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# APPENDIX 1

## SURVEY FOR SMALL AND MEDIUM SIZED ENTERPRISES (SMEs)

# Tactics for small or medium sized enterprises (SMEs) in the technologically innovative sector, that will constrain opportunistic behaviour by large companies in a merger/sell-out

*Contact person:*
*Jill Sawers*
*Tel (012) 349-0382*
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*e-mail: jsawers@theinnovationhub.com*

**This information will be treated as confidential.**

## SURVEY FOR SMALL AND MEDIUM SIZED ENTERPRISES (SMEs)

PERSONAL PARTICULARS

| | | | | |
|---|---|---|---|---|
| 1) Title, Name and Surname: | | | | |
| | | | | |
| 2) Name of company: | | | | |
| | | | | |
| 3) Your job title or position (e.g., Managing Director, Financial Director, Technical Manager, etc.) | | | | |
| | | | | |
| 4) Office Telephone: (including area code) | | | | |
| | | | | |
| 5) Approximate number of full time employees in your firm on 31 March 2003 (please select only one answer): | | | | |
| 1<br><=5 | 2<br><=20 | 3<br><=40 | 4<br><=200 | 5<br>> 200 |
| 6) Annual turnover of your firm on 31 March 2003 (please select only one answer): | | | | |
| 1<br><=R0,15 million | 2<br><=R4 million | 3<br><=R10 million | 4<br><=R40 million | 5<br>>R40 million |

**For Office Use**

Respondent no:

V1 ☐☐☐ 1-3

V2 ☐☐☐ 4-6

V3 ☐☐ 7-8

V4 ☐ 9

V5 ☐ 10

| 7) Total gross asset value (excluding fixed property) (please select only one answer): | | | | | For Office Use |
|---|---|---|---|---|---|
| 1<br><=R0,10 million | 2<br><=R1,5 million | 3<br><=R3,75 million | 4<br><=R15 million | 5<br>>R15 million | V6 ☐ 11 |
| 8) Are you a local subsidiary of a foreign company? | | | Yes<br>(1) | No<br>(2) | V7 ☐ 12 |

*CHECK POINT 1: Should your company comply with at least two of the below-mentioned criteria (i.e. you are a large company), please do not fill in any further details, but return this questionnaire to us*

1. *more than 200 employees*
2. *an annual turnover of more than R40 million*
3. *total gross asset value of more than R15 million*

**Definitions:-**

**(a) Industrial Cluster:** groups of companies (eg. multiple suppliers and institutions) from a specific industrial sector

**(b) Intellectual Property (IP):** IP entails ownership of at least one of the following:

- Patents
- Software
- New products
- New processes

(c) **Innovation:** a new or greatly improved product/service/process introduced to the market, or the introduction within your organisation of a new or greatly improved product/service/process. The innovation is a result of new technological developments, new combinations of existing technology or utilisation of knowledge acquired by your company.

(d) **Joint Venture (JV):** A partnership between two or more companies where there is shared ownership of the new entity, substantial sharing of resources and long term commitment.

(e) **Large Company (LCO):** As per the National Small Business Act, 1996, a LCO is defined as having more than 200 full-time employees, an annual turnover in excess of R40 million, and total gross assets – excluding fixed property, of over R15 million (see definition below).

(f) **Small and medium size enterprise (SME):** As per the National Small Business Act, 1996, an SME is defined as having 200 or fewer full-time employees, an annual turnover of R40 million or less, and total gross assets – excluding fixed property, of R15 million or less (see definition below).

| Size | Full-time employees | Annual Turnover | Total gross asset value (fixed property excluded) |
|---|---|---|---|
| Medium | 200 | R40 million | R 15 million |
| Small | 40 | R10 million | R 3,75 million |
| Very small | 20 | R 4 million | R 1,5 million |
| Micro | 5 | R150 000 | R100 000 |

**All the questions below require a yes (1) or no (2) response:-**

| | Yes (1) | No (2) |
|---|---|---|
| A. Has your company developed proprietary information during the period 1995 – 2003? (This intellectual property may include patents, software, new products and/or new processes.) | 1 | 2 |
| B. If yes, has this intellectual property (IP) been patented? | 1 | 2 |

If you did register at least one patent, please indicate for each year, the number of patents that were registered:

1995: number of patents...........................
1996: number of patents...........................
1997: number of patents...........................
1998: number of patents...........................
1999: number of patents...........................
2000: number of patents...........................
2001: number of patents...........................
2002: number of patents...........................
2003: number of patents...........................

| | Yes (1) | No (2) |
|---|---|---|
| C. If you did register at least one patent, your reasons for patenting are because you (more than one answer possible): | | : |
| 1) Wish to commercialise the patent | 1 | 2 |
| 2) Wish to retain your option to commercialise the patent | 1 | 2 |
| 3) Wish to extend the coverage of a particular patent | 1 | 2 |
| 4) Wish to prevent a competitor from developing this technology | 1 | 2 |
| 5) Wish to sell the patent | 1 | 2 |
| 6) Other reasons (specify) | | |

**For Office Use**

V8 13
V9 14
V10 15-16
V11 17-18
V12 19-20
V13 21-22
V14 23-24
V15 25-26
V16 27-28
V17 29-30
V18 31-32
V19 33
V20 34
V21 35
V22 36
V23 37
V24 38-39
V25 40-41
V26 42-43
V27 44-45
V28 46-47

| | Yes (1) | No (2) | For Office Use |
|---|---|---|---|
| D. If you did NOT register a patent, WHY not (more than one answer possible) ? | | | |
| 1) Desire to keep the intellectual property confidential | 1 | 2 | V29 48 |
| 2) Patenting is not worth the investment / time spent | 1 | 2 | V30 49 |
| 3) Indecision by company to patent or not | 1 | 2 | V31 50 |
| 4) Patenting was unaffordable | 1 | 2 | V32 51 |
| 5) Insufficient resources to defend the patent | 1 | 2 | V33 52 |
| 6) Other reasons (please specify) | | | V34 53-54<br>V35 55-56<br>V36 57-58<br>V37 59-60 |

| | Yes (1) | No (2) | For Office Use |
|---|---|---|---|
| E. Have you during the period 1990 – 2003 cooperated and/or partnered with a large company (LCO)?<br>**If yes, on what basis?** (If no, go to question F) | 1 | 2 | V38 61 |
| 1) Joint venture (A partnership between two or more companies where there is shared ownership of the new entity, substantial sharing of resources and long term commitment) | 1 | 2 | V39 62 |
| 2) Technology development sub-contract | 1 | 2 | V40 63 |
| 3) Licensing | 1 | 2 | V41 64 |
| 4) Beta test site | 1 | 2 | V42 65 |
| 5) Distribution agreement | 1 | 2 | V43 66 |
| 6) Assembly agreement | 1 | 2 | V44 67 |
| 7) A joint project | 1 | 2 | V45 68 |
| 8) Other type of cooperation (please specify) | | | V46 69-70<br>V47 71-72<br>V48 73-74<br>V49 75-76 |

| F. Have you, during the period 1990 – 2003, been acquired or been partially acquired by a large company (LCO)?<br>Specify the shareholding percentage the LCO acquired (where 0% will indicate that you have *not sold any shares* to a LCO): | Yes (1) | No (2) | Number of LCOs acquiring this percentage of shareholding | For Office Use |
|---|---|---|---|---|
| 1) 0% | 1 | 2 | | V50 V51 77-79 |
| 2) 1-25% | 1 | 2 | | V52 V53 80-82 |
| 3) 26-50% | 1 | 2 | | V54 V55 83-85 |
| 4) 51-99% | 1 | 2 | | V56 V57 86-88 |
| 5) 100% | 1 | 2 | | V58 V59 89-91 |

*Check point 2: Should you not have been in a partnership with a large company as per questions E and/or F above, please do not complete the remaining questions.*

**For the remaining questions, if you have been in more than one partnership arrangement, please relate the remaining questions to the MOST IMPORTANT partnership, and please indicate below which type it was (i.e. your selection in E):**

**……………………………………………………………**

| | Successful (1) | Not successful (2) | Partially Successful (3) |
|---|---|---|---|
| G. Did your company perceive the partnership/acquisition to be a success? | 1 | 2 | 3 |

H. What were the main reasons for the partnership being successful/unsuccessful/partially successful? (please specify)

I. Did you use quantitative measures to determine whether the partnership was successful/unsuccessful/partially successful? If yes, please specify the type of measure used (e.g. increased profitability).

| | (Yes) | (No) |
|---|---|---|
| J. Was your technological offering complementary to the LCO's core business? | 1 | 2 |

| | High (1) | Low (2) | Medium (3) |
|---|---|---|---|
| K. What was your level of trust in the large company **prior** to the partnership? | | | |
| L. What was your level of trust in the large company with whom you partnered **after** the partnership? | | | |

| | (Yes) | (No) |
|---|---|---|
| M. Would you consider partnering with this large company again? | 1 | 2 |

Why? (please specify)

For Office Use

V60 92

V61 93-94

V62 95-96

V63 97-98

V64 99-100

V65 101-102

V66 103-104

V67 105-106

V68 107-108

V69 109-110

V70 111-112

V71 113

V72 114

V73 115

V74 116

V75 117-118

V76 119-120

V77 121-122

V78 123-124

V79 125-126

| | Reason | | Expectation | | | For Office Use |
|---|---|---|---|---|---|---|
| N. What do you believe were the MAIN REASONS FOR THE LARGE COMPANY TO PARTNER WITH YOU (consider list of reasons below, please mark yes (1) / no (2))? **Please also indicate whether their initial expectations later proved to be correct (1) or incorrect (2)** | Yes (1) | No (2) | Correct (1) | Incorrect (2) | Do not know (0) | |
| 1) To acquire the brand | 1 | 2 | 1 | 2 | 0 | V80 V81 127-128 |
| 2) To acquire the expertise | 1 | 2 | 1 | 2 | 0 | V82 V83 129-130 |
| 3) To acquire the patent | 1 | 2 | 1 | 2 | 0 | V84 V85 131-132 |
| 4) To access a source of innovation | 1 | 1 | 1 | 1 | 0 | V86 V87 133-134 |
| 4) To acquire the technology | 1 | 2 | 1 | 2 | 0 | V88 V89 135-136 |
| 5) To acquire the product | 1 | 2 | 1 | 2 | 0 | V90 V91 137-138 |
| 6) To access new market segments | 1 | 2 | 1 | 2 | 0 | V92 V93 139-140 |
| 7) To access your network and relationships | 1 | 2 | 1 | 2 | 0 | V94 V95 141-142 |
| 8) To acquire your assets | 1 | 2 | 1 | 2 | 0 | V96 V97 143-144 |
| 9) To take advantage of financial synergies e.g. high growth potential of the SME, but cash strapped | 1 | 2 | 1 | 2 | 0 | V98 V99 145-146 |
| 10) To downsize the company by outsourcing | 1 | 2 | 1 | 2 | 0 | V100 V101 147-148 |
| 11) To challenge and change the dominant logic of the large company | 1 | 2 | 1 | 2 | 0 | V102 V103 149-150 |
| 12) To increase sales | 1 | 2 | 1 | 2 | 0 | V104 V105 151-152 |
| 13) To pursue market dominance | 1 | 2 | 1 | 2 | 0 | V106 V107 153-154 |
| 14) To acquire a competitor | 1 | 2 | 1 | 2 | 0 | V108 V109 155-156 |
| 15) To create a barrier to entry | 1 | 2 | 1 | 2 | 0 | V110 V111 157-158 |
| 16) Not to miss a trend, which could result in falling behind other competitors | 1 | 2 | 1 | 2 | 0 | V112 V113 159-160 |
| 17) To benefit from your company's black economic empowerment initiatives | 1 | 2 | 1 | 2 | 0 | V114 V115 161-162 |
| 18) To form a technological alliance with a view to an eventual acquisition | 1 | 2 | 1 | 2 | 0 | V116 V117 163-164 |
| 19) To protect own brand | 1 | 2 | 1 | 2 | 0 | V118 V119 165-166 |
| 20) To develop a <u>shallow</u> relationship (i.e. buy a non-controllable share and/or get a seat on the Board,.and/or create an option to buy remainder of equity) | 1 | 2 | 1 | 2 | 0 | V120 V121 167-168 |
| 21) To develop a <u>deep</u> relationship with many co-operative activities (viz: cross ownership with reciprocal positions on the Boards of Directors, equally balanced joint ventures, multiple smaller projects that do not involve equity positions) | 1 | 2 | 1 | 2 | 0 | V122 V123 169-170 |

| | Yes (1) | No (2) | Correct (1) | Incorrect (2) | Do not know (0) | For Office Use |
|---|---|---|---|---|---|---|
| 22) To develop a 'quick win' that has a high probability of success and will probably produce an immediate pay-off | 1 | 2 | 1 | 2 | 0 | V124 V125 171-172 |
| 23) To satisfy managerial motives such as: | | | | | | |
| (1) Marketing economies of scale | 1 | 2 | 1 | 2 | 0 | V126 V127 173-174 |
| (2) Increasing profitability | 1 | 2 | 1 | 2 | 0 | V128 V129 175-176 |
| (3) Spreading of risk factors | 1 | 2 | 1 | 2 | 0 | V130 V131 177-178 |
| (4) Reducing costs | 1 | 2 | 1 | 2 | 0 | V132 V133 179-180 |
| (5) Technical economies of scale | 1 | 2 | 1 | 2 | 0 | V134 V135 181-182 |
| (6) Recognition of management expertise for proposing cooperation | 1 | 2 | 1 | 2 | 0 | V136 V137 183-184 |
| 24. Other reasons (specify) | | | | | | V138 185-186<br>V139 187-188<br>V140 189-190<br>V141 191-192<br>V142 193-194 |

| | Yes (1) | No (2) | Do not know (0) | For Office Use |
|---|---|---|---|---|
| O. Did the large company (LCO) have a technology strategy? | 1 | 2 | 0 | V143 195 |
| P. If "yes", did it's technology strategy: | | | | |
| 1) explain or specify how each technology should be used for competitive advantage? | 1 | 2 | 0 | V144 196 |
| 2) specify whether certain technology should be developed in-house? | 1 | 2 | 0 | V145 197 |
| 3) specify whether a given technology should preferably be procured from a foreign (i.e. non-South African) country? | 1 | 2 | 0 | V146 198 |
| 4) specify who, in the company, was responsible for technology management decisions? | 1 | 2 | 0 | V147 199 |
| Q. Does your large company partner source innovative technologies from: | | | | |
| 1) SMEs specifically? | 1 | 2 | 0 | V148 200 |
| 2) LCOs specifically? | 1 | 2 | 0 | V149 201 |
| 3) Research institutions specifically? | 1 | 2 | 0 | V150 202 |
| 4) A combination of the above | 1 | 2 | 0 | V151 203 |

| | | | | For office use |
|---|---|---|---|---|
| 5) Other sources (please specify) | | | | V152 204-205<br>V153 206-207<br>V154 208-209<br>V155 210-211<br>V156 212-213 |
| 6) If yes to one of the above, why? (please specify) | | | | V157 214-215<br>V158 216-217<br>V159 218-219<br>V160 220-221<br>V161 222-223 |
| | | Yes (1) | No (2) | |
| R. Did your large company partner task one of its employees to be the interface/champion between them and your company? | | 1 | 2 | V162 224 |
| 1. Was a representative from the LCO the project champion? | | 1 | 2 | V163 225 |
| 2. Was a representative from your company the project champion? | | 1 | 2 | V164 226 |
| S. Were you aware of the internal politics of your large company partner? | | 1 | 2 | V165 227 |
| T. Did you have an adequate understanding of the strengths and weaknesses of your large company partner? | | 1 | 2 | V166 228 |
| 1. Was your offering complementary to the LCOs SWOT? | | 1 | 2 | V167 229 |
| U. When sourcing innovative technologies, your large company partner sources: | Yes (1) | No (2) | Do Not Know (0) | |
| 1) disruptive technology i.e. technology that will radically change the way you do business | 1 | 2 | 0 | V168 230 |
| 2) incremental technology i.e. technology that will result in improved processes and/or products | 1 | 2 | 0 | V169 231 |
| V. Is the sectoral environment in which your company operates one of: | | | | |
| 1) occasional changes which the company manages (incremental innovation) | 1 | 2 | 0 | V170 232 |
| 2) occasionally dealing with a once-off change (spasmodic innovation) | 1 | 2 | 0 | V171 233 |
| 3) frequent change of a recurring nature (repetitive innovation) | 1 | 2 | 0 | V172 234 |
| 4) fast & furious changes coming from all directions (incessant innovation) | 1 | 2 | 0 | V173 235 |

| | Yes (1) | No (2) | Do Not Know (0) | For Office Use |
|---|---|---|---|---|
| W. When sourcing a technology, the preferred strategy of your large company partner is: | | | | |
| 1) To wholly acquire the technology | 1 | 2 | 0 | V174 236 |
| 2) To enter into one of the following partnership arrangements with an SME: | | | | |
| 2.1) A joint venture (A partnership between two or more companies where there is shared ownership of the new entity, substantial sharing of resources and long term commitment) | 1 | 2 | 0 | V175 237 |
| 2.2) A license | 1 | 2 | 0 | V176 238 |
| 3.3) Becoming a "reseller of the technology" | 1 | 2 | 0 | V177 239 |
| 3) To enter into one of the following partnership arrangements with a large company: | | | | |
| 3.1) A joint venture | 1 | 2 | 0 | V178 240 |
| 3.2) A license | 1 | 2 | 0 | V179 241 |
| 3.3) Becoming a "reseller of the technology" | 1 | 2 | 0 | V180 242 |
| 3.4) Other methods of sourcing (please specify) | | | | V181 243-244<br>V182 245-246<br>V183 247-248<br>V184 249-250<br>V185 251-252 |

| | Yes (1) | No (2) | For Office Use |
|---|---|---|---|
| X. Do you have a documented process for monitoring: | | | |
| 1) Quality control of your products? | 1 | 2 | V186 253 |
| 2) Reliable delivery? | 1 | 2 | V187 254 |
| 3) Reliable product support ? | 1 | 2 | V188 255 |
| Y. Do you segment your potential market using, inter alia, the following categories of potential clients: early innovators, early adopters, early majority, late majority, and laggards? | 1 | 2 | V189 256 |
| Z. Is the worth of your company based on: | | | |
| 1) your sales turnover? | 1 | 2 | V190 257 |
| 2) your number of customers? | 1 | 2 | V191 258 |
| 3) an analysis of your financial statements (ratios, profitability, etc)? | 1 | 2 | V192 259 |

| | Yes (1) | No (2) |
|---|---|---|
| 4) a high customer:sales ratio | 1 | 2 |
| 5) the longevity of your average customer account? | 1 | 2 |
| 6) your reputation in the market place? | 1 | 2 |
| 7) projected growth of profits? | 1 | 2 |
| 5) Other (please specify) | | |
| **ZA. Do you think that the large company gathered information on your company by:** | | |
| 1) Scanning relevant technological magazines? | 1 | 2 |
| 2) **Formal** business appointment(s) with the owner(s) and/or staff of your company? | 1 | 2 |
| 3) **Informal** meetings/lunches with the owner(s) and/or staff of your company? | 1 | 2 |
| 4) Word of mouth? | 1 | 2 |
| 5) Relationship building at networking event(s)? | 1 | 2 |
| 5) Other methods (please specify) | | |

| ZB. What was the main motivation for your company to partner with the large company? **Did this prove to be correct (1) or incorrect (2)** | Yes (1) | No (2) | Correct (1) | Incorrect (2) |
|---|---|---|---|---|
| 1) Gaining access to new markets or larger share of current market | 1 | 2 | 2 | 2 |
| 2) Improving/adding to your management skills | 1 | 2 | 1 | 2 |
| 3) Easing pressure from investors | 1 | 2 | 1 | 2 |
| 4) Obtaining financial support | 1 | 2 | 1 | 2 |
| 5) Optimising entrepreneurship value ("cashing in") | 1 | 2 | 1 | 2 |
| 6) "Piggy backing" on the LCO's technical infrastructure and expertise | 1 | 2 | 1 | 2 |

For Office Use

V193 ☐ 260
V194 ☐ 261
V195 ☐ 262
V196 ☐ 263
V197 ☐☐ 264-265
V198 ☐☐ 266-267
V199 ☐☐ 268-269
V200 ☐☐ 270-271
V201 ☐☐ 272-273
V202 ☐ 274
V203 ☐ 275
V204 ☐ 276
V205 ☐ 277
V206 ☐ 278
V207 ☐☐ 279-280
V208 ☐☐ 281-282
V209 ☐☐ 283-284
V210 ☐☐ 285-286
V211 ☐☐ 287-288
V212 ☐☐ 289-290
V213 ☐☐ 291-292
V214 ☐☐ 293-294
V215 ☐☐ 295-296
V216 ☐☐ 297-298
V217 ☐☐ 299-300
V218 ☐☐ 301-302

| | Yes (1) | No (2) | Correct (1) | Incorrect (2) |
|---|---|---|---|---|
| 8) Your company had moved into a mature phase and no longer provided challenges for management | 1 | 2 | 1 | 2 |
| 9) Other reasons (please specify) | | | | |

| | Yes (1) | No (2) |
|---|---|---|
| ZD. Can you quantify the approximate cost for the large company to switch to/acquire your technology? | 1 | 2 |
| ZE. Is the cost influenced by? | | |
| 1) Equipment being made obsolete | 1 | 2 |
| 2) Acquisition and/or development of new equipment and/or systems | 1 | 2 |
| 3) Staff retrenchment | 1 | 2 |
| 4) Cost of employing new staff and new competencies | 1 | 2 |
| 5) The loss of customers | 1 | 2 |
| ZF. As part of the negotiation process, did you, with your partnering large company: | | |
| 1) Establish a long-term strategic intent? | 1 | 2 |
| 2) Develop a short-term joint intent? | 1 | 2 |
| 3) Identify and create project teams? | 1 | 2 |
| 4) Widely communicate the joint intent? | 1 | 2 |
| 5) Obtain stakeholder support? | 1 | 2 |
| 6) Establish an implementation plan? | 1 | 2 |
| 7) Develop an exit strategy for the SME? | 1 | 2 |
| ZG. During negotiations with the large company, was a substantial equity stake in your company held by: | | |
| 1) A venture capital company | 1 | 2 |
| 2) Another company viz: a) Another SME | 1 | 2 |
| b) A large company (more than 200 employees, with a turnover exceeding R40 million) | 1 | 2 |
| 3) An angel investor (a high net worth individual who takes equity in exchange for investing in the company) | 1 | 2 |

**For Office Use**

V219 303
V220 304-305
V221 306-307
V222 308-309
V223 310-311
V224 312-313
V225 314
V226 315
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V230 319
V231 320
V232 321
V233 322
V234 323
V235 324
V236 325
V237 326
V238 327
V239 328
V240 329
V241 330

| | Yes (1) | No (2) |
|---|---|---|
| 4) An incubator (a facility offering shared facilities and mentorship to start-up companies) | 1 | 2 |
| 5) A bank | 1 | 2 |
| Other (please specify) | | |
| ZH. Are you recognized as an important player in your industrial cluster? | 1 | 2 |
| ZI. Did any key strategic individuals in your company leave within a 12 month period of the partnership with the large company? | 1 | 2 |
| 1) If "yes", did they leave because of cultural differences? | 1 | 2 |
| 2) If they left, did this create a problematic capacity gap? | 1 | 2 |
| ZJ. Is your company dependant on complementary assets of the large company partner (such as new product development, branding, expertise, etc)? | 1 | 2 |
| ZK. Is the large company partner dependent on the complementary assets of **your** company? | 1 | 2 |
| ZL. Did (or would) one of the below-mentioned factors **strengthen (1)** or **weaken (2)** your position when negotiating with the LCO? | | |
| 1) a substantial equity stake in your company was held by another company/investor | 1 | 2 |
| 2) you are an important player in your industrial cluster | 1 | 2 |
| 3) your company is dependent on the complementary assets of the large company | 1 | 2 |
| If yes, why? (please specify) | | |
| ZM. Please list the main core values to which **your large company partner** ascribes: | | |

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V244 333
V245 334
V246 335
V247 336
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V249 338
V250 339
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V255 344
V256 345
V257 346-347
V258 348-349
V259 350-351
V260 352-353
V261 354-355
V262 356-357
V263 358-359
V264 360-361
V265 362-363
V266 364-365

| | Yes (1) | No (2) |
|---|---|---|
| ZN. Would you describe your large company partner as being an opportunistic company viz: seeking self-interest with guile? | 1 | 2 |
| ZO. What evidence would you look for to conclude whether the LCO was an opportunistic company? | | |
| ZP. Was your large company partner a South African company? | 1 | 2 |
| ZQ. In your opinion, which tactics should be avoided by large companies to ensure a successful partnership? | | |
| ZR. Please list the main core values to which **your company** ascribes. | | |

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V268 367-368
V269 369-370
V270 371-372
V271 373-374
V272 375-376

V273 377

V274 378-379
V275 380-381
V276 382-383
V277 384-385
V278 386-387

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V281 392-393
V282 394-395
V283 396-397

**Thank you for your assistance in completing this questionnaire.**

# Appendix 2

## Transcripts from the case study interviews

SME1 was founded in January 2000, the original team comprised the CEO (who had a PhD in electronic engineering), the Chjef Technical Officer (who had an MSc in electronic engineering) and three technical persons (one had an MSc in electronic engineering, the second had a BEng and was studying towards an honours in electronic engineering, and a third was studying towards a Masters in electronic engineering). As at June 2005 SME1 had grown to 6 full-time employees and a turnover of $\leq$ R 4 million. SME1 specialises in innovative product development for information and communication security solutions, with a current focus on applications utilising technologies at the convergence between mobile (GSM) and conventional data networks (the Internet). An example of a recent product it developed is “Cell Power”. Cell Power is a prepaid electricity vending solution that uses mobile telephones as Point-of-Sales devices. SME1 developed the Cell Power system to assist Municipalities reduce their lost revenue through the difficult task of managing electricity usage. Another product of theirs is **eXstream**LITE, which is a robust, secure network device that ensures the optimal use of expensive Internet bandwidth through a unique blend of Internet traffic classification, bandwidth shaping and traffic prioritisation engines.

SME1 wished to achieve two objectives for which they required a partner, namely: to raise cash for growth, and to gain a “big brother”, i.e. protection that would be afforded by having a bigger player as a partner. The expectation was that should a dispute arise with another large company (LCO), then that the “big brother” would enter into high level negotiation to try to resolve the dispute. With this in mind they sought a partner that they believed had a similar culture as their own and were in the same domain as they were namely electronic product development and deployment.

The company with whom they partnered, the LCO1, was a large, reputable South African corporate that specialized in electronics and communications. The LCO1 Ltd had several Divisions that focused on development and implementation – largely for the defense industry. The Division, LCO1Div, although responsible for the lion’s share of LCO1’s turnover of over R1 billion/year, focused on marketing of telecommunications equipment and solutions and did not do its own development – it had no in-house IP. Recognizing their vulnerability in this area, LCO1Div had a strategy of investing in SMEs in order to acquire and gain access to IP. In line with this strategy, LCO1Div, via LCO1, took a third share in SME1 in exchange for a substantial cash injection.

The expectation from SME1's side was that it would be able to continue with new product development and piggy back off LCODiv's marketing infrastructure and reputation. Furthermore SME1 expected the LCO1 to offer SME1's products protection by engaging with any other LCO that exploited SME1's patents unfairly, and resolve the dispute in a preferably amicable fashion. However, the reality was that LCO1 did not wish to tarnish its own reputation by supporting SME1 against the opportunistic LCOs that were breaching SME1's patents, as LCO1 already had existing relationships with these opportunistic LCOs that it viewed as important. SME1 was therefore expected to "fight its own battles" without the backing of its LCO partner. SME1 indicated that the relationship was partially successful because only one of the two objectives for partnering, had realized, namely the ability to raise cash. An opportunity was later created for SME1 to buy back its shares from LCO1 when a new CEO was appointed at LCO1Div who, in focussing the company's resources on its core business, sold off all subsidiaries where LCO1Div investment was R10 million or less. In this way SME1 managed to exit from a less than optimal partnership.

In discussing the difference between capabilities and competencies, The CEO clarified his understanding of capabilities as being "skills", and cited project management, programming, software development and the associated support, as capabilities that he believed were captured in the employees of SME1. Such skills were necessary in order to produce a business output such as intellectual property (IP) – which he defined as a competency. He believed that SME1 had a competency in developing GMS-internet interface systems, and that this competency was dependent on the skills set of the employees. The CEO drew an analogy of capabilities being like gears and competencies being like a gearbox, where the individual gears were all components of a gearbox, and where the gears on their own could not perform work, as part of a gearbox, they could. An LCO, he believed, therefore either had the option either to grow organically by hiring in "gears" and over a period of time assembling them into a "gearbox", or alternatively, partnering with an SME and rapidly acquiring the entire gearbox. (In the case of SME1, they had, in fact, been approached by a second LCO who was merely interested in the skills of one of their employees and wished to partner with the company merely to access this set of skills. As they feared that this partnership would lead to the demise of SME1, they declined the partnership offer.) However, the CEO believed that a fully functional gearbox, including market share, customers etc, was of greater value to an LCO that the individual skills of the SMEs employees.

The CEO commented that competencies and capabilities were certainly important for partnership success. He believed that competencies rather than capabilities were more important. His reasoning was that large companies do not partner with SMEs to acquire skills, as they can "buy these in" merely by employing individuals. They are more interested in partnering with an SME such that they gain access to a "total product". In the case of SME1, it was the "existing IP belonging to the company as well as the company's "competence" to develop new IP that attracted the large company into a partnership with SME1" said the CEO. He believed that LCOs were typically after two competencies: IP and market share. In the case of SME1, although they had IP, they did not have market share.

Protecting the SME's capabilities and competencies was important when partnering with an LCO as "LCO's were ruthless and would take everything", commented the CEO. SME1 protected its capabilities and competencies, in an attempt to ensure a successful relationship, by having in place the following:

- patents already secured the first customers to used their service
- a restraint of trade had been built into their employees contracts prohibiting them from working for a competitor within a reasonable period of time
- entered into a formal shareholders agreement with the LCO that
    - excluded re-evaluation of the company against future cash flow projections *
    - the LCO had to buy the majority share of SME1 (up to 51%) after a 3 year period (the market value of the shares would be determined by a third party); whereafter at any time thereafter, SME1 could offer to sell the remaining shares at market value and LCO1 Ltd would be obliged to buy them. (This clause was premised on the assumption that LCOs wish to hold the majority of the SMEs shareholding and hence SME1's intention was to build up the value of the company and then exit.)
- the relationship was built on trust where there was a similar culture and the individuals with whom they were dealing had a similar background

* The CEO mentioned that a common oversight SMEs make when entering into a shareholder's agreement with an LCO is that they fail to take note of a clause that is

usually inserted by the LCOs linking the value of the SME to its cash flow projections. The strategy is that because the SMEs typically make very optimistic cash flow projections in order to entice LCOs to invest, that when, after a certain period of time (e.g. 2 years) the SME's worth is reassessed, should it not have achieved the originally projected cash flow, then the LCO can demand additional shares in exchange for the value that had not realized. In this way an SME seriously compromises itself as the LCO can dramatically increase its shareholding without the need for further investment. In this way an LCO can gain the majority share from an unsuspecting SME.

**2. SME2**

SME2 was founded by the CEO in 1999, the core business of the company being network recording. At the time of the partnership with LCO2 AG, SME2 had only one employee (the CEO) and had a turnover of $\leq$ R4 million. SME2 has subsequently grown to 31 number of employees and has a turnover of over R 35 million per year, and its core business is developing systems for mass interception and capturing of data and voice. Their current skills include being able to develop cutting edge hardware designs; software development based on knowledge of industry and systems engineering (in systems engineering the CEO believes South Africa has a competitive edge as unlike in other countries, South African engineers do not have the luxury of specializing in a niche area but need to address the overall picture); software electronic engineering with computer science. The CEO, having a BCom and BProc degrees, was the sole owner of SME2. The CEO's prior experience was in financial management – his last position prior to starting SME2 was as a Financial Director of a high-tech engineering company. Because of his interest in technology, in 1994 he had joined a company that supplied voicemail and the system that sends SMS's for one of South Africa's large cellular service providers,, as the MD. This gave The CEO an opportunity to familiarize himself with the telecommunications industry. Thereafter he joined ME2 who had an OEM (original equipment manufacturer) agreement with LCO2 to design and manufacture new products. ME2 was keen to sell the company to an American company, and as they did not believe the OEM part of the business (that was worth approximately 25% of the business) would be attractive for the sale, they wished to sell this off. The CEO bought this part of the business from ME2, around which he established his own company, SME2.

The CEO believes that having capabilities and competencies is essential for partnership success, and furthermore, that there should be complementarity, i.e. the SME should have competencies that the LCO does not have and requires. SME2 offered a competence in the design and manufacture of products. However, this competence was outsourced to a second company with whom SME2 had a relationship. ME2 (for whom The CEO worked prior to starting SME2) could bring a new product to market at a hugely reduced cost, and much faster, than LCO2, and it was this that had attracted LCO2 to form a partnership with them. When ME2 decided to sell off this section to SME2, a three-way agreement was signed between ME2, LCO2 and SME2 whereby SME2 took over the terms and conditions of the original ME2-LCO2 agreement without any modifications. Hence, SME2 was still expected to deliver new products to the market cheaper and faster than LCO2 could.

The interest from SME2 in partnering with LCO2 was because of LCO2's strong brand, its reputation, and access to international markets. However, the relationship turned out to be unsuccessful, largely because of a mismatch in size and power, the CEO commented. The agreement was very one sided where LCO2 had all the rights and SME2 had all the obligations. An example was where SME2 would have to give them information on new products they were developing and would also have to guarantee availability of spare parts for these products for fifteen years, whereas there was no obligation on LCO2 to buy any of these products. Another example was where LCO2 competed head-on with SME2 selling SME2's own products to SME2's customers. As SME2 was obliged to disclose the names of its customers, LCO2 would then sell the SME2 product at a much higher price than were SME2 to sell its product directly to its customer. It appeared that the philosophy of LCO2 was to conclude the deal at all costs, and do "damage control" thereafter. The CEO commented that for a partnership to be successful both parties must benefit and it should be a win-win situation. The agreement should reflect the same rights and obligations for both parties.

The relationship between ME2 and LCO2 was never good. The CEO described it as LCO2 being "pedantic, nitpicking, demanding, and lopsided". The relationship with LCO2 deteriorated further once SME2 became the OEM. SME2 had tried to end the agreement with LCO2 and wrote a letter to them requesting that their relationship be terminated. However, it was only after a period of approximately nine months that LCO2 in fact responded, and this was after they became aware that SME2 had introduced a new product to the market. Their response was in the form a letter suing SME2. The CEO believes that this was merely a tactic to soften SME2 up for the step that followed. LCO2 then offered to withdraw the charge provided that SME2 would perform a demonstration of their new product to one of LCO2's potential customers to the satisfaction of the customer.

This did eventually lead to a sale of the product to LCO2's customer, and LCO2 is again expressing interest in working with SME2 - the CEO believes it is because they are interested in SME2's new product. The CEO concludes that were he to enter into an agreement with LCO2 once the old agreement has expired, he would structure the contract around the rights and obligations of the generic seller and the generic buyer respectively, rather than the rights and obligations of each specific company. In this way he believes that balance can be obtained.

The CEO defines a competence as a combination of skills, knowledge and experience that give a company a competitive edge whereas capabilities would be more generic e.g. a technical support capability, a sales capability, a financial capability – on their own these will not necessarily give a company a competitive edge. The CEO believes that established companies can't innovate that easily as they often have legacy processes and have too much invested in old systems to innovate and change to new systems. Hence he believes that competencies are more important for a successful partnership than capabilities. In the case of LCO2, he re-iterated that it was SME2's ability to develop new products and bring these to the market at a cost and time period attractive to LCO2 that attracted this company to the partnership.

The CEO commented that it is very difficult to protect one's capabilities and competencies when partnering with a large company, but safeguards would certainly help. Firstly, patents are not an effective safeguard unless you have sufficient resources to defend the patent. However, having registered patents does increase the value of the company, the CEO believes. Having "first mover advantage" would be one form of safeguard, as would having a restraint of trade agreement with your employees and preventing the LCO from appointing your employees. Also, including sales targets in the agreement with the LCO could serve as a safeguard. (The current agreement between SME2 and LCO2 lacks sales targets, but lists detailed technical specifications as to norms with which new products must comply, buying and selling prices etc.). Any new agreement to be negotiated would be for a shorter period of time (three, rather than five years), and the arbitration would be moved to an affordable location like South Africa.

The CEO believes that the contractual relationship is more important than a trust-based relationship. Not only is the development of the MOU an important part of the negotiation process, but it is an important reference document for what was originally envisaged and promised – especially for when the originators of the agreement are no longer present. A "fall-back" option is also important, i.e. having a second client (or more) lined up should the relationship with the LCO fail. Relying on a single company is risky.

The CEO concluded by saying that he would more easily trust a South African company than a foreign company – mainly because of a similar culture, as well as proximity and ability to interact on a continual basis. He believes that it is important to interact regularly with the LCO partner and to "keep a finger on the pulse". "LCO's will circumvent agreements. The more you hurt them in the market place, the more negotiable they are" the CEO comments.

### 3. SME3

SME3 was founded in 1999 by the CEO and his business partner, CTO, who both had a Masters in Electronic Engineering. The CEO and CTO had both left LCO3 (Pty) Ltd, a large player in the South African defence industry having approximately 300 employees, that focused on optoelectronic product development and commercialization for this industry, to found their own business in opto-electronics. This move was partly because they wished to go on their own and partially because LCO3 was short staffed and employees were carrying more than a fair work load. LCO3 had made the CEO a counter-offer when they heard he intended leaving, but as he was intent on starting his own company, they agreed that he would continue to assist LCO3 by contracting on an hourly basis with them. Prior to resigning, the CEO had been managing a project and had been working alongside an LCO3-appointed project manager for approximately 4 months. Once he went on his own, his main point of contact within LCO3 for the project contractual work was this project manager. Additional work for the new SME3 came mostly from the LCO3's laser technicians that his partner had worked with whilst still an employee of LCO3.

SME3 has grown over the years and currently has a turnover of $\leq$ R4 million as well as 7 full-time employees plus 5 – 8 students at any one time. Its core business is electronic engineering solutions and products – and the vision is to become a premier provider of electronic product solutions. SME3, today, has experience in the following industries: telecommunication; military and defense; aviation; agriculture; information technology; security; and mining. The skills set encompass opto-electronics, embedded hardware and software development; PC software; analog design; mechanical draughting; and PCB schematics and layout. Products include: infra-red perimeter beams that provide a cost effective means of detecting when an object passes through an infrared beam; in-circuit serial PIC programmer that programmes a wide range of microchip's 16 and 18 series of PICs; and a smart vehicle harness – an intelligent in-vehicle network that uses the CAN protocol. SME3 is currently participating in an incubation programme.

The CEO commented that he believed that having capabilities and competencies was important for partnership success. It was the CEO and his partner's opto-electronic capabilities and detailed product knowledge of LCO3's products that attracted the LCO to partner with them. The nature of the partnership was one of contracting SME3's specialist skills, on an order-based basis, to assist LCO3 with product development and support. Initially this product development related to the LCO3's core products. However, with time the situation changed as the LCO built up its own in house capabilities in the areas that it had previously subcontracted SME3. Thereafter it would contract SME3 to develop test equipment or supportive products that would enhance the LCO's product range. Because both the CEO and his business partner had been employees of the LCO they used to interact on a social level and were friends of many of the technical personnel of the LCO. This relationship had been fundamental in securing continued orders from the LCO.

The CEO believes that it was SME3's capabilities (specialist technical abilities) rather than their competencies that attracted the LCO. At the stage of the partnership, they did not have sufficient processes in place for them to have competencies, but specialist knowledge they did have. The CEO believes that this would still be the case today as LCO3 wants to develop its own products, hence it wishes to access specialist knowledge rather than, for example, a product development capability. It is difficult to find specialists, and especially locally for defence related work, hence "buying in" the skills was not a realistic option LCO3.

The relationship with LCO3 has changed over time. In the beginning no thought was given to the need of protecting its competencies. The relationship was based on friendship where the contract work that SME3 performed for LCO3 was based on a verbal agreement, the specifications of which were captured in an order that was placed by LCO3 with SME3. The order would either specify the expected outputs to be delivered against the number of hours of input, or payment for the achievement of certain milestones, or in some instances SME3 would simply develop a complete product, carrying all the costs for product development, and this product would be sold to LCO3.

However, associated with the departure of key contacts from LCO3, as well as SME3's own growth, the preference of SME3 is to have a company-company agreement in place as a framework within which to subcontract work to the LCO. Such a contract could specify means of monitoring the partnership e.g. having the books of the partner audited to ensure the correct reflection of payment to the partner. The CEO believes that not only is it important to have a contract in place, but as it is not always easy to monitor whether there is compliance with the contract (e.g. where disclosure on sales is required for royalty payments), retaining and not handing over a crucial part of the product (e.g. the software component) would further protect SME3's capabilities in its dealings with a LCO. Formal safeguards (e.g. contracts; deposits) he believes are critical to prevent a situation for a breach in trust to occur. "It is important to tie down the LCO's promises early" says the CEO. Formal safeguards are therefore vital in a partnership – he would consider entering a relationship with an unknown partner (i.e. no existing relationship) where there were formal controls in place, than entering a partnership based solely on trusting what the partner promises, e.g. huge sales turnover. One cannot rely solely on goodwill. However, he is of the opinion that some initial trust is required prior to entering a relationship with an LCO.

## 4. SME4

SME4 was established during January 1982 at a South African University. The original group comprised 3 Computer Science professors and 9 Computer Science Honours and Masters students. It became a closed corporation (CC) in March 1989. The CC was converted to SME4 (Pty) Ltd in 1993 and the overseas expansion of the company resulted in SME4 America Inc being established during 1998 as well as SME4 Limited that handled the UK business. During 2000 at least 3 subsidiary companies were created as new "venture capital"-oriented companies and SME4 supplied all the funding. The abovementioned companies now employ approximately 400 people.

SME4 initially supplied "systems programming" solutions to companyA and companyB. Companies A and B were in computer networking systems and were medium sized companies. The founder of SME4 commented that having capabilities and competencies was critical for partnership success as it was because of a product that SME4 had developed (a human resource (HR) module) that LCO4 had approached them in the first instance. LCO4 AG and LCO4 South Africa concentrated on ERP (enterprise resource planning), "an industry term for the broad set of activities supported by multi-module application software that helps a manufacturer or other business manage the important parts of its business, including product planning, parts purchasing, maintaining inventories, interacting with suppliers, providing customer service, and tracking orders.

ERP can also include application modules for the finance and human resources aspects of a business. Typically, an ERP system uses or is integrated with a relational database system. The deployment of an ERP system can involve considerable business process analysis, employee retraining, and new work procedures." (www.Webopedia). LCO4 recognized that SME4 had certain competencies and asked them to customize the LCO4 HR module for the South African market. SME4 then entered into a Memorandum of Agreement with LCO4. SME4 later became an LCO4 implementation partner after they had been fully trained and gained the required experience. SME4 has grown from 12 full-time employees with a turnover of ≤ R4 million in 1994 to over 400 people having a turnover of in excess of R240 million in 2006. Most of the staff in the earlier days of SME4 was recruited from the University's Department of Computer Science. It is hence no longer an SME but today qualifies as a LCO. The experience shared below, however, relates to the experience of SME4 when it was still a start-up company (1994), and had a turnover of < R1,2 m.

SME4 had both competencies and capabilities that had attracted LCO4. It had a broad spectrum of knowledge and skills for developing applications and new developments, as well as systems processing skills and an ability for complex programming for example, software protocol development – i.e. capabilities. In addition the company had some knowledge of the domain. The founder clarified that his understanding of capabilities was the ability to bring about new developments, and a competency was an ability to deliver something now. For example, SME4 used its payroll competency to customize the LCO4's payroll system.

The founder believed that both competencies and capabilities were important for a successful partnership. The SME must demonstrate some competency, although this competency did not need to be specifically in the domain of the LCO. However, a demonstration of the SME's capabilities and competencies was important for a prospective partnership. The founder further commented that because of domain independence, capabilities were possibly more important than competencies, for example, an LCO in the financial sector might have seen the SME's capabilities to develop systems in the mining sector, and request them to develop similar systems for the financial sector. This would clearly indicate recognition of certain capabilities that could be used to develop a new competence in a new sector or domain.

When the SME is really small, it appears that the LCO is more interested in the SME's capabilities, but as it grows and develops certain competencies, it appears that the LCO shifts its interest to the SME's competencies. The founder commented that this would be in line with Geoffrey Moore's "chasm"-discussion on how to introduce a technology product to the market as some LCOs tend to be risk averse and would be more interested in accessing a demonstrated competence than merely a capability that would need to be developed into a competence. However, the interest in accessing competencies and capabilities would also be dependent on the situation and the specific need of the LCO, for example, if specialist skills were required for instance to develop cutting edge innovation and radical thinking, then the LCO would be more interested in accessing capabilities to include in its own systems and processes than looking for a competence. Alternatively, and citing examples like Cisco and Microsoft, an LCO may recognize a domain competence in some of the individuals of an SME and acquire the SME, strip it of the people who are not core to the competence, and integrate the competence into its own company. The founder is of the opinion (and talks from SME4's current position as an LCO) that LCOs are looking for complementarity with their own business focus.

The founder believes that integrity (a confidence or trust that the one company will not try to deceive the other and that the company will deliver on what it promised) is critical to a partnership. The founder referred to work done by Fernando Flores, who obtained a PhD in Philosophy from the University of California, Berkeley on *Management and Communication in the Office of the Future*, and who discusses a four stage cycle for coordinating effort, which he refers to as the "atom of work". This is an iterative process of negotiation, commitment, and delivery on expectations. For this process to be effective there must be inherent trust and this trust gets further developed as one follows the process. The founder believes that a contract is mostly about the process of discussing the expectations (including capturing the specifications), and then having an ability to monitor the outputs against the expectations. Where there is a deviation, a contract provides the point of departure for addressing the deviation. He believes that having a contract for punitive measures is less important as if it gets to that stage, then the relationship is already broken and the partnership cannot be successful. He is of the firm opinion that contracts are put in place to avoid misunderstanding, and that they become increasingly important as the business grows. The founder stressed the importance of a contract and especially for setting the framework for the partnership and clarifying expectations. Also, contracts were important for continuity such that if the negotiator(s) left the company, the terms of the agreement are codified for the successors. However, he cautioned that SMEs need to be very alert to opportunistic clauses in contracts e.g. a clause that says should the LCO find a buyer for x% of their shares, then the SME is obliged also to sell x% of its shares. He did not believe that a partnership could exist purely on trust.

An important way of protecting the company's capabilities and competencies, the founder commented, was to retain their competent employees. This SME4 did by creating a family culture where people felt they belonged. As the company grew, so the culture changed, but it also became less important to retain critical people as critical mass had been built up by that stage and the company had gained a momentum of its own. Another way of protecting itself against opportunism by the LCO was to ensure that it could offer a better service than the LCO.

To conclude, therefore, the founder believes that good service delivery, trust, contracts and culture are important to improve the relationship between competencies, capabilities and partnership success. Where the contract serves as a safety net, a trusting relationship is critical. If there is no trust, then a contract will not save the relationship.

# Appendix 3

## Experts' analysis of case studies

### Expert 1:

**Qualifications:** PhD in Solid State Physics
**Current position:** Managing Director of a (Pty) Ltd
**Disciplines of expert knowledge:** Technology Management; Innovation Management; Knowledge Management; Business Solutions Engineering
Experience in the field: business consulting in the field of technology management for 17 years, including strategic market assessment, technology strategies, innovation strategies and knowledge management strategies, with an emphasis on small business, government policy development in the science and technology sector and small/large business interfaces.

| | General/Specialist capabilities/ competencies | Discipline specific/multidisciplinary | Capabilities/ competencies | Weak/strong Safeguards |
|---|---|---|---|---|
| SME1 | 3 | 2 | **3** | **3** |
| SME2 | 1 | 4 | **1** | **2** |
| SME3 | 4 | 1 | **2** | **1** |
| SME4 | 2 | 3 | **4** | **4** |

### Expert 2:

**Qualifications:** BSc. Eng (Electronic). BSc.(Hons) MBA. OPM (Harvard). Fellow of SAAE
**Current position:** CEO BrainWorks Management (Pty) Ltd. Business Coach.
**Disciplines of expert knowledge:** ICT, Strategy, Marketing, Product Development, Leadership Development, Venture Capital & Business Coaching. 29 Years in ICT industry, 10 years founder CEO of ICT company with R100m turnover; board member of 4 ICT companies.

| | General/Specialist capabilities/ competencies | Discipline specific/multidisciplinary | Capabilities/ competencies | Weak/strong Safeguards |
|---|---|---|---|---|
| SME1 | 4 | 1 | **4** | **2** |
| SME2 | 3 | 3 | **3** | **3** |
| SME3 | 1 | 2 | **1** | **1** |
| SME4 | 2 | 4 | **2** | **4** |

## Expert 3:

**Qualifications:** D.Comm; MSc; MBA
**Current position:** Director of Innovation at a South African University
**Disciplines of expert knowledge:** Technology Management; Innovation Management; in the field for 23 years.

| | General/Specialist capabilities/ competencies | Discipline specific/multidisciplinary | Capabilities/ competencies | Weak/strong Safeguards |
|---|---|---|---|---|
| SME1 | 4 | 1 | **2** | **3** |
| SME2 | 2 | 3 | **3** | **2** |
| SME3 | 1 | 4 | **1** | **1** |
| SME4 | 3 | 2 | **4** | **4** |

## Expert 4:

**Qualifications:** MBL; MSc; BSc (Eng)
**Current position:** Assoc. Prof in Software & Telecoms Engineering at a South African University
**Disciplines of expert knowledge:** Technology management; software engineering; telecommunications engineering; knowledge management; geospatial information systems; innovation management.

| | General/Specialist capabilities/ competencies | Discipline specific/multidisciplinary | Capabilities/ competencies | Weak/strong Safeguards |
|---|---|---|---|---|
| SME1 | 4 | 1 | **1** | **2** |
| SME2 | 2 | 3 | **2** | **1** |
| SME3 | 3 | 2 | **3** | **3** |
| SME4 | 1 | 4 | **4** | **4** |