Research summary:
Tracing intellectual capital cash flows

Overview and objective
The study represents an initial exercise in tracing the
utilisation of a specific stock of intellectual capital
elements (ICEs) to the cash flows they generate from
their use on client projects. We identified these ICEs,
representing pieces of corporate know-how, processes
and relationships, in earlier studies conducted with
a virtual international consulting firm known as
Flare Solutions Ltd. In the current study, four of the
five partners of the firm maintained records of the
proportional usage of each of these ICEs in relation
to monthly billings to clients on projects in the
consulting unit of their firm. From this information,
it was possible to determine a frequency of use and
to affix a monetary value to a select group of ICEs at
monthly, quarterly and annual intervals.

The main findings emerging from this research are as
follows:

• It is possible to affix monetary values to ICEs and
indeed this was done for all 42 ICEs used in
the tracing process.

• Seven of the 42 ICEs contributed over half of the
cash flows for the company arising from consulting
activities.

• The frequency with which each ICE was used
strongly reflected its contribution levels towards
cash flows.

• The 42 ICEs came from six of the 11 categories of
ICEs originally identified for Flare.

• The tracing process has helped the partners
formulate company strategy consistent with IC
usage and dollar contribution.

• The record of IC inventory stocks and flows has
ensured the transfer of ideas among the partners,
thus avoiding isolation of a stock of knowledge in
a single partner and thereby inhibiting its use by the
entire firm.

• This exercise has created awareness among
the partners as to which ICEs are most useful in
driving cash flows and which ICEs are crucial for the
organisation’s survival, thus worth protecting in
some manner.

• The partners are now aware of those ICEs that may
be losing potential to generate cash in the
consulting process, and this enables them to
determine if they are ready for standardisation or
commoditisation as a software product.

Research process
Intellectual capital (IC) is frequently discussed
at an abstract level and it is generally measured
within organisations in terms of its inputs, outputs
or outcomes, such as training courses taught, sales
generated from new products, or percentage of
satisfied customers. Rarely is it ever specifically
identified, because in most people’s minds it
constitutes an intangible asset that eludes direct
observation.

Working with a virtual firm called Flare Solutions Ltd.,
Herremans and Isaac were able to develop a process
called the Intellectual Capital Realisation Process
(ICRP) that helps organisations to inventory their
stock of IC by first identifying and then managing
and measuring it on an on-going basis. From this
earlier research, Flare was able to create a stock of
inventory of its intellectual capital elements (ICEs)
and assess their current and potential significance
in terms of cash flows for the firm. ICEs constitute
pieces of corporate know-how, relationships, and
processes possessed by employees and the company,
that directly or indirectly contribute wealth to the
organisation. Once 127 ICEs were originally identified
(this number has now grown to around 160 ICEs),
the ICRP permitted the Flare partners to achieve the
following outcomes:

• Gain a better understanding of the company’s
current IC assets by making tacit knowledge
explicit.
• Develop insight into those ICEs requiring further development (the ICRP automatically prescribes different strategies for different types of ICEs).

• Measure and track changes in these ICEs over time to gain a better understanding of the knowledge life cycle.

• Share a greater level of awareness of the organisation’s vulnerability regarding valuable ICEs.

• Identify barriers to developing ICEs and implement specific strategies to minimise these barriers.

• Capture important organisational knowledge held by only one of the partners (in case the person leaves the company).

• Develop more effective approaches for working together.

• Treat the subject of IC in a concrete manner, rather than at an abstract level, to ensure more effective operations for the company.

Our current study continues the long term research efforts and relationship with Flare. The Flare partners living in the United Kingdom and Canada have oil and gas industry clients throughout the world. They also contract with associates in a variety of countries to help them on specific projects, when consulting tasks become routine or they need a particular type of expertise for a project. Flare is highly dependent upon its IC, as it works primarily within the knowledge economy.

After creating an inventory of their stock of IC, the Flare partners and the researchers categorised this stock based on the traceability of the IC to the final project, similar to factory costs of direct material, direct labour and overhead for a manufacturing company. Three categories of stock emerged and the explanation is at the top of the next column.

1 Generator ICE
a. Directly generates cash flows or cost savings for the client.
b. Directly traceable to, and identifiable with, the client’s project.
c. Similar to raw material or labour used in manufacture of a product/service.
d. Specific Flare examples: RAPOR, POSC.

2 Facilitator ICE
a. Indirectly identifiable with a client’s project by supporting or facilitating generator ICEs.
b. Traceable to, and identifiable with, the client’s project by its association with generator ICEs.
c. Similar to factory overhead and considered part of cost of product/service.
d. Specific Flare examples: logging client progress, databases, channels and working around the clock due to time zone differences for partners.

3 Capacity ICE
a. Not easily traceable to the final project but support generator and facilitator ICEs; extremely difficult to come up with a percentage for frequency of use.
b. Provides organisational capacity to operate, such as facility level costs.
c. Similar to other operational expenses (selling, general, and administrative).
d. Specific Flare examples: organisational structure and building a unique corporate image.

The Flare partners chose 42 ICEs from the inventory for monitoring purposes based on their perceived significant contribution towards cash flows. Most of these ICEs fall into the generator ICEs category, with a few falling into the facilitator category.

We gathered data on both a monthly and quarterly basis and aggregated the data to an annual basis. To do this, we created a template containing the selected inventory of ICEs, their identification numbers and descriptions, and the total billed to the client. Then, each partner who helped to secure or perform the contract indicated the following information on the template.
1) Whether or not a particular ICE was used in either securing or completing the contract.

2) The significance of the role that the ICE played during the specific period of time to assist in achieving goals on the contract.

The partners determined the significance of each ICE using a seven-point scale anchored with the following definitions.

**Useful (1):** The ICE proved useful in securing or completing the contract within less time or with higher quality levels, but not at the same level as ‘important’ i.e. without this element, the contract would still be secured or completed.

**Important (4):** The ICE assisted in securing or completing the contract, by offering the client higher levels of quality or shorter periods of time to accomplish the project’s goals.

**Critical (7):** Without this ICE, Flare could not have secured and/or completed the contract.

If two or more partners completed a template for a single project, all ratings were averaged to determine a single score for each of the ICEs and to avoid double-counting.

The templates provided us with the opportunity to determine the frequency of use for each generator and facilitator ICE, the relative dollar value of each client invoice attributed to the ICE in question, and finally, it permitted tracking of ICEs to determine which of them were changing over time. In this latter case, some ICEs undergo a transformation as they evolve, while others become less useful and have a limited shelf-life. The results allowed the partners to determine which ICEs were used most frequently in securing and completing contracts and which ones could perhaps be sold or licensed (in a commercialisation process) as they become less critical for generating cash flows in the consulting part of the firm.

The researchers and Flare partners were well aware that the dollar amount attributed to each ICE was not an absolute amount due to the subjective nature of the rating process. However, assigning a dollar amount helped to determine the relative importance of the ICEs and provided a sense for what role each ICE played in the organisation. Each high value-added generator ICE (and relevant facilitator ICEs) could be assessed in terms of the matrix presented below. It also provided a starting point for determining price for a selling or licensing agreement.

**Risk (to Flare) if ICE is lost to a competitor**

<table>
<thead>
<tr>
<th>Ability of competitor to substitute or imitate</th>
<th>Lo</th>
<th>Hi</th>
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</thead>
<tbody>
<tr>
<td>Easy</td>
<td></td>
<td></td>
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<tr>
<td>Sell or Commercialise</td>
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<tr>
<td>Differentiate and Protect</td>
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<tr>
<td>Difficult</td>
<td></td>
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<tr>
<td>License</td>
<td></td>
<td></td>
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<tr>
<td>Retain as Core Competency and Protect</td>
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**Findings**

Flare Solutions Ltd. has a number of cash flows arising from software sales, maintenance, licenses and other sources not considered in this study. The only cash flows considered here relate to the 42 ICEs.

The actual cash flows generated by Flare will not be presented to maintain confidentiality for this organisation. Instead, we present our findings for ICE contributions in relation to every $100 of cash flow. As shown in Graph 1 (on the next page), the 42 ICEs tracked are listed in decreasing order of dollar contribution, identified by their specific inventory number. As can be readily seen, the top seven ICEs generated 51% of all cash flows for the calendar year 2005 from the ICEs tracked.
From our earlier research, we originally identified 11 categories of ICs for Flare Solutions Ltd. and the 42 ICs came from six of these categories. The categories of ICs that were not used included organisation structure, business strategy processes, management enhancement processes, team dynamic/culture and individual differences. These categories, although still important inventory ICs to Flare, consisted mainly of lower level facilitator or capacity ICs, less traceable to cash flows. The remaining categories contributed the following percentages towards cash flows:

1. Technical knowledge ICs – 41%.
2. Marketing ICs – 36%.
3. Concept formulation ICs – 9%.
4. Team psychological processes ICs – 5%.
5. Knowledge management support systems ICs – 5%.
6. Communications ICs – 4%.

In general, the academic IC literature proposes three main categories of IC; human, organisational, and relational. Human capital refers to the activities that create knowledge based upon experience that ultimately contributes value to the firm. Organisational capital includes databases, technology, control systems, and other processes and procedures that assist the company in storing or utilising the knowledge created by its employees. Finally, relationship capital consists of the associations with customers, suppliers and other stakeholders essential to the firm’s economic sustainability. Our findings attribute the generation of cash flows to these categories as follows: human capital- 54%, organisational capital- 8%, and relational capital- 38%.

We found a very strong statistical relationship between the frequency of use for an ICE and its annual contributions towards cash flows. Thus the more an ICE was used, the larger its contribution (Pearson correlation coefficient = .834), adding validity to our method of tracing dollars to ICs.

To examine this finding further, we created a graph (see Graph 2 on page 5) where we plotted the annual contributions towards cash flows for the 42 ICs against their frequencies of use (similar data point locations may give the appearance of missing data). We can now examine where each of the ICs are located in four separate quadrants (we chose the midpoints prescribed by our data to establish the quadrant lines). Of the 42 ICs, 23 (or 55 percent) fell in the low frequency-low dollar amount quadrant. These ICs require further investigation or monitoring. Some of them represent generator ICs in the early stages of consulting practice (early stage of the knowledge life cycle) and it is possible that they may move over time into the high frequency-high dollar...
amount category. Others represent ICEs that are in the mature stage of the knowledge life cycle because they are used less in consulting practice. They have become more standardised and are now ready for use by associates (associate use was not tracked in this research) or could be transformed to software applications.

The low frequency-high dollar amount quadrant contains no ICEs and, in general, this is good. ICEs generating high cash flows but infrequently used, are ICEs with unexploited potential. The 12 ICEs in the high frequency-low dollar amount quadrant are strong facilitator ICEs, slightly less traceable to dollar values, but no less important, such as the ability to share mindsets among the partners. The seven ICEs falling in the high frequency-high dollar amount quadrant are those generating 51% of Flare’s cash flows for the year 2005 of the ICEs tracked.

By considering the risk/ability to substitute or imitate matrix (presented earlier), the partners can decide which ICEs can be sold, licensed, or retired. Also, they can decide which ICEs need to be protected and differentiated, and finally, which ones need to be retained as a core competency, as well as protected.


Implications for management
Because the Flare partners participated in the ICRP in earlier research (see suggested readings), they reaped several benefits. Perhaps the greatest benefit of participation in the ICRP was the peace of mind it brought the partners to know that they were concretely managing their IC through a searchable inventory and not merely using input, output, or outcome measures which infer the existence of the IC that generates these measures.

The current study extended this previous research by achieving the ultimate goal, namely permitting us to affix a monetary value to each of the 42 ICEs selected for tracking purposes. In so doing, it has allowed us to abandon earlier perspectives that IC constitutes an ephemeral, elusive, intangible asset and thus defies good management. Instead, we may embrace the idea that it can be dealt with on a concrete basis like any other tangible asset possessed by an organisation. The ability to achieve this outcome ought to assume increasing importance throughout the business world as we move steadily towards a knowledge-based economy.

From Flare’s perspective, the information generated through this study assumes importance for several reasons. First, the partners interact with one another generally on a virtual basis, and frequently they are in various locations around the globe. This situation makes it difficult for individual partners to accurately assess exactly which ICEs are the most useful in relation to the generation of cash flows for the company. While a partner possesses knowledge about useful ICEs for the particular project currently worked on, it is difficult to see the bigger picture for the company without the type of process utilised in this study. This process aids in the transfer of knowledge between partners and thus avoids isolating significant knowledge in the mind of a single partner.

Also, this process aids in ensuring that tacit knowledge moves to explicit levels, as the partners communicate and share ICEs arising from work on individual projects, not only among themselves, but with their associates and clients. Thus the process utilised in this study ensures the transfer of ideas on a feed forward basis from the individual to the organisation and a feedback basis from the organisation to the individual. It should also be noted that the template utilised in this study asks the partners to identify and record new ICEs developed from various projects.

Furthermore, the process of identifying and tracking the 42 ICEs helps the organisation to strategically plan on a concrete basis the development of those ICEs possessing the greatest potential. This approach makes each partner aware of ICEs that ought to be retired, as they no longer contribute value, and those ICEs that perhaps should be commercialised, sold or licensed.

Finally, this study is helping both the researchers and the partners understand the nature of knowledge as it passes through a life cycle, especially in the early stages of its birth. The eventual birth of an ICE involves what the partners have dubbed first generation IC or ‘leading edge thinking’ (LET). LET innovations are really generator ICEs in the making, but they are in a rudimentary form that often precludes their immediate contributions towards cash flows. They frequently act as a springboard for more advanced ideas arising from them – an evolutionary process where a LET 1 becomes a LET 2 and so on, until sufficient refinements permit it to act as a generator ICE for use on client projects. Many are subject to rapid transformations during their periods of formulation. At times, these successive LET processes may slow down, sometimes due to a lack of opportunities for commercial applications. Further, only about one in ten ideas that generate successive LET processes ever actually result in viable commercial applications (a process playfully referred to by the partners as moving from ‘tumbleweed to cash’).

The process utilised in this study permits the partners to note the entry of a freshly hatched ICE and to reflect upon its conceptual LET history. Also, they can observe its further transformation through actual application over time in various projects and in a number of complex ways. For example, ICE number 132 called “Wave” provides an illustration of the complex evolution of knowledge within Flare. This ICE
was conceptualised in 1999, rapidly improved through LET processes, and used in two large oil companies in the year 2000. Also in 2000, the prototype for ICE number 147 (using the E & P catalogue) was born and over a succession of LET processes during a five year period of incubation, it was finally integrated with ICE number 132 (Wave) for commercial application in 2005, proving to be the fourth highest contributor to this particular cash flow for the company.

**Conclusion**

In conclusion, the findings of this study demonstrate that ICEs can be tracked over time to assess their individual contributions towards company cash flows. By eschewing the measurement of intellectual capital in terms of its indirect effects (such as percentage of satisfied customers) and by actually identifying and tracking ICEs, we have moved a considerable distance towards turning discussions on the subject of IC from intangible to tangible realms. We suggest that it is only possible to make wise decisions about corporate IC when managers can actually see these kinds of reports and know its real value to the company.
Resource materials and further reading

An article featuring the earlier work with Flare Solutions Ltd and the application of the ICRP appears in:


An article featuring the application of the ICRP in a non-profit organisation, the Canadian Sport Centre Calgary (CSCC) appears in:


An article featuring the development of the proper management and control systems for knowledge-intensive organisations appears in:


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