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Revenue Maximisation - An Examination of the Influence of Heuristics and Biases on the Yield Management Decision Process in Dublin Hotels

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Abstract

Yield management in hotels has been described as a method of profitably managing fixed room capacity. A critical element of yield management is the decision strategy employed, as this determines the degree to which optimum financial solutions are generated. Recent research has indicated that the use of technology assisted decision optimising models, specifically the management science model of decision making, would greatly improve decision optimisation, by minimising the need to employ guesswork in achieving financial goals.

However, despite this assurance, yield management remains couched in uncertainty through being inextricably associated with forecasting future demand for a perishable product in an increasingly volatile and competitive environment. The consequential pressures on decision-makers have afforded the opportunity for human idiosyncrasies to play a significant role in the decision-making process. The primary objective of this paper is, therefore, to gain an insight into how decisions are constructed in the yield management environment of Dublin hotels.

The study reviews current literature on management science as a decision-making option. It also assesses heuristics and biases associated with decision-making, and their influence on rational decision protocol.

The methodology employed phenomenological and hermeneutical techniques, with discourse analysis, in accessing and analysing data.

The research findings reveal that within Dublin hotels, the management science model of decision-making has been sidelined in favour of decision strategies, wherein "human intervention" plays a more significant role. The findings also suggest that this "human intervention" has subconsciously facilitated an environment for decision-makers to fall into psychological traps, with the potential to make systematically biased errors, through satisfaction of ego needs and rationalising the irrational.

Introduction

Yield management, in the hotel industry, is defined as a method of profitably managing fixed room capacity (Lieberman, 2003), involving "an integrated, continuous and systematic approach to maximising revenue" (Jauncey, Mitchell, and Slammet, 1995). This approach fundamentally requires hotels to make decisions on the number of rooms that should be allocated at differentially prescribed rates to segmented markets, within an ever narrowing time frame (Kimes and Chase, 1998; Kimes, 1989).

However, this decision process is neither clinical nor simple. Intensive growth in business competition, acute price sensitivity of customers and increasing pressure from shareholders has intensified the need for hoteliers to maximise revenue. These factors, when coupled with increasing time and data overload pressures on managers, have resulted in high levels of decision uncertainty, wherein computerised yield management systems are often promoted as a rational solution to the problem of maximising revenue generation, in an increasingly hostile marketplace (Upchurch, Ellis and Seo, 2002; Johns, 2000).

In order to achieve revenue maximisation, hotels often need to strike a fine balance between being competitive, through cost reduction, and satisfying shareholder utility, through maximising revenue. This balance, according to Cross (1997), is achievable through the application of disciplined tactics that predict consumer behaviour at the micro market level.

However, although the above apparent complex mix of decision variables often appears "manageable", it can promote a fear of, or an inability to examine all possible alternatives. This in turn, may drive the decision maker into psychological traps, characterised by the "comfort zone" of familiar patterns of recognition (Shefrin, 2007; McKenna and Martin-Smith, 2005; Bazerman, 2004; Slovic, Finnucane, Peters and MacGregor, 2002; Klein, Orasnu, Calderwood and Zsambok, 1993).

Within the hotel industry, dynamic combinations of price and room availability continuously alter the yield management decision environment, making the optimum solution a moving target for the decision maker. Therefore, from a decision-making perspective, the seamless updating of room price and room availability is critical in minimising the risk of selling rooms at a sub-optimised rate (Sanchez and Satir 2005; Upchurch et al 2002; Johns, 2000; Kimes, 1997). This would suggest that the complex mix of variables should invite the assistance of a rational based solution to the decision problem. Indeed, research argues that mathematical models of decision-making will help take the guesswork out of the room management decision process by statistically improving the capability of delivering optimum revenue generating solutions (Sanchez and Satir, 2005; Lieberman, 2003; Kimes, 1997; Orkin, 1988;).

However, despite the assurances offered by unemotional decision processes, the diffuse yield management decision environment is complicated by human factors associated with the seductive influences of heuristics and biases. Helliar, Power and Sinclair (2005); in agreeing with Herbig, Milewicz and Golden (1993), argue that pressures associated with forecasting may lead to practitioners becoming vulnerable to subjective biases and fears that negatively impact on the accuracy of the forecast, and suggest that Baysean assignment of judgement probabilities should be utilised to eliminate that pressure.

Specific human idiosyncrasies that influence decision behaviour within the yield management process are outlined by Yeoman and Ingold (2000). Examples of these idiosyncrasies include; ethical concerns about overbooking (concern for the customer outweighing a requirement for profit maximisation), pressure to achieve budgeted targets, and personal pressures associated with performance-linked incentive payments. This appears to suggest that while the internet has become a preferred booking conduit for many travellers, it may be perceived as a poisoned chalice for the incentivised decision-maker. Indeed, despite recent research suggesting that transferring a substantial amount of room booking activity to the internet will guarantee significant competitive advantage and generate higher revenues (Marmorstein, Rossomme, and Sarel, 2003; Noone and Andrews, 1999), the majority of hotels have not attempted to sophisticate their yield management techniques. Instead they have resorted to indiscriminate price structuring, based on simplistic timing rules that avoid communication and data analysis**.** This reluctance to embrace internet technology has been identified by Yeoman and Ingold (2000), who hypothesize that many hotels still input information based on historical demand associated with particular customer market segments, attributable to specific times of the year, rather than using a dynamic pricing strategy, such as that offered by a computerised yield management system.

Other human idiosyncrasies, namely, the avoidance of internal conflict, through the individual's need to satisfy the group decision goal and career promotion issues, may also influence decision behaviour. Additionally, a greater weighting being given to

qualitative thinking over quantitative thinking may impact on the eventual decision outcome, through the promotion of solutions that are made to appear "acceptable" via practitioner value biases and delusions of success (Shefrin 2007; Helliar, Power and Sinclair, 2005; Sloman, 2002; Tversky, Sattath and Slovic, 1988).

So, where the option exists to use cold logic in formulating the yield management decision, or to follow heuristical pathways, which one wins? In the process of decision-making, a tension can exist between immediate intuition and a more measured rational belief. This tension is often exemplified by an evaluative or non evaluative comparison between emotion laden heuristics on the one hand, and a coherent justifiable set of data or beliefs on the other. Within this tension, decision-makers can be torn between decisions that they personally resonate towards (associative thinking), and decisions that they find analytically more accurate (rule based thinking). Sloman (2002) argues that parallel processing of information through diffuse associative links (intuitive bias, regulated by associonistic or unconscious forces), where appropriate information is rejected or ignored, often conflicts with deliberate and sequential manipulation of internal representations, through a rule governed system (conscious computer logic), thus making decisions more difficult for the decision maker.

Zajonc and Markus (1982) conclude that in situations that involve uncertainty or ambiguity, one information format normally attains a higher value leading it to carry a greater weighting in many judgement tasks. This heuristical factor may have significant relevance in hotel yield management, where decisions are often based on numerical projections and forecasts, thus creating the possibility that decision makers may give a greater weighting or trust to specific data in order to justify their decision, or become blinded by the "halo effect" of leadership and past successes or failures when it comes to team support for particular decisions.

Conversely, rule based systems (if-then scenarios) create a large set of propositions in which rule based language is encoded into a signifier and signified model of operation that gives decision-making a logical structure. Here, the "correct" application of the rules is determined by the relations among symbols, rather than through any meaning that we attribute to the symbols (Sloman, 2002).

Evans and Over (1996) suggest that these two systems of thinking are driven by different forms of rationality. Associative behaviour is concerned with the achievement of one's goals, whereas rule-based behaviour connects with ensuring that one's conclusions are sanctioned by a normative theory. Sloman (2002) argues that when a response is produced by an associative system, we are conscious only of the result of the computation and not the process, (indicating the presence of unconscious or automatic behaviour), whereas we are aware of both the result and the process in a rule-based computation (Sloman 2002). Sloman proposes that in situations where computer data gives an alternative and more justifiable solution to an initial intuitive feeling, individuals may chose to reject the computer solution because they are fed up with being dictated to (rule aversion behaviour).

The conundrum, therefore, faced by hotels is how to maximise revenue while at the same time offering a product, which is competitively priced and satisfies price-sensitive customers. If, as suggested, revenue maximisation is a key success factor for a hotel, it would appear that optimised revenue management decisions, capable of being made in a rational-normative way by the use of technology assisted rule-based systems, would accentuate this requirement. However, in contrasting the power of decisions that are intuitively compelling against those that are probabilistically correct, Tversky and Kahnemen's Conjunction Fallacy Theory (1983) argues strongly that judgment related to "similarity" and "representitiveness" is stronger than logical argument, strongly linking it with the compulsive behaviour argument proposed by Arnaud (2002), and the Inclusion Fallacy Theory proposed by Osherson, Smith, Wilkie, Lopez and Shafir (1990), which propose that compelling logical arguments often fail to erase an even more compelling intuition.

The Management Science Model of Decision Making

The management science model of decision-making is closely aligned with the rational/normative model of decision-making and incorporates the additional capability

of speedily and accurately solving problems that have too many explicit variables for human processing (Burgess and Bryant, 2001; Rosenfeld and Wilson, 1999; Kimes, 1989). As yield management is predicated on large volumes of programmed decisions taken in an environment of temporal uncertainty, and is further complicated by attempts to correlate price setting, room capacity management and market segmentation, (Yeoman and Ingold, 2000), the management science decision model may offer the perfect solution to revenue optimisation.

As the inherent mathematical algorithm in the management science model may contain many variables, each one relevant in some way to the ultimate outcome, this process is viewed by Rosenfeld and Wilson (1999), as encoding arguments and rationalisations in a very precise and predictable form, usually through a set of sequential decision steps. This suggests that the management science decision model, in utilising statistical analysis from multiple relevant data reports, will either make the decision (a dynamic model), or alternatively offer the best option for selection by the decision maker (a semi-static decision support model).

Ongoing advances in computing capabilities have further extended the potential capabilities of the management science toolkit (Bohan and Dillane, 2001; Burgess and Bryant; 2001; Clark and Scott, 1999), by minimising the risk involved in successfully forecasting "probability". The real value of the management science model, therefore, lies in its ability to extract decision pathways from a maze of uncertainty that is increasingly being attributed to information overload, while facilitating objective, cost-benefit analysis of suggested options. This suggests that the availability of user friendly technology should have propelled decision-making from an intuitive model, with a greater emphasis on human intervention (Gore 1995), to a more rational model that improves decision making effectiveness through the elimination of guesswork (Marakas 2003).

In advancing the case for management science solutions to problems of forecasting, Wright (2000) illustrates how quickly scenarios can change, evidenced by the growing requirement for customer relationship management. Here, the pull coming from ever

demanding and proactive customers, and the push from increasingly sophisticated technology coupled with increasing globalisation, make predictable futures more and more unlikely, thus forcing organisations to gather and process increasing amounts of customer data within narrower market segments.

Moreover, while accurate forecasting enhances an organisation's performance, inaccurate forecasting can seriously debilitate an organisation wherein practitioner bias may become a factor impacting negatively on the accuracy of forecasts (Shefrin, 2007; Sanchez and Satir, 2005; Herbig et al, 1993). Here, it is argued, that the use of management science techniques that include scenario analysis, and the interpretation and assignment of judgement probabilities, would constitute an effective tool in counterbalancing the negative effects of bias and elaborate rationalisations that are often embedded in forecasting. In supporting this viewpoint, Wisniewski (1997) proposes that information overload, caused by a combination of the increasing pace of competition and continual improvements in telecommunications, strains the information capacity of managers, and ultimately diminishes their ability to assess, analyse or react to problems or opportunities.

Applications of technology assisted decision evolution are common in research literature. Lewis and Shoemaker (1997) suggest that technology systems have addressed the issue of consumer price sensitivity, thus removing the uncertainty of gut feeling or trial and error from the decision process. While modern software packages greatly improve capacity management decisions through negating the tendency to disregard information which may be critical to the decision-making process (Orkin 1998).
However, research also illustrates that there are potential downsides to the use of information technology as a decision-making tool. Donaghy, McMahon-Beattie and McDowell (1997) suggest that the hospitality industry has been slow to adapt, citing the unavailability of integrated software and the requirement for "multiple technologies" as creating a bias against using technology. In addition, the perception of a "loss of control" is identified by Carroll and Siguaw (2003) as militating against the acceptance of technology in the decision-making process. The authors argue that the global shift to

increased numbers of distribution channels, with their complex interconnectivities, can create the feeling of a loss of control on the part of the decision maker and that this in turn creates a mental block against utilising the technology in the decision process.

An alternative view, argued by Davis and Olsen (1985), proposes that although structured programmable decisions can be completely automated, provided the requisite information to apply the decision rule is available, human review is generally considered necessary. This decision mindset is supported by Colville and McCauley (1996), who posit the case for "ontological security", (a need to "believe in the data"), in decisions relating to financial risk and uncertainty. The above divergence of opinion immediately suggests a conflict between the desire to optimise decisions and the degree of trust in systems that can execute these decisions.

Furthermore, Glazer (1992) argues strongly that the mere presence of additional information may have dysfunctional consequences, even where decision makers process the information correctly. This "local rationality" phenomenon suggests that although decision makers may focus on "chunks of information" that assist in the delivery of a pattern recognised decision, the presence of "additional information" will have a seductive or distracting effect, leading managers to consider alternative decision-making components. This practice ultimately results in poorer decisions if these additional components are not those most closely related to success.

Heuristics and Biases

Heuristics are generally defined as pattern recognitions or rules of thumb that become useful and effective when providing hard-pressed managers with simple ways of dealing with complex decisions (Tversky and Kahneman 1973, 1974). However, despite their efficacy, a key drawback of their usage involves individuals being frequently unaware that they are dependent on them.

This dependence links the perceived benefits of heuristic usage to the potentially destructive forces of bias, and may in turn result in decision makers making systematically biased errors, where human actions in serving egotistical ends enable

rational choice to fall prey to an individualistic bias (Shefrin, 2007; Bazerman, 2004; Wrong, 1994).

Furthermore, an inability or unwillingness to learn from mistakes can seduce the decision maker into psychological traps. This behavioural trait promotes repetitious behaviour by limiting the search for solutions and consolidates an already existing fear of moving away from the tangible, to the unknown (Nutt 2002). What makes these traps so dangerous is their "invisibility." Within this "invisibility" behavioural catalysts force decision makers to take a defensive posture by collecting information that "justifies" the decision that they have already taken (McKenna and Martin-Smith, 2005; Hammond, Keeney, and Raiffa 1999). What makes Tversky and Kahneman's (1973, 1974) theories significant and radical is that they apply human behaviour in the guise of heuristics and biases to judgement and decision-making under conditions of uncertainty. Their work skilfully integrates the causal relationships between statistical prediction, subjective probability and both the positive and negative significance of rules of thumb in decision-making.

In their seminal paper on Prospect Theory (1979), Kahneman and Tversky's findings counter traditional assumptions of economic theory. Their theory proposes that ordinary people make rational choices based on individual self-interest, evidenced when they frequently fail to fully analyse situations in which they must make complex judgements. Thus, rather than economists making their decisions in a logical, unemotional manner, the authors found that decisions were often based on factors such as "fairness," "vividness of past events," how the problem was "numerically framed" or the individual's "aversion to loss." These behavioural influences on the decision process have been more recently cited (Shefrin, 2007; Carberry and Garavan, 2003; Colville and McAulay,1996), as factors relevant to the possible sub-optimisation of revenue generation.

Judgemental heuristics have traditionally been classified under three main headings, namely, the availability heuristic, the anchoring and adjustment heuristic and the representativeness heuristic (Tversky and Kahneman, 1973, 1974). More recent

research into heuristics and biases (Rozin and Nemeroff, 2002; Sloman, 2002; Slovic, Finnucane, Peters and MacGregor, 2002), has focussed on the influence of "emotion," "feelings" and "automaticity" on the decision process.

The availability heuristic depicts the tendency to judge the likelihood of an occurrence on the basis of the extent to which other like instances or occurrences can be recalled (Shefrin, 2007; Bartol and Martin, 1998). As a result, decision makers when experiencing "difficulty" in extracting diagnostic information from the signs and signals attracting their attention, become prone to using information that is both vivid and readily available, while overlooking information that may be more diagnostic (Nutt, 2002). Tversky and Kahneman (1973) propose that decision makers often assess the frequency, probability or likely causes of an event by the degree to which instances or occurrences of that event are already "available" in the memory.

While this "vividness" can make the availability heuristic a valuable tool in yield management decision-making, it can also be fallible, through being affected by factors unrelated to the objective frequency of the judged event, such as when the mind subconsciously blocks out undesired information which is "vivid" for all the wrong reasons (Hellier, Power and Sinclair, 2005; Bazerman, 2004; Plous, 1993). Such salient factors, according to Kahneman, Slovic and Tversky (2001), suggest that personal experience of the success or failure of a decision is a significant element of the decision-making process.

The anchoring and adjustment heuristic proposes that decision makers make assessments by starting from an initial value and subsequently adjusting this value to yield a final decision. This can lead to decision makers being drawn to available information due to a combination of the "anchoring" of personal experience and selective perception of solutions (Hellier, Power and Sinclair, 2005; Bazerman, 2004; Plous, 1993). Here, a common anchor impacting on forecasters is the record of past events or trends, where according to Yeoman et al (2000), experienced yield managers when giving their opinions on a forecasting option, can construct consequential anchoring of the opinions of other members of the yield management team. Anchoring, therefore, may prejudice

thinking in that it inhibits the making of objective revenue maximising decisions. The anchoring trap permits this through an over reliance on one's first thoughts, which subsequently establish the terms on which a decision will be made.

The representativeness heuristic is associated with a tendency to be overly influenced by stereotypes in making judgements about the likelihood of occurrences (Shefrin, 2007; Bartol and Martin, 1998). In this decision environment, making a judgement is based on initial "gut feelings or traits" that correspond with previously formed stereotypes. Bazerman (2004) argues that judgemental deficiencies arise where individuals tend to rely on such strategies, in the absence of sufficient information, or when better information that would lead to more accurate decisions exists, but is ignored.

However, the representativeness heuristic can alternatively lead to irrational behaviour. The "status quo" trap suggests that decision makers display a strong bias towards alternatives that perpetuate the current situation (Hammond, Keeney and Raiffa, 1999). The authors suggest that this pull of the status quo becomes even stronger when there are several alternatives, and that decision behaviour in such instances may be associated with subconscious impacts, including the search for the comfort zone of familiarity, resulting from information overload.

Representativeness, in the form of the "evidence trap," also leads decision makers to seek out information that confirms their instinct or point of view, while avoiding information that contradicts it. Hammond et al (1999) suggest that there are two fundamental psychological forces at work here. Firstly, our tendency to decide what we want to do before we figure out why we want to do it, and secondly, our tendency to be more engaged by things we like than by things we dislike. This leads the decision maker to be drawn to information that confirms their subconscious leanings (Slovic, Finnucane, Peters and MacGregor, 2002).

The Influence of Emotion, Feelings and Automaticity

More recent research into the relationships between heuristics and biases focus on the influence of emotion, feelings and automatacity on the decision-making process. Sympathetic Magical Theory (Rozin and Nemeroff 2002), involves a set of biases that

place a significant emphasis on the individual's own perception of what is real for them. This decision bias fundamentally highlights the contrast between an initial reflexive evaluation, strongly associated with feelings, and a more considered rational assessment. What is really interesting here, is that decision makers are either aware, or can be made aware, of the irrational aspects of these biases, but chose to ignore them. Individuals, therefore, become prone to rationalising the irrational, through a conscious contradiction of empirical data. This preference for the irrational state is guided and controlled by the power of feeling, in which their interaction with logical or rational reason is evidence of a conscious state being used to validate or rationalise a subconscious state.

Similarly, the affect heuristic (Slovic et al 2002) suggests that "feelings" encapsulated in a sense of "goodness or "badness," that equate with the positive or negative quality of a stimulus, can significantly drive judgement and decision-making, where avoidance of actions that feel harmful or negative is a very powerful influence on decision-making (Johnson, 2004). In a similar context, Simon (1987) argues that the intuition of the emotion driven manager is very different from the intuition of the expert, the latter's behaviour being the product of learning and experience, the former's being more influenced by primitive urges.

The affect heuristic also impacts on the perception of risk. Alhakami and Slovic (1994) illustrate how risk and benefit are negatively correlated. Their research suggests that if decision makers "like" a decision strategy, they are likely to judge the risks as being low and the benefits as being high. However, if they "dislike" it, they tend to judge the opposite, (high risk and low benefit). Within yield management, this would impact on the preference for human intervention in decision-making (low risk, high benefit), as against the use of technology in decision-making (high risk, lower benefit). Agreement with this theory is found in Finnucane et al (2000), who demonstrate that where time pressure reduces the opportunity for analytic deliberation, the inverse relationship between perceived risks and benefits increased greatly.

Within a team environment, emotional factors, such as the "framing" of the yield management problem and "misuse of analogy" may also contribute to the biasing of decisions. Hotel yield managers are often vulnerable to a framing effect when their decisions are influenced by the manner in which the setting for the decision task is framed. Indeed, making a comparison with the "known," or forcefully indicating one's prior experience of the problem, often helps to remove the ambiguity of choice in the minds of the decision team members creating a comforting calm in the process (Brindle 1999).

However, despite this positive intent, endeavouring to deflect attention from the decision to be taken can cause the process to go astray when issues of problem framing through misuse of analogy shape matters. Brindle (1999) illustrates this well when describing how suggestions are sometimes categorised as being "like a previous idea that failed," or "that definitely worked before." This categorisation has a substantial influence on decision makers through associated emotional contexts. These emotional contexts again correspond with the laws of sympathetic magic (Rozin et al 2002), and Lacan's identification of language as being an unconscious signifier of intent (Arnaud 2002)

Problem framing through misuse of analogy is closely linked with over-confidence in decision-making, typically where uncertainty is a critical component of the decision-making process. Lovallo and Kahneman (2003) suggest that decision failure is best explained, not as a result of rational choices gone wrong, but more likely as a consequence of flawed decisions due to delusional optimism.

To achieve a desired outcome, rationalisation of the decision choice is often achieved through the spinning of scenarios of success, while overlooking potential for mistakes and miscalculations. This over-optimism is caused by the tendency of individuals to over-exaggerate their own talent, which is then amplified by a tendency to misperceive the cause of certain events, i.e. taking personal credit for successes while attributing negative outcomes to external factors (Shefrin 2007). Indeed, where the pursuit of economic goals becomes an organisational aim in itself, organisational narrative and myth goes beyond being a sense making tool, providing members instead with an

emotional outlet, where fantasy prevails over reality and where spontaneous activity temporarily replaces regimentation (Gabriel 1991).

So do yield management decision-makers gravitate towards technology based mathematical models, or do they fall prey to urges and comfort zones facilitated by heuristics and biases? The growing justification for an unquestioned acceptance of the mathematical management science rational model of decision-making is finely counterbalanced by impeding factors that militate against its acceptance. Accordingly, in a market environment imbued with uncertainty, where profit maximisation has become increasingly significant, it is interesting to speculate if hotels have embraced mathematical models of decision-making in the search for optimum revenue management solutions.

Methodology

Fifteen Dublin hotels offered to participate in the research. Each of the hotels was independently graded as a four or five star hotel and had access to technology for assisting with, or making booking decisions. Phenomenological interviews were carried out in all sites, typically lasting one hour. Observation as a participant took place in three of the hotels. All other hotels declined the request for participant observation.

Methodologically, the author stands firmly within the interpretivist perspective (Burrell and Morgan 2000) where knowledge is seen as an emergent social process, and where understanding and explanation of the phenomenon of interest, comes through the language of the respondent. The research asks if extenuating forces impact on the yield management decision-making process. Therefore, it is not simply a case of the respondent describing how decisions should be made, but rather, how they feel that these decisions should be made.

The specific methodological approach chosen employed a combination of phenomenology (Polkinghorne, 1999) and hermeneutic enquiry to access both the

conscious and subconscious elements of the research. While broadly speaking phenomenology is associated with the conscious state, due to its focus on intentionality, hermeneutic inquiry is more appropriate in accessing the subjectivist state of the subconscious.

It was, therefore, felt that use of phenomenological approaches would be effective in understanding if individuals consciously construct the decision environment to satisfy and placate their own subconscious urges. Hermeneutics was considered as being additionally useful in collecting data that observes the underlying causes of behaviour in relation to the interviewees' decision processes, thus making it a useful method of accessing both conscious and subconscious behaviour (Nakkula and Ravitch 1998).

Findings and Conclusions

The purpose of this research was to establish if decision-making in the yield management environment of Dublin hotels utilises a rational approach to decision making, or if heuristics and biasing factors significantly influence the decision-making process. While acknowledging that there were some findings that were site specific, this paper will address two broad overarching findings that were common within participating hotels.

The first overarching finding indicated a strong preference for greater "human involvement" in the yield management decision-making process. This articulated preference was particularly evident when managers discussed relationships with linked variables, such as, information technology usage, data overload, decision autonomy and the requirement to evaluate data. The data used to make decisions was invariably historical and was generally speaking, internally generated. However, although there was a reluctance to engage in the process of verification, respondents were quick to indicate that they trusted the data that they chose to use, even though it was not validated. This was evidenced by managers selecting specific data in order to justify their decision preference, thus corresponding with Yeoman et al (2000) who argue that

for the rational model to be successful, perfect knowledge of the alternatives needs to exist. It also suggests that through the need for ontological security, decision makers are being driven into the evidence trap (Hammond et al, 1999; Colville et al, 1996).

Data overload, in the opinion of a majority of respondents, impacted on the process of making decisions, also leading them to engage in the selection of particular data sets to suit the required decision. These findings agree with Wisniewski's (1997) contention that information overload ultimately diminishes the ability of the decision maker to analyse or react to a problem or an opportunity. It also aligns with both Bazerman's (2004) contention, that the availability of vivid information may cause the mind to subconsciously block out undesired information, and with the affect heuristic (Slovic 2002), which argues that personal experience of the success or failure of a decision is deemed critical factor in the decision process.

The greater weighting towards the individual's involvement in the decision-making process also broadly corresponded with a strongly expressed desire for decision autonomy and a distinct preference for decentralised decision-making over centralised decision-making, due in part to a belief that local knowledge lay within the gift of the local manager. Thus, the management science model was not considered as being appropriate to decision making by a majority the respondents.

Although there was an acute awareness among the majority of managers interviewed, that technology could facilitate the making of decisions, the same respondents chose to ignore this for a number of reasons, particularly, a fear of losing control within their decision environment, and thereby, the likelihood of personal recognition. This finding corresponds with the phenomenon identified by Carroll & Siguaw (2003), who argue that the global shift to increased numbers of distribution channels, with their complex interconnectivities, can create the feeling of a loss of control on the part of the decision maker, and this in turn creates a mental block against utilising the technology.

The prospect of human oriented decision-making being replaced by a technology system also resulted in a tendency to question trust in technology outputs. Indeed, an overall unwillingness or inability to trust technology in decision-making emerged as a universal theme. Evidence of this mistrust ranged from either viewing systems as a waste of money, arguing that information received was only as good as what was inputted, to a mistrust of internet-based decision systems due to the framing bias associated with articulating both primary and secondary sourced evidence of systems failing to deliver verifiable information in "other" hotels.

With regard to the application of the rational model of decision making, the findings suggest that systematic analysis and objective evaluation of a complete suite of options did not occur. Neither did a cost-benefit analysis of the chosen options occur through the evaluation of the relationship between the chosen data and the resultant outcome. The findings thus correspond with those of Yeoman et al (2000), who argue that a cost benefit analysis of all available options is greatly facilitated by adapting the management science model of decision making. The findings also correspond with those of Gore (1995), who posits that internal political factors and time pressures may mitigate against the acceptance and appropriateness of the rational/normative model of decision making.

However, while some managers, in advocating the need for human intervention, described rational decision making as "cold and unfeeling," others referred to the necessity to feel good about a decision. This finding corresponds with the "feeling factors", characteristic of the affect heuristic (Slovic et al, 2002) and the imputation of a negative evaluation to negative feelings as proposed in magical theory (Rozin et al, 2002). This strong disposition towards human input correlated directly with the lack of support for the management science decision-making model, epitomised in a constant and often irrational downplay of the role of information technology in optimising the decision-making process, despite a parallel acknowledgement of the benefits and superior processing power of available information systems (Rozin and Nemeroff, 2002)

The apparent rejection of rational decision making may additionally be attributable to unconscious factors such as use or misuse of analogy (Brindle, 1999), wherein a concerted dismissal of the rational model of decision making, particularly the management science model, appears to have infiltrated the mindset of the respondents and possibly influenced the hotel's approach to the use of technology based decision models.

Coincidentally, the second overarching finding was also related to a preference for greater human involvement in the yield or revenue management decision-making process. However, this "preference" was often articulated through personalised psychodynamic biases such as a need for applause, a need for role recognition and a desire for self-aggrandisement on the part of the decision maker. The findings here suggest that individual feelings or emotions, both positive and negative, do indeed influence the revenue management decision process. Factors associated with a positively or negatively disposed feeling towards the decision taken, and their corresponding associations with heuristics and related biases, evidenced through a need for the comfort of familiarity, or indeed "overconfidence", "fear" and "anxiety" were evident in a number of the responses.

A general consensus was that yield managers are conscious of this fact in that they use rules of thumb to improve the quality of the decision taken. Pattern recognition, in terms of previously experienced situations, and the vividness of those experiences and associated data, were seen as positive influences on the decision process. However, these experiential factors were advocated as support for a greater weighting on human intervention, indicating use of both representativeness and anchoring and adjustment heuristics, through satisficing, or the provision of "good enough" solutions to revenue maximisation problems.

Equally, the time at which a decision needed to be taken and the level of pressure on the decision maker at that time were significant determinants of the strategy employed in making that decision. While the decision environment was amiably described as

“chaotic”, a number of the respondents felt “a sense of enjoyment” in utilising their gut feeling to find an acceptable solution to problems of pricing and revenue maximisation. However, these findings also concur with Nutt (2002), suggesting that time pressure on the decision maker resulted in limiting the search for remedies, thus consolidating a fear articulated through respondents moving away from the tangible to the unknown.

In addition, here was strong evidence of decisions being based on gut feeling that corresponded with previously formed stereotypes, thus aligning it with the comfort factor associated with reliance on historical data. This previous experience was used in some cases as an analogy to justify decision behaviour. Again, this over-dependence on previous experience appeared to make decision makers give disproportionate weight to the information available. The findings concur with Bazerman (2004) who argues that judgemental deficiencies arise where individuals tend to rely on such strategies in the absence of sufficient information, or when better information that would lead to more accurate decisions exist but is ignored.

The need for applause and role recognition, as a theme was widely evident, where respondents expressed the need to be well thought of. This highly personalised response was associated through a form of overconfidence playing its own part in the decision making process. This corresponded with an individualistic approach to decision making, where some respondents formulated decisions in terms of how they would be viewed, prior to attending a yield management meeting. Indeed widespread evidence was apparent of respondents preferring autonomy in the decision making process. This suggests that the referring to a “team approach” to decision-making is a front for the subliminal need for individual power roles in the decision-making process.

Evidence was also apparent wherein respondents rationalised their behaviour through the bypassing of organisational rules, agreeing with Slovic (2002) who suggests that individuals perceive rules as being either unfair or leading to unnecessary additional work being required. In fact, the practice of keeping “rooms up sleeves” enabled one participant to justify their actions by constructing and justifying outcomes as being

better for the hotel, while openly stating that the real reason for this practice was related their own "satisfaction and pride". These "better outcomes" were rationalised while the respondent simultaneously downplayed the potential outcomes if the required organisational protocols were followed.

The overall research conclusion is that within Dublin hotels, the management science model of decision-making has been sidelined in favour of a decision-making approach that emphasises human intervention. However, what is particularly significant is that those interviewed believed that technology assisted models were indeed appropriate to the delivery of optimum revenue generating solutions due to their greater computing ability, but were not willing to consider a move towards information technology systems making, or supporting the actual decision. As such, the influence of bias and heuristics significantly impacted on the consensus to reject an expanded use of the management science model. Furthermore, these factors were internally rationalised, thus becoming conscious and, therefore, real for those interviewed.

The availability to Dublin hotels of the management science model, overlaid with individual yield manager's inability and unwillingness to evaluate all available data, provided a perfect cover for rejecting the rational model of decision-making, while simultaneously providing space for advocating a disproportionate preference for human influence in the decision-making process, thus suggesting that associonistic behaviour is more significant for, and relevant to these yield or revenue management decision makers, than is rule based behaviour.

As an evaluation of the outcomes of yield or revenue management decisions taken in the research sites was not carried out within this research, the determination of whether or not systematically biased mistakes were inherent was not possible. However, broad evidence of respondents not being willing to validate or evaluate data would indicate the possibility of these systemically biased errors being inherent in the process.

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