The United Nations ICT & E-Communication Study:
Options for Reducing Organizational Travel

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Introduction

The UN is a geographically dispersed organization with functional, divisional and regional presence, and some 4,000 out-posted offices around the world. It is composed of some 70 agencies and 200,000 employees. Over the years, the UN has made relatively modest investments in ICT infrastructure and services. However, the time has now come to make significant investments in both ICT infrastructure and services, and to provide a robust and reliable foundation that enables the UN to function effectively as a networked organization. ICT has to be integrated into UN, into virtually all functions, to deliver its mandate effectively by “doing more with less”.

Information and data are key assets of the organization, similar to financial assets, and have to be treated as such.

This e-Communication/e-Collaboration study is aimed at collecting information and inputs from various UN divisional, regional, out-posted offices of agencies belonging to the UN ICT Network and secretariats. The intent was to understand the main uses of e-Communication and ICT in each of the offices/agencies, identify related problems/issues that hamper activities, review current and planned resources, requirements and priority items to be addressed. This report will deal with core UN-wide e-Communication and ICT issues, and those of persistent and reoccurring nature that could be solved in a relatively short time. The report will provide details of the existing e-communication capabilities and see how they are used. A separate strategy is needed in the future to develop a long-term, forward-looking plan and roadmap.
Background

Trends, Behavior, Challenges and Opportunities

The Sustainable United Nations (SUN) facility responded to the UN Chief Executive Board’s decision to adopt the UN Climate Neutral Strategy by providing support to the United Nations Secretariat, as well as other organizations of the UN System, to reduce greenhouse gas emissions. SUN is using a whole-organization approach for identifying the underlying causes for emissions, and responses are expected to involve a wide range of functions within the organizations, such as facility management, travel, and ICT services, as well as organizational culture and procurement.

Initial results indicate that travel of staff members for meetings with participants, consultants and others associated with UN’s programme of work represent the largest share of greenhouse gas emissions for most UN organizations, in some cases accounting for more than 90% of emissions (over 50 % for the entire UN system). Data reported for 2008, 2009 and 2010 for UNEP, for instance, shows an increase in tonne CO2 equivalent/personnel from 9.5 to 10.5 and to 11.2, respectively. For this reason, SUN is developing a sustainable travel strategy, which includes using electronic communications and collaboration systems to replace the need to travel in some instances. SUN is therefore identifying and analyzing the capabilities and requirements for different forms of e-Communication/e-Collaboration, such as virtual presence, video conferencing, online meetings through web platforms, social platforms, video on demand (VOD), e-learning, and so on. Organizations can gain a clearer picture of the role these tools can play in a sustainable travel policy. Therefore, SUN, in collaboration with interested agencies of the UN ICT Network, seek to identify a range of e-Communication/e-Collaboration options that may allow a reduction of UN official travel.

UNEP Greenhouse Gas Emission Inventory 2009 - SUMMARY

<table>
<thead>
<tr>
<th>Reporting Year</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Personnel *</td>
<td>1.214</td>
<td>1.185</td>
</tr>
<tr>
<td>Number of Flights</td>
<td>9.155</td>
<td>9.172</td>
</tr>
<tr>
<td>Total CO2e from Air Travel</td>
<td>10.130 (87%)</td>
<td>11.435 (92%)</td>
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<tr>
<td>Total CO2 from other emissions</td>
<td>1.492 (13%)</td>
<td>1.035 (8%)</td>
</tr>
<tr>
<td>Tonne CO2eqv</td>
<td>11.585</td>
<td>12.470</td>
</tr>
<tr>
<td>Tonne CO2e/Personnel</td>
<td>9.5</td>
<td>10.5</td>
</tr>
</tbody>
</table>

* ) Including P, D, L and G-staff, interns, UNVs, JPOs, and long-term consultants (>6 months)
Objectives of the study

Assessing the e-Communication/e-Collaboration capacity across the UN system

An in-depth study on the current access to and availability of e-Communication/e-Collaboration services in each agency and office of the UN has been undertaken. The potential for adopting (if not already adopted) a minimum level of e-Communication/e-Collaboration standards and tools including computer-to-computer video systems, high quality video conferencing systems, Internet Protocol (IP) based meetings and class rooms, and Internet supported telephone conferencing services, has also being investigated.

The study also tried to assess the needs, habits and attitudes of UN staff towards existing e-Communication/e-Collaboration systems, including attitudes towards, and expectations on improved or alternative forms of e-Communication/e-Collaboration. The purpose of this assessment was to identify the drivers and barriers to using e-Communication/e-Collaboration tools as well as the knowledge/awareness of staff in regard to new technologies and tools.

The outcome of the report should trigger greater e-Communication activities that in turn will reduce the Green House Gas footprint of mission travel in both short-term and longer term scenarios. The study aimed to present an overall view of UN staff with respect to usage, knowledge and awareness of e-Communication/e-Collaboration tools resulting in initial steps towards policy and governance activities.
Current UN ICT Environment

The UN is a highly decentralized geographically dispersed organization, with a global mandate and a limited budget based on multiple sources of funding. In addition, the UN hosts the secretariats for a number of programmes, funds, trusts, and specialized projects. Given the relative small number of UN staff and its over-arching mandate, the UN relies heavily on partnerships for its programme delivery. Many UN offices around the world are attached to other service providers and/or international organizations and have signed ICT service agreements with them. The lack of a UN-wide ICT policy and strategy since its establishment has led to ad-hoc and disparate development of ICT across the different organizations, offices and duty stations, dictated mostly by the specific environment and availability of resources. ICT is the backbone on which an e-communication strategy falls. UN offices have adopted the technologies and acquired the skills they found to be most useful for their work, but this was done without paying due attention to the need for efficient information exchange across the organization, and the importance of presenting a unified corporate image to the rest of the world. The most important elements in this multi-dimensional environment to which ICT solutions should carefully adapt are:

- Geographical distribution (geographical dispersed organization)
- Existing ICT Skills and investments
- Institutional set up (hierarchy, reporting channels)
- Funding / Budgetary constraints
- Legal Mandates and requirements
- External Factors

Ultimately, these factors will determine which ICT solutions are feasible for the UN globally.

In the past, the lack of centralized coordination on ICT, not only in the UN as an entity, but also within UN agencies, has led to a significant disparity in investments among the various UN offices. Some agencies and offices have invested heavily into ICT, while others have done the bare minimum. Program managers have invested in the technologies, skills, and expertise that they considered best for their projects. The UN needs to leverage existing investments and available skills, while bringing its ICT up to the required level. Hardware, software, networking, security, analysis, and programming policies are divergent.
Assessment of UN Needs and Proposed framework

The survey on the “Use of E-Communications within the UN” collected information that will serve as a source to finalize a global ICT framework by providing an initial “snap-shot” of e-Communication capabilities in the UN, amongst other information. Once adopted, the framework will help define the strategy that will serve as the Organization-wide approach for meeting the strategic e-Communications and ICT needs of the Secretariat and other UN agencies, over the next three to five years. The strategic ICT needs of the UN ICT network family have been identified and summarized into four broad categories of “institutional drivers”, namely: 1) knowledge sharing and collaboration; 2) improvement of and support for internal Secretariat and UN agency operations; 3) communications and infrastructure; and 4) overall ICT management.
For the implementation of a new ICT strategy, the United Nations will need to put in place the necessary structure and establish three corresponding sub-programmes: 1) Knowledge Management Systems Section (KMS); 2) Resource Management Systems Section (RMS); and 3) Infrastructure Management Systems (IMS) (e-Communications falls under this latter category).

Gartner, a well-known ICT consulting firm, delivers technology and market research to global business leaders, allowing them to make informed decisions on key initiatives. It recommends that organizations work with converging domains of communication, collaboration, and content management. These encompass a very broad and deep technology domain, and they are also influenced by non-technology organizational dynamics, such as etiquette and incentive systems.

The importance of the non-technology organizational dynamic should not be overlooked; the adoption of any successful system-wide e-communications/ ITC strategy depends as much on technology as it does on buy-in from organizations and staff and the championing of these new policies by senior management that would contribute to a change in the organizational culture.
A successful e-Communication ICT strategy will exhibit the elements provided in the diagram above. The collaboration and content diagram accentuates two usage modes — synchronous and asynchronous — for four topic domains: communication, collaboration, content and social. As suggested in the diagram, content serves as the currency (i.e., the means of information capture and exchange) for all modes of communication and collaboration.
Survey Introduction

The survey assessed e-Communication/e-Collaboration use and capability across the UN System. It determined the current use of e-Communication tools in UN System organizations, and the potential for adopting a policy/governance body to provide guidelines for a minimum set of e-tools to be used across the UN System.

Objectives and guiding vision

The overarching objective is to:

a) Ensure that UN staff members have the information and systems in place to accomplish their work objectives regardless of where they are (HQ, offices away from HQ, or while traveling).

b) Strengthen the UN identity and collaboration among/within the various agencies by improving and simplifying communication and information exchange.

c) Reduce UN environmental footprint by supporting green exchange and communications systems.

UN staff members should have access to a robust ICT infrastructure, reliable desktop and notebook computer hardware, e-Communication tools, consistent phone systems, and applications such as e-mail, Intranet, and office productivity tools on a daily basis. Staff members should be able to use their computers from home and access their e-mail on Personal Digital Assistants (PDAs) or similar mobile devices. Senior managers and programme officers should have access to critical up-to-date information on the organization, upon demand, for informed decision-making. Only when the basic ICT is in place, for all staff members, the UN will be able to take the next step from a strong foundation to a comprehensive knowledge management organization. Communication with other UN entities and personnel needs to be smooth, easy to use and seamless.

Scope

The focus is on how to empower and enable staff members, senior managers, and programme officers to perform their tasks more effectively using ICT tools. The report covers ICT issues that affect UN as a whole. Though it does not deal in detail with those issues that are specific or unique to individual, divisional, regional, or out posted offices, it proposes a framework to guide and facilitate their resolution. This report and its recommendations focus on addressing those issues of a persistent and recurring nature that can be solved in a relatively short time. However, it will provide key inputs to UN’s forward-looking, long-term strategy and road map, which will still need to be further developed.

Process
The data collected from the UN-wide survey, had a good balance of ICT skills, knowledge of UN work programmes and operations, as well as representation from UN HQ, divisional, regional, out-posted offices, convention secretariats, and other UN agencies, funds, trusts and programmes. During the analysis phase, recent relevant documentation, input from consultants, and feedback received from UN agencies were used. The team invited representatives from other Task Forces and ICT focal points and listened to their needs. Additionally, the team invited senior managers to provide their points of view.
UN civilian staffing level by location (http://www.un.org/depts/Cartographic/map/profile/CivilianStaff.pdf)
90% of the survey respondents participated in the Chief Executive Board for the ICT Network and represented UN agencies around the globe.

**Survey Topics**

If we look at our environment and go stakeholder-by-stakeholder, technology-by-technology, we find that different agencies under the UN umbrella (other agencies, governments, NGO, etc.) face different issues. However, they all have one thing in common: the need to collaborate and communicate both internally and externally in order to deliver on their mandates. This section will capture generic information applicable to each UN duty station, in order to find a common ground for our phased ICT e-Communication/e-Collaboration implementation plan, and in parallel, as a secondary target, to reduce UN’s Green House Gas emissions yearly.

According to the UN wide study, 90% of the respondents said that their organizations participated in the Chief Executives Board and the other 10% did not. The respondents provided feedback on the following topics:

- e-Communication Tools
- Connectivity, Core Applications & Services
- Enterprise Resource Planning Systems
- Knowledge Management
- Need for faster Internet Connectivity / Bandwidth
- Training / Support
- Mobility
- ICT Governance
Key Analysis

E-Communication Tools

The technology world is a fast changing environment. Thus, any technology adoption must account for major market trends, upgrades and transitions.

The reality today is that businesses and organizations are moving towards standardization in their IT infrastructure. This process started in the late 1990s mainly in an effort to cut down cost. A down side is that many end-users face this technology standardization. Everything is optimized for everybody, but it does not work particularly well for anybody. This means that people are rapidly going outside the organization for their ICT needs and are taking matters into their own hands. They are bringing the tools that they prefer to use into the workplace. This section will capture the existing e-Communication/e-Collaboration capacity of UN System offices. The study seeks to determine the ability of offices to deploy and expand these services as a substitute for travel and in response to more restrictive travel policies, which could become part of future internal UN regulations.

The SUN team found out that throughout the organization, different UN agencies have different styles of communications and different preferences. These styles and preferences vary even in the same UN organization depending on the office and geography.

Some people, for example, are using tools like email as their preferred method of communications; others are very comfortable with collaborative workspaces, even consumer tools like Facebook. The net result is that, across the organization, different people have different preferences as to how they work, how they communicate, and how they collaborate.
Today's e-Communication and ICT tools belong to and are designed to work with very specific systems and software; this keeps some of the potential users apart. The approach of individual users to different communication technologies is reflected in the users’ personal choice of communication means. For example, people that are very comfortable with the use of live communication means, such as the telephone, might struggle to collaborate closely with people whose first option would be the use of indirect platforms, such as Facebook. In such a situation, it might be complicated to overcome communication barriers, affecting thus the quality of collaboration. What would be appropriate is to set up a model where people can connect, communicate and collaborate recognizing their different styles, different preferences, and the different workspaces available on a standardized platform.

**Operating Systems**

An operating system (OS) is a software consisting of programmes and data, which runs on computers, manages computer hardware resources, and provides common services for executing various application software. The operating system is the most important type of software for computers, as it enables the running of application programs on computers, which otherwise can not be performed (unless the application program is self-booting).

For hardware functions such as input, output and memory allocation, the operating system acts as an intermediary between application programs and the computer hardware, although the application code is usually executed directly by the hardware and will frequently call the operating system or be interrupted by it. Operating systems are found on almost any device—from cellular phones and video game consoles to supercomputers and web servers.

The majority of the operating systems deployed are Windows XP and Windows 7 on desktops/laptops. The process of migrating staff from Windows XP Professional to Windows 7 (64 bit) has started. MAC OS is allowed for a special group of users, such as Editors or Print shop units.

Approximate mix of desktop vs. notebook computers in the UN organization is 70% vs. 30%, respectively; however, we see the beginning of phasing out desktop computers.
The refresh cycle for employee desktop / notebook computers varies on average from 4 to 5 years.

**Productivity tools**

Productivity tools are a suite of applications for creating, editing, and sharing text, spreadsheets, presentations and other documents. Productivity tools can be software that helps employers to increase their business productivity: a few examples might be project management software, to do lists, cost management software, employee monitoring software, print manager software and so on.
Instant Messaging

Instant messaging (IM) is a form of real-time direct text-based communication between two or more people using personal computers or other devices, along with shared clients. The user's text is conveyed over a network, such as the Internet. More advanced instant messaging software clients also allow enhanced modes of communication, such as live voice or video calling.
In many cases, the integration of Voice over IP (VoIP) systems in instant messaging software is common. In the UN a total of 58% of the organization has a VoIP system deployed or being deployed. The majority of the respondents are using Cisco Unified Communication, Skype, and Ericsson PBX that have recently been upgraded to be VoIP compatible and for some units, Alcatel phone systems.

**Audio conferencing**

A conference call is a telephone call in which the calling party wishes to have simultaneously more than one called party accessing the audio portion of the call. The conference calls may allow active or passive interaction. The called party may actively participate during the call, or the call may be set up so that the called party is a mere listener, with no verbal interaction. It is often referred to as an ATC (Audio Tele-Conference).

Conference calls can be designed so that the calling party calls the other participants and adds them to the call - however, participants are usually able to call into the conference call themselves, by dialing a special telephone number that connects the user to a "conference bridge" (a specialized type of equipment that links telephone lines).

Companies commonly use specialized service providers who maintain the conference bridge, or provide the phone numbers and PIN codes that participants dial to access the meeting or conference call. The spreading of the use of conference facilities is also strongly affected by the high prices charged by some facilities providers.

In-house audio conferencing facilities are available for larger conferences. The majority of the Regional and Sub-Regional Offices have full audio and video conference facilities. A small number of field offices rely on the “landlord” organization to provide audio/video conferencing, but it was indicated that these are difficult to access as they reside in rooms dedicated for video conferencing which tend to be popular with HR for recruitment purposes.
The maximum number of participants and concurrent calls that the average audio conferencing systems can support is 30 participants, though an average of 5 participants seems to be the norm. Video conferencing, rather than audio conferencing, is becoming more frequent (On average we see up to 4 concurrent video conferencing sites that can participate in a video conference).

Future plans to enhance the current audio conferencing capacity within the next 2 years are being shelved as all focus will likely be on video conferencing expansion. The approximate averages of conference calls that occur in a month vary from 25 to around 50 across the different UN agencies.

A variety of external audio conferencing services are also used with no clear indication of standardization and/or minimum requirements or Service Level Agreements (SLAs) in place.

**Video Conferencing**

A videoconference (also known as a video teleconference) is a set of interactive telecommunication technologies that allow two or more locations to interact via a two-way video and audio transmission system, simultaneously. It has also been called 'visual collaboration' and is a type of groupware.
Virtual Conferencing

Virtual conferencing or Tele-presence refers to a set of advanced Tele-robotics technologies, which give the virtual impression to have the other participants physically present, while they are located in different places.

Tele-presence stimulates users' senses as to give the feeling of being in that other location. Additionally, users may be given the ability to affect the sensorial perception in the remote location. In this case, the user's position, movements, actions, voice, etc. may be sensed, transmitted and duplicated in the remote location to bring about this effect. Therefore, information may be traveling in both directions between the user and the remote location.

Tele-presence virtual conferencing uses a higher level of video telephony, which deploys greater technical sophistication and improved fidelity of both video and audio than in traditional videoconferencing. Recent technological advancements in mobile collaboration have extended the capabilities of videoconferencing
beyond the boardroom for use with hand-held mobile devices enabling effective collaboration from independent locations.

Most organizations provide an in-house video conferencing bridging facility with dedicated equipment usable in all conference rooms, but these are managed by a different department. The total number of participants and concurrent calls supported by the in-house video conferencing system are on average up to 4 participants maximum (sites). Video conferencing equipment in field offices allows a total number of 10 to 30 participants, depending on the size of rooms. Future plans to enhance the in-house video conferencing capacity include upgrading Video Conferencing Bridge and end points to High Definition Conferencing capacity, Video on-demand capacities, expanding the use of individual point-to-point systems (i.e. WebEx, Arkadin) and the introduction of multi-point voice and video call service, off-premise. The approximate number of video conference calls that occur in a month range from 20 to 400 calls. External video conferencing services are occasionally used for high-level meetings. The approximate numbers of video conference calls that occur in a month vary but are expected to double in the near future.

The most popular Desktop Video Conferences are Skype and WebEx. While security is enhanced, video is possible where bandwidth and licensing permits in many stations.

Approximately 25-30% of users are using the personal desktop video conferencing tools (like Skype, WebEx, etc.) with an average number of 3-4 video calls per month using these tools.

The Cisco’s Tele-presence Suite that is currently deployed in Geneva, New York, Bonn and Nairobi seems expensive, and underutilized due to location and bandwidth constraints of UN field offices. However, we do see deployment of many Tele-Presences “like” solutions using 2 screens and lower bandwidth (Tandberg, Polycom, etc.). More details can be found on the solution cost, savings and productivity increase in the Return on Investment (RoI) section.
Connectivity, Core Applications & Services

All UN staff members throughout the organization need access to a standard ICT package (hardware, software, and services) to deliver / implement UN’s work programme and its activities. The survey highlights the issues to be addressed. The core package would have to be implemented by the ICT Team in accordance with the existing UN guidelines, taking into account open standards for interoperability and security for both access and information integrity. The core ICT package would need to be evaluated and revised as new technologies and services become available.

Funding for the core package should be made available from the corporate ICT budget as part of the basic infrastructure to carry out UN’s work programme. Considering the variations of local costs, it is certain that the basic package will require different levels of expenditure in each location. This is similar to the funding allocated for other basic infrastructure elements, such as cost of renting office space or cost of living adjustment (post adjustment).

Components of the ICT core package can include, up-to-date hardware (desktop computer, laptop, printer), Bandwidth, Access to UN-wide e-mail-Directory, E-mail services, Secure access to and from Internet, Secure remote access to internal resources, Desktop management, Backup / Recovery for e-mail, Centralized license procurement and management for all core software, ICT Training (ICT and other UN staff members), archiving, etc.

Further needs include complete Helpdesk support including Apple Macintosh applications, IT Expert Forum – Knowledge Sharing Environment, enable VoIP communications (Voice Over IP Network) like Skype, Net-meeting, access to Phone / fax / video conferencing, provision of a global WIFI provider while on travel to access UN’s email, ensure appropriate insurance coverage for laptops and accessories while on travel, etc.

With facilitated meeting technologies, the core challenges that these electronic meetings present is managing the participants. Generally, all activities involving the management of video or audio conferences, the identification of speakers, sharing presentations, and the provision of interactive experiences present unique challenges. Some products were devised in such a way to address these issues and the next set of questions was proposed to investigate the level of experience and implementation in each organization and station.
The introduction of new technologies and communications solutions has led to significant changes in user behavior and a blurring of the distinction between traditional devices, solutions and means of communications. The opportunities and goals are to leverage this flexibility while delivering simplification by bringing the capabilities and devices together in a seamless way, to deliver a more productive environment. This part of the study collected an inventory of the existing infrastructure and computing environment.
There is no formal training for staff on these products, because many of these tools have not been officially procured, and as a result no training can be organized.

Considering the wide availability of broadband and internet services globally, we see people rapidly going outside the organization and taking matters into their own hands. They are bringing the tools and applications that they prefer to use into the workplace. This leaves the IT organizations in a bit of a quandary. Unfortunately, this causes major obstacles for support personnel and creates possible security risks.
Enterprise Resource Planning Systems

Enterprise Resource Planning (ERP) integrates internal and external management information across an entire organization, embracing finance/accounting, manufacturing, sales and service, customer relationship management, etc. ERP systems automate this activity with an integrated software application. Its purpose is to facilitate the flow of information between all business functions inside the boundaries of the organization and manage the connections with outside stakeholders.

UN programme managers lack timely, accurate and up-to-date (integrated) information on (both) the (financial, human and substantive) status of the implementation of their programmes and projects. An Enterprise Resource Planning System attempts to integrate all the administrative data and processes of an organization into a single unified system. Aging and diverse Integrated Management Information System (IMIS) and ERP systems are sometimes incapable of performing required functions and linking with new modules and other remote systems.

There are currently two leading commercial off-the-shelf ERP solutions (SAP and Oracle / PeopleSoft) available on the market. The advantage of using a commercial off-the-shelf solution is that it implements industry’s best practices in enterprise resource management; however, it requires extensive customization to fit the organization’s specific business processes and is very costly and complex to implement, operate and maintain. While ERP systems are plastic and allow for customization, this can become a barrier to future upgrades and support services. The UN Secretariat is currently in the midst of implementing the $ 300 million “Umoja” project: a SAP-based new ERP system that will harness the Web for its function.

Enterprise Resource Planning Software and Integrated Management Information Systems (IMIS) are used to facilitate joint project implementation between different organizations and agencies.

**Does your Organization currently use an ERP (Enterprise Resource Planning) System? If yes, please specify the ERP Tool your organization uses in the text box below.**

- Yes: 81%
- No: 19%

*Powered by Zoomerang© Online Surveys*
Many Enterprise Resource Planning Systems are currently in use in the different organizations. Some of these include: Infor Smart-stream, Atlas (based on PeopleSoft, shared with UNDP and UNFPA), PeopleSoft for HR and Financials, SAP, PeopleSoft/Oracle, Oracle E-Business suite, IMIS, Agresso, Microsoft Navision, etc.

Functionality and features currently supported in the existing ERP systems include:

- Finance/Procurement
- HR (Recruiting, talent management, performance management, workforce planning)
- Enterprise Portal
- Asset Accounting
- Fund and Grant Management
- Inventory Management
- Sales and Distribution
- Payroll NPO (non-profit organizations)
- Travel Management
- Time Entry
- Leave Requests
- BI Reporting
- Supply Chain

There are currently little or no sustainability indices or criteria that current IMIS/ERP systems capture.

Enterprise Resource Planning Software is mainly accessed through Citrix across the UN system.

Knowledge Management and Corporate Identity

Knowledge Management (KM) comprises a range of strategies and practices used in an organization to identify, create, represent, distribute, and enable adoption of insights and experiences. Such insights and experiences comprise knowledge, either embodied in individuals or embedded in organizational processes or practices.

The UN must ensure that it has the tools and expertise in place to manage and track its correspondence, manage and archive its documents in electronic format, and use ICT tools to share and exchange content internally and with its partners. The UN Study concentrates its efforts on the basics, covering what is achievable in the next 24 months. Once a required formal UN-wide ICT Advisory board is in place, they should pursue the completion of a more thoroughly designed Knowledge Management Strategy. In the long run the Knowledge Management Strategy of the organization should drive the ICT initiatives. It is important to note that a Knowledge Management Strategy cannot be achieved by solely providing the technical (ICT) tools to do the job. The UN must immediately start preparing to migrate to a
comprehensive solution by identifying, documenting, and re-engineering its business processes. Apart from streamlining the process of document flow and arresting the loss or misplacement of important documents, the proposed solution should also aim to create a paperless environment, in line with the UN climate neutrality strategy (still in its infancy) and attempt to reduce its environmental footprint.

There is a lack of corporate identity and branding, which gives the general impression to average users that the organization is fragmented, lacks focus, and is not result-oriented. The SUN team suggests the following recommendations:

a) Purchasing/developing a scalable content management system for all UN websites for preservation of institutional knowledge and dissemination of information internally and externally.

b) Developing the Content Management System (CMS) at central level, and providing it to all offices to ensure consistency of presentation and pertinence of content.

c) Creating a new internet (e-media) policy and establishing an internet (e-media) board. There needs to be a more cohesive internet presence, albeit that the UN is composed of some 70 (semi)autonomous entities, agencies, funds and trusts.

d) The global common goal should be to have an UN-wide shared intranet, with consistent layout, standard technology, and providing relevant and consistent messages to reach stakeholders everywhere.

e) Focusing on the adoption of a global system for a shared extranet, in addition to the need for a shared intranet. Some offices have already developed solutions to this requirement by implementing a variety of systems, such as SharePoint, WIKI, Quick Place, etc.

f) Conducting a review of needs to determine the extent of the extranet requirements within the organization, and evaluate existing team collaboration products, make recommendations for use, and arrange for training where necessary.

g) Creating a single UN Document Management / Archive System (at least in the Secretariat and associated agencies). The UN has recognized the need for an integrated document management system for the tracking, administration, and archiving of its documents. However, it was evident that as an organization, the UN does not have clearly defined business processes that dictate how the institutional knowledge should be preserved. Promoting interoperability / accessibility (services & databases) within the UN. As any large organization, the UN maintains data in many distinct and independent databases that have been developed at different times, on different platforms, and/or using different data management systems. These databases are hosted on a variety of servers around the world. The need to access and exchange data between UN staff

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1 a) As an example, SUN identified a need for one Correspondence Tracking System (CTS) for UNEP. This agency receives a large amount of correspondence that needs to be acted upon in a timely manner. The majority of the correspondence that is of a corporate nature ends up in the Office of the Executive Director’s (OED) mail log, from where it is redirected to the appropriate staff members. The distribution is currently handled manually, resulting in poor tracking, occasional duplication, and some loss of responses.
members and partners, brought about the subject of interoperability, which is an important need for an international organization operating in the 21st century.

The following Content Management Systems (CMS) are currently in use across the UN:

- SharePoint
- EMC Documentum
- Hummingbird
- Oracle – Stellent
- IBM Content Manager
- jOOMLA
- Drupal for intranet
- Microsoft CMS for web
- Gauss of Open Text
- EXtron CMS

**Need for faster Internet Connectivity / Bandwidth**

Lack of access to high-speed internet connection and other remote access services in the majority of the duty stations was frequently mentioned as one of the major problems. In some large duty stations, inadequate bandwidth means that simple operations, such as the automated basic security or integrity training provided by UN HQ, cannot be done online. SUN recommends securing adequate bandwidth levels for all duty stations with a minimum bandwidth level to secure quality of service for all services to be deployed in the standard ICT package. Improving remote access from home or mission locations, while in parallel developing a policy for “acceptable use of bandwidth”, traffic prioritization, and traffic shaping were also regarded as necessary.
Since internet connectivity is crucial for the use of e-Communication / e-Collaboration tools, minimum required bandwidth is to be defined for each and every UN agency and duty station. It should be noted that the speed and available bandwidth of the connectivity to the local ISP vary from 256kB to 10Mb (ADSL), and up to 45Mb (T3). In addition, duty stations that possess the CISCO Tele-presence suit would typically require a dedicated 15 MB bandwidth for this purpose, however this requirement is not always fulfilled. In Nairobi, for example, the system operates at a sub-optimal level of 5 MB bandwidth.

Training

Traditional classroom learning does not fully meet the training needs of staff members in dispersed global organizations like the UN. Today’s fast-paced environment often requires e-Learning & remote training capacities. The need to attend and/or deliver training courses remotely has become the order of the day. Fast and on-demand access to engaging content that is tracked and recorded enables organizations to enhance training to improve employees’ skills and competencies in a cost-effective way. This part of the study sought to gauge the current e-Learning capability of the UN organization.

In order for the UN to realize the full potential of its ICT investments, a robust training component must be an integral part of UN's ICT Services. Training in core applications and services needs to be made available not only to ICT staff members, but to all UN staff members, worldwide, on an ongoing basis.

Training and e-learning can leverage the business value of Web 2.0 investments. The term Web 2.0 is associated with web applications that facilitate participatory information sharing, interoperability, user-centered design, and collaboration on the World Wide Web. A Web 2.0 site allows users to interact and collaborate with each other through social media dialogue as creators (prosumers) of user-generated content in a virtual community, in contrast to websites where users (consumers) are limited to the passive viewing of content that was created for them. For example, Video On Demands (VODs), wikis and persistent group meeting rooms can create a single repository for training and educational material, and can be much more personable as a result of the implicit social elements of Web 2.0.

Trainees and students are able to control the frequency and delivery of information, and can readily interact with instructors and peers using a variety of collaboration and communication facilities. When viewed as a next-generation collaboration platform, Web2.0 offerings can enable a whole range of ad hoc training and mentoring capabilities.
Access to e-Training (CBT - Computer Based Training, WBT - Web Based Training, Virtual Class Rooms with streaming content, etc.) has been limited until recently as bandwidth and relatively inflexible network management policies have been a barrier.

The average number of e-Courses deployed varies from application to application and organization to organization. There are 2,160 online courses active in the UN Learning Management System. Some organizations that are leading for instance, UNITAR and UN Staff College, offer Prince II as well as those courses offered under the UN Skill Port. Approximately, 50 formal HR e-learning courses have been deployed.

The average numbers of trainees that have taken these e-Courses vary from a few hundred to more than thousand depending on the organizations and duty station. At this point in time, on-demand trainings are covering approximately 1000 topics reaching approximately 4,000 topic hits per month. Furthermore, very good leverage of the technology for staff trained on ICDL via e-Learning, as for new staff orientation, mandatory security trainings, etc. is proven successful.
Most of the organizations are considering the use of e-Training courses in the near future with wide implementation of an e-Learning platform in 2011-2012. Uniformity and standardization of the UN wide implementation plans will be critical.

Support

E-Communications/e-Collaboration tools and social networking platforms are fundamental components of the “new world of work”. Whether it is real-time (instant messaging, video conferencing, white boarding, application sharing) or asynchronous (blogs, wikis, profiles, status updates, team/project workspaces, file sharing, community forums), moving to a Web 2.0 environment is something that all IT managers should be thinking about when designing their support.
Do your organization’s ICT policies allow employees to download and use e-communication & collaboration tools available free-of-charge or at a low cost from the web?

- Yes: 42%
- No: 58%

Please indicate how your organization acquired the licensing agreements for these tools:

- Other, please specify: 23%
- Provided to us by UN Secretariat under blanket License Agreement: 3%
- Acquired with our own organization’s funds: 74%

Which of the following best describes your Organization’s existing communication & collaboration tools / infrastructure?

- There is no inventory of existing or deployed communication / collaboration tools: 13%
- Some documentation of deployed communication / collaboration tools exists but it is not up-to-date: 55%
- Up-to-date documentation of all deployed communication / collaboration tools exists: 32%
New ICT applications are rolled out in many organizations without an ICT governing committee. UNEP is the leading organization. Within UNEP, there is an ICT Advisor and an ICT Governance Framework that has been written and approved by UNEP's senior management to make decisions on the utilizations of new tools. This framework details the processes and procedures to be followed regarding new applications and change management. Certain organizations are right now putting together working groups to oversee the implementation, once done, a set of guidelines will be followed with regards to any ICT matter.

Some organizations and duty stations have ICT policies in place allowing employees to download and use e-Communication & e-Collaboration tools available free-of charge or at a low cost from the web (Skype, WebEx etc.). Few organizations have software and installation policy requests for security purposes. Many cloud-based tools do not require centralized installation and can be installed via a browser. In general, governance states that any such products should be authorized centrally before being used. In practice, they are used anyway.

The UN System must accelerate its efforts towards a commonly negotiated licensing deal towards the few big, relevant vendors (Microsoft, Cisco, etc.) as no policy is in existence. This can result in substantial costs savings as shown in the case of the new ERP system.

**Mobility**

Industry data and forecast show that Mobility is pervasive in our life. Case in point, having a simple Wi-Fi network for wireless connectivity or using a blackberry or messaging services is becoming pervasive. We ought to embrace mobility within our work environment, deliver real productivity and business goals with these tools, and partner with the right vendors to navigate these issues. This section will help to identify strategic partners to the UN that can assist with the implementation of these technologies.

There are many different reasons for this: customers demand it, employees want it, stakeholders expect it and of course, the environment needs it. There are many Green benefits that come with teleworking and mobile workspaces. We have new ways to Green campuses worldwide, with the deployment of new technologies.
Does your UN System Organization allow / encourage employee telecommuting?

- Yes: 68%
- No: 32%

If telecommuting is allowed / encouraged, what kind of usage / guidelines / policies do you have with regard to employee telecommuting? Please select all that apply.

- Employees are provided with portable computers: 78%
- Employees are encouraged to work from home: 37%
- Employees do work from home time-to-time: 67%
- Employees can access e-mail using mobile phones: 81%
- Employee home internet access is subsidized: 7%
- Employee home telephone is subsidized: 0%
- Other, please specify: 19%
Some of the UN System Organizations allow / encourage employee telecommuting and are finalizing a pilot project testing feasibility of teleworking within the organizations. We expect telecommuting to be allowed on a much broader base. Right now we see some staff occasionally telecommuting, however no formal policy is in place across the UN.

While there are policies that allow telecommuting for work-life balance, UN does not make it mandatory for cost reasons (home office set up, insurance, IT support, etc.). Overall, the modalities are still being looked at (HR-wise), regarding managing such a system. However, staff can request permission to work from their homes from time to time depending on the nature of the task they have to complete.

While telecommuting is allowed / encouraged, the SUN team could only identify a limited number of staff members that were provided with portable computers. Web email access is not systematically granted to laptop users. A pilot exercise at the UN Secretariat in New York however, found that 75% of supervisors approved of the job staff did while telecommuting. Based on this study, it is possible for further analysis leading to decisions in this regard to be made.

Overall, SUN concluded that a UN Wide implementation of this policy is still needed and should be further explored with global standardization as a requirement.
ICT Governance / Organizational Philosophy and Policies

The fundamental consideration in global governance is based on the control model. Should the ICT authority reside centrally, locally or in combination? There is no perfect model; one that works at one stage might be not as satisfactory at a later stage. One thing is certain, with no carefully constructed governance, decision making, oversight and even simple visibility, the ICT organization will quickly become muddled.

As a rule of thumb or as a danger signal: How do you know when there is not enough governance?

- You see cost rise due to duplication efforts
- You discover “unexpected” systems running in remote locations
- Local agencies / stations are not following processes or guidelines when initiating projects, etc.

The key findings related to ICT governance with a direct impact on the UN wide organization are:

- Lack of coherent ICT vision and leadership
- Inability of UN to articulate its ICT needs
- Ad-hoc development of ICT within divisions and locations, leading to duplication of efforts
- Unbalanced investments in core ICT infrastructure and services
- Lack of mechanisms to develop, monitor, and enforce standards and policies
- Lack of effective oversight of the level of ICT services provided to UN

By implementing the UN-wide ICT Governance structure, the majority of the issues would be addressed.
Before closing the survey, SUN encouraged staff members to reduce air travel (and the Green House Gas (GHG) emissions, costs, and employee time & fatigue associated with it) where possible by using e-Communication / e-Collaboration tools. One of the UN business drivers also focuses on the environment. This mandate was assigned to a specific agency namely, the United Nations Environment Programme (UNEP). UNEP is most concerned with the environment and is very much interested in learning more about the adoption of technical innovations that can be deployed to help reduce Green House Gas emissions. This section will help to identify existing policies and common practices applied by all UN staff members globally related to this UNEP initiative identified through interviewing focal points.

Hereafter some of the most relevant quotes:

“One of the major businesses of OPCW (Organization for the Prohibition of Chemical Weapons) is inspections of Chemical sites (Chemical weapons, Chemical Industries, etc...). This implies heavy travel that can hardly be substituted today. There are some preliminary discussions about reducing the number of inspectors on a mission by using technology (such as on-line cameras), but we are far from implementing it (also for confidentiality reasons). The major success in travel substitution is in recruitment: the candidates are almost systematically interviewed by VC, if the candidates are not regional.”

“There is resistance to REDUCING travel by replacing it with Video Conferencing. Time zone differences are an issue. We are seeing increased uptake. It has to be very convenient (on premises) and easy and reliable. We are using Skype a lot for recruiting. We are trying to better define the various levels of service and educate users on their options (from self-service through to full service). Tele-presence looks very promising for senior management, but we need more active coordination across agencies so that we get a critical mass of adoption that would make this option attractive.” (IMF, Washington)

“Remote Participation is increasingly of interest to International Telecommunication Union (ITU) Member States and Sector Members. Use in the ITU Standardization sector is now widespread. Recent feedback from delegates who participated in meetings remotely has been very positive, with participants using the technology as a substitute for travel and to provide remote expertise to delegations. The ITU is one of the first UN agencies to implement webcasting.”

“Using Internet based tools is certainly the easiest and most cost effective way to go. It is important to remember that there are inherent security risks in many of these applications and these should be considered and addressed prior to implementation.” (UNFPA, New York)

“UCC will help to improve communications for mobile, remote & distributed workforce by replacing face-to-face meetings that require travel with virtual meetings using audio, Web and video conferencing, etc. It can yield substantial cost and carbon-emission savings.” (World Meteorological Organization (WMO), Geneva)

“Video conference is an excellent alternative, and should be used more. Desktop VC should be more readily available to all staff.” (UNODC, Vienna)
“WFP has commenced internal discussion about options for reducing some kinds of air travel, in particular travel associated with meetings, however this remains a lower priority (at around 10% of our emissions footprint) than road transport (30%) and building energy use (60%). In addition, we would note that some of our travel obligations are not readily able to be reduced, such as staff rotation in high security-phase duty stations, and emergency response work. Nevertheless, should opportunities present in these areas, we will explore their feasibility.”

“Electronic tools work well for repeated collaboration, for short meetings and for topics that have already been well defined.”

“We have a positive policy to reduce travel to the field through the use of Video technology and we are increasingly being requested to provide remote testimony to the court room. For us clearly this is a growth area and we will support any initiatives to provide more facilities.”

“Reducing travel increases the IT bottom line costs -- there needs to be a recognition that investing in our services will reduce costs (and emissions) elsewhere. I have a big concern with the ecology of the production and maintenance of equipment and I am not sure that looking only at the energy required to operate the equipment shows a complete equation. If manufacturing a 17” flat panel is the equivalent of a Geneva-New York flight, then buying a big flat panel for videoconference is the equivalent of many trips. This is a big issue and it is hard to get the environmental impact data for procurement. Just some thoughts…”

“E-communication is quite important and that is why the Universal Postal Union (UPU) bought a videoconference system to facilitate meetings with external people. According to IT security reasons, Skype and other similar tools are not allowed.”

“UNESCO is committed to reducing its GHG emissions by 5% per annum from 2011 to 2013 and supports the Secretary-General's Climate Neutral Initiative. Minimizing emissions by maximizing appropriate use of e-communications certainly features in UNESCO’s strategy for reducing emissions, although e-meetings simply cannot replace all face to face meetings: for human beings, personal contacts still matter (although I am hugely skeptical at all the dubious claims that the personal contacts need to be nurtured by business class travel to meet each other). However, strategies are one thing, but walking the talk is quite another: to implement an emissions mitigation strategy requires investment in the infrastructure and human resources needed to do the job, and so far at UNESCO there has been lots of talk, a number of reports and documents, and absolutely no commitment of any dedicated resources - neither financial nor human - to support real emissions mitigation efforts. This is not a sustainable situation.”

“Task Force on Carbon Neutral WTO already created (collaborates with UNEP). This issue is taken seriously by our DG. A World Trade Organization (WTO) Task Force is currently working on this.”

‘Based on our experience, the use of video conferencing over ISDN or IP for job interviews and work meetings is an effective way to reduce travel. We also have good experience with external and internal collaboration using tools such as SharePoint and Live link. In addition, we consider that subject matter
knowledge and training can in many cases be sustained and increased more effectively through e-learning and virtual meetings.”

“It is well known that travel of UN staff accounts for the majority of emissions generated by the UN system organizations. We cannot therefore avoid increasing the use of e-communication to reduce travel and associated emissions. It would also be preferable that the UN can address this in a more holistic and strategic manner to avoid duplication of efforts and unnecessary loss of financial resources available to the UN as a whole. The challenge will be coming up with services that can satisfy the different needs and for which each organization can contribute (based on the use of the different components of the service).”

“We could accelerate the progress within each organization when getting a top down order for action and tangible progress metrics at Chief Executives Board (CEB) level. UNEP should contribute with respective ROI facts and figures and ensure that things like travel reduction lumped into "Greening" and dropping to the end of the CEB-HLCM (High Level Committee on Management) priority list don't happen anymore.”
Key Conclusions and Recommendations

The UN wide study consisted of two components. Phase 1 assessed the use of e-Communication/e-Collaboration capacity across the global UN System. This component of the study described the existing e-Communication/e-Collaboration capacity of UN offices. Phase 2 identified the technical requirements for the potential improvement of e-Communication/e-Collaboration capabilities within the UN. This assessment proposes a set of recommendations as to how e-Communication/e-Collaboration could be improved.

E-Communication Tools

Recommendations:

• All UN staff members throughout the organization need access to a standard ICT package (hardware, software, and services) to deliver / implement UN’s work programme and its activities.
• Funding for the core package should be made available from a central ICT budget, as part of the basic infrastructure to carry out UN’s work programme with the understanding that this support can result in substantial cost savings in the future.
• Components of the ICT core package might include: Up-to-date hardware (desktop computer, laptop, webcam, printer), Bandwidth, Access to UN-wide e-mail-Directory, E-mail services, Secure access to and from Internet, Secure remote access to internal resources, Desktop management, Backup / Recovery,
• Complete Helpdesk support including different operating systems, IT Expert Forum – Knowledge Sharing Environment, VoIP communications (Skype, Net-meeting), access to Phone / fax / video conferencing, provision of a global Wi-Fi provider while on travel to access UN’s email, ensure appropriate insurance coverage for laptops and accessories while on travel, etc.

Connectivity, Core Applications & Services

Recommendations:

• Provisioning of a UN-wide core ICT application & services package.
• Establishment of a mirror site for current and future ICT core applications & services to facilitate access from out-posted offices.
• Standardized use of the un.org domain for all e-mail and website addresses.
• Examine the current procedures and insurance mechanisms, so that the staff members are not adversely affected.

Enterprise Resource Planning Systems

Based on the findings and issues reported, SUN formulates the following recommendations:

**Recommendations:**

• Pending the UN Secretariat’s implementation of its future ERP system (SAP)

• All ICT Chiefs and Focals in different UN programmes need to work closely with UNHQ (OICT) in order to streamline their business processes in preparation for the future ERP.

Knowledge Management and Corporate Identity

Based on the findings and issues reported, SUN formulates the following recommendations:

**Recommendations:**

• Adoption of a global Content Management System (CMS) for internet website management and creation of an internet Board

• Adoption of a global intranet

• Adoption of a global system for extranet

• UN Document Management / Archive System

• Correspondence Tracking System (CTS)

• Interoperability / Accessibility (services & databases)

Need for faster Internet Connectivity / Bandwidth
Recommendations:

- Secure adequate bandwidth levels for all duty stations with a minimum bandwidth level to secure quality of service for all services to be deployed in the standard ICT package.
- Improve remote access – from home or mission travel locations
- Develop policy for “acceptable use of bandwidth” – traffic prioritization / and traffic shaping

Training

Recommendations:

- Training plans part of the on-boarding process
- Delivery mechanism (Streaming, VODs, etc.)
- Develop a training policy

Support

Recommendations:

- Training plans part of the on-boarding process
- Delivery mechanism (Streaming, VODs, etc.)
- Develop Support policy

Mobility

Recommendations:

- Document wireless strategy
- Document wireless implementation plan
- Standardization (PWD, SSID, WEP, etc.)

ICT Governance / Organizational Philosophy and Policies
The following tasks are expected to fall under the mandate of the ICT Advisor assigned by the ICT Network. The Committee should act as an advisory / approval body for significant new proposals for ICT Solutions. It is apparent that there is a large disparity in the levels ICT hardware and software is in use at each of UN’s offices as well as among staff within a particular office. This strategy will include a set of standards and guidelines for UN-wide implementation.

Strategies in this context are understood to be middle to long-term, forward-looking, whereas policies are required to provide UN-wide answers to external developments such as industry trends. Given the speed at which ICT technologies change across the world, it is also understood that this set of policies must not be taken as “carved in stone”, but rather as living documents, which require constant revision by the governance bodies.

**Recommendations:**

- Ongoing support from senior management through the ICT Network
- Establishment of an ICT Team, headed by a senior ICT advisor, reporting to the Office of the Executive Director (OED) of each agency – dotted line to ICT Network
- Establishment of a UN-wide ICT committee with separate budget for the provision of core ICT services to staff at all UN locations
- Establishment and maintenance of a UN ICT strategy
**Return on Investment**

E-Collaboration tools have become business-critical, adding value in many ways. Assessing the return on a collaboration investment happens across three areas:

- **Operational return on investment (ROI):** Achieved by reducing and/or avoiding costs
- **Productivity ROI:** Realized through more efficient processes, faster time to market, and reduced cycle time
- **Strategic ROI:** Leading to business transformation and strategic advantage

While the first deployment of collaboration tools focused on individuals within a single company, it then evolved and includes now more advanced tools that facilitate social sessions across organizations. Now more than ever, a network-centric approach is essential to maximizing the benefits of today's collaboration technology.

The powerful trio of internet, mobile, and broadband technologies changed everything - from the way we search for information and consume media, to how we interact with our peers. Facebook and YouTube, smartphones, and blogging became part of our everyday lives. Today, we enjoy infinite content, no barriers to entry, one to-many communications, and rapidly expanding social networks.

In an era of dispersed teams and reduced travel budgets, it is increasingly difficult to build trusted relationships with customers, partners, and even colleagues. Private social networks, audio and web conferences, team spaces, video, and chat help us overcome the limitations of distance and time zones. Indeed, effective use of these collaboration tools has become essential to business success.

Collaboration technologies add value in a host of important ways. We know this fact from our day-to-day experience in the workplace, but can we really measure the effect on the business? The answer is yes. As mentioned previously, the return on collaboration can be assessed in three areas: operational ROI, productivity ROI, and strategic ROI.

This new collaboration experience helps us cope with information overload by delivering only what we need, just when we need it. We can quickly find experts and participate in blogs, videos, wikis, social networks, team spaces, and conferences from a variety of devices. Thanks to advanced security and policy management, we can include partners, customers, and suppliers in our one-to-many communications.
As a result, virtual communication has become more lifelike and personal, and these richer interactions make for better business. The question is, how much better?

Consider one example: According to March 2010 report from Bernstein Research “technical advances in video conferencing have moved the capability to an entirely new level over the last 18 months, so that it now has the potential to fundamentally impact business travel”. Based on the success of Tele-presence among early adopters, the firm predicts that 70 percent of internal travel and 10 percent of external travel could be replaced over the next 10 to 15 years, resulting in an aggregate reduction of 21 percent in corporate travel spending.

**Operational ROI: Start with Savings**

Companies achieve operational ROI by reducing and/or avoiding costs. They may migrate from a private branch exchange (PBX) to IP telephony to reduce infrastructure costs; use Tele-presence to reduce travel costs; or deploy the Cisco WebEx suite to enable virtual meetings, thereby reducing office-space requirements. This type of ROI is easiest to measure because it reflects hard-dollar savings that go right to profits - and the financial savings here can profoundly affect the business.

In February 2010, a research provider, **Salire Partners**, published a report on the operational ROI of collaboration. Over a period of 3 years, Salire conducted hundreds of ROI analyses for companies of different sizes and in different industries around the globe that had deployed unified communications, IP telephony, and collaboration solutions. Researchers asked companies to report on the net benefit of their technology investment, the total expected cost to implement their solution, and the length of the payback period.

The report concluded that most companies - nearly 80 percent - see a positive return on their investment in collaboration technologies. Numerous important industries showed a 5-year ROI of more than 100 percent and payback periods of 21 to 40 months. Positive results apply to both large and small companies: those with between 1,000 and 25,000 employees posted returns of more than 170 percent.
Productivity ROI: Focus on Efficiency

Cost savings are one way to measure the results of business collaboration, but many companies also make significant productivity gains. Effective collaboration can improve the product-development process or take time out of the project cycle. What is the value of using videos to publish a user manual or Instant Messaging to find the person who can respond to an opportunity immediately?

When you implement more efficient processes, achieve faster time to market, and reduce cycle times, you extract more value from your collaboration investment. If you can identify opportunities to shorten the time needed to make critical decisions, there is no better place to invest.

“Raising the productivity of employees whose jobs can’t be automated is the next great performance challenge - the stakes are high.” When Frost & Sullivan performed a global study of more than 3,500 business and IT leaders in May 2009, the conclusion was that companies had realized a return of 400 percent on their collaboration investments. This report also found that the ROI for collaboration follows a continuum: Companies that deploy more advanced tools and foster a stronger collaborative culture enjoy greater benefits than those that concentrate on the basics. That said, even a minimal collaboration effort yields modest results.

Strategic ROI: Reinvent the Business

Strategic ROI is often hard to quantify in dollars. However, strategy is the key factor to make possible business transformations. Collaboration tools help companies enter new markets, build new business models, accelerate innovation cycles, and make faster, better decisions. These tools enable the major moves that lead to competitive advantage and reinvention of how companies do business.
The financial services industry is a prime example of the strategic ROI that collaboration pioneers are achieving. Have you ever had a virtual banking expert greeting you at the door? Did you know you can deposit a check by taking a picture with your iPhone? Are you surprised when you speak to a service representative who not only knows your banking history, but also can suggest new products based on your personal profile?

The same type of change is taking place in healthcare. Experts and patients have come together to find the right diagnosis and treatment more quickly and accurately. Doctors and nurses are completely mobile, yet they have access to any information they need - in real time.

High-tech manufacturing is another leader in the adoption of collaboration technology. Products today are conceived in one country, manufactured in another, and marketed all around the world. All parties have complete visibility into the process, and the work never stops.

Schools, too, are finding creative ways to make teaching and learning more interactive and mobile - and therefore, more effective.

The Importance of a Network-Centric Approach

Effective collaboration begins and ends with the network. Only a network-centric approach can support the increasing mobility and the full range of communication devices that allow us to communicate with one another. In addition, emerging collaboration applications, such as immersive video, fixed mobile convergence, and location-aware services, all depend on an intelligent network infrastructure to optimize the experience and improve participation.

A network-based architecture provides end users with an “any-to-any” experience - the ability to collaborate anywhere, on any device, across any type of content:

- **Anywhere**: Effective collaboration must deliver the richest possible experience whether one is at home, in the boardroom, in the office, in the hotel, or at a soccer game. Collaboration must offer flexible deployment models including premises-based, cloud-based, and hybrid options.
- **Any device**: Today’s collaboration must support all the different endpoints and platforms that people use today, including PCs and phones, but also increasingly smart mobile devices and tablets. It must also support multiple platforms including Android, Mac, RIM, Symbian, and Windows.
- **Any content**: Collaboration must offer access to any media type - and in the applications that people work in today. This content includes data and voice, but also real-time video.

While a detailed ROI calculation for all e-Communication tools used in the UN is outside the scope of this study, the following case study provides more details and insight on how specific tools are available on the market that can measure ROI, Greenhouse Gas Emissions, etc. in an efficient way with regards to organizational travel reduction options.
Case Study on Tele-Presence ROI

Tele-Presence promises productivity improvements and cost savings from travel, but requires significant investment in both network infrastructure and bandwidth. The obvious question is whether the business case adds up, and what level of use is required for a return on the investment.

Tele-Presence return on investment can be estimated balancing the implementation and running costs against the potential hard and soft savings from travel mitigation and improved collaboration. The logic is quite simple - in a present mode of operation, customers fly for face-to-face meetings; each flight presents a hard cost for travel expenses, a soft-cost in terms of lost productivity, and an environmental cost in terms of carbon dioxide (CO2) emissions. In a Tele-Presence-equipped mode of operation, customers will still travel although at a reduced rate. Travel is replaced by Tele-Presence (with associated hard cost from investment, soft-cost in terms of productivity in meetings and an environmental cost from power consumption). Comparing these two elements gives an estimation of the Tele-Presence ROI, presented in terms of:

- Net Present Value (NPV) of the investment
- Internal Rate of Return of the investment
- ROI period (months)
- Percentage flight reduction required for the NPV to equal $0 (break-even)
- Environmental savings in terms of kg CO2 abated (and the subsequent carbon credit value)

The following systems are available for detailed calculation. This report only shows a few to get a sense of all options available. It is SUN’s intention to follow-up with detailed ROI calculations once this report is studied.

- CTS-500 (1 screen, personal system)
- CTS-1000 (1 screen system, 2 attendees)
- CTS-3000 (3 screen system, 6 attendees)
- CTS-3200 (3 screen system, 18 attendees)
This sample ROI tool provides savings and cost breakdown. Savings breakdown consists of travel mitigation in the form of productivity and travel cost. Cost breakdown consists of bandwidth, services and equipment.
The sample ROI tool above concentrates on Green House Gas aspects, and it will have real-time automatic updating with the environmental benefit of the scenario modeled by each company/organization.

Conclusion

Business collaboration tools, such as Tele-presence, video conferencing, enterprise social software, and unified communications, have changed our lives. By connecting scattered team members across organizations and time zones, collaboration technology enables organizations to reduce and avoid costs, accelerate time to market, and transform entire industries.

Is collaboration worth it? Researchers say it does. To measure the full return on collaboration, business leaders should consider results across three areas: operational ROI, productivity ROI, and strategic ROI. A modest level of collaboration results in moderate performance gains; however, better collaboration yields progressively better performance and returns. Now is the time to plan UN collaboration strategy. Pioneers in financial services, healthcare, education, and other industries already are defining new enterprise
standards in their industries. Organizations should not miss the opportunity to be an innovative collaboration leader.

**Resource Plan**

The UN-wide study identified the requirements for the UN to further adopt e-Communication and e-Collaboration systems, and proposed recommendations on how these systems can be adopted in the UN. A rough estimation of the resources required for the implementation of the recommendations can be presented as soon as a list of recommendations is identified as actionable task.
Study conclusions and next steps

In the framework of this study, many issues were highlighted and the UN has many possibilities/opportunities ahead based on some of the recommendations made. The study created a UN-wide ICT “snap-shot” but what should follow?

Next steps:

- Readout of the report to the ICT Network
- Define some quick wins with all ICT Focal points via the ICT Network
- Suggest e-communication options and deployment of minimum UN-wide technologies
- Suggest training/support and governance requirements
- Present analysis on cost benefits of e-communication implementation options
- Create a UN-wide ICT task force
- Devise an overall e-communication/e-collaboration strategy
- Define the implementation plan
- Define the resource plan and the UN Wide Advisory Function
- Create long term UN ICT strategy over the next 3-5 years

The SUN team was able to capture a wealth of information that should be further shared with the extended team. Several people expressed their interest and would like to be part of the team/board/council in charge of moving things forward.
Nota Bene

This report serves as a follow-up on the presentation from Lakshmi Panyam (Rome – October 2010) and presentation from Gert De Laet for the ICT Network (NY/Geneva – April 2011) based on the UN-Wide “E-communication” survey.

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Glossary

A

Address book

In e-mail, list of regular contacts' addresses held in the e-mail software.

Animation

A rapid display of a sequence of images to give the impression of movement, Simple animation programs are available on the web.

Anti-virus software see virus

Application - see software

Archive

To store files which are not needed but cannot be discarded. This often involves backing up/saving to a separate hard disk, floppy disk or other storage medium. Also used for stored messages contributed to e-mail discussions, sometimes searchable by date, topic, contributor, etc.

Attachment

A file that is attached (linked) to and sent with an e-mail message.

Back up

To make a duplicate but separately stored copy of the contents of a computer-held data set, software application, or individual files. Back-ups should be done regularly.

Bandwidth

Range of signal frequencies which indicates how much data can pass along a channel at one time. Broadband networks, the basis of the information superhighway, allow video signals to pass at high speed; narrowband networks tend to be text-only and are slower. For example, voice over the telephone network requires a bandwidth of 3 kHz, while uncompressed video requires a bandwidth of 6 MHz.

Bits per second (bps)

Unit of measurement of data transfer speed. For example, the bit rate of widely used modems is in the range 300 to 56000 bps (or 56 Kbit/s; higher rates are given in Kbit/s).
Broadband

Informally used to mean 'faster than common networks', and so the actual meaning depends on what is common at the time. Currently, broadband is regarded as starting at 34 Mbit/sec (Mbps) – under this classification, all commonly occurring local area networks (such as Ethernet) are narrowband.

Browser

Software used to search and retrieve information from the World Wide Web. Netscape, Microsoft Internet Explorer and ANT Fresco are browsers.

Bug

Error or fault in computer software, which causes it to malfunction.

Byte

Unit of information equal to eight bits, usually, each byte stores one character.

CD-ROM (compact disk read-only memory)

Computer storage medium, optical disk which physically resembles a 12 cm audio CD, but contains a range of data types stored digitally, such as words, graphics and sound rather than sound only. CD-ROMs can store up to 250,000 pages of text with a capacity of 650Mb. Once written, the disk cannot be altered, hence 'read-only'.

Computer conferencing

Development of electronic mail designed to support many-to-many communication. Each conference consists of a group of users who have a common interest in the conference subject matter. Computer conferencing software enables organization, storage, structuring and retrieval of messages. In particular, messages may be organized under different topics, by author or by date of posting.

Computer program see program

Conferencing see computer conferencing, Tele-conferencing or video conferencing

Convergence

Term applied to the way in which computing, telecommunications and, more recently, television are moving towards a common technological basis characterized by the use of digital systems.

Courseware
Computer-based instructional material, e.g. lecture notes, tutorials, tests, etc.

Data

Representation of information – facts, concepts or instructions – in a formalized manner in order that it may be communicated, interpreted or processed by people or automated means. In computing, this information may be processed by a computer.

Data logging

Acquisition of information by a computer through the use of sensors to measure and record environmental changes – for example, the changes in temperature of water in a pond over the period of several hours.

Database

Structured collection of conceptually related data or data files organized and stored in a computer system. Databases can be set up in different ways: for example, the simplest are tables with a row for each record (a set of related items such as an individual's name and address) and a column for each field (the categories within each record such as last name, house number, street, town, etc.). Hierarchical databases hold their data in tree structures, e.g. one for a school might divide into staff and students at a high level, with individual names at the lowest and divisions like department or class in between. The most powerful databases use a method of storing data, which does not restrict the way users can query it.

Desktop computer

A traditional office or personal computer. This has three or more parts linked together by cables: the system unit which houses the central processing unit and disk drives, the monitor, a keyboard and probably a mouse.

Desktop publishing (DTP)

Production via a desktop or personal computer of page layouts which combine words, graphics and images with different sizes and styles and form the master copies of materials such as newspapers, magazines and leaflets.

Dial-up

Connection to the internet or another computer over an ordinary telephone line.

Digital versatile disk (DVD)

Data storage medium, optical disk capable of storing high quality video as well as data such as programs, text, still images and sound (also known as 'Digital Video Disk').
Directory

Named grouping of files, also known as folder. Directories can sit within directories as sub-directories, and files are usually organized in a tree structure of directories, with the root directory (often 'C' on a personal computer) at the top.

Download

To use one computer to obtain data from another computer, electronically Downloaded information can be incorporated into other files, displayed, printed or saved.

DVD see digital versatile disk

Electronic communication aid - see augmentative and alternative communication

Electronic mail - see e-mail

Electronic whiteboard

Interactive screen modeled on a standard whiteboard that is linked to a computer. The computer image is projected onto the screen, sometimes using a standard data projector (often ceiling mounted). The user interacts on the screen with a 'pen' and the screen sends information back to the computer about the pen's movements, enabling the user to interact with various software packages.

E-mail (electronic mail)

Messages or letters sent and received in electronic form via computers.

E-mail attachment - see attachment

Encryption

Conversion of data into a format that cannot be read except with a special decryption program. Used on the internet for secure transactions.

FAQ see frequently asked questions

Favorites see hotlist

Fax (facsimile)

Transmission of images over the telephone network, most often of letters or other text. Fax messages can be sent direct from a desktop computer fitted with a fax modem.
Fax modem

Modem which, in addition to its normal data transmission capabilities, handles faxes. With suitable software, a fax modem allows a microcomputer to operate like a fax machine, in the sense that any electronic document can be printed to the fax modem and thus sent out as a fax. Some fax modems with suitable software allow the receipt of faxes and their display on the computer screen.

Fibre optic cable

Very thin strands of pure glass used for transmitting high volumes of data at high speed.

File

Collection of data held on a computer as one thing with one name. A file can be a piece of work created by the user in an application such as a word processor or a database. Each file needs a unique label (filename) in order to be accessed. See also directory

File transfer

The action of copying or moving a file from one computer to another.

File transfer protocol (FTP)

Common method of transferring files from one computer to another over the internet. See also protocol.

Firewall

Means of protecting a networked computer system to prevent unauthorized access.

Freeware

Software that can be copied and used without payment to the author.

Frequently asked questions (FAQ)

List of the most frequently asked questions and their answers, produced as a reference document for individual e-mail discussion lists/groups or World Wide Web sites, in order to avoid repeating answers to the same questions.

Full motion video

Video signal before it has been processed by video compression.

Gateway
Device connecting different networks by carrying out protocol conversion between them, i.e. translating the rules of communication of one set of computers to those of another.

**GIF (graphics interchange format)**

Format commonly used to store digitized images as most popular software can cope with it. See also JPEG.

**Gigabyte (Gb)**

1024 megabytes or one thousand million bytes

**Graphical user interface (GUI)**

Screen representation of the computer’s control system, enabling the user to move an on-screen cursor, usually with a mouse, and 'click' on pictorial representations or icons in order to make the computer perform various instructions. Mouse movements usually have keyboard alternatives.

**Groupware**

Computer technologies used to support group interaction. Examples include conferencing (audio, graphics and video), electronic mail, computer conferencing, scheduling and diary management systems, shared desktop systems and multi-user editors.

**GUI** see **graphical user interface**

**Hard copy**

Printed output from a computer as opposed to the 'soft' copy stored on the computer.

**Hard disk**

Computer storage medium, rigid disk usually made from aluminum, coated with magnetic material and hermetically sealed fitted internally in a personal computer. See also CD-ROM, floppy disk.

**Hardware**

Physical components of a computer or a communications system, including both mechanical and electronic parts, such as the processor, hard drive, keyboard, screen, cables, mouse and printer Contrasted with software

**Home page**

Opening or main page of a web site of a particular organization or individual
Host

Computer acting as an information or communications server; often used for a computer acting as a web server.

Housekeeping

Organizing and pruning information and software on a computer to keep them manageable and minimize the storage space they occupy.

HTML - see hypertext mark-up language

Http - see hypertext transfer protocol

Hyperlink

In a hypertext document such as a world wide web page, the predetermined area (which can be a word or set of words, an image or part of an image) which can be clicked on to jump to other documents, or other parts of the same document.

Hypertext

System enabling the non-sequential connection of information, linking one computer files with another or part of another. The user can choose to follow the link or to continue using the original file sequentially. Used for the World Wide Web. See also hyperlink, hypertext mark-up language.

Hypertext mark-up language (HTML)

Computer language used to create hypertext documents such as world wide web pages. The author using HTML ‘marks up’ or defines how elements of the text will appear on the web by inserting ‘tags’ which will be invisible to the ordinary user of that page. The tags are special instructions to the computer, such as to insert a picture or to change text size and style. Tags may also define text or an image as a link to another page (a hyperlink). Text editors or word-processing packages can be used to create HTML documents, and it is useful to know how to create and edit ‘raw’ HTML, but there are also many specially designed packages enabling easy HTML creation. Standard for the process of requesting and transferring a page on the World Wide Web for the transfer to succeed, the page must have been constructed as a hypertext document using the hypertext mark-up language.

ICT see information and communications technology

ILS – see integrated learning system

Information and communications technology (ICT)
Application of modern communications and computing technologies to the creation, management and use of information

Information superhighway

Usually used to mean a broadband network capable of transferring very large amounts of information, including video, still images, audio and text, at high speed between remote users. See also internet.

Information technology (IT) - see information and communications technology

Install

To copy all the files of a software package on to a computer and make any changes needed to existing files so that the software then works. Installation or set-up programs do this for users.

Integrated learning system (ILS)

Computer-Based system with a diagnostic capability that monitors and manages the delivery of curriculum material to students so that they are presented with individual programs of work.

Integrated package

Software package, a suite of applications which have a consistent interface and include a word-processor, spreadsheet and database, bundled together. Other software may be included, such as graphics and communication modules. Data can be transferred easily between the applications.

Integrated Services Digital Network (ISDN)

Telecommunications standard for the transmission of digital information over ordinary telephone lines, and the name for the digital telephone network. Contains channels for digitized speech, data, image or video signals.

Interface

Equipment or software which enables a user to communicate with the 'raw' system they are accessing, for example, a menu or icons on a screen (see graphical user interface). Also any join between items of hardware or software, such as connections with printers. For a peripheral device such as a printer to communicate with the main computer, their interfaces must be compatible.

Internet

Also known as the 'net', the inter-communicating computer networks that host and provide access to the World Wide Web, file transfer, e-mail, news and other services.

Internet protocol (IP)
Set of communication standards, which control activity on the internet. An IP address is the number assigned to any computer connected to the internet, and is the only way in which information sent through the internet can find its way to that computer. It is a number of the form A.B.C.D where each letter represents a number from 0 to 255, e.g. 193.63.56.222. See also domain name system.

**Internet relay chat (IRC)**

Method of ensuring 'real-time' and multi-user communication. When internet users are on line simultaneously, they can communicate by sending text messages which are read almost as quickly as they are sent -- i.e., on a par with normal face-to-face conversation.

**Internet service provider (ISP)**

Organization with a direct connection to the internet acting as an intermediary for other users, providing them with an e-mail address and software, access to the world wide web, and often space on web servers for home pages etc.

**Intranet**

Internal web site set up to serve a closed group, e.g. a school, which contains pertinent information such as school documents, bulletin boards, health and safety information etc.

**IP** see **internet protocol**

**ISDN** see **Integrated Services Digital Network**

**ISP** see **internet service provider**

**IT - see information and communications technology**

**J**

**Java**

Programming language designed to add interactivity and functionality to the web by enabling developers to write and distribute programs that would run on any computer regardless of the operating system.

**K**

**Kb**

Kilo-Bit, Kilobyte

**Kbits/sec**

Unit of measurement of data transfer speed, 1024 bits per second.
Kilobyte (k)

Unit of measurement of storage capacity, 1024 bytes, or one thousand

LAN - see local area network

Laptop computer

Portable computer, small enough to carry around and use on a lap

Laser disk see video disk

LCD - see liquid crystal display

Leased line

Permanent connection over the telephone network to, for example, a PoP. Telephone charges are per line rather than per call made. Therefore, regardless of use, the costs are fixed and predictable.

Link see hyperlink

Liquid crystal display (LCD)

Thin flat screen used in portable computers, digital cameras and watches where space is at a premium.

Local area network (LAN)

Communications system linking computers within a restricted geographical area such as a building or campus, this also allows computers to share information from a central source

M

Mbits/Sec

One million bits per second

Megabyte (Mb)

1024 kilobytes or one million bytes

Monitor

Screen used with a computer, also known as a VDU (visual display unit) or DSE (display screen equipment).
Mouse

Small molded plastic box with clickable buttons on top and a rolling ball or optical 'reader' underneath, moved by hand across a flat surface to control the screen cursor position. It enables the user to access menus and to select and move words or other objects around the screen. Alternatives to the mouse include touch screens and trackballs.

Multimedia

Combination of moving images, graphics, text and sound. A multimedia machine is fitted with hardware such as sound and video cards and a CD-ROM drive, and may include peripherals such as a camera, microphone and scanner.

Network

Electronic communications system linking computers, computer systems and peripherals such as file servers and printers.

Notebook

Type of laptop computer, lighter and thinner than earlier models.

Operating System (OS)

Program or set of programs which controls the computer. Different types of computer use different operating systems, including MS-DOS, Windows 95 and successors, Risc-OS, and MacOS.

Package

Software suite designed for a particular application or job, such as word-processing or accounts.

Packet switching

Data transmission method that breaks down a flow of data into smaller units called packets. These are individually addressed and routed through a network. Technologically developed countries have at least one publicly available packet-switching network.

Palmtop computer

Portable pocket-sized computer with a screen in a folding lid. The keyboard is very small and the screen less than half the size of those on laptop computers.

PC see personal computer
PDF  see portable document format

Personal computer (PC)

Computer designed for individual users rather than several users at any one time. Usually taken to mean an IBM or IBM-compatible machine

PoP (point of presence)

Location and telephone number provided by an internet service provider (ISP) for local dial-up access to the internet by users. The more PoPs in the country, the more likely it is to pay local call rates. (Not to be confused with POP, which stands for Post Office Protocol)

Portable computer

Generic term covering all personal computers, which are light enough to carry with one hand, such as laptops, notebooks and palmtops

Portable Document Format (PDF)

Used to store and transmit text and images with a set appearance, sometimes in order that documents appear exactly as in print with the same line endings and pagination. PDF files can be created and read using software such as Adobe Acrobat.

Printer

Device used to produce hard copy (paper copy) from a computer. Various types are available: a dot matrix printer produces output by firing pins against an inked ribbon; bubble or inkjet printers squirt or squeeze ink through pins, and a laser printer works in a similar way to a photocopier.

Program

In this American spelling, standard term for the set of instructions carried out in sequence by a computer to perform a given task. Programs are written in English-like programming languages and are then translated into binary code by an intermediary program called a compiler. Large software systems are normally sets of several programs.

Programming language

Artificial language constructed to enable the user to communicate with a computer and to create programs for it to run. Examples of programming languages used in school are Logo and BASIC.

Protocol

Rules or procedures usually set out in an agreed international standard (e.g., file transfer protocol) governing how communications are handled by a network of computers.
Public domain software

Freely available and distributable software, also known as freeware. It is free of copyright and should not be confused with shareware.

Real-Time video

Display of moving pictures on a computer screen as they happen. For example, a television broadcast can also be broadcast on the internet. The pictures will be displayed as they arrive at the computer, instead of all being stored in a file first. Two-way real-time video is used in video conferencing. The recipient can see and hear the sender as they speak and can reply in the same way at the same time.

Resolution

Clarity and sharpness of pictures and text as they appear on the screen or on paper, often measured in dots per inch (dpi). The greater the dpi, the better the resolution. Screen resolution is measured by the number of pixels in a row and the number of rows and columns, together with the size of the pixel on the screen. The larger the screen, the higher the resolution should be.

Root directory see directory

Router

Communications device that chooses the route by which information should travel through a network

Server

Computer system that provides a particular service to devices on a network. In the context of the client–server model, a server is the software on a remote computer servicing a client with the resources the client requests. In a local network, a file server holds system software on its hard disk, and is usually the most powerful machine in the system. A network may have a number of file servers storing data of a particular type. Network users can access their own files remotely and interchange information with these central stores.

Shareware

Software that is freely available but developers will ask for fees and depend on the user's honesty for payment. Not to be confused with public domain software or freeware.
Generic term for all computer programs. Software falls into two major types: applications such as spreadsheets or databases, and systems software such as MS-DOS or Windows. In addition, there are utilities or tools, contrasts with hardware. See also compatibility, upgrade.

**Spreadsheet**

Computer program that allows words and figures to be entered into individually identifiable cells on a grid format. Cells can be linked by formulae, so that altering numbers in individual cells will produce an alternative set of results. Spreadsheets may be used to model situations whose rules are governed by mathematical relationships, such as numerical series like Fibonacci or the management of a budget account, and have been extended to act as simple databases and word-processors.

**Switch**

Input device, which at any time can be either on or off. Where a user's physical movement is impaired, switches may be required to operate the computer. Many switches have been designed to meet the particular needs of disabled people. See also assistive technology.

**Systems software** - see software

**Tag**

Formatting code used in hypertext mark-up language (HTML).

**TCP/IP**

Acronym for 'transmission control protocol/internet protocol', the standard set of rules ensuring the proper transfer of information on the internet.

**Telecommunications**

Transmission of information over distance using telephone lines, cables or satellite signals to send and receive images, sounds and words.

**Tele-conferencing**

Using telephone and computer links to connect people in different locations for a meeting. Also known as audio-conferencing or video-conferencing if live (real-time) pictures are involved.

**Touch screen**

Display screen that enables the computer to react to the touch of a finger or stylus.
Uninstall

Use of a program to remove unwanted software from a computer.

Upgrade

New version of a piece of software which is made available to registered users of an earlier version at a lower price than is charged to new users. Usually identified by a later version number – e.g., 1.1, 1.2, 1.3, show updates on version 1.0, whereas 2.0 would signify a major upgrade.

Upload

To transfer data from a small computer (such as a personal computer) to a larger or main one, as well as the transfer of data from a storage medium to a computer.

URL (Uniform Resource Locator)

Unique reference locating a file on the World Wide Web and other internet resources – the Learning Schools Programme URL, for instance, is http://www.learningschools.net. See also domain name system.

USB

Universal serial bus connector, standard for connecting peripherals such as scanners and printer to personal computers simply and quickly.

User group

People who get together to discuss a particular product or technology. Each of the main computer manufacturers has one or more associated user groups.

Utility

Software, usually small, which is designed to perform a single routine task, either on whole files, such as copying, deleting and sorting files, or as an extra bolt-on which extends the capacity of an applications package.

V

Virus

Mischievous or destructive software transferred covertly to files and applications, often via the internet or with other files on a disk. Some can disable a computer or network once activated and must, if possible, be removed using anti-virus software. There are, however, many hoax virus warnings and users should not pass on such warnings unless they are sure of their reliability.
W3C see World Wide Web Consortium

WAN see wide area network

Web address - see URL

Web browser see browser

Web page

File created in hypertext mark-up language and displayed on the World Wide Web.

Web site

Area on a server linked to the internet, which is devoted to one organization or individual's web pages.

Wide area network in contrast to a local area network, which links computers at the same site. The wide area network links computers over a large geographical area, including telecommunication links such as satellites.

Windows

Originally, it was the graphical user interface (GUI) between applications and the operating system developed by Microsoft for IBM-compatible personal computers. Since Windows 95, the operating system and interface combined.

World Wide Web (WWW)

Also known as the WWW, W3, or simply the web, a distributed information service on the internet of linked hypertext documents accessed using a web browser such as Microsoft Internet Explorer or Netscape. On the web, any document can be linked to any other document.

WWW see World Wide Web

Zip

To compress files to reduce the storage space they occupy.