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Towards an e-Model for the Enhancement of Service Rendering by SMMEs Supporting Agencies in South Africa

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Abstract: The traditional and quasi manual-based approach for providing services by SMMEs supporting agencies to South African SMMEs is considered, and associated drawbacks demonstrated. It is shown that, the translation of the existing model to an e-model may lead to an effective and efficient service delivery, which in turn could positively impact on SMMEs operational objectives. The proposed e-model forms the basis for the enhancement of the quality of service rendered by various supporting agencies in order to contribute to the sustainability and growth of small businesses. A plausible operationalisation of such a model may impact positively on socio-economic development through income generation, eradication of unemployment as well as the contribution to GDP growth amongst others.

Keywords: SMMEs, Support agencies, Access to resources, Service provisioning, e-Model, SOA.

1. Introduction

The enterprise landscape[i] in emerging economy countries is predominantly made of Small, Medium and Micro Enterprises (SMMEs). SMMEs[ii] contribution to the economy accounts for up to 40% in countries such as Brazil, Russia, India, China and South Africa [2, 3, 4]. In South Africa, 95% of enterprises operating in the economic ecosystem are SMMEs, contributing up to 65% and 40% to employment and GDP respectively [5]. These statistics demonstrate the significant role played by SMMEs towards the socio-economic development of the country. In effect, a sustained small business represents an active agent for income generation, poverty alleviation and job creation. However, one of the key challenges faced by SMMEs in South Africa remains their inability to maintain their effective presence within the ecosystem for a relatively long period of time. In the country, up to 80% of SMMEs do not survive during their first three years of existence [6]. Such a high attrition rate is cause for concern and there is a need to investigate the various factors preventing small businesses to operate in a sustained manner in order to improve their positive impact to the economy.

Institutions in the ecosystem such as government agencies, banks and various private organizations have developed products (services) aimed at supporting small enterprises to fulfil their operational goals and achieve a reasonably sustainable productivity. The kind of services rendered by *supporting agencies*[iii] to small businesses varies from facilitating access to basic information on entrepreneurship, to provisioning seed capital aiming at financing opportunistic projects (business opportunities). The presence of supporting agencies in the ecosystem and the vitality of their role suggest that, small businesses should reasonably operate in a confident manner. However, a large number of small entrepreneurs

are either not aware of such presence and/or not knowledgeable to the kind of services being offered. For those SMMEs seeking assistance, the inefficient and ineffective manner in which services are rendered make them reluctant to recognize the strategic importance of these supporting agencies. These drawbacks are mostly due to the traditional, manual, and often inefficient approaches used towards service provision. For example a small business (with good credentials) in quest for seed capital to secure a tender of which decision will be made in a week-time would require in general more than three months to secure a loan from a supporting financial agency. This demonstrates the incongruence between business opportunity and resource availability, which negatively impacts on the sustainability of SMMEs. As a result, an increasing number of small enterprises would cease to operate with subsequent unforeseen socio-economic implications.

This paper considers on a generic fashion, the traditional model for rendering services to small enterprises by supporting agencies, and demonstrates its drawbacks and ineffectiveness. It is further shown that by adopting an effective and reliable e-model for service rendering, the productivity of SMMEs could be leveraged, resulting to their sustainability and growth, and therefore to socio-economic development at large.

The remaining part of this paper is structured as follows: Section 2 discusses small business service requirements for fulfilling their operational objectives. Section 3 presents the current approach used by supporting agencies to render services as well as limitations thereof. A preliminary e-model for enhancing service delivery to small businesses is suggested and described in Section 4. A use-case derived from the e-model is briefly presented in Section 5 with associated advantages. The conclusion and further directions to this work are presented in Section 6.

2. SMMEs Service Requirements

In this section, we briefly discuss a generic set of services required by SMMEs to be successful. Since SMMEs are vulnerable in nature due to their size, the relatively low income they generate (individually), and their inability to compete with their large enterprise counterparts, it appears evident that they need to be supported in order to survive.

For small enterprises to be competitive, innovative, and economically viable within the economic landscape, a number of challenges need to be addressed. Successful Small enterprises often possess a range of resources required for addressing their operational needs. Therefore, the mere motivational will and personal capabilities of SMME owners do not suffice to be successful.

One of the most important challenges faced by SMMEs is their inability to access the various resources required for their daily operations. This prevents small businesses to be operationally productive, yet there is a range of supporting structures in place to assist them in various ways (refer to [7] for example). A resource for a small business may be regarded as any tangible or intangible asset on which it relies in order to operate successfully. These resources can either be endogenous[iv] or exogenous to the organization. Endogenous resources usually form part of the starting building block of established small enterprises, while exogenous resources are often required on an "as-needed" basis when opportunities arise. In most cases, exogenous resources are provided by supporting agencies in the ecosystem. For example, an opportunistic need for cash for a business purpose would require obtaining a loan from a financial institution. The small business has to look for the right institution for that exercise. Prior to the loan approval, a range of tasks have to be done starting from the completion of application forms to the loan agreement with a subsequent cash transfer in the enterprise's account. Once the transfer is made, the required cash amount now becomes an endogenous "*financial resource*" to the organization. However, the overall process before the actual acquisition of the loan is referred to the "*financial service*" required to secure the cash. This paper focuses on SMMEs service

requirement instead of SMMEs resource requirement in the sense that the realisation of the latter requirement is preconditioned by the quality of the overall process undertaken in acquiring the former.

Figure 1 depicts an extract classification of services required by South African small enterprises to be operationally sustainable.

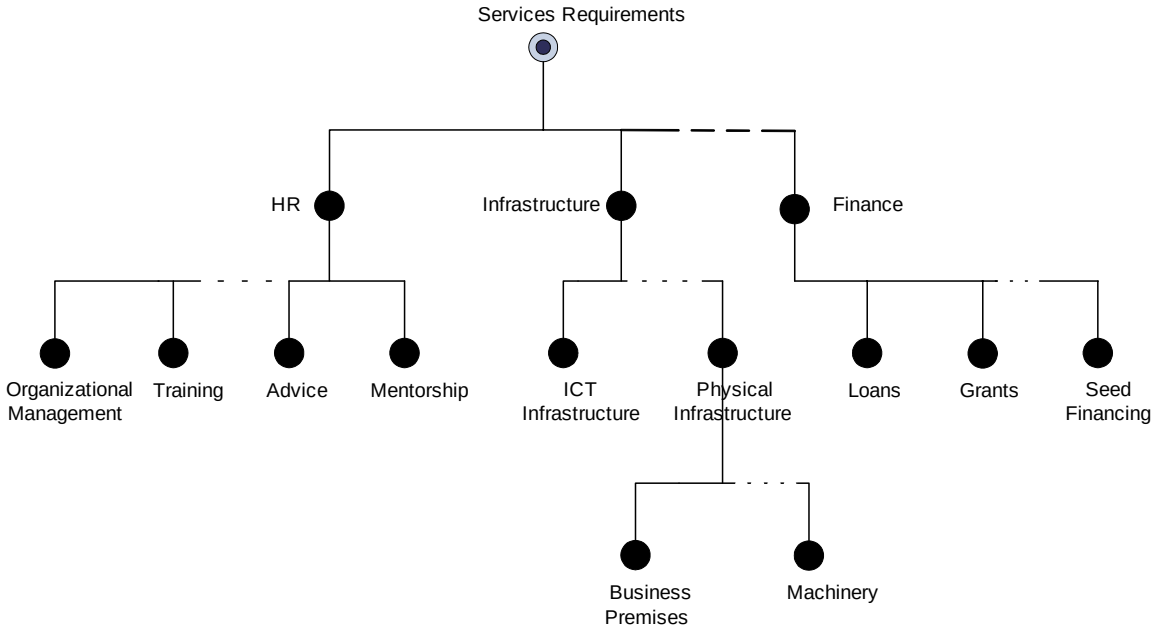

Figure 1: An Extract Typology of SMMEs Service Requirements

In general, three types of services are often required by small enterprises on an "as-needed" basis, and they are briefly described along the following lines:

- ***Human Resources (HR) Services***: These include amongst others specific services such as training, advice, mentorship and organizational management. One of the key challenges of small enterprises is their inability to attract and maintain a suitable workforce for securing their productivity. This usually occurs because workers are often unskilled and/or inexperienced. By providing basic training to some and mentoring the others, the challenge faced by the organization in term of workforce could be resolved. Providing advice to small business owners could enhance their entrepreneur and management capabilities in order to fulfil their daily operations. Furthermore, strategic, relational and organizational management skills are required to some small business owners in order to develop the ability to successfully venture into various market niches that are not necessarily their domain of predilection. They also enable small entrepreneurs to have necessary management skills to motivate and maintain a highly productive workforce within the organization.
- ***Financial Services***: These represent the overall process involved in securing basic financial products such as loans, grants, seed financing amongst others. Small businesses need to be knowledgeable on how such services are afforded to them. They also need to familiarize themselves with the database of providers, as well as associated conditions attached to each service. Of course there are various factors preventing small businesses in securing resources attached to those services. Nonetheless by being engaged in the ecosystem and by establishing strong relationships with appropriate service providers, the organization becomes knowledgeable to the various offers available in the financial market to such extent that it could optimally make use of different opportunities.

- ***Infrastructural Services***: These include services associated in the provision of basic ICT infrastructures, as well as physical infrastructures. In the ecosystem, some providers may offer small businesses the opportunity to materialize their presence within appropriate business premises conducive to enhancing their productivity. However, since in many cases small businesses are not knowledgeable to such services, they often only rely on their own asset (business location) resulting to poor productivity. In the construction industry and manufacturing for example, temporary access to appropriate machinery and technological services appears to be one of the many challenges faced by small businesses.

A typology of service requirements for small businesses represents an appropriate tool for the identification of specialized agencies offering services in the ecosystem. It also provides an understanding of SMMEs service requirements and may form the basis for the provision of new products/services by supporting agencies. The complete study of SMMEs services requirements and their impacts on sustainability are beyond the scope of this paper. In the next section, we briefly present supporting agencies available in South Africa and discuss the current model for service provisioning.

3. Current Service Rendering Model

In South Africa, small businesses are susceptible to request the service of up to eight types of supporting agencies, namely: Government Agencies, Banks, Private Organizations, Sectoral Bodies, International Organizations, NGOs, Academic Institutions, and Regional Bodies. However, very few SMMEs are aware of opportunities supporting agencies can offer, yet alone the existence of supporting bodies. In most cases, only those small businesses registered with their sectoral bodies may benefit from available services provided that they are knowledgeable of their availability. The significant number of supporting agencies in the country is a reflection of the pivotal role played by small businesses in the economy. The number also suggests that the rate of small business failure can be kept at minimum. Plausibly, in order to curb the attrition rate, the manner in which those services are exposed and rendered to SMMEs should be addressed.

In general, three types of services are offered to SMMEs by the various supporting agencies in the landscape, namely: HR services, financial services and infrastructural services. The types of services offered are thus persistent with the small businesses resources requirements discussed in Section 2. The characterization of each type of service provided and its alignment to service requirements are beyond the scope of this paper; instead, we merely focus on a generic model used for service rendering described below.

In general, service providers advertise products (services) in their brochure which may include high level details on each service's features. In most cases, the responsibility lies on small businesses to access those brochures and identify the services that best suit their requirements. Therefore, for those small businesses that have no access to the brochure, chances for taking advantage of opportunities afforded by the brochure are narrowed. Once an appropriate service has been identified by the SMME, various interactions may be initiated between the provider and the requestor (potential consumer). Interactions entail: the application for accessing the service; the reception of the list of documentations required for requesting the service; the completion of all the necessary forms; the submission of a formal request for service provision; the study of the submitted documentations; the validation process; and finally rendering of requested service, preceded by a range of contractual agreements between the provider and the requestor (if necessary). Figure 2 depicts the generic service provisioning use case from its advertising stage to the rendering and monitoring phase. In the figure, the small business is referred to as the consumer and the supporting agency is referred to as the provider. In effect, up to eight stages are required to complete the process, which is cumbersome for all role-players.

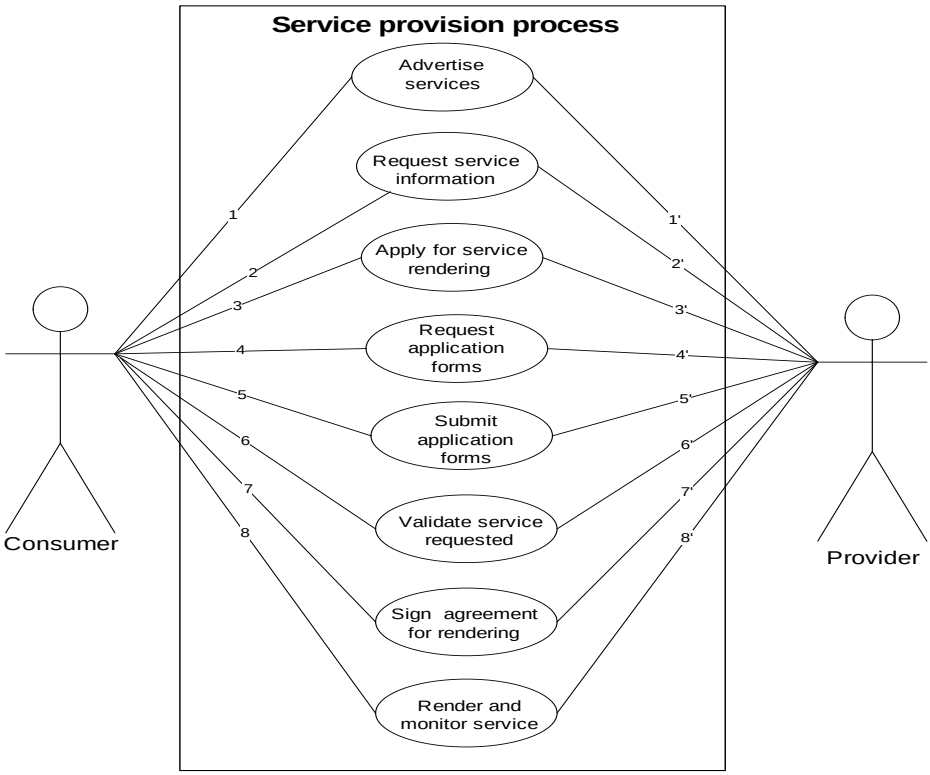

Figure 2: A Contextual Use Case for Service Provisioning

At each stage, there is often very little ICT usage in the completion of each process, which further complicates the overall system in terms of efficiency and reliability. A brief description of each process and associated drawbacks follow:

- **Advertise services**: Supporting agencies advertise products in various forms with the aim of reaching as many SMMEs as possible. Various communication media such as the internet (e-mail and web-pages), print press, pamphlets, TV/radio can be used at cost. However, small businesses with limited access to various communication media may miss such opportunities.
- **Request service information**: If the service advertised has been worthwhile to the potential consumer, more information is required before making any decision. Information provided is useful to the requestor as it enables him/her to make further judgments before proceeding. The provision of information is often done through fax, telephone, e-mail or individually to the requestor upon his/her arrival to the provider's premises. Assuming that many requestors are attracted by the advertised services, many requests will be made followed by a series of explanations to the requestor, which is time consuming to a provider with limited capacity to manage large requests. This contributes to further delaying the rendering time which negatively impacts on the requestor's productivity.
- **Apply for service rendering**: A complete understanding of detailed information on the service is often followed by a request for the various documentations required in order to apply for the service. The previous process can be combined with this process as well as the next one. However, our intention here is to demonstrate the lengthy approach that logically applies for requestors that are unfamiliar with the product, thus would require step-by-step interactions with the provider. The process could happen telephonically, electronically, face-to-face or via post, which is time consuming and costly to both parties. The expected outcome at this stage is the submission of the documentation to the requestor described below.

- **Request application forms**: At this stage, the provider sends required forms to the requestor for completion. In general, further detailed information and certified documents should be attached to completed forms depending on the kind of service in question. This process is often time consuming to the requestor as some information is often omitted during the exercise.
- **Submit application forms**: Completed forms and relevant documents are then submitted to the provider for further analysis. In general, bureaucratic procedures involved in the approval of submitted forms are lengthy. Furthermore, the provider may request additional information from the requestor for the finalization of the procedure, which further delays the process.
- **Validate service request**: The provider notifies the requestor on the outcome of the application. If successful, agreements that formally bind the two parties are finalised before the actual rendering of the service requested.
- **Sign agreement for rendering:** Contractual agreements between the two parties are signed. In most instances, this takes place at the providers' premises. In some circumstances, fax and post mail can be used as the communication medium.
- **Render and monitor service:** After all the above processes have been completed, the actual service rendering happens. In some cases, the provider has to follow up on the service rendered in order to ensure that it has a positive impact on the small business operation. The time taken to provide the service varies depending on the kind of service rendered. For example, a service such as training can be provided to several consumers at the same time. However, unreliable infrastructures and inaccurate timing in providing the service make it difficult to bring together all consumers requesting the same service under one roof.

This generic description of the use-case portrays the lengthy process involved in providing services to small businesses. It involves significant time and effort which could be alleviated by taking advantages of opportunities offered by ICT.

For illustration purposes, a real-life business scenario within the South African financial sector follows. We briefly describe the overall process involved in securing a loan by a small business (X) from a financial institution (Y). A key requirement from the small business perspective is awareness. In effect, the small business needs to be aware that the kind of loan (e.g.: overdraft, short, medium/long term loan, etc) is offered by the financial institution before initiating any form of step towards securing the loan from Y. In general, the small business owner may get cognisance of such financial service opportunity through mouth-to-mouth conversations, by inquiring from the institution itself, or through various communication media often used by Y to get in touch with its client base. Having cognisance of the kind of financial service offered by Y does not suffice to secure the loan. Instead, it represents the starting point towards various obligatory steps to be followed before a subsequent loan approval. The business owner would then have to formally get in touch with institution Y in order to materialize its desire to secure a loan. This materialization is achieved through various interactions involving submissions of documentation required by the institution in order to ascertain the quality, credential and financial capabilities of the business. The next step consists of the formal loan application by the small business owner. This involves the completion of forms and their submission along with the various legal documentations required to accompany such an application depending on Y's requirements. Once the application has been received and the necessary documentation provided, the financial institution has to study all aspects of the application before granting the loan. The actual transfer of a cash amount to X's account only happens when loan agreements have been signed between the two parties.

Although the description above is straightforward, much more iterations may be necessary at any stage of the process depending on the kind of problem encountered. In

general, many financial institutions have in place systems that can speedily grant or decline a loan to the client provided that all the requirements are met. Therefore, the average time taken to process an application from a small business, that has complied with all requirements is relatively short (a minimum of 5 working days and a maximum of 6 weeks). However, the most common drawback of this system usually comes from small business owners, who find it very difficult to meet all the requirements and thus unable to provide appropriate documentation that should accompany the application form. As a result, there will be an increasing number of interactions between role-players, which is time consuming. In these circumstances, it may take up to 3 months to a small business to secure a loan from a financial institution due to the administrative burden involved [15]. This simplistic loan application process demonstrates that more needs to be done to minimize the processing time and improve the efficiency of the overall system in order to increase the satisfaction of small businesses. Thus, there is a need to further investigate various business scenarios, of a different nature (financial, infrastructural, etc), in order to bring ICT into the picture as an optimal tool for improving the efficiency of interactions amongst role players in the ecosystem.

Our intentional representation of the delivery process (Figure 2) demonstrates that, while current service delivery approaches are quasi manual-based, they can be compounded into a single system of which certain parts could be automated. There is a need to conceptualize the delivery model as an e-model with automatic service rendering for a more efficient and effective service delivery. Section 4 discusses our proposed e-model.

4. Proposed e-Model for Service Provisioning

Previous sections have referred to the term *service* as a somewhat manual activity preformed by supporting agencies in order to resolve some challenges faced by small enterprises. In this section, unless stated otherwise, the term *service* refers to the automatic execution of business processes (made of one or many activities) with the aim at delivering outputs [8]. In order for a service to be executed, an "initiator" referred to as the service *requestor* issues a "demand" to the service owner (the service *provider*). The service requestor becomes service *consumer* of the *output* when an *agreement* has been reached between the two parties. We use the terms *provider* and *consumer* to *artificially* mimic supporting agencies and small enterprises respectively. Meaning that, some roles previously undertaken by those entities are now substituted into deployable artefacts [9]. The agreement process between the provider and the consumer is materialized (and preconditioned) by a range of activities managed by the service *coordination* module discussed later. Our suggested e-model enables automatic interactions between supporting agencies and small businesses aimed at improving the productivity of both parties.

Figure 3 depicts the high-level architecture of the proposed e-model which is comprised of three major environments: the shared environment, the consumer environment, and the provider environment. The provider and consumer environments are logically similar in terms of components. The shared environment is a virtual collaborative environment where services are advertised, discovered, and composed [10]. It also serves as the interface between role-players during service delivery (execution of the composed service).

Each component of the e-model is briefly described below:

- **The Service Engineering and Deployment (SED) module**: This module is a platform for enabling the translation of conceptualized services into artefacts to be deployed in the DRIEM (Deployment, Repository, Interaction, Execution and Monitoring) subsystem described below. Therefore, role-players would have the flexibility to model their services (and improvements thereof) on an as-needed basis. Deployable services originated from the module, consist of an interface describing the service and its operations [10]. Upon deployment, the interface that characterizes the service's

advertisement/discovery and composition capabilities is transmitted in the shared environment and its operations (implementations) reside in the DRIEM subsystem.

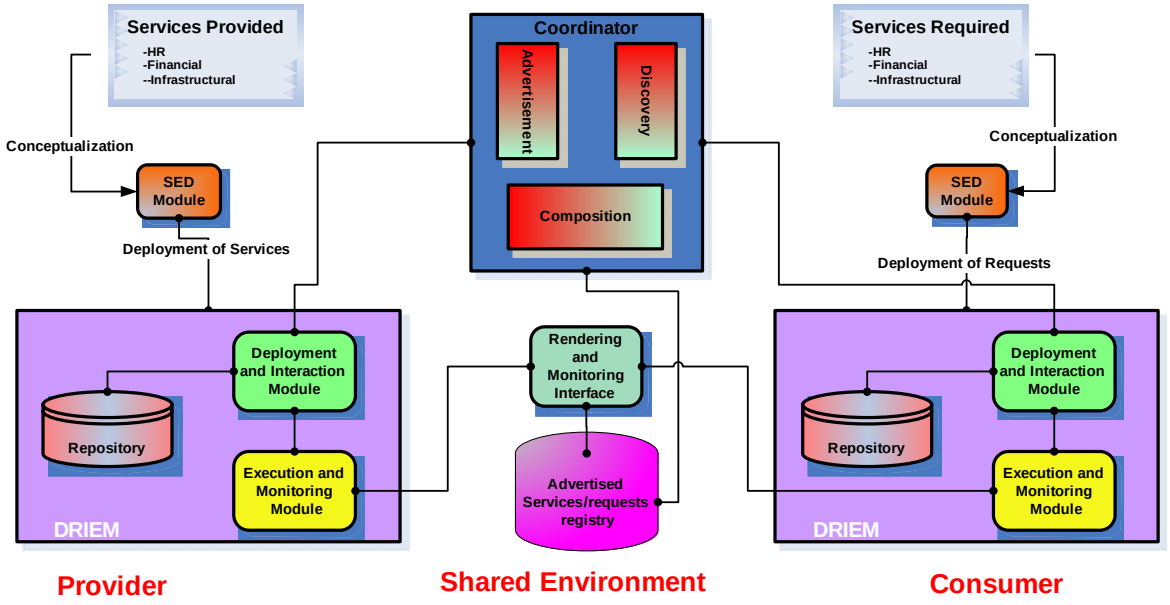

Figure 3: A Proposed e-Model Architecture for Service Provisioning

- **The DRIEM subsystem**: The architectural layout of this subsystem partially exploits the conventional Service Oriented Architecture's backend including the server application layer [10], and is present at both the provider and the consumer environments. The components of the subsystem are described as follows:
  - **The Repository**: Holds codes and data necessary for interactions between the provider and the consumer. This is the placeholder for the "Deployment and Interaction Module" and "Execution and Monitoring Module" described below.
  - **The Deployment and Interaction Module (DIM):** Is responsible for deploying services/requests into the so-called service registry within the shared environment. Upon service agreement between the provider and the requestor, a message is sent to the provider's DIM whose responsibility is to coordinate the delivery of the requested service. Similarly, when the consumer's DIM is messaged regarding an agreement reached with the provider, it invokes its service delivery engine in order to receive the requested service.
  - **The Execution and Monitoring Module (EMM):** The module's role is to establish a link[v] between the provider and the consumer, through the Rendering and Monitoring Interface positioned in the shared environment. The execution engine is responsible for rendering the composed service and the monitoring engine performs follow-ups on the service rendered.
- **The Coordinator:** It virtually resides in the shared service environment and is responsible for initiating advertisement, discovery and composing services. After a successful composition, the coordinator messages the DIM so as to initiate the rendering process. It is made of subcomponents with the ability to advertise (*advertising engine*), discover (*discovery engine*) and compose (*composition engine*) services.
- **The Rendering and Monitoring Interface (RMI):** Serves as the interface between the two DRIEM subsystems. It ensures that, during services rendering or monitoring, connection is maintained until completion of the whole process.
- **Advertised services/requests Registry:** This mimics the service directory component of SOA, and serves as a repository where shared environment codes reside.

This e-model would have the capability of enhancing the current approach for providing services to small businesses. In effect, many business processes that can be automated as well as those that are usually considered as "interactions-intensives" using the traditional manual-based approach would be potential candidates for implementing the proposed model. The advantages offered by e-service delivery based on SOA and interoperability have been intensively demonstrated in the literature and interested readers may refer to [10, 12, 13]. The e-model forms the basis for the improvement of the quality of services rendered to small enterprises in a real-life scenario. In the next section, we briefly describe the generic use-case for service provisioning based on the e-model.

5. A Generic Use-Case Based on e-Model.

Figure 4 depicts the generic use-case based on the e-model. It can be observed, from a high-level perspective that, only three processes are required to complete the service provisioning process as opposed to the eight processes described in the contextual use-case in section 3. Therefore, adopting the e-model could significantly leverage the productivity of supporting agencies as well as that of small businesses. Although some services may not be completely rendered automatically, all automated activities required to complete the process of delivering a given service, could be handled within the e-model.

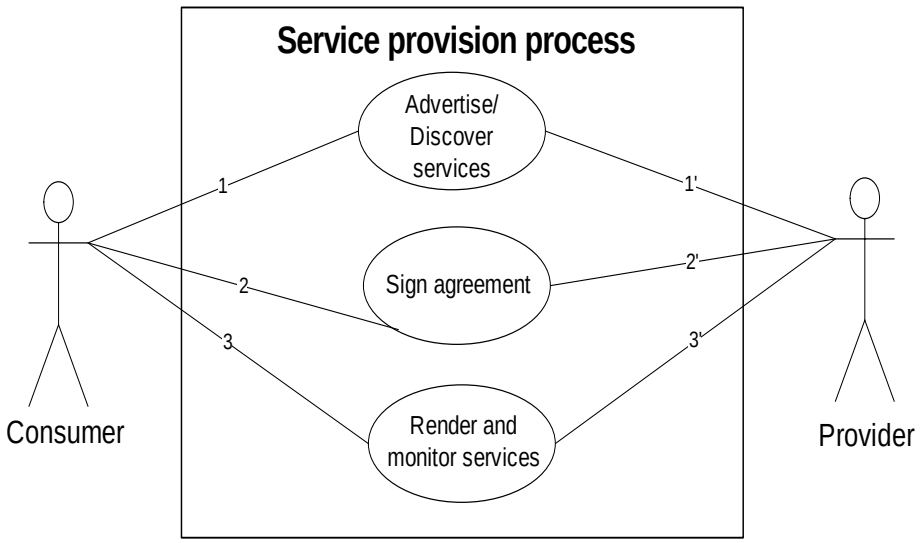

Figure 4 A Generic Use-Case for Service Rendering Based on the e-Model

Based on the proposed e-model, an application, such as the *financial loan* business scenario suggested in section 3, would be executed at optimum such that there would be limited manual intervention in the process. In effect, once a loan is advertised in a virtual environment (the shared environment in the e-model), its discovery by a service consumer is done in real-time provided that an appropriate service for loan discovery has been engineered from the consumer side and deployed in the shared environment. It follows that, *compatible services* (service aimed for each other) will be able to bind together in order to achieve the goal required by the business scenario. In the presented example, two services such as the *advertised-loan*, /*discover-loan* may be regarded as compatible services in that, the *discover-loan* may bind with the *advertised-loan* in order to trigger the *financial loan* business scenario. Technical details on binding, composition, service level agreement and the likes are left as a matter of future work. This scenario, demonstrates the advantage of using the e-model for rendering services to small enterprises, and in our view would significantly leverage the productivity of role-players in the ecosystem. The conclusion and further directions to this work are presented in the next section.

6. Conclusion and Future Work

In this paper we have proposed an e-model for leveraging the quality of service provisioning to small businesses in South Africa as an alternative to the current approach. The proposed e-model is envisaged to have a positive impact on productivity of SMMEs. However, its operationalisation requires role-players in the ecosystem to be ICT-enabled.

Current work towards operationalisation of the e-model include the design, prototyping and implementation of the various modules described above using existing technologies on SOA, Interoperability, and Intelligent Agent Technologies [9, 10, 13]. The e-model is currently in the early stage of investigation. Hence, we aim to explore the interactions between role-players, through the utilisation of various technological (ICT) infrastructures. The strategy envisaged for the operationalisation of our e-model is incremental prototyping. We therefore aim to develop on an incremental fashion several prototypes based on the above mentioned technologies. Upon the development of each prototype, a range of real-life scenarios will be used to evaluate the operationalisation of the e-model by relying on prospective participants in the ecosystem. To this end, we are currently recruiting a range of role-players within the ecosystem in order to setup a specialized focus group whose aim is to ascertain that the e-model will indeed have a positive impact of the operational objectives of all role-players (small businesses and service/resource providers). Moreover, research currently being done will not only limit itself within the South African environment. We envisage to expand our work globally and more precisely within emerging economy countries such as Brazil, Russia, India and China (BRIC).

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[i] The terms landscape and ecosystem are considered synonymous in this paper, and refer to the overall economical (business) environment in which SMMEs operate and interact with other stakeholders.

[ii] Throughout this paper, the terms SMMEs, small businesses, and small enterprises will be used interchangeably. An explicit definition of SMME in the South African context may be found in [1].
[iii] Supporting agencies in this paper are organizations (private or public) that offer various forms of assistance to small enterprises in order to contribute to their sustainability.
[iv] *Endogenous* resources are regarded as those that form part of the internal assets of a business without which a small enterprise would not be able to operate. However, in order to maintain its presence in the ecosystem, it may require from time to time *exogenous* resources as opportunities and needs arise.
[v] The link entails the type of protocol used for communication between the participants and may be either connection-oriented or connectionless [11]