

# Key Dimensions of Personal Innovativeness

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**by**

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## **Abstract**

The purpose of this paper is to provide insight into the concept of Personal Innovativeness through an application of the Ettlé and O'Keefe (1982) Innovativeness Scale. A mixed-mode approach to data collection involving online and postal surveying was used to obtain responses from 404 practicing UK managers. Although the work has a number of limitations relating to the Personal Innovativeness scale employed and difficulties associated with comparative analysis of the results, the findings are statistically significant and appear to have face value. The most important finding from this study is the identification of five key dimensions of Personal Innovativeness which suggests that the concept is fragmenting and becoming more complex. The paper concludes by considering the implications of the findings in terms of recruitment of managers, their education and training, the design of reward packages, and the allocation of resources.

## **Key words**

Personal innovativeness, innovativeness scales, innovativeness.

## **1 Introduction**

Innovation is a complex concept (Roehrich, 2004; Trott, 2012) that is difficult to define (Tellis et al, 2009), however, for the purposes of this paper it will be taken to be “...*the management of all the activities involved in the process of idea generation, technology development, manufacturing and marketing of a new, or improved, product or service*” (adapted from Trott, 2012, p15). Innovation is an essential activity if an organisation is to adapt and evolve in response to change in its business and competitive environments (Trott, 2012). Indeed, Erikson et al (2008), Priyadharshini et al (2015), Schumpeter (1943), and Steenkamp et al (1999) argue that it is essential for organisational evolution, growth and profitability.

The subject of innovation provides a rich setting for researchers and, as a consequence, the literature on innovation is extensive. Indeed, a recent search of the Business Source Complete database using “*innovation*” in a key word search produced 250,003 hits. This literature deals with all manner of matters associated with innovation but one subject that has been of interest over many years is an individual's disposition to innovate or Personal Innovativeness and it is this that is the focus of this paper.

The paper outlines the methodology used to collect data regarding Personal Innovativeness as well as presenting and interpreting the output from an innovativeness scale. A section is devoted to explaining a factor analysis which was conducted for the purpose of trying to identify the key dimensions of Personal Innovativeness and the paper ends with a summary and conclusions section. To begin, however, it is useful to consider the nature of Personal Innovativeness in more detail.

## 2 Personal Innovativeness and Propensity to Innovate

According to Ettlíe and O'Keefe (1982) there is “*widespread evidence*” of a relationship between an individual's attitudes or values and their innovative behaviour. Indeed, as Rothwell

(1994, p2) states “*..at the very heart of the successful innovation process were 'key individuals'... with a strong commitment to innovation*”. Further, while research into the relationship between individuals and innovation extends back to the late 1960's and early 1970's (eg Nabseth and Ray, 1974; Rokeach, 1967) the subject remains a popular focus for projects today with journals still regularly reporting the results of research into the nature of the relationship (eg Hidayanto et al, 2015; Tan and Sie, 2015; Thakur and Srivastava, 2015).

The basis for research into the relationship between individuals and innovation is the tendency for people to react differently when presented with innovations. Some appear much more willing to take a risk and to adopt the innovation much more readily than others who are suspicious and risk-adverse (Yi et al, 2006). This propensity is persistent and enduring across time, cultures and innovation domain types (Goldsmith, 1991; Hurt et al, 1977; Midgley and Dowling, 1978; Moore, 1999; Rogers, 1995; and Yi et al, 2006) and as a consequence it is the basis for much of modern innovation adoption theory (Rogers, 1995) and many studies (eg Fagan et al, 2012; Im et al, 2003; Jackson et al, 2013; Yang et al, 2007; Yi et al, 2006) have supported the existence of a relationship between innovativeness and innovation.

Innovativeness was initially operationalised in terms of “*time of adoption*” but this approach was not seen as particularly useful (Agarwal and Prasad, 1998) because it is too narrow, does not allow inter-study comparison, and lacks reliability and validity metrics (Midgley and Dowling, 1978). Instead, most contemporary authors now assume that it is a latent personality trait (Roehrich, 2004) that is derived from cognitive and / or sensory motivations (Venkatraman, 1991).

The propensity to innovate has been referred to as *innovativeness* (Midgley and Dowling, 1978; Steenkamp et al, 1999; and Venkatraman, 1991), *innovative predisposition* (Midgley and Dowling, 1993), *innate innovativeness* (Hirschman, 1980; Im et al, 2003; Roehrich, 2004; Yi et al, 2006) and *Personal Innovativeness* (Agarwal and Prasad, 1998; Lin, 2006; Rogers, 1995). According to Agarwal and Prasad (1998, p206), “*...personal innovativeness as a construct that is important to the study of individual behaviour toward innovations has had a long-standing tradition in innovation diffusion research...*”. As a consequence, this paper will use the term Personal Innovativeness and adopt the definition proposed by Rogers (1995, p252) which is “*the degree to which an individual or other unit of adoption is relatively early in adopting new ideas*”.

When considering Personal Innovativeness Midgley and Dowling (1978) believe that it is important to distinguish between propensity to innovative and actual Personal Innovativeness. This is because while an individual's propensity to innovative might be high, their opportunities to innovate may be limited and their revealed or actual Personal Innovativeness might be low. This is because of various generic intervening variables including innovation characteristics (Steenkamp et al, 1999), marketing factors (Steenkamp et al, 1999), and social interactions (Midgley and Dowling, 1978). In the work setting the intervening factors may

also include aspects of the job being addressed, the team, and the organisation (Hormiga et al, 2013).

In addition to acknowledging a difference between propensity to innovative and actual Personal Innovativeness it is also useful to distinguish between general Personal Innovativeness and domain specific Personal Innovativeness (Agarwal and Prasad, 1998). As Trot (2012, p11) reminds us “*Within organisations it is individuals who define problems, have ideas and perform creative linkages and associations that lead to inventions...*” and “*... within organisations it is individuals in the role of managers who decide what activities should be undertaken, the amount of resources to be deployed and how they should be carried out*”. As such, individual employees and especially managers (Augusto et al, 2014; Burdon et al, 2013; Dershin, 2010; Dubey et al, 2015; Munoz-Doyague and Nieto, 2012) are often faced with numerous and varied innovatory contexts and knowledge concerning their general Personal Innovativeness provides valuable insight concerning their likely behaviour. On the other hand, however, general Personal Innovativeness may not have a particularly strong effect on the specific behaviours exhibited in a specific situation or domain (Venkatraman, 1991) and Goldsmith and Hofacker (1991) claim that domain specific scales offer better predictive power than generic scales.

Over the last 40 years numerous researchers have sought to measure Personal Innovativeness (sometimes in the form of *innovativeness*) using various scales. It is apparent that some of the scales have sought to measure Personal Innovativeness as a generic construct (eg Ettlle and O’Keefe, 1982; Goldsmith, 1991; Hurt et al, 1977; Kirton, 1976; Kocak and Onen, 2012; Pallister and Foxall, 1998) while others have sought to measure Personal Innovativeness as a domain specific construct. These specific domains include entrepreneurship (Gibson and Gibson, 2011), personality (Jackson, 1976), propensity to change (Hage and Dewar, 1973), innovative purchasing behaviour (Leavitt and Walton, 1975), consumer innovativeness and decision making (Goldsmith and Hofacker, 1991; Goldsmith et al, 1995; Ostlund, 1974), mobile commerce (Kourouthanassis et al, 2014; Lu, 2014; Roca et al, 2010; Thakur and Srivastava, 2015), exploratory behaviour (Baumgartner and Steenkamp, 1996; Raju, 1980), consumers eco-innovation (Jansson, 2011), internet banking (Gounaris and Koritos, 2008; Hidayanto et al, 2015), Information Technology (Agarwal and Prasad, 1998; Jackson et al, 2013; Tan and Sie, 2015; Yi et al, 2006), virtual reality simulations (Fagan et al, 2012), webcasting adoption (Lin, 2006), employee level (Hormiga et al, 2013), social media marketing (Pentina et al, 2014), and mobile learning (Cheng, 2014).

Interestingly several authors have sought to investigate Personal Innovativeness in more detail by subjecting data relating to innovativeness to further analysis in order to identify the key dimensions of innovation (see Table 1). This is useful not only in terms of understanding the concept of Personal Innovativeness but also as a means of reducing the data set in order to focus management attention on those aspects that are of greatest importance (Field, 2012). As with much of the research into Personal Innovativeness it is difficult to compare and contrast the results of these studies because they have different theoretical intentions and make use of different methodologies (Roehrich, 2004). However, it is apparent that while three of the four studies listed in Table 1 identify three key dimensions the dimensions themselves are indeed very different. This may very well be due to limited published research as well as the differing intentions of the various studies but it does mean that this is an area of innovation theory that may benefit from further research and, although not the primary aim of the study

underpinning this paper, this study has generated findings that appear to contribute usefully to knowledge.

TABLE 1 – ABOUT HERE

### **3 Methodology**

A questionnaire was developed based primarily on the 20 point Ettlíe and O’Keefe (1982) Innovativeness Scale (see Annex 1), which has been used in several other recent applications (eg Muñoz-Doyague and Nieto, 2012; Whetton and Cameron, 2011). The questionnaire was piloted in an on-line format across a range of industry sectors and feedback was used to make a number of subsequent modifications. The poor response rate to the on-line pilot was addressed with a mixed method of data collection being adopted for the main survey. The online approach to data collection was retained for surveying the University Sector but a postal survey was conducted in all the other sectors.

A total of 4,777 questionnaires were posted out to managers working in various industry sectors in the UK and 403 were returned completed which constitutes an overall response rate of 8.4%. The response rate by sector is shown in Table 2. The sample size of 404 gives the findings a 95.0% level of confidence with a margin of error of +/- 5.0% (West, 1999). The data was analysed using SPSS 19 and the findings relating to the market for micro-scale anaerobic digestion reported elsewhere (Goodall et al, 2014).

TABLE 2 – ABOUT HERE

### **4 Results**

The data generated by the 20 point Ettlíe and O’Keefe (1982) Innovativeness Scale is summarised in Table 3. The calculation of a mean makes it possible to rank the statements and identify those that the respondents identify with most and those that they identify with least. Indeed, in the first instance it is apparent that there is a tendency to agree with the majority of the statements which may in itself suggest that as a group the respondents have something of a predisposition to innovate. It is also apparent, that the respondents see themselves as being humorous, willing to speak out in public and willing to try new ideas and approaches. Conversely, it is apparent that as they tend not to set aside resources for risky projects they may be a little risk averse, which might be intuitively against the conventional wisdom regarding innovators, and they do not necessarily use their personal contacts to maneuver themselves into choice work assignments.

Initially, therefore, the data suggests that the respondents are indeed innovative, however, when the Scoring Scale advocated by Whetton and Cameron (2011) (see Annex 1) is applied to the data there is something of a surprise. The overall score for all the respondents is 74% which suggests that only 50% of people generally will score below the respondent’s which in turn suggests that the respondents are not particularly innovative. Analysis at the Sector Level (see Table 4) appears to provide further evidence to support this contention. While somewhat

unexpected it is possible that this could be because some of the respondents are employed in sectors which in the UK remain in the public sector where the imperative to innovate is not so strong. Indeed, when this finding is related back to the initial data where many respondents have reported agreement with innovativeness statements it is possible to suggest that for many it is more important to be perceived as innovative rather than actually being innovative and confirms Midgley and Dowling's (1978) view that it is useful to distinguish between propensity to innovative and actual Personal Innovativeness.

The original Whetton and Cameron (2011) Scoring Scale was developed from data provided by students so the scale and subsequent interpretation may not be particularly valid. Although no issues were identified with regard to the Ettlíe and O'Keefe (1982) Innovativeness Scale itself the fact that this survey collected data from practicing managers means that a Scoring Scale developed from this data may well be both different to and of greater value than the Whetton and Cameron (2011) Scoring Scale. In the event two alternative Scoring Scales were developed from the current data set and are presented as Tables 5 and 6. Table 5 makes use of the same scores as the original Whetton and Cameron (2011) Scoring Scale and has been produced to allow direct comparison. This Table confirms that there is a difference between the original Whetton and Cameron (2011) Scoring Scale and the new scale developed using the current data set. The second Scoring Scale presented in Table 6 has had the Scores adjusted to focus on the quartiles which are more commonly used reference points (Field, 2012) and as such may serve as more useful review points for researchers who wish to make use of the Ettlíe and O'Keefe (1982) Innovativeness Scale in the future. However, when the data from the current study is revisited using the revised Scoring Scales it is apparent that it simply serves to confirm that the respondents are not particularly innovative.

TABLE 3 – ABOUT HERE

TABLE 4 – ABOUT HERE

TABLE 5 – ABOUT HERE

TABLE 6 – ABOUT HERE

#### **4.1 Dimensions of Innovativeness**

In order to examine the data for key dimensions it was subject to a Principal Component Factor Analysis with Varimax Rotation. Missing data had to be replaced by mean values in order to successfully run the analysis which then converged in 9 iterations. The overall Kaiser-MeyerOlkin (KMO) Measure of Sampling Adequacy of 0.888 indicates that the sampling adequacy is "great" (Field, 2012; Hutcheson and Sonfroniou, 1999) while Bartlett's Test of Sphericity ( $X^2(190) = 2,382.439, p < .001$ ) indicates that there are relationships between the variables and that this result is highly significant and that factor analysis is appropriate for use with this data. The output from the Factor Analysis is presented in Table 7 where with an Eigenvalue cut-off of 1.0 it appears that a five factor solution, explaining 56.21% of the variance in the data, is the optimal solution. Output from similar analyses conducted at the individual sector level lends further support to the five factor solution (Table

8). The items that load on the same factor are highlighted and an interpretation based on the views of the research team and a number of independent researchers is presented in Table 9.

TABLE 7 – ABOUT HERE

TABLE 8 – ABOUT HERE

TABLE 9 – ABOUT HERE

The statements that load on the Factors appear to suggest that there are five dimensions to a manager's Personal Innovativeness: Leadership, Team, Communication, Risk, and Reward. Intuitively, these five dimensions seem entirely appropriate and this then provides valuable insight for managers. A manager engaged in innovation must demonstrate leadership in order to engage those staff for whom they are responsible in the innovation. If they are to engage the talents and skills of the staff in the innovation process they also need to be able to take a team approach to the process. The fact that innovation involves a team and that to maximise the chances of successful innovation the team must work together well then there is a need to communicate efficiently and effectively. Of course, as with any work activity the final outcome cannot be guaranteed and so there is an element of risk involved. However, alongside risk there is also reward and this not only serves to motivate the manager but also to counter the risks. It would appear, therefore that these dimensions have *face validity* (Denzin, 1978).

The outcome of the factor analysis is interesting not only because of the nature of the dimensions identified but also because of the number and this then provides valuable insight for academic researchers interested in innovation. In the previous studies noted in Table 1 the number of dimensions identified range from one (Hurt et al, 1977) through to four (Goldsmith, 1991) with two studies (Ettlie and O'Keefe, 1982; Gibson and Gibson, 2011) finding the existence of three dimensions. Although the number of studies looking at the dimensions of Personal Innovativeness are small (just five including this study) which makes it impossible to be certain, and the fact that the Gibson and Gibson (2011) study might be construed as contradictory, there is some evidence to suggest that over time the concept of innovativeness has fragmented and that today it is more complex than in the past. In addition to the findings from this study there is some evidence to this effect to be found in the literature where Rhaiem (2012) states that “..*the innovation process has become more complex...*”. If correct the implications of this trend are important as senior managers would need to ensure that junior managers they appoint to innovate have the skills and aptitude to engage on the five dimensions and / or they need to ensure that staff development is available to promote these characteristics in employees.

## **5 Summary and Conclusion**

Innovation is an essential activity for most businesses if they wish to remain competitive in the early 21<sup>st</sup> century. As a consequence, the predisposition to innovate or Personal Innovativeness is a desirable characteristic of employees and especially managers. As a consequence, this study collected information regarding Personal Innovativeness from 403



managers employed across a wide range of business sectors using the 20 point Ettlíe and O'Keefe (1982) Innovativeness Scale.

The research has a number of limitations that serve as caveats regarding the findings. The first is that Whetton and Cameron's (2011) Scoring Scale for Ettlíe and O'Keefe (1982) Innovativeness Scale, was developed with students and not practicing managers and the different samples may account for at least some of the differences in the findings. Second, over time and with applications in different domains it has been necessary to adapt the wording of Ettlíe and O'Keefe's (1982) original scale (eg "wit" was changed to "sense of humour" and "manager" was changed to "governors and / or LEA" for use in the school sector) and this also could account for some of the differences in the findings. Third, the issue of concept and construct diversity, originally identified by Ettlíe and O'Keefe (1982), remains applicable today and this makes relating the results of this study to the other studies reporting on innovativeness dimensions challenging. Finally, while the findings of this survey and factor analysis are statistically significant some of the subsequent observations are, in essence, made using a meta-analysis of the findings arising from several other studies of innovativeness dimensions. However, the number of such studies is very small and so these findings must be treated with caution. For the reasons just outlined it is apparent that the findings of this study are not conclusive, however, they are based on a survey of a fairly large number of managers and the results are statistically significant so it appears that the insight arising from the findings make a useful contribution to the subject area of innovation in general and the debate about Personal Innovativeness in particular.

A review of the initial descriptive data suggests that the respondents are indeed well disposed to innovation but application of Whetton and Cameron's (2011) Scoring Scale reveals that they are actually no more innovative than 50% of the population. Development and application of an alternative Scoring Scale based on the data provided by the practicing managers who responded to this survey only serves to further confirm the limited innovativeness of the respondents. Of much more interest and theoretical importance, however, are the results of a factor analysis of the data which sort to identify the key dimensions of Personal Innovativeness. Not only did this reveal the existence of five key dimensions relating to Leadership, Team, Communication, Risk, and Reward but it also suggests that over time innovativeness has fragmented and is becoming more complex.

The findings of the study have important practical implications for managers who will be expected to engage in innovation. In the first instance, it is intuitively appealing to appoint managers with relatively high levels of Personal Innovativeness to roles where they will be expected to innovate and that with some minor grammatical changes to contextualise and update it the Ettlíe and O'Keefe's (1982) Innovativeness Scale remains a valid measure of Personal Innovativeness that may be usefully employed as a diagnostic tool in the recruitment process for managers. It would also appear that the Ettlíe and O'Keefe (1982) Innovativeness Scale, and especially the data arising from its application, can be used to inform the education and training of managers. The fact that in the contemporary work situation Personal Innovativeness has five key dimensions relating to Leadership, Team, Communication, Risk, and Reward will allow managers to focus their attention and efforts and look to develop these attributes in their employees in order to facilitate innovation. The findings from an application of the Ettlíe and O'Keefe's (1982) Innovativeness Scale might also be used to facilitate innovation through the design of reward packages to encourage the recruitment of

employees with high levels of Personal Innovativeness and, hence, have a role to play in the allocation of resources.

Finally, while this study has provided useful insight into Personal Innovativeness it has also established a need for further research and provided some direction and focus for future studies in the area. The fact that the findings of this study must be treated as provisional means that there is a need for further research to verify the findings while it is also evident that the development of an Personal Innovativeness scale designed specifically for use in the various specific sectors may well provide results that have higher predictive power than the Ettlé and O'Keefe's (1982) Innovativeness Scale.

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## Annex 1 – The Original Ettlíe and O’Keefe 20-item Innovation Scale

		never applicable	Almost Seldom true	Not always true	Often	Almost
1.	Openly discuss promotion with my boss.	1	2	3	4	5
2.	I try new ideas and approaches to problems.		1	2	3	4 5
3.	I take things or situations apart to find out	1	2	3	4	5 how they work.
4.	I seek uncertainty and unusual circumstances	1 2 3 4 5				
5.	I negotiate my salary openly with my supervisor.		1	2	3	4 5
6.	I will be counted on to find a new use for existing equipment.		1	2	3	4 5 methods or
7.	Among my colleagues and co-workers, I will be the first the first to try out a new idea or method.		1	2	3	4 5 or nearly
8.	I will have the opportunity to translate communications from departments for my work group.		1	2	3	4 5 other
9.	I demonstrate originality.		1	2	3	4 5
10.	I will work on a problem that has caused others difficulty.		1	2	3	4 5 great
11.	I provide critical input toward a new idea.	1	2	3	4	5
12.	I provide written evaluations of proposed ideas.		1	2	3	4 5
13.	I develop contacts with experts in my area located outside	1 2 3 4 5				
14.	I use interpersonal contacts to maneuver myself into choice	1 2 3 4 5				
15.	I make time to pursue my own pet ideas or projects.		1	2	3	4 5
16.	I budget funds for the pursuit of a risky idea.		1	2	3	4 5
17.	I tolerate people who depart from organizational routine.		1	2	3	4 5
18.	I make comments at staff meetings.		1	2	3	4 5
19.	I work with project teams designed to solve one complex		1	2	3	4 5 problem.
20.	If my co-workers are asked, they will say I am a wit.	1	2	3	4	5

Source: Ettlíe and O’Keefe (1982)

### Scoring Key

To compute your score on the Innovative Attitude Scale, simply add up the numbers for your responses to the twenty questions. Then compare your total score to the following norm group. Note that the percentile indicates the percent of the people who are expected to score below you.

Score	Percentile
39 .....	5
53 .....	16
62 .....	33



71 .....	50
80 .....	68
89 .....	86
97 .....	95

Source: Whetton and Cameron (2011)

Table 1 - Key Dimensions of Innovation

<b>Hurt et al (1977)<sup>1</sup></b>	<b>Ettlie and O’Keefe (1982)</b>	<b>Goldsmith (1991)</b>	<b>Gibson and Gibson (2011)</b>
i innovativeness	i. innovator ii. preserver of the status quo (Anti-innovator) iii. Unchallenged	i. willingness to try ii creative original iii opinion leader iv ambiguities and problems	i feelings that change is energizing and exciting ii feelings that new methods and procedures should be attempted iii beliefs that there exist new and unusual paths to achieve the final goal and success

<sup>1</sup> This study did identify two factors but the authors acknowledge that the bi-dimensionality of this result was an artefact of the directionality of the wording of items, rather than the content of the items, and in the end concluded that innovativeness was uni-dimensional.

Table 2: Response by Sector

<b>Sector</b>	<b>Total Sent</b>	<b>Total Returned</b>	<b>Response Rate</b>
Hotel	2000	173	8.6%
School	2000	139	6.9%
Prisons	137	23	16.7%
Golf Courses	152	13	8.6%
Food Processing	221	27	12.2%
Universities	115	8	7.8%
Hospitals	152	21	13.1%
<b>Total</b>	<b>4,777</b>	<b>404</b>	<b>8.4%</b>

Table 3 – Ranked Responses

Almost  
never Seldom Not Often Almost

	true	true	applicable	true	always true	Mean
1.If my co-workers are asked, they will say I have a sense of humour.	5	15	28	185	133	4.16
2.I speak out in staff meetings.	2	13	51	176	135	4.14
3.I try new ideas and approaches to problems.	4	18	19	225	120	4.14
4.I provide critical input toward a new solution.	5	11	36	242	84	4.03
5.I will work on a problem that has caused others great difficulty	5	19	27	240	87	4.02
6.I work in teams to try to solve complex problems.	6	38	45	182	107	3.92
7.I demonstrate originality.	3	24	47	228	70	3.91
8.I develop contacts with experts outside my organization.	3	40	51	182	101	3.90
9.I take the opportunity to translate communications from other departments for my work group.	4	18	79	197	74	3.86
10.I openly discuss with my how to get ahead with my Line management.	15	24	65	178	104	3.86
11.Among my colleagues and co-workers, I will be the first or nearly the first to try out a new idea or method.	3	33	56	215	69	3.84
12.I take things or situations apart to find out how they work.	14	29	45	214	82	3.84
13.I can be counted on to find a new use for existing methods or equipment.	6	33	41	237	59	3.82
14.I negotiate my salary openly with senior management.	72	52	159	56	36	2.82
15.I provide written evaluations of proposed ideas.	10	77	73	160	55	3.46
16.I tolerate people who depart from organizational routine.	17	85	88	155	32	3.27
17.I welcome uncertainty and unusual circumstances related to my tasks.	20	106	60	158	41	3.25

18.I make time to pursue my own pet ideas or projects.	26	89	90	133	38	3.18
19.I use personal contacts to maneuver myself into choice work assignments.	39	80	130	85	34	2.99
10.I set aside resources for the pursuit of a risky project.	48	96	131	83	18	2.81

Table 4 – Innovativeness by Sector

	N	Mean
Hotels	173	74%
Schools	139	73%
Universities	8	70%
Food Processors	27	75%
Hospitals	21	73%
Prisons	23	71%
Golf Courses	13	78%

Table 5 Revised Scoring Scale Using Original Scores

	Percentile Score	Percentile	from this study
39 .....	5 .....	7	
53 .....	16 .....	9	
62 .....	33 .....	19	
71 .....	50 .....	49	
80 .....	68 .....	80	
89 .....	86 .....	95	
97 .....	95 .....	99	

Table 6 Revised Scoring Scale Using Quartiles

	Percentile Score	from this study
65 .....	25%	
71 .....	50%	

78 ..... 75%  
 100 ..... 100%

Table 7 – Factor Analysis

Item	Component				
	1	2	3	4	5
1. I openly discuss how to get ahead with my line management.	-.030	.015	.474	.571	.372
2. I try new ideas and approaches to problems.	.246	-.025	.246	.734	-.045
3. I take things or situations apart to find out how they work.	.240	.173	-.040	.731	.135
4. I welcome uncertainty and unusual circumstances related to my tasks.	.235	.351	-.038	.546	-.068
5. I negotiate my salary openly with senior management.	.133	.059	.050		.790
6. I can be counted on to find a new use for existing methods or equipment.	.574	.023	.052	.103	.280
7. Among my colleagues and co-workers, I will be the first or nearly the first to try out a new idea or method.	.729	.124	.038	.298	.042
8. I take the opportunity to translate communications from other departments for my work group.	.456	.145	.436	.107	-.032
9. I demonstrate originality.		.240	.163	.159	-.016
10. I will work on a problem that has caused others great difficulty.	.723	.111	.268	.101	.063
	.733	.107	.266	.147	
		.234	.309	.132	
11. I provide critical input toward a new solution.		.145	.391	.066	.125
	.696				
12. I provide written evaluations of proposed ideas.	.326		.101	.127	.112
13. I develop contacts with experts outside my organisation.			.022	-.108	.357
14. I use personal contacts to maneuver myself into choice work assignments.	.447		.113	-.133	.366
15. I make time to pursue my own pet ideas or projects.			.185	.160	.159
16. I set aside resources for the pursuit of a risky project.	.243	.700		.118	-.048
17. I tolerate people who depart from organizational routine.				.083	-.219
	.156			.036	
	.091	.719			
				-	

	.062				
		.792			
		.476			
18. I speak out in staff meetings.	.292	.012	.629		.211
19. I work in teams to try to solve complex problems.	.101	.131	.800		-.012
20.If my co-workers are asked, they will say I have a sense of humour.	.365	.127	.466		-.118
Eigenvalue	3.437	2.246	2.213	2.051	1.296
% of variance	17.186	11.230	11.064	10.253	6.478

#### KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.888
Approx. Chi-Square	2382.439
Bartlett's Test of Sphericity	df
	190
Sig.	.000

Table 8 – Number of Factors in Sector Data

	<u>No. of Factors</u>
Hotels	5
Schools	5
Universities <sup>1</sup>	-
Food Processors	6
Hospitals	7
Prisons	5
Golf Courses	5

<sup>1</sup> Insufficient data to compute Factors.

Table 9 Factor Interpretation

Factor 1	Leadership dimension
Factor 2	Team dimension
Factor 3	Communication dimension
Factor 4	Risk dimension
Factor 5	Reward dimension

