

Elements of SME Collaboration within an Regional E-Marketplace Environment

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Abstract: The work and concepts described in this paper are of interest to SME e-marketplace specialists. It describes a three-year, €5.2 million regional ICT initiative, funded by the European Regional Development Fund. The initiative is focussed on up-grading the businesses of partner SMEs through collaboration with a broader range of partners. It proposes a regional marketplace model focussed on describing what SMEs can do, allowing them to find compatible partners and to jointly respond to enquiries for work at low cost. It builds on strengths of the existing models and limits their weaknesses by leveraging regional resources and loyalties. Collaborative working is the key tool in enhancing the prospects of engineering SMEs.

1. Introduction

Since the emergence of the Internet and the World Wide Web, Small and Medium Sized Enterprises (SMEs) have faced many key e-challenges. A number of SME E-business adoption guides have emerged to help SMEs successfully exploit the benefits of Internet trade such as Fingar et al Three Wave Model [1], Michael Earl's Evolving the E-Business Model [2] and Cisco Systems Inc. Model [3]. These usually prescribe an evolutionary approach, typically, the five proposed steps (in Cisco's Model) are:

1. Connect – E-mail, Business communication use of the Internet to build new strategies.
2. Grow – Website, Internet marketing an evolution in business strategy.
3. Trade E-Commerce, Increasing channels to market in the Internet age.
4. Build - E-Business, Re-engineer your business model for the Internet economy.
5. Evolve – Ecosystem, The business ecosystem, a new concept for the Internet economy.

The projects undertaken have led us to believe that for engineering SMEs this viewpoint is ill focused and irrelevant. In the Autocle@r and Autolean regional project described in previous conferences, a significant number of Automotive SMEs in the West Midlands were exposed to new Internet and Communications Technologies. From these projects, a number of lessons were gained in terms of what capabilities SMEs have and what ICT requirements they needed to undertake collaborative working.

The authors have found that nearly all SMEs in their region have achieved Step 1, most are struggling with Step 2, and a few are addressing Step 3. These results we believe are typical. Our experience with the Autolean and Autocle@r projects in the region suggests however that by joining a suitably configured and operated e-marketplace, SMEs can move directly to Steps 4 and 5.

2. The Environment

The design, manufacture and delivery of automotive products, within the supply chain, require an ever-increasing level of knowledge, expertise and complexity. Product design needs the establishment and sustainment of rich relationships in order to facilitate Concurrent Engineering amongst partners and stakeholders. Collaboration costs can be

substantial for SMEs, especially when they have contracts with different OEMs using different technical standards and expensive Computer Aided Engineering software tools.

The main problem for Engineering SMEs is that existing e-commerce models are very product orientated, whereas the engineering industry is very process orientated. Many engineering SMEs provide highly customised products or ‘one-off’ jobs and thus, standard information such as prices or stock levels hardly exist. This is compounded by cost down efficiency pressures leading to concepts such as a batch size of one. Thus profit margins for many SMEs are low, the average utilisation at automotive manufacturing plants is at 70% [4] and margins in automotive SMEs rarely rise above 10%. A future downturn in sales will reduce manufacturing plant utilisation further and losses may become intolerable. Automotive-based manufacturing is a key activity in the West Midlands.

2.1 The West Midlands

The West Midlands region lies at the heart of the United Kingdom (UK) and has a population of some 5.3 million people [5] representing 9.5% of the country’s workforce. The region is the UK’s manufacturing and agricultural heartland and the hub of the national transportation network. Overall the region generates £60.9 billion in GDP for the UK economy. For SMEs operating in the West Midlands automotive sector the figures in Table 1 provide a median descriptive profile.

SME Category	Median
Number of employees	23
Gross turnover (x 000)	£1,000
% business with automotive sector	42%
% with largest automotive sector customer	20%
Total number of customers	55
Significant automotive sector customers	8

Table 1 –Median average of SMEs within the West Midlands

Source: Autolean II Project Summary Report, Accelerate Partnership [6]

2.2 Collaborative Issues

Most automotive engineering SMEs do not produce standard products and most products are made as a result of detailed collaboration with customers and suppliers. The average life of an automotive component is being compressed by the OEMs striving to produce new vehicles with ever decreasing life cycles. Within the life of the components, its design and specification are subject to frequent modification and thus interaction between customers and suppliers is critical and recurrent. Delays can be costly and time wasted in frequent physical meetings can be significant.

The wasted time can occur as a result of:

1. Travelling time
2. Preparation time, preparing data, reports etc for the meetings at the remote location.
3. Time wasted as a result of the difficulty in scheduling a physical meeting
4. Time wasted because the right expertise may not be accessible during the meeting. The authors have noted the frequent use of mobile phones to try to get opinions from back at base during meetings.

These difficulties tend to result in long, many participant, infrequent meetings. However rich collaboration requires short, focussed and frequent meetings. A mixture of physical and electronic meetings can better meet these demands.

A number of Industry specific e-marketplaces have arisen to try to aid the product development and sourcing process. Covisint and SupplyOn are prime examples in the automotive sector. However, research shows that for SMEs supplying the automotive sector, on the average just under 50% of their turnover is derived from that sector. Does such a firm need to sign up to three vertical marketplaces, each with its own unique protocols, procedures, practices and ultimately costs? To participate in e-commerce via the many electronic marketplaces that exist is not viable for SMEs with limited funds and technical capability. Based on their experience in the West Midlands region in the UK, the authors see a clear need for regional e-marketplaces to provide the infrastructure and processes for collaboration with the many sector specific systems being developed.

A regional model introduces new financing options. It is also closer to the grass roots, tapping into regional loyalties and local social dynamics that are difficult to reach for the national and multinational B2B operators. For us a key objective is to increase the sales by SMEs in the West Midlands generated by e-Commerce. A Cisco Systems Inc. study found that European SMEs using online activities to increase business are seeing their margins grow from 5-20% to 20-40% over a twelve-month period. The average Automotive SME in this region has margins of around 5%. A Regional Marketplace model can help us quickly take many SMEs from doing little or no e-business to fully integrated e-business. However to achieve this, the emarketplace, must focus on engineered goods. Rather than choosing standard products from e-catalogues, it must focus on the engineering SMEs ability to make what the customer wants. Collaboration is essential to this.

In the manufacturing supply chain, the value of engineered products exceeds that of “off the shelf” catalogue items by a significant degree. Trade in engineered products requires closer relationships of a technical nature. Thus marketplaces serving the manufacturing sector need to provide robust facilities to support on-line collaboration between supplier and customer and stimulate the building of rich relationships. Previous efforts at establishing these rich relationships within supply chains have failed due to high cost and technical expertise requirements. Electronic Data Interchange (EDI) is a good example of a supply chain collaboration technology that has failed to reach the middle and lower levels of the supply chain [7-9].

3. A Regional Marketplace for all Regions?

The West Midlands Collaborative Commerce Marketplace (WMCCM) project applies the ideas and concepts described to the needs of SMEs in the core West Midlands region. The marketplace is financed by the European Regional Development Fund and will provide an electronic collaborative marketplace for the region with over 1000 SMEs. The collaborative marketplace will allow SMEs to participate in regional, national and international e-trade under better conditions. For a region without such a marketplace, it would be like having a major Autobahn/Motorway running through the region but having no junctions to access it.

The key functional elements of such a marketplace, which we have built around our existing regional portal, www.go4gain.co.uk, are:

- Competence Profiling and Search capability - This unique copyright capability is based around understanding the processes and skills of individual Engineering SMEs (their competence) and being able to search for appropriate skills and competencies to form virtual organisations in response to enquiries. For an example see the link to the competence profiling capability from the home page of our regional portal www.go4gain.co.uk.
- Project Collaboration Capability - The system will allow companies to create a project space to collaborate on engineering design projects. It provides communication and document management functionality to enable this collaboration.

- Marketplace Capability - The ability to generate and respond to Request-for-Information (RFI's), Request-for-Quotation (RFQ's) and to run simple auctions with associated management tools.
- Purchasing Aggregation - Provide links to the catalogues of approved suppliers and service providers to the WMCCM. These will allow SMEs registered on the marketplace to directly order goods and services. This is particularly focused at the procurement of non-direct materials.
- Clustering Capability - Will allow companies registered on the marketplace to be clustered (i.e. have a common look and feel and set of information services) based on their location, expertise or market. For example all companies involved in the motor racing sector.
- Bazaar - A section where surplus goods and requirements can be posted and traded. Partnerships have been formed to
- External Links - Links to a number of external relevant marketplaces will be required. These will be chosen to support the requirements of companies hosted on the regional exchange. These could include marketplaces such as Covisint, Exostar or TradeIslands.
- Catalogue Capability - A limited catalogue capability will be needed for SMEs wishing to "showcase" their products, and for small suppliers wishing to make their products available.

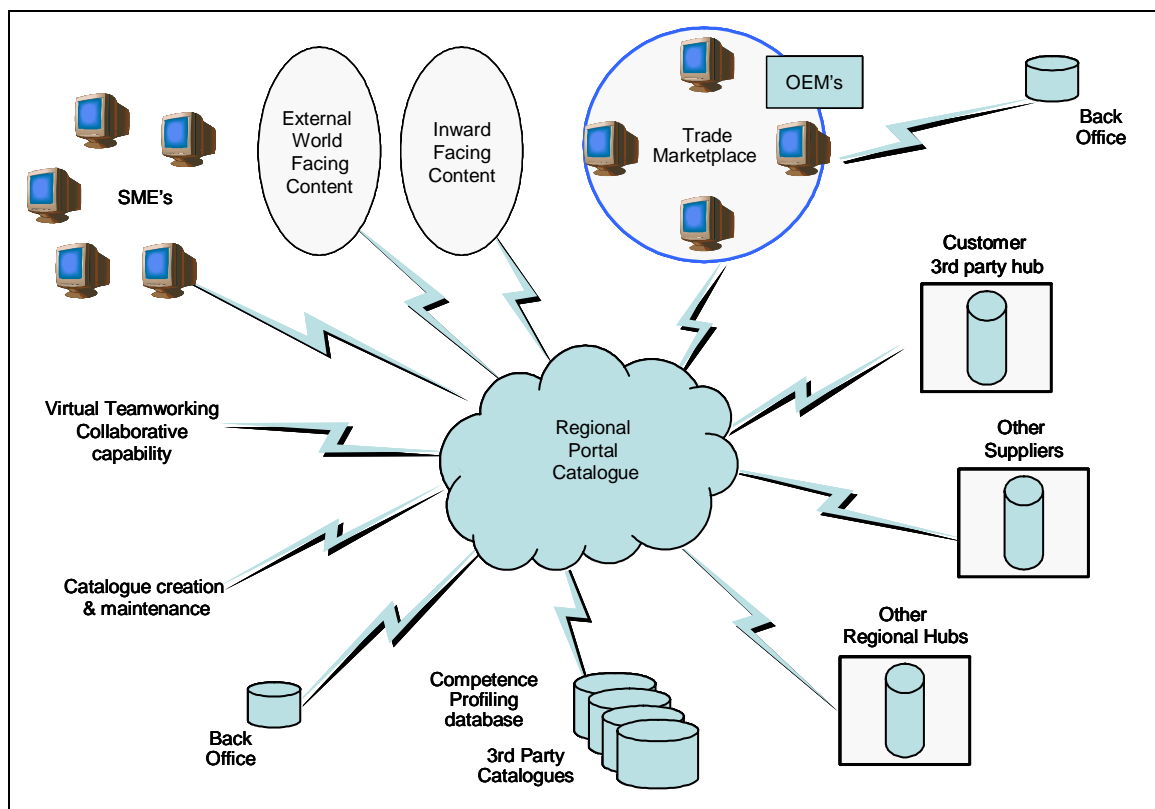


Figure 1 - Regional Marketplace Infrastructure

There have been various attempts at developing e-marketplaces in other regions in the European Union. Examples of which include the Schweizer Marktplatz Online, www.smo.ch, in Switzerland and the Lake Constance Marketplace, www.mbo.de, in Germany. Although both have had varying levels of success they have been focused towards the Business to Consumer market. The WMCCM model aims firmly at the regional Business to Business market and for this reason is unique.

Such a B2B marketplace will:

1. Lower transaction costs through electronic communication
2. Provide improved access to existing and new market opportunities.
3. Enhance collaboration to generate new opportunities.

It will increase sales by providing eased access to the competences and capabilities of the regions SMEs for both customers within the region, nationally and internationally.

In order to enhance effective collaboration within the regional e-marketplace, experience has been drawn from the “Autocle@r” project. Taking a Virtual Teaming approach, a Low Cost Virtual Teaming (LC VT) collaborative environment was developed and deployed within twenty automotive engineering SMEs within the West Midlands region. Thus this approach allows SMEs to share their knowledge and information outside their enterprises within their enterprises irrespective of their locations. A system based on Microsoft NetMeeting and Communities was configured and provided to 20 SMEs.

4. Low Cost Collaborative Working for SMEs

The systems received a mixed response. Some companies were willing to pay to expand the system (approximately £150/client) whereas others found great difficulty is using it.

One example of where the LC VT system streamlined the design process was when a toolmaker was able to collaborate in real time with its second tiered customer resulting in a time consuming visit being unnecessary, freeing up an engineers time, and the tooling being completed in a shorter period. Another SME integrated the system within its web-based Collaborative Product Commerce procedures and now uses it as part of its New Product Introduction Process with OEMs such as Audi AG and MG Rover.

The conclusions were:

- Companies will not replace existing ways of working for electronic collaboration (in existing relationships).
- They do not have the human skills to make electronic collaboration effective! For example, we know to start a physical meeting we shake hands, ask about the journey and may offer a coffee. No such protocol exists for electronic meetings.
- Companies will work in new ways to address new opportunities.
- They need time to familiarise themselves and use the product before they will be prepared to pay for it.
- Synchronous collaboration is still beyond most companies, better they start with Asynchronous capability.
- They need to be part of an established community prepared to work in this way.

The “local” element can build a sense of community and belonging that is essential to the success of such marketplaces. This is an attractive target for many sellers and buyers, especially as many large blue chip organisations don’t have appropriate sales channels into this type of market. Equally small businesses will be able to leverage more favourable procurement terms and conditions.

5. Discussions

Any country or region that cannot show the world what its companies are capable of undertaking is unlikely to succeed in exploiting the potential of e-business. Any country or region where a search of the capability and competences in that country/region cannot be easily conducted will be at a major disadvantage. Through using competence profiling methodology regions can provide a ‘shop window’ for their capability in goods and services to the world.

A key feature in our system is the ability to create viable groupings of capability. For example we can create consortia to tackle projects which acting individually would not be

possible. As an example we were able to create a partnership to address the need for toilet modules for railway carriage manufacturers in the region. Another example is historically the furniture industry in Malta has found it difficult to remain competitive and compete with large foreign manufacturers when bidding for contracts within home and international markets. Although they have traditionally offered high quality furniture they were too small to win contracts with the Maltese hotel industry. However, by forming collaborative clusters they were able to form commercially stronger bids, and qualify for (and win) business which alone they traditionally could not.

The primary membership of the regional marketplace is small engineering business. Individually they find it difficult to negotiate good discounts from service and goods providers. The formation of 'clusters' of a number of small businesses creates a Virtual Organisation offering an attractive combined "market". These can provide an attractive "market" to business services providers. For example, a group of SMEs can get IT systems from IBM, rather than each individually having to go to a small supplier, of lower capability.

Existing SME e-marketplace models are structured around products, services or components, which can be described, defined and compared in catalogue type structures. The West Midlands regional model extends this to products and services that are less comparable and "soft" features such as reputation; ethos and capability rather than "hard" features such as price, quantity and quality defines that.

6. Conclusions and Further Work

The West Midlands Collaborative Commerce Marketplace builds on strengths of the existing models and limits there weaknesses by leveraging regional resources and loyalties. It will increase sales by providing eased access to the competences and capabilities of regions SMEs for both customers within the region, nationally and internationally. The participation in collaborative working enabled, will increase skills and capability in the regions SMEs.

Eventually e-marketplaces from different regions could connect together to mutually support SMEs. This could enable complementary regions to benefit from the sharing of knowledge, resources and skills. For example, an Automotive Injection Moulder from South Africa has been helped to form a link with a specialist-tooling provider in the West Midlands. There is modest automotive support infrastructure in South Africa compared to the West Midlands where the infrastructure exists, but competition is fierce. There are mutual benefits of linking up companies in both of these regions. Negotiation for new regional e-marketplaces is well established in a number of other regions.

Within the UK alone there is €5.3 billion in funding available for Objective One / Two geographic areas acting as an instrument to readdress the economic imbalances with in the Union. Less prosperous regions, indeed any region within or outside the European Union, could adopt the region marketplace concepts and capitalise on the establishment of a regional business trading identity. In the same way that a region without good transport links face becoming an economic backwater, if the majority of the SMEs in a region do-not/can-not participate then the region faces becoming an electronic backwater.

The West Midlands Collaborative Commerce Marketplace is a bespoke solution encompassing XML, ASP.net and web services, since existing standard e-marketplace functionality does not meet the needs of engineering SMEs. The authors see this as an opportunity to test and validate the regional marketplace model and develop it further for franchising opportunities in the future.

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