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تحديد لمراكز البحث والتطوير والمختبرات العالمية في مجال تقنية المعلومات والاتصالات (ICT) التي ينبغي استقطابها الى مجمع تقنية المعلومات والاتصالات بالرياض

دراسة مقدمة للمؤسسة العامة للتقاعد

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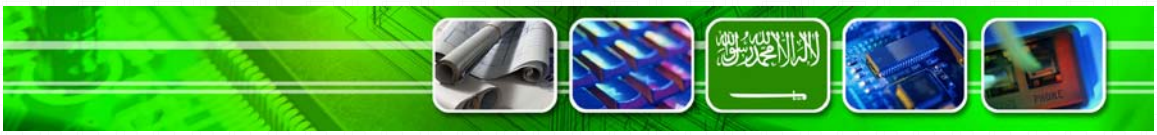


1- الهدف من الدراسة

إن الغرض الرئيس من إنشاء مجمعات (أو مناطق أو حدائق) التقنية هو توفير البنية التحتية والخدمات المتقدمة اللازمة لتكوين بيئة أعمال اقتصادية مترابطة ومتكاملة تساعد في تنمية صناعات تقنية (متوسطة وعالية) ذات أبعاد إستراتيجية واقتصادية. وقد أثبتت مجمعات التقنية نجاحها حول العالم كبيئة محفزة لها دور مهم في بناء ميزة تنافسية عالمية متقدمة ساهمت بفعالية في تنمية اقتصادية مستدامة للعديد من الدول الصناعية والدول شبه الصناعية والدول النامية التي أنشئت فيها هذه المجمعات.

إن تواجد مراكز البحث والتطوير (R&D) والمختبرات المتخصصة داخل مجمعات التقنية يعتبر عامل مشترك في جميع مجمعات التقنية حول العالم . ولأهمية تواجد هذه المرافق في مجمعات التقنية ولدورها الفاعل في تطوير ودعم الصناعات التقنية فقد خصصت جميع مجمعات التقنية حول العالم - بمختلف انماطها- نسب معينة من اراضيها لاحتواء مرافق البحث والتطو ير والمختبرات وسعت حثيثا الى استقطابها. ومن هذا المنطلق فقد حرص مجمع تقنية المعلومات والاتصالات التابع للمؤسسة العامة للتقاعد على احتواء هذا المشروع الرائد على نسبة قدرها سبعة ونصف في المائة (7.5%) من اجمالي مساحة مخطط المشروع لتكون استخداماتها مخصصة لمراف ق ومعامل البحث والتطوير والمختبرات.

وتهدف هذه الدراسة الى تحديد مراكز البحث والتطوير والمختبرات العالمية الرائدة والمتخصصة في مجالات تقنيات المعلومات والاتصالات لغرض تركيز جهود التسويق عليها اثناء السعي لاستقطابها الى مجمع تقنية المعلومات والاتصالات بالرياض لتكون هذه المرافق بمثابة الركيزة الاساسية لنقل التقنية ولتطوير صناعة تقنية معلومات واتصالات متقدمة وذات تنافسية عالمية قوية.

2- تعريف البحث والتطوير ووصف أنواعه ومرافقه

تولد التقنية عن طريق الابحاث والتجارب والتطوير (Research and Experimental Development (R&D)) وتجري عمليات البحث والتطوير في مراكز (أو معاهد أو معامل) البحث والتطوير العامة والخاصة سواء كانت هذه المراكز مستقلة أو تابعة لجامعات أوشركات أو جهات حكومية. كما تقوم المختبرات الفنية بمساندة عمليات البحث والتطوير من خلال تقديم عدة عمليات فنية وعلمية مهمة.

وتعتبر مراكز البحث والتطوير والمختبرات عامل اساسي في استيعاب وتطويع واستنبات التقنيات اللازمة لتطوير الصناعة وبدونها يصعب فك رموز المعرفة الكامنة داخل التقنيات المجسدة وغير المجسدة حولنا ، حيث أن الاستمرار في استيراد وإستخدم التقنية بحد ذاتها يؤدي الى الاعتماد الابدي على مصنِّعيها ولايحقق للاقتصاد الوطني القيمة المضافة المنشودة. أما العمل على التطوير والابتكار المستمر لهذه التقنيات ومن ثم تصنيع أنواع محلية مستحدثة منها ذات اداء يفوق تلك المستوردة يعتبر هو العامل الأه م والحاسم في تحقيق معدلات نمو عالية وسريعة للاقتصاد الوطني.

تعريف البحث والتطوير

لقد عرفت "منظمة التعاون والتنمية الاقتصادية" (OECD) البحث والتطوير بالآتي:

البحث والتطوير هو النشاط الإبداعي الذي يتم على أساس قواعد علمية وطريقة منظمة بهدف زيادة المعرفة العلمية والتقنية واستخدامها في تطبيقات جديدة.

وينقسم البحث من حيث الوظيفة الى نوعان رئيسيان هما البحث الاساسي (النظري) والبحث التطبيقي:

البحث الاساسي: هو تحري اصلي ومنظم من أجل زيادة مخزون المعرفة العلمية للموضوع تحت الدراسة ومحاولة التوصل إلى حقائق ومفاهيم ومبادئ واكتشافات جديدة دون أن يهدف ذلك إلى تطبيق معين.

وتؤدى معظم البحوث الاساسية في مراكز/معامل البحث والتطوير التابعة للجامعات أو الحكومة ولا تمول عادة من القطاع الصناعي.

البحث التطبيقي: هو تطبيق نتائج البحث الاساسي والمعارف الاخرى أو اكتساب معرفة جديدة لتحقيق غرض معين له ابعاد تجارية. ويشمل البحث التطبيقي التحقيق في الاستخدامات المختلفة للمعرفة في المنتجات والخدمات وطرق الانتاج وتقييم ذلك.

وتؤدى معظم البحوث التطبيقية في مراكز/معامل البحث والتطوير التابعة لشركات القطاع الصناعي والخدمي الخاص وتمول من قبله.

التطوير: يمثل التطوير نشاطاً منظما يستفيد من المعرفة الجديدة الناتجة من البحث الأساسي والتطبيقي ، بالاضافة الى الاستفادة من الخبرات والتجارب العملية المكتسبة من الانتاج الحالي بهدف انتاج مواد أو منتجات جديدة او إبتكار طرق وأنظمة جديدة أو إحداث تحسينات جوهرية على الموجود منها تمهيداً للاستخدام التجاري في الانتاج

والخدمات. ويشمل التطوير عمليات تصميم وتطوير النماذج الاولية وطرق الانتاج.

وتؤدى معظم عمليات التطوير في معامل القطاع الصناعي والخدمي الخاص وتمول من قبله.

تعريف العمليات المخبرية

هي عمليات فنية وعلمية مساندة لعمليات البحث والتطوير تقوم بها المختبرات (أومعامل) الفحص (Test Laboratories) وتقدم انشطة مثل:

- التجارب (Experimentation)
- الفحص (Testing and Inspection)
- القياس والتحليل (Measurements and Analyses)
- اعتماد نتائج فحص (Certification)
- قياس تطابق المنتجات للمقاييس (Compliance to standards)
- تطوير النماذج الاولية والقوالب (Prototype development)

و تعتبر المختبرات مرافق مساندة لعملية البحث والتطوير وتقتصر انشطتها غالبا على العمليات الموضحة اعلاه ولا تشمل عمليات البحث والتطوير المتعارف عليها.

وتنقسم المختبرات من حيث التجهيز الى نوعين هما مختبرات/معامل السوائل (wet labs) وتكون مخصصة ومهيئة للتعامل مع المواد الكيم يائية والغازات، والنوع الثاني هو مختبرات /معامل جافة (dry labs) وهذه تكون مخصصة للالكترونيات وتقنية المعلومات والاجهزة الكهربائية وما شابه ذلك.

أنواع مرافق البحث والتطوير والمختبرات من حيث الملكية

ومن الممكن تقسيم مراكز البحث والتطوير والمختبرات من حيث ملكيتها الى نوعان رئيسيان هما:

1 - مراكز البحث والتطوير والمختبرات التابعة للشركات الكبرى أو الجامعات أو الجهات الحكومية.

وتخدم هذه الفئة غالبا توجهات وانشطة الجهة التي تتبعها فقط. ولقد انتشر هذا النوع من المراكز - وبخاصة تلك التي تكون مملوكة للشركات الكبرى- في مجمعات التقنية حول العالم لغرض تمكين الجهة الام من الاستفادة من ميزات المجمع التقني سواء كانت دعم حكومي أو حوافز اقتصادية أو تواجد ميزة تنافسية معينة في منطقة مجمع التقنية مثل تواجد الكوادر العلمية والفنية المؤهلة . ويقدم الجزء الثالث في هذه الدراسة تفصيل اكبر عن هذه المراكز.

2 - مراكز البحث والتطوير والمختبرات المستقلة.

تعتبر هذه المراكز كيانات مستقلة تعمل كشركات خاصة نشاطها الاساسي هو تقديم خدمات البحث والتطوير والاعمال المخبرية لجهات اخرى بنظام التعاقد. ويقدم الجزء الرابع في هذه الدراسة تفصيل اكبر عن هذه المراكز.

3- مراكز البحث والتطوير والمختبرات التابعة للشركات العالمية الكبرى في صناعة تقنية المعلومات والاتصالات

لقد قامت هذه الدراسة بتحديد الشركات العالمية الاكثر صرفا على البحث والتطوير والتي تعمل في صناعة تقنية المعلومات والاتصالات (ICT)، ومن ثم تم التركيز على تلك التي يؤول لها مراكز بحث وتطوير في أكثر من دولة. ويقدم الملحق-1 قائمة بالشركات العالمية في مجال تقنية المعلومات والاتصالات الاكثر صرفا على البحث والتطوير وتوضح القائمة قيمة الصرف لكل شركة في عامي (2006/2005)[1].

ويتصدر قائمة الصرف على البحث والتطوير من الشركات التي تندرج تحت التصنيف الصناعي رقم 35 والتي تركز على منتجات وخدمات تقنية المعلومات والحاسب الآلي (35 - Software & computer services) عشرة شركات امريكية عملاقة هي: Microsoft ، IBM، Oracle، CA، Symantec، Google، Yahoo، Cadence Design Systems، Unisys، Adobe Systems، وكانت الشركة الوحيدة الغير امريكية ضمن أول عشرة شركات في هذه القائمة هي شركة SAP الالمانية (انظر الملحق-1).

أما بالنسبة الى الشركات التي تندرج تحت التصنيف الصناعي رقم 37 (37- Technology hardware & equipment) والتي تنتج اجهزة الاتصالات و/أوالحاسب الآلي فقد احتل اول عشرة مراكز الشركات التالية:

1- Intel, USA
2- Nokia, Finland
3- Motorola, USA
4- Hewlett-Packard, USA
5- Hitachi, Japan
6- Cisco Systems, USA
7- Ericsson, Sweden

[1] The Financial Times Limited "R&D - who, where and how much" Published: October 29 2006

8- Toshiba, Japan
9- NEC, Japan
10- Alcatel, France

وبعد التعرف على اكثر شركات المعلومات والاتصالات العالمية صرفا على البحث والتطوير قامت هذه الدراسة بتحليل الشركات المدرجة في الملحق- 1 من حيث تواجد مراكز أبحاث وتطوير تابعة لها في عدة دول. والغرض من هذا التحليل هو معرفة أماكن تواجد مراكز البحث والتطوير لهذه الشركات ومناطق تجمعها للخروج بمؤشرات لاسباب إنشائها لمراكز في تلك المناطق.

ويقدم الملحق- 2 وصف موجز عن مراكز البحث والتطوير والمختبرات التابعة لشركات تقنية المعلومات والاتصالات العالمية الاكثر صرفا على البحث والتطوير والتي تنشأها هذه الشركات خارج دولتها . وعند النظر الى اماكن تواجد هذه المرافق يتضح تركيز هذه الشركات على انشاء مراكز بحث وتطوير تابعة لها في الصين والهند واليابان والمانيا، وياتي في المرتبة الثانية من التركيز دول مثل اسرائيل وسنغافورة وايرلندا وماليزيا وروسيا وتايوان.

وكما سبق الاشارة اليه ان مراكز البحث والتطوير والمختبرات التابعة للشركات تخدم مصالح الشركة الام فقط ولا تخدم مصالح الشركات الاخرى المنافسة. ولهذا قد لا يكو ن التركيز على استقطاب هذا النوع من المراكز والختبرات الى مجمع التقنية بالرياض من الاولويات حيث انها لن تخدم الاحتياجات البحثية والتطويرية للمؤسسات الوطنية، هذا بالاضافة الى ضعف المحفز أو الميزة التنافسية المطلوبة (مثل الكوادر البشرية اللائمة أو حجم السوق أو سهولة الأنظمة أو وجود حوافز اقتصادية مشجعة) التي تتطلبها تلك الشركات لانشاء مركز بحث وتطوير أو مختبر تابع لها في المملكة العربية السعودية. ورغم ذلك فقد حرصت الدراسة على تحديد مراكز البحث والتطوير التابعة للشركات الكبرى والتي تنشأها في مناطق خارج دولتها لان قرار إنشاء مركز بحث وتطوير تابع لشركة عالمية في المملكة قد يستند الى

عدة عوامل خارجة عن نطاق التحليل لهذه الدراسة مثل علاقة القرار بالتزامات مشاريع التوازن الاقتصادي أو ما شابه ذلك.

كما انه عند دعوة هذه الشركات الكبرى الى مجمع التقنية بالرياض بالامكان تقديم خيارات استثمارية عديدة لهم مثل انشاء مرافق تصنيع وانتاج جديدة او مقرات اعمال تغطي السوق المحلي والاقليمي حيث انه من المعروف ان سوق المملكة لمنتجات تقنية المعلومات والاتصالات يعتبر الاكبر حجما ونموا في المنطقة.

4- مراكز البحث والتطوير والمختبرات المستقلة

يقدم الملحق-3 عرض لاهم مراكز البحث والتطوير والمختبرات العالمية المستقلة والتي تعمل في مجالات تقنية المعلومات والاتصالات المختلفة ، وقد ركزت هذه الدراسة على تحديد تلك الرائدة منها وبخاصة التي يكون لها مرافق في اكثر من دولة. وتقدم الدراسة هذه المراكز كعينة استوفت بعض المواصفات المطلوبة (مثل: استقلاليتها، حجمها، نوع وعدد عملائها وتوزيعهم الجغرافي، سمعتها، تخصص الانشطة العلمية لديها، وجود فروع أو مرافق لها في اكثر من دولة) وبالامكان التوسع في هذه العينة لتشمل عدد اكبر عند مراحل التسويق المتقدمة.

وقسمت الدراسة هذه المرافق الى قسمين حسب النشاط وهما:

1. مراكز/معامل البحث والتطوير
2. مختبرات/معامل الفحص والقياس

وتحبذ الدراسة السعي حثيثا على استقطاب هذا النوع من المرافق لانها تعتبر عامل جذب للمؤسسات الإنتاجية وسيكون لتواجدها في مجمع التقنية بالرياض الاثر الكبير في انجاح عملية استقطاب العديد من الشركات والمصانع المحلية والعالمية. فهناك العديد من شركات ومصانع تقنية المعلومات والاتصالات التي تحتاج الى الخدمات التي تقدمها مثل تلك المرافق، و قد تتخذ القرار بالانضمام الى مجمع التقنية بالرياض لتكون بجوار مراكز ومختبرات رائدة تساندها في عمليات التطوير والانتاج والتسويق.

1. مراكزالبحث والتطوير المستقلة

إن مراكز البحث والتطوير المستقلة هي مؤسسات متخصصة في اداء عمليات البحث والتطوير ولا يشمل نشاطها الانتاج التجاري ، ولذلك كل ما تطوره هذه المرافق من تقنيات ومعرفة تؤول ملكيته ا الفكرية الى الجهة الممولة للبحث. وتمتلك هذه المرافق غالبا اجهزة وقدرات تفوق تلك المتوفرة عند مراكز البحث والتطوير التابعة للشركات الانتاجية. ولذلك غالبا ما تلجئ الشركات الانتاجية الى مراكز البحث والتطوير المستقلة لمساعدتها في تطوير تقنيات ومنتجات جديدة ترغب في انتاجها تجاريا.

كما تقوم مراكز البحث والتطوير المستقلة دوما بالسعي الى تطوير مشاريع بحثية وتطويرية جديدة تخدم جميع المصنعين وتسعى الى استقطاب التمويل اللازم لها من عدة جهات سواء كانت شركات او جهات الحكومية . وبعد الانتهاء من مشاريع البحث او ا لتطوير تقوم تلك المرافق بتمكين الجهة (الجهات) الممولة من امتلاك الملكية الفكرية لهذه التقنيات والمعرفة لان نشاطها الاساسي ليس الانتاج التجاري أو الاستخدام.

لقد حددت الدراسة (في الجزء-1 من الملحق-3) عدة مراكز بحث وتطوير مستقلة تعتبر رائدة في مجالا ت تقنية المعلومات والاتصالات وتم ادراج

مجالات بحثها واماكن مراكزها حول العالم بالاضافة الى عناوين مواقعها الاكترونية للرجوع اليها عند مرحلة التسويق.

2. مختبرات/معامل الفحص

إن مختبرات/معامل الفحص المستقلة هي مؤسسات متخصصة في العمليات المخبرية المذكورة سابقا في الجزء 2 من هذه الدراسة . وتقوم هذه المرافق بدور كبير في دعم عمليات التطوير والانتاج . ومثل مراكز البحث والتطوير المستقلة لا يشمل نشاطها على الانتاج التجاري، ولذلك كل ما تقدمه هذه المرافق من معرفة تؤول ملكيته الفكرية الى الجهة الممولة . وتمتلك هذه المرافق غالبا اجهزة وقدرات مخبرية تفوق تلك المتوفرة في المختبرات التابعة للشركات المنتجة، ولذلك غالبا ما تلجئ الشركات الانتاجية الى المختبرات المستقلة للقيام بفحص ومعاينة منتجات جديدة ترغب في انتاجها تجاريا. كما ان هذه المختبرات تعتبر جهة خارجية موثوق بشهادتها ولها دور كبير في اعتماد المنتجات والبرامج قبل خروجها للسوق، كما تقوم بقياس مدى تطابق المنتجات للمقاييس العالمية المتعارف عليها في الصناعة.

وتطبق المختبرات المتخصصة في مجال تقنية المعلومات والاتصالات عدة معايير ومقاييس عالمية متعارف عليها في هذه الصناعات مثل (PCMCIA, USB-IF, PCI, Wi-Fi, RapidIO) وتقوم هذه المختبرات بفحص تطابق المنتجات لهذه المقاييس كما تقوم باقتراح مقاييس جديدة على الصناعة.

وتقدم الدراسة (في الجزء-2 من الملحق-3) عدة مقاييس عالمية مهمة لتقنية المعلومات والاتصالات و التي تطبقها المختبرات لفحص المنتجات والبرامج، كما ادرجت نبذه عن المنظمات التي تشرف على تطبيق تلك المقاييس.

وكخطوة تالية تم التعرف على عدة مختبرات مستقلة معتمدة من قبل منظمات المقاييس العالمية وهي تعتبر من الرائدة في مجالات تقنية المعلومات والاتصالات ولها فروع أو مرافق في عدة دول. وتقدم الدراسة (في الجزء-3 من الملحق-3) عدة مختبرات عالمية وتم ادراج مجالات أنشطتها المخبرية واماكن تواجدها حول العالم بالاضافة الى عناوين مواقعها الاكترونية للرجوع اليها عند مرحلة التسويق.

إن تواجد مختبرات عالمية مستقلة في مجمع التقنية بالرياض سيوفر للشركات المنتجة داخل المملكة - سواء المحلية منها أو العالمية- سرعة فحص العينات واعتماد المنتجات للسوق العالمي، كما سيكون لها دور ايجابي مهم في ترسيخ مفهوم المقاييس العالمية والجودة في صناعة تقنية المعلومات والاتصالات في المملكة. ويؤدي الاحتكاك اللصيق بين العاملين في هذه المختبرات و العاملين في مؤسسات تقنية المعلومات والاتصالات المحلية الى نقل معرفة كبير لا يمكن تقديره بارقام لان خبرة هذه المختبرات العالمية في تفاصيل المنتجات وطرق الانتاج واسعة وطويلة وتشمل تجارب العديد من الشركات والمنتجات في شتى انحاء العالم.

وتوصي الدراسة بالتركيز على استقطاب مثل تلك المختبرات عن طريق دعوتهم مباشرة وإغرائهم ببعض المحفزات الاقتصادية مثل:

- تخفيض قيمة الايجار لهم.
- السعي الى ربطهم ببعض المشاريع الوطنية والحكومية المتعددة الاطراف.
- السعي الى إلغاء الضرائب عليهم.
- السعي الى إلغاء الرسوم الجمركية على الاجهزة والمواد التي تستوردها تلك المختبرات.

5- مجمعات تقنية المعلومات والاتصالات (ICT) الرائدة حول العالم ومراكز البحث والتطوير والمختبرات بها

لقد قامت هذه الدراسة بتحليل مجمعات تقنية المعلومات والاتصالات الرائدة حول العالم من حيث تواجد مراكز بحث وتطوير ومختبرات بها . وتعتبر هذه المجمعات مثال جيد بالامكان الاستفادة منها في رسم مستقبل مجمع التقنية بالرياض. ولا يجب ان يفهم ان مجمع التقنية بالرياض لابد ان يكون مطابقا لتلك المجمعات لان صناعة تقنية المعلومات والاتصالات سريعة التطور والتغير وما نراه اليوم في المجمعات الرائدة قد لا نراه في المجمعات التي ستكون رائدة بعد عشر سنوات مثلا.

وعند النظر الى مجمعات التقنية التي تعتبر شبيهة لمجمع التقنية بالرياض يجب علينا فهم ان نمط مجمع التقنية بالرياض ليس مطابقا للعديد منها لان مخططه لا يقتصر على احتواء مراكز البحث والتطوير ومقرات وفروع شركات مثل ما يسمى بـ مجمعات البحث (Research Parks) أو مجمعات العلوم (Science Parks) والتي غالبا ما تقام في اراضي الجامعات ولا يسمح بالتصنيع فيها، كما ان نمط مجمع التقنية بالرياض لا يقتصر على الاعمال والتجارة مثل مجمعات الاعمال (Business Parks)، بل هو مجمع متعدد الاستعمالات ويسمح فيه جميع الانشطة الاقتصادية الرئيسية (التجارة، والبحث والتطوير، والصناعة، والاعمال، والخدمات المساندة ، بالاضافة الى حاضنة أعمال) وهذا ما يهيئ ليكون اقرب الى ما يسمى بمجمع عنقودي للتقنية (Technology Cluster) يربط داخله جميع اطراف سلسلة القيمة المضافة (Value Chain) التي تحتاجها الصناعة المحلية لتقنية المعلومات والاتصالات لتتمكن من التنافس عالميا.

ويقدم الجزء-1 من الملحق-4 قائمة تشمل جميع مجمعات التقنية في العالم التي تركز على مجال تقنية المعلومات والاتصالات والمسجلين في عضوية

المنظمة العالمية لمجمعات العلوم والتقنية (IASP). وعند النظر الى تلك القائمة نلاحظ كثرة تلك المجمعات وانتشارها في العالم وهذا ما يجعل التنافس بينها في استقطاب العملاء شديد . وتتنافس جميع هذه المجمعات التقنية في اغراء الشركات المحلية والعالمية من خلال تقديم حوافز اقتصادية وخدمات مختلفة لهم لتميز نفسها عن المجمعات الاخريات . وعند النظر الدقيق الى تخصصات هذه المجمعات نجد أن معظمها لا يقتصر تركيزها على مجال تقنية المعلومات والاتصالات فقط بل يشمل التركيز على عدة مجالات اخرى مثل التقنية الحيوية أو الطيران أو المواد الجديدة ، وهذا ما يجعلها مجمعات تقنية عامة و غير مؤهلة لتكوين تجمع عنقودي (Cluster) لصناعة أو تقنية معينة لان أغلب البنية التحتية والخدمات والحوافز التي تتطلبها صناعة تقنية المعلومات والاتصالات تختلف عن تلك التي تتطلبها الصناعات والتقنيات الاخرى. ولهذا يعتبر العديد من المحللين الاقتصاديين أن انجح مجمعات التقنية حاليا هي تلك التي تركز على مجال واحد (أو عدة مجالات ذات علاقة) وتهيئ لهذه المجالات البنية التحتية والبيئة المناسبة التي تتيح للقاطنين في المجمع ميزة تنافسية كبيرة لا يجدونها خارجه.

ولعمل تحليل ادق قامت الدراسة بالتركيز على مجموعة من مجمعات التقنية المتخصصة في تقنية المعلومات والاتصالات والتي تعتبر الاكثر شهرة وريادة في العالم . ويقدم الجزء-2 من الملحق-4 نبذة عن هذه المجمعات التقنية الرائدة وعن مراكز البحث والتطوير والمختبرات الموجودة داخلها.

مجمعات تقنية المعلومات والاتصالات العالمية الرائدة

1. مجمع العلوم بسنغافورة (Singapore Science Park)
2. مجمع ملتيميديا سوبر كوريدور (MSC) بماليزيا
3. مجمع التقنية - أولو (Technopolis Oulu) فنلندا

4. مجمع الأبحاث الثلاثي (Research Triangle Park) بولاية كارولينا الامريكية.
5. مجمع صوفيا انتيبولس (Sophia Antipolis) بفرنسا
6. مجمع هنشو للصناعات التقنية (Hsinchu Industrial Science Park) بتايوان.
7. مجمع شينزين للصناعات التقنية (Shenzhen High-Tec Industrial Park) بالصين
8. مجمع هونك كونج للعلوم والتقنية (Hong Kong Science and Technology Park)
9. مجمع يوكوسوكا للابحاث (Yokosuka Research Park) باليابان
10. مجمع أدستسترال (BT Adastral Park) ببريطانيا.
11. مجمع التقنية العالمي (The International Tech Park - Bangalore) ببانقالور
12. مجمع تقنية البرامج ببانقالور
(Software Technology Parks of India (STPI) Bangalore)

وتعتبر مجمعات التقنية الإثنى عشر اعلاه من انجح مجمعات التقنية في العالم بناء على استنتاجات عدة دراسات اقتصادية متخصصة . ورغم وجود عدد كبير من مناطق التقنية الناجحة حول العالم الا ان هذه الدراسة ركزت على تلك التي تتخصص في مجال تقنية المعلومات والاتصالات وبخاصة التي تكون مشابهة من حيث النمط الى منطقة التقنية بالرياض.

لقد نجحت هذه المجمعات الاثنى عشر في استقطاب العديد من مراكز البحث والتطوير والمختبرات العالمية اليها، بل أن معظم هذه المرافق كانت من أوائل المستأجرين في مجمعات التقنية المذكورة . وانعكس ذلك ايجابيا على سمعة ورقي هذه المجمعات. وساهم وجود هذه المرافق البحثية والمخبرية الى

جلب العديد من الشركات والمؤسسات الانتاجية والتي عادة ما ترغب في تكوين روابط قوية مع مثل تلك المراكز والمختبرات.

ويشمل الجزء-2 من الملحق- 4 على قائمة بمراكز البحث والتطوير والمختبرات الموجودة في مجمعات التقنية الاثنى عشر ووصف موجز عن كل مرفق بامكان القارئ الرجوع اليه عند الحاجة.

الملاحق

ملحق-1

World largest R&D Spenders from the ICT industries

شركات تقنية المعلومات والاتصالات الاكثر صرفا على البحث والتطوير

RANKING OF FIRST 300 OF TOP 1,250 GLOBAL COMPANIES BY R&D INVESTMENT WITHIN INDUSTRY

Source: The Financial Times Limited, “R&D – who, where and how much," Published: October 29, 2006

ICT Companies within Industrial classes: 8, 10, 27, 35, 37	2005/06 R&D Investment $ M
8 – Electronic & electrical equipment	**31492.12**
Siemens, Germany	6080.88
Samsung Electronics, South Korea	5441.06
Canon, Japan	2427.22
LG Electronics, South Korea	1754.45
Sharp, Japan	1255.04
Sanyo Electric, Japan	1116.94
Agilent Technologies, USA	738
ABB, Switzerland	734
Schneider, France	639.47
Pioneer, Japan	537.52
Sumitomo Electric, Japan	478.54
Omron, Japan	418.9
Olympus, Japan	404.32
Danaher, USA	379
Seiko Epson, Japan	363.5
LG Philips LCD, South Korea	361.52
ALSTOM, France	309.06
TDK, Japan	307.97
Emerson Electric, USA	303
Legrand, France	281.45
Samsung Electro-Mechanics, South Korea	274.05
Hon Hai Precision Industry, Taiwan	265.94
Yokogawa Electric, Japan	245.69
10 – Fixed line telecommunications	**7537.11**
NTT, Japan	2694.94
BT, UK	1248.11
France Telecom, France	844.6

Telefonica, Spain	641.71
Deutsche Telekom, Germany	510.77
Telstra, Australia	404.94
TeliaSonera, Sweden	361.26
27 – Mobile telecommunications	**1051.49**
Vodafone, UK	353.66
SK Telecom, South Korea	250.8
35 – Software & computer services	**28105.2**
Microsoft, USA	6584
IBM, USA	5378
Oracle, USA	1872
SAP, Germany	1284.16
CA, USA	781
Symantec, USA	682.13
Google, USA	599.51
Yahoo!, USA	587.53
Cadence Design Systems, USA	423.34
Unisys, USA	389.6
Adobe Systems, USA	365.33
Sega Sammy, Japan	352.38
Intuit, USA	336.59
Synopsys, USA	319.99
Dassault Systemes, France	305.47
Autodesk, USA	301.6
Cerner, USA	273.98
BMC Software, USA	269.3
SunGard Data Systems, USA !	244.8
Support services	1532.64
Automatic Data Processing, USA	624.1
Accenture, Bermuda	243.45
37 – Technology hardware & equipment	**82214.44**
Intel, USA	5145
Nokia, Finland	4692.48
Motorola, USA	3680
Hewlett-Packard, USA	3490
Hitachi, Japan	3432.1
Cisco Systems, USA	3322
Ericsson, Sweden	3220.26
Toshiba, Japan	2948.57
NEC, Japan	2332.93
Alcatel, France	2113.86
Fujitsu, Japan	2035.32
Texas Instruments, USA	2015
Nortel Networks, Canada	1856

Sun Microsystems, USA	1785
STMicroelectronics, The Netherlands	1554
Infineon Technologies, Germany	1466.25
Lucent Technologies, USA	1409
Freescale Semiconductor, USA	1195
EMC, USA	1171.93
Advanced Micro Devices, USA	1144.03
Mitsubishi Electric, Japan	1106.03
Qualcomm, USA	1011
Applied Materials, USA	940.51
Ricoh, Japan	935.26
Xerox, USA	755
Broadcom, USA	650.63
Micron Technology, USA	603.7
Apple Computer, USA	534
Analog Devices, USA	497.1
Dell, USA	463
Agere Systems, USA	462
Kyocera, Japan	460.9
Corning, USA	443
Taiwan Semiconductor Manufacturing, Taiwan	426.79
LSI Logic, USA	397.31
Avaya, USA	394
ASML, The Netherlands	388.1
Tokyo Electron, Japan	371.86
Juniper Networks, USA	355.42
Nvidia, USA	352.1
Tellabs, USA	344
Kla-Tencor, USA	340.28
Lexmark, USA	336.4
National Semiconductor, USA	333
Maxim Integrated Products, USA	328.17
Hynix Semiconductor, South Korea	327.77
ATI Technologies, Canada	327.02
Xilinx, USA	326.13
Marconi (now Telent), UK	319.33
NCR, USA	319
Marvell Technology, Bermuda	312.88
Maxtor, USA (now part of Seagate Technology, Cayman Islands)	293.56
United Microelectronics, Taiwan	293.33
Nikon, Japan	284.35
Murata Manufacturing, Japan	278.29
Atmel, USA	276.61
Rohm, Japan	274.03
Conexant Systems, USA	268
UTStarcom, USA	253.13
Novellus Systems, USA	247.32

Network Appliance, USA	242.99
ZTE, China	242.82

ملحق-2

مراكز البحث والتطوير والمختبرات التابعة للشركات العالمية التي تنشائها خارج دولتها

R&D Centers and Labs Established in Foreign Countries by Global ICT Companies

1. Yahoo!

Yahoo! Research

Yahoo! Research has facilities in Silicon Valley, Southern California, and Berkeley, Calif. As well as in:

- **New York City,**
- **Barcelona,**
- **Spain,**
- **Bangalore, India**
- **Santiago, Chile.**

The Yahoo R&D centers' core activity includes developing innovative technologies and global product platforms for Yahoo Inc. The R&D centers focuses on Product Engineering, Technology Research, Market Innovation and Engineering Services.

2. Bell Labs

http://www.alcatel-lucent.com/wps/portal/BellLabs

Bell Labs is part of Alcatel-Lucent's innovation engine. The broad range of disciplines at Bell Labs enables our researchers to solve complex problems, and along with Bell Labs' global presence, gives us the ability to approach these problems from a variety of angles and with a wealth of experience.

Our global presence also enables us to be close to customers around the world and respond to the real world challenges that drive innovation at Bell Labs. Helping our customers meet their unique needs keeps Alcatel-Lucent at the forefront of technology.

Bell Labs in the United States

Bell Labs' U.S. locations have been the site of seminal inventions such as the transistor, Unix, and the laser, as well as the research hub for many projects related to electronic switching, data communications, and optical transmission.

Bell Labs Research, Ireland

Bell Labs Research Center, Ireland was established in 2004 and serves as a global focal point for research in the telecommunications and supply chain fields.

Bell Labs in The Netherlands

In The Netherlands, Bell Labs has locations in Enschede and Hilversum, concentrating on applied research in advanced telecommunication technologies.

Bell Labs Research, India

In October 2004, Bell Labs Research Center, India was launched in Bangalore, India's silicon city. The Center's mission is to conduct fundamental and applied research in scientific fields related to computing and communications software; and create the technology innovations for enabling the world's leading wireline and wireless service providers to deploy and manage next-generation networks.

Bell Labs Research, China

Since its founding in March 2000, Bell Labs in China has fully committed itself to achieving its goal of establishing a center of technical excellence and innovations to strengthen the support to Alcatel-Lucent business units and customers in the China and Asia Pacific region.

Bell Labs in Germany

The Bell Labs team in Germany is located in Nuremberg and has its roots in wireless advanced technologies system engineering, global wireless system research, and wireless advanced technologies.

3. GE Global Research

http://www.ge.com/research/

GE Global Research has been the cornerstone of GE technology for more than 100 years. We are one of the world's largest and most diverse industrial research labs with a presence that spans the globe. We're delivering the innovations and breakthroughs that are driving growth for GE's businesses and revolutionizing markets. We believe "what we imagine, we can make happen."

We have more than 2,500 of the best and brightest researchers spread out at four multi-disciplinary facilities around the world. Headquartered in Niskayuna, New York, we also have facilities in:

- **Bangalore, India;**
- **Shanghai, China;**
- **Munich, Germany.**

4. HP Labs

http://www.hpl.hp.com/

Some of the world's top scientists and researchers are working together at HP Labs to invent technologies that will connect and empower people around the globe.

HP Labs are located in:

- **Bangalore, India**
- **Palo Alto, USA**
- **Beijing, China**
- **St. Petersburg, Russia**
- **Bristol, England**
- **Tokyo, Japan**
- **Technion City, Haifa, Israel**

5. IBM Labs

http://www.research.ibm.com/worldwide/

The Watson Research Center , Yorktown, USA
established: 1961
employees: 1,793
focus: Computer science, database, data mining, business intelligence, user interface, storage systems software, materials science, nanotechnology, life sciences, services research, mathematics, semiconductor technology

Almaden Research Center, Silicon Valley, USA
established: 1955
employees: 500
focus: Computer science, database, user interface, web software, storage systems software & technology, physical sciences, materials science, nanotechnology, life sciences, services research

Austin Research Laboratory, Texas, USA
established: 1995
employees: 74
focus: High performance/low power VLSI design and tools, system-level power analysis, and new system architectures

China Research Laboratory, Zhongguancun Software Park, Beijing, China
established: 1995
employees: 150
focus: Business integration and transformation, information and knowledge management, future embedded systems and devices, resilient and pervasive infrastructure, and user interactions.

IBM Haifa Labs, Israel
The IBM Haifa Labs include the Research Lab in Haifa (HRL), the Haifa Development Lab (HDL), and the Haifa Software Lab (HSL) in Rehovot.
Established: 1972
employees: 490
focus: Storage and business continuity systems, verification technologies, multimedia, active management, information retrieval, programming environments, optimization technologies, and life sciences.

Tokyo Research Laboratory, Japan
established: 1982
employees: 188
focus: Analytics and optimization, software engineering, middleware, system software, security and compliance, electronical and optical packaging technology, engineering and technology services, text mining and speech technology, and accessibility center

IBM Zurich Research Laboratory, Switzerland
established: 1956
employees: 250
focus: Nanoscience and –technology, semiconductor technology, storage systems, advanced server technology, systems design, IT security and privacy, business optimization, mobile enablement, services research; industry solutions lab

IBM India Research Labs
The IBM India Research Laboratory was established in April 1998 in New Delhi as the eighth of IBM's research labs. The lab expanded to its second site, Bangalore, in August 2005**.**

- IBM India Research Lab – Delhi
- IBM India Research Lab – Bangalore

employees: 110
focus: Speech technologies, pervasive computing, e-governance, information management, e-commerce, life sciences, distributed computing, software engineering.

6. Microsoft

http://research.microsoft.com/aboutmsr/labs/default.aspx

Microsoft Research Redmond was founded on the Microsoft Redmond campus in 1991. To this day, the bulk of Microsoft researchers work out of the Redmond, Washington, campus in buildings 112 and 113. Being near the product teams at Microsoft proved valuable in the early days, and that remains true today. Redmond often hosts researchers from Cambridge, England; Beijing, China; and San Francisco, California who come to collaborate closely with teams and other researchers onsite.

Microsoft Research Asia is Microsoft's basic research arm in Asia-Pacific region. Since its founding in November 1998, Microsoft Research Asia has attracted over 100 top-caliber researchers and scientists from all over the world, supplemented by a Post-Doc research center and over 200 visiting researchers and students. We perform leading-edge research on advanced user interface, networking and wireless, next-generation multimedia, and Asian information processing technologies.

Microsoft Research Cambridge was founded in 1997 and now numbers over 100 employees. The Cambridge lab conducts basic computer science research on a wide variety of topics, including machine learning, security, information retrieval, operating systems, programming techniques, and networking. Microsoft Research Cambridge maintains close ties to the University of Cambridge and the University of Cambridge Computer Laboratory.

Microsoft Research Silicon Valley, located in Mountain View, California, was founded in August 2001 and now employs about twenty-five researchers. The Silicon Valley lab maintains a research focus in the area of Distributed Computing — including privacy, security, resource location, protocols, the Internet as a platform, reliability, availability, scalability, management, and related theory. In January 2006, the Silicon Valley lab merged with Microsoft's Bay Area Research Center (BARC) in San Francisco. The joint lab will continue to build Microsoft Research's presence in the San Francisco Bay Area.

Microsoft Research India was established in January 2005 in Bangalore. The lab employs about 50 scientists and support staff and hosts a large number of interns each year. The lab conducts long-term basic and applied research in different areas: cryptography, security, and algorithms; digital geographics; mobility, networks, and systems; multilingual systems; rigorous software engineering; and technology for emerging markets. Microsoft Research India also collaborates extensively with research institutions and universities in India and abroad to support scientific progress and innovation.

7. Motorola Labs

http://www.motorola.com/content.jsp?globalObjectId=6640-9278

Motorola makes huge investments in research and development. Over 25,000 engineers and scientists are on the Motorola team. We have over 21,300 patents, and counting. Motorola manages an R&D portfolio of over $3 billion aimed at delivering commercial value and shaping the future with innovative technology, architectures, and software.

Motorola's Center of Excellence and some of the ways we're innovating:

Networks Research
Converged Systems
System & Software Engineering
Development Processes & Tools
Autonomic Computing Network Services

Physical Realization Research
Microminiaturization
Visual Communications
Environmental Technology
Organic Semiconductors

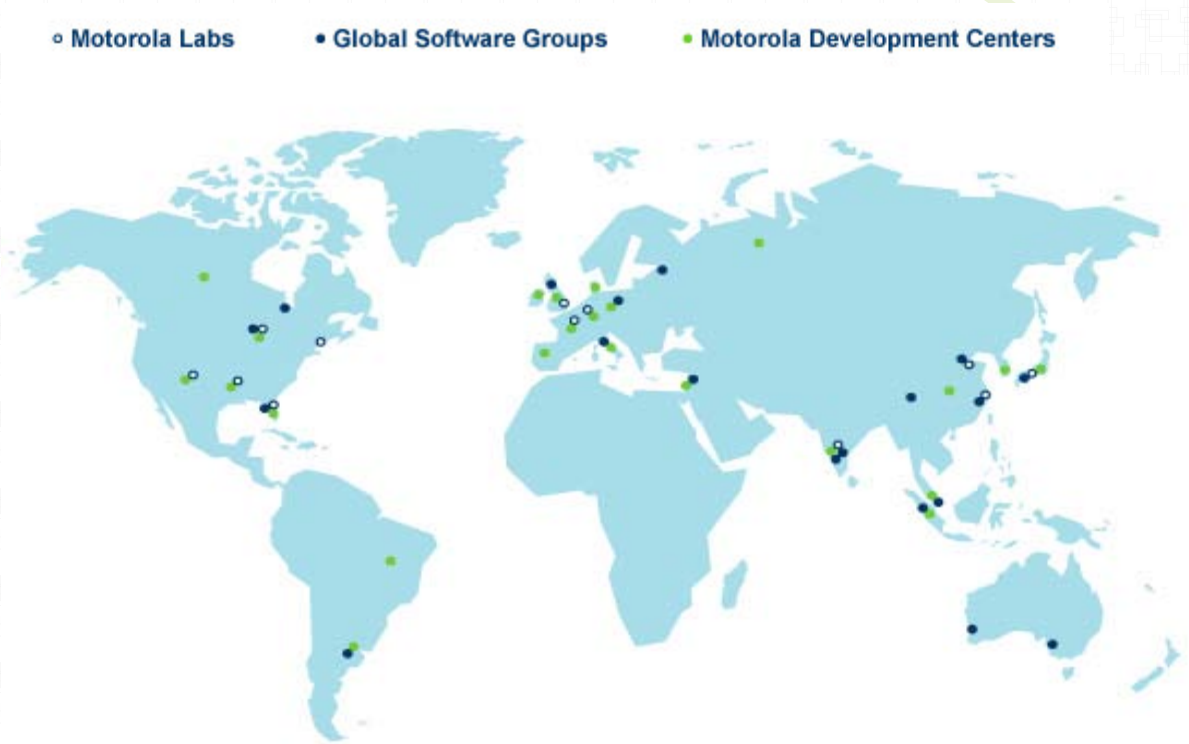
Embedded Systems Research
Energy
Security
Integrated Sensor/Actuator Systems
Nanotechnology

Wireless Access Research
Alternative Networks
Software & Cognitive Radio
Things-to-Things Communications
Electromagnetic Engineering

Human Interaction Research
Multimodal Interaction
Tactile Technologies
Voice Dialogue Systems
Image Understanding

Applications Research
Multimedia
Pervasive Platforms
Personalization & Knowledge
Enterprise Applications

At Motorola, we know how important it is to have a global footprint. Worldwide, our innovation centers are home to over 25,000 researchers working with colleagues across oceans and multiple time zones. By spanning our research across the globe, Motorola is not only able to work with some of the best scientists and engineers in the world, but also to develop technological solutions specific to each region's needs.



Motorola Labs
Schaumburg, IL, USA
Phoenix, AZ, USA
Plantation, FL, USA
Boston, MA, USA
Fort Worth, TX, USA
Tokyo, Japan
Basingstoke, United Kingdom
Paris, France
Taunusstein, Germany
Bangalore, India
Shanghai, China
Tianjin, China

Global Software Group
Schaumburg, IL, USA
Plantation, FL, USA
Tel Aviv, Israel
Cordoba, Argentina
Montréal, Canada
Livingston, Scotland
Turin, Italy
Krakow, Poland
St. Petersburg, Russia
Bangalore, India
Hyderabad, India
Singapore
Kuala Lumpur, Malaysia
Adelaide, Australia
Perth, Australia
Chengdu, China
Nanjing, China
Beijing, China
Tokyo, Japan

Motorola Development Centers
Arizona, Texas, Florida, Illinois, USA
India
Malaysia
Singapore
China
Canada
Brazil
Argentina
United Kingdom
Ireland
France
Spain
Germany
Italy
Israel
Poland
Denmark
Russia
South Korea
Japan

8. Siemens

http://www.siemens.com/index

Research and Development Locations Worldwide

Around 50,000 researchers and developers – more than 10 percent of our worldwide workforce – are employed at our 150 R&D locations in 40 countries around the world.

Research Area

- Digital Health
- The Thinking Car
- Intelligent Networking
- Personalization
- Remote Services
- Elements of Life
- Always-on
- Software
- Sensor Technology
- Clean Energy
- Materials Research
- New Light Sources
- Medical Imaging
- Robots & Agents
- Usability
- Factory of the Future
- Logistics

9. Sony

Sony Computer Science Laboratories (Sony CSL)

http://www.csl.sony.co.jp/index.shtml

- Sony Computer Science Laboratories, Tokyo, Japan.

- Sony Computer Science Laboratory, Paris, France.

10. Sun Microsystems Laboratories

http://research.sun.com/

Established in 1990, Sun Microsystems Laboratories is the applied research and advanced development arm of Sun Microsystems, Inc., with locations in California and Massachusetts. Sun Labs is one of the ways Sun invests in the future – the Labs is responsible for many of the technology advancements and inventions that have made Sun a technology powerhouse.

Researchers at Sun Labs are working on projects that are significant to the evolution of technology and to our society's future – asynchronous and high-speed circuits, optical interconnects, 3rd-generation web technologies, sensors, network scaling and Java[tm] technologies, to name a few.

Although many companies have R&D groups, Sun Labs can claim one of the highest rates of technology transfer, i.e., the incorporation of Labs' technology into future products. However, the Labs also pursues high-risk projects, those with the most dramatic potential, knowing that some will not work out, while a few will have significant payoff. After all, you only need a few dramatic successes to shake up the world.

- **Sun Microsystems Laboratories Office – California**
- **Sun Microsystems Laboratories – Massachusetts**

Other Labs at Sun Microsystems

The following labs are available to customers and business partners. They provide an opportunity to test applications on new Sun products, to determine compatibility, scalability and performance.

- Benchmarking and Testing
Sun's Benchmark Center Facilities, located in Hillsboro, Oregon, and Newark, California, can help your organization develop benchmarks, optimize systems, and improve the skills of your HPTC system and network managers. Both Centers provide customer suites, networking, and timeshare on a range of Sun servers and storage.

- Compatibility Testing
Sun's Customer Environment Testing Lab (CET) was developed to provide self-certification testing programs for customers and software developers, so that they can ensure their applications will work properly on new Sun platforms.

- Proof of Concept
Sun iForce Solution Centers provide a setting where Sun and its iForce partners come together with the customer to validate proposed HPTC architectures and test the performance in a setting based on your organization's own data center and network environment. This process can help to accelerate the deployment schedule and reduce the risk involved. The iForce Solution Centers and iForce Partner Centers also offer demonstrations and simulations.

4. Usability Labs
Sun's Usability Labs offer a full range of user-centered design and evaluation services. Their primary mission is to serve Sun's development project teams. However, the usability labs are sometimes available for rent by outside organizations, with or without support services such as recruiting and technical support.

What technology collaborations Are of Interest to Sun?

Sun is interested in ideas and technologies that will have commercial importance in two to five years and will help provide direction to Sun engineering and product groups.

Current areas of interest include Java[tm] technology, Security, Internet, Networking, Software Management & Quality, High Performance Computing, Compilers, Multimedia, Communication, Computer Architecture, and OpenSPARC or OpenSolaris.

We are also interested in learning about interesting technologies we might be missing.

Here is a sample of successful collaborations:

University of California-Los Angeles ~ Embedded Network Sensing
Carnegie Mellon University ~ CMU Parallel Data Consortium
Massachusetts Institute of Technology ~ Kerberos
Virginia Tech ~ Attribute Certificates and Grid Computing
University of British Columbia, Vancouver ~ Self-timed Circuits in Synchronous Processors
University of Michigan ~ NFS for Linux
North Carolina State University ~ Java Based Self Organizing Media
Seoul National University, Korea ~ Instruction Scheduling for ULTRASPARC
University of California, Santa Barbara ~ Quantum Logic Operation
Bologna, Italy ~ Power Estimation for Advanced Microprocessors
Melbourne, Australia ~ Economic Based Brokering and Scheduling Grid Technology
Uppsala, Sweden ~ HPC Efficiency on Parallel Processors

Who Do We Collaborate With?
Sun collaborates with faculty, research directors, and principal investigators at universities, national labs and nonprofit research organizations.

11. Intel

http://www.intel.com/research/labs.htm

The Intel Exploratory Research Network of Labs operates under a model of collaboration between industry and academia. Wholly owned and funded by Intel, these labs also operate in a uniquely open fashion where much of their research is published and shared widely.

Technology and Infrastructure for Emerging Regions (TIER)

The TIER (Technology and Infrastructure for Emerging Regions) project is a multidisciplinary effort that aims to make technology accessible to emerging regions by developing hardware, software and infrastructure that's explicitly designed to address the physical, political and economic realities of those regions. The primary funding for the project comes from the National Science Foundation.

Intel is an active participant in TIER, and one of several companies providing additional financial support. Following is an overview of TIER-related research underway at Intel's Berkeley lab. The focus of the Intel research is on developing novel wireless networking solutions.

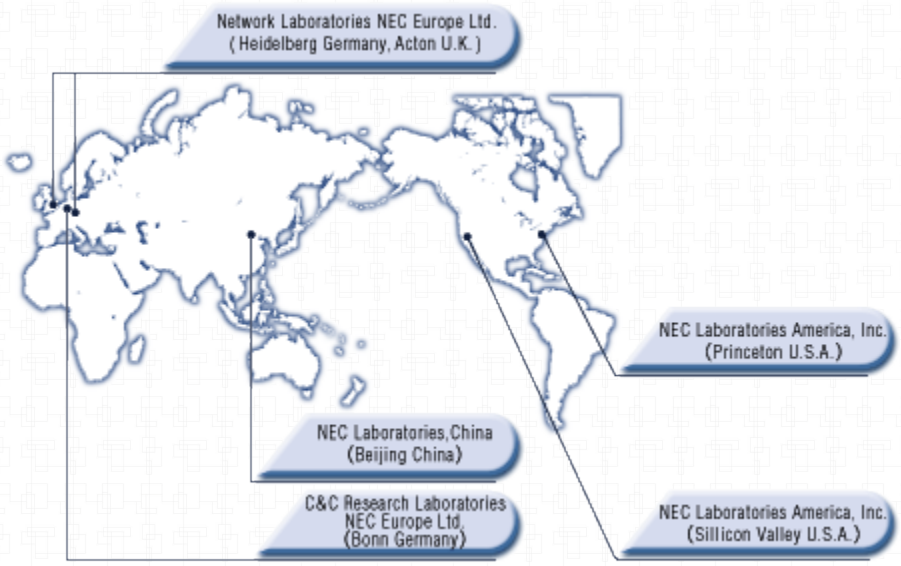
Intel Research Network of Labs

Lab	Research Focus
Berkeley Director: Eric Brewer, Ph.D.	Networks as databases & technology for developing regions: • Sensor Networks • Internet-Scale Services • IT for Developing Regions
Pittsburgh Director: Todd Mowry, Ph.D.	Software for widely distributed systems: • Internet Suspend Resume • Diamond • Open DHT
Seattle Director: James Landay, Ph.D.	New usage models for ubiquitous computing: • Digital Home • Healthcare • Activity Inferencing • Location

12- NEC

http://www.nec-labs.com/

NEC Laboratories has nine domestic research and development facilities as well as six facilities in the United States ,Europe, and China. Approximately 1600 employees in Japan and 250 employees in other countries maintain close links to conduct active research and development activities. The establishment of this global research structure demonstrates NEC's belief in the exchange of ideas while making good use of the specialized knowledge offered by each region.



NEC Laboratories America, Inc. (NEC Labs) is the US-based facility in NEC's global network of research laboratories. It was created in November 2002 as a merger of NEC Research Institute (NECI) and NEC USA's Computer and Communications Research Laboratory (CCRL). The primary focus is on technology research and early market validation in support of NEC's core businesses.

With a staff of approximately 120, NEC Labs operates as a subsidiary of NEC USA with locations in Princeton, New Jersey and Cupertino, California.

Ranked as one of the world's top patent-producing companies, NEC Corporation delivers tailored solutions in the key fields of computers, networking and electronic devices, by

integrating its technical strengths in IT and networks, and by providing advanced semiconductor solutions through NEC Electronics Corporation. The NEC Group employs more than 148,000 people across 293 subsidiaries in 27 countries and had net sales of approximately $45 billion in the fiscal year that ended March 2005.

- NEC Laboratories America, Inc., Princeton, NJ

4 Independence Way
Suite 200
Princeton, NJ 08540
Tel: 609-520-1555

- NEC Laboratories America, Inc., Cupertino, CA

10080 North Wolfe Road
Suite SW3-350
Cupertino, CA 95014
Tel: 408-863-6000

13- Cisco Systems

http://www.cisco.com/

Cisco innovates in many different ways: via technology development and the expansion of technologies after their initial invention, and through adjacent technology and market extension. We also innovate through world-class integration and scaling of acquisitions, by starting new business models, and in the way we partner with other companies.

Culture of Innovation:

- Organic development - $4.07 Billion + spent on R&D in Fiscal Year 2006
- Active acquirer of/investor in innovative start-ups - Cisco has acquired 114 companies since 1993
- US R&D facilities in San Jose, CA; Boxborough, MA; Richardson, TX; Lawrenceville, GA and Raleigh, NC

- Other major R&D facilities in Bangalore, India; Shanghai, China; Herzliya, Israel; Tokyo, Japan and Galway, Ireland; Smaller facilities in North America, Europe and Asia

14. SAP

http://www.sap.com/company/saplabs/index.epx

SAP Labs researches, designs, and delivers leading-edge software solutions that enhance and extend mySAP Business Suite.

By creating knowledge, encouraging innovation, and investing in people and technology, SAP Labs develops solutions that enable SAP customers to improve their business processes and achieve their business objectives.

SAP Labs represents a dynamic community within SAP's global research and development organization, sharing insights and promoting creativity on a worldwide basis. With operations around the world, SAP Labs integrates ideas and leading-edge technologies that address the needs of specific industries and geographic regions, and keep SAP and our customers at the forefront of business success.

Creating knowledge. Driving innovation. Achieving results. At SAP Labs, it's what we do every day.

To learn more, visit SAP Labs in your region:

- SAP Labs Bulgaria
- SAP Labs Canada
- SAP Labs China
- SAP Labs Hungary
- SAP Labs India
- SAP Labs Israel
- SAP Labs U.S.

15. Hitachi

http://www.hqrd.hitachi.co.jp/global/

Research in the R&D Group is conducted in the six corporate laboratories. The R&D Group also works in close cooperation with Business Group R&D and overseas R&D organizations.

Corporate R&D Worldwide

Hitachi Europe Ltd.

Corporate Technology Group - Headquarters

Whitebrook Park,
Lower Cookham Road
Maidenhead, Berkshire SL6 8YA, U.K.

Hitachi Cambridge Laboratory
Location: Cambridge, U.K.
Research Areas: Spintronics, Quantum Communications, Organic Electronics

Hitachi Dublin Laboratory
Location: Dublin, Ireland
Research Area: Numerical Analysis

Hitachi Sophia Antipolis Laboratory
Location: Sophia Antipolis, France
Research Areas: Mobile Communications, Security

Automotive Research and Development Laboratory
Location: Munich, Germany & Paris, France
Research Area: Automotive Systems

Hitachi America, Ltd.

Research & Development Division - Headquarters
3403 Yerba Buena Road(Office#2240-06)
San Jose, CA 95135, U.S.A.

Automotive Products Research Laboratory

Location: Farmington Hills, Michigan

Research Areas: Engine Control Systems,
Car Navigation Systems,
Production Process Technologies

Wireless Systems Research Laboratory

Location: San Jose, California

Research Area: Advanced Broadband Wireless Systems

SAN Solutions Laboratory

Location: Santa Clara, California

Research Areas: Next-generation Storage Solutions,
Life-cycle Data Management Architecture

Hitachi (China) Research & Development Corporation

Beijing Research Institute

North Wing 301 Tower C,
Raycom Infotech Park,
2 Kexueyuan Nanlu,
Haidian District, Beijing 100080, China

IP Network System Laboratory

Location: Beijing

Research Areas: Next-generation Mobile IP Network Systems & Applications

Open System Software Laboratory

Location: Beijing

Research Areas: Open Source Software Development Tools, Engineering for Offshore Development

Ubiquitous Platform Development Laboratory (Beijing branch)

Location: Beijing

Research Areas: Digital Appliances, Image & Storage Media

Shanghai Research Institute

Ruijin Building 2610,
205 Maoming Nan-lu,
Luwang District, Shanghai 200020, CHINA

Ubiquitous Platform Development Laboratory

Location:	Shanghai
Research Area:	Digital Television Systems

Innovative Systems & Materials Laboratory

Location:	Shanghai
Research Areas:	Automotive Components & Materials, Innovative Software, Future TV System Technology

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Digital Appliances Development Center

Ruijin Building 2610,
205 Maoming Nan-lu,
Luwang District, Shanghai 200020, CHINA

Location:	Shanghai
Research Area:	Digital Television Software Development, Market & Technology Survey

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Development Center for Home Appliances

6#40B Jinqiao Export Processing Zone,
No. 1765 Chuanqiao Road, Shanghai 201206, CHINA

Location:	Pudong New District, Shanghai
Research Area:	Air-conditioning System Design

Hitachi Asia Ltd.

Research & Development Centre

16 Collyer Quay,
#20-00 Hitachi Tower,
Singapore 049318

Hitachi Storage Mechanics Laboratory

Location: Singapore

Research Area: Hard Disk Drives

17. Oracle

www.oracle.com

Oracle is currently participating in a number of R&D projects that are contributing to the development of new and better computing architectures. Competency development and research funding, tests, proofs of concept and use-case validation are amongst the key activities Oracle runs within the R&D sector, both in Applied and Fundamental Research.

A major part of the research is around building a reliable, dynamic and flexible IT infrastructure where applications and services can be used in a modular, functionality-driven and secure way. Grid computing is now mature enough for many organizations to start to benefit from it, but there remain many challenges to overcome before we have truly mastered the art of computing in very large distributed environments. For example, Oracle and its R&D partners are currently investigating better ways to enable virtualisation and orchestration, paving the way for improved Service Oriented Architectures (SOA) and Event-Driven Architectures.

Oracle R&D centers are located in USA Europe, India, China, Israel

The newest is the Oracle Research & Development Center in Shenzhen Hi-Tech Industrial Park,

18. Nokia

http://research.nokia.com

There are more than 1100 of us, researchers, engineers and scientists, working in the Nokia Research Centers and Lablets that Nokia maintains around the globe. We have a variety of personal and technical backgrounds, but we are all working on research issues relating to mobilility of voice and data, management and communications.

Nokia Research Center (NRC) is a separate unit within Nokia, not attached to anyone of the specific product development business units.

Nokia Labs Locations

Nokia Research Center, Beijing

- Nokia House1
  No.11, Hepingli Dongjie
  100013 Beijing
  CHINA

  Tel. +86 10 6539 2828 Fax +86 10 8421 0595

Nokia Research Center, Bochum

- Nokia GmbH
  Nokia Research Center
  Meesmannstrasse 103
  D-44807 Bochum
  GERMANY

  Tel. +49 234-984-0

Nokia Research Center, Budapest

- Nokia Hungary Kft.
  Nokia Research Center
  H-1092 Budapest
  HUNGARY

  Köztelek u. 6
  City Gate Building II
  7-8th floors

  Tel. +36 20 977 7797 Fax +36 20 963 8405

Nokia Research Center, Cambridge

- 3 Cambridge Center
  2nd Floor
  Cambridge, Massachusetts
  United States
  02142

  Tel. +1 617 453 2300 Fax +1 617 225 0480

Nokia Research Center, Helsinki

- Visiting address:
  Itämerenkatu 11-13
  FIN-00180 Helsinki

  Postal address:
  P.O. Box 407

FIN-00045 NOKIA GROUP, FINLAND

Tel. +358 7180 08000 Fax +358 7180 37306

Nokia Research Center, Palo Alto

- 955 Page Mill Road,
  Suite 200
  Palo Alto, California
  United States
  94304-1003

  Tel: +1-650-496-4400 Fax: +1-650-739-0779

Nokia Research Center, Tampere

- Visiting address:
  Visiokatu 1
  FIN-33720 TAMPERE

  Postal address:
  P.O. Box 100
  FIN-33721 TAMPERE
  FINLAND

  Tel. +358 7180 08000 Fax +358 7180 35703

Nokia Research Center, Toijala Project

- Sampolantie 5
  FIN-37800 TOIJALA
  FINLAND

  Tel. +358 3 541 8840 Fax +358 3 542 1390

Nokia Research Center, Tokyo

- Nokia Research Center
  Nokia Japan Ltd.

17th Floor, Arco Tower,
Shimomeguro 1-8-1 Meguro-ku,
Tokyo, 153-0064, JAPAN

Phone : +81 3 5759 7001 Fax : +81 3 5745 7934

19. Thales Group, France

http://www.thalesgroup.com

Thales represents an annual investment of around EUR1.9bn. More than 20,000 researchers work on cutting-edge technologies for civil and military applications, producing approximately 250 inventions per year. Thales boasts a patent portfolio of more than 12,000 references, and has over 30 ongoing cooperation agreements with universities and public research laboratories in Europe, the United States and Asia.

The Group has several technological research laboratories, particularly in:

- France,
- United Kingdom
- Netherlands.
- The Orsay (France)
- Reading (UK) establishments are managed directly from corporate level.

The main areas of research are as follows:

- architecture of software-intensive systems (re-use, security, etc.)
- new communication technologies (IP, software radio)
- system intelligence (intelligent agents, □pitomizes□s, data fusion)
- signal processing for detection (radar, sonar, electronic warfare) and communications; algorithms (encryption)
- microwave materials and components (III/V) for optics and opto-electronics, displays (LCD, polycrystalline silicon), magnetism (superconductors)
- software technologies (middleware, high-level languages)
- computational software for physical □pitomiz (antennas, analog circuits) and system modeling
- system engineering, software and hardware engineering for complex, high-security, high-reliability products.

20. Symantec

http://www.symantec.com/about/profile/business.jsp

At research and development facilities around the world, more than 3500 Symantec engineers are building solutions to help individuals and enterprises assure the security, availability, and integrity of their information. Below is an overview of the technology currently available from Symantec.

As Symantec's research organization, Symantec Research Labs ensures the company's long-term leadership through innovation, generation of new ideas, and development of next-generation technologies. Projects include both long-term investigations and shorter term innovations that provide immediate benefit to customers across all of Symantec’s businesses.

Symantec has facilities in 40 countries, with research and development facilities located in:

- Australia
- Belgium
- Canada
- China
- Germany
- India
- Ireland
- Israel
- Japan
- New Zealand
- United Kingdom
- United States:
    - California
    - Colorado
    - Florida
    - Maryland
    - Massachusetts
    - Minnesota

  - Oregon
  - Pennsylvania
  - Texas
  - Utah
  - Virginia
- Symantec has a number of Security Operations Centers and Security Response Labs around the world, providing 24x7 information security expertise
- Symantec also has more than 25 Support Centers globally, helping individuals and enterprises with their security and availability needs.
- Symantec's primary manufacturing facility is located in Dublin, Ireland.
- Symantec has 260 issued U.S. patents in technologies addressing security, systems management, and storage needs for consumers, small businesses, and enterprises.

ملحق-3

Independent
R&D Centers and Test Laboratories
for the
ICT industry

مراكز البحث والتطوير والمختبرات المستقلة
العاملة في مجال صناعة تقنية المعلومات والاتصالات

الجزء-1: مراكز ومعامل البحث والتطوير المستقلة
الجزء-2: منظمات المقاييس العالمية
الجزء-3: مختبرات ومعامل الفحص المستقلة

Part-1
Independent R&D Centers and Laboratories

الجزء-1 (من ملحق-3)
مراكز ومعامل البحث والتطوير المستقلة

DataPlex, Inc

http://www.dataplex.com/

DataPlex, Inc. is a high-technology consulting firm comprised by experienced engineers & scientists, dedicated to finding high-quality systems, engineering and intellectual property solutions for their clientele, on time and on budget. DataPlex is based in Los Angeles, California and has clients in North America, Europe and the Far East.

Besides providing R&D and other engineering services, DataPlex also develops hardware and software products both for its clients and for itself.

Eurescom

http://www.eurescom.de/

Eurescom is the leading organization for managing collaborative R&D in telecommunications. Our mission is to provide efficient management and support of R&D projects, programs, and initiatives for our customers.
We offer 15 years of experience in managing large-scale, international R&D for major industry players, the European Commission, and EUREKA Cluster program CELTIC.
What distinguishes Eurescom is the combination of a secure, reliable infrastructure for collaborative work, a large European network of experts, and internationally outstanding project management skills.

Fraunhofer IESE

http://www.iese.fhg.de/fhg/iese/

Fraunhofer IESE in Kaiserslautern currently has 200 employees who perform research in the areas of software development, software quality management, and software competence management.

To a large extent, Fraunhofer IESE owes its worldwide reputation to the international cooperation with other research institutions and project partners, which by now comprises five continents:

- North America, with our sister organization “Fraunhofer Center Maryland FC-MD”, in close cooperation with the University of Maryland and many partners from the International Software Engineering Research Network (ISERN) in the U.S. and Canada
- Europe, with numerous strategic projects (e.g., with Hungary in the area of “Ambient Intelligence”)
- Asia, with the focus on Japan, India and China
- Australia, with our close cooperation with the National ICT Center of Australia (NICTA)
- South America, with our partners within ISERN

KDDI R&D Laboratories

http://www.lab.kdd.co.jp/eng/index.html

We conduct:

・ Commissioned of R&D projects

・ Products development and technical support

・ Education, training, and consulting in the field of telecommunications systems

・ Provision of intellectual property rights, including patents and copyrights

・ Direct sales of products, disclosure, and transfer of technology resulting from our research

Our Research areas:

- Multimedia Applications
- Mobile-Wireless
- IP Networking
- Photonic Networking
- Ubiquitous Networking

Battelle

http://www.battelle.org

Battelle is a global science and technology enterprise that develops and commercializes technology and manages laboratories for customers. Headquartered in Columbus, Ohio, we have a vast science and technology reach. With the national labs we manage or co-manage, we oversee 20,000 staff members and conduct $3.7 billion in annual research and development.

Battelle has major technology centers, specialized facilities, affiliations, subsidiaries, and offices worldwide.

International Office Locations

- Geneva, Switzerland:
  - Environment
  - AgriFood
- Havant, United Kingdom
- Kiev, Ukraine
- London, England
- Mexico City, Mexico
- Moscow, Russia
- Ongar, United Kingdom
- Slavutych, Ukraine
- Tokyo, Japan

Rydal Research and Development

http://www.rydalresearch.com/

Since 1998 Rydal Research and Development, Inc. has been carrying out research and development in advanced networking and computing technologies for use in tomorrow's high-performance processing and communications systems.

Rydal is closely associated with a number of universities and government and private research laboratories in the region. This association provides Rydal Research with access to a full range of state-of-the-art design, development, modeling, simulation, and measurement tools for the analysis and development of advanced networking and processing components and systems. Resources include HP-Eesof CAD tools such as

MWSPICE and Libra for high frequency circuit simulation and OMNISYS for systems level modeling of analog signals. Synopsis and Mentor Graphics are available for complete VHDL digital circuit synthesis, simulation, custom IC layout, and PC board layout. Complete facilities for digital and analog hardware development and characterization including analog network analysis to 50 GHz and digital analysis up to 12 Gb/s in both the electrical and optical domains are available.

Rydal Research is an original sponsoring member of the RapidIO Trade Association and an active participant in Trade Association activities.

Part-2

Global Standards for ICT

الجزء-2 (من ملحق-3)
منظمات المقاييس العالمية

Several independent labs exist to serve OEMs and vendors working with global standards for the ICT industry. Below is a list of the most important global standards for ICT industry. Following this will be a list of the most important testing labs that does compliance testing and work for OEM under these standards.

1. PCI-SIG Standards

http://www.pcisig.com/home

Formed in 1992, the PCI-SIG is the industry organization chartered to develop and manage the PCI standard. With over 900 members, the PCI-SIG effectively places ownership and management of the PCI specifications in the hands of the developer community.

Peripheral component interconnect (PCI) delivers I/O functionality for computers ranging from servers to workstations, PCs, laptop PCs and mobile devices. PCI is also a standard, relying on a high-performance I/O interconnect to transfer data between a CPU and its peripherals.

2. USB-IF Standards

http://www.usb.org/home

USB Implementers Forum, Inc. is a non-profit corporation founded by the group of companies that developed the Universal Serial Bus specification. The USB-IF was formed to provide a support organization and forum for the advancement and adoption of Universal Serial Bus technology. The Forum facilitates the development of high-quality compatible USB peripherals (devices), and promotes

the benefits of USB and the quality of products that have passed compliance testing. Some of the many activities that the USB-IF supports include:

- USB Compliance Workshops
- USB compliance test development
- www.usb.org Web site
- USB pavilions at CES, CeBIT, IDF, WinHEC, and other events
- Marketing programs and collateral materials, such as retail newsletters, retail salespeople training, store end-caps, etc.
- USB Developer Conferences
- and many more...

3. RapidIO Standards

http://www.rapidio.org/home

RapidIO technology is an established, scalable, packet-switched, high-performance fabric specifically developed to address the needs of equipment designers in the wireless infrastructure, edge networking, storage, scientific, military and industrial markets. Under active development since June 1997, the RapidIO standard represents continued commitment of the RapidIO Trade Association to addressing the needs of the ever changing networking and communications marketplace.

4. PCMCIA Standards

http://www.pcmcia.org

PCMCIA (Personal Computer Memory Card International Association) is an international standards body and trade association with over 100 member companies that was founded in 1989 to establish standards for Integrated Circuit cards and to promote interchangeability among mobile computers where ruggedness, low power, and small size were critical. As the needs of mobile computer users has changed, so has PCMCIA. By 1991, PCMCIA had defined an I/O interface for the same 68 pin connector initially used for memory cards. At the same time, the Socket Services Specification was added and was soon followed by the Card Services Specification as developers realized that common software would be needed to enhance compatibility.

5- Wi-Fi Alliance

http://www.wifialliance.com/

In 1999, several industry leaders came together to form a global, non-profit organization with the goal of driving the adoption of a single worldwide-accepted standard for high-speed wireless local area networking. We are that organization. We are known as the Wi-Fi Alliance.

Today, with more than 300 members and growing, common goals still bind us together.

As Wi-Fi networks continue to expand through businesses, homes, and now public hotspots that provide wireless access locations for people on the go, compatibility is critical. At the Wi-Fi Alliance we develop universal specifications and follow through with rigorous testing and Wi-Fi certification of wireless devices. The end result leads to the confidence that both home and enterprise users need to continue to embrace Wi-Fi.

To date we have certified the interoperability of more than 3,300 products. There is more, however, to Wi-Fi Alliance than interoperability. We work to provide Wi-Fi users with the information they need to make decisions about today's Wi-Fi systems. Whether you are a tech-savvy IT director, a security-minded CIO, or a home user intrigued by Wi-Fi possibilities, our aim is to provide the information you need to proceed with confidence and peace of mind.

6- The Linux Foundation

http://www.linux-foundation.org/en/Main_Page

The Linux Foundation is a nonprofit consortium dedicated to fostering the growth of Linux. Founded in 2007 by the merger of the Open Source Development Labs and the Free Standards Group, it sponsors the work of Linux creator Linus Torvalds and is supported by leading Linux and open source companies and developers from around the world. The Linux Foundation promotes, protects and standardizes Linux by providing unified resources and services needed for open source to successfully compete with closed platforms.

The Linux Foundation protects the future of Linux by employing key Linux developers like Linus Torvalds so they can maintain independence while working

full time to improve Linux. The LF also offers legal protection services for developers to safeguard the future of Linux.

The Linux Standard Base delivers interoperability between applications and the Linux operating system. Currently all major distributions comply with the LSB and many major application vendors, like MySQL, RealNetworks and SAP, are certifying. The LSB offers a cost-effective way for application vendors to target multiple Linux distributions while building only one software package. For end-users, the LSB and its mark of interoperability preserves choice by allowing them to select the applications and distributions they want while avoiding vendor lock-in. LSB certification of distributions results in more applications being ported to Linux and ensures that distribution vendors are compatible with those applications. In short, the LSB ensures Linux does not fragment.

7- IEEE

www.ieee.org

The IEEE is a leading developer of standards that underpin many of today's technologies. Our standards are developed in a unique environment that builds consensus in an open process based on input from all interested parties. With nearly 1,300 standards either completed or under development, we are a central source of standardization in both traditional and emerging fields, particularly telecommunications, information technology and power generation

IEEE standards encompass a striking range of industries. They address significant topics in high-impact technologies, whether for existing infrastructures basic to our society or disciplines that promise to change the nature of our world. Some of the fields our standards cover are:

Information technology
Power and energy
Instrumentation and measurement
Internet best practices
Mobile and stationary batteries
Nanotechnology
Organic electronics
Telecommunications, especially wired and wireless networking for personal, local and metropolitan area networks
Transportation safety, especially highway communications and rail safety

Part-3

الجزء-3 (من ملحق-3)

Independent Test Laboratories

مختبرات ومعامل الفحص المستقلة

Intertek

25 Savile Row,
London W1S 2ES, UK
http://www.intertek.com/

Phone:
Americas :+1 800 967 5352 EMEA :+44 20 7396 3400
Asia Pacific :+852 2173 8888

Intertek Group plc (ITRK), a global leader in testing, inspection and certification services, operates over **250 laboratories and 510 offices in more than 99 countries throughout the world.** The ETL SEMKO division of Intertek provides access to global markets through its local services including product safety testing and certification, EMC testing and performance/benchmark testing.

The Information Technology (IT) market is one of the most competitive hardware markets in the world. Where time to market is critical, our global network of laboratories will help you get new products to market faster. Whether you are a manufacturer, importer or retailer of IT equipment, Intertek's ETL SEMKO division can help you fulfill mandatory requirements and increase your advantages in the market.

Examples of Information Technology Equipment Intertek tests:

- Computers such as desktop PCs, notebook/laptop PCs, PDAs, and pocket PCs
- Peripherals such as keyboards, mice, scanners, printers, LCD/CRT monitors, CCTV monitors, projectors, CD/DVD ROM drives, digital cameras, mobile phones, plasma displays, and multimedia speakers

- Power supply units
- Office equipment such as fax machines, paper shredders, photo printers, copy machines, calculators & access points.
- Telecommunications devices such as telephones/cordless phones, hubs, modems/xDSL modems, routers, KTS/PABXs.

Aculab

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http://www.aculab.com/

Aculab offers solution providers a wide range of hardware and software building blocks for integration into high performance, wired and wireless communications solutions. Products for use in telco or enterprise platforms incorporate digital network access and media processing resources, in both PSTN and IP environments.

International offices

Aculab location	Address	Contact information	Support contact information
Australia	PO Box 516 Lilydale Victoria 3140 Australia	t: +61 3 9735 5796	t: +61 3 9735 5796 support@aculab.com
Germany	Garmischer Str.8, D-80339 Munich, Germany	t: +49 89 5080 710 f: +49 89 5080 7177	t: +49 (0)89 508071-15 support.gmbh@aculab.com
USA	197 First Avenue, Suite 130, Needham, MA, 02494, USA	t: +1 781 433 6000 f: +1 781 433 6099	t: +1 781 433 6060 support@aculab.com

Schweitzer Engineering Laboratories, Inc

2350 NE Hopkins Court – Pullman, WA 99163
Phone: +1.509.332.1890 – Fax: +1.509.332.7990
http://www.selinc.com/index.html

SEL relays, communications processors, meters, fiber optics, and software products are the roots of complete integrated solutions. More than 45 SEL Technical Service Centers around the world provide the best customer service and sales support in the industry.
Our Systems and Services Division delivers innovative solutions worldwide, including integration architectures, relay coordination and settings, model power system studies and simulations, and complete substation control, protection, and automation solutions. Drop-in control houses provide a cost- and space-efficient integrated system solution.

MCCI

Judy Cone
3520 Krums Corners Road
Ithaca, NY 14850
Tel: 607 277-1029
Fax: 607 277-6844
Email: jlc@mcci.com
URL: www.mcci.com

As one of the six test labs certified by USB-IF, MCCI can quickly and authoritatively test devices for USB logo certification. Our test lab also lets us perform WHQL testing for our customers. MCCI's engineering capabilities allow us to help in diagnosing failures and recommending solutions.

Headquartered in Ithaca, New York, MCCI is a privately held corporation with offices around the world. **Local application engineering and support is available in China, Korea, Taiwan, Japan, and Europe, in addition to the United States.**

Allion Computer Inc.

Mr. Summer Chien
9F, No. 3-1, Yuan Ku Street
Taipei, Taiwan 11543, R.O.C.
Tel: +886-2-2655-7877
Summer Chien's Ext. 1850
Fax: +886-2-2655-7879
Email: sales@allion.com
URL: www.allion.com

Allion Japan Lab
URL: www.allion.co.jp

Allion Computer Inc. is the world leading Information Technology (IT) testing organization to conduct testing services in multiple regions of Asia and North America. Headquartered in Taiwan, Allion connects to worldwide IT developers by providing outstanding and cost-effective testing solutions.

Established in 1991, Allion has been in the forefront with advances in the IT industry and has tested thousands of products in categories such as desktop computers, notebook computers, multi-media devices, networking & wireless devices, mobile devices, digital home appliances, peripherals, software applications and more. Aiming at each stage throughout new product development, Allion is able to generate customizable test plan with exceptional technical expertise for high level efficiency. Moreover, Allion is qualified by some of the world's top standard organizations such as PCMCIA, USB-IF, Wi-Fi Alliance and more to conduct official certification programs in Asia. For nearly 15 years, Allion excelled as the primary gatekeeper for product quality control and have become the most trusted business partner for significant numbers of top IT product developers.

Professional Multimedia Testing Centre (PMTC)

Johan Craeybeckx
Wetenschapspark 5,
3590 Diepenbeek
Belgium
Tel: +32 11 30 36 53
Fax: +32 11 30 36 90
Email: johan@pimc.be
URL: www.pmtctest.com

The PMTC testing procedures are the result of years of practical experience and technical know-how. They combine the expertise of testing over a thousand of multimedia titles and products since 1992 with a solid knowledge of industry standards, specifications and guidelines.

Over the years, PMTC has built up a wide experience in the field of hardware testing. As a test centre, we incorporate 3 major qualifications:

Independent
Professional
Experienced

The combination of our testing experience with profound market-end product knowledge enables us to perform hardware tests for a very wide range of products. This experience has lead PMTC to perform a number of Certification and Pre-Certification programs.
The table below provides an overview which programs PMTC currently can cover: (further info you can obtain by clicking the corresponding menu buttons on the left)

Official Certification
USB certification: for all products
IEEE 1394(firewire)

Pre-Certification and Compliance testing
DLNA
IEEE-1394(firewire)
Javaverified
PCI Express
SATA
WHQL
WI-FI
USB certification: for all products

In-depth test services
USB Spec Compliance
USB Electrical
USB Extended Interoperability
WIFI

NSTL, Inc.

Ted Erfer
670 Sentry Parkway
Blue Bell, PA 19422
Tel: 610 832-8413
Fax: 610 941-6705
Email: ted@nstl.com
URL: www.nstl.com

For three decades, the innovators of technology have trusted NSTL with testing and certifying their most important products. Our clients, many of whom who have been with us for more than 20 years, rely on our deep technical expertise, our flexibility and scalability and our global reach to ensure that their products are tested to the highest standards and that time to market is optimized.

Technology Expertise

Our technology expertise covers the mobile, PC and digital living markets. We bring specific technical expertise to all of our certification and QA programs and of equal importance; we have established procedures that ensure our ability to quickly and effectively master new technologies.

Worldwide Reach

With locations in the United States and Canada, the United Kingdom and Europe, the Asia-Pacific region and in India and South America, enjoy convenient access to NSTL.

One-stop to Market

Because we can handle pre-testing, QA, consulting and multi-platform certifications in just one stop, you save money when you partner with us — and you get your application or hardware to market faster than ever before.

A History of Successful Certification Program Partnerships

NSTL has tested thousands of competing products and has gained a reputation for unmatched independence and objectivity. This reputation has positioned NSTL as the IT industry's premier certification lab.

GLOBAL LOCATIONS :

With locations throughout the world, access to NSTL couldn't be easier. Select from one of the international regions below to get in touch with the NSTL location nearest you.

In North America:

United States (NSTL Headquarters)
Canada

In South America:
Brazil
In the Asia-Pacific Region:
Taiwan, China, Japan
In Europe:
UK, Germany, Austria, Switzerland
Other locations:
India

National Technical Systems (NTS)

Dat Nguyen
Tel: 714 879-6110
Fax: 714 879-6117
1536 E. Valencia
Fullerton, CA 92831-4797
E-mail: dat.nguyen@ntscorp.com
http://www.ntscorp.com or http://www.ntslabs.com

NTS provides a full range of integrated engineering services and technical solutions, product testing and design for compliance, regulatory standards compliance testing and evaluation, project management, technical resources, engineering solutions and managed services. NTS is globally accredited by leading regulatory agencies, providing cost-effective programs that help our clients meet their clients' requirements. NTS has testing laboratories and engineering services offices located throughout North America, Europe and Asia, offering the most skilled technical services possible from the largest independent testing laboratory in the world.

NTS provides a wide range of hardware and software services to the computer industry. From software and automation testing for enterprise environments, to programming test suites to validate development code, no one else provides our breadth of services. These include programming, compatibility, functionality, interoperability testing, establishing benchmarks, performance testing, load/stress testing, usability analysis, test plan development, system comparison and much more. NTS routinely provides highly skilled, high-tech professionals for premier technology companies just when they need them for as long as they need them. We have an extensive multi-million dollar hardware and software library that is continuously updated so that we can verify product and software compatibility, compliance and performance to international standards and user requirements including USB and WHQL certification.

- Software and Automation Testing for Enterprise Environments

- Development Code Validation
- Extensive Software Library for Interoperability Testing
- USB and WHQL Certification
- CE Marking
- Game Console Functionality, including the Xbox
- ZigBee Compliant Platform Certification
- Contract Design Engineers and Programmers

RIOLAB

http://www.rio-lab.com/
RIOLAB™ - RapidIO Interoperability Lab
349 Terry Fox Drive
Kanata, Ontario
Canada K2K 2V6.
Telephone: +1 613 271-9636

RIOLAB is a state-of-the-art, independent testing facility that provides the **RapidIO** eco-system with device interoperability and specification compliance testing to meet the growing needs of silicon vendors and OEMs. Originally launched in February 2006 by Tundra Semiconductor Corporation, RIOLAB is now a division of Fabric Embedded Tools Corporation, and continues to receive overwhelming support from the RapidIO eco-system including Ericsson, Freescale Semiconductor, Lucent Technologies, Texas Instruments, Xilinx, and other members of the RapidIO Trade Association Steering Committee, industry experts, and OEMs.

Wi-Fi Alliance R&D Laboratory

2475 De La Cruz Blvd.
Santa Clara, CA 95050 USA
Phone: +1 (408) 988-8395
http://www.wi-fi.org/
(new)

Agilent Technologies

Agilent Technologies, Inc. Headquarters
5301 Stevens Creek Blvd
Santa Clara , CA 95051
United States

phone +1 (877) 424 4536 fax +1 (650) 752 5300
http://www.agilent.com/labs/

Agilent Laboratories is a world-leading industrial-research center whose purpose is to power Agilent Technologies' growth through breakthrough technologies. Labs focuses on Agilent's future to ensure leadership in Agilent's existing businesses and to provide technology foundations that can create new businesses for the company going forward.

Agilent Laboratories is a global organization. The majority of research is located in Santa Clara, Calif., with additional sites in Europe in Leuven, Belgium, and South Queensferry, Scotland; in Asia in Beijing, China; and in the United States in Everett, Wash.

Underwriters Laboratories

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http://www.ul.com/

Underwriters Laboratories Inc. (UL) is an independent, not-for-profit product safety certification organization that has been testing products and writing Standards for Safety for over a century. UL evaluates more than 19,000 types of products, components, materials and systems annually with 21 billion UL Marks appearing on 71,000 manufacturers' products each year. UL's worldwide family of companies and network of service providers includes 66 laboratory, testing and certification facilities serving customers in 104 countries.

UL is the trusted source across the globe for product compliance. Benefiting a range of customers - from manufacturers and retailers to consumers and regulating bodies - we've tested products for public safety for more than a century.

Information Technology Equipment (ITE) Services

UL's integrated testing and certification solutions for information technology equipment manufacturers.

- Effective Date
- EMC (electromagnetic compatibility) services
- NEBS (Network Equipment Building Systems) testing
- Management system registrations to ISO 9001, ISO 14001 and TL 9000
- Laser testing to safety standards IEC 60825-1/60825-2
- Supply chain inspection services

Telecommunications Equipment Services

- UL's Integrated Services for the Telecommunications Industry
- UL Categories and Standards Related to the Telecom Industry
- NEBS Testing Services
- TCB Program
- Conformity Assessment Body Program
- Terminal Attachment
- Special Services
- EMC Services
- Fire Testing Services (NEBS, GR-487-CORE, Wire and Cable, Raceway Systems, etc.)
- TL9000 Quality Management
- Hazardous Locations Equipment
- GR-63-CORE Fire Resistance Criteria for Electronic Components; Requirement R4-31

ملحق-4

Information & Communications Technology Parks around the Globe

مجمعات تقنية المعلومات والاتصالات حول العالم

الجزء-1: جميع مجمعات تقنية المعلومات والاتصالات حول العالم
الجزء-2: مجمعات تقنية المعلومات والاتصالات العالمية الرائدة ومراكز البحث والتطوير والمختبرات بها

Part-1 الجزء-1 (من ملحق-4)

ICT Parks Around the World جميع مجمعات تقنية المعلومات والاتصالات حول العالم

IASP members operating within the:
ICT / Media and Multimedia / Telecommunications sector: 151

Name	Country	Member Category
22@Barcelona	Spain	Full Member
Aberdeen Science and Technology Park	United Kingdom	Full Member
Adelaide University Research Park	Australia	Full Member
Agenzia per lo Sviluppo SPA - BIC in Trentino	Italy	Full Member
Alatau IT City	Kazakhstan	Full Member
ANKARA CYBERPARK - Ankara Technology Development Zone	Turkey	Full Member
AREA Science Park	Italy	Full Member
Associação Parque de Ciência e Tecnologia Almada/Setúbal - Madan Parque	Portugal	Full Member
Athena High Technology Incubator Ltd.	Cyprus	Full Member
Atlanpole, the Nantes Atlantique Technopole and Business Incubator	France	Full Member
Attica Technology Park <Leukippos>	Greece	Full Member
Auckland University of Technology - Technology Park	New Zealand	Full Member
Australian Technology Park	Australia	Full Member
Brisbane Technology Park	Australia	Full Member
Cambridge Science Park	United Kingdom	Full Member
Cartuja 93 Science and Technology Park	Spain	Full Member
CERT Technology Park	United Arab Emirates	Full Member
Chungbuk Technopark Foundation	Korea	Full Member

Consorzio Ventuno - POLARIS Parco Scientifico e Tecnologico della Sardegna	Italy	Full Member
Corporación Parque Tecnológico Sartenejas	Venezuela	Full Member
CREALYS®- Science Park of the Province of Namur	Belgium	Full Member
Daedeok Innopolis	Korea	Full Member
Dhahran Techno-Valley	Saudi Arabia	Full Member
Ester Limoges Technopole	France	Full Member
Forskningsparken As	Norway	Full Member
Futuroscope Poitiers Technopoles	France	Full Member
Guilan Science and Technology Park (GSTP)	Iran	Full Member
Hong Kong Science and Technology Parks	China	Full Member
i4G - Incubation for Growth - Euroconsultants S.A.	Greece	Full Member
ICICI Knowledge Park	India	Full Member
Ideon Science Park	Sweden	Full Member
Innovation Place Research Park	Canada	Full Member
IT Fornebu AS	Norway	Full Member
Joensuu Science Park Ltd.	Finland	Full Member
Jyväskylä Science Park	Finland	Full Member
Khorasan Science and Technology Park - KSTP	Iran	Full Member

Kilometro Rosso Science Park	Italy	Full Member
Kista Science City	Sweden	Full Member
Klaipeda Science and Technology Park	Lithuania	Full Member
Konya Teknokent Technology Development Services	Turkey	Full Member
Krakow Technology Park	Poland	Full Member
Kulim Technology Park Corporation Berhad	Malaysia	Full Member
Kyoto Research Park	Japan	Full Member
Lahti Science and Business Park Ltd.	Finland	Full Member
La Trobe Research & Development Park	Australia	Full Member
Latvian Technology Park	Latvia	Full Member
Laval Mayenne Technopole	France	Full Member
LAVAL TECHNOPOLE	Canada	Full Member
Lispolis-Polo Tecnologico de Lisboa	Portugal	Full Member
Macquarie University Research Park	Australia	Full Member
Metz Technopôle	France	Full Member
Mjärdevi Science Park	Sweden	Full Member
Multimedia Development Corporation (MDeC)	Malaysia	Full Member
Nanjing New and High Technology Industry Development Zone	China	Full Member
Ortadogu Teknopark AS	Turkey	Full Member

Sicilia, S.C.P.A.		
Parc Tecnològic del Vallès, S.A.	Spain	Full Member
Pardis Technology Park	Iran	Full Member
Parque Científico-Tecnológico de la Universidad de Alcalá, S.A.U.	Spain	Full Member
Parques Tecnológicos de Castilla y León, S.A.	Spain	Full Member
Parque Tecnológico de Álava-Arabako Teknologi Parkea, S.A.	Spain	Full Member
Parque Tecnológico de Andalucía	Spain	Full Member
Parque Tecnológico de Bilbao	Spain	Full Member
Parque Tecnológico Misiones	Argentina	Full Member
Pólo Científico e Tecnológico da Madeira, Madeira Tecnopolo, S.A.	Portugal	Full Member
Polo Tecnologico di Navacchio	Italy	Full Member
Poznan Science and Technology Park, Adam Mickiewicz University Foundation	Poland	Full Member
Purdue Research Foundation	United States	Full Member
Québec Metro High Tech Park	Canada	Full Member
Research Triangle Foundation of North Carolina	United States	Full Member
Riverside Corporate Park	Australia	Full Member
Rooyesh ICT Incubator	Iran	Full Member
San Sebastian Technology Park	Spain	Full Member

Science and Technology Park of Gijón	Spain	Full Member
Scion-DTU a/s	Denmark	Full Member
SEPIVA (València Parc Tecnològic)	Spain	Full Member
Servitec srl	Italy	Full Member
Shanghai Hongqiao Linkong Economic Zone	China	Full Member
Shanghai Zhangjiang Hi-Tech Park	China	Full Member
Singapore Science Park Ltd.	Singapore	Full Member
Southern Taiwan Science Park	Taiwan (China)	Full Member
Taguspark-Lisboa Science & Technology Park	Portugal	Full Member
Tampere Technology Centre Hermia	Finland	Full Member
Tech Gate Vienna Science and Technology Park	Austria	Full Member
Technium	United Kingdom	Full Member
Technologiepark Heidelberg GmbH	Germany	Full Member
Technologiepark Ostfalen	Germany	Full Member
Technology Centre Innopark Ltd	Finland	Full Member
Technology Centre Kareltek Inc .	Finland	Full Member
Technology Park Adelaide	Australia	Full Member
Technology Park Malaysia Corporation Sdn. Bhd.	Malaysia	Full Member
Technology Park Western Australia	Australia	Full Member
TECHNOPARC SAINT-LAURENT	[illegible]	[illegible]

Montréal Métropolitain		
Technopole Brest-Iroise	France	Full Member
Technopole Rennes Atalante	France	Full Member
Technopolis Plc.	Finland	Full Member
Technopolis Ventures Oy	Finland	Full Member
TECNOPARQUE INTERNACIONAL DE PANAMA	Panama	Full Member
TEHNOPOL - Tallinn Technology Park	Estonia	Full Member
The Innovation Hub	South Africa	Full Member
The Science Park Administration, Hsinchu Science-based Industrial Park	Taiwan (China)	Full Member
Thessaloniki Technology Park	Greece	Full Member
Toulon Var Technologies	France	Full Member
Tsinghua University Science Park	China	Full Member
Turku Science Park	Finland	Full Member
University City Science Center	United States	Full Member
Vega Venice Gateway for Science and Technology	Italy	Full Member
Walqa Technology Park	Spain	Full Member
West Mediterranean Technopolis	Turkey	Full Member
Yazd Science and Technology Park (YSTP)	Iran	Full Member
Zernike Science Park	The Netherlands	Full Member
[illegible]	[illegible]	[illegible]

Industries Development Zone		
Akwa Ibom Science and Technology Park	Nigeria	Affiliate Member
Arak Science & Technology Park	Iran	Affiliate Member
AS Ülemiste City	Estonia	Affiliate Member
Centre de Recherche Public Henri Tudor / Technoport Schlassgoart (BIC)	Luxembourg	Affiliate Member
Corporation de développement économique de Gatineau	Canada	Affiliate Member
East Azarbaijan Science and Technology Park	Iran	Affiliate Member
Fars Science and Technology Park - FSTP	Iran	Affiliate Member
Fundación Innova	Spain	Affiliate Member
Fundación Parque Tecnológico de Ciencias de la Salud de Granada (PTS)	Spain	Affiliate Member
HRD International Enterprise Centre	Kuwait	Affiliate Member
Information and Communication Technology Incubator (ICTI)	Syria	Affiliate Member
Information Technology and Technology Innovation Park Co, Ltd (Infopark Co, Ltd)	Hungary	Affiliate Member
Kaunas High-Tech & IT Park	Lithuania	Affiliate Member
Khuzestan Technology Incubator Center	Iran	Affiliate Member
Knowledge Oasis Muscat (KOM)	Oman	Affiliate Member
Lakeside Science & Technology Park	Austria	Affiliate Member

Longueuil Economic Development (DEL)	Canada	Affiliate Member
Louvain-la-Neuve Science Park	Belgium	Affiliate Member
Mersin Teknopark A.S.	Turkey	Affiliate Member
Parc Tecnològic Barcelona Nord	Spain	Affiliate Member
Parque Científico de Alicante	Spain	Affiliate Member
Parque Cientifico Tecnológico de Córdoba, S.L.- Rabanales 21	Spain	Affiliate Member
Parque Tecnológico de Antioquia, S.A.	Colombia	Affiliate Member
Parque Tecnológico de Asturias	Spain	Affiliate Member
Sapiens Parque, S.A.	Brazil	Affiliate Member
Science and Technology Park of Epirus S.TE.P.E S.A.	Greece	Affiliate Member
Semnan Science & Technology Park	Iran	Affiliate Member
Shijir Science Park	Mongolia	Affiliate Member
Sociedad Gestora del Parque Científico y Tecnológico de Cantabria, S.L.	Spain	Affiliate Member
Tartu Science Park	Estonia	Affiliate Member
Technopolis Thessalonikis S.A. - High Technology Business Park	Greece	Affiliate Member
The Kyonggi Small Business Center (KSBC)	Korea	Affiliate Member
The Technology Park of Sao Paulo	Brazil	Affiliate Member
Visoriai Information Technology Park	Lithuania	Affiliate Member

Part-2

الجزء-2 (من ملحق-4)

Most renowned ICT Parks in the world, and a list of R&D centers and Testing labs in them

مجمعات تقنية المعلومات والاتصالات العالمية الرائدة ومراكز البحث والتطوير والمختبرات بها

1- Sopia Antipolis, France

http://www.sophia-antipolis.org/index1.htm

Founded and marketed by an non-profit-making economic interest group in 1969, the creation programme of a scientific park has been able to be extended thanks to the strength of wilful people from the Alpes Maritimes department, from the State, from the P.A.C.A region and from the five first towns (Biot, Valbonne, Mougins, Vallauris and Antibes), which cover 2300 hectares of lands. Four other towns (Villeneuve-Loubet, La Colle sur Loup, Opio and Roquefort les Pins) have joined them to contribute to the Park extension project.

There are 1227 corporate names. 25 911 direct jobs have been created in the Park / 1260 companies.

The computer science, electronics and telecommunications pole accounts for 25% of the companies and nearly 50% of the jobs. You can notice the presence of a large number of famous French and foreign companies like Air France, Amadeus Development Company, Bouygues Télécom, ETSI, France Telecom, Matra Communication Sud, SEMA Group Télécom, Siemens, Atos Ingénierie Intégration etc. The density and the complementary nature of the companies are the core of the Club TelecomValley. The Aérospatiale, IBM and Texas Instruments, settled near the Park, are also members of the Telecom Valley.

ICT related R&D centers and labs in Sopia Antipolis

CERMICS
Research in computer science and applied mathematics.
Web site : http://cermics.enpc.fr
Employees : 20

CMA
Applied Mathematics Centre: Research activities ranging from computer science to systems theory.
Web site : http://www.cma.ensmp.fr
Employees : 16

CNRS – CRHEA
Center for Research on Heteroepitaxy and its Applications: Epitaxial growth and physics of wide bandgap semiconductors, applications to optoelectronics, electronics, semiconductors, nanotechnology.
Web site : http://www.crhea.cnrs.fr
Employees : 39

CNRS – UNSA – I3S
The Sophia Antipolis Computer Science, Signals and Systems Laboratory: Fundamental and applied research in areas that include computing, control, robotics, and signal and image treatment.
Web site : http://www.i3s.unice.fr
Employees : 213

CNRS – UNSA – LEAT
The Electronics, Antennae and Telecommunications Laboratory: Electronics laboratory, fundamental and applied research in microwaves, antennas, imaging radar and mobile communications, higher education. Microelectronics.
Web site : http://www.elec.unice.fr
Employees : 20

INRIA
Research in computer science and control, technology transfer, information dissemination, international cooperation.
Web site : http://www-sop.inria.fr
Employees : 475

2- Technopolis, Oulu, Finland

http://www.technopolis.fi/index.php?128

Technopolis Linnanmaa is a unique cluster of some 4,000 top experts, with almost two hundred companies working closely together. The area is one of the most important centers of technological development in Finland. VTT (the Technical Research Center of Finland) and the University of Oulu are in its immediate vicinity.

ICT related R&D centers and labs in Technopolis

Provisec Oy
R&D process improvement services: assessment, development, training.
http://www.provisec.fi

NetHawk Oyj
NetHawk is one of the world´s leading manufacturers of analysers and simulators for telecommunications networks. The main customers are prominent GSM/GPRS/EDGE/UMTS network infrastructure manufacturers and operators.
http://www.nethawk.fi

Codenomicon Ltd
Codenomicon developes and markets state-of-the-art software testing tools for proactive elimination and prevention of security vulnerabilities. Codenomicon test tools are available for a wide range of protocols and file formats.

Tellabs Oy
Design, manufacture and marketing of digital transfer, □pitomizes and cross-connection devices and related network management systems.
http://www.tellabs.com

VTT (the Technical Research Center of Finland)
VTT helps customers take advantage of the fast development of Information and Communications Technology (ICT) and of electronics. Our high quality global service and expertise cover the valuable chains of the entire information industry: semiconductor materials, manufacturing of microchips, as well as the design of electrical and optical components and circuits based on microelectronics, micro-mechanical sensors and systems and information networks. Also, service platforms, services, information systems and media and support technology for content are covered.
http://www.vtt.fi/index.jsp

3- BT Adastral Park, UK

http://www.atadastral.co.uk/

From pioneering work in optical technologies, digital, switching through to work in advanced software techniques and protocols Adastral Park become recognized as one of the leading centers of technical innovation in the communication world.

ICT related R&D centers and labs in Adastral Park

Centre for Integrated Photonics Ltd
www.ciphotonics.com

CIP's rich heritage developed out of the fibre optics activity that was commenced under BT in the mid 1970s and continued under Corning. CIP is a leading supplier of advanced photonic components and services in the communications, life sciences, industrial and defence market places. Engineers at CIP have been involved with some of the fundamental developments in fibre optics including development of EDFAs and SOAs along with buried heterostructure Multi Quantum Well device structures using MOCVD. CIP also remains at the forefront of planar silica on silicon structures and their use in passive hybrid integration with active chips.

Fujitsu Laboratories of Europe
www.labs.fujitsu.com

Founded in 1968 as a wholly owned subsidiary of Fujitsu Limited, Fujitsu Laboratories Limited has a global network of laboratories in Japan, the United States, Europe and China. The □pitomizes□s conducts a wide range of basic and applied research in areas of IT Core Systems, IT Media, Networks, Peripherals, Advanced Materials and Electronic Devices. Fujitsu researchers based at Adastral Park are working primarily on the field of photonics and next-generation optical internetworking.

4- Yokosuka Research Park (YRP), Japan

http://www.yrp.co.jp/en/

Numerous national and private (both domestic and overseas) research organizations specializing in radio telecommunication technology have located themselves within the hilly inland area overlooking the Bay of Tokyo in the city of Yokosuka forming a hub for research and development. Here they are advancing fundamental through cutting-edge research and development activities in a wide range of fields.

ICT related R&D centers and Testing labs in YRP

- NTT DoCoMo, Inc.
- YAZAKI RESEARCH AND TECHNOLOGY CENTER
- National Institute of Information and Communications Technology (NICT)
- Panasonic Mobile Communications Co., Ltd.
- TOA CORPORATION
- FUJITSU LIMITED
- FUJITSU LABORATORIES LTD.
- NEC Corporation
- ALPHA SYSTEMS INC.
- COTEAU VERT Co,LTD
- Yokosuka Telecom Research Park Co., Ltd.
- National Institute of Information and Communications Technology (NICT)
- Waseda University Global Information and Telecommunication YRP Office
- ITU-Waseda ICT Center,Waseda University
- Faculty of Science and Technology,Keio University
- Tokyo Institute of Technology,Oyama Lab.
- Beijing University Post and Telecommunications YRP Research Center
- Kyoto University YRP Mobile Networking Lab.
- The University of Tokyo,Aoyama & Morikawa Lab.
- Institute of Industrial Science Unversity of Tokyo,Imai Lab
- Nagoya University,Katayama Lab.
- The University of Electro-Communication Cooperative Research Center
- Yokohama National University,Kohno Lab.
- ITS21 Co.,Ltd.
- Ubiquitous Desibning Inc.
- Wireless Communications Laboratory
- Asia One Communications Ltd.
- ASC Soft Company
- Oki Electric Industry Co.Ltd.
- YRP Information Industry Cooperative Society

- YRP office of Telecom Engineering Center(TELEC)
- Association of Radio Industries and Businesses(ARIB)
- Mobile Techno Corp.
- DENSO CORPORATION
- Satellite Office of Yokohama National University COE for Creation of Future Social Infrastructure Based on Information Telecommunication Technology
- KEIKYU SERVICE CO.,LTD.
- CTC Technology Corporation
- Hitachi Ltd.
- NTT Advanced Technology Corporation
- MITSUBISHI ELECTRIC CORPOPATION
- TOSHIBA CORPORATION
- Nippon information Technology Consulting Co.,Ltd
- Hitachi Kokusai Electric Inc.
- KDDI R&D Lboratories
- KDDI CORPORATION
- Sony Ericson Mobile Communications Japan,Inc.
- Texas Instruments Incorporated,Japan
- Kozo Keikaku Engineering Inc.
- Nippon Intelligence Corporation
- NTT-ME Corporation
- Nippon Ericsson K.K.
- Catapult Communications KK.
- TeKtoronix Japan Ltd.
- Soft Kaihatsu Corp.
- DoCoMo Mobile,Inc.
- Toyo System Engineering Co.,Ltd.
- Evolium Japan Limited
- FJ Mobile Core Technologies Co.,Ltd.
- YRP Business Development Institute,INC
- Aplix Corporation
- YRP ICT Security Training Center
- JEOL Ltd.

5- Hong Kong Science and Technology Park (HKSTP)

http://www.hkstp.org/eindex.php

Inaugurated on 7 May 2001 as a statutory body set up by the Government of the Hong Kong Special Administrative Region, the Hong Kong Science and Technology Parks Corporation (HKSTP) is leading the transformation of Hong Kong into Asia's hub for technology innovation in the focused clusters (Electronics, Biotechnology, Precision Engineering , and IT & Telecommunications).

HKSTP offers a comprehensive range of services to cater for the needs of industry at various stages, ranging from offering a series of management and technical support programs through industry and university collaboration; nurturing technology start-ups through the Incu-Tech program support at a Tech Centre; providing advanced facilities and support services in the 22-hectare state-of-the-art Hong Kong Science Park for applied R&D activities; providing land and premises in the three Industrial Estates totaling 239 hectare for hi-tech manufacturing.

ICT related R&D centers and Testing labs in HKSTP

HKSTP operates some of the world's advanced technical facilities and labs designed to support the development of the ICT tenants in the park.

The Photonic Centre

One of the most vital physical infrastructures located within HKSP, is designed to provide a multi-disciplinary research and development facility for the benefit of the Science Park community and society as a whole. The major facilities include:

Photonics Development Support Centre

To provide a one-stop service to companies for design & simulation, test & measurement, fabrication & processing, prototype assembly & integration, product qualification and education & training for photonics.

Photonics Product Analysis Lab

To provide nano-scale design, debug, evaluation and qualification services for photonics sub-components & components, materials characterization and analysis including nano-metrology. As a shared support service, the laboratories are also available for use by local universities, Science Park's pitomize and tenants as well as industries in Hong Kong.

Integrated Circuits (IC) Design Centre

The Hong Kong IC Design Centre at Hong Kong Science Park aims at providing state-of-the-art EDA tools and technology supports to integrated circuits design companies so that they can upgrade their product offering thus enhance Hong Kong ‘s capabilities in high-value added electronics industry. The IC Design Centre includes the following facilities:

- **EDA Centre**
- **Data Centre**
- **Design Engineering Office**
- **IC Design Training Centre**

EDA Centre
The EDA Centre is geared up with the advanced Solaris UNIX based server groups and high speed network access to deliver EDA tools to customers through a EDA-on-demand systems.

IC Design Centre
The IC Design Centre works with the most leading edge EDA tool vendors to provide tool platforms for designing:

- Digital IC
- Analog and RFIC
- Mixed Signal IC
- SoC

IC Development Support Centre

- The right to use an onsite Probe and Test Development Centre, with sophisticated test equipment, wafer probers, IC test handlers and advanced RF lab equipment, and a staff of experienced engineers.
- Access to onsite Reliability laboratory and IC Product Analysis laboratory, equipped with advanced IC life and environment test equipment to support 0.13 um and sub-micron IC evaluation and circuit editing.
- Test package (load board, probe card, production test program, etc) development
- Small scale wafer test and final test production runs
- Reliability monitor program
- The opportunity to collaborate with an IC Designer Training Centre to develop and take advantage of training programs to enhance IC design skills of electronic engineers.

Data Centre
Because design data is the most important intellectual property of the design company, the Data Centre highly concerns with the intellectual property protection and is equipped with the most sophisticated SAN and the tape library which are protected by advanced Firewalls and VPN. The systems are managed by experienced system engineers to provide customers with secure storage and backup of their design databases.

Product Analysis Lab
The PAL offers the most comprehensive range of advanced equipment worth over HK $200 million, including 22 state-of-the-art product analysis machines, which is the number one in the region, and its capacity keeps growing.
To facilitate high quality and precise analysis works, the lab is located in a secluded area away from railways and main roads to minimize the impact of vibrations. The lab features a world-class anti-vibration zone that matches the rigid Class-E laboratory standard. Manufacturers will be able to enjoy the most reliable, comprehensive yet economical professional analysis services in the region.

Design Engineering Offices
The Centre provides a comfortable and high secure design engineering environment. Each room is equipped with Solaris and Linux based workstations for designing integrated circuits products.

6- Singapore Science Park

http://www.sciencepark.com.sg

The Singapore Science Park, developed and managed by Ascendas, is Asia's most prestigious research and development (R&D) and technology hub. It was set up under a government initiative in 1980 to provide infrastructure for R&D to flourish in Singapore. Since then, the Park has gained a reputation as South East Asia's foremost address for R&D.

ICT related R&D centers and labs in Singapore Science Park

- Fuji Xerox
- Institute for Infocomm Research (I2R),
- Institute of Microelectronics (IME) and the associated R&D labs of leading multinational companies.
- Kent Ridge Digital Laboratories (KRDL)
- Network Technology Research Centre (NTRC)
- Centre for Wireless Communications (CWC)

7- Shenzhen High-Tec Industrial Park, PRC

http://www.ship.gov.cn/en/index.asp?bianhao=20

As one of the five state-level high-tech parks particularly supported by the Chinese central government, Shenzhen High-tech Industrial Park (SHIP) was established in September 1996, which covers an area of 11.5 km2.In 2003, the total industrial output value of SHIP was 89.5 billion RMB, in which the hi-tech output was 86.7 billion RMB,that means SHIP occupying 0.6% of the total Shenzhen land produced 18% of the whole industrial output of Shenzhen, and its value of exportation was 5.2 billion USD. SHIP is becoming a rich soil for business and home for success.

Shenzhen focuses on developing the industries of computer and parts, very large-scale integrated circuit, network and communication, software, photoelectron, digital electrical household appliances, biological engineering, new material and environmental protection and renovates traditional industries by making use of high technology and advanced applicable technologies.

Lots of big enterprises have set up their research and development centers in SHIP and quite some of them have their research funds exceed 10% of all their sales revenue.

The south part of SHIP includes mainly research institutes and scientific and technological R&D organizations, the central part of SHIP is characteristic of biomedicine enterprises and software enterprises,IT interprises or optical¨Celectro - mechanical enterprises are situated in the north district. The R&D building of big enterprises are all near to the main trunk Road of Shenzhen--Shennan Road, good for both city landscape of Shenzhen and image demonstration of large companies.

ICT related R&D centers and labs in SHIP

SHIP computer industry cluster includes: China CGC Computer Shenzhen co., Ltd. Legend Electronics (Shenzhen) Co., Ltd. Dawning Information Industrial Shenzhen Limited. GKI Electronics Co., Ltd. Changke International Electronics Co., Ltd (the holding company of IBM) etc.

SHIP communication industry cluster includes: Shenzhen ZTE Corporation, ALCTEL Telecommunication (Shenzhen) Co., Ltd. China ZHENHUA(holdings) Technology stock Co., Ltd. UTSTARCOM (Shenzhen) Co., Ltd. Shenzhen SHANGFEI Consumption Telecommunication Co., Ltd. HARRIS (Shenzhen) Telecommunication Co., Ltd.

Shenzhen S¦«nsum Kejian Mobile Telecommunication Technology Co., Ltd. UNION FRIEND Group Industrial Co., Ltd (group) etc.

8- Hsinchu Science Park, Taiwan

http://eweb.sipa.gov.tw/en/index.jsp

Hsinchu Science Park was established by the government of the Republic of China on December 15, 1980 with investment from the Kuomintang. It straddles Hsinchu City and Hsinchu County in Taiwan. A total of 370 high-tech companies, mainly involved in the semiconductor, computer, telecommunication, and optoelectronics industries, have been established in the park at the end of December 2003. Hsinchu Science Park is now one of the world's most significant areas for semiconductor manufacturing. It is home to the world's top two semiconductor foundries, Taiwan Semiconductor Manufacturing Company (TSMC) and United Microelectronics Corporation (UMC), both of which were established at the nearby Industrial Technology Research Institute. There is also a science-themed amusement park in the area.

ICT related R&D centers and labs in Hsinchu Science Park

- Elan Microelectronics Corporation
- Foxconn
- Holtek Semiconductor
- Lite-On
- Logitech
- MXIC – Macronix International Co., Ltd.
- Microtek
- Optodisc
- Philips
- PSC – Powerchip Semiconductor Corp.
- ProMOS
- Realtek
- Tecom – Tecom Co., Ltd
- TSMC – Taiwan Semiconductor Manufacturing Company Ltd.
- UMC – United Microelectronics Corp.
- VIS – Vanguard International Semiconductor
- Winbond

9- Research Triangle Park (RTP), NC, USA

http://www.rtp.org/

Research Triangle Park (RTP) is a public/private, planned research park, created in 1959 by leaders from business, academia and industry. But the idea of creating a research park started many years before.

The Park overall grew slowly through the early 1960's. Then, in 1965, with the advent of both International Business Machines Corp. (IBM) and the National Institute of Environmental Health Sciences, the Park began to grow in earnest. By 1969, 21 companies had located in RTP. From 1970 to 1979, 17 additional companies located here. By 1989, 28 more companies chose locations in the Park.

From 1990 to 2000, more than 42 new companies have established facilities in RTP. New construction and expansion has totaled over 5 million square feet. A research business incubator was formed to provide interim laboratory facilities for early-stage companies. And Park Research Center, a campus of about 12 buildings that was formerly occupied by the National Institute of Environmental Health Sciences, was established to provide wet lab space to smaller and mid-sized research companies.

- An estimated 157 organizations are located in the Park (January, 2007)
- 132 research and development-related organizations
- Approximately 82% of the employees in the Park work for multinational corporations
- 97.3 % of employees work for R&D related organizations

IT/Informatics/Pervasive Computing/Telecommunications (19 Companies and 20,525 Employees):

Brown Computer Company
Caspian Networks
Chorus Systems
Cisco Systems
EMC Corporation
Ericsson
IBM
Learning Machines
Lenovo
Mi-Co
National Institute of Statistical Sciences
Network Appliance
Network Development Group

Nortel Networks
Software Development Europe, Inc.
Sony Ericsson
Statistical and Applied Mathematical Sciences Institute
Triangle Research Collaborative
UAI Technology, Inc.

10- The Multimedia Super Corridor, Malaysia.

http://www.msc.com.my

The Multimedia Super Corridor (MSC Malaysia) is Malaysia's most exciting initiative for the global information and communication technology (ICT) industry.

Conceptualized in 1996, the MSC Malaysia has since grown into a thriving dynamic ICT hub, hosting more than 900 multinationals, foreign-owned and home-grown Malaysian companies focused on multimedia and communications products, solutions, services and; research and development.

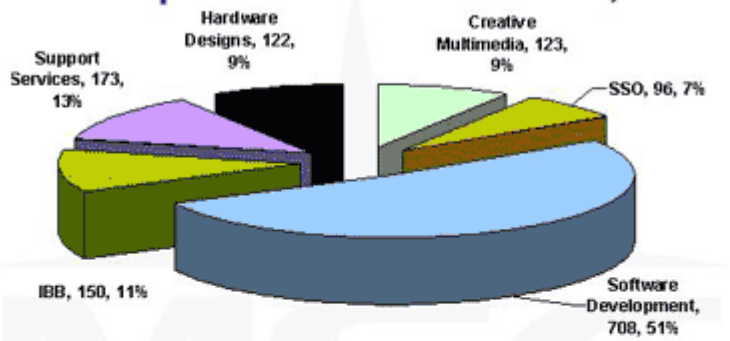
With this unique corridor, Malaysia continues to attract leading ICT companies of the world to locate their industries in the MSC Malaysia and undertake research, develop new products and technologies and export from this base. The MSC Malaysia is also an ideal growth environment for Malaysian ICT SMEs to transform themselves into world-class companies. Furthermore, the MSC Malaysia welcomes countries to use its highly advanced infrastructural facilities as a global testbed for ICT applications and a hub for their regional operations in Asia.

One of the main goals of the Multimedia Super Corridor (MSC) is to catalyse and nurture a competitive cluster of Malaysian ICT/multimedia companies that will become world class over time. In line with this objective, a total sum of RM120 million has been allocated for the MSC Malaysia Research and Development Grant Scheme (MGS) to support R&D initiatives within the MSC. Multimedia Development Corporation (MDeC) has been entrusted to manage the grant and oversee the progress and completion of funded projects.

- 1,036 research personnel and 15 IC Design interns are employed in the 65 approved projects
- 31 ICT local and foreign awards won by 14 MSC R&D Grant Scheme (MGS) recipients

- 8 out 16 MSC companies listed in Deloitte Technology Fast 500 Asia Pacific 2004 are MGS recipients
- 12 MGS recipients are currently listed on MESDAQ: PUC Founder (MSC), Willowglen MSC, Infortech Alliance, Redtone Telecommunications, Ingenuity Microsystems, The Media Shoppe, Viztel, I-Power, Jobstreet.com, Green Packet, IRIS Corporation, MLABS.

MSC Status Companies by Technology Cluster: Operational as at Jan 31st , 2007



Cluster	Awarded*	Operational**
1. Creative Multimedia	168	123
2. SSO	99	96
3. Software Development	868	708
4. Support Services	213	173
5. IBB	238	150
6. Hardware Design	151	122
GRAND TOTAL	**1,737**	**1,372**

* All companies granted the MSC status

** Companies which are still active and conducting MSC approved activities

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85 MSC Malaysia Multi National Companies (MNC) as of Jan 31st , 2007

- Nokia (M) Sdn Bhd*
- SITA
- SAP Learning Technologies (M) Sdn Bhd*
- Siemens Multimedia Sdn Bhd*
- Motorola Multimedia Sdn Bhd*
- Alcatel Networks MSC Sdn Bhd
- Lotus Development Services (M) Sdn Bhd
- Lucent Technologies (M) Sdn Bhd*
- Oracle MSC Sdn Bhd*
- Ericsson Expertise Centre Malaysia Sdn Bhd*
- Ericsson Academy Sdn Bhd
- Ericsson Business Consulting Sdn Bhd
- EHPT Sdn Bhd
- Asia Pacific Information Service (DHL)*
- Baan Education Asia Pacific
- Shell Information Technology International Sdn Bhd*
- British American Tobacco GSD (Kuala Lumpur) Sdn Bhd*
- Reach Internet Services(MSC) Sdn Bhd
- Rockwell Automation (M) Sdn.Bhd.*
- Unisys MSC Sdn Bhd*
- Alcatel MSC Sdn Bhd
- IBM (M) Sdn Bhd
- Computer Associates (M) Sdn Bhd*
- Lotus Engineering Malaysia Sdn Bhd*
- Biodata Information Technology Malaysia Sdn Bhd
- Scope International (M) Sdn Bhd*
- Huawei Technologies Sdn Bhd*
- Fortum Sendi Prima Sdn Bhd
- IT-365 Malaysia Sdn Bhd*
- Satyam Computer Services Ltd*
- SmartTrust Sdn Bhd*
- AVEVA Asia Pacific Sdn Bhd*
- Atos Origin Services Sdn Bhd*
- Shell Global Solutions (Malaysia) Sdn Bhd*
- HSBC Electronic Data Processing (Malaysia) Sdn Bhd*
- WIPRO Limited*
- BMW Asia Technology Centre Sdn Bhd*
- Prudential Services Asia Sdn Bhd*
- Silicon Graphics Sdn Bhd*
- Panasonic R&D Centre Sdn Bhd*
- ZTE (Malaysia) Corporation Sdn Bhd*
- ExxonMobil Business Support Centre Malaysia Sdn Bhd*
- Amway2u.com Sdn Bhd*
- e2 Power Sdn. Bhd*
- Getronics Technology Sdn Bhd*
- Motorola Technology Sdn Bhd (SCO Division)*
- Affiliated Computer Services Malaysia Sdn Bhd*
- Convergys Employee Care Malaysia Sdn Bhd*
- TRW Automotive Services Sdn Bhd*
- Monster Technologies Sdn Bhd*
- Codemasters Studios Sdn Bhd*
- Dell Global Business Center Sdn Bhd*
- DHL Asia Pacific Finance Shared Services Sdn Bhd*
- Ideas & Values Sdn Bhd*

Regional initiatives

* Active

85 MSC Malaysia Multi National Companies (MNC) as of Jan 31st , 2007(continued)

- Fujitsu (Malaysia) Sdn Bhd*
- Bloomberg (M) Sdn Bhd*
- Intel Malaysia Design Center (MSC) Sdn Bhd*
- Reuters (M) Sdn Bhd*
- Fujitsu Telecommunication Asia Sdn Bhd*
- Pernec Multimedia R&D Center Sdn Bhd
- BT Multimedia Sdn Bhd*
- Sun Microsystems (M) Sdn Bhd*
- NTT (MSC) Sdn Bhd*
- EDS MSC Sdn Bhd*
- Compaq Multimedia Sdn Bhd
- Microsoft Knowledge Capital Center Sdn Bhd*
- Comptel Communications Sdn. Bhd.*
- Tecnomen (M) Sdn. Bhd.*
- Castlewood Systems (M) Sdn Bhd
- Marconi 3G Sdn Bhd
- CISCO MSC Division*
- Canal+ Technologies Sdn Bhd
- NEC Systems Integration Malaysia Sdn Bhd*
- TATA CONSULTANCY SERVICES MALAYSIA SDN BHD*
- Petronas eLearning Solutions Sdn Bhd*
- Aljazeera International (Malaysia) Sdn Bhd*
- Telenor Research and Development Centre Sdn Bhd*
- Access Pavilion Sdn Bhd*
- Thor Animation Sdn Bhd*
- Altera Corporation (M) Sdn Bhd*
- Kenexa Technologies Sdn Bhd (Formerly known as Xplore Tower Sdn Bhd)*
- Qtelmedia (Malaysia) Sdn Bhd*
- Mini-Circuits MSC Malaysia Sdn Bhd*
- IBA Health (Malaysia) Sdn Bhd*
- Netripples Software (Malaysia) Sdn Bhd*

* Active

10

11- The International Tech Park, Bangalore

http://www.bangaloreit.com/

The International Tech Park, Bangalore (ITPB) is the icon of India's IT success story, and continues its contribution to the development of Whitefield as a major IT hub in India's Silicon Valley. Located just 12 km from Bangalore Airport and 18 km from the city centre, ITPB catalysed the growth of a burgeoning suburban city at Whitefield.

Managed by Ascendas, ITPB epitomizes the finest of the Ascendas Advantage offering: Quality Business Space, Reliable Solutions and an International Business Lifestyle second to none. Its world-class business infrastructure amidst wide green spaces provides the optimal environment for Fortune 500 corporations, MNCs and leading local corporations located at the Park.

Opened in 1998 as India's first work-live-play business environment, ITPB is virtually a self-contained city spread over a sprawling 28-hectare estate. The Park integrates office, retail, residential and recreational facilities in a single location, set amidst a refreshing and aesthetically appealing lush landscape. In 2002, ITPB's plug-and-play services and contribution to Bangalore's remarkable growth earned the accolade of "World Teleport Property of the Year" from the New York-based Intelligent Community Forum.

Today, this top-line facility managed by Ascendas has become the benchmark of excellence for IT parks across India. At ITPB, over 19,000 tech-savvy professionals work for more than 120 companies in the fields of IT & ITES, bioinformatics, software development, telecommunications, electronic and other hi-tech industries.

12- Software Technology Parks of India (STPI) Bangalore

http://www.bangaloreit.com/

India's software exports have been growing at 50 percent a year in recent years, thanks in part to India's partly government-owned and operated Software Technology Parks (STPs). The Major Park in Bangalore is sponsored by the government of Singapore in collaboration with Tatas. Twelve STPs have been set up around the country including Bangalore, Pune, Bhubaneshwar, Noida (near Delhi and GE's operations there) and in Hyderabad.

Even though, STPI Centres have come-up across the country in as many as 21 locations, the major Industry concentration is at Bangalore, Noida, Chennai, Hyderabad and Pune, reflecting the natural technology clustering effect that has taken place in other technology clusters like Silicon Valley, Boston, Dallas, Ireland, Sweden and Tokyo.

Bangalore is by far the largest IT Center in India. It is the hub of India's semiconductor industry, producing chips for Intel and Texas Instruments. Its origin lies in the trained personnel from the Tata Institute for Science and Engineering and the government's Indian Space Research Organization (ISRO). Two universities feed expertise to Bangalore's Silicon Valley (Bangalore University and Karnataka University).

ICT related companies and R&D centers and labs in STPI

Sl no.	Company	Location
1	Anz information technology pvt. Ltd.	Bangalore
2	Applitech Solution Limited	Ahmedabad
3	CBS India	Chennai/Bangalore
4	CGI Information Systems and Management Consultants Private Ltd	Bangalore
5	CG-Smith Software Limited	Bangalore
6	Citicorp Overseas Software Limited	Mumbai
7	Cognizant Technology Solutions	Bangalore
8	Covansys India Pvt. Ltd.	Bangalore
9	DCM Technologies	Hyderabad
10	Engineering Analysis Center of Excellence Pvt. Ltd. (EACoE)	Bangalore
11	FCG Software Services (India) Pvt. Ltd.	Bangalore
12	Future Software Ltd	Chennai
13	HCL Perot Systems	Noida/Bangalore
14	HCL Technologies Limited	Chennai
15	Hewlett Packard India Software Operations Limited	Bangalore
16	Hexaware Technologies Limited	Chennai and Mumbai
17	Honeywell India S/w Operations	Bangalore
18	Hughes Software Systems	Bangalore
19	IBM Global Services	Bangalore
20	i-flex solutions limited, IT Services Divisions	Mumbai and Bangalore
21	Information Technologies (India) Ltd.	New Delhi
22	Infosys Technologies Limited	Bangalore

23	InfoTech Enterprises Limited	Hyderabad
24	Intergraph Consulting Pvt. Ltd.,	Hyderabad
25	International Computers (India) Ltd.,	Pune/Mumbai
26	ITC Infotech Ltd.	Bangalore
27	Intelligroup Asia PVT.Ltd.,	Hyderabad
28	IT Solutions (India) Private Limited	Bangalore and Chennai
29	Kshema technologies Ltd	Bangalore
30	Larsen & Turbo Infotech Limited,	Mumbai and Navi Mumbai
31	LG Soft India Pvt. Ltd	Bangalore
32	MphasiS-BFL Limited	Bangalore
33	Mastek Limited	Mumbai
34	Motorola India Electronics Ltd.,	Bangalore
35	Network Systems & Technologies (P) Ltd.,	Trivandrum
36	NIIT, Software Solutions	Bangalore
37	NeST Information Technology (P) Ltd.,	
38	Patni Computer Systems Ltd	Mumbai
39	Philips Software Centre Private	Bangalore
40	Phoenix Global Solutions (I) Pvt. Ltd.	Bangalore
41	Sasken Communication Technologies Limited.	Bangalore
42	Satyam Computer Services Ltd.	Hyderabad
43	SignalTree Solutions (India) Ltd.	Hyderabad
44	SkyTECH Solutions Pvt Ltd.	Kolkata and Mumbai,
45	Sobha Renaissance Information Technology Pvt. Ltd.	Bangalore
46	Sonata Software Limited	Bangalore
47	SSI Technologies	Chennai
48	Syntel, Inc. (India)	
49	Siemens Information Systems Ltd.,	Bangalore
50	Tata Consultancy Services	Bangalore
51	Tata Interactive Systems	Mohali
52	TCG Software Services Pvt. Ltd	Calcutta
53	Wipro Technologies	Bangalore
54	Robert Bosch India Limited	Bangalore
55	LG CNS Global Pvt.Ltd	Bangalore/Delhi