السلطة الوطنية الفلسطينية

الجهاز المركزي للإحصاء الفلسطيني

مسح قطاع الأعمال لتكنولوجيا المعلومات والاتصالات، 2007

التقرير التحليلي لواقع النفاذ والاستخدام لتكنولوجيا المعلومات والاتصالات في المؤسسات الاقتصادية في الأراضي الفلسطينية

إعداد

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تم إعداد هذا التقرير حسب الإجراءات المعيارية المحددة في ميثاق الممارسات للإحصاءات الرسمية الفلسطينية 2006

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شكر وتقدير

يـتقدم الجهاز المركزي للإحصاء الفلسطيني بالشكر والتقدير لموظفي الإدارة العامة للأرصاد الجوية الفلسطينية، في وزارة النـقل والمواصلات الذين تعاونوا مع الجهاز في توفير المعلومات والبيانات اللازمة لإعداد التقرير.

لقد تم إعداد تقرير الأحوال المناخية بقيادة فريق فني من الجهاز المركزي للإحصاء الفلسطيني، وبدعم مالي مشترك بـين كل من السلطة الوطنية الفلسطينية (PNA) وعدد من أعضاء مجموعة التمويل الرئيسية للجهاز (CFG) لعام 2009 ممـثلة بمكـتب الممثلـية النرويجية لدى السلطة الوطنية الفلسطينية، ومكتب الممثلية الهولندية لدى السلطة الوطنية الفلسطينية، والوكالة السويسرية للتنمية والتعاون (SDC).

تـم تمويل طباعة هذا التقرير من الاتحاد الأوروبي. تجدر الإشارة إلى أن محتويات هذه الوثيقة من مسؤولية الجهاز المركزي للإحصاء الفلسطيني.

يتقدم الجهاز المركزي للإحصاء الفلسطيني بجزيل الشكر والتقدير إلى أعضـاء مجموعة التمويل الرئيسيـة للجـهاز (CFG) والاتحاد الأوروبي (EU) الذين ساهموا بالتمويل على مساهمتهم القيمة في إعداد هذا التقرير.

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تقديم

يعتبـر الاقتصاد الإلكتروني أحد أهم بوابات النفاذ التي تتيح للاقتصاد الفلسطيني التواصل مع الاقتصاد العالمي وتجاوز القيود المفروضة عليه من الاحتلال الإسرائيلي. لذلك وضمن سياسة الجهاز المركزي للإحصاء الفلسطيني بنشر الرقم الإحـصائي الفلـسطيني، قام الجهاز بتنفيذ مسح قطاع الأعمال لتكنولوجيا المعلومات والاتصالات، 2007 بهدف توفير المعلـومات الإحـصائية لصانعي القرار، ومن أجل الاستثمار الأمثل لبيانات المسح تم إعداد هذا التقرير التحليلي لواقع النفاذ والاستخدام لتكنولوجيا المعلومات والاتصالات في المؤسسات الاقتصادية في الأراضي الفلسطينية.

يتمثل الهدف الرئيسي لهذه الدراسة التحليلية في محاولة فهم تأثير تكنولوجيا المعلومات والاتصالات الفلسطيني في أنشطة المؤسسات الاقتصادية، والعمليات التجارية التي تنفذها هذه المؤسسات، وما يترتب على ذلك من تأثير في التنمية الاقتصادية والاجتماعية بوجه عام. وتحديدا قياس دور تكنولوجيا المعلومات والاتصالات في المساهمة في الأعمال الإنتاجية ورفع الكفاءة والنمو الاقتصادي. بالإضافة إلى تقييم مستوى انتشار تكنولوجيا المعلومات والاتصالات بين المؤسسات الاقتصادية في الأراضي الفلسطينية، ومحاولة فهم وتفسير وجهات النظر لأصحاب ومدراء المؤسسات الاقتصادية في مجال دور وفعالية تكنولوجيا المعلومات والاتصالات في إدارة وتشغيل أعمالهم التجارية.

نأمل أن يسهم هذا التقرير في تمكين المخططين وصناع القرار من القيام بأعبائهم في رسم السياسات التنموية حول القضايا الأساسية المرتبطة بتكنولوجيا المعلومات في الأراضي الفلسطينية، وأن ينير درب متخذي القرار وصانعي السياسات ضمن مسيرة التنمية الوطنية الشاملة في هذا الوطن.

والله ولي التوفيق،،،

حزيران، 2009

علا عوض
القائم بأعمال رئيس الجهاز

ملخص الدراسة

تقديم

جاء تنفيذ مسح تكنولوجيا المعلومات والاتصالات لقطاع الأعمال والاتصالات في الأراضي الفلسطينية، 2007 استكمالا لجهود الجهاز المركزي للإحصاء الفلسطيني في قياس مجتمع المعرفة والمعلومات الفلسطيني، ومن أجل إغناء قاعدة بيانات تكنولوجيا المعلومات والاتصالات بمؤشرات هامة تلبي الاحتياجات المحلية وتنسجم مع التوصيات الدولية ولتساعد على معرفة مدى التقدم والنمو الاقتصادي لواقع الاقتصاد الفلسطيني من خلال تأثره بثورة تكنولوجيا المعلومات والاتصالات التي أصبحت سمة هذا العصر، كذلك المساعدة في توصيف ظاهرة التجارة الإلكترونية و قياس الاقتصاد المبني على المعرفة في المؤسسات الاقتصادية في الأراضي الفلسطينية.

تم تنفيذ مسح قطاع الأعمال لتكنولوجيا المعلومات والاتصالات، 2007 خلال الفترة الواقعة ما بين 2008/05/7 – 06/15 /2008 على عينة عشوائية من المؤسسات العاملة في الأراضي الفلسطينية بلغت 2,966 مؤسسة، منها 1,948 مؤسسة في الضفة الغربية و 1,018 مؤسسة في قطاع غزة.

تجدر الإشارة إلى أن مسح تكنولوجيا المعلومات والاتصالات لقطاع الأعمال في الأراضي الفلسطينية، 2007 هو التجربة الأولى من نوعها التي ينفذها الجهاز في مجال الاقتصاد الإلكتروني، ويأتي بعد ثلاثة مسوح نفذها الجهاز في مجال النفاذ والاستخدام الأسري والأفراد لتكنولوجيا المعلومات والاتصالات، ولقد وفرت هذه المسوح قاعدة بيانات ومؤشرات جيدة حول واقع تكنولوجيا المعلومات والاتصالات في الأراضي الفلسطينية، وساهمت في سد الفجوة التي كانت قائمة في هذا المجال.

أهداف الدراسة

تتحدث الأدبيات العلمية المتعلقة بتكنولوجيا المعلومات والاتصالات عن وجود ضبابية في فهم تأثير تكنولوجيا المعلومات والاتصالات على قطاع الأعمال، ولم يفلح الباحثون حتى الآن في الكشف عن صلة مباشرة بين استخدام تكنولوجيا المعلومات والاتصالات وقضايا أخرى مثل العمالة والإنتاجية والربحية. تحاول هذه الدراسة توضيح هذه العلاقة بين تكنولوجيا المعلومات والاتصالات والأنشطة الاقتصادية وخاصة على المستوى المؤسسي وضمن السياق الفلسطيني.

يتمثل الهدف الرئيسي لإعداد هذه الدراسة التحليلية من واقع بيانات مسح قطاع الأعمال لتكنولوجيا المعلومات، 2007 في فهم تأثير تكنولوجيا المعلومات والاتصالات الفلسطيني في أنشطة المؤسسات الاقتصادية، والعمليات التجارية التي تنفذها هذه المؤسسات، وما يترتب على ذلك من تأثير في التنمية الاقتصادية والاجتماعية بوجه عام، وتحديدا قياس دور تكنولوجيا المعلومات والاتصالات في المساهمة في الأعمال الإنتاجية ورفع الكفاءة والنمو الاقتصادي. ومن الدوافع وراء إعداد هذه الدراسة التحليلية هو عدم وضوح العلاقة وطبيعتها بين تكنولوجيا المعلومات والاتصالات والكفاءة في الإنتاج. تتلخص أهداف هذه الدراسة في تقييم مستوى انتشار تكنولوجيا المعلومات والاتصالات بين المؤسسات الاقتصادية في الأراضي

الفلسطينية، ومحاولة فهم وتفسير وجهات النظر لأصحاب ومدراء المؤسسات الاقتصادية في مجال دور وفعالية تكنولوجيا المعلومات والاتصالات في إدارة وتشغيل أعمالهم التجارية.

النتائج الرئيسية

- أشارت نتائج المسح أن معدل استخدام تكنولوجيا المعلومات والاتصالات من قبل المؤسسات الاقتصادية في الأراضي الفلسطينية أقل من مثيلاتها في دول العالم. وفي هذا السياق بلغت نسبة المؤسسات التي لديها خط هاتف ثابت 42.9%، ونسبة المؤسسات التي تستخدم الهاتف النقال 63.5%، والفاكس 13.7%. أما نسبة المؤسسات التي لديها وسيلة اتصال واحدة (هاتف ثابت أو نقال) فقد بلغت 92.7%.
- أشارت الغالبية (82.1%) من أصحاب أو مدراء المؤسسات التي تم استطلاع آرائهم إلى أن السبب الرئيسي في عدم استخدام مؤسساتهم لتكنولوجيا الاتصالات والمعلومات (الحاسوب أو الإنترنت) هو عدم الحاجة إليها، وأن حجم ودرجة تعقيد العمليات التجارية التي تنفذها هذه المؤسسات لا يتطلب استخدام مثل هذه التقنيات. تشير هذه النتيجة بطريقة أو بأخرى إلى وجود نوع من عدم الوضوح لدى مشغلي هذه المؤسسات الاقتصادية لطبيعة وإمكانيات الخدمات التي يمكن لتلك التقنيات ان تقدمها ومجالات توظيفها في خدمة الأنشطة الاقتصادية التي تقوم بها هذه المؤسسات.
- أظهرت نتائج المسح أن نسبة المؤسسات التي استخدمت الحاسوب قد بلغت 21.3% من اجمالي المؤسسات، وان ما نسبته 12.7% من اجمالي المؤسسات متصلة بالإنترنت. كما تجدر الإشارة إلى أن السبب الرئيسي لتدني تلك النسبة هو صغر حجم تلك المؤسسات حيث أن اكثر من 90.0% منها هي مؤسسات تصنف على أنها متناهية الصغر بحجم عمالة لا يتعدى 4 عاملين في كل مؤسسة. وعند مقارنة نسبة المؤسسات الاقتصادية في الأراضي الفلسطينية الموصولة بالإنترنت والبالغ عدد العاملين فيها 10 فاكثر، يتبين أن تلك النسبة تضاهي مثيلاتها في دول العالم خاصة الدول النامية، حيث بلغت نسبة تلك المؤسسات الاقتصادية في الأراضي الفلسطينية الموصولة بالإنترنت 68.2%، وان 82.1% من تلك المؤسسات لديها أجهزة حاسوب.
- أفادت نتائج المسح أن الغالبية العظمى من المؤسسات الاقتصادية الموصولة بالإنترنت، تستخدم تكنولوجيا الحزمة العريضة عن طريق تقنيات ال (ADSL).
- بلغت نسبة العاملين في المؤسسات الاقتصادية في الأراضي الفلسطينية القادرين على استخدام الحاسوب 43.3% وترتفع هذه النسبة لتصل 49.6% في المؤسسات التي لديها 10 عاملين فاكثر، فيما كانت نسبة العاملين الذين يستخدمون الحاسوب فعليا لا تتعدى ال 15.2%.
- بلغت نسبة العاملين الذين ترتبط تخصصاتهم بتكنولوجيا المعلومات 3.5% من مجموع العاملين في القطاع الخاص. أما بالنسبة لاستيعاب أخصائيي الاتصالات والمعلومات في المؤسسات الاقتصادية، أفاد 82.4% من المؤسسات انهم لا يوظفون أي أخصائي للمعلومات، وحوالي 17.6% منهم يوظفون على الأقل أخصائي واحد. وتبين نتائج الدراسة أن عدد أخصائيي المعلوماتية مرتبط بشكل وثيق مع حجم ودرجة توظيف هذه التقنيات من قبل المؤسسات.
- أوضحت نتائج المسح أن السبب الرئيسي وراء عدم استخدام تكنولوجيا المعلومات له علاقة بقناعة أصحاب الأعمال بعدم الحاجة إلى تلك التقنيات في إدارة أعمالهم. فقد أفاد ما نسبته 82.1% من أصحاب تلك المؤسسات بعدم حاجة مؤسساتهم إلى تلك التقنيات. واللافت في النتائج أن التكلفة شكلت ما نسبته 5.9% وراء إحجام المؤسسات عن

استخدام تلك التقنيات، فيما كان عدم امتلاك القدرة والمهارات اللازمة لتشغيل تلك التقنيات 7.5% وراء عدم استخدامها، ويمكن القول بأن السبب الرئيسي لعدم استخدام التقنيات الحديثة يعود للثقافة السائدة بين أصحاب ومدراء المؤسسات الاقتصادية، وفي عدم امتلاكهم المعرفة الضرورية لتوظيف تلك التقنيات في إدارة أعمالهم.

- عند دراسة أنماط استخدام التقنيات في الأعمال الاقتصادية لدى المؤسسات التي شملها المسح، أشارت النتائج أن المهام المنفذة من قبل المؤسسات يغلب عليها طابع البساطة والتقليد. فقد أشارت نتائج المسح أن 40.7% من المؤسسات تستخدم الإنترنت للمراسلات عبر البريد الإلكتروني، وهذا يمثل الاستخدام الأساسي للإنترنت بالنسبة لهم، بينما الاستخدام الرئيسي الثاني كان البحث عبر الإنترنت باستخدام محركات البحث. ويمكن القول بأن السبب الرئيسي وراء عدم توجه أصحاب الأعمال إلى الاستخدامات الأكثر تقدما مرتبط بضعف المعرفة لدى أصحاب الأعمال حول تلك التقنيات وبتدني انتشار الإنترنت في المجتمع الفلسطيني بوجه عام. تجدر الإشارة إلى أن نجاح استخدام الإنترنت على نطاق واسع للتجارة الإلكترونية مثلا يحتاج إلى قاعدة عريضة من المستخدمين للإنترنت تصل على الأقل إلى 40.0% من الأسر والمؤسسات، وهذه النسبه دون هذا المستوى في المجتمع الفلسطيني.
- انخفاض نسب استخدام التقنيات من قبل مؤسسات الأعمال ليس محصورا بالمجتمع الفلسطيني بل هي صفة غالبة في المجتمعات النامية. وتعود أسباب هذا الانخفاض لوجود فارق كبير بين السرعة التي يتم بها تطوير تلك التقنيات من قبل الشركات المصنعة(مدفوعة طبعا بدافع المنافسة وتحقيق الأرباح) وبين مدى استيعاب المؤسسات الخاصة في الدول النامية لتلك التقنيات وتوظيفها في أعمالها التجارية اليومية. هذا بالإضافة إلى أن أدوات ووسائل تكنولوجيا المعلومات لم يتعدى استخدامها سنوات معدودة وهي بحاجة إلى المزيد من الوقت لكي يتم استيعابها وتوظيفها بشكل افضل.
- اظهرت الدراسة تدني في جودة الخدمات المقدمة من قبل الشركات التي تقدم خدمات الإنترنت. فقد أشار 39.1% من أصحاب و مدراء المؤسسات إلى وجود مشاكل فنية مرتبطة بالسرعة وجودة الخدمة، كما أفاد 21.7% من المؤسسات إلى وجود انقطاع دائم في خدمة الإنترنت، فيما تبين أن 22.0% من المؤسسات تعاني من مشاكل لها علاقة بالفيروسات.
- أفادت نتائج المسح أن حوالي 25.0% من المؤسسات التي تمتلك حاسوب تستخدم تقنيات الشبكات وخاصة الشبكات المحلية المستخدمة لربط الحواسيب مع بعضها البعض في داخل أبنية المؤسسة. وبالنسبة للمؤسسات التي لها عدة أفرع فقد تم رصد حوالي 5.9% من مجموع المؤسسات التي تستخدم تقنيات الشبكات البعيدة لربط الحواسيب مع بعضها والتي تعرف بتقنية الشبكات العريضة (WAN).
- بلغت أعلى نسبة استخدام لوسائل تكنولوجيا المعلومات في قطاع الخدمات والقطاع المالي من بين القطاعات المختلفة. وهذا يدلل على طبيعة العمليات التجارية التي يمارسها هاذين القطاعين، حيث تتصف خدماتها بأنها غير ملموسة ويمكن توفيرها والتعامل معها باستخدام الأنظمة المحوسبة.
- بينت نتائج المسح أن ما نسبته 9.2% من إجمالي المؤسسات التي شملها المسح قد مارست نشاط ذي علاقة بالبحث العلمي والتطوير بما يخص استخدام المعلوماتية في أعمالهم التجارية. وبخصوص النظرة المستقبلية لاستخدامات المعلوماتية، أفاد اكثر من نصف المؤسسات إلى التوجه بزيادة إنفاقها في مجال المعلوماتية. وقد أبدى قطاع الخدمات والقطاع المالي رغبة أكبر من القطاعات الأخرى في زيادة الإنفاق على خدمات المعلوماتية.

- بلغ مجموع الإنفاق السنوي بالدولار الأمريكي (بالألاف) على خدمات تكنولوجيا المعلومات والاتصالات في المؤسسات الاقتصادية في الأراضي الفلسطينية 175,282.9 دولار أمريكي، منها 128,762.6 دولار في الضفة الغربية، و46,520.3 دولار أمريكي في قطاع غزة.

لوحظ من نتائج المسح أن ما نسبته 62.4% من إجمالي النفقات على تكنولوجيا المعلومات والاتصالات قد كانت على الاتصالات بشكليها الهاتف الثابت والنقال، يليهما الإنفاق على الحاسوب 9.9%، يليها الإنفاق على كل من شراء الأجهزة والمعدات الإلكترونية وصيانة الأجهزة والمعدات الإلكترونية بواقع 8.2% لكل منهما. ومن ثم الإنفاق على الإنترنت والشبكات بواقع 6.1% من إجمالي الإنفاق على تكنولوجيا المعلومات والاتصالات. يليها الإنفاق على شراء البرامج الجاهزة بواقع 3.8%، فيما بلغت نسبة الإنفاق على تدريب العاملين في المؤسسات على التكنولوجيا واستخداماتها 0.7%. أما نسبة الإنفاق على تنفيذ دراسات وأبحاث متعلقة بالتكنولوجيا فقد بلغت 0.4% من إجمالي الإنفاق على تكنولوجيا المعلومات والاتصالات.

الاستنتاجات

- الاستخدام الفعال لتكنولوجيا المعلومات والاتصالات في المؤسسات الاقتصادية يتطلب تغيير جذري في طريقة تشغيل وإدارة هذه المؤسسات، سواء في العمليات التجارية، مثل المحاسبة والإدارة المالية، والإعلان والتسويق، والشراء والبيع والعمليات المماثلة والتي تشكل جوهر عمل أية مؤسسة، وعادة ما تنفذ المؤسسات الاقتصادية عمليات التشغيل بطرق تقليدية، ومن الصعب بالنسبة لأصحاب ومدراء هذه المؤسسات تغيير نمط العمل بالاستناد إلى وسائل وأدوات تكنولوجيا المعلومات والاتصالات والذي سيكلفهم الجهد والمال والوقت. هذا النمط من التفكير لدى أصحاب ومدراء المؤسسات الاقتصادية يفسر ارتفاع نسبة المؤسسات التي أجابت بأنه "لا حاجة" عندما سئلوا عن السبب وراء عدم استخدام الحلول القائمة على تكنولوجيا المعلومات والاتصالات، وقد بلغت هذه النسبة 82.1%، بالإضافة إلى 3.2% أجابوا أنهم ليسوا مهتمين في تنفيذ أعمالهم التجارية بوسائل تكنولوجيا المعلومات والاتصالات. والمسألة الثانية هي ان تقييم التوازن بين النفقات وتحقيق مكاسب من هذه التكنولوجيا لعملياتهم التجارية هو حقا مسألة دقيقة جدا للحكم من قبل المالكين ومدراء المؤسسات، وفي معظم الحالات يكون من الصعب على المالكين ومدراء المؤسسات رؤية المزايا الأساسية لتكنولوجيا المعلومات والاتصالات وأثرها على تنفيذ العمليات التجارية. إن أصحاب الأعمال والمدراء في معظم الحالات لا يستثمرون في شيء ليس من المؤكد بأنه سيحقق فوائد أو زيادة في الأرباح.
- إن تقنية المعلومات ليست بمجرد أدوات عند شرائها وتوصيلها إلى المكتب تتحول إلى أداة فعالة متكاملة التأثير، إنما تعظيم الاستفادة منها يتطلب مشاركة واسعة من المستويات الإدارية والفنية. كذلك فان مستوى استخدام تكنولوجيا المعلومات والاتصالات في أي مؤسسة يتماشى مع مستوى تعقيد عملياتها التجارية، ولا يمكن أن نتوقع من المؤسسات الصغيرة التي يشغلها المالك وبعض أفراد أسرته أن تتضمن شبكات متطورة لنظم المعلومات تكلف مئات الآلاف من الدولارات. لذلك فان الأسباب وراء انخفاض معدل انتشار حلول تكنولوجيا المعلومات والاتصالات مرتبط بانخفاض مستوى التطور في المؤسسة، والحقيقة أن معظم المؤسسات الفلسطينية صغيرة جدا، حيث أن حوالي 90% من المؤسسات تشغل 4 عاملين فأقل.

- من العوامل التي تؤثر في اعتماد الحلول القائمة على تكنولوجيا المعلومات والاتصالات هو توفر هذه الحلول ونضجها في السوق المحلية من قبل الشركات المنتجة لتكنولوجيا المعلومات والاتصالات، وخصوصا في تطوير البرمجيات لتكون قادرة على إنتاج حلول تقنية مهنية وسهلة الاستخدام ومجدية من حيث التكلفة. إن من أهم العناصر اللازمة لانجاح هذه الحلول القائمة على تكنولوجيا المعلومات هو مدى ملاءمتها لاحتياجات الأسواق المحلية والاقليمية.
- الأثر الاقتصادي لتكنولوجيا المعلومات والاتصالات مرتبط بقوة بمستوى انتشار وسائل هذه التكنولوجيا بين الأفراد والمؤسسات، حيث تؤكد الكثير من الأدبيات على أن الحد الأدنى المطلوب لمستوى انتشار وسائل التكنولوجيا هو 40.0% لضمان أثر اقتصادي واضح لهذه التكنولوجيا. وفي الحالة الفلسطينية فأن مستوى انتشار وسائل تكنولوجيا المعلومات والاتصالات ما زال دون الحد الأدنى، لا سيما نسبة الاتصال بالإنترنت التي لا تزال أقل من 20% على مستوى الأسر والمؤسسات.

التوصيات

- ضرورة توفير المناخ الملائم للقطاع الخاص من اجل توطين التقنيات وزيادة فعاليتها وذلك عن طريق البحث العلمي وتشجيع إنتاج البرمجيات المحلية التي تلبي متطلبات السوق المحلي، وذلك لأهمية دور استخدام تقنيات المعلوماتية كأحد الفرص التي يجب استغلالها من قبل القطاع الخاص لتحقيق التنمية الاقتصادية.
- تشجيع الدراسات والأبحاث التي تعنى بدراسة أنماط استخدام تقنيات الاتصالات والمعلوماتية في المؤسسات الاقتصادية والمؤسسات الحكومية والأسر. مما يساعد في فهم أنماط الاستهلاك والاستخدام لتلك التقنيات ودرجة انتشارها.
- الاهتمام بالعنصر البشري من خلال التدريب وبناء القدرات المستمر والفعال، حيث يعتبر العنصر البشرى المدرب والكفء هو السر وراء نجاح توظيف تقنيات المعلوماتية على كل الأصعدة، وذلك بسبب اعتبار تقنيات المعلومات أدوات صماء إذا لم تجد العقول المبدعة القادرة على توظيفها في العمليات الاقتصادية.
- ضرورة الاهتمام الكافي بالمصادر غير الملموسة لدى المؤسسات الاقتصادية مثل الاهتمام بعلاقة المؤسسة مع المحيط الخارجي، وبالعمليات الإدارية، وعمليات اكتساب المهارات والمعارف، وذلك من خلال زيادة الوعي بأهمية المصادر غير الملموسة بين مدراء واصحاب المؤسسات الاقتصادية، حيث تعتبر تلك المصادر الأساس وراء تطور المؤسسات الاقتصادية وزيادة قدرتها على المنافسة، كما أن أحد أهم الأسباب وراء تدني استخدام تقنيات المعلوماتية هو قلة الاهتمام بالمصادر غير الملموسة
- سن التشريعات والأنظمة والقوانين وتحديثها بحيث تواكب المتطلبات المتسارعة لتقنية المعلومات، من خلال تخفيض الأسعار وذلك لتشجيع القطاع الخاص على تبني حلول قائمة على هذه التقنيات.
- اهتمام القطاع الخاص بتطوير المنتجات التقنية وحلول محلية تلبي متطلبات المؤسسات في الوطن، وذلك لأن الحلول المحلية هي الأكثر ملائمة من تلك المستوردة للاحتياجات الوطنية، علاوة على أن تشجيع قطاع المعلوماتية الفلسطيني يجعله منافسا في الأسواق الإقليمية والدولية.
- الاهتمام اكثر بالمعلومات على اعتبارها أحد أهم مصادر التطور، والعمل على تحويلها إلى ابتكارات جديدة، فقد أثبتت التجارب والمبادرات أن استخدام تقنيات المعلوماتية لوحدها لن يؤدي إلى تحقيق الأهداف التنموية المنشودة إذا لم يقرن بمبادرات وابتكارات تستهدف بناء القدرات وتغيير أنماط الإدارة والتسويق التقليدية.

Palestinian National Authority
Palestinian Central Bureau of Statistics

Business Survey on ICT, 2007

Analysis of ICT-Access and Usage of Enterprises in the Palestinian Territory

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Preface

In line with the policy of PCBS with regard publishing Palestinian statistics, the Business ICT survey (BICT, 2007) was carried out in 2008 to make statistical information available for decision and policy makers. This study will substantially contribute in enriching the database of information and communications technology (ICT), through providing detailed list of indicators necessary to meeting local needs, and consistent with the international practices. In line with these guidelines, PCBS accomplished this analytical report focusing on ICT data analysis aiming at maximizing the benefits foreseen from the BICT, 2007.

The study is meant to understand the impact of ICT on the Palestinian private sector activities, business operations, and development. It is also set to measure the role of ICT in contributing to the business productivity, efficiency and economic growth. The project is motivated by the lack of clarity of the linkage between ICT and business performance. One of the study goals is to assess the penetration level of ICT among Palestinian enterprises and to understand how business owners and executives perceive ICT in managing and operating their businesses.

In ICT literature there exist a weakness in understanding the impact of ICT on business, and till now researchers have failed to create tight link between the ICT use and issues such as profitability and labor productivity. This study works to clarify this link between ICT and economic activities especially at micro and enterprise level, within the Palestinian context.

PCBS hopes that this report will enable the business and the ICT communities, decision makers, and government officials to learn and utilize the lessons turned out of the study in promoting the ICT sector in the Palestinian Territory which will definitely reflect on the overall development processes in the whole society.

June, 2009

Ola Awad

Acting President

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Executive Summary

- The average fixed line and mobile penetration among enterprises is relatively low when compared with international figures. The typical fixed line usage is 42.9%, whereas mobile usage is on average 63.5%, and faxes penetration 13.7%, while 92.7% of all enterprises have either a mobile or a fixed phone line.
- The majority of enterprise executives think that the main reason for not using ICTs is their belief that there is NO NEED for these technologies. This indicates attention should be paid about the level of awareness of the people running businesses with the significance and potential benefits of ICTs.
- Operating computers and accessing the Internet and transforming these technologies into effective tools for management, marketing, and knowledge acquisition to boost businesses profits need totally different skill sets. For computer solutions to be effective, employees need a special set of competences that are not acquired by ordinary people, or even ICT graduates.
- The computing technologies penetration of Palestinian enterprises shows that 21.3% of them are using PCs and half of those that use PCs (12.7%) of the total number are connected to the Internet. When compared to enterprises with 10 and more employees of countries from different regions of the world, the level of Internet penetration among Palestinian enterprises seems to be in line with the international level, especially in developing countries.
- 43.3% of employees are computer literate, and this number rises at 50.0% of employees among the enterprises with 10 and above employment size. However, only 15.4% of employees are actually using computers in the course of doing their jobs.
- Only 6.0% of enterprises owners or executives reported that cost is the cause for not using ICTs, 82.1% think that there is no need in their businesses for ICT, and 7.5% are not capable of using these technologies at all. Apart from financial constraints, it is the lack of knowledge of the benefits of ICTs that prevents many enterprises operators from using ICTs.
- The Internet practice among Palestinian enterprises is still classical and seems to have minor impact on business operations. Between 50.0% and 60.0% of all enterprises use Internet mainly for sending and receiving messages. Information seeking comes next to electronic messaging: between 25.0% to 50.0% of enterprises have it as their main application. One of the main reasons behind this conventional type of application for the Internet has to do with the low level of Internet diffusion among businesses. For the electronic services to be widely spread and effective there should be a considerable penetration level of Internet access among enterprises and households alike, in order to create Internet and Internet-based applications viable for business purposes.
- Technology can progress at an incredibly fast pace, but the people's adoption of these technologies in their daily practices takes time, and costs efforts and money before it becomes an everyday practice, especially if this technology has been invented and used by other societies, mainly the developed societies. This indicates that it is still early to

expect wide deployment and advanced applications of ICTs among Palestinian enterprises.

- Enterprises with Internet connection are mostly using broadband to connect to the Internet, and most of them are using ADSL.
- Considerable percentage of enterprises reported on different types of technical impediments facing them in using Internet effectively. 39.2% of enterprises are not satisfied with the speed, 21.0% are reporting frequent interruption, and 22.0% suffering from viruses, among other problems.
- About one fourth of all enterprises who own computers are using LAN technologies either wired or wireless with 8.1% using wireless LANs. About 6.0% of enterprises who own PCs are using WAN.
- The percentage of ICT or ICT-related specialists mounts to 3.5% of the total number of employees. Among all enterprises 82.4% do not employ any IT specialists and 17.6% employ at least one ICT specialist. The number of IT specialists and the percentage of enterprises with IT specialist are increasing when larger numbers of computers are used by the enterprises.
- Service and financial sectors recorded the highest level of ICT penetration. That is basically related to the nature of these sectors services and operations, as they deal more with the soft services, or intangible goods, such as banking, insurance, education, consultation, hospitality, and news media, among others.
- The survey has shown that 13.5% of enterprises (that have access to the Internet) placed at least one purchase order through the Internet, while 9.8% of them have received at least one selling order via the Internet. The majority of transactions are completed through the email.
- The chief obstacle for not using Internet for business transactions has to do with culture and traditions of practices. In fact this is the line of reasoning of the majority of respondents, which amounted to 76.8% of all responses. 1.3% of all enterprises offer a price list and catalogues on their website, and 0.5% of all enterprises have an online payment mechanism over their websites, which is extremely insignificant when scaled to the total number of enterprises.
- Open source applications are at a penetration level of 8.0% among Palestinian enterprises, which is still very low, but indicates certain familiarity and awareness of the open sources culture among Palestinian enterprises.
- It seems that Palestinian enterprises are well aware of security threats imposed by the Internet, as the majority of them have responded positively to these threats. Most enterprises have enforced some level of security measures in their information systems. About 50.0% of enterprises underwent at least one computer virus attack originating from the Internet.
- The survey has revealed that 9.2% of all enterprises have some R&D activities in regards to ICT applications, and the amount of activities increases with the enterprise size. In general about half of Palestinian enterprises have plans to increase their future

expenditure and usage of ICTs. In relation to economic activities, services and financial intermediation enterprises plan to have extra ICT applications in their operations and services.

- Regarding expenditures, 62.4% of enterprise spending in ICT goes for telephone bills, both mobile and fixed including fax services. 32.1% of it is paid for fixed telephony and 30.3% for mobile. The next spending channel is that of electronic equipment other than ICT, such as TV and satellite sets, refrigerators, conditioning systems, and so forth, together with maintenance services; this accounts for 16.4% of the total expenditure. Computing services, both software and hardware, account for 13.6% of all spending, with computer hardware accounting for 9.9%, three times higher than computer software which amounts to 3.8%. The lowest spending is recorded for capacity building and for Research and Development, with 0.7% and 0.4% respectively.
- Human resources are the major source of competitive intangibles for enterprises. One of the key approaches for human resources to generate and strengthen competitive intangibles is through ICT. ICT becomes a contemporary tool in creating intangible goods, and adds extra values to tangible or industrial products.
- The difficulty in adopting, managing and appreciating ICT solutions by enterprises has to do with the fact that ICT is more linked to intangible assets, and the difficulty to see immediate financial returns on investment upon implementing these solutions. There are three categories of intangible circles that ICT can inspire: relational, structural and human. Relational capital includes all relations and linkages with external stakeholders such as suppliers, customers, community, government, and others. Structural capital refers to the management structures and processes within the enterprise, to be productive, effective, competitive, and innovative. Human capital refers to competencies, attitudes, abilities, and qualities of the enterprise employees.
- Effective use of ICT demands a dramatic change in the way the business is operated and managed. When taking a decision for adopting ICTs, owners and executives have first to examine their resources and competencies against cost and effective utilization of these solutions. If resources are accessible, the second issue that is assessed is the balance between expenses and gains of these technologies to their business operations.
- ICT entails a chain of tools and systems in software and hardware, with a broad level of sophistication starting with trivial tools like phones to complex interconnected information systems. The level of ICTs in use by any enterprise goes in line with the level of complexity of its business operations. One reason behind the failure in utilizing ICT among enterprises is the ineffective business processes and operations performed by the enterprise. Business owners and executives hate to change since it is painful, and requires employment of extra resources.
- Advanced ICT solutions are linked to strategic management and planning in enterprises. These solutions need long term to have evident impact on business outcomes. In most cases advanced ICT solutions have no immediate impact on business development, and this explains why some businesses are reluctant to expand their ICT usage towards more sophisticated solutions. Besides, ICT investment contains a high

level of uncertainties and the predictable benefits and estimates are not straightforward. ICT investment by nature is uncertain and considered by many analysts more like R&D projects.

- A minimum penetration level of 40.0% of ICTs including Internet is required for the economic impact to be pronounced. It is also to be noticed that there is a causality effect between the penetration level and the economic impact. That means higher penetration of ICT causes economic prosperity, and economic prosperities and higher GDP work to boost ICT penetration. ICT also exhibit an interesting effect, the network externality effect, which denotes that the more users on the network the more value the network has, and this is very much applicable to ICT. In relation to the Palestinian case, the lower diffusion of ICTs work against more sensible impact by enterprises, as the ICT diffusion level, being telephony, mobile, and the Internet, is still below the critical mass, especially in Internet connection and broadband Internet, which is still below 20.0% and less than 10.0% in broadband.
- Another argument which plays a role in boosting ICT diffusion is the maturity and appreciation of enterprises and people alike to the intangible goods and services. Intangible assets are well appreciated in developed countries, and they are protected by laws of intellectual property, while they receive less attention and appreciation in developing including Palestinian societies. One of the main issues that works against full leverage adoption of ICTs by enterprises and by the people alike in developing countries, is the low appreciation they pay for information, and their abilities to transform them into knowledge and actions. The low appreciation of information and knowledge leads to low appreciation for the technologies that process them, i.e. ICTs.

Recommendations

- Stakeholders, including government bodies, business associations, and academic institutions, should seek ways of encouraging innovation, cooperation, customization, and R&D to harness ICT solutions that best fit the local market needs. Businesses, especially software development firms, should work at full leverage to fill in this gap, since many enterprises are relying on customized ICT business solutions that are developed by foreign firms.
- There needs to be consistent and regular data collection initiatives that allow better understanding of enterprises and household behavior in regards to ICT adoption and utilization. Changes in enterprises behavior should be traced through years to be able to monitor progress (or lack of it) in regards to ICTs.
- ICT is known as human intensive technologies. Investment in human capacity building is not receiving the attention it deserves from business owners and executives. Successful, effective, and sustainable implementation of ICT by firms requires intensive investment in building the human competencies in ICT, and that requires cooperation between enterprises, business associations, and training agencies.

- It is to be remarked here that the evaluation of ICT solutions in most cases fails to count and recognize intangible commodities. These solutions create and nurture. This might be one reason behind the unenthusiastic attitude some business owners and executives maintain in regards to ICTs. Intangible commodities should receive the attention they deserve from business owners and executives, and should be counted in a better way in the future.
- There is a growing consensus among the development communities of the importance of using ICT for developing and sustaining vibrant businesses, but they lack visions, action plans, and competencies to accomplish that. To help enterprises achieve these goals it demands on the side of the governments to place more endeavors in increasing the base of ICT customers, through improving connectivity, reducing prices and improving service quality, especially in promoting broadband Internet access, and the development of high quality local contents.
- One of the most important elements needed for the success of the ICT solutions is the quality of the locally developed ICT solutions, their suitability to the needs of the local markets, including the ease of use, especially the use of Arabic interface. Additionally, of major concern is the technical after-sale service of these products that the ICT producing companies should be able to provide.
- Low Internet penetration prevents enterprises from sensing the benefits of ICT, at the same time not sensing the benefits of ICTs, does not encourage enterprises from adopting Internet protocols (IP) based solutions in their operations. The best possible exit strategy of this loop is through government initiatives and policies to push prices down and boost penetration up, such that could help the country cross a threshold penetration after which people start to sense the benefits of ICT.
- Adoption of ICTs alone will not promote growth and development if it is not combined with training, capacity building, organizational and operational changes within the enterprise. Many studies have found that organizational changes are essential to reap the potential benefits of ICTs. This is a call for enterprises to start considering modernizing their management principles and skills and allow more room for ICTs to be more competitive and effective.

Chapter One

Introduction

1.1 Information and Communication Technologies

Information and Communication Technologies or ICTs are identified as the tools, systems, operations, and processes that are concerned with the various kind of data processing such as acquisition, storage, manipulation, management, control, display, switching, interchange, transmission, and reception of data, for the sake of extracting useful or meaningful information out of them to be used by people and institutions to achieve development. ICT includes under its umbrella the computing technologies including software, hardware, and firmware, computer networks such as Local Area network (LAN), Wide Area Networks (WAN), and Internet, in addition to specialized software systems to operate them. ICT further includes telecommunication technologies and systems both fixed and mobile, and their applications such as Simple Message System (SMS) and Multimedia Message System (MMS), in addition to other more advanced technologies such as the Private Branch Exchange (PBX), and automatic call processing technologies. It also incorporates the Internet and its applications, such as email, and other web-based applications. Media technologies, such as TV and Radio broadcasting are also integral parts of ICTs.

ICT can be of significant benefits for enterprises as it can be used to stay in contact with the outside spheres and assist in keeping track with customers and suppliers. It also enhances interaction with government authorities, Non-Governmental Organization (NGO) and the civil societies. ICT opens up huge marketing opportunities through enlarging the market size, increase competitiveness and quality of services, and staying informed about competitors and suppliers.

ICTs also help in managing and controlling internal business operations, such as accounting, budgeting, balancing, inventory archiving, and the like. Above all ICT gives great help in gaining and creating knowledge, in relation to business development, opening up of new markets, developing new products, tracking new investment opportunities, and so forth. ICT can also help enterprises raise their voices and defend their interest through lobbying and pressuring authorities. ICT enhances operation efficiency in enterprises and in interaction with other bodies and agencies, in addition to providing better accountability and efficiency. ICT is also known to be a very effective means in cost saving and controlling of expenses.

ICT has also a special role to play in Palestinian case, in breaking up the barriers and blockades imposed on Palestinians by the Israeli authorities, without which communication with the outside world would be impossible. ICT offers a great help in keep contact with the two sides of the Palestinian territories in the West Bank and Gaza Strip, without which it would be extremely difficult to synchronize activities and cooperate. Remark that Palestinians have no sea, air, or land ports and all their communications with the outside world is channeled through Israel.

However, the benefits mentioned before cannot be exploited unless the right atmosphere is being employed not only on the enterprise level, but further within the business activity, government's bodies, regulations and the society at large. Exploiting ICTs requires new set of skills and competencies and new way of thinking and mind set. The degree to which an enterprise, or any institution, can benefit from ICT depends on the way they perceive ICT, and their ability to reengineer their operations and processes to better integrate and customize

ICTs for the betterment of the enterprise. One of the key issues is to identify the current and future information processing practices and needs, as well as the obstacles that the enterprise faces in their daily business activities, and to provide guidance in creating relevant policy initiative that will lead to more economic activities, growth and employment.

1.2 Objectives of the Survey

The primary objective of the present study is to understand the impact of ICT on the Palestinian private sector activities, operations and development, and to see how ICT is contributing and can contribute to vibrant businesses, and economic growth. The study is motivated by the lack of clarity about the impact of ICT on business performance. The study is meant to research the penetration level of ICT among enterprises and how business owners and executives perceive ICT in managing and operating their businesses.

In related literature there is a lack of clarity about the impact of ICT on business, and till now researchers have failed to create tight link between the ICT use and issues such as profitability and labor productivity. This study is meant to clarify the link between ICT and economic activates on micro and enterprise level, within the Palestinian context.

1.3 Report Structure

This report includes six chapters in addition to the preface. Chapter one is a general introduction about the subject of the survey and its objectives. Chapter two displays concepts and definitions used in the survey. Chapter three deals with the methodology used in planning and conducting the survey. Chapter four covers the overview of Palestinian Enterprises. Chapter five discusses ICT infrastructure: Penetration, Readiness, and Usage. Chapter six contains conclusions and recommendations.

Chapter Two

Concepts and Definitions

Anti Spam Appliances:
Are hardware devices integrated with on-board software that implement anti-spam techniques (e-mail) and/or anti-spam for instant messaging and are deployed at the gateway or in front of the mail server. They are normally driven by an operating system optimized for spam filtering. They are generally used in larger networks such as in companies and corporations, Internet Service Providers (ISPs), universities, etc.

Asymmetric Digital Subscriber Line (ADSL):
A form of DSL, a data communications technology tool, that enables data transmission over copper telephone lines faster than a conventional modem.

Computer Use:
It is defined for this survey's purposes as the basic uses of the computer (during the last twelve months) such as: opening the computer and files as well, create, copy, paste, and saving files.

Dial-up Internet Access:
It is a form of Internet access via telephone line. The client uses a modem connected to a computer and a telephone line to dial into an Internet service provider's (ISP) node to establish a modem-to-modem link, which is then routed to the Internet.

Digital Camera:
It is a camera that takes video or still photographs, or both, digitally by recording images on a light-sensitive sensor.

Digital Subscriber Line (DSL):
It is an Internet connection via modem and dial-up software utilizing the Public Switch Telecommunications Network (PSTN).

Domain Name:
It is the unique name by which a network-attached device. It is used to identify a particular host in various forms of electronic communication such as the World Wide Web, e-mail.

E-mail:
It is a means for exchanging messages, texts and attached files among internet or intranet users.

Economic Activity:
The kind of work which is done by the establishment, and the main economic activity is the activity that contributes to the largest value added in enterprises practicing more than one activity. The UN International Industrial Classification of all Economic Activities, third revision (ISIC-3), was used for coding the activities at the five digit.

E-Commerce:
It is the conducting of business communication and transactions over computer networks and through individual computers linked to the Word Wide Web. Strictly defined, e-commerce is the buying and selling of goods and services, and the transfer of funds, through digital communications.

E-Government:
It refers to the use of internet technology as a platform for exchanging information, providing services and transacting with citizens, businesses, and other arms of government. It may be applied by the legislator, judiciary or administration, in order to improve internal efficiency, the delivery of public services, or processes of democratic governance.

Enterprise:
An economic entity that is capable to in its own right of owning assets, incurring liabilities and encaging in economic activity and transaction with other entities.

Extranet:
It is a private network that uses Internet protocols, network connectivity, and possibly the public telecommunication system to securely share part of an organization's information or operations with suppliers, vendors, partners, customers or other businesses. An extranet can be viewed as part of a company's Intranet that is extended to users outside the company (e.g., normally over the Internet).

Firewall:
It is a device or set of devices configured to permit, deny, encrypt, or proxy all computer traffic between different security domains based upon a set of rules and other criteria.

ICT:
It is used to describe the tools and the process to access, retrieve, store, organize manipulate, produce present and exchange information by electronic and other manual automated means.

Intranet:
It is a private computer network that uses Internet protocols and network connectivity to securely share part of an organization's information or operations with its employees. Sometimes the term refers only to the most visible service, the internal website.

Internet:
A worldwide public computer network. Organizations and persons can connect their computers to this network and exchange information across a country and/or across the world. Internet provides access to a number of communication services including the World Wide Web and carries email, news, entertainment and data files.

Internet Use:
It is defined for this survey purposes as the basic uses of the Internet (during the last twelve months) like: access to certain sites, reading newsletters, and download files or programs from the web.

Integrated Services Digital Network (ISDN):
A digital access technique for both voice and data. This is a digital alternative to an analog public switched telephone service and carries data or voltages consisting of discrete steps or levels, as opposed to continuously variable analog data. ISDN enables digital transmission over the PSTN.

Local Area Network (LAN):
It is a computer network covering a small geographic area, like a home, office or group of buildings, e.g., a school. The defining characteristics of LANs, in contrast to wide-area networks (WANs), include their much higher data-transfer rates, smaller geographic range, and lack of a need for leased telecommunication lines.

Modulator\Demodulator (Modem):
A hardware device that enables a computer to transmit and receive information over telephone lines. The modem is responsible for converting the digital data used by your computer into an analog signal used on phone lines and then converting it back once received on the other end.

Open Source Software:
It refers to computer software under an open source license. An open-source license is a copyright license for computer software that makes the source code available under terms that allow for modification and redistribution without having to pay the original author. Such licenses may have additional restrictions such as a requirement to preserve the name of the authors and the copyright statement within the code.

Privacy Policy:
Is a legal notice on a website providing information about the use of personal information- particularly personal information collected via the website by the website owner. Privacy policies usually contain details of what personal information is collected, how the personal information may be used, the persons to whom the personal information may be disclosed, and the security measures taken to protect the personal information.

Reference Date:
The date referred to in calculating all set of indicators in this survey is between 01/01/2007 to 31/12/2007.

Satellite:
A satellite stationed in geosynchronous orbit that acts as a microwave relay station, receiving signals sent from a ground-based station, amplifying them, and retransmitting them on a different frequency to another ground-based station. Satellites can be used for high-speed transmission of computer data.

Self Propelled Automatic Mail (SPAM):
It is unsolicited electronic messaging, regardless of its content.

Server:
An open, standards-based computing system that operates as a carrier-grade common platform for a wide range of communications applications and allows equipment providers to add value at many levels of the system architecture.

Secure Sockets Layer (SSL):
Cryptographic tool that provides secure communications on the Internet for web browsing, e-mail, Internet faxing, instant messaging and other data transfers.

Video Conference:
A set of interactive telecommunication technologies that allow two or more locations to interact via two-way video and audio transmissions simultaneously.

Website:
Location on the World Wide Web identified by a web address. Collection of web files on a particular subject that includes a beginning file called a home page. Information is encoded with specific languages (Hypertext mark-up language (HTML), XML, Java) readable with a Web browser, like Netscape's Navigator or Microsoft's Internet Explorer.

Web Hosting Service:
A type of Internet hosting service that allows individuals and organizations to provide their own websites accessible via the World Wide Web. Web hosts are companies that provide space on a server they own for use by their clients as well as providing Internet connectivity, typically in a data center.

Wide Area Network (WAN):
A computer network that covers a broad area (i.e., any network whose communications links cross metropolitan, regional, or national boundaries. The largest and most well-known example of a WAN is the Internet

Wireless:
Includes fixed wireless, mobile wireless and satellite Internet connections.

Hacking:
Involvement in computer security/insecurity, to discover exploits in systems (for exploitation or prevention), or in obtaining or preventing unauthorized access to systems through skills.

Wireless Network:
Type of computer network that is wireless, and is commonly associated with a telecommunications network whose interconnections between nodes is implemented without the use of wires, such as a computer network (a type of communications network). Wireless telecommunications networks are generally implemented with some type of remote information transmission system that uses electromagnetic waves, such as radio waves, for the carrier and this implementation usually takes place at the physical level or "layer" of the network.

Virtual Private Network (VPN):
A computer network in which some of the links between nodes are carried by open connections or virtual circuits in some larger network (e.g., the Internet) instead of by physical wires.

Chapter Three

Methodology

3.1 The Survey Questionnaire

PCBS has employed substantial efforts and resources to carry out the survey on ICT access and usage among Palestinian enterprises. The study entailed about one year of nonstop hard work to be accomplished. The survey efforts were extended through the year 2007. A group of experts in related fields such as ICT, economic, and statistics, took responsibilities of designing the survey, through conducting series of meetings and workshops. The team has extensively discussed the survey goals, target areas, approaches, and potential outcomes. The team also benefited from international experience in similar studies.

Upon specifying the target information, a questionnaire has been designed, which incorporated three key sections; ICT diffusion among enterprises, ICT usage and utilization, and a third section on the future prospective of ICT as seen by enterprises owners and executives.

The section on ICT diffusion investigated the degree of penetration of ICT devices and tools such as Personal Computer (PCs), fixed and mobile telephony, computer networks, Internet connectivity, software packages, web site ownership, and so forth. The section on ICT usage, explored the applications of these technologies by enterprises, for instance, e-commerce, business transactions, customers' care, marketing, management and internal operations. This section further investigated obstructions facing effective use of these technologies by enterprises. The third section dealt with the future and potential applications of ICT by enterprises, and their future plans, especially in regards to investment in harnessing these technologies.

The scope of the study involves all private enterprises that are economically active in the Palestinian Territory. The survey has utilized the general census commenced in 2007, which covered the entire Palestinian enterprises activity, regardless of their activities and sizes.

3.2 Sampling and Target Population

The sample which is worked to be a true representation the enterprise activity contained 2,966 enterprises, where 65.7% in West Bank and 34.3% in Gaza strip. The sample was further divided into six categories; industrial, construction, whole sale and retail, transportation and communication, financial intermediation, and services. The percentage of each category in the sample mirrors the true percentage in the business sector. An additional division of enterprises was conceived in accordance to their sizes, which is conventionally reflected in the number of employees per enterprise. In that regard the sample was broken up into four categories; four and less, five to ten, eleven to thirty, thirty and more employees per enterprise.

3.3 Weighing

The results were weighted against a weighting factor which is estimated based on the percentage of elements in accordance to their actual representation. This weight is calculated to be the inverse of the probability of that element considering all enterprises. Weighting the survey findings is fundamental to lessen bias and deviation from true denomination.

Weighting is also significant to elucidate the degree of reliability of the observations recorded by the survey, and their degree of demonstration of the actual observations. This is

accomplished through calculating the standard error of the recorded observations, as a representation of the standard error for the true observation of the whole enterprise population. Of course there should be a difference between the sample mean and the population mean, which is expressed as the standard error of the mean. This standard error is estimated based on the calculation of the standard deviation as computed from the sample of the data being analyzed. Therefore, the standard error is calculated as the square root of the standard deviation of the sample itself. This estimate is based on the fact that the standard deviation of the error difference between the estimate and the true value is the same as the standard deviation of the samples themselves. The variances of observation in the survey were calculated using the Statistical Package for Social Sciences (SPSS), whereby the method of Ultimate Cluster is used to calculate the value of variances.

To ensure proficiency, and to avoid uncounted for circumstances, a pilot survey were conducted on a small sample of 72 enterprises. The exercise commenced all activities of the main survey, including field work such as interviewing, recording, data processing, and so on. Lessons learnt from the pilot project were reflected on the survey methodology, training manual, as many recommendations were taken from interviewees in enhancing the quality of the overall project.

3.4 Field Work Operations

A training manual covers all aspects of the fieldwork practices and the filling of the questionnaires was prepared. It details each and every task conceived by fieldworkers in interviewing executives and business owners, and the best way to extract their feedbacks in relation to all probed issues. Training manuals for supervisors and editors were also prepared to secure team training and coherence in understanding among all workers. A training course was held in May 2008 for four days, attended by 75 participants, and fieldworkers. Another training course was held for supervisors, editors, and assistants, who will be responsible for processing the raw data and summarizing main results. A training program dealt with the design of the surveys, selecting and reaching enterprises, interviewing, and records taking, was held to all survey participants. ICT specialist was also commissioned to clarify the technical concepts and terminology in relation to the survey. The training ended with practical exercises on filling in the questionnaire, and interpreting responses, and filing of records among other activities.

3.5 Data Processing

The project's team developed disciplined techniques to optimally process the collected data upon their gathering. Before filing data recorded by questionnaires, questionnaires were examined to make sure that they were properly filled and the data covered an eligible enterprise. Uncompleted, erroneous, and partially filled questionnaires were disqualified and excluded from the study. Interviewing and questionnaire filing were followed up by supervisors, who have the responsibility to allocate tasks to interviewers, including list of enterprises to be visited. Data filing started on May 15, 2008, and completed in June 28, 2008, 15 staff members were engaged in verifying and entering of records from questionnaires. Tabulation of results was performed using the SPSS for Windows (version 12.0).

Chapter Four

Overview of Palestinian Enterprises

Palestine is an exceptional area with unique economical complications resulted from the elongated military occupation and oppression by Israel. The aim of this section in the context of the study is to place the reader in the context of the Palestinian enterprises activities which are the subject matter of the study. It describes the economic conditions in Palestine and attempts to elucidate how political sphere influence economic activities and development.

The economic status in the Palestinian Territory swings up and down following the political sphere in the region. In 2000 after the eruption of the second Intifada, the typical earnings of Palestinians have fallen off by about 30%, which brought almost 50% of Palestinians below the poverty line of 2 USD/day. In May 2006, and following the adjustment of the poverty line to be 2.7 USD per day, 70% of Palestinians fall below the poverty line. (IFC 2007). In the same period unemployment approaches 50%.

Due to the political and economic instabilities, and the continuous invasions of Israeli military forces into the Palestinian Territory, the Palestinian private sector activities are constantly weakening, and investment sphere is not encouraging. This situation pushed additional people to live on donations, either directly or indirectly through the Palestinian National Authority (PNA). These circumstances have weakened the private activity and increased the formalization of the economy.

The deteriorating of the local economy has shifted the Donors' assistance towards more urgent matters, therefore, donations become more of a relief nature rather than of a long term sustainable development. Beginning of the year 2008, some fund started to be channeled back to support national development programs, including the private activity, nevertheless, it has been demonstrated that with no enhancement in political and security status, significant progress cannot be achieved in regards to development in all circles including businesses.

Palestinian economy is traditional in nature, and centered on service, agriculture, and some industrial activities. Olives, cereals, citrus, and vegetables are the main agricultural products, with sheep and goats being the principal livestock. Processing of food, textiles, stone cutting and granite are some of the main industries. Table (4.1)details the employment percentage across the various economic activities.

Table 4.1: Percentage Distribution of Employed Aged (15 and over) by Economic Activity, 2003-2007

Economic Activity	Year				
	2003	2004	2005	2006	2007
Agricultural and Fishing	15.7	15.9	14.6	16.1	15.6
Manufacturing	12.5	12.7	13.0	12.4	12.5
Construction	13.1	11.7	12.9	11.1	11.0
Commerce, Hotel & Restaurants	20.1	19.4	19.4	19.2	19.5
Transport, Storage & Communication	5.8	5.4	5.7	5.7	5.6
Services & Other Branches	32.8	34.9	34.4	35.5	35.8
Total	**100**	**100**	**100**	**100**	**100**

Source: PCBS 2008. Palestine in figures 2007.

Table (4.1) shows that the contribution of different economic activities in employment is almost the same in the period between 2003 and 2007. One third of Palestinian employees are centered in the service sector, while manufacturing and construction sectors are contributing about 12.5% and 11.0% respectively through the same years. Agricultural activities employment contribution is fluctuating around 15%.

Table 4.2: Number of Enterprises by Economic Activity, 2003-2007

Economic Activity	Year				
	2003	2004	2005	2006	2007
Industrial	14,839	13,468	13,344	12,909	15,340
Financial Intermediation	478	467	468	469	844
Construction	391	704	644	570	627
Transport, Storage and Communication	551	874	869	823	1,215
Services (Profit & Nonprofit)	13,077	18,895	20,099	19,967	24,655
Wholesale, Retail Trade and Repair	41,365	53,420	55,024	54,862	59,253
Total	**70,701**	**87,828**	**90,448**	**89,600**	**101,934**

Source: PCBS 2008. Palestine in figures 2007-2008.

Table 4.3: Percentage Distribution of Enterprises by Employment Size and Economic Activity, 2007

Economic Activity	Employment Size			Total
	0-4	5-9	10+	
Industrial	77.1	15.1	7.8	**100**
Construction	66.6	21.2	12.2	**100**
Retail and Whole Sale	95.2	3.8	1.0	**100**
Transportation and Communication	86.5	8.7	4.8	**100**
Financial	66.6	20.8	12.6	**100**
Services	70.2	11.8	18.0	**100**
Total	**89.5**	**7.1**	**3.4**	**100**

Table (4.3) details the distribution of enterprises according to the employment size across the different activities. In total there are 89.5% of enterprises with employment size less than 5. Zero employment means that the enterprise is operated by the owner. 7.1% of all enterprises are employing between 5 and 9 persons, and 3.3% of all enterprises are hiring 10 or more employees. Large percentage of the enterprises with employment size less than 5 is centered in the retail and whole sale activity, and the majority of them are shops selling different kinds of goods, and are scattered in markets within cities and towns, owned and operated by the owner and his family members. Enterprises with 10 or more employees are found in the service activity, financial and construction, than other activities.

Table 4.4: Percentage Distribution of Enterprises by Employment Size and Region, 2007

Employment Size	Region		
	West Bank	Gaza Strip	Palestinian Territory
0-4	88.6	91.6	**89.5**
5-9	7.5	6.5	**7.1**
10+	3.9	1.9	**3.4**
Total	**100**	**100**	**100**

Table (4.4) shows the distribution of enterprises in West Bank and Gaza Strip, and indicates that in general West Bank have larger enterprises size than Gaza Strip, which is explained by better economic conditions and higher living standards in West Bank than Gaza Strip due to closure imposed on Gaza Strip since the late election in 2006.

In a study performed by Massar on micro enterprises in 2003 (Massar, 2003), it was found that 10.5% of employees have no education, slightly less than half have primary or elementary education, and a quarter have secondary education. On average, two thirds of the enterprises have no employees. Half of those who have employees have one, and a quarter have two. An overwhelming majority of employees are relatives, slightly less than one fifth of them are children under 16, and about two thirds of them work without monetary rewards (Massar, 2003).

Table 4.5: Gross Domestic Product by Economic Activity at Constant Prices, 2003-2007 (Values in Million USD)

Economic activity	Year				
	2003	2004	2005	2006	2007
Agriculture & Fishing	422.1	319.0	312.6	334.0	340.8
Manufacturing & Mining	489.7	564.3	564.8	531.1	527.3
Construction	145.2	103.7	119.4	104.0	103.8
Wholesale & Retail Trade	378.6	359.0	373.9	382.7	415.2
Transport, Storage and Communication	378.5	444.4	461.5	466.0	478.5
Financial Intermediation	139.6	170.0	187.4	186.7	192.5
Services	975.5	1,047.2	1,100.2	940.2	914.7
Public Administration and Defense	647.6	736.4	796.1	552.7	598.8
Other	588.5	503.7	586.7	609.6	564.2
Gross Domestic Product	**4,165.3**	**4,247.7**	**4,502.6**	**4,107.00**	**4,135.8**

Source: PCBS 2008. Palestine in figures 2007.

Table (4.5) above details the gross domestic product (GDP) of the various economic activities in the period between 2003 and 2007. It is remarkable to note that the gross domestic product did not exhibit any significant improvement in this period and kept fluctuating following the political spheres, as well as other external factors like international donations and access to labor market inside Israel. In reference to 2005, a significant drop in gross production is witnessed in the year 2006, and 2007, due to the international embargo imposed on Hamas led government, and the erection of the separation wall between Israel and the Palestinian Territory. As a consequence of these measures, Israel stopped the transfer of the monthly taxes collected by their authorities on behalf of the Palestinian authorities on the Palestinians'

imported goods. Other countries also followed through stopping their donations to the PA, and even their contributions to development activities outside the PNA bodies. One can notice a slight recovery between 2003 and 2005 where the economy started to recover with an increase of about 8.1% in domestic production in 2005 reference to 2003. This gain was fully lost in 2006, which brought the economy back to per 2003 conditions. The fluctuation in economy as reflected on the Gross Domestic Product (GDP), cumulated growth, and GNI per capita between 2000 and 2005 is summarized in Table (4.6).

Table 4.6: Palestine Macroeconomic Trends Estimates, 2000-2005

Macroeconomic Trends	Year					
	2000	2001	2002	2003	2004	2005*
Percentage of Real GDP Growth	-5.6	-14.8	-10.1	6.1	6.2	8.7
Percentage Cumulated Growth Since 1999	-5.6	-19.6	-27.7	-23.3	-18.5	-11.4
Percentage Cumulated Growth Since 1999,Per Capita	-9.5	-25.9	-35.7	-34.1	-32,4	-29.0
Population (Million)	2.93	3.05	3.16	3.27	3.39	3.51
GNI Per Capita, USD	1,626	1,217	1,001	1,088	1,181	1,318
Percentage Consumer Price Inflation	2.7	1.2	5.7	4.4	3.0	3.0

Source: World Bank and PCBS.
*: Projection, estimates exclude East- Jerusalem.

According to a study prepared by the World Bank in 2006, the Palestinian economy has the potential to operate at a much better pace than what is recorded in the years 2000 through 2007, (World Bank 2007). By the end of 2005, real GDP per capita was almost 30% lower than in 1999. According to the Palestinian Central Bureau of Statistics, following the formation the Hamas-led Government, GDP in real terms dropped sharply by 7% in the first quarter of 2006 compared to the last quarter of 2005. A drop by 1.7% was again witnessed in the second quarter of 2006.

Table 4.7: Percentage Distribution of Labour force by Economic Activity, 1995 - 2006

Year	Economic Activity				
	Agriculture	Construction	Manufacturing	Services	Other*
1995	12.7	19.2	18.0	25.6	24.5
1996	14.2	16.8	16.8	29.2	23.0
1997	13.1	18.4	16.4	28.2	23.9
1998	12.1	22.0	15.9	27.1	22.9
1999	12.6	22.1	15.5	28.1	21.7
2000	13.7	19.7	14.3	29.9	22.4
2001	12.0	14.6	14.0	34.5	24.9
2002	14.8	10.9	12.9	36.9	24.5
2003	15.7	13.1	12.5	32.9	25.8
2004	15.9	11.7	12.7	34.9	24.8
2005	15.4	12.9	13.0	34.5	24.2
2006	13.2	12.2	11.6	36.4	26.6

Source: PCBS 2008. Palestine in figures 2007.
* Other includes: commerce, restaurants, hotels, transportation, storage and communication Activity.

Table 4.8: Percentage Distribution of Labour force by Employment Status, 1995 – 2006

Year	Employment Status				
	Employers	Self Employed	Wage Employee	Unpaid Family Member	**Total**
1995	6.9	21.2	61.7	10.2	**100**
1996	5.5	22.3	61.4	10.8	**100**
1997	5.3	22.9	62.0	09.8	**100**
1998	5.8	21.0	65.3	07.9	**100**
1999	5.5	18.7	67.8	8.0	**100**
2000	4.6	19.6	66.1	9.7	**100**
2001	4.7	23.9	62.2	9.2	**100**
2002	3.7	26.8	59.2	10.3	**100**
2003	3.5	27.8	57.3	11.4	**100**
2004	4.1	26.5	58.3	11.1	**100**
2005	4.3	26.1	59.5	10.1	**100**
2006	4.2	26.6	61.1	8.1	**100**

Source: PCBS 2008. Palestine in figures 2007.

The fluctuation in economic activities is further seen in the distribution of Palestinians workers in the various activities of the economy, as depicted by Table (4.7) and (4.8). A declining trend in employment in the manufacturing and construction can be easily seen, and a growing number of employees in agriculture and service activities, especially following the outset of the Intifada in 2000 and the Israeli invasions in 2002. This table also reflects a shortage of investments funds in the Palestinian economy, as manufacturing and construction activities need more investment than agricultural and service activities. Increasing employment in agricultural activities reveals the creation of more unpaid or low-paid jobs. Moreover, the increased employment in services reveals more self- employed persons, as most enterprises in the services activity in Palestine are micro-enterprises, as show by Table (4.2).

Chapter Five

ICT Infrastructure: Penetration, Readiness, and Usage

Before we explore the level of ICT penetration and readiness of Palestinian enterprises as reveled by the survey, it is useful to define the terms; penetration and readiness. Penetration of ICT is defined as the degree to which information and communication technologies are adopted by enterprises, and it is largely articulated as the percentage of enterprises that are of particular ICT technology in reference to the total number of enterprises. Some resources use the term Tele-density, or Info-density to express the same measures. Readiness can be identified as the state of being ready or prepared for use of ICTs for the advantage of the enterprise. In that regard readiness is more inclusive than penetration, since it implies acquisition of skills and competences of using these technologies including, technical, management, financial and others.

Possession of information and communication technologies or access to ICTs on the whole is directly proportional to enterprise size, which is indicated in our case by the total number of employees. Table (5.1) illustrates this observation. The chart depicts the ICT possession index versus size of employment for all enterprises included in the survey in the categories size indicated. The ICT possession index is the sum of all ICT indicators in the survey, such as the number of PCs, laptops, number of computers with Internet connection, printers, scanners, fixed phones, mobiles phones, etc.

Table 5.1: Percentage Distribution of ICT Possession Index* by Employment Size, 2007

Possession Index	Employment Size		
	0 - 4	5 - 9	10 +
0	11.5	2.0	0.0
1 - 10	81.2	62.0	22.9
11 - 100	7.3	36.0	71.4
101 - 1000	0.0	0.0	5.6
1001 - 5000	0.0	0.0	0.1
Total	**100**	**100**	**100**

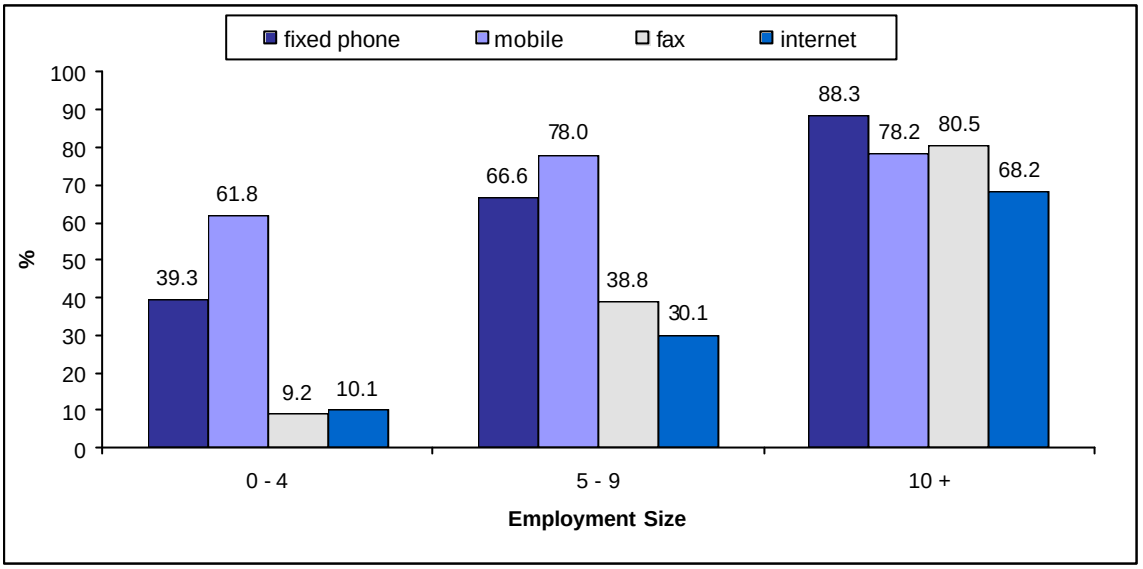
*** Possession index**: Defined as number of (PCs + laptops + PCs with Internet connection + printers + copiers + scanners + TV + Satellite receiver + fixed phone + mobile + fax + digital camera + software packages + servers + video conferencing.

The trend is quite apparent, that is the larger the enterprise size the higher its ICT possession index. This behavior explains the low penetration of ICTs among Palestinian businesses when compared to ICT penetration in other countries, as the overwhelming majority of Palestinian enterprises are having less than 10 employees.

5.1 Penetration of Telephone

The average fixed line and mobile penetration among enterprises is relatively low when compared with international records. The typical fixed line usage is 42.9%, whereas mobile usage is on average at 63.5%. Mobile access is almost flat among enterprises regardless of their sizes, whereas there are sizeable differences among enterprises with access to fixed phones. The low penetration of fixed lines can be explained by the fact that most enterprises rely on mobile phones which are used both for business and private purposes. This is better shown in Figure (1) which contrasts fixed line, mobiles, fax, and Internet connection possession among enterprise of different sizes.

Figure 1: Ownership of Fixed Phone Line, Mobile, Fax, and Internet among Enterprises by Employment Size, 2007



For a better perspective, and to see how these figures compare to international figures, we have extensively searched for eligible data for fixed and mobile phones penetration statistics among enterprises, but unfortunately, we have not been lucky as most studies done on the subject have not covered fixed and mobile phones. The only contemporary study of benefit was a report published by Research ICT Africa, undertaken and published in 2006, for 14 African countries. The study researched the impact of ICT on business sector growth, and how ICT can contribute to vital enterprises sector and economic growth in the context of these African nations. The study covered Botswana, Cameroon, Ethiopia, Ghana, Kenya, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Zambia and Zimbabwe countries (E-Access Africa, 2006). From time to time we will refer to this study, for the purpose of contrasting and scaling with the results of our own study.

Table (5.2) below summarizes the study outcomes in regards to fixed, mobile and fax lines in these 14 countries.

Table 5.2: Comparison of Penetration Level for Certain ICT Services by Country and Employment Size

Penetration level	Employment Size			Total
	0 - 4	5 - 9	10 +	
Fixed Phone line				
African Countries	23.6	58.1	83.0	**51.2**
Palestine	39.3	66.6	88.3	**42.9**
Mobile for Business Purposes				
African Countries	82.9	83.3	83.7	**83.3**
Palestine	61.8	78.0	78.2	**63.5**
Fax Line				
African Countries	4.4	25.5	57.6	**26.1**
Palestine	9.2	38.8	80.5	**13.7**

Source: UNCTAD, 2008. Information Economy Report 2007-2008. Geneva - Switzerland.

Note that the division used by the African study is somewhat different from ours. The Definitions according to E-Access and Usage Africa is as follows:

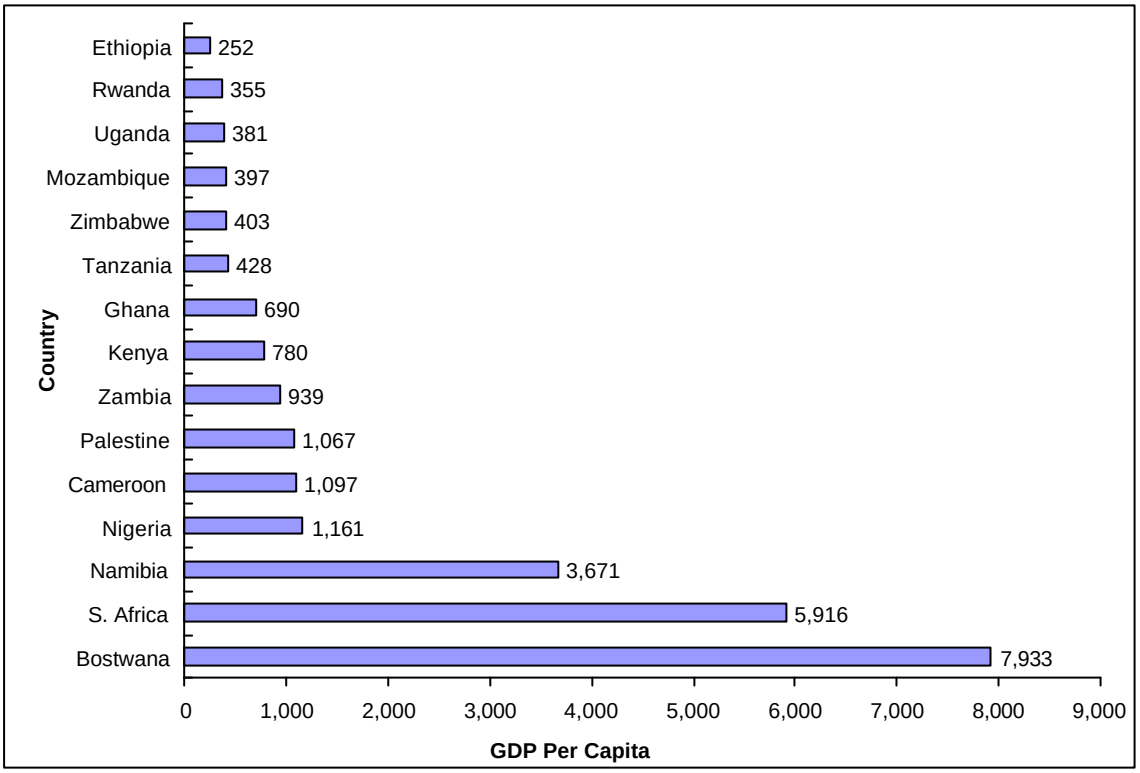
- Informal: no employees or few of them, normally run by the owner, no distinction between private and business finances. Do not keep records or pay taxes.
- Semi-formal: less than 10 employees, may keep records, and may not pay taxes, and with no distinction between private and business finance
- Formal: lager than 10 employees, registered with the authorities, and pay taxies, and distinguish between private and business finance.

The splitting up of enterprises in the African study is almost in agreement with that of our study, where in our case the employee's number is the determinant factor for the partition, their study counted up few more parameters. Remark that their definition of informal enterprise corresponds to a one with employment between 0 and 4, semi-formal enterprise is a one between 5 and 10, and formal enterprise corresponds to a one with larger than 10 employees.

Table (5.2) indicates that mobile, fixed and fax penetration of Palestinian enterprises is on average lower than that of the African countries enterprises. Palestinian enterprises scored 8.3 points in fixed phone, 19.8 points for mobile, and 12.4 points for fax line lower than African enterprises. When each enterprise category is considered on its own, Palestine scored slightly higher than African countries, in case of fax and fixed telephone penetration, but lower in mobile. That can be explained by the fact that the percentage of informal enterprises (From 0 to 4 employees) is pretty higher in case of Palestine than the African countries, and when the overall percentage is weighted with the number of enterprises in each category, the average penetration of all enterprises is pulled down substantially. In mobile penetration, African countries scored 20 points higher than Palestinian enterprises, which looks rather disappointing and exceptional and should be further looked at.

The economic conditions of the African countries included in the comparison are more or less at the same level as that of Palestinian's as revealed by the Figure (2), which depicts that GDP per capita of these countries.

Figure 2: GDP Per Capita for Some African Countries and Palestine



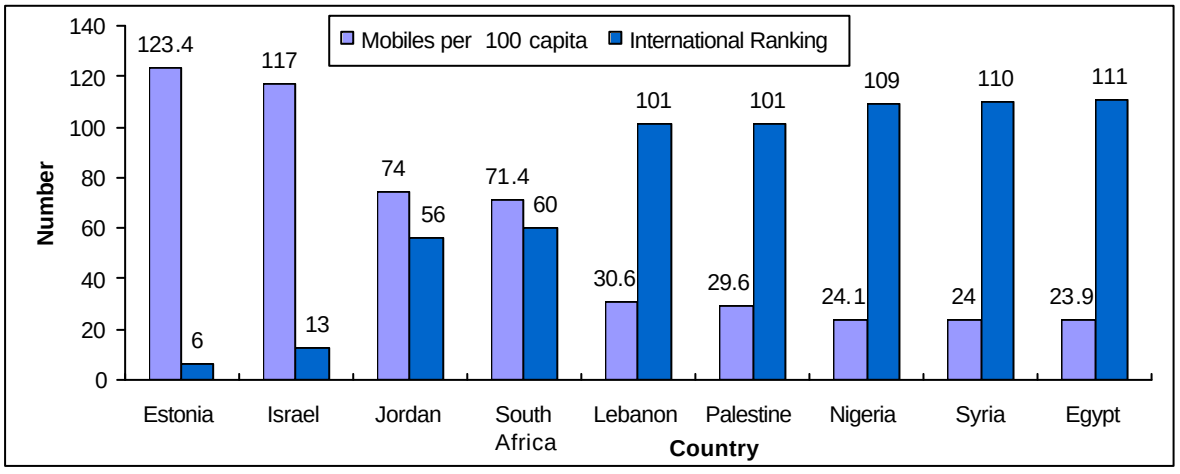
Source: UNCTAD, 2008. Information Economy Report 2007-2008. Geneva - Switzerland.

The GDP per capita in Palestine is 1,067 USD, which is comparable to some of these countries, higher than others and less than five other countries.

The explanation of the remarkable low mobile penetration among enterprises, we think, has to do with the monopolistic regime of the Telecom sector that Palestinians have suffered from for years, reflected negatively on prices and quality of service. There is only one mobile operator in Palestine and only in 2006 was the telecom market liberalized, it is expected that the second mobile operator, Wataniya Palestine will be operational in the second half of 2009.

Figure (3) presents some facts on the mobile penetration in some countries and in Palestine in support of our assumptions.

Figure 3: Mobile Penetration and International Ranking by Country



Source: UNCTAD, 2008. Information Economy Report 2007-2008. Geneva - Switzerland.

Political and economic volatilities enveloping the region work to distress enterprises expenditure policies, especially at micro and small levels, and prevent them from buying a mobile or fixed phone service. Another argument behind the low level of mobile penetration may well have to do with the ownership of a fixed phone, and the reluctance to have a cost overhead of paying for a mobile. To examine this argument, the enterprises ownership of the mobile is tested against that of the fixed phone, and below is a summary of the results.

Table 5.3: Percentage of Enterprises by Ownership of Mobile and or Fixed Phone Line, 2007

Ownership	Fixed Phone Line	Mobile Line	Percentage
Percentage of Enterprises without Fixed Phone Line and with Mobile	No	Yes	23.6
Percentage of Enterprises with Fixed Phone Line and without Mobile	Yes	No	14.7
Percentage of Enterprises with Fixed Phone Line and Mobile	Yes	Yes	54.4
Percentage of Enterprises Neither Fixed Phone Line nor Mobile Phones	No	No	7.3
Percentage of Enterprises with Either Mobile or Fixed Phone Line	No Yes	Yes No	92.7

Table 5.3 helps explaining the low penetration of mobile among enterprises, by the fact that some enterprises use the fixed line to make their business calls. There is about 15% of enterprises that own a fixed phone and prefer not to purchase a mobile. On the whole, the values in the last row of Table (5.3) shows that 93% of all enterprises have either a fixed phone or mobile, which means that the vast majority of enterprises is keen to have at least one communication mean.

Another factor that might play some role in lowering the mobile ownership percentage has to do with the confusion that the record takers might create when posing the question of whether the mobile is used for businesses or private purpose. We think that in many cases there is no plain distinction between business and personal transactions, especially in using mobiles.

The low penetration of fixed and mobile phones, 42.9%, and 63.5% respectively, indicates that enterprises still do not rely heavily on making electronic business transactions among each others using for instance phone calls, but rather prefer face to face deals. This is illustrated by the low possession of faxes which is about 13.7% on average among all enterprises. Again the possession of faxes is higher for larger enterprises particularly with 10 and more employees, see Table (5.2).

The low penetration of telecom technologies whether mobile, fixed line or fax implies that the financials of most Palestinian enterprises are vulnerable to the degree that they are affected by expenditure on these facilities, which is projected to be less than 100 USD. This indicates the fragility of a considerable percentage of these businesses. It also indicates the marginal added value of these tools for some of the enterprises, turn over, as felt by owners.

Why there is a low penetration of fixed phone and mobile phones among businesses, i.e., why is it not 100% penetration. There should be a reason for this behavior, since it cannot be expected that an enterprise, however small it is, does not need a phone. Is this associated with an intolerable cost of phones for these businesses? Is the prepaid model amore appropriate solution for these enterprises, rather than the post-paid? Mobile telephones certainly have

taken some of the shares that are left by the fixed phones, since there is about 20% increase in mobile phone penetration over fixed phones, especially for micro enterprises with 0-4 employment size. However the difference between mobile telephones and fixed telephones diminish as the number of employees increase.

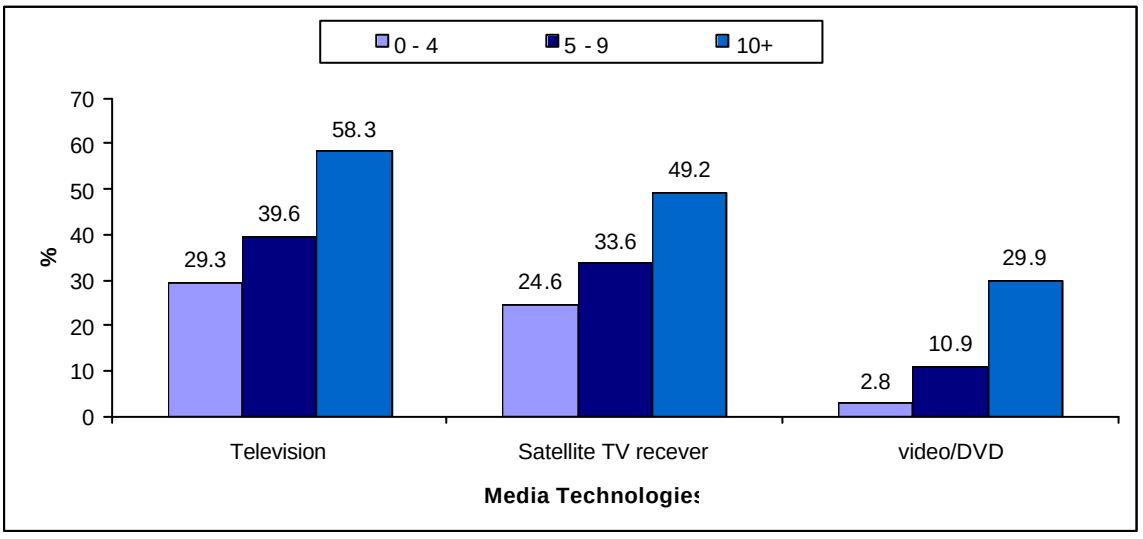
The mobile is the most highly rated ICT tool among all ICTs. In addition to mobility which is a very attractive feature, mobile devices have many advantages over fixed phones and many computing features as well. The mobile phone can also be used to send messages through SMS, and more recently MMS. Mobile phones now come with a large memory which can be used to store data such as the mobile directory, keep tracks with appointments, store and take pictures. It also has visual interface that is much more attractive for customers. This of course in addition to the new trends in mobile computing such as mobile commerce, mobile banking, and so on, which is currently competing with the Internet-based or E-computing and services.

In terms of flexibility, while the mobile phone is more physically movable (remaining with the owners or managers wherever they go), the fixed line phone is more flexible from a business point of view with more people having access to it. A fixed line can further be used as a fax line or for modem Internet dial up. This might explain some of the continuing demand for fixed line phones identified in earlier sections.

5.2 Media Technologies

What is remarkable is the high possession of TV sets and satellite receivers, though it is hard to directly associate these technologies with business practices, generation of values, and profitability. These technologies are more of a media rather than business nature. About 30% of enterprises possess TV and satellite sets. The phenomenon is a common practice even when scaled against enterprises size. See Figure (4). The high penetration of these technologies can be justified by the political status quo of the region that needs to be followed on daily if not hourly basis, as it strongly affects business and individual prospects alike. Part of this phenomenon is linked to the fact that these facilities cost only the installation and equipment expenses and do not entail monthly subscription fees as is the case with Internet or phones.

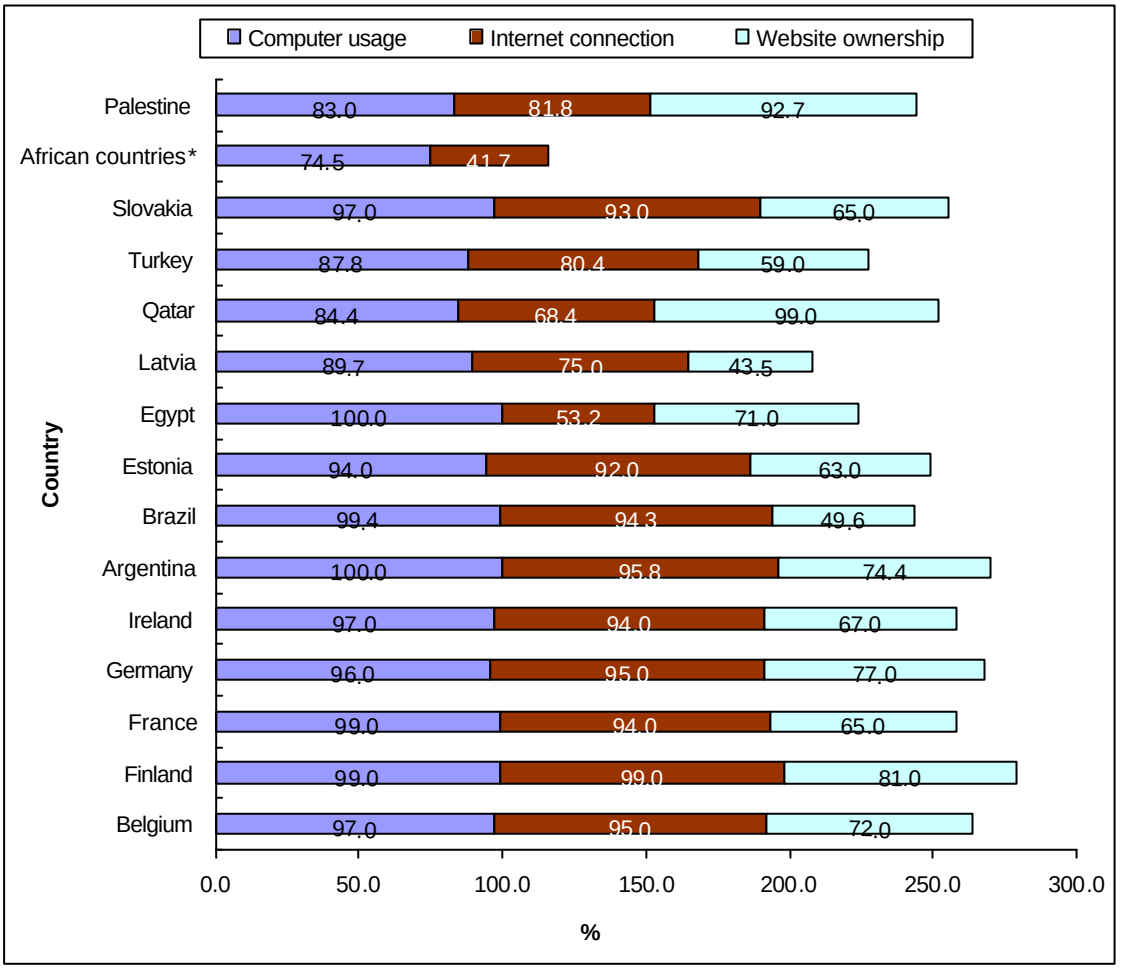
Figure 4: Percentage of Enterprises by Ownership of Media Technologies and Employment Size, 2007



5.3 Computing and Internet Technologies

When we examine the computing technologies penetration of Palestinian enterprises as is revealed by the survey, it shows that about one fifth (21.3%) are using PCs, and half of those who use PCs (or 12.7% of the total number) are connected to the Internet. When compared to enterprises with 10 or more employees of countries from different regions of the world, the level of Internet penetration among Palestinian enterprises for 10+ employment size enterprises, seems to be in line with the international level especially that of developing countries. See Figure (5).

Figure 5: Comparison of Computer Usage, Internet Connection, and Website Ownership by Country (10+ Employment Size)



Source: UNCTAD, 2008. Information Economy Report 2007-2008. Geneva – Switzerland.
*: These figures are taken from the report: Towards an African e-index: SME e-access and usage across 14 African countries 2006.

The average Internet penetration when taking all enterprises into account is recorded at 12.7%, which means 87.3% of all enterprises are not connected to the Internet. Internet connectivity among enterprises is quite low compared to international figures even in poor countries. The key reason behind this, we think, is the fact that most enterprises involved in the survey were very small or micro enterprises that were not interested in joining the Internet community, as they do not see any value added to their businesses, and they do not tolerate the monthly expenses of these services on their budgets.

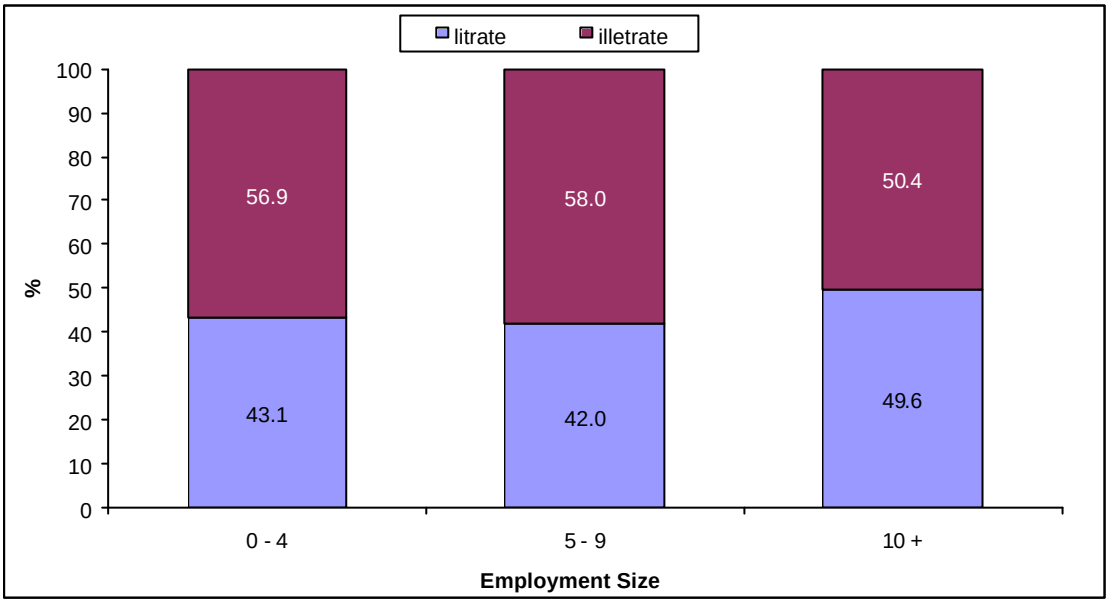
The same trend is repeated amongst Small and Medium Enterprise (SMEs) owning a computer. About 82.1% of enterprises with 10 and more employees owning a computer,

while this level is only 15% for micro enterprises with less than 5 employees. This can basically be justified by the fact that the purchasing power of large enterprises is significantly higher than small ones. Moreover, computer applications and prospects to utilize computers resources are much higher for larger enterprises.

5.4 Rationale Behind not Using ICT

In trying to understand why some enterprises do not adopt ICTs (either computer or Internet) in their business operations, we look first at the PC literacy among employees, which is shown in the diagram below Figure (6).

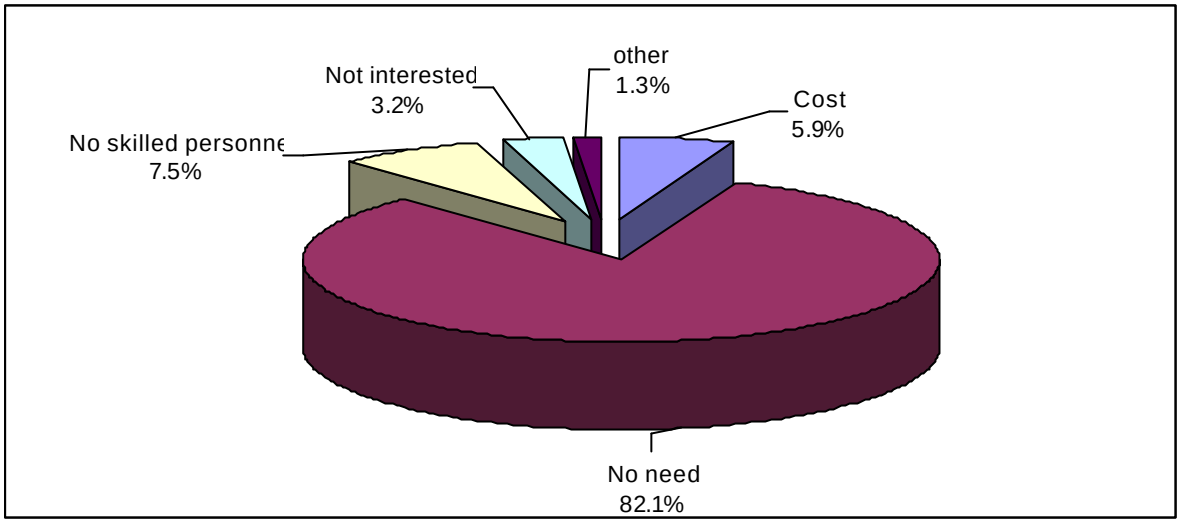
Figure 6: PC Literacy by Employment Size, 2007



It is quite clear that literacy has a certain role to play when considering low ICT penetration especially among micro enterprises with employment size less than 5. The enterprise size is correlated to PC literacy of the employees to some degree, which shows that the likelihood of enterprise personnel knowing the basic ICT skills is higher if the employee works for an enterprise of considerable size. One reason behind this could be that large enterprises work to employ people with some level of knowledge and experience in ICT, or they act to improve the ICT skills of their employees during their employment time.

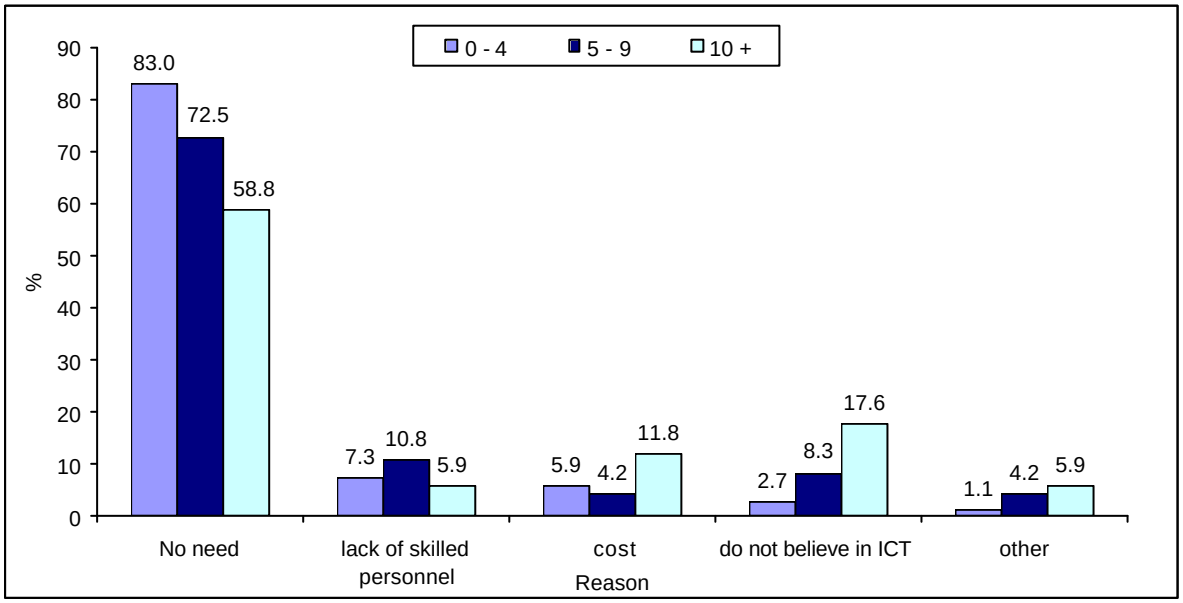
However, when we look at ICT managers' or executives' perception of obstacles for not using ICTs, it turned out that computer literacy has a lesser role in inhibiting higher penetration. The main reason according to enterprises' owners and managers for not using ICT has to do with the way they perceive ICTs, which is more to do with awareness of how to employ ICTs and the culture of doing business. Surprisingly, the main hindrance is not cost, as there is a small fraction of about 6% of enterprises owners or executives who reported that cost is the cause for refraining from using ICTs. In fact the second reason behind not using ICT, has to do with literacy as is shown by Figure (7).

Figure 7: Percentage of Enterprises by Reasons for not Using PCs, 2007



What is striking is that the majority of enterprises executives think that the main reason for not using ICT, is their belief that there is NO NEED for these technologies. This signals a deep concern about the level of awareness of the people running these businesses concerning the significance and potential benefits of ICTs. A negative sign is that this belief is not only conceded by micro enterprise executives, but it is rather common among all enterprise regardless of their sizes as shown in Figure (8). For those who do not own ICT they report that the reason has to do with their belief that ICT cannot bring any advantage to their businesses.

Figure 8: Percentage of Enterprises by Reason for not Using PCs and Employment Size, 2007

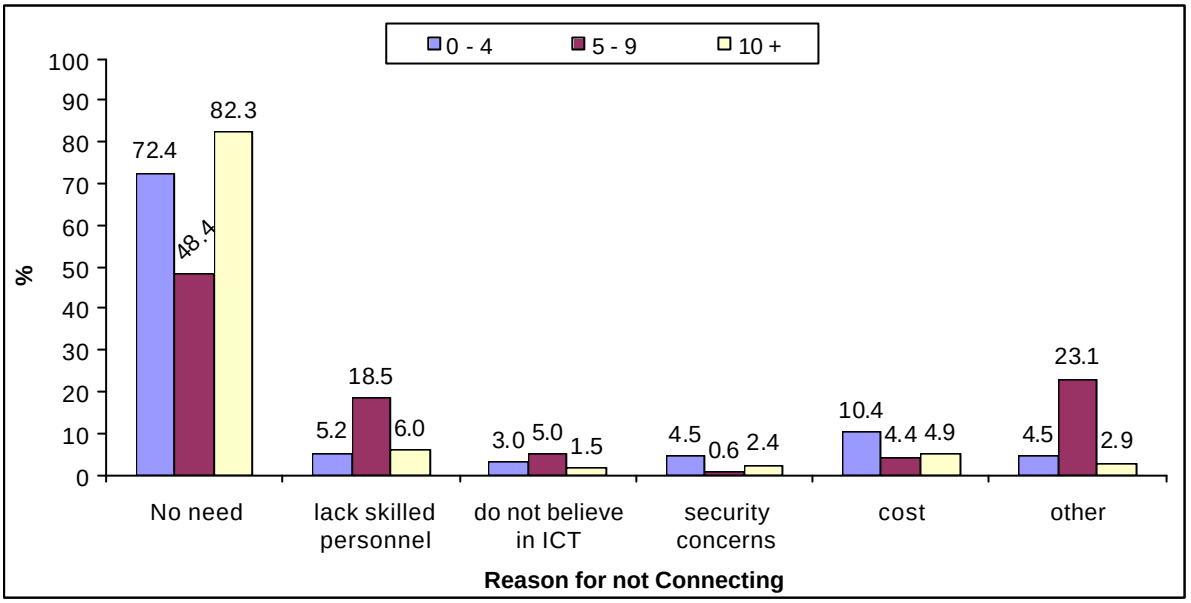


In fact operating computers and accessing the Internet is transforming these technologies into effective tools for management, marketing, and knowledge acquisition to boost businesses profits and need totally different skill sets. This is also why there is a much higher penetration for mobile and fixed phones, as compared to computers with specialized software packages and with Internet-based applications. For computer solutions to be effective,

employees need special set of competences that are not acquired by ordinary people, only by ICT graduates.

To have more insight into the rationale behind not using ICTs, we look at perceptions as recorded for enterprises with different sizes, for both PCs and Internet connection. Looking closely into owner's and managers, perception regarding connection to Internet, there appears to be no big significant difference among the three groups behind not having an Internet connection, Figure (9). Noteworthy that cost is not the main hindrance, even for very small enterprises.

Figure 9: Percentage of Enterprises by Reason for not Connecting to the Internet, 2007



As revealed by Figure (9), 10% of enterprises of employment size less than 5 reported that they cannot afford connecting to the Internet, whereas, about 5% reported that cost is the main barrier for enterprises with 10 employment size and more, and lack of skills. It seems, as the case of using PCs, that the majority agree on the NO NEED contention even among enterprises with 10 employment size and more. What is most striking is the percentage of enterprises with 10 or more personnel hat think there is no need for the Internet connection. This again underscores the potential for education in this sphere. It seems that enterprises executives do believe in the value of Internet, since they responded positively when they were asked about whether they believe or not in Internet, but the real issue for them is how to exploit it to benefit their businesses.

Remember that these figures are the perception of executives of enterprises without Internet connection, which is 31.8% for enterprises with 10 or more personnel, 69.9% for enterprises with personnel between 5 and 10, and 89.9% for enterprises with 1ess than 5 personnel. That might help in explaining the large percentage of enterprises with employees 10 or more, the no need Internet. It seems that there are certain groups of businesses that believe Internet and computing is difficult to be employed for the benefit of their enterprises, such as industrial, construction and transportations to give some examples. For large portion of people, Internet is mainly seen as an information source of political news, weather forecasts, sports, stock market, and for those, TV connected with satellite receivers, and FM radios are also very good sources, and much cheaper than Internet, especially since they do not require monthly subscription fees.

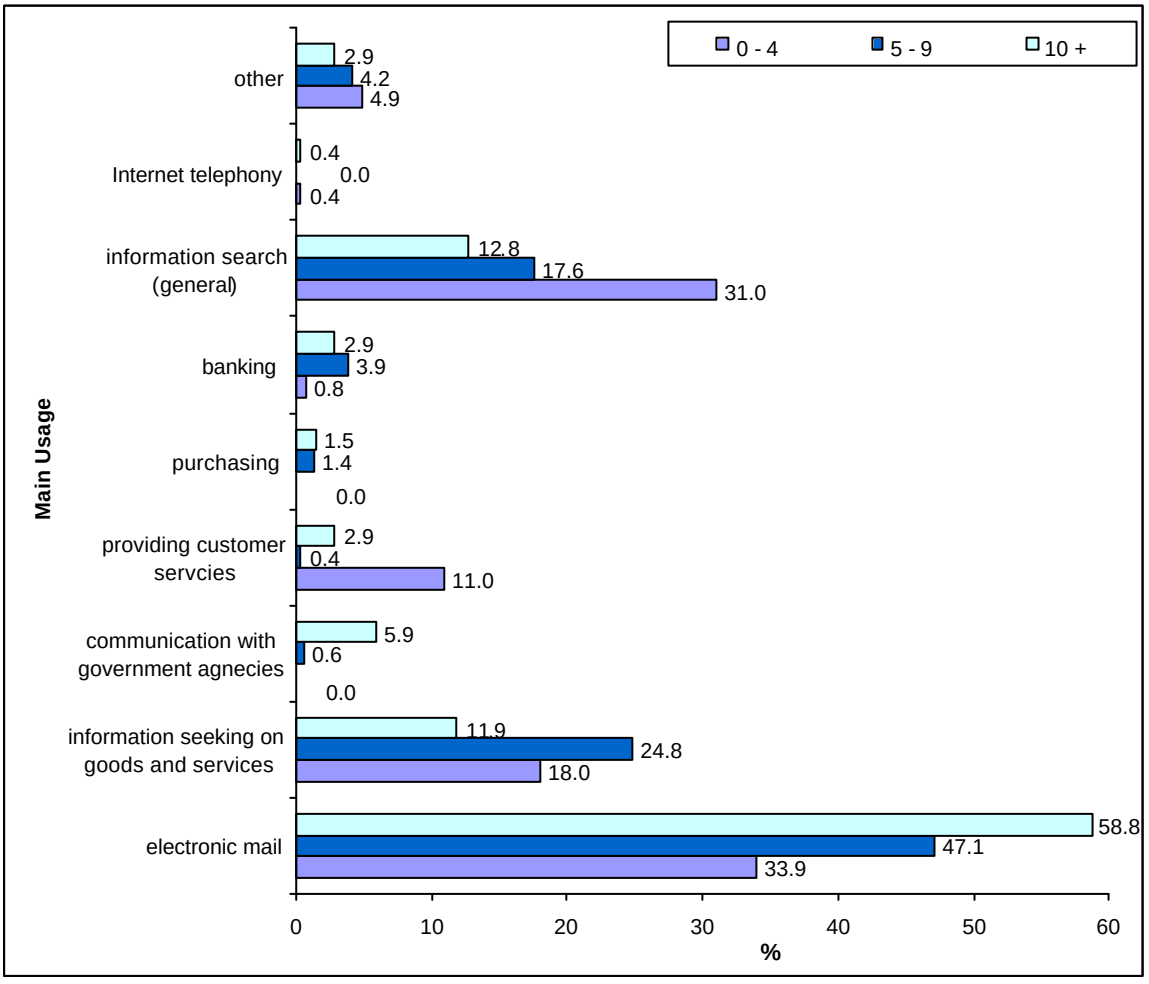
ICT cannot be treated as a single technology or tool, and the reasoning behind not using ICT cannot be treated in this simple manner as was done by the survey. Different kinds of rationales can be used for not using certain level of ICT technologies, starting from the very simple like telephones and faxes, to PCs and Internet, to computer networks and specialized information systems. This issue will be dealt with in amore extensive way in Chapter 6.

Most micro enterprises (employment size less than 5) owners are running their businesses as a result of push rather than pull reasons. Push factors are when a person has no other choice but to open up an enterprise since there is no other job available. By comparison, pull factors are when a person sees an opportunity that can be exploited and prefers to be an entrepreneur rather than being employed. In general, apart from financial constraints, it is the lack of knowledge of the benefits of ICTs that prevents many enterprise operators from using them. So, low levels of education could play a role in the relatively low usage of computers and Internet access amongst enterprises, especially small ones.

5.5 Electronic Services Usage Among Enterprises

The diagram shown in Figure (10) details the Internet usage as conducted by enterprises of various sizes. The first striking broad conclusion extracted from the diagram reveals that Internet practice among Palestinian enterprises is still very classical and seems to have a minor impact on business operations.

Figure 10: Percentage of Enterprises by Internet Main Usages and Employment Size, 2007



The other notable conclusion is that the difference in perception of enterprises with different employment sizes is not as dramatic as one might think regarding Internet usage, especially that Internet access was strongly correlated with businesses size. Refer to Figure (2) to see correlation between Internet penetration and enterprises size. Two third of enterprises with employment size larger than 10 have Internet connection, while one third of enterprises with employment size between 5 and 10 have internet connection, compared to only one tenth of enterprises of employment size less than 5.

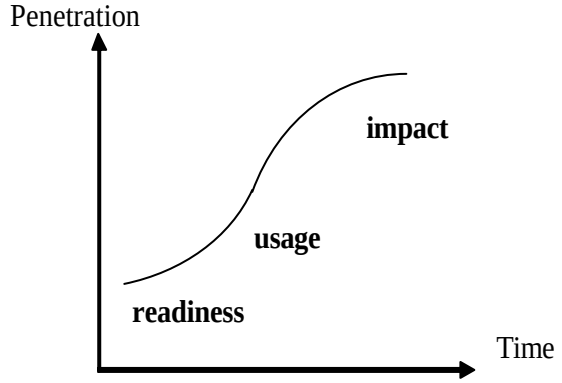
Thus, the high Internet penetration among enterprises with 10 and more employees is not associated with the adoption of advanced set of applications entailing providing electronic services through the Internet. It seems that there are other factors playing roles in identifying the Internet usage by Palestinian enterprises.

Looking at the diagram of Figure (10) one can easily recognize that the prevailing usage of Internet by Palestinian enterprises is electronic messaging via email. Between 33.9% and 58.8% of all enterprises use Internet mainly for sending and receiving message. The absence or inefficiency of the classical mailing system plays a role in this phenomenon, as it normally takes weeks, and in some cases moths to send or receive a letter using the normal postal system. Of course cost is another element, as sending almost an email cost nothing, if compared to the normal postal system, especially express and registered delivery systems. This observation has also to do with restrictions on movement on persons and goods either inside the country due to road blockades or with the outside world as there is no national ports for Palestinians or under Palestinian control.

The other main employment of Internet, as shown by Figure (10) is information seeking both for general knowledge and for information on products and services that are of interest for the enterprise. Information search comes next to electronic messaging with the 12.8% to 31.0% of enterprises using it as their main application. Other services like e-commerce, e-banking, e-government, Voice over the Internet protocol (VoIP) are too marginal to be mentioned. These findings are in line with the general consensus of the lack of awareness and the vague vision in employing ICTs in general and Internet-based services in particular, to enhance enterprises effectiveness, and boost their profitability.

One of the main reasons behind this conventional type of services for the Internet has to do with the low level of Internet diffusion among businesses and the population at large. For the electronic services to be widely spread and effective, there should considerable penetration of Internet access among enterprises and households alike, to create Internet and Internet-based applications viable for business purposes.

Figure 11: The Conceptual Diagram of the Internet Penetration Versus Time



The conceptual framework used to explain this behavior and usually quoted here is the one shown by Figure (11). The diagram suggests that effective usage cannot be sizeable unless considerable level of penetration is achieved, which articulates the readiness of a certain society to start using that technology. High level of readiness prompts large scale usage, and usage in its turn accelerates penetration of technologies because of what is coined as networking, or network externalities effect. Network externalities effect says that for electronic services such as telecommunication and Internet, the value of a connection is exponentially multiplied with the total number of connections, since the opportunity for that connection to make transactions with other connections substantially increases.

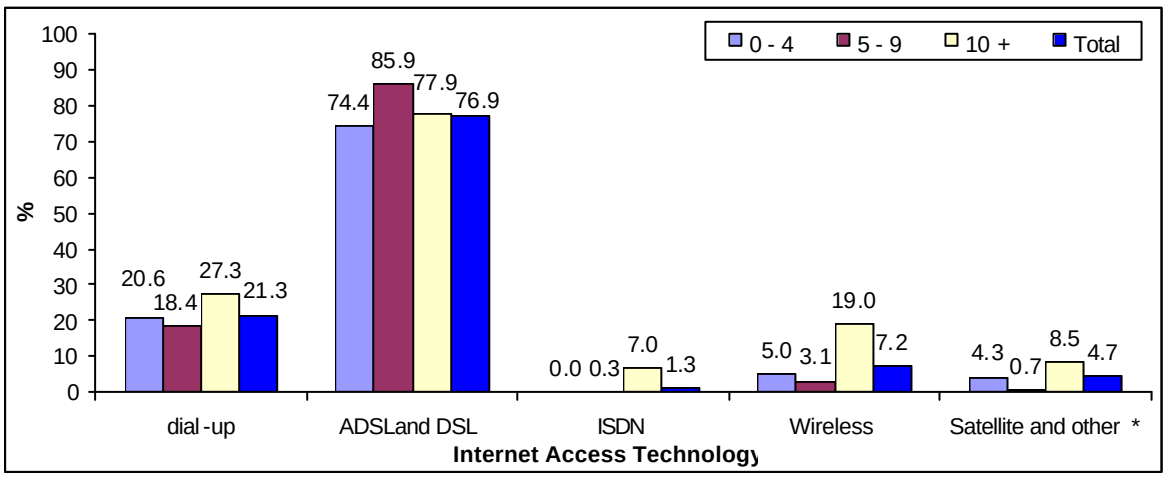
Consequently, as usage increases with time, impacts of these technologies become more pronounced and turn out to be more valued by enterprises. Only at that stage will these technologies have direct impact on enterprise profitability, productivity, expendabilities, and the ability to move into Internet-based businesses.

Another critical issue to be thought of in this regards is that even if enterprises do have access to the Internet, they will still prefer the traditional way of performing their businesses, in what is called the cultural barrier. Technology can progress at an incredibly fast pace, but the people's adoption of these technologies in their daily practices takes time, and costs effort and money before it becomes an every day practice, especially if this technology has been invented and used by other societies, mainly the developed societies. The bottom line is, the Internet, especially broadband, is widely used by Palestinians enterprises only since 2004, which means it is still early to expect wide deployment and advanced electronic applications of it among Palestinian enterprises.

5.6 Internet Connection in Terms of Technology Used

The survey reveals that among enterprises with Internet connection the majority (90.1%) is connected via a broadband technology, see Figure (12). Broadband is the connection with a minimum transfer speed of 256 Kilo Bit Per Second (Kbps). Other references identify 128 Kbps as the minimum speed. In terms of connecting technologies, broadband includes all except dial-up technology, which has a maximum speed of 56 Kbps. The high penetration of broadband is in line with the claim made by most enterprises' executives and owners that Internet cost is not the main hindrance for not having Internet Access, since broadband is substantially more costly than narrow band technology.

Figure 12: Percentage of Enterprises According to their Internet Access Technology, 2007



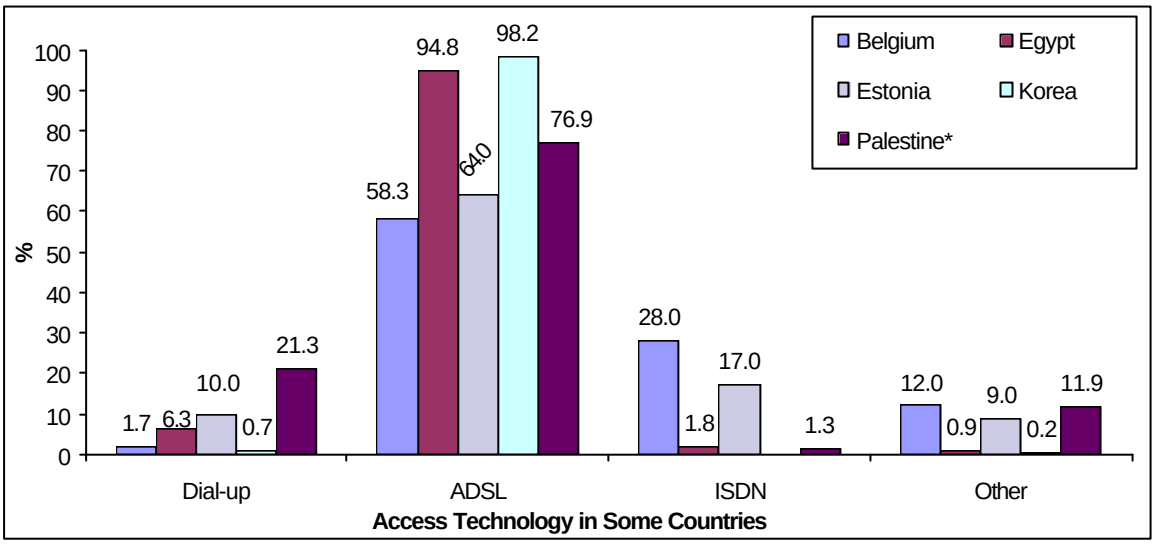
Other: includes Leased Line, Mobile, and E-Card

It is well-established that broadband facilitates enterprises implementation of Internet-based applications better than narrow-band. Broadband access increases the capacity of enterprise to benefit from the Internet, and also to deliver services any-where any-time. Broadband enhances the ability to integrate different media, including video, audio, in addition to text and images, which are essential for presenting products and promoting marketing over the web. In general, industries can enhance e-business solutions through broadband.

Despite growing recognition of the positive impact broadband can have on productivity, the recognition of its potential among Palestinian enterprises is still low, as will be shown below.

It is also good to see how Palestinian businesses are rated in their access mode with respect to countries from different regions of the world.

Figure 13: Internet Penetration of Enterprises by Access Technology in Some Countries



Source: UNCTAD, 2008. Information Economy Report 2007-2008. Geneva – Switzerland.
*:ADSL includes DSL. Other: includes Leased Line, Mobile, E-Card, Wireless, and Satellite.

Figure (13) Shows that Palestine is among the highest countries in using dial-up in businesses, low in using ISDN technology, and typical in using ADSL.

The survey also explored the degree of satisfaction of enterprises with the Internet services as is provided by the sole provider Paltel. A considerable percentage of enterprises reported on different types of technical impediments facing them in using Internet effectively. Figure (14) below summarizes some of them.

Figure 14: Percentage Distribution of Enterprises Report Technical Difficulties in Accessing the Internet, 2007

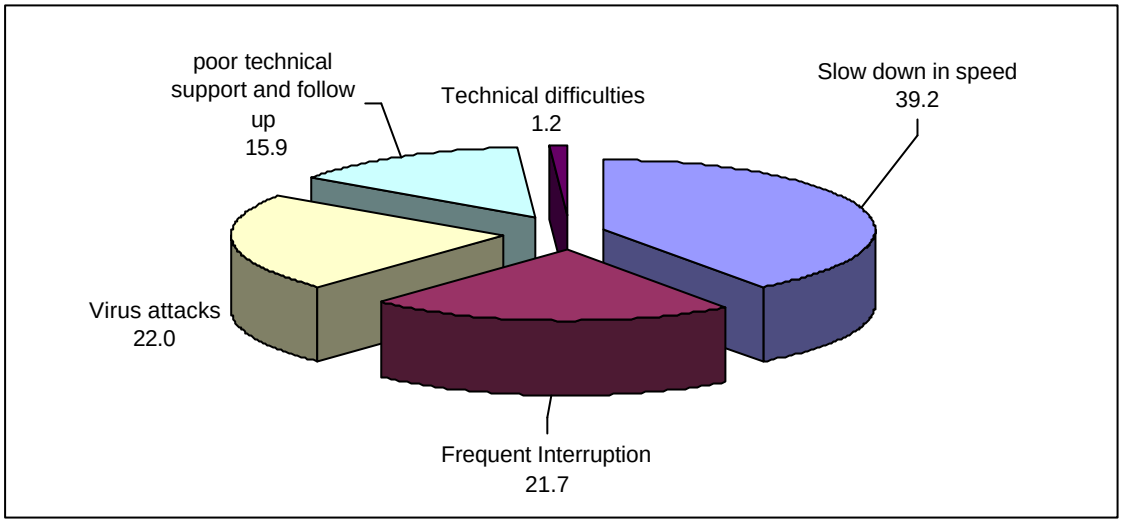
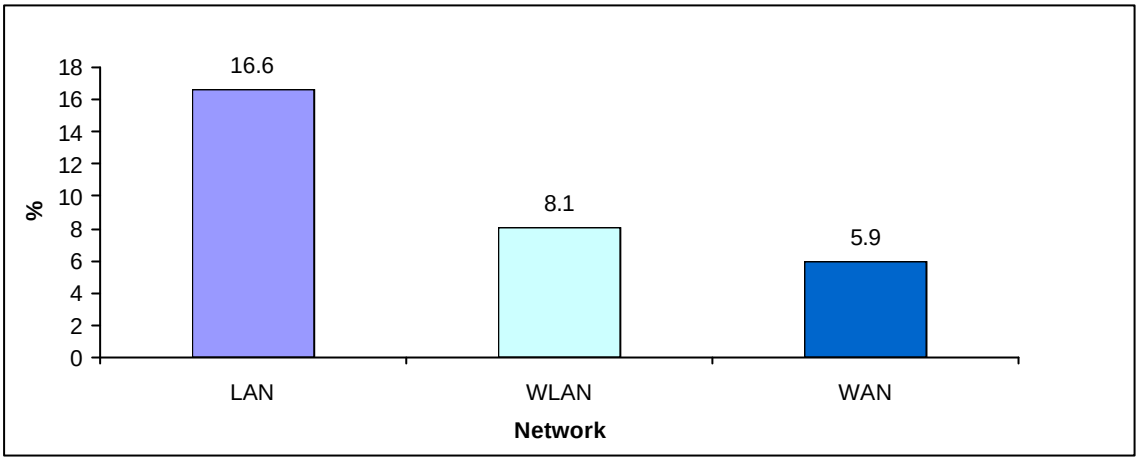


Figure (14) demonstrates that high percentage of enterprises expressed dissatisfaction with the level of Internet services. The respondents hold the provider responsible for most of these problems. 39.2% of the respondents are not satisfied with the speed, especially when uploading and downloading files via Internet. Of course, for those customers, it might be that their Internet connection speed is not high enough to satisfy their needs, and they are not willing to spend more on their Internet connection. Generally speaking, the level of disappointment and frustration with the quality of services is quite high, as most enterprises report displeasure with one or another service facet. That might also be a reason why enterprises are not investing in Internet-based solutions and services, since enterprises are not confident with the level of Internet services offered by providers.

5.7 Networking Technologies Among Palestinian Enterprises

The survey inspected the penetration level of private computer networks and their applications among enterprises with ownership and use of PCs. Figure (15) below shows that about one fourth are using LAN technologies either wired or wireless, and about 6% of enterprises who own PCs are using WAN. Building LAN is easier and cheaper than building a wide area network. In case of LANs, the network is localized within one enterprise building or complex in case of more than one building. LANs use high speed connections, entirely owned and operated by the enterprise. In case of WAN, the company should first build LANs in all its branches, and connect these branches with each others through a carrier network, which is Paltel in our case. Therefore, the company should be substantially large in size and have more than one branch for the WAN to be justified. This may well explain the low percentage of enterprises with WAN networks. To connect these branches with each others, enterprise can choose from diverse range of technologies such as the dial-up, frame relays, or leased lines, which is the most expensive of these technologies.

Figure 15: Diffusion of Networking Technologies Among Palestinian Enterprises, 2007



Wireless networking technologies such as Wireless Fidelity (WiFi) are booming; about a third of the enterprises who own LAN are using wireless technologies. This indicate the future potential of wireless networking technologies and the pace at which these technologies are disseminated. WiFi technology is only few years old, as it starting to show up in markets in 2000-2002, and perhaps after 2004 in Palestinian markets.

It would be interesting to see which enterprises decided to build networks and which kind, and for type of services they are using these networks.

Table 5.4: Distribution of Enterprises According to their Ownership of PCs and LANs, 2007

Numbers of PCs	Numbers of Enterprises	Percentage of Enterprises	Cumulative Percentage	Numbers of Enterprises Owning LAN	Percentage of Enterprises Owning LAN with Respect to Ones Which Own PCs
0	1,329	51.5	51.5	0	0.0
1	497	19.3	70.8	0	0.0
2 - 5	409	15.9	86.7	97	24
6 - 20	249	9.7	96.4	133	53.4
21 - 50	68	2.6	99.0	45	66.2
51+	27	1.0	100.0	24	88.9

As shown Table (5.4), it is large enterprises with large number of PCs who own LANs. The table also shows that the larger the number of PCs possessed by the enterprise the higher the LAN penetration, with about 89% of enterprises owning 50 PCs or more are having LANs. Of course, networking maximizes computing services through sharing of data, software applications, hardware, and the Internet connection.

As also noted before, a considerable number of enterprises do have a wireless LAN, though the technology is quite new. As recorded by the survey about 5.0% of the enterprises own a laptop, which is typically equipped with a WiFi networking card. The ownership of laptops encourages the setting up of Wireless Local Area Network (WLAN). Of course, this has to be added to the fact that building a WLAN is much easier and cheaper than wired LANs, and the

survey results show that the wireless technologies are on the way to being disseminated among enterprises.

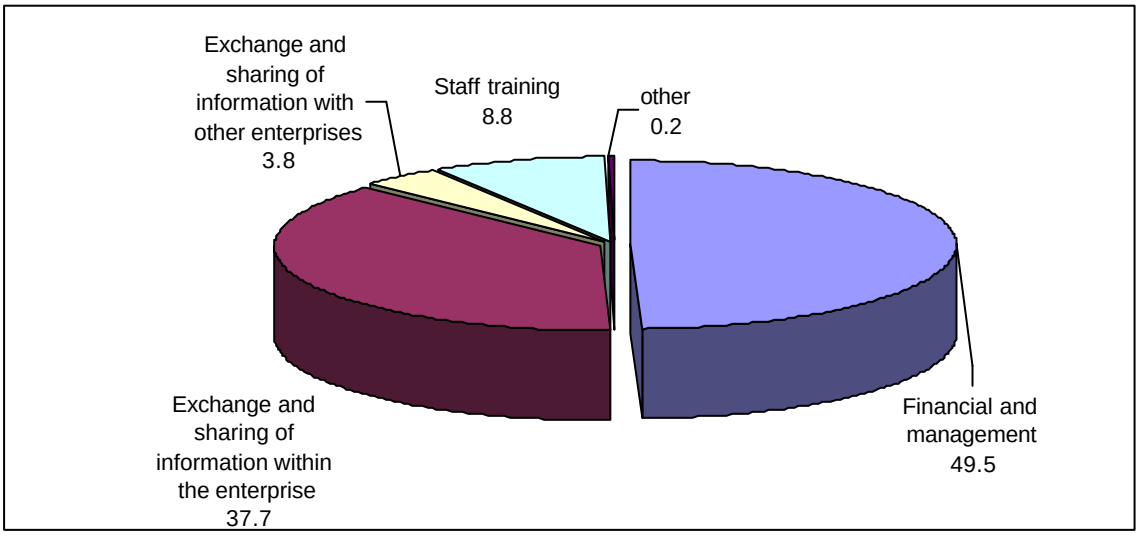
The survey has shown that about 5.9% of those enterprises owning PCs have a WAN connection in their enterprises. As the number of PCs and employment increases the survey records a higher chance to have a WAN, especially for enterprises with more than one branch. It has also to be observed that, building, managing, troubleshooting, and upgrading of WANs are more demanding than LANs. In most cases it requires the existence of a computer group, or an Information Technology (IT) unit which takes responsibility for administrating and maintaining the WAN.

Virtual private network (VPN) is one type of technology that is implemented over WANs. It is a private network that is built (in software) among remote sites of the same enterprise using a public network. Such VPNs use encryption and other security measures to insure that only authorized users can access the network and that data cannot be intercepted by outsiders as it goes through public channels. VPN is important when financial transactions are executed over the Internet.

The other important application of building LANs and WANs is Intranet. Intranets are web publishing techniques that allow only enterprise personnel or those who have access to the private network to use it. It is used to disseminate information internally through the web technologies that is not eligible to be exposed to outsiders. In fact the ownership of Intranets by enterprises is a rigorous sign that they are using advanced ICT techniques and they are utilizing computing resources and their aptitudes.

For those enterprises who own networks, management and financial applications scored the highest among the different applications voted for in the sample, followed by staff training and sharing of information. See Figure (16) below.

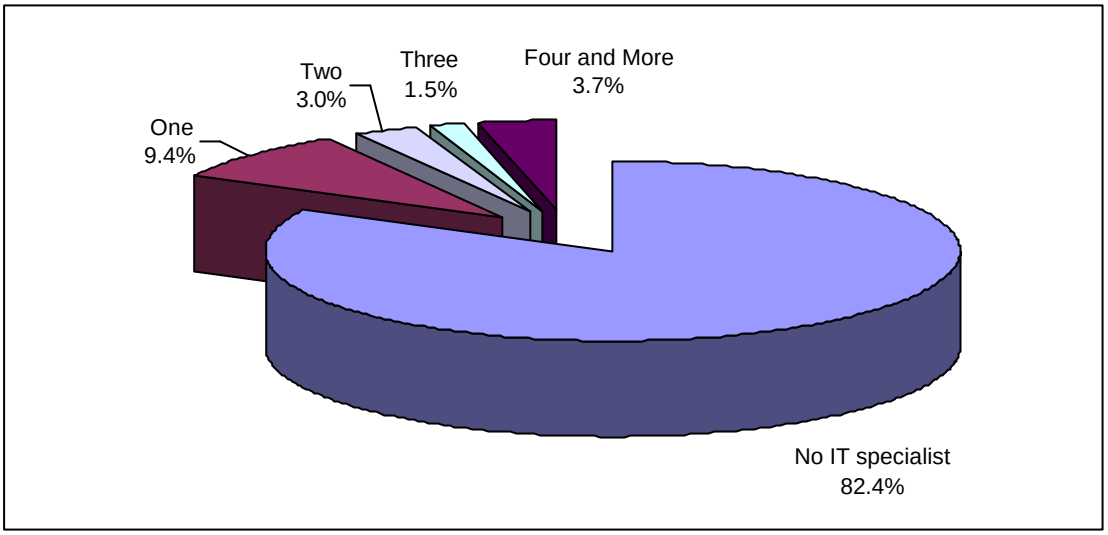
Figure 16: Percentage Distribution of Enterprises by Network Applications, 2007



5.8 Enterprises Human Resources

The enterprises sample taken for the study revealed that the percentage of ICT or ICT-related specialists totals about 3.5% of the total number of employees of all enterprises. It also reveals that among all enterprises, 82.4% do not employ any IT specialist while 17.6% do employ at least one ICT specialist Figure (17).

Figure 17: Percentage Distribution of Enterprises by Number of ICT Specialists, 2007



Statistics also show that 4.8% of total employees are IT specialists, and 23.0% of them are female, which shows that this kind of profession is male-dominated. With regards to distribution of enterprises according to their employments of IT specialists, the vast majority of enterprises 82.4% do not employ any IT specialist. This is in line with the fact that only 21.3% of all enterprises use PCs and 12.7% have access to the Internet. The number of IT specialist employed by the enterprises is linked to the penetration level of computing technologies, and both the number of IT specialists, and the percentage of enterprises with IT specialist increase with the increasing number of computers used by the enterprises.

Table 5.5: ICT Specialists Employment Relation to PC Ownership, 2007

Number of ICT Specialists	Number of PCs in Enterprises					Total
	0 - 1	2-5	6-20	21-50	51+	
0	81.9	12.8	5.0	0.3	0.0	**100**
1	32.5	33.7	24.8	8.2	0.8	**100**
2	5.2	35.1	37.7	19.5	2.5	**100**
3-5	3.8	25.0	46.2	18.8	6.2	**100**
6-10	0.0	19.2	30.8	15.4	34.6	**100**
11+	0.0	11.1	33.6	25.9	29.4	**100**
Total	**70.8**	**15.9**	**9.7**	**2.6**	**1.0**	**100**

The analysis of the statistics reveals that the employment size of the IT specialists is highly correlated with the size of the enterprise and the number of PCs used, and their ownership of advanced technologies such as LANs and WANs. The Table (5.5) reveals the larger the number of PCs owned by the enterprise the larger the number of IT specialists.

Figure 18: Percentage of ICT Specialists by Specializations, 2007

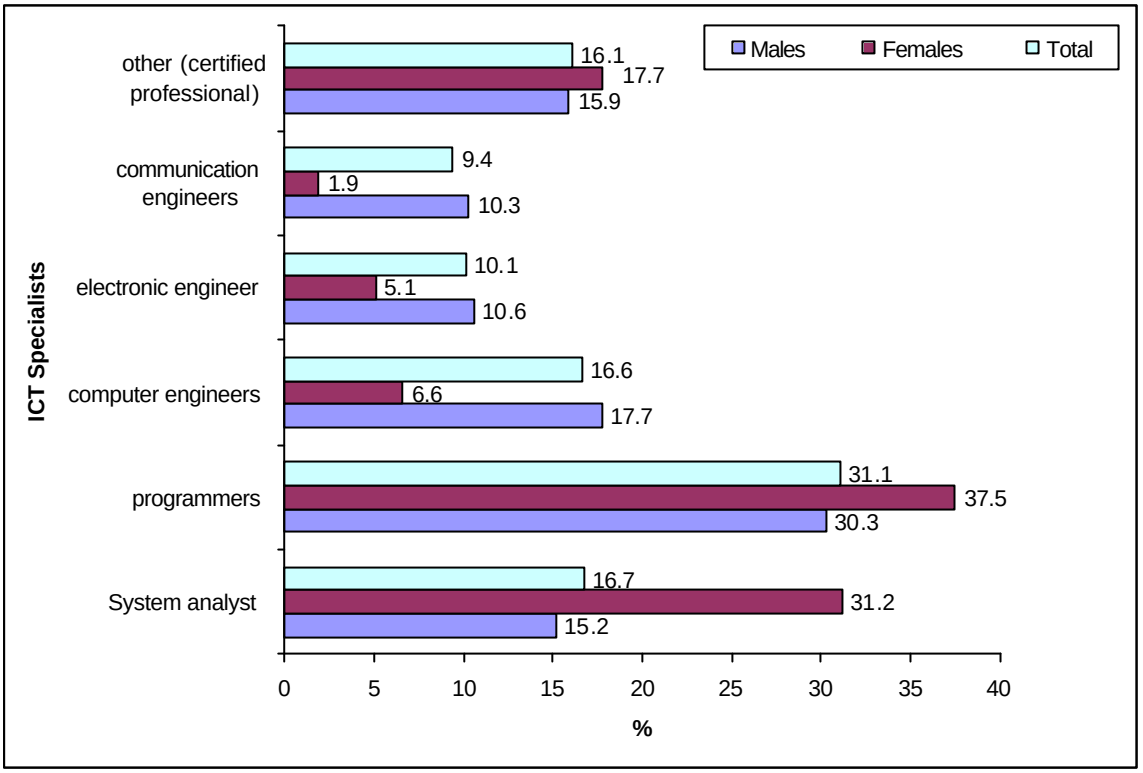


Figure (18) depicts the distribution of different specializations among ICT professions as employed by enterprises. About 47.8% of them are working either as systems analysts, designers or as programmers, which is relatively high in regards to other professions assumed by personnel. Of course whether these employees are working in that area or not is still to be investigated. What is lacking in these figures are professionals specialized in maintenance and troubleshooting, sometimes called help desk, which is in principle needed by any enterprise of a considerable size.

One more observation that is worth mentioning is to do with the percentage of ICT professionals of non-university degrees which are designated as certified professionals, see Figure (18). There are about 16.0% of these employed by Palestinian enterprises, and this is reasonably satisfactory. Of the main reasons behind their employment could be their high degree of practical and technical knowledge, and the lower wages they demand in comparison to university graduates.

5.9 ICT Literacy Among Enterprises Labour force

Computer literacy is one's ability to use the computer for basic functions such as word processing, excel sheets, and power point presentations, in addition to browsing and searching the Web. A computer or IT literate person is one who is capable of using the computer technologies efficiently, and not the one who is specialized in developing computer applications; however, knowing how the computer works, and having some knowledge level of computer hardware is also fundamental to computer literacy.

Out of 100 employees, 43.3% have reported their capacity to use the computer. However, only 15.2% of them have their work linked to one degree or another to computers. In regards to the Internet, there are about 10.2% of total employees using the Internet at work. See Figure (19).

Figure 19: Percentage of Employees by Computer Literacy, Computer Usage, Internet Usage and Employment Size, 2007

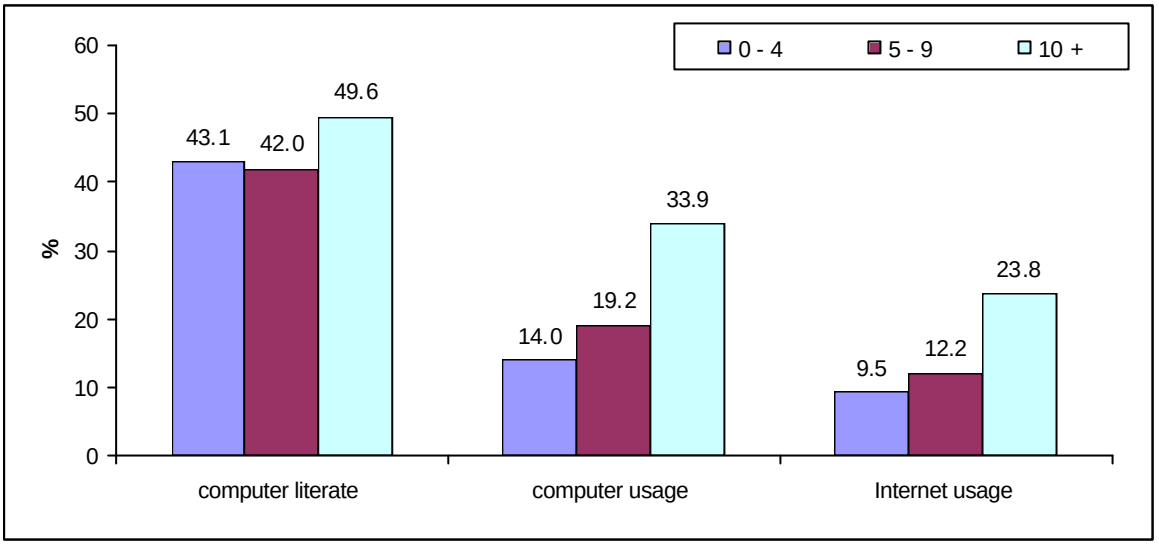


Figure (19), demonstrates that both computer and Internet usage increase with the size of the enterprise employments; however, the level of computer literacy is almost flat among enterprises, which indicates that enterprises have marginal roles in increasing level of computer literacy among their personal.

A comparison between the level of computer usage by workforces among Palestinian enterprises and enterprises from different countries shows that the level of computer usage in Palestine is within the acceptable range of developing countries as is shown by Table (5.6) below.

Table 5.6: Percentage of Employees by Computer and Internet Usage, Compared to Some Countries (10+ employment Size)

Country	Employees Using Computers	Employees Using Internet
Belgium	57.0	41.0
Finland	67.0	59.0
France	63.0	34.0
Germany	56.0	39.0
Ireland	54.0	37.0
Argentina	39.7	24.8
Brazil	47.6	36.5
Estonia	38.0	33.0
Egypt	17.9	9.9
Latvia	26.5	20.9
Qatar	97.1	90.0
Turkey	40.6	34.1
Slovakia	39.0	29.0
Palestine	**33.9**	**23.8**

Source: UNCTAD, 2008. Information Economy Report 2007-2008. Geneva – Switzerland.

Table (5.6) depicts the percentage of employees who use computer or the Internet at work in enterprises with 10 or more employees, from different countries around the world, as taken from the UNCTAD report of the year 2007. The table shows that the Palestinian enterprises are within the acceptable range of most countries, even compared to countries with high GDP.

Note that the statistics given above taken for enterprises with 10 or more employment size, which for the Palestinian case represents about 3.3% of the total number of enterprises. That might indicate that the main reason behind the low penetration of these technologies has to do with very small number of enterprises with 10 or more employees. About 90.0% of all Palestinian enterprises have four less employees, and 7.0% of them are from 5 to 9 employees.

Figure 20: Percentage of Employees by Computer Literacy and Usage, Internet Usage and Economic Activity, 2007

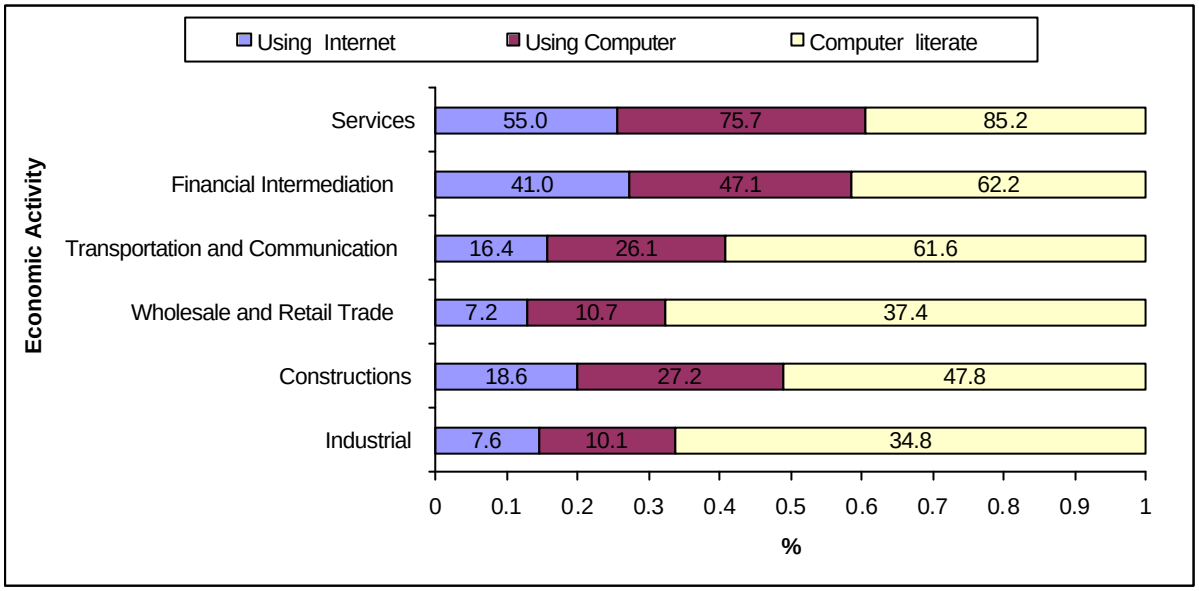


Figure (20) illustrates computer usage among different enterprises according to their economic activities. Service and financial sectors recorded the highest level of penetration. That is basically related to the nature of these sectors' services and operations, as they deal more with the soft part of the economy, sometimes called intangible goods, such as banking, insurance, education, consultation, hospitality, and news media, among others. In soft-sector economies, employees work to deploy knowledge assets, collaboration assets, and process-engagement to create productivity, performance improvement, and values. Typically output of this sector is content (information), service, attention, advice, experiences, and/or discussion, also known as "intangible goods".

Since the quality of most services depends largely on the quality of the individuals providing these services, it becomes essential for the service sector to enhance the level of their personnel to levels up the quality of their offered services. Whereas a manufacturer may use technology, automation, and other techniques to lower the cost of goods sold, the service provider often faces an inexorable type of increasing costs.

More and more services are becoming tradable, especially with the dissemination of ICTs among businesses and households. This means that the service sector, especially the financial

sector is a main beneficiary of ICTs, which encourages enterprises in this sector to invest heavily in ICT, and train their teams.

Service sector is also highly competitive, as can be clearly pronounced in the banking segment. Banks are leading other sectors in constantly improving their services, to be innovative, and restructuring their services and processes to be more attractive to customers.

Service sector is very dynamic and experience many dramatic transformations. Moreover, the restructuring of processes and improvement of existing services have led to the introduction of new services, which also encourages the adoption of ICT.

It is noteworthy that ICT resources found in most enterprises have more potential than what is being exploit by these enterprises. This is basically due to the lack of competent personnel who can effectively and sustainably exploiting ICTs.

5.10 The Electronic Commerce

The survey has shown that about 13.5% of all enterprises have placed at least one purchase order through the Internet, while 9.8% of them have received at least one selling order via the Internet. The purchase orders increase with the enterprise size while the selling orders are not affected by the employment size. The chart below illustrates the purchase and selling orders received through the Internet in relation to the economic activities of the enterprises.

Figure 21: Percentage of Internet Based Purchase and Selling Orders by Economic Activity, 2007

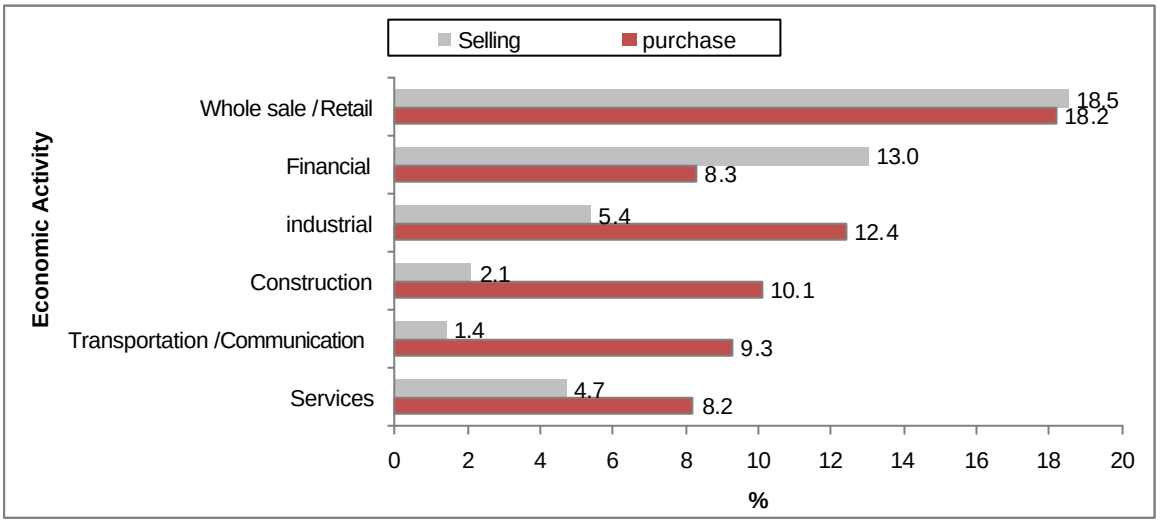


Figure (21) shows that in general placing purchasing orders over the Internet is more frequent than receiving selling orders. In purchasing the enterprise is the customer, and it is in most cases a business to business transaction. The sector with the highest purchasing and selling is the whole-sale retail sector, which is logic since they normally deal with larger number of goods than any other sector which means larger number of transactions. They also deal more with outside providers than other sectors. The level of selling orders received by the whole sale and retail is also considerable and comparable to the purchasing orders which appears unusually since this would be a customer to business transaction more than business to business transaction, and normally performed locally.

Table 5.7: Percentage of Enterprises Selling or Purchasing Electronically by Selected Variables, 2007

Selected Variable	Purchasing	Selling
Region		
West Bank	14.0	10.1
Gaza Strip	11.7	8.5
Palestinian Territory	**13.5**	**9.8**
Employment Size		
0 – 4	11.4	10.4
5 - 9	11.0	6.8
10+	23.5	10.3
Economic Activity		
Industrial	12.4	5.4
Construction	10.1	2.1
Wholesale and Retail	18.2	18.5
Transportation and Communication	9.3	1.4
Financial Intermediation	8.3	13.0
Services	8.2	4.7

For other sectors, the level of placing purchase orders is significantly more than receiving buying orders except for financial service sector, where purchasing is at 8.3% level and selling is at 13.0%, which is also logic since the whole financial sector is built on offering services to customers and many of them, especially in the banking sector, is computerized and began to offer services via the web. The industrial sector on the other hand makes twice than receiving purchases orders which is logic since they have to make many orders for materials and equipments through the web.

The survey also has revealed that placing and receiving orders through the Internet is slightly more widespread in the West Bank than in Gaza Strip by almost three percent. See Table (5.7).

When enterprises were asked to report on the method in which they make electronic transactions over the web, it was found that the majority of transactions were completed through email, as revealed by the Table (5.8).

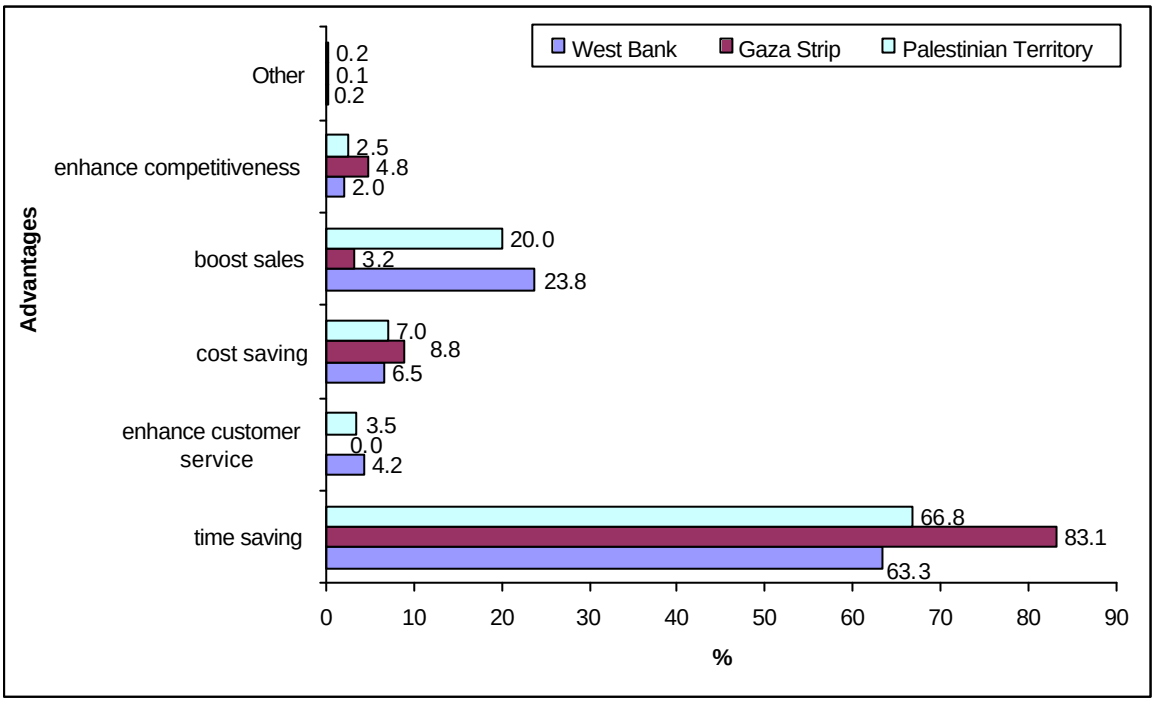
Table 5.8: Percentage Distribution of Enterprises that Used Electronic Transactions by Methods and Region, 2007

Electronic Transaction Method	Region		
	West Bank	Gaza Strip	Palestinian Territory
E-mail	**70.1**	**63.6**	**69.0**
Enterprise Email	41.3	28.6	**39.0**
Web-based E-mail	28.8	35.0	**30.0**
On-line Application	**6.7**	**34.8**	**11.7**
Electronic Shopping Cart	**22.5**	**1.6**	**18.8**
Other	**0.7**	**0.0**	**0.5**
Total	**100**	**100**	**100**

As is shown by Table (5.8), email is the most popular means of making transactions, representing 69.0% of all transactions. Note that enterprise private email is used equally as the web or public email system, like Yahoo mail, Hotmail, or the Gmail. Of course the popularity of web-based mail comes from the fact that they are free-subscription based, easy to use, and used for both personal and business purposes. Private email is normally used by large enterprises that have the capability of owning a web site and a special domain name, or a private email which requires subscription fees, such as Palnet email. Other methodologies such as online forms or electronic shopping carts are marginal when compared to the use of email.

The survey also investigated the predicted advantages of executing transactions through electronic instead of traditional means. Enterprise owners and executives reported on different reasoning, but most agree on the shortening of the transaction time as the major benefit, with 66.8% of all enterprises reporting on that as their major gain see Figure (22).

Figure 22: Advantages of E-commerce by Region, 2007



Other arguments like cost saving, boosting sales, and enhancing customer service are marginal when compared to time saving. Note that benefits are mostly not seen to enhancing customer services and competitiveness of the enterprise, but rather as the enterprise acting as a customer for other companies, especially international companies from where they can buy products and services. The time saving advantage is achieved by the enterprises in buying goods, and not in selling goods and services. This is of course hinted at by the fact that the implementation of customer services, boosting sales, and increasing the competitiveness of the enterprises are marginal benefits expected from the company. This observation emphasizes our former finding that the deficit between selling goods and services and buying them through the Internet as significant for the Palestinian enterprises. We believe that this behavior can be explained by the low penetration of Internet among Palestinian households and enterprises, for reasons of the culture issue, among other reasons. Table (5.9) explains the reasons behind not using the Internet for commercial purposes.

Table 5.9: Percentage Distribution of Enterprises by Reason for Not Using the Internet or Hindered for Electronic Commerce and Region, 2007

Reason for Not Using E-commerce	Region		
	West Bank	Gaza Strip	**Palestinian Territory**
Goods Not Suited to be Sold Via Internet	28.6	16.4	**26.2**
Security Concerns	2.4	5.0	**2.9**
Privacy Concerns	2.6	7.8	**3.6**
Prefer In Person Deals	50.4	51.4	**50.6**
Not Enough Online Customers	1.6	0.6	**1.4**
Cost of Tools Development and Maintenance	1.8	1.3	**1.7**
Insufficient Skilled Personnel	6.4	17.0	**8.6**
Other	6.2	0.5	**5.0**
Total	**100**	**100**	**100**

The responses of the enterprises executives and owners to the question of why not implement E-commerce activities is not related to expenses. Only 1.7% of responses referred to cost as the major hindrance. The chief obstacle for not using Internet for business transactions has to do with culture and traditions of practices. In fact this is the line of reasoning of the majority of respondents, which counted for about 76.8% of all responses. The culture rationale is the first reason; goods are not suited for electronic commerce 26.2%, and the preference of personal or face-to-face communication which counted for 50.4% of all responses. The argument of goods not suitable for electronic commerce indicates lack of knowledge and awareness of how to do these kinds of activities. There is always a one way or another to do business using the web, but the question is how, which requires knowledge and entrepreneurship, and a degree of risk taking from the side of the enterprise. Half of all respondents give the reason of culture more explicitly through their preference of face-to-face interaction. In fact these people have not experienced this kind of transactions, and per se cannot imagine that it can be done.

Parenthetically culture and tradition barriers and resistance to change is not something special for Palestinian businesses but rather something intrinsic in human nature and well known phenomenon for historians and social scientists. Whenever a new technology or wave of technologies invades humankind, everybody feels threatened by these technologies and work to resist it. Intrinsically, people hate to change, and work every possible means to escape it. Change costs them money, effort, and peace of mind, in addition to fear of losing their positions. People changed only when they feel threatened by losing their positions, or left behind, i.e. When the amount of threat equals or becomes larger than resistance, people are forced to change, and this is very well applies to e-commerce issue among Palestinian enterprises. The bottom line is that technology precedes human comprehension and acceptance; it will always take time for these technologies to be absorbed by people and enterprises alike.

Another reason behind the low level of E-commerce among Palestinian enterprises has to do with the fact that the Palestinian market is closed, and globalization is not a big issue for Palestinian businesses. Most are not really concerned about international competition, and do not make the needed efforts to have a foot in the international market.

Few owners and executives are concerned about privacy and security, which are strongly linked with each others. They do not trust the Internet to be used for business transactions. In

total this argument is used by 6.5% of respondents. But the question still to be answered is whether this notion came out of experience, education, media or any other means. Have these people actually tried the Internet and found it not secure enough for their business transactions.

The line of reasoning which is more striking than others is the response of enterprise owners and executives to the question of the existence of a customer base. Only 1.4% of reactions state that the cause for not committing electronic commerce has to do with the non existence of enough customers. We think that there is some confusion here, and the question should have been asked about the existence of *on-line* or *e-commerce* customers, and not just customers. The lack of online customers (especially local ones) is a major issue for not executing E-commerce. But the other open question is who creates high penetration of electronic commerce sites creates a base of electronic customers, or the existence of the customer base, i.e., people willing and/or capable of executing electronic transactions, encourages enterprises to launch services and trade electronically. This issue needs more investigation.

Enterprises are also not much concerned about the cost of launching these services, and it seems that they are set to spend extra cash on such services. Only 1.7% are concerned about cost, and the majority see it as non critical hindrance. We think that their response to this issue is similar to their response to other critical issues such as the existence of customer base and the existence of skilled personnel, which need more investigation. Note that the questionnaires were filled by owners and executives who do not use electronic commerce, and it looks as if these people are looking at the subject superficially, without thinking deeply of how much it cost, or how it is built, and marketed. There is also the issue of electronic payment using local or international credit cards which has to be activated to make this service possible.

In order to further investigate the e-commerce issue, enterprises with websites were asked about the content of their sites, to foresee how these contents have served their e-commerce activities. Table (5.10) summarizes the reactions of businesses executives and owners in regards to the content of their web site.

Table 5.10: Percentage Distribution of Enterprises that Have Website by Content, 2007

Website Content	Have Website		Total
	Have	Does Not Have	
List of Prices/Catalogue	46.6	53.4	**100**
Privacy Policy	34.7	65.3	**100**
Receiving Orders	40.7	59.3	**100**
Online Payment Service	18.6	81.4	**100**
Security Policy	30.9	69.1	**100**

It seems that enterprises who own a website are very keen to present their goods and price list on their website, and this represent 46.6% of all enterprises, in addition to their privacy and security policies about 34.7% and 30.9% respectively. Some web-sites are also equipped with tools to receive and process electronic orders. In total there are 40.7% of enterprises with websites having these online applications ready to be used by customers, see Table (5.10).

Looking closely into these schemes and tools as implemented by enterprises, shows that from the technical point of view it looks as through these companies are well prepared for electronic commerce transactions. They have their goods and services presented on the web, they have secure mechanisms for electronic payment, and they guarantee privacy of customers, in addition to their ability to receive orders over the Internet, and process electronic payments.

Overall the conclusion is that enterprises are to a certain extent prepared for E-commerce, but the question is how big is the size of these transactions.

Remember these findings are for enterprises who owns websites and this represents only 2.6% of all enterprises. For instance we are talking about 1.3% of all enterprises who offer price list and catalogues in their website. For the online payment system, there are about 0.5% of all enterprises who install online payment mechanisms over their websites, which is extremely insignificant when scaled to the total number of enterprises.

5.11 The Setting up of an ICT Department

ICT tools and solutions in principle can be divided into two categories; simple and straightforward solutions such as using telephone and mobile, using PCs for word processing and browsing the web and sending and responding to email, which are common practices for any one with basic ICT literacy. The other category includes tools and activities that requires professionalism and a high degree of technicality. This category includes the use of specialized software for accounting, human resources, financial analysis and reporting, web development and maintenance, and so forth. These activities require the hiring of specialized personnel, with a high level of ICT competences, such as computer science or engineering university graduate, IT graduate, or somebody with professional IT certification. The ability of an enterprise to fully utilize advanced ICT applications and services requires the hiring of an IT specialist, or for larger enterprises the setting up of an IT unit or computer system group, as some people call it. The IT unit takes responsibility to manage and operate the enterprise computer network, specialized software applications, databases, and the development and maintainace of the enterprise website, or web portal. The web portal is more advanced than the web site, and requires a higher level of competency, especially since it offers interactive services, so that the web portal visitors can interact with the site, by sending requests or comments, filling up forms, and receive immediate responses without the intervention of humans. This kind of web service is developed using new web development technologies like Java Server Pages (JSP), Personal Home Page (PhP), or Active Server Page (ASP) net tools, and are always linked with a database.

In most cases embarking on these advanced services involve the setting up of a special IT unit, since outsourcing such services is very difficult as it involves continuous follow up with the enterprise interventions, and precise knowledge of the enterprise products and services. For these reasons, the survey included a series of questions to research the issue of setting up a specialized unit among enterprises.

Figure 23: Percentage of Enterprises by Availability of IT Unit and Employment Size, 2007

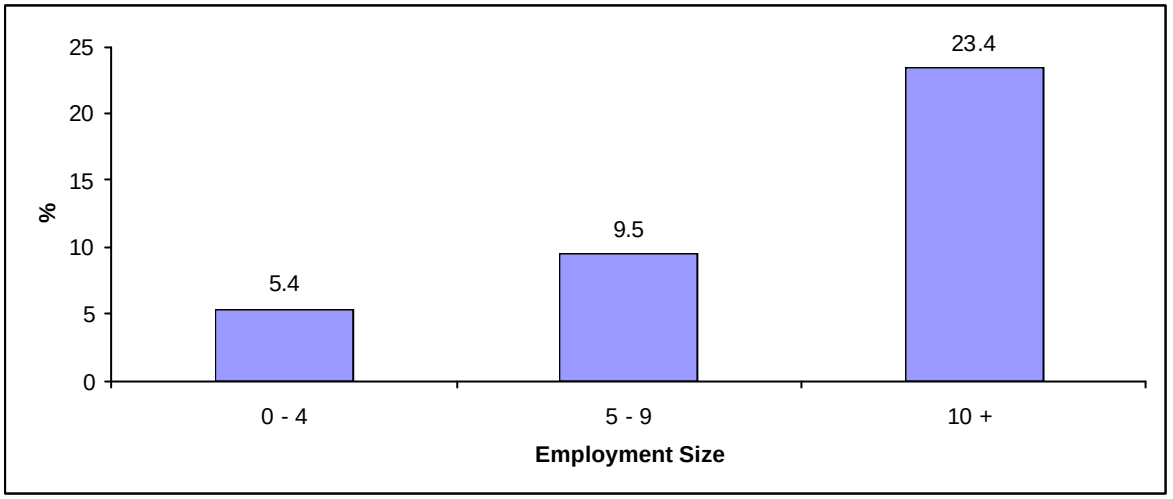
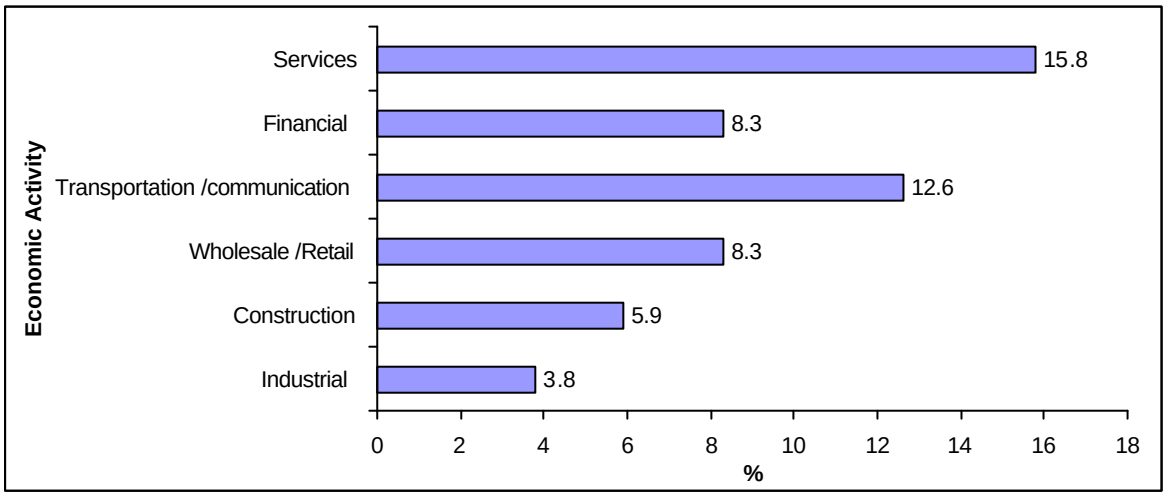


Figure 24: Percentage of Enterprises by Availability of IT Unit and Economic Activity, 2007



Figures (23) and (24) detail the existence of IT unit by enterprises of different sizes and according to different economic activities.

As is shown by the charts above, the availability of IT unit linked with some features of enterprise. On one hand, it is highly correlated to the enterprise size as expressed by number of employment. On the other hand, it relies on the economic activity of the enterprise.

The larger the enterprise size the higher the chance to set up a separate IT unit, and the penetration of this facility is noticeably higher in both the service and transport and telecommunication sectors. The economic activities of enterprises that encompass soft or immaterial services, especially web-based services will entail higher prospects for setting up an IT unit and this is confirmed by the findings of the survey.

Some other enterprises rely on specialized firms, to manage and operate their high profile ICT services. The distribution of these enterprises who is dealing with ICT companies is shown in Table (5.11).

Table 5.11: Percentage of Enterprises by Dealing with ICT Companies and Selected Variables, 2007

Selected Variable	Dealing with ICT Companies
Region	
West Bank	66.1
Gaza Strip	61.2
Palestinian Territory	**65.1**
Employment Size	
0 – 4	56.7
5 – 9	71.8
10 +	89.3
Economic Activity	
Industrial	69.2
Construction	91.1
Wholesale and Retail	51.7
Transportation and communication	75.7
Financial Intermediation	73.6
Services	82.1

Note that the majority of enterprises (about two thirds) are in a state of dealing with ICT companies, and it would be good to investigate what kind of services they are looking for.

Table (5.12) reveals that the culture of open source is still not a common practice to the Palestinian enterprises, as most of them are relying on Microsoft for their operating systems; the Windows family. A small percentage of enterprises experiment with open source operating system, as indicated by their possession of both the Microsoft Windows and an open source, such as Linux, operating system.

Table 5.12: Percentage Distribution of Enterprises by Operating System and Selected Variables, 2007

Selected Variable	Operating System			Total
	Windows	Open Source	Both	
Region				
West Bank	93.9	0.1	6.0	**100**
Gaza Strip	99.7	-	0.3	**100**
Palestinian Territory	**95.1**	**0.1**	**4.8**	**100**
Employment size				
0 – 4	98.4	-	1.6	**100**
5 – 9	91.1	-	8.9	**100**
10+	84.3	0.5	15.2	**100**
Economic Activity				
Industrial	96.3	0.2	3.5	**100**
Construction	98.3	-	1.7	**100**
Wholesale and Retail	94.6	-	5.4	**100**
Transportation and communication	95.3	-	4.7	**100**
Financial Intermediation	99.0	-	1.0	**100**
Services	90.0	0.8	9.2	**100**

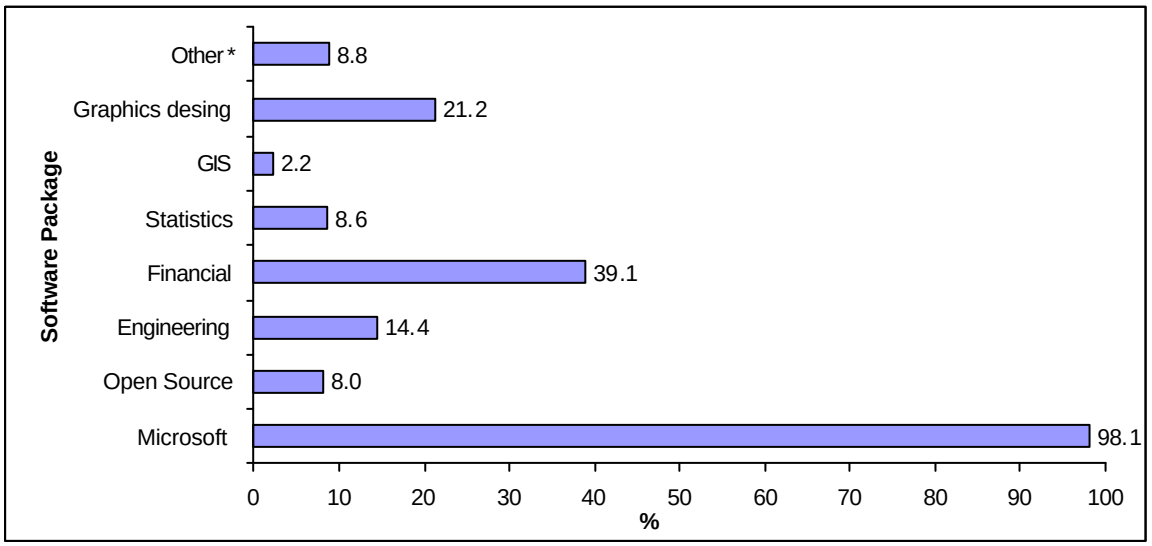
Open source software is a term which is used to describe software packages that have their source or core code open to the public. Software application passes through stages in their for development. They are written first using a certain programming language such as Basic, Java or C++, then it is compiled by a compiler which changes it into assembly language that is used by the computer microprocessor for execution. The first stage of the software is called the source code stage. We describe the software code as open when one is able to modify or upgrade that software without the intervention of the original producer. Open source software is also a term that is normally coined for freeware software, which is distributed for free without the need to buy a license from the producer. Open software, or open source software are supported and encouraged by some international and local communities who are struggling against monopolies and exclusivities, especially for exceptionally common products like computer software.

One explanation for the high penetration of Microsoft products versus open source is linked to the high software piracy in Palestinian society, including commercial enterprises. Most software packages traded in Palestine are not licensed. This situation does not give open source any advantage over commercial software especially the Microsoft operating system, windows or Microsoft office. An additional line of reasoning for the low penetration of open software has to do with the low maturity of these products when compared to Microsoft products, and low dissemination of software applications which are compatible with the open source operating systems.

What we have stated is in fact confirmed by the survey results. 95.0% of all enterprises are using Microsoft Widows, compared to 5.0% who are experimenting with the open source operating system. Observe that large companies, which supposed to have better financial resources, are using open source more than small ones. This can explained by the fact that bigger enterprises have a better knowledge of ICT than small ones including knowledge on open source, and their concern of not using unlicensed software products.

The dissemination of specialized software packages among enterprises reveals again the dominance of Microsoft products over other applications, as shown by Figure (25).

Figure 25: Percentage of Enterprises Using Software Packages by Type of Applications, 2007



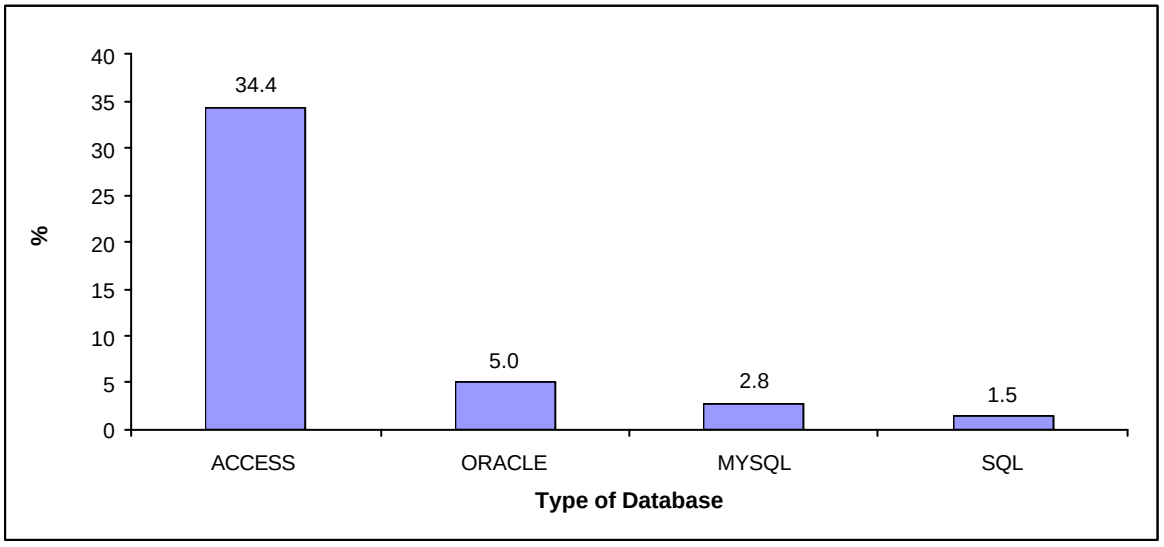
*Other includes: Banking systems, human resources, and similar specialized applications

The diagram above confirms the dominance of Microsoft products over any other product or software application, as is the case with the operating system. Once more, for the same line of reasoning, Microsoft products including the famous Microsoft Office, which includes, the word processor, the presentation package of Power Point, the analytical package of Excel sheets, the database framework of Access, the Outlook, and some new packages like Office Publisher, and the Office Note, are used by all enterprises regardless of their sizes and activities. These applications are very common for all enterprises and in most cases installed for free, along with being highly compatible with Microsoft operating system Windows. Note that open source applications are at a penetration level of 8.0% which is still very low, but indicates certain familiarity and awareness of the open sources culture among Palestinian enterprises.

Financial applications, which are less typical than the Office package and in most cases are locally developed, have a relatively high level of penetration. The most widespread financial package is the one used for accounting and auditing. These applications are needed by most companies, especially the ones that pay taxes and have financials that are hard to be followed manually. Another cause for the high penetration of financial applications has to do with the need to make exact computation, and decrease the likelihood of committing mistakes.

Other applications are less common over a wide spectrum of enterprises, and are more linked to their line of business, such as engineering packages, graphics design, statistics, and Geographical Information Systems (GIS). Specialized software packages are more expensive and entail more resources to be operated and maintained than other common software packages. Specialized software packages are also to a large extent simple to be controlled and traced in regards to their licensing, which make their dissemination level less than other general purpose applications such as the Office package. The same trend is also recorded for database development environment where the Microsoft database development platform Access has recorded the highest usage among all database applications. ACCESS was selected by 34.4% of all enterprises, followed by Oracle 5.0%, MySQL 2.8%, and SQL is selected by 1.5% as shown in Figure (26).

Figure 26: Percentage of Enterprises Using Databases by Type, 2007



5.12 Software Security Measures

Security measures are actions that are taken by enterprises to maintain security and safety of their information and transactions. The objective of computer security can include protection

of information from theft or corruption, or the preservation of availability, as defined by the security policy. Computer and information security ranges from limiting access to people who will not compromise security, to implementing security through the operating system, by enforcing certain security policies, such as authentication, to network policy which includes both software and hardware, to the most sophisticated security measures such as encryption and the use of firewalls.

The wide spread of the Internet, and the connections of all PCs in enterprises with the rest of the world through the World Wide Web imposes new threats; such as computer viruses, bugs, Trojans, and email spams. These threats increase the needs for more robust procedures in information security especially for enterprises that exchange sensitive information and services, such as banks and credit card companies.

According to the survey results, it seems that Palestinian enterprises are well aware of security threats imposed by the Internet, as the majority of them have responded positively to these threats, as detailed by Table (5.13).

Table 5.13: Percentage Distribution of Enterprises by Having Security Measures and Selected Variables, 2007

Selected Variables	Security Measure		Total
	With	Without	
Region			
West Bank	82.9	17.1	**100**
Gaza Strip	83.7	16.3	**100**
Palestinian Territory	**83.1**	**16.9**	**100**
Employment Size			
0 – 4	85.2	14.8	**100**
5 – 9	66.1	33.9	**100**
10+	91.3	8.7	**100**
Economic Activity			
Industrial	88.9	11.1	**100**
Construction	90.7	9.3	**100**
Wholesale and Retail	78.7	21.3	**100**
Transportation and Communication	84.1	15.9	**100**
Financial Intermediation	81.9	18.1	**100**
Services	97.4	2.6	**100**

As revealed by Table (5.13) most enterprises have enforced a level of security measures in their information systems. However, what might differ is the type and level of complexity of these measures, which were not included in the study.

The survey investigated one group of security threats that is very common nowadays, that is computer viruses. About 50.0% of enterprises underwent at least one computer virus attack which originated from the Internet. When these attacks are measured according to the enterprise size it was noticed that the larger the enterprise the lower percentage of these attacks, which signals that larger companies have more effective measures against computer viruses, and that is because these enterprises are firmer in implementing antivirus measures, and have higher capacity to do so than smaller enterprises. Figure (27) presents some statistics in relation to computer viruses attacks.

Figure 27: Percentage of Enterprises That Suffered from Computer Viruses by Employment Size, 2007

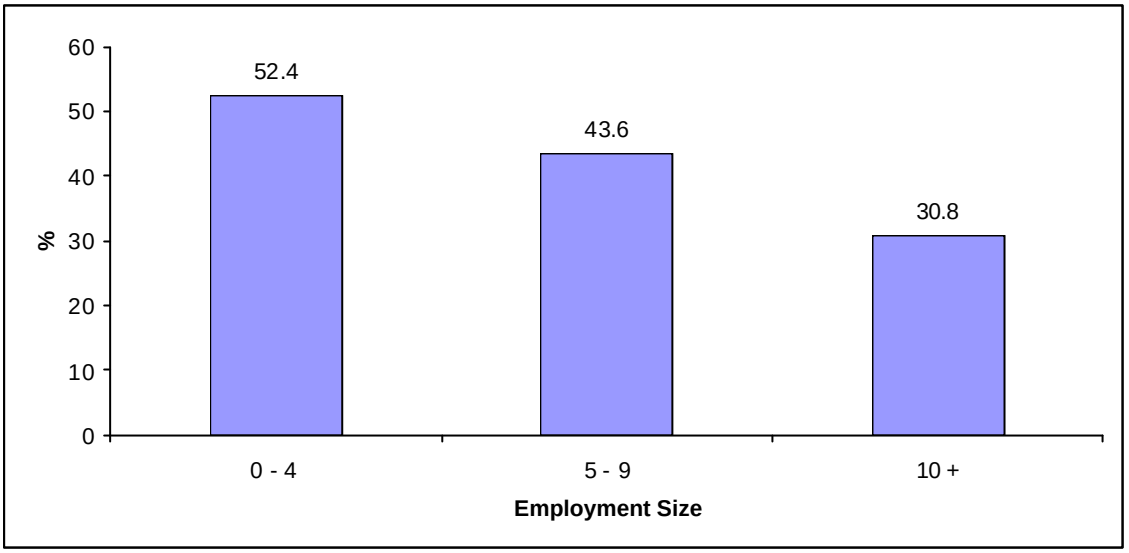
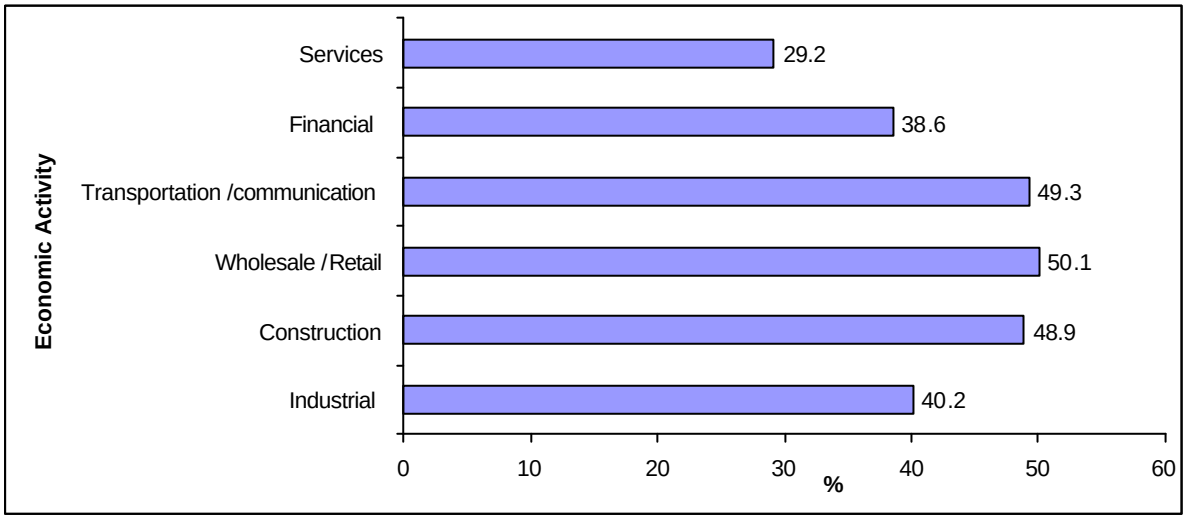


Figure (28) describes enterprises that suffered from computer viruses in regards to their economic activities, and shows that service companies and financial intermediation enterprises have suffered the least.

Figure 28: Percentage of Enterprises Suffered from Virus Attacks by Economic Activity, 2007



The diagram above can be interpreted by noting that the financial and the service sector have soft products and services more than other sectors, which make them sharper and keener to protect their electronic services, and allocate more resources than other sectors to prevent these attacks.

5.13 Research and Development and Future Vision in ICT

For Information and communications technologies to be effective in improving management, boosting profitability, competitiveness, and surviving in the national and global economy, enterprises have to exert extra efforts in selecting the right ICT applications, enhance the existing ones, develop others and keep track with the latest advances in that field. That basically requires the setting up of a specialized unit to perform research and

development in relation to ICT for the benefit of the enterprise. The ICT specialized unit can take responsibility of these activities, as it is the department which knows best the present and future needs of the enterprise.

The survey researched this aspect by asking enterprises about engagements in Research and Development (R&D) activities regarding to their use of ICT applications and services. The enterprises reactions to this issue have showed minor interest in the subject matter where about 10.0% of enterprises are involved in activities related to research and development in ICT. The Table (5.14) details the percentage of enterprises involved in such activities as recorded by the survey.

Table 5.14: Percentage Distribution of Enterprises by Involvement in Some Research and Development Activities and Selected Variables, 2007

Selected Variables	Involvement in R&D Related to ICT		Total
	With Some R&D Activity	Without R&D Activity	
Region			
West Bank	9.6	90.4	**100**
Gaza Strip	7.7	92.3	**100**
Palestinian Territory	**9.2**	**90.8**	**100**
Employment Size			
0 – 4	7.7	92.3	**100**
5 – 9	6.3	93.7	**100**
10+	16.7	83.3	**100**
Economic Activity			
Industrial	5.0	95.0	**100**
Construction	7.2	92.8	**100**
Wholesale and Retail	13.2	86.8	**100**
Transportation and Communication	6.1	93.9	**100**
Financial Intermediation	7.3	92.7	**100**
Services	11.9	88.1	**100**

The survey has revealed that 9.2% of all enterprises have some R&D activities in regards to ICT applications, and the amount of activities increases with the enterprise size.

One of the issues investigated in the study was the future outlook and vision in regard to the use of ICT. This section was designed to see whether enterprises' owners and executives are thinking about increasing the level of ICT penetration and expenditure in their businesses. What was investigated were issues like, do you think of improving the level of ICT penetration in your enterprise, do you plan to include ICT in your budgeting plan for the next year. Another question was about the kind of service the enterprise wished to introduce to the enterprise. The collected responses were averaged and summarized in Table (5.14).

Table 5.15: Percentage Distribution of Enterprises by Future Attitudes Towards ICT Development and Selected Variables, 2007

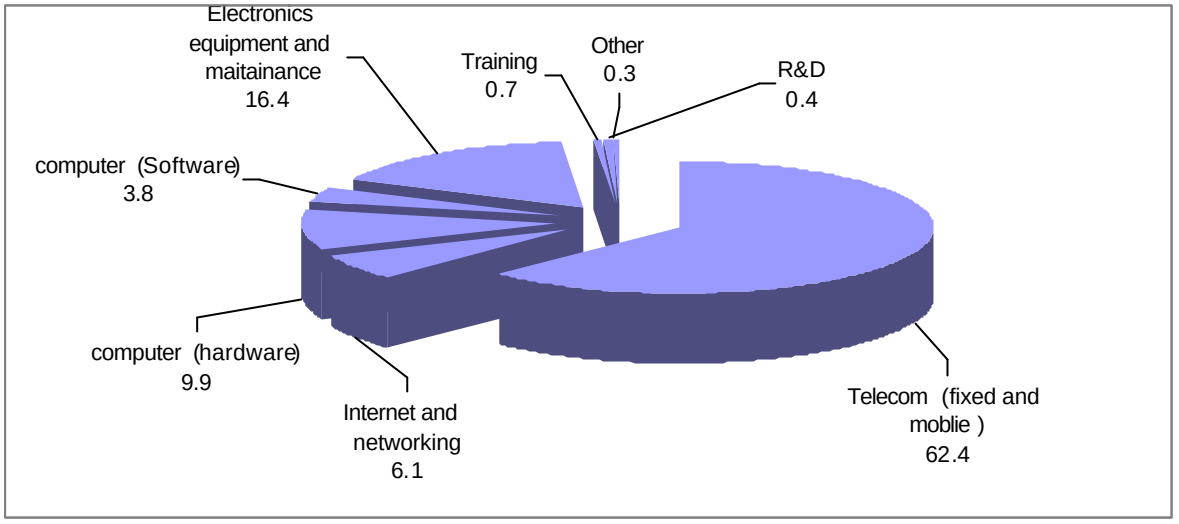
Selected Variables	Future Attitude for Technology Development		Total
	Yes	No	
Region			
West Bank		49.3	**100**
Gaza Strip		59.6	**100**
Palestinian Territory		**52.3**	**100**
Employment Size			
0 – 4		55.2	**100**
5 – 9		38.4	**100**
10+		15.8	**100**
Economic Activity			
Industrial	46.5	53.5	**100**
Construction		41.7	**100**
Wholesale and Retail		56.8	**100**
Transportation and Communication		41.7	**100**
Financial Intermediation		40.5	**100**
Services		25.8	**100**

The future vision of ICT varies among Palestinian enterprises according to their size and economic activities. Large enterprises have amore positive view than small ones, and enterprises with soft services have more positive view than others. In general about half of Palestinian enterprises have plans to increase their future expenditure and usage of ICTs. In relation to economic activities, services and financial intermediation, enterprises plan to have extra ICT applications in their future operations and services. This is basically linked to how enterprises owners and executives see ICT's role in adding values to their business operation and future plans.

5.14 Enterprises Expenditure on ICT

To have a clearer picture of the spending areas as reported by enterprises, ICT services and technologies were divided into four categories; Telecommunications including both fixed and mobile, computer software and hardware, electronic hardware, training and capacity building and finally research and development. Figure (29) shows the percentage spending on each of these areas.

Figure 29: Percentage Distribution of Annual Expenditure on Various ICT Applications, 2007



It is quite clear that about two third 62.4% of enterprises spending in ICT is for telephone bills both mobile and fixed including fax services. 32.1% of it is paid for fixed telephone and 30.3% for mobile. The next spending percentage is that of electronic equipment other than ICT, such as TV and satellite sets, refrigerators, conditioning systems, and so forth, together with maintenance services, it accounts for 16.4% of the total expenditure. Computing services both software and hardware accounting for 13.6% of all spending, with computer hardware account for 9.9% three times higher than computer software which mounts to 3.8%. Spending on Internet and networking services is at 6.1% of total expenditure. The lowest spending is recorded for capacity building research and development, at 0.7% and 0.4% respectively. The distribution of spending among different services can be interpreted taking into consideration the distribution of enterprises with regards to size and activities.

Table 5.16: Percentage Distribution of Annual Expenditures on ICT by Employment Size, 2007

Expenditure	Employment Size			Total
	0 - 4	5 - 9	10+	
Less than 599 USD	58.2			
600 – 1199 USD				
1200 – 6000 USD				
6001 – 11199 USD				
12000+ USD				
Total				

Table (5.16) clarifies the expenditure tendency in relation to enterprises' size. It is quite clear that the bigger the enterprise, the higher its spending on ICT. Micro enterprises with employment size less than 5, which represent the majority of enterprises, spend more on phone calls than on computing activities, and this explains why the largest percentage of spending goes to telecommunications services. ICT possession index that is calculated and shown in Table (5.1), indicates that this index is highly correlated with enterprise size. Larger enterprises are more likely to possess more computing resources with a higher level of

sophistication, and this is indicated by the lower percentage of expenditure on these technologies. Note also that computer hardware is three times higher in expenditure than computer software, since the majority of software products are unlicensed, and that is basically the reason for the low level of spending on computer software.

Table 5.17: Annual and Monthly Average Expenditure on Some ICT Services and Applications, 2007

ICT Service	Percentage of Enterprise Using the ICT Service	Number of Enterprises with that Service	Expenditure on that Service (thousand USD)	Annual spending Per enterprise (USD)	Monthly spending Per enterprise (USD)
Computing	21.3	19,997	17,297.9	865	72
Internet	12.7	11,923	10,768.4	903	75
Fixed phone	42.9	40,277	56,186.1	1,395	116
Mobile phone	63.5	59,617	53,112.4	890	74

Table (5.17) was calculated by considering the number of enterprises employing that service, and dividing the total expenditure by the total number of enterprises which gives the average spending per enterprise. The results show that spending is mostly of the same order of magnitude for the different services which is around 100 USD per month per enterprise. The Internet spending is relatively high, since a considerable percentage of enterprise who own a PC is connected to the Internet. There are about 12.7% of all enterprises do have an Internet connection, and the majority of them is having a broadband connection, either through ADSL, leased line or wireless connection. That means in total there are about 9,388 enterprises connected to the Internet. If we divide the amount of spending by the total number of enterprises connected to the Internet, this gives the average annual spending per enterprise on Internet services which mounts to about 903 USD/year. This gives a monthly spending of 75.25 USD, or about 316 Shekel, which is quite logic considering the Internet connection pricing at local market. Using the same logic, we can calculate the average annual and monthly spending per enterprise on landline phone, mobiles, computers and the Internet, taking into account the penetration level of these services and the total number of enterprises.

Chapter Six

Conclusions and Recommendations

6.1 Business Operations in Nutshell

This subsection is intended to assist in understanding how ICT is perceived by business owners and executives a way to enhance their business operations. It also helps with understanding why sometimes business people retain from adopting ICT solutions, and why these technologies fail to achieve their preset goals as business development enablers.

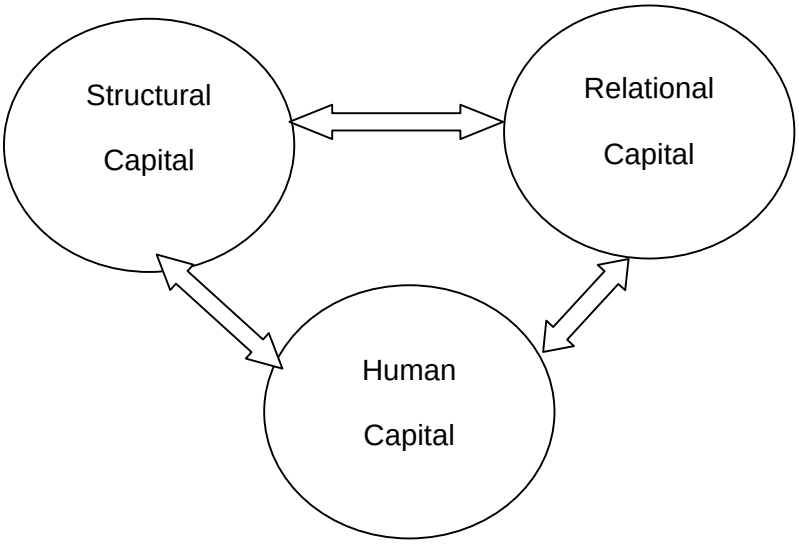
Business operations consist of activities involved in running an enterprise for the purpose of generating values, through effective use of resources owned by an enterprise. Assets can be either tangible or intangible. Tangible assets are, for example, buildings, machinery, or land. An example of a value derived from a physical asset such as a building is rent. Intangible assets are, for example, trade secrets, copyrights, patents, trademarks, and goodwill. These are sometimes called legal intangible or intellectual properties. There are also another group of intangible assets called competitive intangibles comprised of knowledge activities or know-how, collaboration activities, leverage activities, and structural activities. Competitive intangibles directly impact effectiveness, productivity, expenditure, and creation of opportunities within an enterprise. Moreover, competitive intangibles affect expenses, profits, consumer service and degree of satisfaction, market value, and share price. The last group of intangibles is recently receiving mounting attention from enterprises, especially those who seek a footstep in the global market.

Human resources are the major source of competitive intangibles for enterprises. One of the key approaches for human resources is to generate and strengthen competitive intangibles through ICT. ICT becomes a contemporary tool in creating intangible goods, and adds extra values to tangible or industrial products. It is to be remarked here that the evaluation of ICT solutions is in most cases fail to count and recognize intangible commodities these solutions create and nurture. This might be one reason behind the unenthusiastic attitude some business owners and executives keep in regards to ICTs.

Business operations encompass three basic activities that collectively aim to maximize values generated via business assets. These are the generation of recurring income, increasing the market value of business assets, and guarantying the stability of income and value of the business. The higher the recurring income of an enterprise the more valuable it becomes. Consequently, the more valuable a product becomes the more income it generates. For example, a luxury car can be rented at a higher rate than a low-cost car. The basic value of an asset and its potential to generate income cannot be attained without a means to acquire it. For instance, underground water is valueless unless processes and equipment are developed and employed to extract and distribute it.

The difficulty in adopting, managing and evaluating ICT solutions by enterprises has to do with the fact that ICT is more linked to intangible assets, and the difficulty to see immediate financial returns on investment upon implementing these solutions. ICT investment introduces the notion of uncertainty, change, value creation, and new knowledge which needs to be understood in their unique context, [D. Binnery, et al. 2007]. However, this view is changing in contemporary times as many enterprises are deriving their economic values from intangible assets, through delivering knowledge solutions, or knowledge intensive resources. [Boedker, 2007].

The Tripartite model which is developed to study impact of all intangible assets including ICTs can be used to explain the potential benefits of ICTs to businesses. This model is developed by the European school of intangibles [Edvinsson, 1997, Roos, 1998, Sveiby 1997]. The tripartite model distinguishes three categories of intangible circles that ICT can inspire; relational, structural and human. Relational capital includes all relational linkages with external stakeholders such as suppliers, customers, community, government, and others. Structural capital refers to the management structures and processes within the enterprise, to be productive, effective, competitive, and innovative. Human capital refers to competencies, attitudes, abilities, and qualities of the enterprise employees, [Binnery D. 2007]. See diagram below.



Effective use of ICT demands a dramatic change in the way the business is operated and managed. In business operations such as accounting and financial management, advertising and marketing, management of inventories, purchase and sales and similar operations, that make up the core business of any enterprise, these operations are used to be managed and conducted conventionally. It is very hard for business owners to change their handling of these operations through invoking ICTs. That will cost them efforts, money and time, for something that is not explicitly seen to bring values to their businesses. These thoughts and beliefs explain the high percentage of enterprises that responded by saying *no need* when they were asked about the main reason behind not using ICT-based solutions. 82.1% of all enterprises believe that there is no need for their enterprises for ICT solutions, in addition to 3.2% that responded that they are not interested in ICT for their businesses. When taking a decision for adopting ICTs, owners and executives have first to examine their resources and competencies against cost and effective utilization of these solutions. If resources are accessible, the second issue that is assessed is the balance between expenses and gains of these technologies to their business operations. This is genuinely a very delicate question to judge by owners and executives. In most cases it is very hard to see explicit benefits from ICT for the core business operations, especially if managers do not feel these needs at present. Business owners and executives in most cases do not invest in something that is not certain, or feasible, on the prospect to bring benefits, add value or boost profits.

There is a growing consensus among the development communities of the importance of using ICT for developing and sustaining vibrant businesses, but they lack visions, action plans, and competencies to accomplish that. To help enterprises achieve these goals there is need on the side of governments to place more effort in increasing the base of ICT customers,

through improving connectivity, reducing prices and improving service quality, especially in promoting broadband Internet access. A good ICT service enhance interaction among enterprises, between enterprises and their customers, and it opens up new business opportunities, especially for enterprises far from urban centers.

6.2 Assessing the ICT Usage by Palestinian Enterprises

This section of the report is meant to draw a general picture of the ICT penetration and usage among Palestinian enterprises, and tries to explain the adoption patterns and behaviors in relation to ICT solutions in businesses.

First of all it is to be recognized that ICT is not a single and simple tool that is purchased and plugged into an office and it follows to turn into an effective tool with full leverage, as is the case with any electronic appliances. ICT entails chain of tools and systems in software and hardware, with abroad level of sophistication which starts with trivial tools like phones to complex interconnected information systems. The level of ICTs in use by any enterprise goes in line with the level of complexity of its business operations. It cannot be expected that a small shop operated by the owner and some of his family members would incorporate a sophisticated networked information system that cost several hundred thousands of dollars. We believe that one reason behind the low penetration of ICT solutions, and the low level of their sophistication, are linked to the fact that most Palestinian enterprises are very small and informal businesses run by families. About 90.0% of all enterprises are with 4 or less employees, and 7.0% are between 5 and 9 employees. A large portion of enterprises' owners are survivalists, which means that they opened their enterprises, either because they inherited it from the family, or they were forced to do so, as they could not find anything else to do, especially securing a salary paid job.

As has been stated before, ICT adoption ranges from simple to very sophisticated and interconnected systems. This paragraph is intended to clarify the categorization of these levels, and the rationale behind their adoption as conceived by enterprises.

Level One: Simple Communication

This is the simplest usage scenario. It does not require any special skills, is very cheap and fundamental for any enterprise regardless of its size and business. The main ICT tools for this level are the mobile and the landline phones. These tools are multipurpose and can be used to make private calls, and do not require the set up of an office. Enterprises, who adopt these technologies alone, need not track financials, or prepare budgets. In most cases, there is no distinction between business and private financial, and they do not pay taxes. Enterprises in this category do not need to use a PC, or connect to the Internet for their business operations; consequently, there is no need for an IT specialist. The majority of Palestinian enterprises belong to this category, as most of them are micro enterprises with employment size less than 5. This can explain the high percentage of enterprises with a phone line, either mobile or landline, or both. 92.7% of all enterprises do have at least on phone line, i.e. either landline or mobile, and 54.4% have both landline and mobile phone.

Level Two: Executive Support System

In this grouping, enterprises needs an office, and keeps low profile business operations. ICT solutions are needed to run the enterprise efficiently, at the same time keeping a low level of expenses for these tools. ICT is meant as executive support system which is designed to help senior management make business decisions. It is used to collect, analyze and summarize the key internal and external information used in the business.

In this category, computers are needed for typical computational operations, like word processing, electronic spread sheets, and PowerPoint presentations, sending and receiving emails, and browsing the web, and in some cases using professional accounting software. In this category, enterprises are more formal than the first one, as they keep financial records, distinguish between business and private financial, and pay taxes. In most cases there is no need for an IT specialist, as ICT operations are executed by owners and other employees. Accounting and budgeting operations are outsourced to a specialized firm or accounting office. Stand alone, i.e. not networked PCs are used, as the amount of information exchanged internally can be managed without a network. The amount of ICTs that is embedded in enterprise is determined by the capacity of the enterprise to pay for and to run the ICTs without the need to hire an ICT specialist. This explains the high demand for employees with basic ICT skills by enterprises, especially small ones.

The basic criteria for this group are the ownership of at least one PC preferably with an Internet connection, and the use of general purpose software solutions like Office packages. The percentage among Palestinian enterprises of this level ranges between 15.0% and 20.0%, as indicated by the percentage of enterprises that own and use PC (19.2%) and have an Internet connection (13.5%), and use software packages (16.0%).

Level Three: Management Information System

In this category, enterprises have more sophisticated business operations, more staff members and their operations are difficult to be managed manually. Enterprises belonging to this group possess many PCs that are connected in a network, employ specialized software packages, and have a web site used as a platform for marketing their products and services. ICTs in this case are called management information system (MIS) which is mainly concerned with internal sources of information and solutions. MIS usually takes data from the transaction processing systems and summarizes it into a series of management reports. Generated reports are used by middle management and operational supervisors, in addition to top management. ICTs that are specifically designed to assist managers take right decisions in cases where there is ambiguity in relation to the outcomes. In addition to accounting software, they also have human resources packages and payrolls, electronic archiving system, which is used to manage and coordinate all resources, information, and functions of a business from shared data stores, or centralized database management system. At this level ICT operations and management need a dedicated ICT professional with a university degree or technical certification.

The percentage of Palestinian enterprises that can be categorized as level three is designated by the existence of at least on ICT specialist 17.6%, see Figure (5.17), the ownership of LAN 5.9%, see Figure (5.15). Based on the numbers given above, we think that the percentage of Palestinian enterprises in this category is between 5.0% and 10.0%.

Level Four: Fully Fledged Information System or Knowledge Management System (KMS)

This system covers all core functions of an enterprise, regardless of the organization's business or charter. These are typically used in a business where employees create new knowledge and expertise which can then be shared by other people in the organization to create further commercial opportunities, and products. Good examples include firms of lawyers, accountants and management consultants. KMSs are built around systems which allow efficient categorization and distribution of knowledge. For example, the knowledge itself might be contained in word processing documents, spreadsheets, PowerPoint presentations, Internet pages or the like. To share the knowledge, a KMS would use group collaboration systems such as an intranet. These systems might also include transaction

processing systems; which are designed to process transactions efficiently and accurately. Transaction processing systems include billing systems to send invoices to customers, systems to calculate the weekly and monthly payroll and tax payments, production and purchasing systems to calculate raw material requirements, and stock control systems to process all movements into, within and out of the business. Enterprises use these systems normally employing electronic commerce facilities, and have their business procedures fully automated. This level is normally used by large enterprises with branches.

This category is characterized by their use of the most advanced ICT solutions such as Intranet, WANs (5.9%), complete information systems, the existence of a full fledge ICT unit (1.2%), and the ownership of computer servers (3.1%). A rough estimation of Palestinian enterprises in this category is about 1-3%.

Enterprises use any of these systems that might enhance their level of ICT penetration, and leap to a higher level based on their capacities, the need of their business operation and the satisfaction with the ICT benefits.

6.3: Reflections on ICT usage by Palestinian Enterprises

One reason behind the failure in utilizing ICT among enterprises is the ineffective business processes and operations performed by the enterprise. Most enterprises use traditional business operations, and they do not want to switch to more advanced ones as they are comfortable with the way they are handling their businesses. Business owners and executives hate to change since it is painful, and requires employment of extra resources. This fact has been confirmed by the analysis of section 4.4, which discusses the rational behind not using ICT. The majority of enterprises owners and executives think that the main reason for not using ICTs, is their belief that there is no need for these solutions. This confirms our claim that business people are happy with the way they are running their businesses, and they see no point in adding more overhead to it through ICTs. This does not mean they are not interested, but their businesses do not need it. 82.1% of respondents reported that there is no need for ICT in their enterprise, 5.9% refer to cost, 7.5% refer to the lack of skilled personnel, and 3.2% bluntly reported that they are not interested.

The same thesis was also clear in the response of enterprises to the question of why they are not using E-commerce. The chief obstacle for not using Internet for business transactions has to do with culture and traditions of practices. In fact this is the line of reasoning of the majority of respondents, which accounted for about 76.8% of all responses. The culture rationale is the first reason; either goods were not suited for electronic commerce 26.2%, they had the preference of personal or face to face communication 50.6% of all responses.

The age of the enterprise and the age of its owner play a role in shaping the view in regards to the use of ICT. Startup companies are keener to incorporate up-to-date tools, mainly ICTs, than old ones. ICT help new enterprises disseminate, be effectively operated and competitive to older ones. Furthermore, young owners or entrepreneurs are more open to use ICT than old ones, as they are more educated towards the use of ICTs, and they have stronger desires to learn and gain knowledge.

Additional factors that play a role in adopting ICT-based solutions, are the availability and maturity of these solutions in the local market. ICT production companies, especially in software development, should be able to produce ICT solutions that are professional, user-friendly, modular, and cost effective. One of the most important elements needed for the success of these solutions is their suitability to the needs of the local markets, including the

use of Arabic interface. One of the issues that is of major concern is the technical after-sale service of these products that the ICT producing companies should be able to provide.

Advanced ICT solutions are linked to strategic management and planning in enterprises. These solutions need along term to have an evident effect on business outcomes. In most cases advanced ICT solutions have no immediate impact on business development, and this explains why some businesses are reluctant to expand their ICT usage towards more sophisticated solutions. Enterprises, especially small ones, have limited resources, including financial, human and infrastructure. Enterprises have stronger tendencies towards tools that have immediate and more explicit benefits, compared to those with longer term and implicit benefits. ICTs are known to be of the second kind, that is, the kind with long term and indirect impact. This explains why many enterprises are reluctant to adopt them in their business operations. This also explains the high penetration of mobile and landline phones in comparison with software solutions. About 92.0% of all enterprises have either a landline, or mobile, in comparison with a small percent that have specialized software solutions. Phone calls will save money, speed up transactions, and facilitate interaction with customers and businesses, in addition to limiting their expenses by a substantial degree.

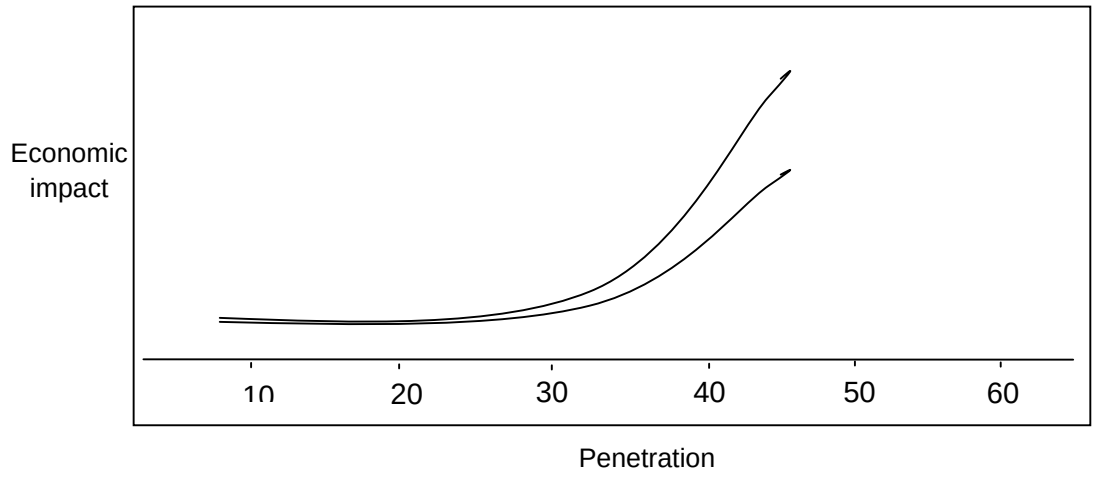
All kinds of ICT investments involve some sort of validation. The type of justification will vary based on the nature of the investment, size and type of business. The following are some investment goals; survival, improving efficiency, improving effectiveness, and competitive advantage. The justification for an ICT investment is normally developed in phases. It starts with a weighting of cost and benefits or values, then weighted against other competing investment proposals, for instance, investment in ICT might be compared with buying a car, or renting a new office, or the like. The ICT cost encompasses the cost of hardware, software, training and capacity building, and the cost of the stuff needed to design, operate and maintain the system. Part of the cost estimation is related to the time needed to absorb the technology, makes it operational, and employs it in the main business operations stream. The cost also includes the costs to the business of implementing the system, changes of processes, and the possible disruption to service.

The benefits and value element of the investment equation comprises measurable and qualitative benefits. Quantifiable are the benefits that can be changed into financial terms, and qualitative benefits, sometimes called soft benefits, such as improvement in customer services, speed of decision making, etc. Quantifiable benefits are considered the main benefits of any investment in businesses, so business cases are built solely based on financial rationales. Other kinds of benefits including qualitative are considered secondary. However, sometimes the value that can be derived from intangible benefits could reach to ten times the tangible value of any investment case, [Brynjolfsson, 1997]. Investment and tracking ICT investment is not as easy as one might think, especially in case of sophisticated ICT systems and investments. ICT investment contains a high level of uncertainties and the predicable benefits and estimates are not straightforward. ICT investment by nature is uncertain and considered by many analysts more like R&D projects.

The structure which stems out of the ICT involvement includes many stakeholders: IT, partners, the enterprise, consumers, the society, and all other components, processes, applications, and software and hardware, which comprises the ICT system. When the system becomes operational it becomes part of a bigger system, and it should enhance that bigger system. This means if there is no coherence between the enterprises and the bigger system, then ICT will probably not be fully utilized.

The other basic question that is also to be dealt with has to do with learning and development opportunities opened up by ICT, does ICT investment assist in the development of enterprise organizational and employee?. Efficiencies through enhancing the learning prospects for them? Does it open up opportunities for knowledge flow between the organization and external parties? That basically depend on the existence of the stimulating and rich online material and the incentives offered by the enterprises to their employees in response to improving their knowledge and competencies.

One barrier behind the low penetration of advanced ICT technologies and solutions, especially IP-based solutions, is the low penetration level or access to these technologies among enterprises themselves which affects the business to business transactions. The household or customer to business transactions is also affected when the household penetration level to ICT is low. Low Internet penetration prevents enterprises from understanding the benefits of ICT, at the same time not understanding the benefits of ICTs does not encourage enterprises from adopting IP-based solutions in their operations. The best possible exit strategy of this loop is through government initiatives and policies to push prices down and boost penetration order to help the country cross a threshold penetration after which people start to understand the benefits of ICT.



The economic impact of ICT is strongly correlated to the penetration level. Furthermore, it has been noticed that this impact is also subject to a critical mass phenomenon. According to a study performed by the Center for Economic Policy Research, in London a minimum penetration level of 40.0% is required for the economic impact to be pronounced. It can also be noticed that there is a causality effect between the penetration level and the economic impact. That means higher penetration of ICT causes economic prosperity, and at the same time economic prosperities and higher GDP work to boost ICT penetration. ICT also exhibit an interesting effect, the network externality effect which indicates that the more users on the network the more value the network has, and this is very much applicable to ICT.

In relation to the Palestinian case, the lower diffusion of ICTs work against more sensible impact by enterprises, since, the ICT diffusion level (telephone, mobile, and the Internet), is still below the critical mass, especially in Internet connection and broadband Internet, still below 20.0% and less than 10.0% in broadband.

Adoption of ICTs alone will not promote growth and development if it is not combined with training, capacity building, organizational and operational changes within the enterprise.

Many studies have found that organizational changes are essential to reap the potential benefits of ICTs. Are Palestinian enterprises aware of the need for these changes and ready for them? This issue in particular was not covered by the survey but it can be inferred from their responses to the question for reasons behind not implementing ICT. More than 80.0% responded with No Need, from which we can conclude that they are satisfied with the way they do their business and they are not ready, or want to change. The same rational is used for not connecting to the Internet, where also more than 80.0% claimed that the main reason for not being connected to the Internet is No Need argument.

Another argument which plays a role in boosting ICT diffusion is the maturity and appreciation of enterprises and people alike to the intangible goods and services. Intangible goods are more common in the service sector than any other sector, and this explains why ICT is more common in service than other sectors. Intangible goods are products, identifiable non-monetary assets that cannot be seen, touched or physically measured. Things like domain names, computer programs, online applications, e-books, web-space, logos, phone rings, e-learning are some examples. Even music and videos which can be downloaded from the web are considered intangible. Intangible assets are well appreciated in developed countries, and they are protected by intellectual property laws, while they receive less attention and appreciation in developing including Palestinian societies. People in developing societies pay less attention to subscribe to a web-based service, which provides, for instance, content, and pay less for these services than people do in developed societies. This is backed by the fact that content provider companies, or intangibles are among the most famous and valued companies in the world, such as Google, and Yahoo. According to Fortune magazine Google is the most famous brand in the last two years, 2007, 2008, and it will still be for 2009. People and also enterprises in developing countries are not used to pay for intangibles, as they pay for physical goods. I think it is a cultural issue that they cannot imagine paying thousands of dollars for software, for instance, that is stored on a CD which weighs only a few grams. This is why we find a very high software piracy rate among people and enterprises in developing countries. This phenomenon is reflects badly on ICT as an industry, and as an enabler for other industries. ICT, both in its technological side, and in its information or content side, are affected by how people perceive intangible assets and goods. In fact, the appreciation of intangible, intellectual, and knowledge goods and services is so dominant nowadays, that it has created a new kind of economy; the knowledge economy. The knowledge economy has introduced substantial changes in goods, and their classifications, such that it introduces mounting value on intangible goods and assets. Knowledge economy mainly involves three parts: the development of contents, the dissemination of content, and information processing. In fact and generally speaking, intangibles are crucial to give tangibles higher values. Moreover, development is more linked to activities that are associated to intangibles; like research activities, design, management, authoring and writing manuscripts, and audio and visual production.

One of the main issues that works against full leverage adoption of ICTs by enterprises and by the people alike in developing countries is the low appreciation they have for information, and their abilities to transform it into knowledge and actions. Information and knowledge are not considered by many enterprises to be central assets like money, land, or real estate. The majority of enterprises in the third world, especially small ones, lack the know-how to accumulate and utilize information and transform it into know-how to advance the enterprise situation to be more competitive. They are also not accustomed to such practices in their businesses and their life as well. Some of enterprises owners and executives might be practicing such activities, but in an effortless, and hectic fashion, even sometimes without knowing that they are processing information, or acquiring knowledge that might have a huge

impact on their enterprises. The low appreciation of information and knowledge leads to a low appreciation for the technologies that process them, i.e., ICTs.

In recent years many scholars argued that the digital divide is indeed an information divide and not a technology divide (Kenny 2006). Although this issue has not been directly investigated by the survey, it can be sensed from the survey results. First of all, the low diffusion level of ICTs in general is a key indicator to the hypothesis we are trying to make. This includes the relative low level of telephones (42.9% for fixed line and 63.5% for mobile), PCs (21.3%), and Internet connection (12.7%). The Internet is the most information-rich platform and still nine-tenths of all enterprises are not connected to the Internet, which indicates that about 90.0% of all enterprises are not interested in the enormous amount of information that can be unleashed there. About 80.0% of enterprises owners and executives claim that the NO NEED argument is behind not using ICTs. In a society that appreciates information and knowledge there isn't such a rationale or a situation where there is NO NEED for information. In recent years competitiveness is based on knowledge, and learning and knowledge gaining are the engines which drive businesses and societies towards prosperity and success. Learning, gaining of knowledge, and competency building is the most promising vehicle towards more competitiveness and success, and the Internet is the best channel for achieving that.

6.4 Conclusions

ICTs can be seen as a production sector in itself and as catalyst for different sectors of the economy. This report in meant to discuss the second aspect and assess the impact of ICTs on doing business among local enterprises. ICTs are known to play a role in reducing transaction costs, increasing efficiency, enhancing market access, in internal management, and the development of new products and services.

The main conclusions of the study can be summarized as follow:

- The results from the present survey demonstrate that the impact of ICTs on labor productivity and business efficiency is a function of the enterprise size and the complexity level of its operations. Therefore dividing enterprises into categories facilitates better explanation of the survey results especially in regards to adoption patterns. The lower level of ICT penetration and usage among Palestinian enterprises is a direct consequence of the high percentage of very small, informal enterprises, and family business enterprises.
- Another factor which also affects the level of ICT penetration is the type or nature of products and services offered by enterprises as being tangible or intangible. Intangible products demand more ICT services by enterprises. This also helps explaining the low level of ICT diffusion among Palestinian enterprises belonging to the industrial or manufacturing sector in contrast to enterprises in service and hospitality sector. The adoption level of intangible goods is low in the Palestinian society and that basically one reason that plays a role in lowering the level of ICT adoption by local enterprises.
- Almost all enterprises are intense users of mobile phones. Mobile phones have overtaken landline phones and computers as the mainstream ICT technology in maintaining and running of enterprises, given their prevalence, ease of use and low cost. This indicated the need for the development of applications based on mobile platform. Acquiring a mobile phone is a relatively low cost proposition for most enterprises in comparison with a computer, or implementing specialized software packages in management and production. Mobile is the most accessible ICT by enterprises and people alike, which facilitates interaction between enterprises and customers. Mobile-based applications that are particularly suited for enterprises that are able to, for example, track inventory, provide

cash flow and income statements, need to be developed. Mobiles can be used to replace cash as the preferred transaction form with customers and suppliers, allowing informal micro enterprises to build up transaction histories and hence gain access to financial services. This level of services of course requires cooperation between mobile operators and the banking sector in the local market, and update of regulations to cope with such developments.

- ICT use among local enterprises can be characterized as traditional. Typical tools and applications are most common among enterprises. The point here is that managers are not fully aware of the best possible approaches to invoke ICTs, especially advanced ones in their operations. Most enterprises maintain their traditional methods of operating their businesses and attempt to invoke ICTs in these operations, which in most cases does not yield satisfactory outcomes. Utilizing ICTs requires new ways of thinking, business operations reengineering, capacity building, and continuous update and learning process to turn these tools into effective ones. Stakeholders, including government bodies, business associations, and academic institutions, should seek ways of encouraging innovation, cooperation, customization, and R&D to harness ICT solutions that best fit the local market needs. Businesses especially software development firms are not working at their full leverage to fill in this gap, and many enterprises are relying on customized ICT business solutions that are developed by foreign firms.
- The survey revealed that while mobile phones are highly diffused among enterprises, access to more advanced ICTs in general, and most notably broadband Internet, is still low among most enterprises. 12.7% of all enterprises are using the Internet, and about 70.0% of them or 9.5% of all enterprises are using broadband connection. Broadband is important for business operations, such as marketing, and the use of interactive portals that are capable of providing intensive information services. Access to broadband should be encouraged not only among enterprises but among other institutions and households as well, as higher internet penetration promotes enterprises to adopt internet-based solutions and services. ICTs, such as mobiles, computers and internet connections, can only have a transformative role if they are accessible and affordable – a feature still to be attained by the Palestinian markets as compared to neighboring countries. For enterprises to fulfill their improvement prospective, enabling policies need to involve initiatives to make affordable ICT access central target. Lower ICT costs can be achieved through regulatory interventions that facilitate competition among existing players by issuing licenses for new operators, and updating the telecom law to cope with the evolving technologies.
- There needs to be consistent and regular data collection initiatives that allow better understanding of enterprises and household behavior in regards to ICT adoption and utilization. Changes in enterprises behavior should be traced through years to be able to monitor progress (or lack of it) in regards to ICTs.
- The correlation between ICTs and increased return on investment is not clear in the survey, and should be included in forthcoming studies. Through this study it was difficult to establish linkages between level of ICT diffusion and profitability, which we think very crucial to influence enterprise owners and executives to adopt ICTs.
- One of the main conclusions out of the survey is related to the role of human resources in managing and operating ICTs. It is quite clear from the study that investment in human capacity building is not receiving the attention it deserves from business owners and executives. That is reflected in the amount of investment in building the ICT capacity of their employees. This observation we believe is one reason behind not attaining the right leverage ICTs have for enterprises.

- Another observation that implicitly inferred out of the study has to do with the lack of appreciation for the value of information and the enterprises ability to transforming this information into knowledge. It has been quite clear that acquiring, processing, and disseminating information using ICTs, especially the Internet is not receiving the consideration they deserve form enterprises managers and owner. Linking ICTs to information and knowledge needed for advancing the enterprise is not well established among most enterprises, without which development of viable businesses will be much less effective.
- Local enterprises are not sure of what are the appropriate ICT solutions in which to invest. They also lack the awareness of the existence of many of these solutions and how to implement them in their business operations. This phenomenon has to do with their desire of not changing the way they manage their enterprises and the reluctance to take the risk of trying new approaches based on ICTs. It is very hard for enterprises owners and executives to change their business operations through invoking ICTs, as that will cost them money, efforts, and time for something that is not certain.
- It is to be recognized that advanced ICT solutions do not immediately impact business operations and development. Enterprises have stronger tendencies towards solutions that have immediately impact their businesses, compared to the ones that have long term and implicit benefits. This explains why the majority of enterprises are reluctant to adopt ICTs, and they think that there is no need for these solutions in their business operations. ICTs will need many more years to impact the Palestinian economy, especially on the macroeconomic level, and for that to happen there should be many initiatives to encourage enterprises adopt ICTs.

6.5 Recommendations

- Stakeholders, including government bodies, business associations, and academic institutions, should seek ways of encouraging innovation, cooperation, customization, and R&D to harness ICT solutions that best fit the local market needs. Businesses, especially software development firms, should work at full leverage to fill in this gap, since many enterprises are relying on customized ICT business solutions that are developed by foreign firms.
- There needs to be consistent and regular data collection initiatives that allow better understanding of enterprises and household behavior in regards to ICT adoption and utilization. Changes in enterprises behavior should be traced through years to be able to monitor progress (or lack of it) in regards to ICTs.
- ICT is known as human intensive technologies. Investment in human capacity building is not receiving the attention it deserves from business owners and executives. Successful, effective, and sustainable implementation of ICT by firms requires intensive investment in building the human competencies in ICT, and that requires cooperation between enterprises, business associations, and training agencies.
- It is to be remarked here that the evaluation of ICT solutions in most cases fails to count and recognize intangible commodities. These solutions create and nurture. This might be one reason behind the unenthusiastic attitude some business owners and executives maintain in regards to ICTs. Intangible commodities should receive the attention they deserve from business owners and executives, and should be counted in a better way in the future.

- There is a growing consensus among the development communities of the importance of using ICT for developing and sustaining vibrant businesses, but they lack visions, action plans, and competencies to accomplish that. To help enterprises achieve these goals it demands on the side of the governments to place more endeavors in increasing the base of ICT customers, through improving connectivity, reducing prices and improving service quality, especially in promoting broadband Internet access, and the development of high quality local contents.
- One of the most important elements needed for the success of the ICT solutions is the quality of the locally developed ICT solutions, their suitability to the needs of the local markets, including the ease of use, especially the use of Arabic interface. Additionally, of major concern is the technical after-sale service of these products that the ICT producing companies should be able to provide.
- Low Internet penetration prevents enterprises from sensing the benefits of ICT, at the same time not sensing the benefits of ICTs, does not encourage enterprises from adopting Internet protocols (IP) based solutions in their operations. The best possible exit strategy of this loop is through government initiatives and policies to push prices down and boost penetration up, such that could help the country cross a threshold penetration after which people start to sense the benefits of ICT.
- Adoption of ICTs alone will not promote growth and development if it is not combined with training, capacity building, organizational and operational changes within the enterprise. Many studies have found that organizational changes are essential to reap the potential benefits of ICTs. This is a call for enterprises to start considering modernizing their management principles and skills and allow more room for ICTs to be more competitive and effective.

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