

Implementation of the integrated emerging contractor development model: Towards enhanced competition for small construction firms

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ABSTRACT

South Africa is a technology colony. A technology colony is merely a stage of technological development of a country and should neither be something to be ashamed of, nor necessarily seen as a disaster. Remaining one should not be a fate to be suffered, but an opportunity to be managed. The notion of South Africa's "technology colony" status is explored to highlight the country's challenges in terms of technological development.

The authors suggest that an Integrated Emerging Contractor Development Model (IECDM) is a framework that effectively facilitates transfer of skills and knowledge to the construction firms in the construction sector and should therefore be exploited to address the existing technological gap. The IECDM was developed to assist in developing small construction firms to become competitive and sustainable businesses (Dlungwana, *et al*, (2004). The paper shares some salient aspects of the contractor development programme that was piloted in the Eastern Cape province in South Africa between 2004 and 2006. Based on this pilot programme the authors argue that the model improves the performance, sustainability and competitiveness of construction firms.

The IECDM is promoted as a spring-board towards a future construction industry that will have improved profitability and general business sustainability. Based on the IECDM's performance record, the authors explore how IECDM can become an effective vehicle for transferring technology to small construction firms. The potential role of IECDM is seen to have huge benefits for moving South Africa's small construction sector beyond the technology colony stage into a technology-driven sector.

Introduction and Background

South Africa is a technology colony. A technology colony is merely a stage of technological development of a country and should neither be something to be ashamed of, nor necessarily seen as a disaster. Remaining one should not be a fate to be suffered, but an opportunity to be managed. The notion of South Africa's "technology colony" status is explored to highlight the country's challenges in terms of technological development.

One of the major challenges facing South African entrepreneurs today is arguably the increasing gap in the technological capabilities enjoyed by their international counterparts. The South African small construction firms are not an exception in this regard. There is an urgent need for construction firms to acquire knowledge and innovative technologies in order to become sustainable and competitive. Small construction firms and those practitioners involved in the sector's development programmes need to figure out how to effectively transfer knowledge and technologies to small construction firms in a manner that truly elevates this sector to new levels of growth and competitiveness.

The Integrated Emerging Contractor Development Model (IECDM) has been proven to be an effective framework for developing small construction firms to become sustainable businesses. The paper strengthens this argument by describing the salient aspects of the contractor development programme that was piloted in the Eastern Cape province in South Africa between 2004 and 2006.

The current challenge for the IECDM is therefore to adequately fulfil its intended role as an effective contractor development framework in a manner that bridges the wide technological gap which exists in the small construction sector.

South Africa's Technological Development Stage – the Notion of a Technology Colony

De Wet (1998) illustrates the notion of a technology colony by means of a diagram in figure 2, where the levels of activity (in terms of monetary value) are plotted over the product life cycle. These levels of activity in the technology colony in the foreground, are compared to the levels in the generic, industrialised, First World country in the background. This presentation provides the general features of the technological colony, as follows:

- the predominant industrial business activity in the colony is at the manufacture and “trade-in the final-products” end of the product life cycle, while activities in the industrial country tend towards a continuum over the whole life cycle;
- there is a small group of activities at the research end of the life cycle in the colony, representing the R&D activities of the

- tertiary education institutions, some R&D done in the local industry and some government-funded R&D;
- there is a flow of technology from the developed world into the colony, in the form of licensed products, designs, processes, sub-assemblies and final products, often implemented in the colony in the form of a subsidiary of a multi-national corporation;
- there is an almost insignificant flow of technology from the local R&D community to the local industry sector, mainly because the relevant R&D is done “back home”; but there is some communication between the local and foreign R&D communities.

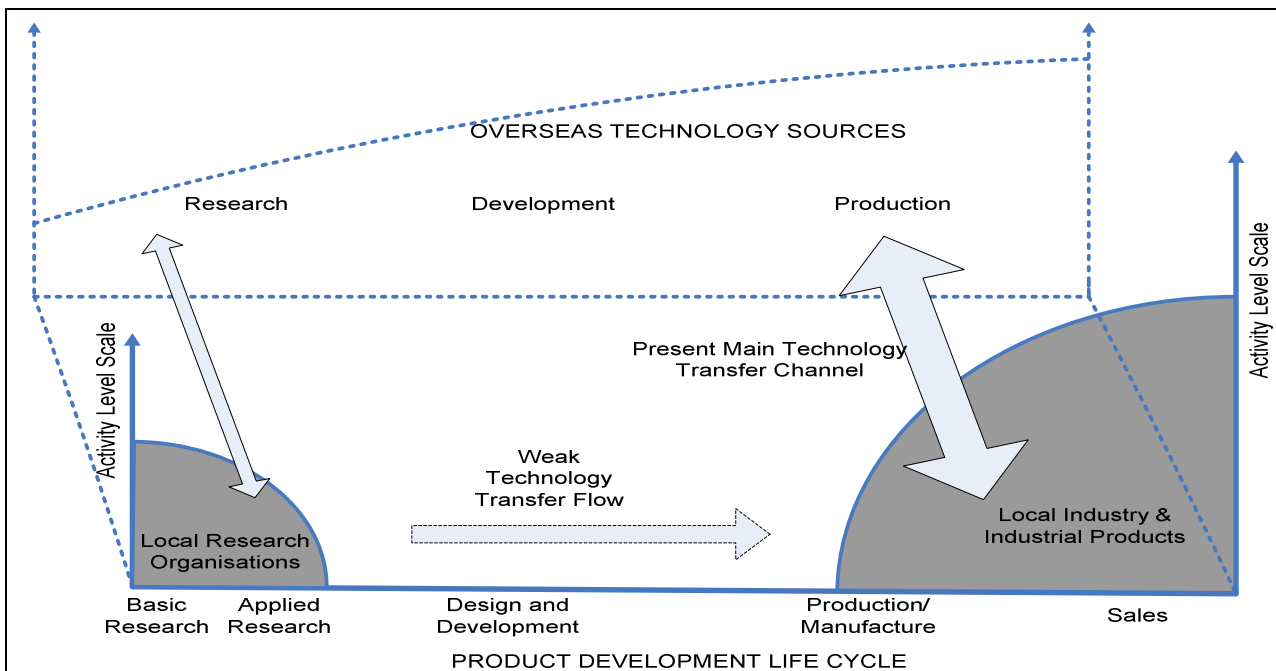


Figure 2: Technology transfer channels in the technology colony (from de Wet)

According to de Wet, more than 80% of the value in the industrial business activity in South Africa is done under licence, and more than 50% of this activity is subject to market constraints. While these statistics may be more relevant for the construction materials suppliers, many small construction firms do not appear to fit into this mould. While many small contactors do not provide their services under licence they are, by

and large, not involved in the creation and/or adoption of new knowledge and transfer. In fact, the construction industry is generally seen as an industry that does not easily adopt new technologies and prefers to stick to primitive technologies.

In tackling the challenges regarding emergence out of the technology colony towards an industrialised economy, de Wet points to the ‘little dragons’ of the Pacific Rim – most notably Singapore – as credible examples of what can be achieved. Two key strategies are suggested to

move the technology colony towards technological independence. The strategies are the development of high skills levels for the country's human resources (adopted by the "Pacific Rim" countries); and the creative use of natural resources by adding value to the initial stages of the value chain through R&D, the so-called backward integration strategy. In essence, however, both strategies require determined effort in the development of people skills.

It is also within the context of skills development that the IECDM model becomes relevant for the construction industry.

Key features of the IECDM Model

The CSIR has been involved in research work on contractor development models with a view to addressing a number of challenges facing small and medium-sized construction firms in South Africa. A typical example of one such model is the Integrated Emerging Contractor Development Model (IECDM) developed by the CSIR (Dlungwana, *et al.*, 2004). The model focuses on the development of basic management capacities of small construction firms to ensure sustainability. A small firm is one that can handle a project of up to R5 m.

IECDM is a framework that promotes entrepreneurship, innovation, sustainability and competitiveness of construction firms.

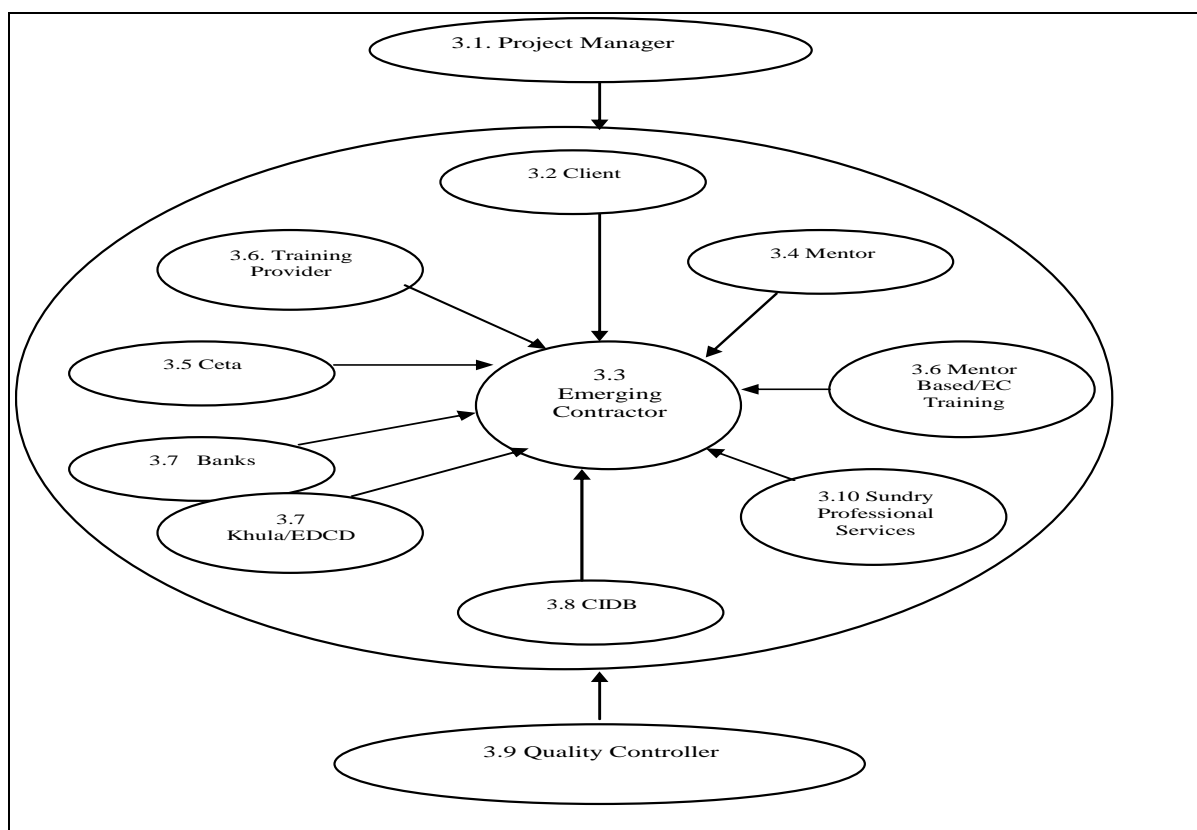


Figure 1: Structure of the IECDM

The model is a framework for managing a contractor development programme effectively by facilitating the selection of suitable construction firms, implementation of a programme of skills training, mentorship and total quality management. The strength of the model is its ability to integrate training and mentoring of small construction firms within a two-year programme in which a number of stakeholders contribute towards contractor development. The IECDM programme typically involves a contractor being trained, mentored and quality assured while at the same time delivering a

construction project. The model is based on the principles of the Total Quality Management (TQM) philosophy which comprise the principles of:

- strong, visionary leadership;
- long-term business perspective;
- client focus;
- caring for the people (staff and broader community);
- balanced, holistic approach to business management;
- continual improvement of business processes; and
- results-orientation.

For quality assurance of the development process, the model uses a questionnaire-based scoring technique to continually evaluate the contractor's level of development and the extent to which best practices are embraced. The model thus facilitates an objective assessment of the contractor's strengths and areas for improvement, and enables management to implement appropriate improvement. More than just an assessment tool, the model aims to contribute broadly to the national government strategy for developing the small construction firms by facilitating the transfer of knowledge, technology and best practices to these businesses. The model also aims to assist construction firms in strengthening the strategic management aspects of the business with a view to improvement of productivity and competitiveness.

Benefits of the IECDM Pilot Programme

The IECDM was piloted with success between 2004 and 2006 as outlined by Hauptfleisch (2007); and the programme is seen as one of the few comprehensively managed contractor development programmes in South Africa. In their paper, Hauptfleisch, *et al*, (2008) further outlined the key benefits from the IECDM programme. The following benefits are clearly captured in the above documents:

Integration of the Activities of the Programme

The IECDM's rigorous programme management approach ensures that the contribution to contractor development of the numerous stakeholders involved is properly planned and coordinated. An integrated approach enables officials to reap the benefits as a result of the

economies of scale and synergy of the various stakeholders.

Promotion of Continuous Improvement

IECDM drives the programme through the TQM philosophy which ensures that the processes and end-results of the programme are continuously measured, analysed and improved to ensure that skill formation for construction firms does indeed happen. The measurement aspect differentiates the IECDM model from the rest and makes it the only known model in South Africa where actual measurement of performance is carried out.

Promotion of Sustainability and Competition

IECDM promotes construction firms' business sustainability and competitiveness. A post-closure survey on construction firms revealed highly enhanced capability to tender for work independent of the mentor, as well as high capability to manage their business accounts. These two aspects are critical in developing sustainable and competitive construction firms.

IECDM as a Vehicle for Technology Transfer

Figure 3 illustrates the potential effect of technology flows resulting from "backward integration", and also indicates how the IECDM framework can be deployed to enhance the technology flows from both overseas sources as well as local research organisations.

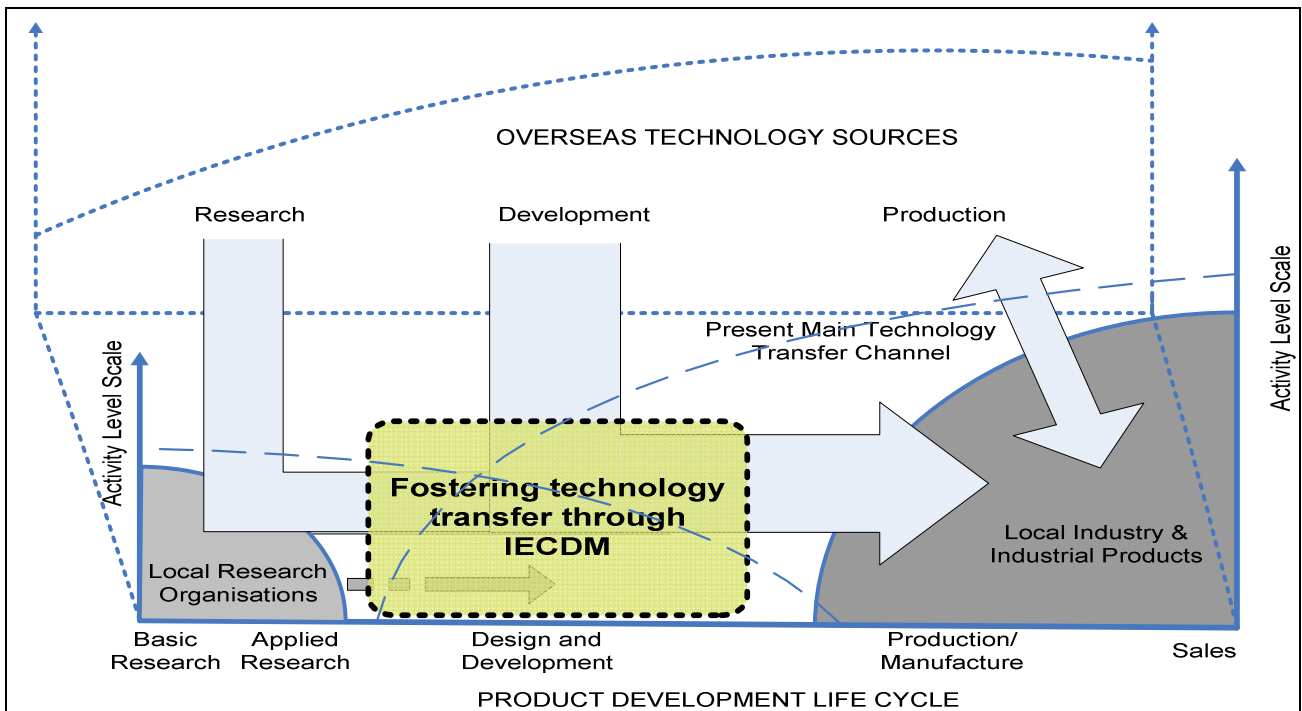


Figure 3: The effect on technology flows resulting from “backward integration” and the deployment of the IECDM. (Adapted from de Wet)

According to De Wet, the technology transfer strategy to move South Africa away from the technology colony status should comprise elements that are aimed at decreasing (in relative terms) technology flows at the production and trade of final products at the end life cycle, while increasing technology in the form of design and development capability as well as applied research. In as much as IECDM has proven itself to be an effective framework in transferring knowledge and skills to small firms, the framework should be adapted to undertake a strong role in the technology transfer arena. The following are some of the areas that require a specific focus:

- adoption of information and communication technologies (ICTs);
- adoption of modern methods of construction;
- adoption of new building materials, such as composites.

Need for a Collaborative Strategy in Fostering Competitiveness for SA Construction Firms

The role of various stakeholders in the Integrated Emerging Contractor Development Programme is covered by ECDC (2007).

A number of government agencies and departments are working towards enhancing the

development of small construction firms. Examples of such agencies are the:

- Council for Scientific and Industrial Research (CSIR);
- Construction Industry Development Board (CIDB);
- Industrial Development Corporation (IDC);
- Independent Development Trust (IDT);
- Construction Education and Training Authority (CETA);
- Government Departments (e.g. Department of Public Works, who are infrastructure clients).

In addition to these government agencies and departments, the private sector can play a major role as infrastructure clients and service providers (e.g. training and mentoring services).

It is therefore critical that various stakeholders are encouraged to form collaborative partnerships in order to deliver effective technology transfer programmes.

Conclusion

In the modern times when technological developments are plentiful, small South African construction firms are still facing numerous challenges that prevent adoption of innovative technologies.

In as much as the IECDM has proven itself as an effective framework for developing and transferring knowledge and skills to small construction firms, the model is now seen as an appropriate framework for addressing the technology gap faced by this segment of the construction industry. A number of stakeholders, including the CSIR, government agencies and the private sector, need to form effective collaborative partnerships in order to address the technological gap and to provide the small firms with a competitive edge.

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