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Exploring the Influence of Decision Style on Decision Support System Acceptance by GPs

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Abstract

While clinical DSS have many proven benefits in the medical field, their uptake by GPs has been limited. This research explores the influence of decision styles as a possible explanatory variable for the usage of DSS. Insight into the reasons why GPs do not use clinical DSS will allow the development of strategies to facilitate more widespread adoption with consequent improvements across many areas. Depth interviews were conducted with 37 GPs comprising a mix of education backgrounds, experience and gender. In addition respondents completed a decisions styles questionnaire. Results indicated that users of DSS were more likely to have an integrative decision style while non users adopted a flexible decision style. Decision style was also strongly correlated to education with overseas trained doctors more likely to have integrative decision styles and Australian trained GPs exhibiting flexible styles.

Keywords
Technology Acceptance, UTAUT, DSS, Decision Styles

INTRODUCTION

The main aim of using a DSS is to provide the user with a tool that enhances their decision making process, resulting in a more informed decision (Holsapple & Whinston 1996; Turban & Aronson 2001; Marakas 1999). However, in spite of increasing developments in DSS, improvement in usage breadth has been modest (Beynon, Rasmequan & Russ 2002). Areas where DSS are most widely used are in corporate functional management fields, such as marketing and logistics. However, within non-corporate areas, such as medicine, their use is limited (Eom 2007). Despite the importance of DSS and their limited uptake, there is little research on the acceptance of these systems, particularly within the medical field.

DSS in the medical field (clinical DSS) have proven to be beneficial in areas such as: patient safety, including medical errors and adverse drug events (Australian Council for Safety and Quality in Health Care 2002); disease prevention (Sullivan & Mitchell 1995); disease management and drug dosing (Teich et al. 2000) and improvements in patient satisfaction (Ruland 2002). Clinical DSS are able to provide such benefits because they can give up-to-date medical evidence at the point of care. The information intensive nature of medicine results in the problem that often doctors can not recall new and often important medical evidence. In addition, it has also been identified that there is a gap between the doctors’ knowledge of best practice evidence and their application during consultation (Stevens, Scott, Von Hellens, L & Iselin 2004). The use of evidence based medicine in practice has been identified to be able to improve the quality of patient care and integrating this knowledge is essential for a physician to be deemed competent (von Lubitz & Wickramasinghe 2006). Although the benefits and importance of using clinical DSS have been identified and large amounts of time and money have been invested in developing clinical DSS (both worldwide and in Australia), their use is limited (Eom 2007).

The area of user acceptance of IT, not just in the areas of DSS or health, has spawned a great deal of interest and research. There are currently a number of models that aim to explain the acceptance and intention to use IT (Davis, Bagozzi & Warshaw 1989; Taylor & Todd 1995b, 1995c; Venkatesh & Davis 2000; Venkatesh, Morris, Davis & Davis 2003). The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al. 2003) is the model on which this research will be based. Although the UTAUT is relatively new, it is based on eight prominent IT acceptance models, including the widely researched technology acceptance model (TAM). The UTAUT therefore is a harmonisation of the eight models based on their unique and significant elements (Venkatesh et al. 2003).

Although technology acceptance research has been conducted for a number of different types of systems (Venkatesh 2006; Venkatesh et al. 2003), there has been a lack of acceptance research with regards to DSS. Research that is conducted is often made using the TAM (Elbaltagi, McBride & Hardaker 2005; Hart & Potter
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2004). Other studies on the acceptance of DSS do not make any reference to a particular acceptance model, but rather examine specific issues (Gonul et al. 2006, O’Leary 2003). The use of DSS in a number of fields is limited, yet the development of DSS is ongoing. DSS differ from other technologies in their ability to provide advice to the user making the decisions, and the factors influencing the use of DSS need to be established. It has been argued that the current technology acceptance models are not suited for more complex, advanced technologies, but rather are more appropriate for simpler technologies such as email and word processing (Boudreau 2005). Many studies on the adoption and acceptance of technologies have focused on the use of these simpler technologies. As a result, it is important to look at these models using a different, more complex technology, to determine if in fact they are relevant. Therefore this research will examine the use of DSS within a health context. Furthermore, technology acceptance research is often conducted using similar environments and subjects, namely university students. A lack of technology acceptance research in different contexts exists.

A key characteristic of DSS is that they provide additional information and solutions to the user that may not otherwise have been considered. Although this characteristic of DSS is useful, it may also be a contributing factor to the non use of DSS, that is a user may not want additional information but may prefer to make a decision more quickly using existing information. Thus decision styles may play a key role in the acceptance of DSS by GPs and indeed this is supported by Shibl (2009) in exploratory interviews with five GPs.

The purpose of this exploratory and theory building research is to examine the influence of users’ decision styles on the use of DSS, thereby developing a conceptual model that will provide a basis to examine the acceptance of DSS and perform some preliminary testing of this. This paper is a result of a larger research project that explores constructs in addition to decision styles. However, due to the identified importance of decision styles and restrictions in paper length, this paper will only examine the influence of decision styles. By using the UTAUT as a starting point, this research will add to the area of technology acceptance by further investigating the UTAUT and refining it to be more suited to DSS acceptance. Moreover, this research will examine technology acceptance in the context of GPs. Although existing research has examined the acceptance of technology by hospital physicians, GPs differ from this group since they are independent workers who make individual decisions. The next section of this paper will provide a brief overview of the literature before overviewing the conceptual model used in the study. Next the research methods will be outlined, followed by an analysis of the results and a discussion of the findings.

LITERATURE REVIEW

This section outlines the main theories used in this study and identifies the gaps in the extant literature. As the study’s conceptual model is based on the UTAUT, a brief review of the UTAUT will be given. Next, a review of the current research in DSS acceptance is presented. Finally, decision style theories will be briefly reviewed.

Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) is comprised of four main determinants of intention and use: Performance Expectancy (PE), Effort Expectancy (EE), Social Influences (SI), and Facilitating Conditions (FC), as well as four moderating variables: gender, age, experience and voluntariness of use. Figure 1 displays the UTAUT model. The UTAUT was empirically investigated through three different tests (Venkatesh et al. 2003) and out-performed the other eight models. Specifically, it was able to explain 70% of acceptance behaviour, whereas other models explained approximately 40% of acceptance (Venkatesh et al. 2003). The UTAUT is said to be a major step in acceptance research (Lin, Chan & Jin 2004). Due to its infancy, the UTAUT has only been incorporated in a few studies to date (Garfield 2005; Li & Kishore 2006; Carter, Schaupp & Evans 2008), with results supporting most of the constructs as well as the overall model.
Within the UTAUT, performance expectancy is the degree to which the individual believes that using the technology will help them improve their work performance (Venkatesh et al. 2003). This construct has consistently been found to be a significant predictor of usage intention (Davis, Bagozzi & Warshaw 1992; Taylor & Todd 1995a; 1995b; Venkatesh & Davis 2000; Venkatesh et al. 2003). Effort expectancy relates to how easy the individual finds using the system (Venkatesh et al. 2003). Social influence is defined as the degree to which individuals feel that significant others believe they should use the technology (Venkatesh et al. 2003). In previous studies, a direct impact of social influence on behavioural intention was found (Venkatesh & Davis 2000). The final construct of the model is facilitating conditions. It is defined as the extent to which the individual believes that organisational and technical support exists to use the system (Venkatesh et al. 2003). There has also been considerable support for the inclusion of facilitating conditions in the model from previous studies (Thompson, Higgins & Howell 1991; Venkatesh et al. 2003). In the UTAUT, facilitating conditions do not influence the intention to use, but instead determine the actual use behaviour (Venkatesh et al. 2003). Four variables, gender, age, experience and voluntariness, moderate the relationships of the four constructs (performance expectancy, effort expectancy, social influence and facilitating conditions). It is stated that the gender of the user will influence three of the constructs, performance expectancy, effort expectancy and social influence, while the age of the users moderates all four constructs. Experience, which refers to the degree of experience the user has with the system that is to be used, is identified as influencing effort expectancy, social influence and facilitating conditions. Finally, voluntariness, which refers to whether the system is mandatory or voluntary, will only influence the social influence construct.

**DSS Acceptance Research**

Although there have been several studies on DSS, research on their acceptance is limited. The top 50 IS journals were searched from 1990 to 2007 for research on DSS and acceptance, using the terms ‘decision support’ and ‘adoption’. The search produced only 15 relevant articles. From the 15 studies identified, a mix of DSS applications were examined, including expert systems, group support systems, OLAP and knowledge based systems. In terms of the samples of these studies, the majority were employees of organisations (knowledge workers), while five of the studies involved students.

In terms of the model used, of the 15 articles examined, only three made reference to one of the eight prominent acceptance models (Gefen & Keil 1998; Elbaltagi, McBride & Hardaker 2005; Hart & Potter 2004); all three of these studies applied the TAM to examine the acceptance of DSS. The study by Gefen and Keil (1998) examined developer responsiveness and its influence on PEOU and PU. The relationship between PEOU and PU was validated, and developer responsiveness was found to be an important antecedent to PEOU and PU. The other two studies examined the acceptance of DSS in a developing country. The focus of the research by Hart and Potter (2004) was to examine the influence of the Cognitive Instrumental Processes (CIP) on technology use as well as on the constructs of TAM. CIP include output quality, result demonstrability and job relevance. These factors have been identified as antecedents of PEOU (Venkatesh & Davis 2000). The other study (Elbaltagi, McBride & Hardaker 2005) examined TAM with the exception of the intention construct, as the study involved participants who were already using DSS. Both studies found that TAM was applicable in the prediction of DSS acceptance within developing countries. However, the study by Elbaltagi, McBride and Hardaker (2005) excluded participants who did not use DSS, and as a result a one-sided view on acceptance issues was examined.

Of the 15 articles on the acceptance of DSS, nine did not make reference to a particular model but instead examined specific issues that were thought to influence the acceptance of DSS. These included the use of explanations by the DSS (Gonul et al. 2006; Ye & Johnson 1995), affective rewards and Group Support Systems (Reining et al. 1996), influence of mass media (Shao 1999) and the impact of cognitive style (Taylor 2004). Other studies examined factors in general that result in the non-acceptance of DSS (Reinig et al. 1996; Taylor 2004). Other studies examined factors in general that result in the non-acceptance of DSS (Reinig et al. 1996; Taylor 2004). Other studies examined factors in general that result in the non-acceptance of DSS (Reinig et al. 1996; Taylor 2004). The study by Elbaltagi, McBride and Hardaker (2005) excluded participants who did not use DSS, and as a result a one-sided view on acceptance issues was examined.

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Decision Styles

There are a number of decision making models that attempt to describe the process by which decisions are made (Turpin & Marais 2004). Decision-making models describe the steps taken during decision making. The most popular of these models is the work of Simon (1977), which states that there are four steps to decision making: 1) intelligence – finding the situation 2) design – inventing and developing possible actions 3) choice – selecting from one of the actions and 4) review – assessing past choices.

Simon’s (1977) model and others like it, aim to explain or describe the process of decision making. Although the process of decision making may be the same or similar in many cases, the way an individual acts during the decision making process can vary significantly (Rowe & Mason 1987; Driver, Brousseau & Hunsaker 1993). This difference between individuals is a result of their decision-making style. This is the way in which an individual tackles the process of decision making. Decision making styles are defined as habits of decision making (Driver & Cresse 1997). The decision style is a cognitive process and involves the individual’s needs, values and self concept (Rowe & Mason 1987). Similar to the numerous models developed for decision making, there are a number of models developed for decision styles.

Two of the most widely used models are those by Rowe and Mason (1987) and by Driver, Brousseau and Hunsaker (1993). According to Rowe and Mason (1987), two characteristics influence the decision style of the individual: cognitive complexity and value orientation. Cognitive complexity is the individual’s ability to identify and draw conclusions from cues. Cognitive complexity also incorporates the ability to tolerate ambiguity and deal with high degrees of uncertainty (Rowe & Boulgarides 1992). The second characteristic, value orientation, refers to the way in which an individual’s values are driven, either human/socially or task/technically (Rowe & Mason 1987). With this framework, there are four decision styles: directive, analytical, conceptual and behavioural.

The Driver, Brousseau and Hunsaker (1993) decision style model examines decision making from different perspectives to that of Rowe and Mason (1987). It describes two factors that influence the decision style of an individual: information use and solution focus (Driver, Brousseau & Hunsaker 1993). Information use relates to how much information an individual will consider before making the decision. The amount of information used divides individuals into either satisfiers or maximisers. Satisfiers use the minimum amount of information needed to make the decision. Conversely, maximisers use all possible relevant information. The second factor, solution focus, is the number of solutions the individual will develop before making the final decision. The number of solutions developed can vary but the focus is either uni or multi. With uni-focus only one course of action is developed, whereas with multi-focus a number of alternatives are devised. Integrating these two factors, Driver, Brousseau and Hunsaker (1993) developed five decision styles: decisive, flexible, integrative, hierarchic and systematic. The decision style model of Driver, Brousseau and Hunsaker (1993) can be seen in Figure 2.

The decisive style uses minimal data that is sufficient to research a suitable single solution. The flexible style also uses minimal data, but is willing to come up with several solutions. Conversely, the hierarchic style develops a single solution but through the use of all available information. The integrative style uses all information possible as well as developing many solutions. Finally, in the systematic style the decision making starts off as integrative but moves to a hierarchic style, where the multiple solutions are ranked and one solution is adopted.

The essence of Driver, Brousseau and Hunsaker’s (1993) model, the use of information and development of solutions, is also the main goal of decision support systems: providing advice/support through the access of information. Conversely, Rowe and Mason’s (1987) decision style model include two different characteristics, cognitive complexity and value orientation. These characteristics focus on how the individual deals with ambiguity and how they deal with people. Since the focus of this study is on the GPs’ use of DSS to provide advice and support to their decision making, the two characteristics of Driver, Brousseau and Hunsaker’s (1993) model of decision styles fits well within the context of this research. Therefore, Driver, Brousseau and Hunsaker’s (1993) model was used over the Rowe and Mason’s (1987) model.

According to the decision style theory of Driver, Brousseau and Hunsaker (1993), an individual generally has two decision styles: an operating style and a role style. The operating style is often used when an individual is in their natural environment, with family or friends or when working alone (Driver, Brousseau & Hunsaker 1993).
Conversely, role style is generally used in the presence of other people, often during work, and especially when the behaviour is being monitored or assessed (Driver, Brousseau & Hunsaker 1993). As this research will examine the decision style of GPs when they are working in their consultation rooms, the role style will be examined. In order to measure the role style of the GPs, the Driver-Streufert Complexity Index (DSCI) was used. This measure has been used since the early 1980’s and has been shown to be reliable and valid (Driver, Brousseau & Hunsaker 1993).

CONCEPTUAL MODEL

The conceptual model developed from this research (shown in Figure 3 below) is based on the UTAUT with a slight adaptation, the inclusion of the Decision Style construct. The initial UTAUT model included the constructs performance expectancy, effort expectancy, social influence and facilitating conditions. Decision styles was treated as a separate factor, and it was presumed that a GP with a particular decision style will be less inclined to actually use the system, even if the factors that influence intention were positive.

Because the GPs’ use of DSS is voluntary, the moderating variable, voluntariness of use, was not applicable to this research and as a result was not included in the model. With the identification of the new factor, the conceptual model for this research is shown in Figure 3 below. The focus of this paper will be on the influence of this factor on use of DSS.

RESEARCH METHOD

The exploratory nature of this research led to the adoption of a qualitative approach using face-to-face depth interviews. This research used snowball sampling as it was identified to be the most suitable strategy to gain access to GPs. GPs are often very hard to access and often the best method is through another GP’s referral (Lee 1993). Asking the initial GPs for referrals allowed the sample to eventually “snowball” from a few GPs to a larger group (Patton 1990). A limitation of snowball sampling is the possibility of introducing bias, through the use of participants who are like the ones that referred them (Patton 1990). However, there was no potential for bias since any GP would have been suitable as long as they used computers and there was a reasonable mix of overseas and Australian educated GPs. This mix of education was achieved by including overseas and Australian educated GPs as the initial GP contacts.

The study utilised a holistic multiple case study method, which involved interviewing 37 GPs from different areas of South-East Queensland. A relatively even proportion of GPs was interviewed from each educational background, thus enabling literal and theoretical replication. Specifically, 20 Australian educated and 17 overseas trained doctors were interviewed. Two questionnaires were also administered, which included demographic and decision style questions. The first was used to obtain generic facts about the participants, such as the GPs’ gender, education, age and GP experience. The second questionnaire was used to determine the decision style of the participant. The questions on decision styles came from a set of questions known as the Driver-Streufert Complexity Index (DSCI) (Driver, Brousseau & Hunsaker 1993), which is used to determine the role style of the participant. The responses are scored and a total score is obtained at the end which is then compared to predetermined styles. All 37 GPs completed both questionnaires. Qualitative responses were coded and analysed based on the important categories: education and gender. As the focus of this paper is the influence of decision styles, only the data from the questionnaires were analysed. Interview data was therefore purposefully left out.

Figure 3  Conceptual model used in this research

![Figure 3  Conceptual model used in this research](image-url)
ANALYSIS

The key characteristics of the participants were reasonably diverse. The profile of the participants in the study was quite varied. In terms of gender, there were slightly more male GPs than female (64.9% males versus 35.1% females), with a total of 24 males and 13 females. In terms of practice size, most GPs worked in a practice that had two or more GPs (64.9%), with the remaining 35.1% working alone in a solo practice. The GPs were grouped as either being educated from an Australian University, or one from overseas. The split between the two was relatively even, but with slightly more Australian trained GPs (54.1%). Turning to the number of years of total GP experience, respondents ranged from one to 32 years, with the majority (51.35%) having worked as GPs for 10 to 19 years. GPs with very little experience (under 5 years) accounted for only 5.41%, likewise, GPs with more than 30 years of experience also accounted for 5.41% (only two GPs in each category). For those GPs who were educated overseas, their GP experience in Australia ranged from 2 to 11 years, with only one GP having more than 10 years’ experience as a GP within Australia. The remaining overseas trained GPs were evenly split between those with 1-5 years’ experience and those with 6-10 years’ experience. Years of experience were also reflected in the age of the GPs, with the majority (43.24%) ranging between the ages of 41-50. Similar to GP experience, only two GPs were in the lowest age range, between 25 and 30, and two were in the highest age range, which is above 61. Finally, in terms of computer competence, the majority of GPs classed themselves between moderate and very low in computer competence. Specifically, 51.35% of GPs were moderately competent, 21.62% had low competence and 8.11% had very low competence. On the other side of the scale, 13.51% had high computer competence, and only 5.41% indicated very high competence.

It was found that, of the 37 GPs, only seven actually used some form of DSS, with a further 20 having heard of them but not using them and ten never having heard of such systems. On this basis the GPs were divided into three groups. Group 1 contained the seven GPs who currently use a DSS. Group 2 were the 20 GPs who had heard of DSS but did not use them (including two who previously used but no longer did) and Group 3 were the 10 GPs who had never heard of DSS. In terms of the type of DSS used by the seven GPs in Group 1, two were identified: a DSS for skin problems and a second for heart measurements (ECG). Both of these DSS are categorised as image recognition and interpretation clinical DSS. The key pattern that emerged from the three groups was the education of the GPs. Groups 1 and 3 were mainly overseas trained GPs, while Group 2 were mainly Australian educated. Therefore GPs who were overseas trained were more likely to use DSS than their Australian educated counterparts. In addition overseas trained GPs were more likely to be unaware of the existence of DSS, but keen to know more.

The analysis of the decision styles found that all GPs’ decision styles were integrative, flexible or hierarchic. The other two decision styles (decisive and systemic) did not match any GP. Specifically, there were 20 GPs with the flexible style, 16 GPs with the integrative style and only one GP with the hierarchic decision style. Therefore, the majority of GPs (36) are multi-focused (flexible and integrative), with only one GP being uni-focused (hierarchic). This trend for the GPs to be multi-focused is in line with the role of the GP as a producer of multiple potential diagnoses (Murtagh 2003). In other words, the GPs often identify more than one possible cause to a patient’s symptoms and arrive at their solutions. In terms of DSS use, an

<table>
<thead>
<tr>
<th>Group</th>
<th>Integrative</th>
<th>Flexible</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1: Currently Use</td>
<td>6</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Group 2: Heard but do not use</td>
<td>5</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Group 3: Never heard</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>20</td>
<td>36</td>
</tr>
</tbody>
</table>

Group 1 were the GPs who currently used DSS in practice. These six GPs were identified as all having an integrative decision style. As this is the only group that currently uses DSS, it appears that GPs who use DSS are likely to have an integrative decision style. Because individuals with the integrative decision style are maximisers, they like to have as much information as possible to arrive at their solutions. In terms of DSS use, an
individual needs this characteristic since the use of DSS is a source of additional information to the user. Conversely, those with a flexible decision style are satisficers and thus prefer limited information to reach their decisions. Therefore, individuals with the flexible decision style are less likely to use DSS. This distinction can be seen in Group 1, where none of the GPs have a flexible decision style.

The second group of GPs (those who have heard of DSS but do not use them) have the opposite decision style to the first. Table 1 shows that there is an uneven split of the 20 GPs’ decision styles, with five having an integrative style and 15 having a flexible one. Thus the majority decision style for this group is the flexible style. The 20 GPs in Group 2 do not use DSS in practice. Three of the GPs in this group had previously used DSS in practice, but gave them up due to their lack of usefulness. These three GPs all had an integrative decision style. Therefore this further indicates that those who use DSS are likely to have an integrative style whereas those who do not use DSS will probably have a flexible decision style. A number of GPs in Group 2 indicated earlier that their knowledge was more than enough for them to reach a decision in the consultation and that they did not need any other information. This lack of need for information is in line with the satisficing characteristic of the flexible decision style.

The final group, Group 3, were those GPs who had never heard of DSS. Their decision styles were evenly split between the integrative and the flexible styles, with five GPs belonging to each style; this matches the even split between decision styles over all groups, and is to be expected since decision style is unlikely to influence whether a GP has heard of a technology. The GPs in Group 3 had not identified whether they would use DSS or not as they had only just been introduced to them. Based on the decision styles of Group 1 and Group 2 and the characteristics of the integrative and flexible styles, it could be hypothesised that the GPs in Group 3 with the flexible style would not use DSS and those with the integrative style would use DSS.

The inclination of Groups 1 and 2 towards predominant decision styles indicates that the use of DSS may be related to the decision style of the individual. Delving further into the groups, another pattern related to the education of the GPs was identified. It was identified that the majority of GPs in Group 1 and Group 3 were overseas trained whereas Group 2 were mainly Australian trained. Groups 1 and 3 both had only one Australian educated GP. The breakdown of the GPs' education per group can be seen in Table 2 as well as the breakdown of decision styles based on the training of the GPs. Examining the decision styles in terms of the GPs training shows that there is a trend for the overseas trained GPs to be more integrative while the Australian trained are more flexible. It can be seen from Table 2 that there were a total of six Australian educated GPs and ten overseas trained GPs with the integrative decision style. Whereas, there was a total of 14 Australian educated GPs and six overseas trained GPs with a flexible decision style. From Table 2 it appears that the education of the GPs may be related to their decision styles. Examination of the other factors revealed that GPs’ education was the only item that linked to decision style. In other words, none of the moderating variables (gender, age or experience) had an influence on decision styles.

Table 2. Decision Styles per Training

<table>
<thead>
<tr>
<th>Group</th>
<th>Integrative</th>
<th>Flexible</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1: Currently Use</td>
<td>6</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Australian/Overseas</td>
<td>1/5</td>
<td>0/0</td>
<td></td>
</tr>
<tr>
<td>Group 2: Heard but do not use</td>
<td>5</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Australian/Overseas</td>
<td>4/1</td>
<td>14/1</td>
<td></td>
</tr>
<tr>
<td>Group 3: Never heard</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Australian/Overseas</td>
<td>1/4</td>
<td>0/5</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
<td>20</td>
<td>36</td>
</tr>
<tr>
<td>Australian/Overseas</td>
<td>6/10</td>
<td>14/6</td>
<td></td>
</tr>
</tbody>
</table>

Therefore, it appears that the use of DSS is influenced by the decision style of the GPs, with a GP with an integrative decision style more likely to use DSS than a GP with a flexible one. Furthermore, culture seems to influence decision styles, specifically the educational origin of the GPs. Therefore because overseas trained doctors are more likely to have an integrative decision style than Australian educated GPs, overseas trained GPs may use more DSS than Australian educated GPs. Overseas GPs were grouped together as long as their education was not from Australia. From observation, it was identified that the majority of the overseas trained GPs were from Southeast Asia. Therefore, there were insufficient numbers to delve further into the differences
between different groups of overseas trained GPs, such as western and non-western. This is perhaps an area for further study.

DISCUSSION

The decision styles of the GPs in this research fit within two main styles, integrative and flexible. As was described earlier, both these styles are multifocused, which means the individual develops more than one solution to the problem. The two styles differ in that the individual with an integrative decision style uses as many sources of information as possible, whereas the flexible style uses the minimum amount needed.

There is a distinctive pattern in terms of the decision style and the GPs’ use of DSS. Those who use DSS have an integrative style, whereas those who do not have a flexible style. There has been little research into the acceptance of DSS or any information technology and the individual’s decision style. A study was conducted on the cognitive styles of individuals and their acceptance of different models (in the model subsystem component of DSS) used to create the DSS (Lu, Yu & Lu 2001), which identified that individuals are inclined to use a DSS model that fits the way they make decisions. The study by Lu, Yu and Lu (2001) differs from this research, which examines the individual’s decision style rather than the decision process, and whether DSS are accepted and used at all rather than matching suitable decision models. Cognitive style is also different from this study as it is defined as sensing or thinking, rather than being determined through information use and solution creation (Driver, Brousseau & Hunsaker 1993). In addition, the study examines the use of DSS by students not professionals as this study has. However, despite these differences, both studies suggest that there are differences in the way individuals accept technology, and this acceptance is not simply based on certain perceived factors as most technology acceptance models claim (Venkatesh et al. 2003; Venkatesh & Davis 2000; Davis 1989). From this research, it can be seen that there is an inherent inclination towards using certain technology for users with certain decision styles. Another recent study (Chakraborty, Hu & Cui 2008) posits that cognitive style influences the acceptance determinants usefulness, ease of use and social norms. Similarly, although that research differs from this study, it still indicates that there are other individual characteristics at play when it comes to technology acceptance.

A study by Martinsons and Davison (2007) more closely supports this research as it examined the likelihood of managers using a particular type of DSS based on their Rowe and Boulgarides (1994) decision style. The study differed from this research in the decision style used and the context. In addition, the actual use of DSS by the individuals whose decision styles were identified was not determined. The research by Martinsons and Davison (2007) supports this research as it states that different individual styles have the propensity to adopt different DSS types. However, the study did not directly measure participants’ decision styles with their use of particular DSS. In addition, it does not take into consideration that decision styles may inhibit the use of DSS, but instead assumes that all decision styles will accept a particular type of DSS. This is contrary to the findings of this research, where it was found that GPs with a flexible decision style will more than likely not use DSS.

It was also identified that decision styles of the GPs could be related to their cultural background. The overseas trained GPs (mainly from Southeast Asia) were more integrative than flexible, whereas the Australian trained GPs were of a flexible decision style. Martinsons and Davison (2007) identified that Western managers tend to have different decision styles than their Asian counterparts (Chinese and Japanese). Furthermore, Driver and Cresse (1997) have also identified that decision styles differ across cultures particularly with role styles, which is the decision style that was examined in this research. This difference of decision styles due to different cultural contexts is perhaps an area for further study.

Therefore, this research suggested that decision styles play a role in influencing the actual use of DSS by the GPs. Although there has been some research conducted that relates to this research issue, there is no literature that specifically deals with this issue as it was dealt with in this research. This research found that GPs are multifocused with their solutions (both integrative and flexible styles are multifocused). However, GPs who have an integrative style are more likely to use DSS because of their desire to use more information, and GPs who have a flexible style are less likely to use DSS because of their desire to use as little information as possible. The cultural difference of these GPs simply confirms that differences in decision styles stem from within the individual, who in turn is strongly shaped by their culture.

CONCLUSION

This study identified that decision styles may influence the acceptance of DSS. This finding has not been researched prior to this study. Thus, the importance of decision styles in technology acceptance is a new and important discovery. The finding that GPs of one style differ in their use of DSS to GPs of another style clearly suggests that decision styles indeed play an important role in an individual’s decision to use DSS.
While attempts were taken in this research to ensure that the findings are both reliable and valid, some minor limitations exist. Firstly, due to limitations in terms of funding and location, restricting the interviews to specifically Queensland, Australia was necessary. Secondly, this research focused on GPs. It was identified earlier that a key gap in the literature is the need for more context specific technology acceptance research. So although this research is limited to GPs, this was intended to address this gap. Finally, the research was conducted using a qualitative approach. However, this research was exploratory and the aim was to build rather than test theory. In terms of future research, studies could be undertaken to incorporate other states in Australia, the entire country or international locations. In addition, this research could be extended to include other contexts, and thus further fulfill the need for more context specific research; this may include fields such as law, where information and data is abundant. Finally, future research could take a quantitative approach, such as cluster analysis for theory testing, and test the theoretical model derived from this research.

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