

The Role of the Expert's Decision Making Skills in Management.

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Abstract

Experts, such as scientists, teachers, and engineers for example, bring to management positions a strong personal background of training and experience that is often lacking in specific management expertise, yet they are apparently successful in their new roles. Are the decision making skills that are developed during the acquisition of their expertise the key to their success? The discussion will focus on the decision making processes developed by experts in their field of expertise, and consider their utility in management. We will discuss some recent observations of experts who are working as managers.

1 Introduction

Experts have been studied in detail by academics, and managers have also received considerable attention, but little has been said about experts as managers. The label 'expert' has been well defined by many authors as people who, through training and extensive experience in a particular field of expertise, have achieved a level of performance that is recognised by their peers as that of an expert [14,21,13]. Many experts are attracted to management positions that require numerous decisions in areas outside the expert's field of expertise.

Experts, such as scientists, teachers, and engineers for example, bring to management positions a strong personal background of training and experience that is often lacking in specific management expertise, yet they are apparently successful in their new roles. Are the decision making skills that are developed during the acquisition of their expertise an important component of their success?

This paper considers the decision making skills of experts, and discusses the role of the expert's decision making skills in management. It also presents some empirical evidence from our on going research of expert's decision making processes.

2 Experts

2.1 Experts defined

The Latin word *expertus*, from which the word 'expert' is derived, referred to a person known by experience. Contemporary dictionary definitions of an 'expert', include a requirement to possess special skill or knowledge [5]. Therefore, in general terms an expert is a person who has experience, and also possesses special skill or knowledge related to a particular task. From this definition, we can see why non-experts turn to an expert, when looking for the best solutions to problems. Perhaps a bona fide expert

could be better described as a person who can consistently exceed the performance of non-experts.

In common usage the word expert is a loose description of a subset of our society. At one extreme the subset contains people who know enough about a subject to impress other less informed people who view them as 'expert', although these 'experts' do not meet the criteria stated above. And at the other extreme there are 'expert' experts, who know more about a subject than anyone, including other experts. This subset of our society contains a wide range of people, who for various reasons are accepted by our society to be expert.

Academic research requires a more rigorous definition to constrain its study of experts. Leading academics in the field accept that an expert is a person who is highly trained in a particular field of expertise and has demonstrated an acceptable level of competence within that field to their peers, usually demonstrated by the achievement of academic or professional qualifications [14,21].

2.2 Why study experts?

When we require the services of an accountant, an architect or an engineer we expect that person to be an expert in their field. They need not necessarily be the best in their field, but certainly capable of excellent performance within the field. Anything less calls into question the person's right to practice in their specialisation. We place this condition on the performance of any person that we turn to as an expert in their field.

Our society is highly dependent on the expertise that experts provide, and because our society relies on experts as it does, they are an interesting research topic [18]. Experts are a unique population of reliable, consistent, accurate decision makers, which makes them worthy of study. There are, as always, some caveats to this claim, because experts do not always live up to our expectations [4] although in many cases the fault is not with the expert and can be traced to inappropriate testing. As Camerer and Johnson [2] state, "experts fail when their cognitive abilities are badly matched to environmental demands".

When experts are studied, we are generally attempting to observe their actions within a defined field, known as their field, or domain, of expertise. We are actually attempting to observe experts demonstrating their expertise. It is the possession of expertise that defines people as an experts, and it is their expertise that we need to study to be informed about experts decision making processes.

2.3. Observing experts

Experts can be observed in any human endeavour. This special capacity, to be an expert, has received substantial academic attention, from which many explanations of expert performance have emerged. However, there is no conclusive explanation for expert performance.

The first, and most substantial, body of literature to discuss expert performance centres around the game of chess [23], which has a well defined hierarchy of ability that allows easy identification of experts. Additionally, the highly structured and confined nature of the game constrains players to their domain of expertise. The structure also allows easy access to the observable components of decisions. Furthermore, chess players are readily able to explain their conscious deliberations, apparently without compromising their performance [11].

From this almost idyllic research environment have come hypotheses on the nature of the expert phenomenon which counter earlier conceptions of expert creation.

Of particular significance here is the rejection of innate ability or talent, and an assumption that persistent practice will lead to expert performance. Furthermore, it is now accepted that it is persistent and specific practice over an extended period of approximately ten years that leads to superior performance [10].

3. Decision making by experts.

Is decision making by experts, expert decision making? Intuitively the answer to this conundrum is yes. If experts make decisions relating to some topic within the field of their expertise, using intrinsic expertise, then it seems reasonable to expect at least a very good decision. In support of this assumption there are many opinions indicating that decision making by experts is expert decision making [7,12,14,22]. However, some doubt remains. There are contrary reports suggesting that decision making by experts is no better than chance [18].

3.1 Studies of experts.

Many studies, going back to Hughes' report of 1917 on grain judges, have not been true studies of expertise. The people accepted as experts for the purpose of these studies would not now be acceptable. They qualified as experts by virtue of experience and / or peer identification with no apparent measure of skill or qualification, an essential component of contemporary definition.

Reliability and validity of expert judgement have been examined in the performance of bona fide experts working in many different roles. Three examples are often quoted; the study of parole decision makers by Carroll et al. [3], the study of court judges by Ebbesen & Kone ni [6], and the study of pathologists by Einhorn [8].

Parole interviewers' predictions, in their domain of expertise, were found to be consistent and fundamentally accurate. The processes followed were consistent, and decisions made were good, within the constraints of a parole system that ensured bad outcomes by requiring a flawed weighting system to be used in the decision making process. As a result of this study by Carroll et al. [8], the Parole Board changed the criteria for parole decision assessment so that the experts' assessment of the parolees prospects, on release from custody, would be better reflected in the decisions taken.

Court judges were found to be consistent in their decision making. Ebbesen and Kone ni [6], presented the results of two experiments which demonstrated that judges gave different weighting to information when forming a judgement in a laboratory situation as opposed to the court room. This is a clear demonstration of experts requiring environmental cues on which to base their judgement; in this case other court personnel. However, within each of the experimental situations Ebbesen and Kone ni found that the judges were consistent. The authors emphasise the importance of recognising that controlled laboratory experiments may not have generality to naturalistic settings.

Pathologists' decision making processes were found to be constant and reliable by Einhorn [8]. He reported that the consistency of judgement by individual medical experts was reliable and valid, although he found an absence of agreement between the experts. Einhorn concluded that although agreement is desirable it is not a necessary determinant of expertise, and that it is often the disagreement and subsequent argument that leads to new knowledge.

3.2 Experts are different

There are differences between expert and novice decision making that become clear when the two are observed working on the same problem. For example experts, having developed the ability to identify the appropriate path to a solution, process available information in a non-goal specific manner, as they work toward the goal [1]. In contrast, novices tend to be goal specific, and work backwards from the goal in their search for a solution, as do researchers when attempting to explain an outcome [22].

The two distinct problem solving methods mentioned, tend to be mutually exclusive. Experts, with a history of problem solving to call on, will tend to be “mechanistic” in their approach to a solution. They will work through the established procedures that make up their expertise which may be technically less efficient than goal specific solutions, but they will be quicker and more accurate because of their expertise. In contrast, working backwards, known as means - ends problem solving, is problem specific and does not build experience in general problem solving. The method prevents the development of a history of problem types by decision makers, but it does ensure that they will attempt to reach a solution in the most direct way possible [1].

Working towards the problem allows the expert to identify and match problems and solutions for future use, but it does tend to lock the expert into “tried and trusted methods” when new, possibly quicker, or better solutions become available. Baron [1] suggests that this may be the cost of expertise. Working backwards may be a better method for solving new problems, but the knowledge gained does not readily transfer to the non-goal specific mode of problem solving which is demonstrably more versatile. This feature of expertise is particularly interesting because it unexpectedly, but clearly, demonstrates that the expert uses generalities to work towards the resolution of problems within their specialisation, not specific solutions unique to the problem faced. In contrast the non-expert tries to use problem specific solutions because they do not have the non-specific information that is available to the expert.

Therefore, as the research shows, experts possess more appropriate decision making skills and knowledge than novices, and this enables the expert to produce better processed decisions. Experts may focus on different information and / or use different strategies to perform a task, so experts cannot be thought of as being merely faster and more efficient than novices. Expert performance is more than faster, and more efficient, than novice performance, it is different. As their expertise has developed the expert’s decision making skills have evolved to use a different methodology [14,22,10].

3.2 Intuitive judgement

There is general acceptance that many decisions are intuitive; that is to say that decision makers rely on their own judgement without reference to established decision making processes. Experts, in acquiring their expertise can be expected to develop an ability to apply their knowledge intuitively; they will rely on their own judgement without reference to decision making aids. Intuitive decisions, based on expertise and extensive passed experience, frequently produce exceptional results, although disastrous results are not uncommon [21,24].

Expert intuitive judgement may be a combination of heuristics, weighting, and other analytical methods that have become sufficiently incorporated into the expert’s decision making processes that they appear to be intuitive. [14,22]. This ‘automated expertise’ [22,19] would enable the expert to make decisions that are apparently intuitive, because the complex decision making processes that the non-expert would refer to, have become part of the normal thinking process for the expert. Furthermore, because the expert is conversant with a diverse range of decision making skills, and

applies them appropriately through intuition, their expert intuitive judgement can actually be superior to their formal analytical analysis. This facility enables an expert to anticipate formal calculations and to accept or reject them on the basis of their intuitive judgement [14,22].

Intuitive decisions are quick and simple, but two flaws are commonly identified in intuitive decision making. Random inconsistencies and systematic distortion can be present in decisions that are based on personal judgement, whether they are made by an expert or a non-expert [19].

Random inconsistencies take place when the decision maker is required to use personal judgement without a properly defined benchmark. The decision maker may reach different conclusions when presented with the same problem at different times due to external influences. There are many examples cited in the medical field, although the phenomenon is evident in all decision situations. As an example consider the situation when a person receives medical diagnosis, then later asks for a review of the diagnosis. It is not uncommon for the second diagnosis to be different from the first. The variation in diagnosis is not usually attributable to lack of knowledge, particularly if the diagnoses are made by an expert. A possible explanation is the making of relative judgements, i.e. comparing the case with other recent cases at the time of each diagnosis [4,19].

Systematic distortion is a bias within our personal decision making framework. We consciously, or subconsciously, apply a weighting or bias to the information as it is obtained. For example most people accept that 'first impressions count' and therefore try to make a good impression at important first meetings because it can take many subsequent meetings to counter the impression made on the first occasion. Another common example is the tendency to attribute good decision outcomes to the decision maker's personal performance, but attribute bad outcomes to external factors or even 'bad luck' [20,24].

3.3 Predictive ability.

Perhaps it should be noted that there has been some condemnation of expert performance, because it has been shown that unaided expert performance is not always equal to the performance of mathematical models [4]. However, we must remember that mathematical models were developed, by experts, as a tool to enable experts to improve upon their own performance; the fact that they do is to be expected, and should not be seen as a condemnation of expert ability but an affirmation of it.

Sophisticated mathematical tools have been developed to aid probability assessment; they should be superior to unaided judgement, that is their sole purpose for being. Consequently there should be no surprise when mathematical models produce better predictions than unaided experts basing their judgement on intuition. In fact there would be some concern if they did not. The power of mathematical models is derived from their ability to analyse the structure of a problem as a generality, without concern for the content of the problem. Consequently, problems are treated out of context [8]. Unlike the mathematical model, experts are not comfortable with generalities, they are specialists. Experts, because of their intensive training, are tightly focused on the content of the problems they encounter, are critically aware of the particular circumstances and any constraints that are imposed on possible solutions, and as a result view the problem in context.

3.4 Process-performance paradox

If it is accepted that expert performance is constrained by the nature of their expertise, that is by acquired skill and knowledge, plus extensive experience and / or practice in a specified domain. Then it must be also be accepted that performance (or outcome) is not a component of expertise, due to factors outside the control of domain specificity.

In the evaluation of expert judgement, accuracy is not a measure of performance, because actual performance of the expert can only be evaluated by taking the decision criteria and prior probabilities into account [15]. As Lipshitz [16,19,89] suggests, the assessment of experts by outcomes is an interesting subject for research, as it is a widespread but inappropriate form of evaluating decisions and decision making.

To clarify this important point, consider how a person acquires expertise. It is generally accepted that expert performance is established over a lengthy development period [10,22], through the deliberate practice of domain specific functions. There is no evidence that during this period any effort is applied to producing a superior, or even an improved end performance. All effort is applied to the acquisition of an improved ability in the processes that constitute the task, not specific end goals which are often unknown. Take an engineer being trained to build bridges, for example. The engineer will learn about construction techniques, how to calculate loads and stress, and how to assess the requirements for bridge foundations. All of this prepares the engineer to build a bridge. After many years of experience and training the engineer may be accepted as an expert bridge builder, but even to this expert each new bridge is different from the last, and each project can develop influences that are beyond the expert's control. No matter how well the engineer follows the processes of their expertise the outcome is beyond their control.

There appears to be a tacit assumption that deliberate and prolonged practice will lead to an improved performance [9,11] resulting in better outcomes, but no calculated procedure can be followed to ensure success. As a result, the outcome is not part of the expert domain, it is a domain in its self. The outcome results from a combination of environmental consequences including prior probabilities, the decision criteria, influences of events external to the expert's domain of expertise, and the quality of the experts performance [15]. Consequently it is inappropriate to consider the outcome from an expert's performance as representative of their expertise [16].

However, in the process of evaluating the process-performance paradox [2], it has been found that experts have better self-insight, about the accuracy of their predictions, than that of non-experts, and this distinguishes experts from others. This self-insight, known as calibration, is an important component of the consistency of expertise [8].

Previous decision making research indicates that experts perform better than novices. Additionally, experts can perform better than mathematical models in the hands of non-domain experts, if the experts have access to similar models to assist their judgement. Experts can be expected to be familiar with all decision making procedures that are pertinent to their specialisation, and to be capable of applying them appropriately [14,22]. Therefore, decision making by experts, is expert decision making, provided that it is decision making within the expert's domain of expertise.

4. Experts as managers

An expert is potentially excellent management material. An expert can be seen to be a person who combines certain specific characteristics. They will be a people, drawn from a huge pool of differing influences, who possess a proven special skill or knowledge, which has been accepted by their peers as excellent. Additionally experts are able to

detect domain specific cues, possess well calibrated judgement, and have highly developed intuitive decision making skills.

All the evidence suggests that an expert is well equipped for the complex decision making environment that is management. Many experts have demonstrated that this is so. However, as a note of caution it must be remembered that expertise has been shown to be domain specific [13]. The expert who is capable of excellent performance in their field of specialisation, may only be able to perform as an expert in a managerial position that requires the same type of skills. Experts who, as a result of their performance as an expert, are selected to be managers of endeavours outside of their specific domain of expertise risk the consequences of 'The Peter Principle'[18]. However, it appears reasonable to assume that most experts will be sufficiently astute to recognise the boundaries of their own expertise and seek out other experts to provide information on which decisions can be made [22,17].

4.1 Experts in management

We have conducted several case studies in which we have observed and evaluated experts who have become managers. The intent of the studies was to gain an understanding about the role of experts' decision making skills in management. The people involved had a well established expertise in their field. In each case they had more than ten years experience and practice in their field, plus the appropriate academic and professional recognition, and had established themselves as a bona fide expert before taking up a management position. The experts studied are successful in their management positions, which require the management of functions within their domain of expertise. However, the managerial positions also include some functions that are outside the expert's field of expertise.

4.2 Observation and evaluation

The experts were selected on the basis of their established expertise and their current status as managers. When asked to participate in the study each person committed themselves without reservation and participated enthusiastically through many meetings totalling approximately 10 hours each.

In the process of the case studies each expert was interviewed several times. The interviews were based on questions that were prepared when the case study methodology was developed. However, the formal procedure was modified during the interview for two reasons. First if the interviewer was unsure of the meaning of the expert's response, and second if there appeared to be further information to be gained from a reframed version of the question. Consequently, supplemental questions were developed and asked as required. The interviews obtained information on how the experts think they make decisions. This included questions about preferred decision making situations, and least preferred decision making situations, plus information on how the expert dealt with situations outside their expertise. In addition, the experts were observed making decisions during their normal management processes, and people who worked closely with the expert were interviewed. Interviewing the expert provided the initial data to establish an image of the person and their decision making processes. The subsequent observation, and interviews with the expert's associates, gained supporting information for the interview responses.

4.3 Preliminary results

The study is part of a larger piece of research which is not yet complete, but preliminary results indicate that the experts do bring to management a well developed set of decision making procedures that they are highly skilled at implementing. The decision making characteristics that have been identified by other researchers were evident and well developed in the experts working as managers.

The experts tended to be highly intuitive in their decision making, displaying a marked preference for quick decisions while working within their expertise. However, the experts recognise that, particularly when other people may be effected, there is benefit in conferring. The experts were seen by their associates to be especially capable people who produced consistently good results and could be relied upon to make suitable decisions when required. Also, the associates considered that the experts were aware of their own limitations and demonstrated a will to overcome them. It was also evident that the outcome from the expert's decisions was not always in accordance with the expectations of their associates, but the expert was always able to justify the outcome to the satisfaction of the associates.

In each case the expert had clearly identified areas that they considered to be outside their area of expertise, and had established procedures for dealing with them. For example several of the experts had no prior experience with the financial decisions required of management. They all deferred this to a financial expert, such as an accountant. Another expert, an accountant, deferred to other experts on matters related to the organisation in which she worked, to gain appropriate information for the financial decisions that fell within her expertise.

The experts had, since becoming managers, identified areas in which their expertise could suitably be developed further and were as a consequence broadening their expertise. As can be reasonably expected after the years of practice and training that they undergo to become experts, it is evident that the experts have well developed learning abilities which they apply to their management positions. Their learning abilities appear to enable them to develop rapidly into their management positions and quickly identify problem areas which can be resolved by their decision making skills.

4.4 Conclusion

Expert's decision making skills appear to transfer to management roles successfully, when experts are managing functions within their field of expertise. Although there is clearly more to successful management than good decision making, the ability to make good decisions is an important part of management [17,16]. Therefore, we can reasonably assume that it is because expertise does include good decision making skills, that experts are invited to take up management roles. To confirm the validity of this logic, this study shows that expert's decision making skills do appear to transfer to management roles successfully when the expert is managing functions within their field of expertise. However, we must also assume that experts in any field will bring to management more than expert decision making, and that the other attributes will have an influence on their achievements as managers.

This is an interesting situation for decision research. If we accept that there is now an identified population of expert decision makers then it is appropriate to follow up Lipshitz's [16] suggestion to study them by evaluating the outcomes of their decisions. If expert's decision making processes are fundamentally sound, but the outcomes from their decisions are not always 'good', how can this be? Can 'expert' decision making tools be developed to enable experts to incorporate information from outside of their field of expertise into their decision making processes? These questions are being addressed by our ongoing research which considers behavioural aspects of

experts decision making processes. The influence of cognitive style is of particular interest in our study, as it appears to be an important determinant of the decision making processes followed by experts.

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