Competitive intelligence: construct exploration, validation and equivalence

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Abstract

Purpose – Little empirical research has been conducted on competitive intelligence (CI). This paper aims to contribute to the quantitative strand of the CI literature by exploring and validating the theoretical constructs of the CI process.

Design/methodology/approach – Data from 601 questionnaires filled out by South African and Flemish exporters were subjected to exploratory factor analysis and construct equivalence analysis between the sub-samples.

Findings – The results showed that the CI process consists of three constructs, while the context in which CI takes place consists of four constructs. This agrees to some extent with the literature. When verifying the constructs for both cultures it was found that all but one CI context construct can be viewed as equivalent in both groups. Bias analysis identified one item in the questionnaire that was biased. Via regression analysis it was also indicated that the context in which CI takes place influences the CI process to a large extent. The research identified size as an important influencing factor in a business' CI process.

Practical implications – Businesses involved in CI should take note that an improvement in their formal infrastructure, employee involvement and internal information processes could enhance their CI capability.

Originality/value – This paper contributes towards the formalising of the constructs of competitive intelligence.

Keywords Competitive strategy, Intelligence, South Africa, Belgium

Paper type Research paper

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1. Introduction

Porter's (1980) seminal work on strategic management and competitive analysis, which focused on tracking specific competitor behaviour and linking competitor analysis to competitive strategy, touched off an avalanche of publications on competitive intelligence (hereafter CI) (Peyrot *et al.*, 2002, p. 748). Much of the CI "research" consisted of anecdotal case studies of corporate CI activity in a variety of settings: a life insurance company (Fletcher and Donaghy, 1993), the forest products hardboard industry (Munk and Shane, 1994), electric utility regional cooperatives (Galing, 1995), banks (Boucher, 1996), the health care industry (Austin *et al.*, 1995), and multi-industry examples (Lenz and Engledow, 1986; Ettorre, 1995).

Ramaswamy *et al.* (1994) state that there has been little empirical research on CI, and the published quantitative research to date has been largely descriptive in nature, describing the distribution of CI skills, resources and capabilities across organizations (e.g. Peyrot *et al.*, 1996; Prescott and Smith, 1989). The quantitative research that was conducted on CI practices of firms since then includes a global survey by Sawka *et al.* (1995) and a survey of high-technology firms in Canada by Calof and Breakspear (1999). The aim of this paper[1] is to contribute to this quantitative strand of the CI literature by exploring and validating the theoretical constructs of CI in export oriented firms with a combined sample of firm data from two very different countries (the Republic of South Africa and the Flemish Region in Belgium).

The comparison between these two countries is interesting because South Africa is an emerging economy, while Flanders (the Flemish region of Belgium) represents a First World economy, allowing us to assess the applicability of constructs we obtain in very different institutional contexts. Our focus fell on export companies, since the differences in economies are most pronounced in these companies. South Africa does not have the diverse export pattern that is present in Belgium. More than 40 per cent of total South African exports are exported to Europe, which is more than 10,000 kilometres away, while the normal export pattern in Belgium (also evident in Flanders) is to export mainly to neighbouring countries. Both countries also differ substantially in terms of openness of their economies: Belgium had a total trade volume (exports and imports) as a percentage of GDP of 169.33 per cent in 2000, whereas it was only 55.15 per cent for South Africa. Belgium's trade is largely within the European Union (and thus to other developed countries), whereas South Africa's trade is more dispersed and includes more trade with developing countries (Heston *et al.*, 2003; UNCTAD, 2003). If a model of the CI construct could thus be developed that holds for both these countries, it may be deemed applicable to a large variety of other countries.

The remainder of this paper is organised as follows: section 2 presents a brief overview of the literature on competitive intelligence; section 3 focuses on the methodology followed and the empirical analysis of the data; finally, in section 4, conclusions are reached and recommendations are made.

2. On competitive intelligence

2.1 Definition

We consider CI to be the component of business intelligence aimed at gaining strategic advantage, as proposed by Porter (1980). CI includes competitor intelligence as well as intelligence collected on customers, suppliers, technologies, environments, or potential

business relationships (Guyton, 1962; Fair, 1966; Grabowski, 1987; Gilad, 1989). The Society of Competitive Intelligence Professionals (SCIP, 2008) defines CI as "a systematic and ethical process for gathering, analysing and managing external information that can affect the company's plans, decisions and operations". This presents the definition of CI that we adhere to in this article.

The concept of intelligence as a process has long been proposed as an effort to improve the firm's competitiveness and its strategic planning process (Guyton, 1962; Montgomery and Urban, 1970; Pearce, 1971, 1976; Montgomery and Weinberg, 1979; Porter, 1980). Already in 1966 William Fair proposed the creation of a corporate "Central Intelligence Agency" within the firm whose function it would be to "collect, screen, collate, organize, record, retrieve and disseminate information" (Fair, 1966, p. 489). Since that time, this proposition has grown to become an emerging business function with delineated job functions directly responsible for intelligence collection, analysis, and dissemination (Kahaner, 1996). Competitive intelligence's goal is to provide "actionable intelligence" (Fahey, 1999; Fuld, 1995, 2000; Nolan, 1999), namely, information that has been synthesised, analysed, evaluated and contextualised. Competitive intelligence presents part of the strategic information management process that is aligned with an organisation's strategy (Bergeron, 1996; Kennedy, 1996; Moon, 2000).

2.2 The competitive intelligence process

The components of the intelligence paradigm have been investigated in many academic fields. However, a holistic view of competitive intelligence has not been developed yet, nor has a process of intelligence been verified empirically (Calof and Dishman, 2002). From previous studies there appears to be support for distinct stages or constructs in CI practices. Key stages that emerge from the literature are:

(1) *Planning and focus*. During this phase an assessment is made of what intelligence is required (Fleisher, 2001). CI should only focus on those issues of highest importance to senior management (Gilad and Gilad, 1985; Herring, 1998). This phase is required to determine the necessary resources for the CI project in the light of its purpose.

(2) *Collection* During this phase, information is collected from a variety of sources, both published and unpublished sources as well as human sources (Marceau and Sawka, 1999; Fleisher, 2001). Collection is also about ensuring that the information and sources of information are tested for reliability and credibility.

(3) *Analysis*. Many practitioners believe that this is where "true" intelligence is created, that is converting information into usable intelligence on which strategic and tactical decisions may be made (Gilad, 1989; Gilad and Gilad, 1985; Kahaner, 1996; Calof and Miller, 1997; Herring, 1998).

(4) *Communication*. The results of the CI process need to be communicated to those with the authority and responsibility to act on the findings. Intelligence communication can take place via *ad hoc* reports, alerts, e-mails, presentations, news briefs, competitor files and special memos (Fleisher, 2001).

(5) *Process/structure*. CI requires appropriate policies, procedures, and a formal or informal infrastructure so that employees may contribute effectively to the CI system as well as gain from the benefits of the CI process. There is much support for a formal structure and a systematic approach to CI (Cox and Goodwin, 1967; Cleland and King, 1975; Porter, 1980; Gilad and Gilad, 1985, 1986; Ghoshal and Kim, 1986).

(6) *Organisational awareness/culture*. For a firm to utilize its CI efforts successfully there needs to be an appropriate organizational awareness of CI and a culture of competitiveness (Garvin, 1993; Sinkula, 1994; Slater and Narver, 1995). Studies have shown that CI units benefit from senior management support (Evangelista, 2005), since management support establishes legitimacy and importance (Fehringer *et al.*, 2005.)

Theoretically it is thus postulated that CI consists of planning and focus, collection, analysis, and communication of intelligence, as well as the necessary processes and structures and an organisational awareness and culture. Based on the above propositions and preliminary research, Calof and Dishman (2002) proposed the following model (Figure 1) for competitive intelligence.

From Figure 1 it is evident that there is a definite CI process, consisting of planning/focus, collection, analysis and communication, but that this process is affected by certain contextual influences, namely organisational culture/awareness, the formal infrastructure available as well as employee involvement. The well-known CI wheel contributes towards this distinction between the CI process and contextual influences (see Figure 2).

Based on the above propositions, this paper sets out to accomplish the following:

(1) To refine and validate a questionnaire used in previous empirical studies of this nature.

(2) To validate the constructs of CI and to test for construct equivalence between samples taken from two very different countries

(3) To establish the influence that the context in which CI takes place has on the success of the CI process.

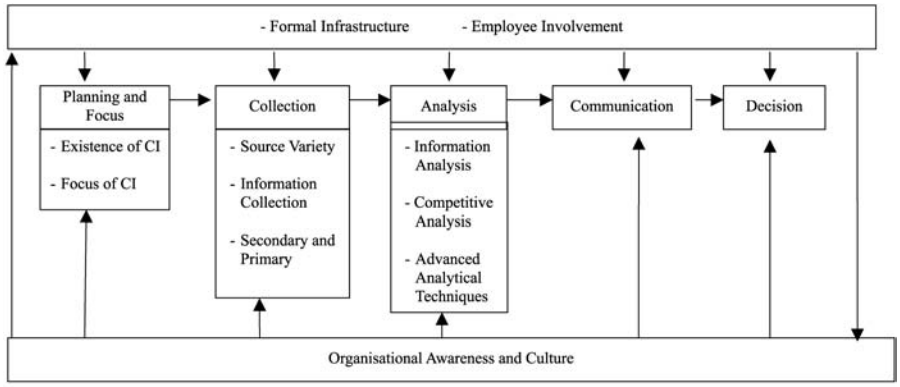
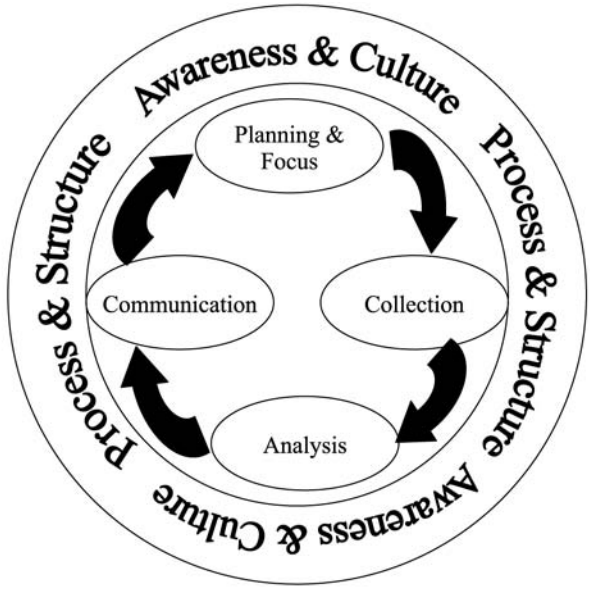


Figure 1.
Calof and Dishman's model of competitive intelligence

Source: Calof and Dishman (2002)



Sources: Adapted from Kahaner (1996) and Fleisher and Bensoussan (2003)

Figure 2.
The competitive intelligence cycle

3. Empirical analysis

3.1 The questionnaire

The questionnaire of the global survey used by Sawka *et al.* (1995) was refined by Calof and Breakspear (1999), Calof and Dishman (2002) and Viviers *et al.* (2002) in their research for Canada and South Africa respectively. These studies can be seen as pilot studies for this research, since the current researchers were involved in some of the previous research[2]. The same questionnaire was further refined (learning from problems experienced with the questionnaire by the above-mentioned South African and Canadian researchers), for the purposes of this research. The questionnaire also contained a definition of CI in order to inform respondents what is meant by the concept (see Appendix (Figure A1)).

The final questionnaire contains, among others, 38 CI-related questions, to be answered on a five-point Likert scale. The Likert scale questions were divided into two sections. In the first section the respondents had to indicate to which degree they agreed or disagreed with 17 statements. In the second part (21 questions) the respondents had to indicate to what extent (never to always) they implemented a certain action. Additionally, a limited number of general questions pertaining to the firm were asked (activity, size, percentage of sales exported).

The CI-related questions were based on the theoretical constructs and preliminary results from earlier research, as described in section 2.2 (Calof and Dishman, 2002; Viviers *et al.*, 2002). In total, it contained 19 questions relating to the CI process and 19 questions relating to the context in which CI takes place. In addition to these questions

a number of questions pertaining to the organisation of CI, the most important sources of information for businesses and the time spent on various CI activities were also included. These results have been reported elsewhere (De Pelsmacker *et al.*, 2005).

The South African version was written in English, the Flemish one in Dutch, and since all the authors are proficient in both languages the questionnaires were considered to be equivalent. Furthermore, they agreed on the fact that the questionnaire shows a high degree of face validity (see Appendix (Figure A1) for the English version of the questionnaire).

3.2 Sampling procedure

In South Africa, data of exporting companies were gathered from two sources, namely:

(1) the Kompass Southern African database (from Reed Business Southern Africa);

(2) the directors/CEOs of the respective Export Council (supported by Trade and Industry Southern Africa).

From the Kompass database, 2,442 manufacturing exporters and 1,610 service exporters were extracted. From the export councils, company information for 1,225 companies was obtained. After eliminating doubly retrieved companies, the eventual sample consisted of 4,612 firms to be surveyed. The questionnaire was e-mailed to the whole sample. In total, 612 e-mails were returned due to incorrect information and 40 recipients replied to indicate that they were non-exporters. The adjusted South African sample is thus 3,960 companies, although the above may be an indication that a number of potential respondents were ineligible. From the e-mail distribution 134 responses were received. This represents 3.38 per cent of the adjusted sample. To improve the response rate telephone marketers were used to phone companies and complete the questionnaire telephonically. After the efforts of the telemarketers, a total of 321 responses were received, representing a response rate of 8.11 per cent.

Part of the Flemish exporter database was obtained from Export Vlaanderen who supplied the list of all the export companies in Flanders. In all, information on 5,086 manufacturing exporters was received, of which 2,666 were approached by e-mail and the rest by mail. In total, 930 e-mails and 20 mail questionnaires returned undeliverable; a total of 220 questionnaires were returned; 30 of them were only partially completed, and were removed, resulting in a net sample of 182 manufacturing exporters. Service export companies were approached by selecting a number of industries such as banks and insurance, transport, distribution, and port-related activities. Mailing lists of companies in these industries were obtained, and 1,767 companies were selected and mailed. No doubt, the majority of these companies' main focus is not export related. This yielded a return of 114 completed questionnaires. In all, the total response was 296, i.e. a 5 per cent response rate.

Although no argument can be put forward against potential non-response bias, as there is no South African or Flanders database of exporters according to size, sector or export intensity, it can be stated that at least some characteristics of the two economies are reflected in the sample. In Flanders, the majority of firms are SMEs and are also more active exporters in the service industries, as is also evident from the respondents (see Table I). In South Africa, exporters are mainly in the manufacturing sector, which is consistent with the main export sector of South Africa, while the low export intensity

		South Africa (%)	Flanders (%)
Sector	Primary	8	4
	Secondary	61	49
	Tertiary	31	47
Size	Small (< 50 employees)	46	64
	Medium (50-200)	28	23
	Large (> 200 employees)	26	13
Export intensity	0-24%	43	26
	25-49%	17	16
	50-74%	18	28
	75-100%	22	30

Table I.
Description of samples

of South African exporters is typical of the broader export population as is evident in a study by Viviers and Calof (1995).

It is evident that small companies are the majority of the respondents in the total sample. It is true that well-resourced, large organizations are still most likely to implement formal CI practices (Bergeron, 2000, p. 153), yet it does not mean that smaller firms are not aware of CI and that they conduct no CI. On the contrary, Calof (2003) found that there were few differences between the intelligence practices of smaller versus larger firms with the exception of large firms conducting more formal analysis and making greater use of their employees. Also, Groom and David (2001) indicated that while the intelligence gathering activities of small firms is largely informal, they do realize the potential returns from CI. Therefore, the researchers acknowledge that the average results of respondents will probably be lower than that of a sample with more large firms, but that this should not pose a severe threat to the validity of the research since the focus falls on construct validation and equivalence.

All companies that did not complete at least 70 per cent of the questions were removed from the analysis. This left us with a useful sample of 601 companies, i.e. 309 South-African ones and 292 Flemish ones. Missing values for the Likert scales were substituted by the series mean.

3.3 Analysis

3.3.1 Factor analysis. Since establishing the various constructs of the CI process empirically is a relatively recent trend in CI research, with only Calof and Dishman (2002) and Viviers *et al.* (2002) attempting to accomplish this, an exploratory rather than confirmatory factor analysis is used. The difference between an exploratory and a confirmatory factor analysis is that in an exploratory analysis, no definite model is imposed on the data and the data are explored to detect characteristic features and interesting relationships. It is for this reason that exploratory factor analysis is especially useful in the early stages of experimentation or test development. Therefore, this route was taken.

The aim of factor analysis is to identify any latent variables that cause the observed variables to covary. The analysis thus delivers an underlying factor structure by analysing the shared variance of observed variables (Costello and Osborne, 2005, p. 2). Based on the premise that CI consists of influential process variables as well as contextual variables, two separate factor analyses are conducted. Two separate exploratory factor analyses were chosen, since previous research and a theoretical

evaluation of CI led us to believe that the contextual variables may influence the process variables, and also that a theoretical distinction can clearly be made. Analysing both within the same factor analysis could thus result in many cross-loadings and skewed results.

Based on previous research by Viviers *et al.* (2002) and Calof and Dishman (2002), who both used a similar questionnaire to the one utilised in the current study, the items that describe the CI process and the CI context respectively were identified. These items are indicated in Table II. This formed the basic premise for the mapping of the questions into the different factors. The reliability of the constructs was investigated by means of Cronbach's alpha coefficients.

These tests were performed on the whole sample (601 companies) and the results of the exploratory factor analyses and the subsequent Cronbach alpha coefficients are indicated in Table III. The number of factors to be extracted was based on the eigenvalues and scree plot, with all factors with an eigenvalue greater than 1 considered. The method used to extract the factors is maximum likelihood, which is indicated by Costello and Osborne (2005, p. 2) as one of the methods that will give the best results. The oblique rotation method, Promax, is chosen since it is postulated that there may be a high correlation between the factors within the CI process and context respectively, and this method allows for correlation between factors. All analyses were conducted with SPSS. Names for factors are suggested in a footnote.

The CI process factor analysis presented four factors with an eigenvalue greater than one. Tabachnick and Fidell (2001) indicated that a cut-off value of 0.32 can be used in exploratory research, and all the observed variables that loaded at least 0.32 onto one of the three factors are highlighted. Questions that loaded 0.32 or higher onto more than 1 factor are disregarded, since they may represent items that discriminate poorly between factors. We also considered the communality values of the item loadings, and these proved to be in the high to high-average range, indicating items' relation to the extracted factors. In the CI process analysis, questions 26[3] and 34[4] had no clear loading on any one factor and these questions are subsequently discarded. The various items that load onto the factors are described in Table IV and factors are named based on the theoretical description of the constructs in section 2.2.

The analysis supports the theoretical constructs of the CI process to some extent, since Planning and focus, Analysis and Communication are all identified. It seems that the Collection construct is not a clear construct in itself, but is divided between Analysis and Communication. The verification of data (originally part of Collection) falls with Analysis, while collection from sources falls with Communication. It is noteworthy that the Cronbach alpha values are above 0.74 for all the factors extracted, indicating good reliability (Nunnally and Bernstein, 1994). The correlations between the factors (Table IV) were indicated as $r = 0.598$ (factors 1 and 2), $r = 0.636$ (factors 1 and 3), and $r = 0.476$ (factors 2 and 3). These correlations can be considered high, and supports our hypotheses that factors within the CI process should be related.

Eigenvalues and the Scree test indicated that four factors could be extracted from the CI context questions. Question 11[5] loaded on more than one factor and was subsequently discarded. The items in each factor are described in Table V. Based on the content of the items as well the theoretical discussion in section 2.2, the factors are named. Again, it is evident that the factors extracted corroborate the theory to a certain extent, with awareness of CI, formal infrastructure, internal information and employee

CI process	CI context
Our company has a variety of methods for collecting information (e.g., trade shows, web sites, industry reports, etc.) (Q12)	Our company recognises CI as a necessary activity for business. (Q5)
Our intelligence findings are widely distributed within the company (Q13)	Our management understand what competitive intelligence is (Q6)
We have a variety of ways to present intelligence findings (e.g. briefings, newsletters, competitor profiles, industry reports, etc.) (Q17)	Most employees understand what competitive intelligence is (Q7)
We are concerned with the plans and intentions of our key competitors, alliances, suppliers, distributors and other stakeholders (Q22)	Senior management supports intelligence activities (Q8)
Our company produces intelligence reports and assessments on emerging technologies that we believe are most important (Q25)	Competitive intelligence can be used to crease a competitive advantage (Q9)
Our company produces assessments that address several possible outcomes of our competitors' actions that might be threats of opportunities for our company (Q26)	Our company has incentives to encourage employees to report their competitive observations and information (Q10)
Our employees report information about our competitors on foreign markets to the right manager for decision-making (Q27)	We have convenient ways for our employees to report observations and information (Q11)
Our company analyses our competitors' plans and strategies to predict and anticipate their actions (Q28)	We maintain a comprehensive map or inventory of internal information and knowledge (Q14)
Our company uses basic competitor analytical models (e.g. SWOT and gap analysis) (Q29)	There is a central co-ordination point for receiving competitive intelligence information (Q15)
In our company, we meet with executives daily to identify their intelligence needs (Q31)	We make competitive intelligence training (e.g. collection and analysis techniques) available to all our employees (Q16)
Our company develops profiles on emerging technologies to better understand their characteristics, potential applications and market advantages (Q33)	We have a formal knowledge management system (Q18)
We use information management tools (e.g., data mining, data warehousing, OLAP or "business intelligence" software) to understand our customers Q34)	Our corporate culture encourages information sharing (Q19)
Key decision-makers are surveyed/ interviewed to verify that the intelligence products produced for them satisfy their needs (Q35)	Our company maintains a central record of reliable sources of information (Q20)
All information is checked for accuracy and validity by at least one other source (Q36)	We have a long-term competitive intelligence plan (Q21)
We train/prepare our employees before they go on trade shows, exhibitions, conventions etc. about what information they should look for (Q37)	We report intelligence findings to the CEO or senior manager (Q23)
Results from exit interviews/job interviews are used in our intelligence system (Q38)	Competitive intelligence is a formal activity in our company (Q24)
Our employees attend intelligence seminars/training programmes (Q40)[a]	In our company, the company's intelligence needs are communicated to employees (Q30)
	Senior management use CI results in their strategic planning and decision-making (Q32)
	We evaluate our competitive intelligence findings (Q39)

(*continued*)

Table II.
Division of questions into CI process and CI context

CI process	CI context
We evaluate the reliability of our sources of information (e.g. persons, publications, internet, etc) (Q41)	
We conduct an internal knowledge audit (e.g. identify and catalogue what people know, what reports they have, publications, etc.) (Q42)[a]	

Notes: [a] The results from Viviers *et al.* (2002) showed that these questions should fall under CI context, while Calof and Dishman (2002) found no significant results for these two questions. Therefore, they were tested for inclusion in both the CI context and CI process, but overall they seem to fit the process better

Table II.

Sources: Compiled from research conducted by Viviers *et al.* (2002) and Calof and Dishman (2002)

	CI process					CI context				
Item	F_1	F_2	F_3	h^{2a}	Item	F_1	F_2	F_3	F_4	h^{2a}
Q12	0.581	−0.225	−0.272	0.617	Q5	0.811	0.061	−0.012	−0.034	0.701
Q13	0.638	−0.046	0.009	0.583	Q6	0.664	−0.099	0.285	0.022	0.705
Q17	0.551	0.101	0.081	0.527	Q7	0.381	−0.096	0.053	0.467	0.595
Q22	0.161	−0.300	0.585	0.565	Q8	0.740	0.068	0.003	0.065	0.712
Q25	0.577	0.116	0.136	0.573	Q9	0.753	0.008	−0.163	0.026	0.633
Q26	0.452	0.012	0.378	0.592	Q10	0.054	−0.091	0.021	0.755	0.673
Q27	0.175	−0.161	0.690	0.638	Q11	0.018	0.440	−0.219	0.473	0.662
Q28	0.434	0.087	0.278	0.526	Q14	0.050	0.496	0.118	0.115	0.614
Q29	0.628	0.108	−0.189	0.477	Q15	−0.008	0.315	0.377	0.098	0.663
Q31	0.273	0.164	0.398	0.553	Q16	−0.160	0.044	0.300	0.547	0.620
Q33	0.524	0.220	0.052	0.546	Q18	−0.040	−0.191	0.900	−0.033	0.720
Q34	0.285	0.699	−0.349	0.648	Q19	0.060	0.421	0.180	0.088	0.504
Q35	0.226	0.554	0.066	0.635	Q20	−0.099	0.239	0.587	0.038	0.637
Q36	0.086	0.507	0.105	0.590	Q21	−0.055	0.115	0.657	0.115	0.658
Q37	−0.203	0.345	0.610	0.581	Q23	0.211	0.591	0.120	−0.171	0.651
Q38	−0.180	0.308	0.550	0.568	Q24	0.245	0.270	0.390	−0.060	0.634
Q40	0.015	0.668	−0.156	0.630	Q30	−0.086	0.731	−0.228	0.231	0.648
Q41	0.051	0.562	0.180	0.571	Q32	0.122	0.746	0.046	−0.155	0.700
Q42	−0.211	0.720	0.131	0.696	Q39	−0.039	0.643	0.089	−0.031	0.653
Alpha	0.838	0.802	0.766		Alpha	0.843	0.840	0.834	0.746	

Table III.
Results of the factor analyses with oblique rotation and Cronbach Alpha's

Notes: [a] h^2 = the communality; CI Process: F_1 = Communication and analysis; F_2 = Collection; F_3 = Planning and focus; CI Context: F_1 = Awareness, F_2 = Internal information; F_3 = Formal infrastructure; F_4 = Employee involvement

involvement identified as factors. Again the correlations between the factors are high, with $r > 0.4$ between all the factors (r (F_1 and F_2) = 0.683, r (F_1 and F_3) = 0.596, r (F_1 and F_4) = 0.433, r (F_2 and F_3) = 0.695, r (F_2 and F_4) = 0.555), r (F_3 and F_4) = 0.488). Our assumption that different factors within the CI context should be related is thus again substantiated.

Table VI shows that, considering their skewness and kurtosis, the factors are normally distributed, with no value exceeding 1. All the process and context factors are

Factor	Items
Factor 1 Communication and analysis	Our company has a variety of methods for collecting information (e.g. trade shows, web sites, industry reports, etc.) (Q12) Our intelligence findings are widely distributed within the company (Q13) We have a variety of ways to present intelligence findings (e.g. briefings, newsletters, competitor profiles, industry reports, etc.) (Q17) Our company produces intelligence reports and assessments on emerging technologies that we believe are most important (Q25) Our company analyses our competitors' plans and strategies to predict and anticipate their actions (Q28) Our company uses basic competitor analytical models (e.g. SWOT and gap analysis) (Q29) Our company develops profiles on emerging technologies to better understand their characteristics, potential applications and market advantages (Q33)
Factor 2 Collection	Key decision-makers are surveyed/interviewed to verify that the intelligence products produced for them satisfy their needs (Q35) All information is checked for accuracy and validity by at least one other source (Q36) Our employees attend intelligence seminars/training programmes (Q40) We evaluate the reliability of our sources of information (e.g. persons, publications, internet, etc.) (Q41) We conduct an internal knowledge audit (e.g. identify and catalogue what people know, what reports they have, publications, etc.) (Q42)
Factor 3 Planning and focus	We are concerned with the plans and intentions of our key competitors, alliances, suppliers, distributors and other stakeholders (Q22) Our employees report information about our competitors on foreign markets to the right manager for decision-making (Q27) In our company, we meet with executives daily to identify their intelligence needs (Q31) We train/prepare our employees before they go on trade shows, exhibitions, conventions etc. about what information they should look for (Q37) Results from exit interviews/job interviews are used in our intelligence system (Q38)

Table IV.
Factor description for CI process

positively and highly correlated, as was expected. The next step in the analysis is to test whether the described constructs hold for both sub-samples (South Africa and Flanders).

3.3.2 Construct equivalence. A popular method to compare factor structures over different groups in the field of social and behavioural research is construct equivalence. This paper follows the methodology of Van de Vijver and Leung (1997) in determining construct equivalence between the South African and Flemish sub-samples. According to this method, the matrices of loadings are rotated with regard to each other. Thus, target rotations are carried out and the factor loadings of the two sub-samples are rotated to a joint common matrix for factor loadings. The factorial agreement is estimated, using Tucker's coefficient of agreement (Tucker's phi). According to Van de Vijver and Leung (1997), Tucker's phi is sensitive to a constant added to all loadings of a factor, but not sensitive to multiplications of factor loadings. Since the index does not have a known sampling distribution, confidence intervals cannot be established, and

Factor	Item
Factor 1 Awareness	Our company recognises CI as a necessary activity for business (Q5)
	Our management understand what competitive intelligence is (Q6)
	Senior management supports intelligence activities (Q8)
	Competitive intelligence can be used to crease a competitive advantage (Q9)
Factor 2 Internal information	We maintain a comprehensive map or inventory of internal information and knowledge (Q14)
	Our corporate culture encourages information sharing (Q19)
	We report intelligence findings to the CEO or senior manager (Q23)
	In our company, the company's intelligence needs are communicated to employees (Q30)
	Senior management use CI results in their strategic planning and decision-making (Q32)
	We evaluate our competitive intelligence findings. (Q39)
Factor 3 Formal infrastructure	There is a central co-ordination point for receiving competitive intelligence information (Q15)
	We have a formal knowledge management system (Q18)
	Our company maintains a central record of reliable sources of information (Q20)
	We have a long-term competitive intelligence plan (Q21)
	Competitive intelligence is a formal activity in our company (Q24)
Factor 4 Employee involvement	Most employees understand what competitive intelligence is (Q7)
	Our company has incentives to encourage employees to report their competitive observations and information (Q10)
	We make competitive intelligence training (e.g. collection and analysis techniques) available to all our employees. (Q16)

Table V.
Factor description for CI context

therefore cut-off values were established to indicate whether constructs can be viewed as similar. phi values higher than 0.95 are therefore seen as evidence that factors are similar, while values of less than 0.85 indicates towards evidence that construct equivalence is implausible (see Van de Vijver and Leung, 1997).

The results of this analysis are shown in Table VII. Note that only the Tucker's phi is reported and that the cut-off values established above are used as guidelines to interpret the results. The results are encouraging and indicate construct equivalence for six of the seven factors. It is noteworthy that only the fourth factor in the CI context has a Tucker's phi value of less than 0.85, indicating construct inequivalence.

Table VII indicates that regarding the CI process, all factors present with sufficient construct equivalence. When compared to the other factors, the phi-coefficients for Planning and Focus are lower, yet are still above the critical value of 0.85. Regarding the context factors, the phi-coefficients for the context factor of internal information is lower in South Africa than in Flanders. The factor of employee involvement clearly misses the mark and is evaluated in the next section to identify certain items in the factor that may cause this dissimilarity between the two countries. The items in this construct are subjected to bias analysis to identify the inappropriate items, as described by Van de Vijver and Leung (1997).

	Mean	Std deviation	Skewness	Kurtosis	Alpha (α)	Communication and analysis	Collection	Planning and focus
Process								
Communication and analysis	2.6540	0.85709	0.099	−0.485	0.838			
Collection	2.2800	0.89061	0.378	−0.311	0.802			
Planning and focus	3.0111	0.89198	−0.038	−0.523	0.766			
Context								
Awareness	3.6767	0.91656	−0.745	0.594	0.843	0.577*	0.295*	0.440*
Internal information	3.0518	0.90751	−0.351	−0.436	0.840	0.794*	0.598*	0.750*
Formal structure	2.4155	0.87933	0.199	−0.576	0.834	0.821*	0.813*	0.684*
Employee involvement	2.7574	0.97562	0.049	−0.635	0.746	0.823*	0.613*	0.749*

Note: * $p \leq 0.01$

Table VI.
Descriptive statistics and inter-factor correlations for the extracted factors

Group	Percentage of sample	CI process Tucker's phi				CI context Tucker's phi		
		Communication and analysis	Collection	Planning and focus	Awareness	Internal information	Formal infrastructure	Employee involvement
Flanders	48.6	0.92	0.95	0.87	0.96	0.99	0.97	0.64
South Africa	51.4	0.99	0.94	0.88	0.98	0.87	0.96	0.80

Table VII.
Construct equivalence of the various CI factors for South Africa and Flanders

3.3.4 Bias analysis. To identify the biased items in the employee involvement factor, items are subjected to bias analysis. To test for bias, an analysis of variance is performed. In the analysis the item score is the dependent variable, while the two sub-samples (South African and Flemish) and score levels (on the employee involvement factor) are the independent variables. Score groups were composed on the basis of the total score on the factor. The partial eta-squared value (partial η^2) is here used as in indicator of strength of association for the analysis of variance. Eta-squared is an indication of the strength of association between a dependent variable and an independent variable. The partial η^2 is most suitable where sample sizes are not equal, and is also independent of the significance and number of other included independent variables (Tabachnick and Fidell, 2001). Two effects can be tested in this manner, namely the main effect of two groups, and the interaction of score level and the groups. When both the main effect of groups (in this case, countries) and the interaction of score level and group are non-significant, the item is taken to be unbiased.

Table VIII shows that a significant η^2 value exists for item 16 regarding uniform bias, indicating that score levels across all groups are influenced (biased) similarly. This implies that for this item there is a consistent difference between the two countries regarding this item (i.e. one group consistently scores higher/lower than the other).

3.3.5 Regression analysis. Finally, this paper sets out to determine whether the context variables identified above influence the CI process and, if so, to determine what the strength of the influence is. This is done using regression analysis, where the process variables are the dependent variables and the context variables the independent variables. Use was made of a stepwise regression and the type of industry, size of the organisation and position of the person completing the questionnaire were used as control variables. The regressions are completed for the total sample and the results for Collection are indicated in Table IX.

Table IX shows that when only the industry, size and position of the person that completes the questionnaire are considered, the size of the firm explains 2 per cent of the variance in Collection. In the final step of the analyses, when all variables are considered, Collection is associated only with the context variables of formal structure, awareness and employee involvement. Considering the beta-values, it can be seen that the relationship is positive with formal structure and employee involvement, and

Item	Uniform bias		Non-uniform bias	
Employee involvement				
Most employees understand what competitive intelligence is (Q7)	0.746	0.000	0.814	0.008
Our company has incentives to encourage employees to report their competitive observations and information (Q10)	0.243	0.003	0.252	0.018
We make competitive intelligence training (e.g. collection and analysis techniques) available to all our employees (Q16)	0.012*	0.013[a]	0.952	0.004

Notes: [a] Practical significant (medium effect): *Partial* $\eta^2 \geq 0.06$; * statistically significant: $p \leq 0.05$

Table VIII.
Item bias analysis of the Employee Involvement items

Model		Unstandardized coefficients *B*	Std error	Standardized coefficients Beta	*T*	Sig.	R^2	ΔR^2
1	(Constant)	2.043	0.155		13.170	0.000	0.020	0.020
	Type of industry	0.011	0.019	0.027	0.611	0.542		
	Size of the firm	0.173	0.052	0.150	3.312	0.001*		
	Position of person	−0.053	0.060	−0.039	−0.887	0.375		
2	(Constant)	0.275	0.107		2.574	0.010*	0.663	0.643
	Type of industry	0.011	0.011	0.027	1.052	0.293		
	Size of the firm	−0.018	0.031	−0.016	−0.582	0.561		
	Position of person	−0.017	0.035	−0.013	−0.482	0.630		
	Formal structure	0.834	0.026	0.818	31.724	0.000*		
3	(Constant)	0.445	0.127		3.505	0.000	0.667	0.004
	Type of industry	0.011	0.011	0.027	1.044	0.297		
	Size of the firm	−0.019	0.031	−0.016	−0.603	0.547		
	Position of person	−0.014	0.035	−0.010	−0.390	0.697		
	Formal structure	0.863	0.029	0.846	30.025	0.000*		
	Awareness	−0.066	0.027	−0.068	−2.452	0.015*		
4	(Constant)	0.443	0.126		3.508	0.000	0.670	0.003
	Type of industry	0.008	0.011	0.019	0.744	0.457		
	Size of the firm	−0.020	0.031	−0.017	−0.634	0.526		
	Position of person	−0.006	0.035	−0.004	−0.161	0.872		
	Formal structure	0.808	0.037	0.792	21.606	0.000*		
	Awareness	−0.091	0.029	−0.093	−3.133	0.002*		
	Employee involvement	0.083	0.036	0.090	2.303	0.022*		

Note: *$p \leq 0.05$

Table IX.
Regression analysis for collection and context variables

negative with awareness. These three context variables explained 67 per cent of the variance in collection.

Results of the regression analysis for communication and analysis are reported in Table X.

Table X indicates then when only the control variables of industry, size and the position of the person completing the questionnaire are considered, size again has a statistically significant association with communication and analysis. The size of the firm explains 3.9 per cent of the variance in communication and analysis. In the final step of the analysis, the size of the firm remained a significant predictor, and all four context variables (employee involvement, formal structure, awareness and internal information) contributed to explaining 82 per cent of the variance in communication and analysis.

Results of the regression analysis for planning and focus are reported in Table XI, and a similar procedure was followed.

Table XI indicates that the type of industry in which the respondent operates explains 1.4 per cent of the variance in planning and focus. When considering all variables, the size of the firm again comes forward as a factor that influences planning and focus. Together, internal information, formal structure, employee involvement and the size of the firm explained 65 per cent of the variance in planning and focus.

Model		Unstandardized coefficients B	Std error	Standardized Coefficients Beta	T	Sig.	R^2	ΔR^2
1	(Constant)	2.353	0.146		16.144	0.000	0.039	0.039
	Type of industry	0.005	0.017	0.012	0.272	0.786		
	Size of the firm	0.225	0.049	0.206	4.598	0.000*		
	Position of person	−0.049	0.056	−0.038	−0.876	0.381		
2	(Constant)	0.594	0.098		6.056	0.000		
	Type of industry	−0.022	0.010	−0.057	−2.269	0.024*	0.691	0.652
	Size of the firm	0.089	0.028	0.081	3.162	0.002*		
	Position of person	0.034	0.032	0.027	1.068	0.286		
	Employee involvement	0.717	0.021	0.818	33.380	0.000*		
3	(Constant)	0.350	0.082		4.281	0.000	0.794	0.102
	Type of industry	−0.011	0.008	−0.029	−1.394	0.164		
	Size of the firm	0.041	0.023	0.037	1.757	0.079		
	Position of person	0.020	0.026	0.015	0.759	0.448		
	Employee involvement	0.426	0.025	0.486	16.905	0.000*		
	Formal structure	0.452	0.028	0.468	16.176	0.000*		
4	(Constant)	−0.017	0.089		−0.195	0.845	0.817	0.023
	Type of industry	−0.008	0.008	−0.020	−1.057	0.291		
	Size of the firm	0.043	0.022	0.039	1.956	0.051		
	Position of person	0.005	0.025	0.004	0.220	0.826		
	Employee involvement	0.350	0.026	0.399	13.715	0.000*		
	Formal structure	0.439	0.026	0.454	16.619	0.000*		
	Awareness	0.166	0.021	0.180	8.115	0.000*		
5	(Constant)	−0.064	0.089		−0.723	0.470	0.823	0.006
	Type of industry	−0.008	0.008	−0.021	−1.115	0.265		
	Size of the firm	0.056	0.022	0.051	2.581	0.010*		
	Position of person	0.009	0.024	0.007	0.361	0.718		
	Employee involvement	0.294	0.028	0.335	10.427	0.000*		
	Formal structure	0.393	0.028	0.406	14.003	0.000*		
	Awareness	0.122	0.023	0.131	5.381	0.000*		
	Internal information	0.148	0.034	0.156	4.360	0.000*		

Note: *$p \leq 0.05$

Table X.
Regression analysis for communication and analysis and context variables

3.4 Discussion

The analysis of the CI data collected via questionnaires from South African and Flemish exporting firms took on various forms and in various aspects the results found were in line with theory and as the researchers expected it to be, but some results need further explanation and verification. First, the factor analysis indicated three instead of four constructs for the CI process. The items that are grouped together represent communication and analysis and it is evident that all the items included some form of report and/or verbal communication (see Table III). The items in the Collection construct focus mainly on the verification of information as described in the theoretical construct, rather than on sources of information that is theoretically also part of this construct (see section 2.2).

Model		Unstandardized coefficients		Standardized coefficients				
		B	Std error	Beta	*T*	Sig.	R^2	ΔR^2
1	(Constant)	2.947	0.153		19.261	0.000	0.014	0.014
	Type of industry	0.038	0.018	0.094	2.108	0.035*		
	Size of the firm	0.034	0.051	0.030	0.664	0.507		
	Position of person	−0.103	0.059	−0.077	−1.742	0.082		
2	(Constant)	0.883	0.128		6.921	0.000	0.658	0.643
	Type of industry	0.021	0.011	0.051	1.913	0.056		
	Size of the firm	−0.102	0.031	−0.090	−3.244	0.001*		
	Position of person	−0.029	0.035	−0.022	−0.835	0.404		
	Awareness	−0.062	0.033	−0.065	−1.908	0.057		
	Internal information	0.338	0.049	0.345	6.938	0.000*		
	Formal structure	0.230	0.040	0.229	5.673	0.000*		
	Employee involvement	0.322	0.041	0.355	7.928	0.000*		

Note: $^*p \leq 0.05$

Table XI.
Regression analysis for planning and focus and context variables

The factor analysis of the context variables lead to an extension of the two constructs into four constructs. This was also expected with the theoretical "Process and Structure" construct containing varied concepts such as employee involvement and formal infrastructure, as also indicated by Calof and Dishman (2002). Employee involvement is "new" in terms of the theoretical CI constructs, but not "new" in the sense that the literature often refers to the nexus between human resource management and CI, and how competitive advantage can be built through the skills of the people in the firm (see Hannon, 1997; Bartlett and Ghoshal, 2002; Pole *et al.*, 2000). This analysis therefore confirms previous research that the context in which CI takes place includes corporate awareness, formal infrastructure, internal information and employee involvement.

All the extracted factors presented acceptable reliability. Testing the equivalence of the extracted factors for both the South African and the Flemish sub-samples revealed that the Employee Involvement construct may be considered inequivalent across the samples. Although this presents a limitation in the application of these factors, more encouraging is the fact that six of the seven extracted factors presented with acceptable levels of construct equivalence (see Table VII). This means that these factors carry the same meaning across the two sub-samples. Thus, the equivalent factors (Communication and analysis, Collection, Planning and focus, Awareness, Internal information and Formal structure) are understood, as measured by our questionnaire, to a similar extent across the two countries that participated in this study. Within the CI process and considering the differences outlined between the South African and Flemish export experience, these procedural and contextual factors thus represent rather robust indicators of CI practices.

The clear inequivalence of the employee involvement factor necessitated item bias analysis, which presented one question with uniform bias. The item ("We make competitive intelligence training (e.g. collection and analysis techniques) available to all our employees") may indicate a very real difference between South Africa and Flanders. Training practices in these two countries may differ on a number of

dimensions. First, competitive intelligence training may be reserved only for employees at a certain level, or within a specific competitive intelligence department. Second, national differences in organisational practices regarding the training of employees may also exist. In South Africa, much more emphasis may be placed on training of employees in an environment where skills development is at the order of the day.

The correlation coefficients between the process and context constructs (see Table V) as well as the results of the regression analysis confirm the idea that the CI context and process variables are in interaction. We justified our separate factor analyses for these dimensions on theoretical grounds, and specifically on the premise that the context should influence the process. The correlations found in this research further suggest that a distinction within process and context variables, and between the process and context in which CI practices take place, is more easily achieved theoretically than practically. Within the process and context variables, extracted factors were highly correlated, as can be expected. However, correlations of the process and context factors were also highly significant, indicating the relatedness of the variables. Although it is again understandable that these variables should be correlated (since they can all be subsumed under the idea of "CI Practices"), greater empirical refinement may be necessary in order to clarify the specific roles of individual factors within the process and context factors. We conducted a second-order factor analysis across our seven extracted factors, and results also indicate that they may be subsumed under one super-order factor (since the inter factor correlations of the second order factor analysis are: Employee involvement = 0.887; Formal structure = 0.864; Internal information = 0.881; Awareness = 0.597; Planning and focus = 0.788; Collection = 0.722; Communication and analysis = 0.908). Our regression analyses presents some preliminary indications that individual factors may operate differently though. The regression analysis showed that all context variables influence Collection, all but Awareness influence Planning and focus and all but Internal information influence Communication and analysis (see Tables IV-XI).

As control factors, the size of the firm, the industry in which it operates as well as the position of the person completing the questionnaire, were also included in the step-wise regression analyses. The only control variable that influences the CI process is the size of the firm – especially Communication and analysis, and Planning and focus which is influenced by size even when the context variables are added. This is an aspect that should be explored further. The fact that the industry in which the firm operates only does not influence the final regression results in any of the CI process constructs can be seen as adding to the robustness of the results in terms of non-response bias.

4. Conclusion and implications

This paper aimed to contribute to the quantitative strand in the CI literature by exploring and validating the theoretical constructs of CI in export-oriented firms with a combined sample of firm data from two very different countries. Questionnaires, based on previous work by Calof and Breakspear (1999) and Viviers *et al.* (2002), were sent to Flemish and South African exporters to determine their competitive intelligence practices. In all, 601 companies from the two countries contributed to the research. The paper set the goals of questionnaire and construct validation and investigation of

construct equivalence between two countries, and established the influence that the context in which CI takes place has on the success of the CI process.

In terms of construct validation and construct equivalence, this research found support for three separate constructs in the CI process, namely Planning and focus, Collection and analysis and Communication. These constructs agree to some extent with the theoretical constructs of the CI process. In terms of the context in which CI takes place, four constructs were identified, namely awareness, internal information, formal infrastructure and employee involvement. Again, it supports the theory to some extent, with formal infrastructure and internal information as part of the theoretical construct of "process and structure". It also supports previous research in terms of identifying employee involvement in the CI practice as an important context variable.

When verifying the constructs for both cultures (South African and Flemish) it was found that all but one CI context construct could be viewed as equivalent in both groups. The bias analysis identified only one question which should be carefully reviewed before it is included in subsequent questionnaires, since it is interpreted differently by different countries. However, the noted difference may also represent a very real difference between these two groups. Although further exploratory analyses are obviously necessary, we present here 34 questions that may be used in future CI research.

Via regression analysis and correlation coefficients, this research established that the context in which CI takes place influences the success of the CI process in a company to a large extent. When evaluating CI performance of firms, the context in which CI takes place should therefore also be assessed. Most of the influences are positive, indicating to better employee involvement, internal information and formal infrastructure that enhance the CI process. Awareness alone is obviously not sufficient for CI.

Support was also found for the notion that the size of the firm influences the success of the CI process. This is one aspect that necessitates further research and it was already proposed by previous research (see Calof and Dishman, 2002) that analysis and employee involvement differ between small and large firms.

While most of the other variables used (e.g. type of industry and position of the individual) indicated relatively little influence on the CI process, exploring how these aspects influence the CI context should also make an interesting contribution.

Considering the four CI context constructs (infrastructure, awareness, employee and internal information) and their influence on the CI process, a number of business implications can be mentioned.

In terms of the influence of the size of a company on the efficacy of CI, past research has shown that smaller companies face a bigger challenge in building and developing an effective CI programme than larger companies do. This probably relates to the availability of resources required for establishing an effective CI capability including appointing personnel for CI and the acquisition of CI tools. In smaller companies, it is often the business owner who also fills the role of CI professional. This is not an ideal situation as there is danger of CI becoming a reactive instrument rather than an instrument providing a future view of opportunities and threats. Success in CI seems to hinge on the availability, not necessarily the quantity of resources such as time, finance and people.

How a company deals with information is a further contextual factor. CI is primarily a strategic management tool and thus has strategic value although it should also fill the more operational requirements that exist in companies. A further test, however, is whether top management uses CI in strategic decision making and whether those strategic needs are communicated to the people involved in CI. Those strategic needs provide the roadmap for CI and should be answered by the CI unit. For this to happen, however, CI must be communicated effectively in a manner suitable to the client preference. This could be in the form of, among others, verbal briefings, e-mails, formal presentations and intelligence reports. To enhance internal information as contextual influence, companies should build an inventory of information and encourage information sharing by giving employees access to information they need.

Effective CI presupposes the existence of a dedicated CI unit that ideally has a central location supported by decentralised function-specific entities throughout the company. A recent study by Best Practices LLC (2008), a group of service professionals with roots at the Harvard Business School, argues that the location of the CI function has a significant impact on its efficacy. Strategic planning and business development are mentioned as ideal locations for the CI unit. Research and Markets (2008) argue that the centralized unit is ideally more strategically focused than the decentralized tactically focused units. Having a dedicated unit also points to the permanent nature of CI in a company and one that probably has a strategic purpose and plan. CI is not an activity that companies engage in times of adversity but should rather be a permanent activity that delivers actionable forward-looking intelligence based on sound historic information captured in a database. Research and Markets (2008) states that top CI practicing companies stay abreast of developments in their competitive environment by "establishing ideal CI structures, hiring the best people and use even the most common tools innovatively to provide the most impact on brand strategy".

The aforementioned also has an impact on employee involvement as context. To be effective, CI must reach the right people within the organization, and they must be willing to act on it and contribute towards CI. Company-wide support for CI is vital to the success and justification of CI. Besides the fact that a sensitized workforce will probably be better users and contributors to CI, it requires them to understand what CI and their role in CI is. Various methods can achieve this including sensitizing meetings, training, information sharing, fulfilling intelligence needs and regular communication. CI must be seen to add value to strategic and tactical users alike. Ensuring contributions from the workforce might prove to be a challenge and incentivising contribution and providing information that enhances their job execution, are methods that could promote participation.

The awareness context refers to the manner in which management and employees of a company view CI. If CI is embedded in the culture of a company, there is a higher probability that the CI activities will be supported and used, and also that employees will participate in those activities (e.g. contributing information and guarding sensitive information).

Above this, however, the management of a company must be seen to support and use CI and set an example that CI is a necessary activity in a company's endeavour to become and remain competitive in its industry. Top management support is an important element in guaranteeing legitimacy and importance, while sales staff support can be linked to them contributing important and unique field data (Research

and Markets, 2008). Embedding a culture of competitiveness presupposes demonstration of the value of CI to the different users of CI in the company (e.g. managers, product developers, sales staff and business development staff).

Notes

1. This paper stems from a research project financed under the Bilateral Agreement on Scientific and Technological Cooperation between the Republic of South Africa and the Flemish Community (Belgium).
2. In the previous South African research, validation of the questionnaire took place with ten respondents visited once the results were available, to ensure that their interpretation of the questions and that of the researchers were similar.
3. Our company produces assessments that address several possible outcomes of our competitors' actions that might be threats of opportunities for our company (Q26).
4. We use information management tools (e.g., data mining, data warehousing, OLAP or "business intelligence" software) to understand our customers (Q34).
5. We have convenient ways for our employees to report observations and information (Q11).

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Further reading

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(The Appendix follows overleaf.)

Appendix

APPENDIX A: COMPETITIVE INTELLIGENCE QUESTIONNAIRE

>>> WHAT IS COMPETITIVE INTELLIGENCE (CI)?

CI is the process through which information from multiple sources is collected according to expressed information needs; then evaluated, analysed, interpreted, communicated and applied in strategic decision-making. The questions relate to the way your company conducts these activities.

>>> COMPANY DETAILS

Please mark the appropriate answer or complete where necessary.

Q1 Sector in which you are active

- ☐ Agriculture
- ☐ Financial services
- ☐ Manufacturing of goods
- ☐ Mining
- ☐ Trading agents
- ☐ Transport
- ☐ Other services

If Other, please specify ☐

Q2 Number of employees

- ☐ Less than 50
- ☐ 51 – 200
- ☐ More than 200

Q3a What percentage of sales is exported?

- ☐ 0 – 24%
- ☐ 25 – 49%
- ☐ 50 – 74%
- ☐ 75 – 100%

Q3b What percentage of total exports is exported to the following regions?

Europe	☐	%
North-America	☐	%
South-America	☐	%
Asia	☐	%
Africa	☐	%
Australia and New Zealand	☐	%

Q4 Your position in the company ☐

(*continued*)

Figure A1.
Competitive intelligence questionnaire

>>> COMPETITIVE INTELLIGENCE QUESTIONS

Please indicate to what extent you agree with the following statements regarding your company's export activities on a scale from 1 to 5, where 1 equals strongly disagree and 5 equals strongly agree.

1 2 3 4 5	
Strongly disagree	Strongly agree

1. Intelligence practices currently in place in your company

Q5	Our company recognizes CI as a necessary activity for business.	**1**	**2**	**3**	**4**	**5**
Q6	Our management understands what competitive intelligence is.	**1**	**2**	**3**	**4**	**5**
Q7	Most employees understand what competitive intelligence is.	**1**	**2**	**3**	**4**	**5**
Q8	Senior management supports intelligence activities.	**1**	**2**	**3**	**4**	**5**
Q9	Competitive intelligence can be used to create a competitive advantage.	**1**	**2**	**3**	**4**	**5**
Q10	Our company has incentives to encourage employees to report their competitive observations and information.	**1**	**2**	**3**	**4**	**5**
Q11	We have convenient ways for employees to report observations and information.	**1**	**2**	**3**	**4**	**5**
Q12	Our company has a variety of methods for collecting information (*e.g. trade shows, websites, industry reports, etc*).	**1**	**2**	**3**	**4**	**5**
Q13	Our intelligence findings are widely distributed within the company.	**1**	**2**	**3**	**4**	**5**
Q14	We maintain a comprehensive map or inventory of internal information and knowledge.	**1**	**2**	**3**	**4**	**5**
Q15	There is a central co-ordination point for receiving competitive intelligence information.	**1**	**2**	**3**	**4**	**5**
Q16	We make competitive intelligence training (*e.g. collection and analysis techniques*) available to our employees.	**1**	**2**	**3**	**4**	**5**
Q17	We have a variety of ways to present intelligence findings (*e.g. briefings, newsletters, competitor profiles, industry reports, etc*).	**1**	**2**	**3**	**4**	**5**
Q18	We have formal knowledge/information management systems.	**1**	**2**	**3**	**4**	**5**
Q19	Our corporate culture encourages information sharing.	**1**	**2**	**3**	**4**	**5**
Q20	Our company maintains a central record of reliable sources of information.	**1**	**2**	**3**	**4**	**5**

(*continued*)

Figure A1.

Q21	We have a long-term competitive intelligence plan.	**1**	**2**	**3**	**4**	**5**
Q22	We are concerned about the plans and intentions of our key competitors, alliances, suppliers, distributors and other stakeholders.	**1**	**2**	**3**	**4**	**5**
Q23	We report our intelligence findings to the CEO or senior manager.	**1**	**2**	**3**	**4**	**5**
Q24	Competitive intelligence is a permanent activity in our company.	**1**	**2**	**3**	**4**	**5**

Please indicate to what extent you implement the following with regard to your export business on a scale from 1 to 5, where 1 equals never and 5 equals always.

1	2	3	4	5
Never				Always

2. Intelligence practices currently in place in your company

Q25	Our company produces intelligence reports and assessments on emerging technologies that we believe are most important.	**1**	**2**	**3**	**4**	**5**
Q26	Our company produces assessments that address several possible outcomes of our competitor's actions that might be threats or opportunities for our company.	**1**	**2**	**3**	**4**	**5**
Q27	Our employees report information about our competitors on foreign markets to the right managers for decision-making purposes.	**1**	**2**	**3**	**4**	**5**
Q28	Our company analyses our competitor's plans and strategies to predict and anticipate their actions.	**1**	**2**	**3**	**4**	**5**
Q29	Our company uses basic competitor analytical models (*e.g. SWOT and gap analysis*).	**1**	**2**	**3**	**4**	**5**
Q30	In our company, the company's intelligence needs are communicated to employees.	**1**	**2**	**3**	**4**	**5**
Q31	In our company, we meet with executives to identify their intelligence requirements.	**1**	**2**	**3**	**4**	**5**
Q32	Senior managers use CI results in their strategic planning and decision-making.	**1**	**2**	**3**	**4**	**5**
Q33	Our company develops profiles on emerging technologies to better understand their characteristics, potential applications and market advantages.	**1**	**2**	**3**	**4**	**5**
Q34	We use information management tools (*e.g. data mining, data warehousing, OLAP or "business intelligence" software*) to understand our customers.	**1**	**2**	**3**	**4**	**5**

(*continued*)

Figure A1.

Q35	Key decision-makers are surveyed/interviewed to verify that the intelligence products produced for them, satisfy their needs.	1	2	3	4	5
Q36	All information is checked for accuracy and validated by at least one other source.	1	2	3	4	5
Q37	We train/prepare our employees before they go to trade shows, exhibitions, conventions etc. about what information they should look for.	1	2	3	4	5
Q38	Results from exit interviews/job interviews are used in our intelligence system.	1	2	3	4	5
Q39	We evaluate our competitive intelligence findings.	1	2	3	4	5
Q40	Our employees attend intelligence seminars/training programmes.	1	2	3	4	5
Q41	We evaluate the reliability of our sources of information (*e.g. persons, publications, Internet, etc*).	1	2	3	4	5
Q42	We conduct an internal knowledge audit (*e.g. identify and catalogue what people know, what reports they have, publications, etc*).	1	2	3	4	5

Figure A1.

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