GAP ANALYSIS OF ICT SKILLS AS AN ENTREPRENEURIAL TOOL FOR MICRO ENTERPRISES

A QUALITATIVE RESEARCH STUDY

**M. FSADNI & Associates
Marketing & HR Dev Consultants**

30.03.11

AGENDA

A *Research Objectives*

B *The Key Expert Team*

C *Research Methodology*

D *Highlights of Research Findings*

A   *Research Objectives*

Overriding Research Objectives

✓ **The ICT Skills Gap Analysis study** was commissioned by MCA as one of the components of the EPITOME project (85% EU funds, 15% National funds).

✓ The overriding objective was **to assess the current level of ICT skills in Maltese micro enterprises** through the perceptions and experiences of local entrepreneurs and their employees.

Specific Objectives

The Specific Objectives of the Research Study were three:

1. **to map the current level of ICT skills and their application in the Maltese micro enterprise** *and to measure them against a benchmark set of skills required to enable the effective use of ICT in business*

2. **to examine the 'gap' between the current and the required level of ICT skills** *of micro enterprise managers and employees*

3. **to use the resulting findings as a possible guide** *for the development of a bespoke training curriculum and as a benchmark to objectively measure the level of ICT skills after the training.*

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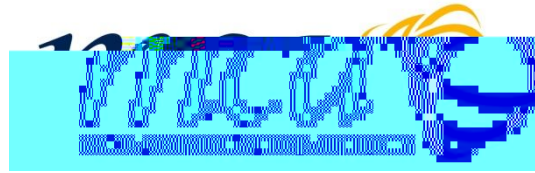
The Key Expert Team

The Key Expert Team

The Key Expert Team engaged on the research project comprised:

- ✓ **Marika Fsadni,** *Project Leader, Key Expert in Social & Marketing Research*
- ✓ **Ronald Aquilina**, *Key Expert in ICT & Information Systems Training*
- ✓ **Dr Frank Bezzina**, *Key Expert in Statistics & Research Methods; Key Expert in Data Analysis*
- ✓ **Irina Atanasova**, *Research Analyst*

C Research Methodology

Research Methodology – Project Phases

The project had 6 stages:

- ✓ **Phase 1** – *Assessing the* **local policy scenario**
- ✓ **Phase 2** – *Identifying the* **ideal set of ICT skills**
- ✓ **Phase 3** – **Adjusting the ideal set** *to the requirements of local micro enterprises*
- ✓ **Phase 4** – *Assessing the* **current level of ICT skills** *in Maltese micro firms*
- ✓ **Phase 5** – **Measuring the gap** *between the ideal and current level of skills*
- ✓ **Phase 6** – **Proposing ways to raise the current level** *of ICT skills*

Research Methodology

Phase 4 – Assessing the current level of ICT skills

✓ **Seven (7) focus group sessions and twelve (12) personal interviews** were conducted with employers and employees in Maltese micro enterprises hailing from the following NACE sectors:

- **Manufacturing**
- **Construction**
- **Wholesale & Retail Trade**
- **Hotels & Restaurants**
- **Transport, Storage & Communications**
- **Real Estate, Renting & Business Activities**

Research Methodology

Phase 4 – Assessing the current level of ICT skills

✓ *In addition, **seven (7) personal interviews were conducted with key stakeholders** to enquire about their experience with micro businesses and the micro companies' use (or non-use) of ICT. Respondents included officials from:*

- **ETC** – *Employment and Training Corporation*
- **MCAST** – *Malta College of Arts, Science & Technology*
- **GRTU** – *General Retailers and Traders Union*
- **MEA** – *Malta Employers Association*
- **Commerce Division -** *(2 personal interviews)*
- **Malta Enterprise**

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Highlights of the Research Findings

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Phase 1 - Assessing the Local Policy Scenario

Phase 1 – Assessing the Local Policy Scenario

An in-depth literature review of local and foreign policy documents showed that:

- ✓ **micro enterprises account for over 90% of businesses** *in the EU and are critical to the economy*
- ✓ *Malta's policy is synchronized with EU policy and focuses on* **strong support for IT and micro enterprises**
- ✓ *Although the vast majority of policies support SMEs,* **no particular attention is given to micro firms** *and their problems*
- ✓ **ICT is still underutilized in Maltese micro firms** *(almost 1/3 used no computer and over half had no website in 2008[1])*

[1] NSO(2008). *News Release: ICT Usage by Enterprises: 2008*

Phase 2 –
Identifying the Ideal Set of ICT Skills

Phase 2 – Identifying the Ideal Set of ICT Skills

✓ In light of the literature review, it was found that **there was no single set of ideal ICT skills for micro firms**, and consequently no set that can be adapted to the Maltese policy and business scenario. For this reason, M. Fsadni & Associates came up with **a set of ideal ICT skills based on the vast amount of literature** that was reviewed on the topic, and then adjusted the resulting set of skills to the Maltese local scenario.

✓ To this end, **an integrated matrix model of ideal ICT skills was synthesized by combining Porter's classic Value Chain[1] model and Levy's Focus Dominance model[2]** which entails 4 quadrants.

[1] Porter, M. (1985). *Competitive Advantage: Creating and Sustaining Superior Performance. NY: The Free Press.*
[2] Levy M., Powell, P. and Yetton, P.(2001). SMEs: aligning IS and the strategic context. *Journal of Information Technology,* **16** (3), pp. 133-144.

	Strategic Focus	
	Cost (Localized)	Value Added (Internationalized)

Customer Dominance

Low

Coordination

Word Processing, Accounting, Customer Databases

Strengths: improved internal communication, improved customer care, increased operational effectiveness
Weaknesses: internal focus, limited integration with business strategy

Innovation

Word Processing, Accounting, Electronic Business

Strengths: IT based strategic leadership, external focus, changes in business processes, changes in employer profile, innovative CEO with IS knowledge
Weaknesses: cost, limited flexibility due to resource constraints

High

Word Processing, Accounting

Strengths: central, cost reduction, simple systems

Weaknesses: operational focus, internal focus, no link with business strategy

Efficiency

Word Processing, Accounting, MRP, EDI

Strengths: reactive to business strategy, improved customer relations, external focus, limited customer power
Weaknesses: customers may determine IS requirements, cost, limited systems flexibility

Collaboration

Cost (Localized)   **Strategic Focus**   Value Added (Internationalized)

Phase 3 –
Adjusting the Ideal Skills Set to the Local Scenario

Phase 3 – Adjusting the Ideal Skills Set to the Local Scenario

✓ **Porter's Value Chain was reinterpreted to include services** in its definition, because services form a significant part of Maltese micro enterprises – Hotels & Restaurants, Transport, Storage & Communications, and Real Estate, Renting & Business Activities.

✓ **The Focus Dominance Model was reinterpreted to include the international versus local focus of Maltese micro firms** on the X axis of the matrix.

✓ **Each firm has its own context and business environment, so it might be misleading to plot an entire NACE sector on the matrix.**

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Phase 4 –
Salient Findings by
Industry Sector

Manufacturing Sector -
Salient Research Findings

Major Findings – Manufacturing Sector

✓ ***The Manufacturing sector showed a great variety in the level of ICT skills*** *– from no use of ICT whatsoever to sophisticated 3D and virtual reality applications. According to key stakeholders,* ***this sector had the greatest potential to use ICT to enhance the business****.*

✓ ***Resource Planning:*** *the majority of micro manufacturers said they do not use any ICT to plan their inventories, but instead* ***'plan in their head',*** *e.g. by producing more items for the Christmas season or attending to clients on* ***a first-come-first served basis****.* ***Only a few used a database on Excel*** *for planning.*

Major Findings – Manufacturing Sector

- ✓ ***Manufacturing Applications:*** *only one respondent indicated he uses ICT in the actual production of his goods, but* **most entrepreneurs used e-mail and Internet to discuss the customers' specifications** *and send pictures of the products to plan for the features.*

- ✓ ***Sales & Delivery Applications:*** *some respondents had a database of their clients (mostly on Excel) and sometimes a backup, and most sold their products directly to clients in their shops or at trade fairs.* **Databases did not appear to be a centralized effort and company strategy, but the results of individual employee initiative.**

Major Findings – Manufacturing Sector

✓ ***Marketing Applications:*** *manufacturers **mostly used the Internet to conduct market research** on trends and customer tastes, and **none had done formal customer satisfaction research**. Only few had websites and there was a fear of lack of authority and copying of products. **Social networks** were also used (Facebook, LinkedIn).*

✓ ***Customer Support****: e-mail commonly used to keep in touch and advise clients, e.g. how to choose original products.*

✓ ***Purchasing of Materials: e-mail preferred for placing orders,*** *because by phone agreements remain only verbal and there is less access to foreign suppliers.*

Major Findings – Manufacturing Sector

✓ ***ICT & Strategy: m**ost respondents had a **positive attitude but were not proactive** in using ICT. They were **reluctant to use consultants** but relied on family members and trusted suppliers for assistance.*

✓ ***HR Applications:** mostly family-run businesses and informal communication. **The majority of employees and managers were self-taught** and only few went to any courses (none were trained at work).*

✓ ***Infrastructure:** manual book-keeping or Sage/Excel prevailed. **Pronounced fear of Internet banking was evident.** Quality control through visual or physical inspection only.*

Construction Sector –
Salient Research Findings

Major Findings – Construction Sector

- ✓ ***The Construction sector was considered by stakeholders as the most disadvantaged with regards to ICT use*** *because the work is mostly manual, demand is greater than supply and the attitudes of entrepreneurs are not proactive in this sector. FGs showed a few notable exceptions.*

- ✓ ***Resource Planning:*** *mostly **manual or even mental**, a few used Excel or calendar. Close partnerships with a few trusted suppliers and **orders placed mostly by Internet or phone**. Entrepreneurs often refused projects if work is too much.*

Major Findings – Construction Sector

- ✓ ***Manufacturing Applications: no software used as all work was manual****, with the exception of one automation company whose entire line of business is based on customized software.*

- ✓ ***Sales & Delivery Applications:*** *databases of clients on Sage and Excel (sometimes with backups), but still over-reliance on diaries, memory and written notes:*

'I can tell you when I'll start,
but I can't tell you when I'll finish'

Major Findings – Construction Sector

- ✓ ***Marketing Applications:*** *no perceived need for promotion, as demand is greater than supply. Mostly **word-of-mouth, personal selling and use of websites** reported, but no web analytics and no e-commerce.*

- ✓ ***Customer Support:*** *entrepreneurs who had websites were **not confident** with them and **admitted their children have taken over**. For many **Internet presence was not a priority** due to perceived confidence in the high demand.*

- ✓ ***Raw Materials:*** *supplies were sourced mostly from abroad by placing orders online or locally by phone (from partners).*

Major Findings – Construction Sector

✓ **ICT & Strategy:** *ICT central to most respondents, but mainly on the administration side of their business.* **Consultants commonly used**, *but* **social media perceived as inappropriate**. *Specialized software used to draw plans.*

✓ **HR Applications:** *not used and most managers/employees were self-taught or trained on the job.* **Fear of employing more people** *and* **remarkably high level of teamwork**.

✓ **Infrastructure:** *accounts done manually and given to a professional accountant (Sage), payments by check or cash and* **Internet banking only rarely** *for foreign suppliers.*

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Wholesale & Retail Trade – Salient Research Findings

Major Findings – Wholesale & Retail Sector

✓ ***The Wholesale & Retail Sector showed great variance in the use of ICT*** *in business according to the orientation of the firm (local or import/export) and the attitude of the entrepreneur to technology.*

✓ ***Resource Planning:*** *supply orders were placed mostly by e-mail (both locally and abroad), or through sales representatives using PDAs. However, several locally based entrepreneurs did not believe in electronic communication:*

'You can't build relationships by e-mail!'

Major Findings – Wholesale & Retail Sector

- ✓ ***Manufacturing Applications: operations were planned mostly mentally and from experience***, *but a few entrepreneurs had fully integrated tailor-made systems for inventory, stock control and automatic order placement.*

- ✓ ***Sales & Delivery:*** *a range from use of databases on Excel and Sage with various backups to no record of customers whatsoever for small local shops.*

- ✓ ***Customer Support & Repair Applications:*** *clear distinction between local micro firms (all support by phone or in person) and import/export firms (all contact by e-mail).*

Major Findings – Wholesale & Retail Sector

- ✓ ***Marketing Applications: wide and varied use of websites and transition to e-commerce*** *was evident. There was even use of bespoke software to create tailored promotions and achieve business objectives (CRM used), while* **social media were considered by most entrepreneurs and used according to product type**. *Strong preference for word-of-mouth and local band club magazines for advertising.*

- ✓ **Purchasing Materials:** *wide use of the Internet to research the market and choose foreign suppliers - in contrast with the stakeholders' impression. Only few local businesses relied entirely on face-to-face contacts and phones.*

Major Findings – Wholesale & Retail Sector

- ✓ ***ICT & Strategy: the role of communication technologies was central for many micro entrepreneurs***, *with a wide variety of applications used to integrate the aspects of the business for competitive advantage.* ***Friends and relatives were preferred to consultants*** *(due to bad experience).*

- ✓ ***HR Applications:*** *most businesses were family-run, and the employees/managers went to ECDL courses or learnt on their own initiative.* ***Some had experienced challenges*** *to teach staff to use the new software they had implemented.*

- ✓ ***Infrastructure:*** *wide use of Internet banking, Sage, Excel*

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Hotels & Restaurants – Salient Research Findings

Major Findings – Hotels & Restaurants

✓ ***There was considerable variety in this sector as well,*** *with some entrepreneurs using a **fully integrated system covering all aspects** of their business and others admitting they **don't even know how to use a computer**. However, most businesses were at the intermediate level of ICT skills.*

✓ ***Resource Planning: all inventory and stock control was done manually**, even in the firms where there was a tailored software system integrating operations and administration. With regards to planning, the majority of respondents said **they 'just know' how much to buy and when**, and they believed technology could not do the job any better.*

Major Findings – Hotels & Restaurants

✓ ***Operations: in the majority of establishments everything was done manually***, *although some used PDAs or in-house systems for order taking. Nevertheless, most entrepreneurs found their hard copy notes easier to manage than their computer files:*

'I prefer my diary to my Blackberry'

✓ ***Sales & Delivery: very few respondents had any database of their clients and even fewer had one in electronic form.*** *Those who had contacts used the database for e-mail shots or to give special treatment and promotions to regular clients.*

Major Findings – Hotels & Restaurants

✓ ***Marketing Applications:*** *many micro firms were listed in industry websites because their own sites were not ready. Social media were used to promote events and show menus and prices, but* **employees were rarely involved** *enough.*

✓ **Customer Support: websites were seen as costly or useless** *for many entrepreneurs, because they relied on local clientele or wanted to remain small and retain their 'exclusivity'.*

✓ **Purchasing Materials: the vast majority purchased everything in person**, *and in few cases by phone. Orders were placed by e-mail where ingredients from abroad were central to the service offer.*

Major Findings – Hotels & Restaurants

✓ **ICT & Strategy:** *some respondents were using computers only out of necessity or **due to pressure from their children or younger employees**, while others were consciously investing in upgrades and integrated systems for their business.* **Consultants were perceived as risky and time-consuming***.*

✓ **HR Applications: those with in-house software gave initial training to employees***, but many firms provided no training whatsoever because **there was 'no need'** as their staff had been the same for many years.*

✓ **Infrastructure:** *subcontracted accountants and payments by cheque and cash prevailed. Face-to-face communication.*

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Transport, Storage & Communication –
Salient Research Findings

Major Findings – Transport, Storage & Communication

✓ ***This sector was more homogenous, and the level of ICT skills was consistently high across the various companies.*** *The majority were based entirely on ICT and their operations were completely dependent on it, including travel agencies, communications and transport companies.*

✓ ***Resource Planning: all planning and shopping for supplies was done online*** *by using the firms' own systems or by logging on to the systems of suppliers **because of the way businesses had evolved in this sector.** An additional factor was that most respondents had international suppliers.*

Major Findings – Transport, Storage & Communication

✓ ***Operations:*** *the operations of micro travel agencies, couriers and communications firms were entirely conducted through their systems or the systems of their suppliers:*

**'If there is no Internet at work,
we could as well just pack and leave'**

✓ ***Sales & Delivery Applications:*** *almost all contact with clients was by e-mail, with **almost no personal face-to-face contact***

✓ ***Customer Service: surprisingly, very few businesses had a database of their customers***, *and those who had temporary client information did not use it in any way*

✓ ***Marketing Applications:*** *internal and external websites, as well as mail shots and social media were seen as cheap and effective tools by the entrepreneurs, but* **the best marketing tool remained word-of-mouth.** *Networking, participation in trade fairs and tenders were also mentioned.*

✓ **Purchasing Materials: the few physical 'raw materials'** *were purchased online or by e-mail directly from suppliers in the travel agency and communications sub-sectors.*

✓ **HR Applications:** *most entrepreneurs had* **a liberal management style** *and involved their employees in many decisions. Formal training related to IT was also provided.*

Major Findings – Transport, Storage & Communication

- ✓ ***ICT & Strategy: the majority of businesses used a mix of paper documentation and sophisticated software** and stated they could not move on to a 'paperless office' due to legal requirements. Entrepreneurs from this sector strived to gain competitive advantage through ICT but travel agents said they **lost a lot of personal touch** due to the Internet.*

- ✓ ***Using an expert ICT consultant was seen as essential**, although respondents had bad experience with both friends and 'professional' specialists.*

- ✓ ***Infrastructure:** payments to suppliers mostly by credit cards over the web; wages by cheque or direct transfers.*

Real Estate, Renting & Business Activities – Salient Research Findings

Major Findings – Real Estate, Renting & Business Activities

✓ ***Most respondents in this sector showed that they already possess most of the ideal ICT skills to gain a competitive advantage in their business.*** *Only few were reactive or slow to adopt changes. According to key stakeholders, micro firms in this sector* **depend entirely on e-mail and Internet for their survival and growth***.*

✓ **Resource Planning: all respondents used a computerized application** *to plan their orders and client accounts, and Microsoft Outlook and Excel were the most popular ones. Some made advanced use of these applications and had them integrated with their mobile phones.*

Major Findings – Real Estate, Renting & Business Activities

- ✓ **Operations:** *although these entrepreneurs essentially provided services, many used specialized software in their actual work, e.g. translation software used by freelancers*

- ✓ **Sales & Delivery: all respondents had a database of their clients with varying levels of sophistication** *and saw it as a basic necessity and a critical CRM tool as the business grows. In some cases initiative was still from employees only.*

- ✓ **Customer Support:** *most respondents had a fully-fledged e-commerce website and considered it as essential in business:*

'Il-website qisu l-faċċata ta' dari'

Major Findings – Real Estate, Renting & Business Activities

- ✓ ***Marketing Applications: the Internet was seen as an essential tool for research*** *on current trends and competitors' moves. Client databases were utilized for e-mail shots and LinkedIn - to keep in touch with business contacts.*

- ✓ ***Purchasing Materials:*** *many intellectual 'materials' (ideas, creativity, knowledge) obtained by reading blogs, participating in online communities or exchanging ideas over the Internet.*

- ✓ ***HR Applications: e-mails were perceived as more effective than personal communication*** *for some respondents, and teamwork was essential for all. ICT training was provided, but in many cases new recruits already had the necessary skills.*

✓ ***ICT and Strategy: there was remarkable strategic investment in ICT in this sector,*** *including both off-the-shelf and customized applications. In fact, the problems of this sector were more related to overdependence on technology and the fear that data loss would be a catastrophe for the business.* ***Using IT consultants was a necessity*** *due to the narrow specialization of many micro firms in the sector.*

✓ ***Infrastructure: Sage and Excel*** *were the most popular accounting applications. PayPal, e-banking and direct transfers were the preferred payment methods to agents abroad and employee wages were generally paid by cheques.*

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A Qualitative Plot of The Salient Research Findings

	Cost (Localized)	**Value Added (Internationalized)**

Customer Dominance (vertical axis: Low at top, High at bottom)

Low

Coordination
Word Processing, Accounting, Customer Databases

Hotels & Restaurants

Strengths: improved internal communication, improved customer care, increased operational effectiveness
Weaknesses: internal focus, limited integration with business strategy

Retail & Wholesale

Innovation
Word Processing, Accounting, Electronic Business

Real Estate, Renting & Business Activities

Strengths: IT based strategic leadership, external focus, changes in business processes, changes in employer profile, innovative CEO with IS knowledge
Weaknesses: cost, limited flexibility due to resource constraints

Transport, Storage & Communications

Word Processing, Accounting

Manufacturing
Strengths: central, cost reduction, simple systems

Weaknesses: operational focus, internal focus, no link with business strategy

Construction

High

Efficiency

Word Processing, Accounting, MRP, EDI

Strengths: reactive to business strategy, improved customer relations, external focus, limited customer power
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Collaboration

Customer Dominance

Cost (Localized)   **Strategic Focus**   Value Added (Internationalized)

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Phases 5 & 6 – Main Gaps & Training Curriculum

Phases 5 & 6: Main Gaps and Training Curriculum

The main gaps were identified to be in the:

- o creation and use of an electronic database

- o ability to choose the right ICT consultant

- o use of social media for marketing and communication

- o amount and quality of training provided to employees

- o ability to conduct structured research to support business

Phases 5 & 6: Main Gaps and Training Curriculum

The main gaps were identified to be in the: (cont.)

- o strategic vision on how to use ICT to gain competitive advantage
- o using employee knowledge and ICT skills to enhance operations
- o use of Internet banking
- o appreciating the critical importance of websites

✓ **Any course based on the findings of this Gap Analysis study should address the above topics and emphasize the value of ICT in management and not only as a practical or technical skill.**

Thank You for Your Attention!