

Collaborative Climate and Effectiveness of Knowledge Work – an Empirical Study

Karl-Erik Sveiby

Swedish Business School, Hanken, Helsinki

Roland Simons

Queensland University of Technology, Brisbane

Final draft July 2002

Published in Journal of Knowledge Management, Vol. 6 No. 5, 2002

Awarded "Most Outstanding Paper"

in 2002 volume of Journal of Knowledge Management

karlerik@sveiby.com

r.simons@qut.edu.au

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1. Abstract

This article suggests that collaborative climate is one of the major factors influencing effectiveness of knowledge work. The concept of collaborative climate is discussed and a survey instrument to measure it is developed. Results based on data from 8277 respondents in a wide variety of public and private sector organisations are presented.

Collaborative climate tends to improve with age, education level and managerial role. It is generally better in private firms than in Collaborative climate seems peak with mid-size firm level. Employees tend to experience a U-formed appreciation of the collaborative climate; very positive at recruitment, then deteriorating and later improving again. Theories proposing that people reach a 'professional plateau' (an S-formed curve) have been supported to some degree. Finally, collaborative climate in the private sector is generally better than in the public sector.

The data were used to identify gaps and potentials for improving effectiveness. Two cases of good and bad practice were further investigated and strengths and weaknesses identified. The survey instrument can be self-tested at www.sveibytoolkit.com.

Keywords: Knowledge work, effectiveness, collaborative climate, knowledge transfer, knowledge sharing, collaboration.

Wordcount: 7,125

2. What is Collaborative Climate?

In 1999 Drucker postulated that the most urgent management issue for the 21st Century is to make the knowledge worker more productive. A term more conducive to value creation in knowledge work would probably be 'effective'. In the last few years it has been argued that the effectiveness of knowledge work has to do with how the creation of new knowledge and transfer of existing knowledge is organised (Nonaka & Takeuchi 1995). Practitioners claim that underutilised knowledge is the largest hidden cost in organisations. (c.f. the CEO of HP Lew Platt lamenting: 'if HP only knew what HP knows').

The organisation's ability to transfer knowledge from one unit to another has been found to contribute to the organisational performance of firms in both the manufacturing (Epple, Argote, & Murphy, 1996) and service sectors (Darr, Argote, & Epple, 1995). The benefits of knowledge sharing have been documented in many settings (Stewart 2001), but the effectiveness varies considerably among organisations (Argote & Ingram 2000).

What is it that makes some knowledge transfer and –creation processes more effective in creating value than others? Clearly, process design, office design, information sharing software,

etc help effectiveness and anecdotes about 'best practice' abound in knowledge management circles. But careful design and IT do not help if the willingness to share with each other is not there. Although Buckman Labs has been a heavy user of IT infrastructure since the mid 1980s, earlier president Bob Buckman attributes his company's more than doubling of introduction of new products from 14% of sales to 34% to an improved climate of trust and increased willingness to collaborate.

The trouble is that knowledge is not a discrete object and that the most valuable knowledge – knowledge – is embedded in people and so difficult to transfer outside the immediate context that it becomes a major competitive advantage. In their theoretical paper (Argote & Ingram 2000) argue that companies can utilise this feature strategically by embedding knowledge in interactions involving people.

However, also internal knowledge transfer is very difficult to achieve. Executives cite the internal 'culture' of resistance to sharing as the hardest barrier to overcome in implementation of KM. In a Conference Board report by Hackett (1999) managers identify the major obstacles to knowledge management. The second biggest hurdle (after 'perceived need for KM') is 'a culture of hoarding knowledge'. The culture is also where the surveyed managers believe the best opportunities will be found in the five years to come.

Scholars tend to define culture as the deeper level of basic values, beliefs and assumptions that are shared by an organisation's members. The values, beliefs and assumptions are influenced by members' activities and can be observed in behaviours, (Schein 1991, Laine-Sveiby 1991). That a culture of trust and collaboration improves knowledge sharing and organisational effectiveness in general is argued by several authors, who also link trust, collaboration and knowledge sharing. Urch-Druskat V & Wolff B. S (2001) argue that trust, identity and efficacy are the core elements for team collaboration. Also Huener, Krogh & Roos (1998) regard the level of trust in the organisation as the most important factor affecting the willingness to share knowledge being.

Although seemingly self-evident, there is scant empirical evidence for such assertions. Tschannen-Moran (2001) has made one of the few empirical studies on the topic and found evidence that the level of collaboration in schools was related to the level of trust. She found a significant link between collaboration with the principal and trust in the principal, collaboration with colleagues and trust in colleagues, and collaboration with parents and trust in parents.

Still, even if we can accept that effective knowledge sharing relies on trust and collaboration which is more effective for creating value, competition or collaboration? Since the birth of market

economy competition has proven its worth. Can collaboration be more effective? Although anecdotal evidence and some empirical studies suggest that trust and collaboration are essential ingredients for the willingness to share knowledge, information and ideas there is no empirical evidence that more collaboration is 'better', i.e. creates more value than competition.

Collaboration and trust can be seen as elements of an organisation's culture, but the concept of culture is contested and too broad to be a good foundation for large-scale empirical studies. We are interested in only one specific aspect of culture; the values, beliefs and assumptions that influence the behaviours and the willingness to share knowledge. We decided to call this aspect *collaborative climate* defined by behaviours that people can observe, 'what people do around here'.

With this in mind we identified and extracted some fifty factors mentioned in literature on culture and employee attitude as influencing knowledge sharing, trust and collaboration. The first selection of survey items was derived from research into the nature of teamwork and knowledge sharing in research and development teams found in literature. Main sources were Cheng J. L. C (1993), Oliver A.L & Liebeskind J.P (1997), von Krogh G. & Roos J., Elkjaer B. (1998), Inkpen A.C (1998), Hales M. (1998), Berman E.M. & West J.P. (1998), Klimecki R. Lassleben H., (1998), Long R.G., Bowers W.P., Barnett T., White M.C. (1998). Initial item creation was based on expert panels interpreting the literature (see 1.1 Design of the Instrument below).

The final set of factors influencing knowledge sharing was grouped in four clusters; One group of questions that describes the respondent's own attitude, *Employee Attitude (EA)*; one that describes the knowledge sharing behaviour of the individual's nearest colleagues, *Work Group Support (WGS)*; one that describes the behaviours of the immediate manager, named *Immediate Supervisor (IS)*; and finally one of leadership factors outside the individual's nearest working environment, which we named *Organisational Culture (OS)*.

1.1 Design of the Instrument

The items from literature were generated in three panels of experts (typically there were five experts per setting) who brainstormed a range of items. In total over 120 items were generated across the three settings. The settings were (1) university research centre staff (n=128), (2) research and development teams in Australian private sector firms (n=213) [computing and pharmaceutical] and (3) government based expert system development teams. The items in each setting were validated by running the complete set of items against a sample of employees and the set was then cut down to the fifty most salient. (Factor analysis and experimental testing were involved at this stage.)

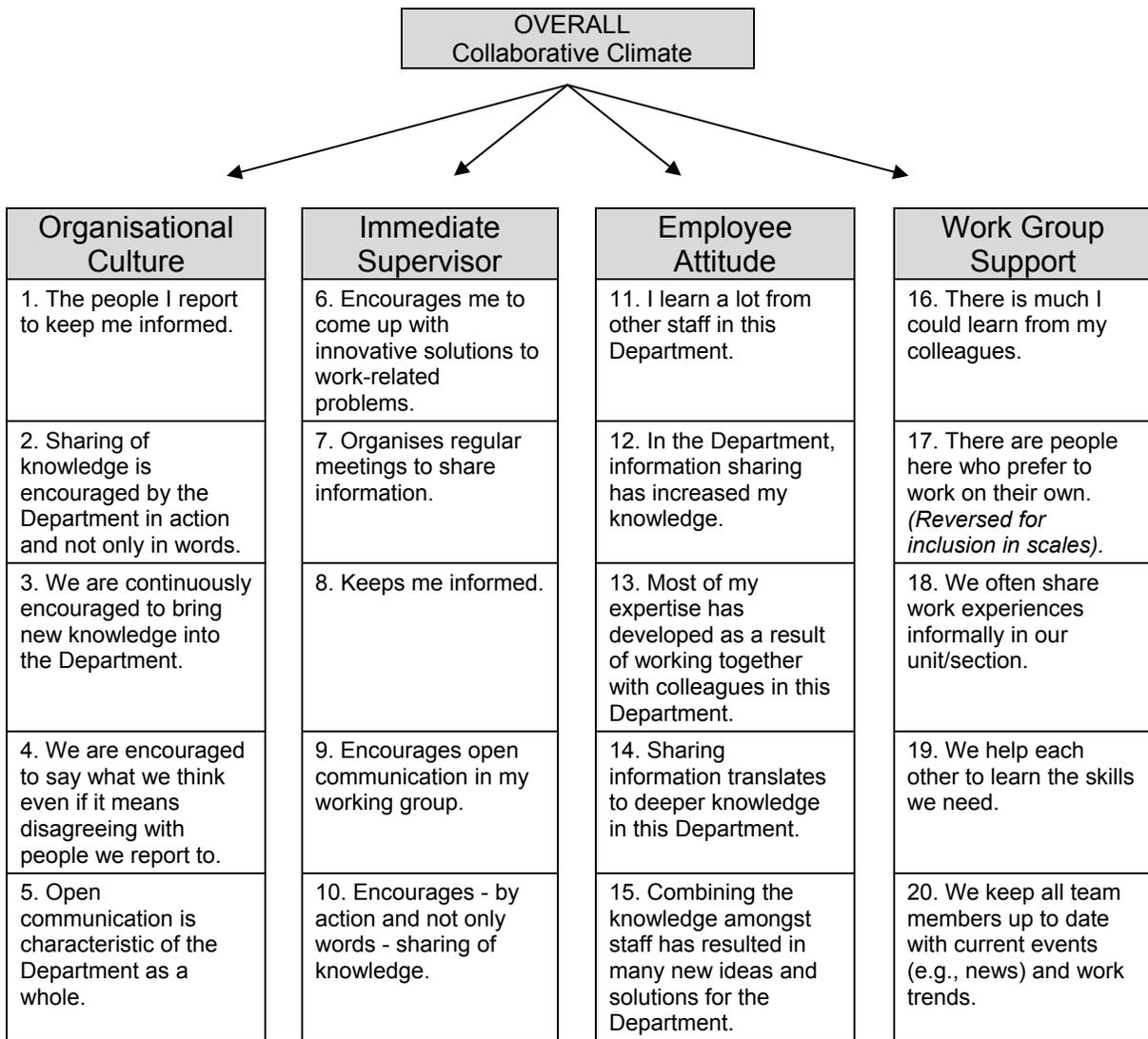
The best items were then selected for the first pilot survey (conducted in a professional services firm) using two different questionnaires each with 25 questions. These were alternate forms designed to be valid and stand-alone versions of the final survey. The first pilot survey was validated into three scales (1) self, (2) leadership and (3) team attitudes to knowledge sharing. However, higher scores were achieved by distinguishing two different categories of leadership, one that we identified as nearest supervisor and one about leadership in more general terms, which we called 'organisational culture'.

Mindful of minimizing survey fatigue we set maximum 20 questions as the goal for the final instrument. The alternate questionnaires were validated with pilot companies with the final set of questions: a 20 item questionnaire with 1 open-ended item attached. Cronbach Alpha for the four scales was 0.89, 0.85, 0.88, 0.81, and 0.87 for Organisational Culture, Immediate Supervisor, Employee Attitude, Work Group Support and Total scores respectively. This indicates a very high reliability.

We then allowed private companies and public sector organisations to access the survey on a commercial basis over a period of three years 1999 - 2001. The responses have been stored in a database (cleared of confidential information), which at the time of this study comprised 8277 responses. The instrument remained unchanged throughout the period of testing (with the exception that some firms chose the terminology of 'firm' whilst others used 'organisation' or 'company'. Public sector organisations chose terminology such as 'The Department'), comprised of four scales each with 5 items: *Employee Attitude* (EA), *Immediate Supervisor* (IS), *Work Group Support* (WGS) and *Organisational Culture* (OS). Each item is rated using a 5 point Likert - (5 = *strongly agree*, 3 = *neutral*, and 1 = *strongly disagree*). Scale scores are calculated by summing item scores. A total score is also calculated by averaging all scores.

The final set of factors is:

Table 1. Components of Collaborative Climate. Composition of Scales



1.2 The Sample

By the end of 2001 the survey had yielded a total sample of 8277 employees. The sample was split into Australian respondents (n=5613), North American/Canadian respondents (n=868), and Rest of the World (largely Asia Pacific and Scandinavian countries; n=1746). The modal age range of respondents was 31 to 35 years. A total of 6107 respondents answered the gender demographic 3461 (56.7%) were males and 2646 (43.3%) were females. Results indicated that 3826 (63.3%) private sector and 2210 (36.7%) public sector responses were collected. Occupational level information provided by 5449 respondents indicated that 4182 (76.7%) were

classified as employee (junior & senior), 873 (16.0%) were classified as management (frontline, middle, senior), and 394 (7.2%) were consultants (internal, external). Highest educational level information provided by 5216 respondents indicated that 216 (4.1%) had primary education, 1614 (30.9%) were high school educated, 2921 (56.0%) held bachelor degrees, and 465 (8.9%) held post-graduate degrees.

Table 2. Demographic characteristics of the sample

Variable	Category	Description	n
Age (n=6527)	1	< 26 years	724
	2	26-30 years	1199
	3	31-35 years	1326*
	4	36-40 years	961
	5	41-45 years	735
	6	46-50 years	651
	7	> 50 years	931
Gender (n=6107)	1	Male	3461*
	2	Female	2646
Sector (n=6036)	1	Private	3826*
	2	Public	2210
Occupational Level (n=5449)	1	Managerial	873
	2	Consultant	394
	3	Employee	4182*
Educational Level (n=5216)	1	Primary Education	216
	2	High School	1614
	3	University degree	2921*
	4	Post Graduate	465
Work Experience (n=3488)	1	0-5 years	1192*
	2	6-10 years	821
	3	11-15 years	732
	4	16-20 years	415
	5	21-30 years	102
	6	>30 years	226

* indicates modal response

1.2.1 Demographic Inter-correlations

Investigation of the demographic variables indicated (as would be expected) significant correlations between Age and years of experience ($r=0.47$) as well as Age and education level ($r=0.12$; See Table 3).

Table 3. Investigation of inter-correlations between demographic variables.

	Total CC Score	Age	Years	
			Experience	Firm Size
Age	0.35**			
Years Experience	0.14**	0.47**		
Firm Size	-0.01	0.02	0.04	
Education Level	0.19**	0.12**	0.04	0.00

* significant at $p<.05$ (two tailed)

** significant at $p<.01$ (two tailed)

A number of statistically significant results were noted between the levels of each categorical variable on each of the continuous variables (see Table 3. Investigation of inter-correlations between demographic variables.). Occupational Levels (employee, consultant, manager) were found to be significantly different on age, years of experience, firm size and educational level. Tests (Tukey's Post-hoc) revealed that employees were significantly younger than both consultant and manager groups and consultants were significantly more educated than managers who were, in turn, significantly more educated than employees. Also consultants were significantly more experienced than both employees and managers and consultants tended to be employed by companies that were significantly larger than both employees and managers.

Table 4. F-test results of categorical demographic variables

	Occupational Level		Gender		Sector	
	F	(Df)p	F	(Df)p	F	(Df)p
Age	21.60	(2,4263)**	1.03	(1,4789)	5.96	(1,4811)*
Years Experience	4.69	(2,2319)**	2.37	(1,2574)	0.00	(1,2622)
Firm Size	4.43	(2,4337)*	0.95	(1,3180)	2.21	(1,3242)
Educational Level	31.63	(2,3431)**	4.37	(1,3832)*	0.56	(1,3905)

* significant at $p<.05$ (two tailed)

** significant at $p<.01$ (two tailed)

Men and women were only found to differ on education level, in which women were (on average) significantly more educated. Private and public sector respondents were only found to differ in age, in which private sector respondents were (on average) older than public sector respondents.

The null hypothesis,

H0. There is no difference between genders in their views on Collaborative Climate, was supported. An ANalysis of CoVAriance (ANCOVA) controlling for the effect educational level indicated a non-significant difference for Gender on Total CC Score, $F(1, 3831)=1.21, p>.05$.

2 The Findings

2.1 Older is Better

One would expect older people to be more experienced in knowledge sharing than the juniors, with larger networks and easier access to knowledgeable colleagues. Therefore they could be expected to regard the collaborative climate more favourably than their younger colleagues. This hypothesis was supported by the data. There is a significant difference in view.

Figure 1. Scales by Age

(OC = Overall Climate, IS = Immediate Supervisor, EA= Employee Attitude, WGS= Work Group Support).

H1: Older respondents regard the Collaborative Climate more favourably than other groups.

An hierarchical multiple regression controlling for the effects of years experience, and educational level (in step 1) indicated a significant prediction of Total CC Score using Age, $F_{\text{change step 2}}(1, 2252)=141.74, p<.001, \text{rsquare}_{\text{change step 2}} = .06$. Linearity analysis indicated, that with the exception of a trend reversal between the 26-30 year and 31-35 year categories, an increase in age was related to an increase in average Total CC score. The hypothesis was supported.

The finding has important implications for the effectiveness of knowledge work: Every year a knowledge worker spends below his/her potential can be seen as a lost opportunity or a 'gap' in terms of effectiveness. What can organisations and (in particular) individuals do to close the gap by reaching a more mature level earlier?

H1 confirms that it takes time to build up experience and the social networks necessary for effective sharing. People who have been employed longer, the 'seniors', should have better internal networks and more experience in navigating the internal politics than the new recruits.

The seniors should not experience the same barriers as the new recruits and would thus regard the collaborative climate in a more positive light.

We tested:

H2 – Employees with more years of employment in the firm regard the Collaborative Climate more favourably than those with less seniority.

Figure 2. Scales by Years of Employment

While the hypothesis about a straight correlation was not supported an interesting U-shape was discovered. A Multivariate Analysis of Variance (MANOVA) revealed a significant multivariate effect for years of employment with the firm $F(16, 19152) = 6.47, p < .001$. Investigation of the univariate effects for each scale revealed significance: Organisational Culture, $F(4, 4788) = 4.86, p < .001$, Immediate Supervisor, $F(4, 4788) = 5.65, p < .001$, Employee Attitude, $F(4, 4788) = 6.52, p < .001$, and Work Group Support, $F(4, 4788) = 5.24, p < .05$.

The multivariate effect size was very small ($\eta^2 = .005$). Yet, it should be noted that investigation of linearity, indicated that a significant quadratic function was better at explaining the differences. Therefore, linear estimations of effect size provided by MANOVA are likely to be limited in validity. Tukey's post-hoc analyses lent further support to the notion that the relationship was non-linear, since significant differences between those with 6 to 20 years employment and those with less than 6 and more than 20 years employment were revealed.

The pattern suggests that new employees enter the organisation enthusiastic about the internal climate; they then grow more cynical. The disillusioned probably leave within the first five years, (in professional services firms staff turnover is highest 2 -4 years after employment). Although we would need longitudinal studies to confirm this conclusion, the stayers would be the survivors; those who thrive and have learned best how to leverage the climate in their favour (plus probably those who find no other alternatives).

The results suggest that it takes much longer for new employees to become truly effective in their new environment than has been generally understood and definitely more than accounted for in induction programs, which typically rarely last longer than 6 months.

The results also have important implications for the effectiveness of knowledge work. Putting more effort into helping employees up to 3-5 years of employment to build relationships and

getting 'logged into' the human knowledge infrastructure should be very profitable investments. There is a lot of money involved here; probably much more than even the cost of staff turnover, which as a rule of thumb amounts to 2-3 times annual salary for a person that leaves.

2.2 The Professional Plateau

What happens when people grow in expertise? One could assume two opposing alternatives, either people grow more cynical over the years and stop sharing knowledge or the more positive alternative; experienced people find the collaborative climate more favourable, perhaps because they no longer fear competition. The following hypothesis (controlling for age) was tested:

H3 – Employees with fewer years of experience regard the Collaborative Climate more favourably than those with more experience.

Figure 3. Scales by Years of Experience

The hypothesis was not supported as stated. It seems that the reverse is true. The greater the years of experience the more likely people are to report more favourable collaborative climate. This was supported by significant correlations as well as significant MANOVA results, $F(20, 13928) = 5.40, p < .001$. The assumption of homogeneity of variance between the groups was violated for Employee Attitude. However, univariate results for the remaining scales were significant: Organisational Culture, $F(5, 3482) = 4.84, p < .001$, Immediate Supervisor, $F(5, 3482) = 5.44, p < .001$, Employee Attitude, $F(5, 3482) = 4.32, p < .001$, and Work Group Support, $F(5, 3482) = 6.20, p < .05$.

The overall multivariate effect size was small ($\eta^2 = .008$) but some deviations from linearity suggest that effect sizes were likely to be larger. Contrast analyses reveal that linear functions were identified for Organisational Culture and Immediate Supervisor scales. Cubic (s curve) functions were identified for Employee Attitude and Work Group Support scales

Tukey's post hoc analyses indicated a significant period of change for Employee Attitude and Work Group Support scales occurred between the 11 to 15 years and 16 to 20 years groups.

Employee attitude seems to peak after some 15 years of experience and then go down. Also the attitude towards the nearest manager deteriorates. There is a trend toward significance between WGS and EA between the 11-15 and 16-20 groups and OC is trending towards different between

the 16-20 and 21 –30 groups IS is trending toward difference between 11-15 (and lower) and 21 to 30 groups.

It is unlikely that people of 20 years experience find themselves in organisations where the collaborative climate is worse than that of people with 15 years of experience. Is there something happening to professionals after 15 years of work, e.g., do people look for something different?

Sveiby (1987 1997) suggests an explanation based on personal observations and anecdotal evidence from professional services firms: that many professional people reach a 'professional plateau' after a number of years in the same profession. They feel they have learned everything there is to learn, they have heard all the questions before and they do not think their own ideas are fresh any more. A very experienced person might also start feeling annoyed by supervisors interfering.

The fact that people experience a plateau after some 15 years in a profession is probably a quite natural development and the insight has important implications for the effectiveness of knowledge work. An experienced but de-motivated knowledge worker is a huge drain on effectiveness both for him/herself and for others. Therefore both organisations and individuals should regard the plateau as normal, plan for it and not be surprised when it occurs.

2.3 Power is Knowledge

We tested three hypotheses about power and knowledge sharing.

First, people who feel powerless may react by raising the barriers against sharing. A reason the workers in the maintenance workshop of ATU (see below chapter 4) express themselves so negatively about the collaborative climate in ATU could be that they feel powerless to influence their situation. People with higher education find it easier to influence their own environment; they are less vulnerable to downsizing than lower educated people, they find access to knowledge easier and they can more easily interpret information shared.

Figure 4. Scales by Education Level

We tested,

H4. Respondents with higher education regard the Collaborative Climate more favourably than other groups.

A hierarchical multiple regression controlling for the effect of age (in step 1) indicated a significant prediction of Total CC Score using Educational Level, $F_{\text{change step 2}}(1, 4138)=90.24, p<.001$, $rsquare_{\text{change step 2}} = .02$. The hypothesis was supported. Linearity analysis identified a steady progression of scores associated with an increase in educational level.

The result highlights the effectiveness potential that lies in having highly educated employees. The climate may be very collaborative, but only those with higher education can experience it. The result also underscores the risk of a two-tier society in the future.

If workers on the shop floor rate the collaborative climate low for lack of power, managers should be more positive. Positional power may influence in a positive way managers' ability to share knowledge and a manager position may bias one's opinion about one's own organisation. We tested the second 'power hypothesis':

H5. Respondents on Managerial level regard the Collaborative Climate more favourably than other groups.

We tested to see whether each occupational group was significantly different from the other. We also took out any sampling differences that might be due to age, experience, firm size, and education level.

Figure 5. Scales by Occupational Level

Whilst mean scores suggest an encouraging pattern the hypothesis was not supported. There is only a trend weak; An ANalysis of CoVAriance (ANCOVA) controlling for the effects of age, years experience, firm size, and educational level indicated non-significant differences for Occupational level on Total CC Score, $F(2, 1246)=1.61, p>.05$.

The third 'power-hypothesis' we tested concerns the influence of the nearest managers. They have a huge influence over the climate at the work place. It is sometimes said that employees join a company but leave their supervisor. One might therefore assume that one's opinion about the supervisor might colour one's opinion about the rest of the organisation.

We tested:

H6 – People who rate their supervisor low on Collaborative Climate also have a generally more negative view as a whole.

We ran a regression on which of the other scale scores (i.e., culture, immediate supervisor, work group) predict employee attitude.

Table 5. Employee Attitude Prediction

	Beta	t	significance	P<.05
OC	-0.01	-0.57	0.57	No
IS	0.03	2.30	0.02	Yes
WGS	0.01	0.71	0.47	No

Only Immediate Supervisor predicted employee attitude. But in total this is a small result with only 0.1% of employee attitude being predicted by immediate supervisor ratings. The survey was designed to measure distinct components of a collaborative climate. The result therefore reassures the validity of the CCS.

2.4 Big is Better

A common sense opinion is that small organisations (SMEs) have a more favourable collaborative climate; both because it is easier to share in a smaller number of people and because the small size suggests a closer-knit community. We tested:

H7 - Respondents in smaller organisations regard the Collaborative Climate more favourably than employees in larger ones.

To our surprise the hypothesis was not supported, on the contrary: larger firm size is positively correlated with better collaborative climate. A hierarchical multiple regression indicated a significant prediction of Total CC Score using Firm Size, $F(1, 4338)=0.13, p>.05$. (A small organisation is 50 people or less, Medium is 51 to 250 people, and Large is 251+).

An interesting result from the further analysis suggests that employee attitude peaks with mid sized firms and that the view on immediate supervisors gradually increases, while Overall Culture and Work Group support both drop slightly with increasing firm size.

Why are not SMEs better at utilising their apparent natural size advantage? Could it be that managers of larger firms are better trained and are able to make up for the drawbacks of larger-sized firms? The findings support specific educational actions aimed at SMEs.

Figure 6. Scales by Size

2.5 Distance is Bad

Thomas Allen (1977) proved that the probability of communicating with other people falls dramatically with distance in a university research setting. The collaborative climate might therefore be judged gradually less and less favourable the farther away the colleagues are from one's own nearest workgroup. To test this assumption we compared the mean difference between one's own work group and the overall culture scores.

H8. Collaborative climate is lower for Overall culture than for work group support.

The hypothesis was supported. T-test revealed that Overall Culture was lower ($M=12.53$) than Work group Support ($M=12.86$), $t(1,8276) = -3.390$, $p<.00$.

The implication for effectiveness is important. Initiatives to reduce distance (in a broad sense) should be profitable investments.

2.6 Private is Better

At face value there is no reason why collaborative climate would be different in public sector organisations compared to private sector companies. One might assume a higher level of competitiveness in private sector, which might influence collaborative climate negatively compared to public sector, but also a public sector that lags behind the private sector in terms of know-how about knowledge management.

Figure 7. Scales by Sector

However, there is a difference: The hypothesis,

H9 – Public sector respondents rate Collaborative Climate less favourably than their private sector counterparts.

was supported. An ANalysis of CoVAriance (ANCOVA) controlling for the effect of age indicated a significant difference for Sector on Total CC Score, $F(1, 4810)=10.54$, $p<.01$, $\eta^2 = .11$.

Investigation of the means scores supports H9 where private sector scores were higher than those seen for public sector respondents.

Why the difference? Public sector organisations employ large number of knowledge workers and do not have less need for knowledge sharing than private sector firms. The study suggests that there is a huge potential for improving effectiveness of knowledge work in the public sector.

3 Good Practice – Buckman Labs

Buckman Labs has become an icon in the KM discipline with its well-publicized initiatives in Knowledge Management. In particular Buckman Labs knowledge sharing culture has been hailed as an example so it was with some anticipation that we examined the results from CCS survey on the Buckman staff. Would Buckman stand up to its reputation? Or would the survey design be invalidated?

Buckman Laboratories produces specialty chemicals for a/o pulp and paper, water treatment, agricultural industries worldwide. Its core competency is its ability to create and manufacture innovative solutions to control the growth of micro organisms.

Founded in 1945, Buckman Labs is privately owned, has revenue of some \$265 million and employs about 1250 people worldwide. Small on a global scale and spread in 80 countries the best brains in the company were hard to leverage.

The need spurred the creation of a new entity called The Knowledge Transfer Department with a budget of about \$8 million. Its goal was to accelerate the accumulation and sharing of knowledge by all Buckman Labs associates worldwide and to eliminate time and space constraints in communication. In 1992 the department developed an interconnected system of data bases, called KNetix. used by Buckman associates worldwide to share knowledge electronically and to collaborate closely with each other. One feature of Buckman's knowledge transfer efforts is the emphasis on direct horizontal communication between individuals via its 'Tech Forum' reducing distortion of interpretations.

3.1 Buckman Survey Results

The CCS on Buckman Laboratories was conducted first quarter 2000. Total sample size was n=39.

Figure 8. Buckman Labs and Australian Transport Utility Survey Results

Buckman Labs outperformed all benchmark indicators with most scales significantly higher than their benchmark equivalent and received a result close to 80% of the maximum score possible. The only exception from this was the Immediate Supervisor scale. Statistical significance was calculated using ANOVA (Analysis of Variance) against the data base, which at the time held 436 respondents. Particular strengths in Buckman's Organisational Culture are the perception that knowledge sharing happens in reality and not only in words. Supervisors encourage open communication and innovative solutions. Work Group Support indicated that overall employees regard each other as a valuable source of knowledge. Furthermore, employees feel that they share information freely (both formally and informally).

The CCS thus confirms the reputation: Buckman Labs seems to have succeeded in creating a collaborative climate where employees regard other employees as colleagues moving towards a common goal, not as adversaries whose progress will impede their own. An essential ingredient

has probably been Bob Buckman's strong push and his belief in the benefits of knowledge transfer is an essential prerequisite for such an effort to succeed.

The most powerful individuals in the future of Buckman Labs will be those who do the best job of transferring knowledge to others. - Bob Buckman

4 Bad Practice – Australian Transport Utility (ATU)

ATU is a government-owned transport utility servicing one of the Australian states with railway and road transport services. It has some 14,000 staff. The ATU CC survey was undertaken in October – November 2000 to establish ATU's state of preparedness in becoming a knowledge-centred organisation. The Collaborative Climate Survey was distributed to approximately 3,000 staff, and 1,180 completed surveys were obtained (representing a response rate of ~ 40%). The survey results were followed up by focus group interviews.

Figure 9. Australian Transport Utility Survey Results

Whilst employees' attitudes (IS) to knowledge sharing are on the mean, the rest of the ATU culture is not seen as conducive to knowledge sharing, with the Organisational Culture (OC) scoring lowest. In particular workers in the maintenance workshops rate the collaborative climate the lowest of all employee groups in ATU, citing many barriers to knowledge sharing in the interviews.

Although ATU is no longer the worst performing organisation in the database, (that unenviable position is at the time of writing, July 2002, held by an Australian volunteer organisation that delivers nursing support to the elderly), the scores of ATU workshops fall into the 5th percentile and are thus indicators of bad practice.

The collaborative climate can be described as the 'the bandwidth' of the human infrastructure for knowledge sharing. Sveiby (2001) identifies nine strategic knowledge transfers for value creation in an organisation plus a tenth integrating strategy. If the collaborative climate is poor, the bandwidth narrows, the infrastructure deteriorates and knowledge sharing does not take place, no matter how sophisticated IT systems are implemented. The organisation's capacity for creating value is thus being restricted.

Table 6. The Ten Knowledge Transfers for Value Creation

1. Knowledge transfers/conversions between individuals
2. Knowledge transfers/conversions from individuals to external structure
3. Knowledge transfers/conversions from external structure to individuals
4. Knowledge transfers/conversions from individual competence into internal structure
5. Knowledge transfers/conversions from internal structure to individual competence
6. Knowledge transfers/conversions within the external structure
7. Knowledge transfers/conversions from external to internal structure
8. Knowledge transfers/conversions from internal to external structure
9. Knowledge transfers/conversions within internal structure
10. Maximise Value Creation – See the Whole

The (verbatim) quotes from the maintenance workers were interpreted in the knowledge-based strategy framework (see Figure 10. Blocking Knowledge Transfers). The quotes highlight blockages in practically all nine strategic knowledge transfers and consequently a severely restricted ability to create value.

The focus group findings from ATU overall highlight a poor collaborative climate in combination with a general lack of trust among employees both towards their colleagues, their managers and the organisation as a whole.

ATU staff see themselves as operating within organisational silos, with little understanding of the ATU that exists around them. Groups compete, rather than collaborate. Staff claim that they are unable to locate relevant information and experts outside their silo; and because they don't know what is happening elsewhere in ATU, efforts are duplicated and mistakes are repeated. At the organisational level, the recently implemented internal trading system is thought by staff to actively discourage both the application of best-available expertise and the reuse of knowledge. It emerges as a significant barrier to knowledge sharing in ATU.

Even within the silos, ATU staff complain they do not share knowledge, expertise and skills freely. The expression knowledge is power is frequently used in the interviews and in the free text responses to the survey, reflecting a perception that in ATU knowledge is a competitive asset. Staff that hoard knowledge are thought to be rewarded – they keep their jobs, and gain promotion

Figure 10. Blocking Knowledge Transfers

Finally, ATU's knowledge base is thought to be eroding. The ongoing downsizing program (through voluntary retirement) creates problems such as inadequately maintained systems for documenting technical knowledge and poor access to training and skill development opportunities. ATU is also seen to be weak at recognising and using valuable external knowledge sources, with a 'right way, wrong way, ATU way' mindset.

5 Conclusions and Suggestions for Future Research

In this article we propose that improving the collaborative climate is one of the major answers to Drucker's 21st Century management challenge; effectiveness of knowledge work. Questions we have tried to answer in this first piece of research have been: Can collaborative climate be measured? Do differences in collaborative climate depend on gender, experience, age, education, size, power position, distance or type of organisation, etc.?

We have developed a theory for identifying the human infrastructure for knowledge sharing and knowledge creation – Collaborative Climate – and proposed a method for measuring it. We have developed and validated a survey instrument, collected data and made a first analysis. The large database makes the findings statistically quite robust.

We have found that collaborative climate tends to improve with age, education level and managerial role. Contrary to 'common sense' collaborative climate also seems to improve with organisational size at least up to mid-size, an inverted U-shape. We have further found that employees tend to experience a U-formed appreciation of the collaborative climate; very positive at recruitment, then deteriorating during the first 5 years and later improving again closely correlated with seniority in the organisation. We have to some degree confirmed theories proposing that people reach a 'professional plateau' after around 15 years in the same profession (an S-formed curve) when they begin to rate lower than in their earlier years what they learn, what they receive from their nearest work environment and their managers. We have also confirmed earlier empirical evidence that distance is bad for collaboration. We have found that gender has no impact on the perceptions of collaborative climate. Finally, we have found collaborative climate in the private sector to be generally better than in the public sector.

This study is but a first step in this field and the conclusions are still tentative. Even if we have been able to identify potentials for effectiveness improvements and also cases of bad and good practice, we have not had the data to empirically prove that the effectiveness potentials can also be translated into value creation in financial or in other terms. Other crucial issues for future research are: What is the difference in value creation between a 'good' vs. a 'bad' collaborative

climate? Do differences in collaborative climate have an effect on profitability? The question of what is most effective: collaboration or competition requires more data particularly financial data, to answer.

The results also highlight several other research issues:

An area of high potential value for organisations should be to study how people can become more effectively 'logged into' an organisation's knowledge sharing infrastructure. What induction processes are required? What is the value of investments in helping employees to build up their knowledge infrastructure? Can 'bad' collaborative climates be improved? What investments are required to change a bad collaborative climate?

What does it take for individuals to move on from a 'professional plateau' and enter a new growth phase? What are the management strategies for dealing with professional plateaus?

Why do public sector organisations have worse collaborative climates than private sector firms? Is it inherent in the structure and the tasks or is it just poor management? What can be done about it?

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