship between the forecasting and operating performance (Smith and Mentzer, 2010).

Based on the conceptual framework in Figure 3, research will verify the factors that affect the users of forecasts in the literature and its influence on the departmental perceptions and understandings of the produced forecasts in international pharmaceutical companies. This research will also identify the factors that have an effect on users' evaluation of the forecasts.

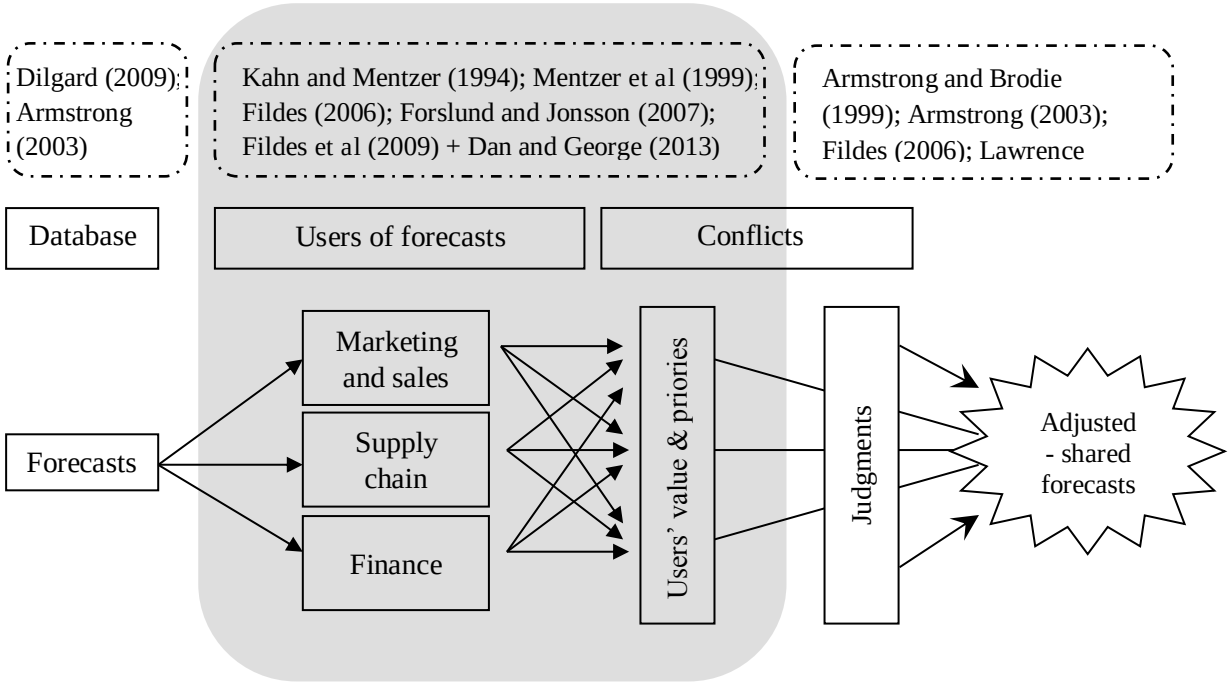

Figure 3: the research conceptual framework

Methodology

The use of Grounded Theory is derived from the symbolic interactionist theoretical perspective (Crotty, 1998), and it is "the discovery of theory from data" (Glaser and Strauss (1967, P. 2). Grounded Theory incorporates the researcher's perspectives that are explicitly and exclusively 'Grounded' in the perspectives of participants as they appear in collected data, which, consequently, gives the Grounded Theory strong explanatory power of phenomena to develop theory through Grounded consideration. Grounded Theory is a comprehensive approach that produces explanations for uniformity of social behaviour, social organisation, and social change (Merton, 1968).

Grounded Theory methodology will bridge the gap between empirical data and theory generation (Hammersley, 1989), to produce an emphasis on the socially constructed nature of reality (Goulding, 1998), and facilitate producing interpretations to explain the social phenomena, like; the main concerns of social actors, to justify their behaviour (Glaser and Strauss, 1967; Hammersley, 1989; Glaser, 1992; Wuest, 1995; Annells, 1996). Grounded Theory can recognise the complexity of the social world, and works to make sense of it to both the analysts and lay-people (Wells, 1995).

In the current research, the data were collected through the usual methods of interviews (Morse and Field, 1995), but theory development is based on comparative analyses between or among groups of persons within a particular area of interest, in addition to constant comparison to the previous literature, and this is the central feature of Grounded Theory (Glaser and Strauss, 1967; Strauss and Corbin, 1994), which will permit the researcher to recognise patterns and relationships between these patterns (Glaser, 1978; 1992).

The research method is also in response to Fildes, et al (2009) to "use interpretive research *methods"* (P. 20) in order to provide deeper understanding of managers' perception – in value and believes – within the organisational context. This research aim is matching with the *"critical realism"* views, and different levels of involvement of the forecasting users within organisations and many possible judgmental influences from different users that were originated from the different values and priorities. This research philosophy is matching with previous researches aimed to explore the reasons behind particular phenomena and transpire complex phenomena in organisations using a critical realists' perspective (Tsoukas, 1989; Costello, 2000; Harrison and Easton, 2002). Critical realists believed that information, perceptions, opinions, and understanding people are critical to identify the realities (Mason, 2002).

Method of data collection

The interpretivists define qualitative research methods (Carcary, 2011) as *"an array of* interpretive techniques which seek to describe, decode, translate, and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring *phenomena in the social world"* (Van Maanen, 1983, P. 9). Qualitative methods concentrate on deeper understanding of behaviour (Snape and Spencer, 2003; Alvesson and Sköldberg, 2009) due to their ability to generate understanding meanings and contexts of complex phenomena and multi-dimensional views through dialect and flexible approaches (Morgan and Smircich, 1980; Creswell, 1994; Mason, 2002).

The "truthvalue" is demonstrated by in-depth description of the topic area and complexities of data interaction (Lincoln and Guba, 1985; Grumet, 1990; Eisner, 1991; Marshall and Rossman, 2006).

Method of data analysis

The interviews were recorded, transcribed and analysed using qualitative methods of analysis. Open coding is the initial stage of the Grounded Theory analysis (Glaser and Strauss, 1967; Strauss and Corbin, 1990). Open coding process is identifying, naming, categorising and describing phenomena found in the text, to be used as the building blocks in the construction of Grounded Theory (Glaser, 1978). The similar data will be grouped together and labelled under the same conceptual label; this process is called categorising, finding the connections between categories and its sub-categories to form axial coding. The integration of axial codes will generate core categories. Core categories are the central ideas or phenomena and are the first story line in the generation of theory. The story has a descriptive nature about specific phenomena of the research; however, the story line is a process of abstracting and conceptualisation of the story of the research.

The categories are linked to the core category through the core categorical relationship by identifying the causal conditions that will lead to the development of phenomena. Here, the context is considered as a set of intervening conditions in which the phenomena are expressed or formulated. As a result of phenomena, actions/interactions occur leading to intended or/and unintended outcomes and responses that are called consequences (Pandit, 1996). Subsidiary categories can be included in the analysis; these categories may explain the linkages between categories and improve the level of complexity of the data analysis and validation. The core categorical relationship is conducted in this research through conditional relationship guide and reflective coding matrix to confirm saturation and develop emerging theory (Pandit, 1996; Scott and Howell, 2008).

The conditional relationship guide or conditional matrix will support contextualise a central phenomenon by arranging the relationships between the categories to construct theory (Scott and Howell, 2008; Strauss and Corbin, 1998). The data are initially broken down by asking the questions of what, when, where, why, how, and what are the consequences (Strauss and Corbin, 1998; Scott and Howell 2008). The conditional relationship guide presents the process of moving the open coding to axial coding and according to Scott (2004) *"this* method (conditional relationship guide) also began to help the dimension of time, or process, to emerge, and move the concepts from a flat, linear conceptualisation to a more complex *pattern of understanding"* (P. 83). The conditional matrix will "contextualise phenomenon and relates categories linking structure with process*",* however, the reflective coding matrix will *"*serve as a bridge to the final phase of Grounded Theory analysis ... and, ultimately, to *substantive theory generation"* (Scott and Howell, 2008, P. 1).

The reflective coding matrix is important to construct the relational hierarchy, contextualise the core category and link the major and minor sub-categories (Strauss and Corbin, 1998) to clarify the picture of the central phenomenon through defining and describing the core category. The reflective coding matrix involves actions and interactions to construct the matrix, and consequently, the story line. *"The reflective coding matrix is rather like putting a* jigsaw puzzle together, trying a piece at a time through multiple iterations until all of the pieces form a narrative picture that fits with verisimilitude as perceived by the researcher, *the participants, and the extant literature"* (Scott and Howell, 2008, P. 8). The last stage in

the process of analysis in the Grounded Theory is integrating, interpreting, and refining the theory (Strauss and Corbin, 1998; McCaslin and Scott, 2003).

Grounded Theory is adopted in this study to explore the managerial conflicts between the users of forecasting which are identified in three different main departments (finance, marketing/sales and supply chain departments) to compare the respondents' values and believes that reflect their judgements and contribution in forecasting management.

Respondents

Respondents were contacted through the emails and recorded mails to participate in this research. The respondents were the users and forecasters or the constructors of the forecasts. The researcher succeeded in interviewing 18 respondents in 8 international pharmaceutical companies in UK, Denmark, Netherlands, Portugal, and Switzerland.

The respondents were from different departments; marketing/sales, finance and supply chain. The respondents will be identified in the data analysis referring to the department, for example; respondent 4/M means interview number 4 with marketing person and 18/S means interview number 18 with supply chain person. The main objective here is to define the conflicts' level of the users and constructors of the forecasts.

Data analysis

After interviewing 18 respondents, it has been found that there is a clear division and conflict has been noted between the users and constructors of the forecasts in the international pharmaceutical companies. The managerial forces vary and depend on the internal arguments on the use of the forecasts. The produced core category is called *"Internal Contamination"*. The Internal contamination is the relevant to relationship between the users and constructors of forecasts within an organisation – interdepartmental conflicts which are related to the variations of departmental views of forecasting. Job description, employees' behaviour, appraisal system, personal and professional targets and commitment are the source of the internal contamination in the forecasting management. Differences in the views and values of forecasts might lead to interdepartmental conflicts, which if not solved will injure the organisational progress and achievements. The Central Phenomenon for this Core Category is: the variations of values between forecasting users can be destructive or constructive conflicts.

Based on the respondents' job title, this core category has three sub-categories which are; marketing/sales views of forecasting, financial views of forecasting and supply chain views of forecasting. The internal contamination between the users of the forecasting might affect the process of forecasting management, the levels of commitment and adaptation of the forecasts produced. As 4/M said *"low forecasting er*ror or high forecasting accuracy does not mean that forecasts can be achieved, success of forecasts depends on accuracy and *commitment from all departments"*. The marketing and sales values are different from the finance and supply chain values, as well as the priorities in each department.

Internal Contamination: marketing and sales views of forecasting

Marketing and sales views of forecasting are basically focused on the customers, appraisals, targets, market size, competition, sales turnover, market trend, price, patients, promotions and value targets, market trends, profits, promotions, numbers of outlets, distribution. This was mentioned by 18/S who said that *"sales and marketing people have the same values* and *priorities when looking into forecasts, the lower the future targets the better for them".*

According to 4/M the sales teams are more interested in achieving or exceeding the forecasts and targets, without considering the reasons behind the over achievements in sales, which might be due to forecasting errors or any other uncertain factors, he said *"sometimes* salespeople are more directed toward the achievement without any consideration of other factors [like errors] *due to the pressure of sales".* This was supported by 14/M who considered the achievement is seen as superb work, he said *"it is funny when marketing and sales over achieve targets, nobody asks why this happened… as we achieve the value we are looking for"*.

Respondents like 1/M, 7/M, 8/M and 15/M mentioned some factors that raise conflicts. For example 1/M mentioned *"we do test the market...* [no] not exactly, but get the feeling ... like our products are used very much be surgeons so when a report comes up in which they say these are the *trends we should be following for the future"* in this quotation the respondent is talking about the customers' and then he got the feeling from customers. 7/M focused on the role of forecasts in relation to targets and appraisal system, he said *"each* company has its own way in putting people in pressure to work, but there are related to the appraisal system and related to the country manager *and patients."* in this quotations, the respondent talked about the appraisal systems and the market dynamics that would affect the view of marketing and sales to forecasting management. Moreover, the majority of marketing and sales respondents mentioned that their targets are value based targets, which means that the sales people performance is related to the value achievement rather than the unit sales.

Based on the analysis of marketing and sales views of forecasting, the main priorities for this department are customers' satisfaction, targets, promotional campaigns, market trends, market dynamics, competition, patients, distributors, sales turnover, costs and profits, expenses and personal appraisal systems.

Internal Contamination: Financial views of forecasting

All financial managers confessed that there are big obstacles facing the forecasting management and processes of setting targets. The financial department justified the reason behind that with the shortage in knowledge about forecasting, in addition to the gap between the reality of the market and the personal values of the forecasting constructors who are the marketing department. This was mentioned by 2/F who said *"marketing people are not* experts in forecasting management, and they either overshoot or underestimate, overshooting forecasts to get more complements from the upper management, but in some cases marketing *people might underestimate the forecasts to make it easier to achieve targets"*. This was supported by 1/M who said *"under forecasting the fut*ure will allow less future efforts, and *marketing people will look good"*; the consequent results are forecasting bias and more conflicts as mentioned by 2/F.

The finance respondents looked at the forecasts from a different angle than the marketing people since the finance department views forecast as future sales turnover, cost of sales,

profits, expenses, share prices, shareholders satisfaction, budgets, purchasing, debit/credit ratio, payroll, financial commitments like banks' loans and product manufacturing.

From another point of view, 4/M justified the origin of conflicts between departments as a consequence of the differences between the departmental goals and objectives, in addition to shortage in the formal and informal data that is needed to build a bridge of trust between departments in forecasting management. Moreover some respondent mentioned the effect of the ownership on the firms' strategy in the forecasting, as the ownership has an impact on the organisational objectives and culture. Forecasting in international companies is different and is difficult as mentioned by 3/F who said *"I* [the respondent] tried to make an economic formula and forecasting process through my career in 18 years, but I failed because of the *type of industry we are working in"*.

Internal Contamination: Supply chain views of forecasting

The consequences of forecasts are delivered to the supply chain department to comply with the demand figures. Based on the views of 9/S who mentioned that *"the output of the* forecasting process from all departments is the starting point for us, and any errors have the worst implications on the su*pply chain department"*.

The forecasting errors will have tremendous implications on this department because the supply chain department usually plans the raw materials and goods based on the forecasts submitted and agreed on. 10/S mentioned that the purchase of raw materials depends basically on the forecasts and goods needed as free medical samples and extra goods. 11/S said that *"from our experience in the previous forecasts, we usually add 20% on the forecasts* as a margin for all goods, whether these products are existing or new, needed to be *manufactured or produced, regardless of the type of product or the quantity in the forecasts".* This situation leads to increased losses in storage and costs of sales, in addition to increasing the overall costs of manufacturing.

Based on the interviews, the supply chain views focus on the effects of forecasts on packaging, price, raw materials, storage space and conditions, distribution, purchasing, shipping, manufacturing and forecasting errors. On the other hand, the supply chain might increase or decrease the forecasts based on the production capacity, and according to 12/S the increase or decrease in the forecasts is usually based on the manufacturing capacity to make a full batch of a certain product, which is a normal procedure for the supply department.

Discussion and Practical Implications

As mentioned earlier, there are three main users of forecasts, marketing/sales department, supply chain department and finance department (Mentzer et al 1999). These departments hold different views of forecasts, and the points of convergence between the three departments might lead to political and internal conflicts.

Based on the conceptual framework, this research identified the forces that affect the users of forecasts, and their influence on users' perceptions and the understanding of departments about the produced forecasts. This matches with the previous literature supporting that individual behaviour and management styles can have an impact on the application of forecasting (Fildes, 2006; Armstrong, 2001; Lawrence, 2000), and different theoretical grounding has emerged to explain the management role in the development of forecasts like

Davis and Mentzer (2007), Winklehofer and Diamantopoulos (2003) and Mentzer et al. (1999). However, Smith and Mentzer (2010) highlighted the lack of research explaining the impact of the actions and perceptions of users on the utilisation of forecasts, which has led to conflicts in identifying the relationship between the forecasting and operating performance.

At the same time, Filders et al. (2009) highlighted the importance of conducting future research that investigates the impact of psychological forces on the forecasting process. Furthermore, Bunn and Wright (1991) said that *"*experts are used to their real world context and the judgemental process is made explicit through a form of *decomposition or audit trail"* (P: 512), and there is a need for re-evaluation of the basic psychological research on judgemental biases, bootstrapping, and calibration in this context in order to improve the best practice quality of the judgements in forecasting. Despite that Goodwin and Wright (1993) and Webby and O'Connor (1996) argued that combining judgments with simple average forecasts through mechanical averaging between both methods would reduce the forecasting errors, the lack of sufficient market and forecasting knowledge by the users will affect the forecasting process and outcome (Harvey and Fischer, 1997) and consequently the accuracy of the final forecasts.

The judgemental influence of different departments was found to affect the forecasting process based on the job pressures and factors that would consequently affect the behaviour and attitude of the users of forecasts. This research revealed that there are differences in the priorities and list of issues that concern each user that might interfere with the views of users and affect their judgments about forecasts. For example, the finance department's views are related to shareholders satisfaction, debit/credit ratios, financial commitments, purchasing raw materials and manufacturing. The supply chain department's views of forecasts, however, are based on packaging, raw materials, storage conditions and space, drug registration, distribution, purchasing, shipping, manufacturing and forecasting errors. Despite of the variations in forecasting views, there are the convergence points between the three departments are sales, targets, profits, expenses and CIF price which includes the cost, insurance, and freight.

These forces would affect users and constructors' judgements on the produced forecasts. Biasness of the produced forecasts commonly starts with the human information processing as explained earlier. Such biasness would clarify and rationalise the human belief revision (Edwards, 1982). Judgements depend on the experience or previous trainings that develop the skills and ability to judge; this experience and training will also add to the self-confidence of forecasters even when associated with minimal changes in performance (Harvey, et al 1987; Marteau et al 1989; Marteau et al 1990). People's confidence in overestimation or underestimation of certain facts is relative and subject to several factors as personal experiences and beliefs (Koehler and Harvey, 1997).

The contradictions in judgments will have an impact on the compliance with the produced forecasts. In practice, the departmental meetings, whether formal and informal meetings, play an important role in forecasting management. These conflicts emerged during the interviews and were raised by many respondents. The finance department looks at forecasting as an instrument for calculating the future profits, preparing the budgets and paying the future payables, whereas, the supply chain department looks at forecasting as the starting point to plan the supply and accommodate the goods. Neither the supply chain nor the finance departments were concerned about the appraisal of performance measurements of forecasts and their achievement because they had other measurements of performance. However, the marketing/sales people were more concerned about the forecasts as it is linked to their

performance measurements, taking into consideration that marketing/sales people were shown in this research as the constructors to show commitment to achieve forecasts. Having inconsistent departmental strategies and variations among the departments' appraisal systems is expected to cause more interdepartmental conflicts and individualism.

Another practical implication of this research is that forecasting should be a team work between the constructors and users to provide accurate forecasts, achieve managerial commitments and users' acceptance.

Conclusion and Future Research

Based on the findings of this research, it has been concluded that the behaviour of the users of forecasts toward the produced forecasts will lead to different conflicts between these users. The researcher collected data in this research from the three departments of the users of forecasts in order to investigate differences between these departments, factors that affect their behaviour and forces that affect their judgments.

In the current research, the researcher found that the consequences of constructing the forecasts by marketing personnel would increase the biasness of forecasts because the achievement of these forecasts is pegged to performance. This case will lead to interdepartmental conflicts in forecasting management. All users or constructors of forecasts in large institutions are facing psychological factors that might affect their views of the produced forecasts and create departmental conflicts. Team work in constructing the forecasts can help in reducing the managerial conflicts and decrease the percentage of failure.

The complexity of this research arises because the forecasts change the behaviour and attitudes of the users, thus, leading to an increase in the areas of conflict between the marketing/sales, finance and supply chain departments. Moreover, conflicts in forecasting techniques, unaided judgments and shortage of knowledge about the forecasting techniques will also contribute to widening the gaps and increasing the conflicts between these departments. Variations in departmental goals change people's perceptions and attitudes toward forecasts in each department and, consequently, affect the forecasting management and its accuracy. The results of this research found that there is a major communication breakdown due to differences in each department's definition of forecasting. Moreover, lack of collaboration and coordination between departments lead to gaps in forecasting management and organisational achievements.

Based on the outcome of this research, there is a need for future research to find an assessment model for forecasting management in large institutions, through which organisations can identify the produced forecast and minimise forecasting errors.

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