**POLICIES OF UNITED NATIONS SYSTEM ORGANIZATIONS
TOWARDS THE USE OF OPEN SOURCE SOFTWARE (OSS)
IN THE SECRETARIATS**

Prepared by

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Joint Inspection Unit

Geneva 2005

United Nations

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In accordance with Article 11.2 of the JIU Statute, this report has been "finalized after consultation among the Inspectors so as to test recommendations being made against the collective wisdom of the Unit".

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ANNEXES

ABBREVIATIONS

AA	Auswärtiges Amt (German Federal Foreign Office)
ACABQ	Advisory Committee on Administrative and Budgetary Questions
ACC	Administrative Committee on Coordination (now CEB)
APDIP	Asia Pacific Development Information Programme (UNDP)
BSA	Business Software Alliance
BSD	Berkeley Software Distribution
CEB	United Nations System Chief Executives Board for Coordination
CIO	Chief Information Officer
COTS	commercial off-the-shelf software
CSS	Closed source software (or proprietary software)
DISA	Defense Information Systems Agency
DoD	Department of Defense (United States)
e-GIF	e-Government Interoperability Framework
EIF	European Interoperability Framework
ERP	Enterprise Resource Planning
FAO	Food and Agriculture Organization of the United Nations
FFIEC	Federal Financial Institutions Examination Council (United States)
FLOSS	free/libre open source software
FOSS	free and open source software
FSF	Free Software Foundation
FY	financial year
GDP	gross domestic product
GITOC	Government Information Officers' Council (South Africa)
GNU	"GNU's Not Unix" (recursive acronym)
GPL	General Public Licence
GSP	Government Security Programme
HLCM	High Level Committee on Management
HLCP	High-Level Committee on Programmes
HP	Hewlett Packard
ICC	International Computing Centre
ICT	information and communication technologies
IGOS	Indonesia Go Open Source
IIS	Internet Information Server
ILO	International Labour Organization
ISCC	Information Systems Coordination Committee
IOSN	International Open Source Network
IPR	Intellectual Property Rights
IT	information technology
ITI	National Information Technology Institute (Brazil)
ITU	International Telecommunication Union
JIU	Joint Inspection Unit
KBSt	Federal Government Co-ordination and Advisory Agency for IT in the Federal Administration (Germany)
LLP	Local Language Program
MAMPU	Malaysian Administration Modernisation and Management Planning Unit
MCT	Ministry of Science and Technology (Venezuela)
MIS	management information system
NACI	National Advisory Council on Innovation (South Africa)
OGC	Office of Government Commerce (United Kingdom)
OSS	open source software
PC	personal computer

RAND   reasonable and non-discriminatory
R & D   research and development
SSI   Shared Source Initiative
TCO   total cost of ownership
TRIPS   Trade-Related Aspects of Intellectual Property Rights
UNDP   United Nations Development Programme
UNESCO   United Nations Educational, Scientific and Cultural Organization
UNIDO   United Nations Industrial Development Organization
UNIF   United Nations Interoperability Framework
UNITAR   United Nations Institute for Training and Research
UNU   United Nations University
WSIS   World Summit on the Information Society
W3C   World Wide Web Consortium
WTO   World Trade Organization
XML   Extensible Markup Language

EXECUTIVE SUMMARY

> **OBJECTIVE:**
>
> **To contribute to raising awareness of the increasing use of open source software (OSS) by public administrations worldwide and to highlight some of the requirements to be met by United Nations system organizations in creating an enabling environment if they intend to make more use of OSS as indicated in the new system-wide United Nations information and communication technologies (ICT) strategy**

MAIN FINDINGS AND RECOMMENDATIONS

A.   OSS has become mainstream and has been recognized in many cases as a valid alternative to corresponding closed source software (CSS). Its availability contributes to widening the choice of software and avoiding vendor lock-in by fostering competition on the market (chap. I, paras. 7–44).

B.   In support of their e-government policies, which aim to use ICT to improve access to information by all stakeholders, many Member States from both developed and developing countries have established e-government interoperability frameworks based on open standards. In that context, many Member States and local governments are showing a growing interest in using OSS and have decided to define a software policy taking into account this new opportunity (chap. II, paras. 45–81).

C.   At the international level, a number of policy statements have stressed the importance of universal access to information and communication services as well as the need for United Nations system organizations to strengthen their capacity to create, share and disseminate information and knowledge. In order to achieve that objective, it is essential to define guiding principles on the basis of which the secretariats would then need to agree on, and abide by, the set of standards required not only to allow the necessary compatibility among their diverse ICT systems but also to make interoperable the data and information resident within those systems (chap. III, paras. 82–94).

D.   In compliance with a request from the General Assembly in its resolution 57/295, the Secretary-General, as Chairman of the United Nations System Chief Executives Board for Coordination (CEB) proposed a system-wide United Nations ICT strategy containing an ICT Charter outlining 15 "key strategy initiatives" including one on OSS. The ICT Charter recognizes inter alia the need "to further exploit opportunities to mitigate software costs through increased usage of appropriate open source software". Considering that many public administrations including United Nations system organizations are largely dependent on CSS platforms, the recognition of the potential benefits of using OSS should translate into a new software policy to be aligned with the guidelines and standards referred to above (chap. III, paras. 89–94).

RECOMMENDATION 1

In line with its resolution 57/295 and in order to guarantee universal access to information and to foster knowledge-sharing, the General Assembly should affirm that the following principles should guide the adoption of a software policy by United Nations system organizations:

- **Principle 1: All Member States and other stakeholders should have the right to access public information made available in electronic format by the organizations and no one should be obliged to acquire a particular type of software in order to exercise such a right;**

- **Principle 2: Organizations should seek to foster the interoperability of their diverse ICT systems by requiring the use of open standards and open file formats irrespective of their choice of software. They should also ensure that the encoding of**

data guarantees the permanence of electronic public records and is not tied to a particular software provider.

RECOMMENDATION 2

For the implementation of the above principles, the Secretary-General, as Chairman of CEB, should take stock of the experiences of Member States and undertake the necessary consultations within CEB in order to establish a system-wide United Nations Interoperability Framework (UNIF) and report accordingly to the General Assembly at its sixty-first session. The proposed UNIF should take into account a number of elements including the following:

(a) UNIF should be based on open standards and open file formats to foster a unified approach to data encoding and sharing for the benefit of all stakeholders;

(b) Any new information system, software application and/or related upgrades or replacements should comply with UNIF except in such justifiable instances approved by the respective Chief Information Officer (CIO) or ICT manager of each organization;

(c) Customized or bespoke software should be owned by the organizations and be made available as appropriate to other system organizations and public administrations of Member States or licensed as OSS;

(d) Organizations should seek to avoid lock-in to proprietary ICT products or services and in that regard, they should level the playing field as a matter of policy by giving equal consideration to all appropriate solutions available on the market including OSS solutions, as long as such products and services comply with the requirements under UNIF and it being understood that the final choice is made on the basis of value for money.

E.   All United Nations system organizations should be able to claim ownership of the final outline of the proposed system-wide ICT strategy, particularly so because its implementation may entail a revision of existing individual organizations' ICT strategies as well as a change of culture and more commitment to adhere to commonly agreed guidelines (chap. III, para. 95).

RECOMMENDATION 3

Based on the outcome of the United Nations General Assembly's consideration of the system-wide ICT strategy, executive heads of other organizations should submit the strategy in due course to their respective governing bodies, along with implications for aligning existing ICT strategies with the new system-wide strategy and for implementing UNIF as suggested above.

F.   Although United Nations system organizations have made important ICT investments based mostly on proprietary software, many of them also use OSS applications and the impact of such usage varies from one organization to the other. Experience thus gained by each one on different applications should be more widely shared for the benefit of all (chap. III, paras. 96–107).

RECOMMENDATION 4

The Secretary-General as Chairman of CEB should take the necessary measures to establish a data repository of mature OSS solutions used by United Nations system organizations and which could be accessed by the organizations and by public entities of Member States and other interested parties.

G.   In the business outline for the OSS initiative envisaged in the ICT Charter, the ICT Network Working Group estimated that the United Nations system had an opportunity to make

financial and performance gains on a significant scale. However, in March–April 2005 the CEB machinery reviewed the list of 15 key initiatives initially mentioned in the ICT Charter and as a consequence, the OSS initiative was not retained among the eight selected for elaborating business cases (chap. III, paras. 91, 114–115).

RECOMMENDATION 5

As a follow-up to the CEB review of key initiatives mentioned in the ICT Charter,

(a) The Secretary-General as Chairman of CEB should include in an addendum to his report on the ICT strategy requested by the General Assembly for the sixtieth session relevant indications concerning the level of priority, savings potential, risk, effectiveness and organizational interest for implementing the proposed OSS initiative;

(b) Executive heads should assess the total cost of ownership (TCO) of their current platforms and they should implement processes measuring the total economic impact of their information technology (IT) investments including their use of OSS and CSS as well as the implications for Member States. The results of their findings should be reported to their respective governing bodies in the framework of their programme budget performance review.

H.   The ICT Charter recognizes the need for "an unprecedented degree of cooperation amongst agencies on ICT matters" and a new inter-agency mechanism is being considered that will require a level of resources still to be specified. Past attempts at coordination in that field have failed to achieve all the results expected, partly because the organizations did not agree first and foremost on common standards to be abided by all (chap. III, paras. 116–121).

RECOMMENDATION 6

On the basis of past attempts at system-wide coordination on ICT matters, the General Assembly should:

(a)   Decide that the establishment of any new CEB mechanism on ICT coordination would be considered only after the CEB members have:

> **(i) Agreed on the mandate, mode of financing, powers and expected outputs of such a body in relation to the proposed UNIF referred to above in recommendation 2; and**
>
> **(ii) Provided reasonable assurance that agreed recommendations will be followed up and their implementation duly reported to governing bodies;**

(b)   Request the Secretary-General as chairman of CEB to give full consideration to all possibilities of using existing mechanisms such as the United Nations Staff College, the United Nations Institute for Training and Research (UNITAR), the International Computing Centre (ICC) and the United Nations University (UNU) for relevant aspects of the implementation of any new initiative, including OSS.

INTRODUCTION

Background

1.   The Plan of Action[1] approved by the 2003 World Summit on the Information Society (WSIS) called inter alia for promoting awareness of the possibilities offered by different software models including open source software (OSS). In 2004, in compliance with General Assembly resolution 57/295, the Secretary-General of the United Nations submitted a system-wide United Nations ICT strategy recognizing inter alia the need to "further exploit opportunities to mitigate software costs through increased usage of appropriate open source software".[2]

Focus and methodology

2.   Based on the above, the Joint Inspection Unit (JIU) review on OSS will be in two parts. Part One will focus on the use of OSS for business within the secretariats, bearing in mind policies followed in that regard by the Member States. Part Two will be issued separately and will examine the extent to which, in the wider framework of applying ICT for development, the use of OSS for development could foster the achievement of some of the objectives set out in the Millennium Development Goals (MDGs)[3] and the WSIS Plan of action.

3.   Besides inputs from the secretariats through interviews and replies to a questionnaire, useful information was gathered from attending two conferences on OSS, in September and November 2004, sponsored respectively by the United Nations Conference on Trade and Development (UNCTAD)[4] and by the Dutch Presidency of the European Union[5]. In addition, more information was secured from the United Nations ICT Task Force[6] and from several officials in the Governments of Belgium and Malaysia, the European Commission and the International Open Source Network (IOSN), an initiative of the Asia Pacific Development Information Programme (APDIP) of the United Nations Development Programme (UNDP).

4.   The views of other stakeholders were sought, including through meetings with some representatives of private companies and civil society organizations involved in or concerned by the promotion of OSS. Further insight on OSS in public administrations was gained from analysing several reviews of Member State policies on OSS as well other sources such as different specialized websites and OSS portals.

5.   Part One of the review detailed below includes an overview of the OSS phenomenon (chap. I) and of selected case studies of Member State policies (chap. II). Chapter III examines the policy and operational frameworks in which OSS is used by secretariats of United Nations system organizations as well as the enabling conditions for their increased use of OSS.

6.   The Inspector wishes to extend his appreciation and thanks to all those who assisted him in the preparation of this report.

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[1] http://www.itu.int/wsis/docs/geneva/official/poa.html
[2] A/59/563.
[3] http://www.un.org/millenniumgoals/
[4] http://www.unctad.org/Templates/Meeting.asp?m=8936&intItemID=1942&lang=1
[5] http://flosspols.org/conf/
[6] http://www.unicttaskforce.org/

CHAPTER I: OVERVIEW OF THE OPEN SOURCE SOFTWARE PHENOMENON

A. Some definitions and concepts

7.   OSS has evolved from a popular tool in academia and a hacker's phenomenon to become recognized in many instances as a valid alternative to corresponding proprietary software and as an attractive business endeavour. During the past few years, it has gained significant momentum, drawing a keen interest and converts from users in private as well as public-sector entities while continuing to fuel an ongoing debate among its advocates and staunch supporters of traditional proprietary software. The following definitions and concepts will help to understand better the issues surrounding this phenomenon.

Software and associated intellectual property rights

8.   Software is a computer programme that carries the instructions or commands telling a computer how to operate. The developer(s) of software use computer programming languages (such as C, C++, Java, Visual Basic or Pascal to cite a few) to write the instructions in human readable form called the source code. These languages have "compilers" that translate the instructions into a machine-readable or binary format (a succession of 1s and 0s) called the object code and which allow the computer actually to operate.

9.   There are two major categories of software: system software such as operating systems and application software such as office suites (i.e. Microsoft Office or OpenOffice), enterprise resource planning (ERP) systems or database management systems (DBMS). System software helps run the computer hardware whereas application software is used to execute specific tasks. All types of software come with the object code but except as detailed in paragraph 41 below, only OSS provides the source code as well. Access to the source code is indispensable for modifying and adapting the software and for redistributing changes to other users.

10. Software is usually protected by a copyright granting its author, for a limited time, the exclusive right to copy and distribute his/her work. Third parties need permission from the author to copy and redistribute the work legally. Copyright on software is recognized and binding at international level under the terms of article 10, paragraph 1, of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) adopted by the World Trade Organization (WTO) and which stipulates that "[c]omputer programs, whether in source or object code, shall be protected as literary works under the Berne Convention (1971)".[7]

11. In some countries, software may also be protected by a patent which is granted by the Government which gives an inventor a temporary monopoly on the use, copying and distribution of his invention, in return for its publication. Users of a patented invention need permission from the inventor to use, copy, distribute or re-distribute a product derived from said invention legally. There is a pending controversy over the patentability of software, fuelled inter alia by diverging interpretations given to article 27, paragraph 1, of the TRIPS Agreement which states that "... patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application".[8]

12. A software licence is a contract between an author and a recipient of his work, governing what the recipient may or may not do with the software. Most software comes with a licence, except that which is in the public domain. If a licence is not provided with the software (and the software is not in the public domain), then the recipient is granted only those rights that are not reserved to the author by copyright and/or patent laws.

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[7] www.wto.org/english/docs_e/legal_e/27-trips.pdf
[8] Ibid.

Closed source software

13. Closed source software (CSS) or proprietary software is software for which the author holds the exclusive rights (copyright and/or patent) and considers the source code to be a trade secret. Provisions for its use, redistribution or modification are governed by strict conditions aimed primarily at protecting intellectual property rights (IPR) of the copyright owner who can eventually choose to make it available free of charge or even grant permission for limited access to the source code. CSS is also referred to as commercial software or commercial off-the-shelf software (COTS) but both expressions may be misleading to the extent that commercial distributions of OSS are now available on the market. Although the global CSS market is very diversified, Microsoft has more than a 90 per cent share of the operating systems and office productivity segments[9] and the resulting situation has generated a number of antitrust lawsuits.[10] These segments are particularly important for different levels of government, as "communications between the public sector and citizens, businesses and other administrations are frequently documents-based".[11]

Free software and open source software

14. The full definitions of "free software" and "open source software" can be found on the respective websites of the Free Software Foundation (FSF)[12] and the Open Source Initiative (OSI)[13]. Free software is also called "free and open source software" (FOSS) or sometimes "free/libre and open source software" (FLOSS). While there are ethical and philosophical differences between OSS and free software (for FSF, the term "free" refers to freedom and not price), in both cases developers have a copyright on their work and they use licensing conditions which may vary but do not preclude the software being commercialized. The two expressions are used interchangeably in many reviews including this one because they share a number of important commonalities, i.e. (*a*) a community-based collaborative development model which allows peer review through free access to the source code; (*b*) the perpetual and irrevocable right for everyone, everywhere, to use, study and modify the software as they see fit, and (*c*) the licence also grants the right to redistribute the software or a derivative work made by the users under certain conditions usually not related to any form of monetary compensation. In that connection, free software requires everyone redistributing the software to grant to recipients exactly the same rights as in the initial licence and failure to comply constitutes a copyright infringement. FSF uses the term "copyleft" to better express the fact that the "copyright" attached to "free software" is different from the traditional one.

15. Most OSS solutions do not carry a licence fee and are freely downloadable from the Internet. This does not mean that their use is necessarily cost-free: such costs may be related to training, support or documentation if required. There are more than 50 OSS licences and their number keeps increasing. They fall however into two main categories which include (*a*) the GNU General Public Licence (GPL) and GPL compatible licences which provide the main freedoms attached to OSS and require in addition that the software and derivative work remain under GPL or GPL-compatible licences, and (*b*) other licences which grant variable rights and under which the open source code can be combined with the proprietary code and either remain as OSS or become proprietary software.

Interoperability

16. Interoperability has been defined in the European Interoperability Framework (EIF) as "the ability of information and communication technology (ICT) systems and of the business

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[9] Valoris, "Comparative assessment of open documents formats market overview", http://europa.eu.int/idabc/en/document/3439/5585#ODF
[10] "California cities and counties sue Microsoft for antitrust", http://informationweek.com/story/showArticle.jhtml?articleID=45400106
[11] http://europa.eu.int/idabc/en/document/2592/5588
[12] http://www.fsf.org/licensing/essays/categories.html#PublicDomainSoftware
[13] http://www.opensource.org/docs/definition.php

processes they support to exchange data and to enable the sharing of information and knowledge".[14] According to Wikipedia, a free encyclopaedia accessible on the Internet,[15] "with respect to software, the term interoperability is also used to describe the capability of different programs to read and write the same file formats and utilise the same protocols".[16] In other words, the goal is not just to ensure technical interoperability, i.e. the interconnection between systems, but also semantic interoperability, i.e to allow the data they contain to interoperate. For public administrations, ensuring interoperability between diverse ICT systems is crucial for delivering services to their stakeholders in the framework of e-government.

Localization

17. The Localization Industry Standards Association[17] defines localization as the process of making a product linguistically and culturally appropriate to the target locale (country/region and language) where it will be used and sold. Major software companies release their software initially in English. Localization is therefore indispensable for a wider dissemination. It is market driven under a proprietary software business model whereas the open-source development model allows developers all over the world to collaborate via the Internet to a localization project, resulting quite often in easier, faster and more affordable adaptations of software to suit a particular locale.

Open standards

18. Open standards have been defined in Wikipedia as "publicly available specifications for achieving a specific task. By allowing anyone to use the standard, they increase compatibility between various hardware and software components since anyone with the technical know-how and the necessary equipment to implement solutions can build something that works together with those of other vendors".[18] There is however no universally accepted definition of openness for technical specifications and the issue is the subject of lively debates.[19]

19. The International Telecommunication Union (ITU) IPR Ad Hoc Group discussed the definition of open standards at its meeting in March 2005. The preliminary outcome, although not yet officially endorsed by ITU, gives the following definition:

"Open Standards" are standards made available to the general public and are developed (or approved) and maintained via a collaborative and consensus driven process. "Open Standards" facilitate interoperability and data exchange among different products or services and are intended for widespread adoption.[20]

20. The Committee for Trade, Industry and Enterprise Development of the United Nations Economic Commission for Europe (UNECE) approved[21] in March 2000 a document[22] proposed by the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) stating inter alia that:

(*a*) "All specifications must be *open*, free of any constraints or restrictions associated with intellectual property rights (IPR)";[23] and

(*b*) "Technical Specifications must not depend on features that are available only on one application or industry specification. Software developers and end-users around the world must be able to depend on technical

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[14] http://europa.eu.int/idabc/en/document/3761
[15] http://www.wikipedia.org
[16] http://en.wikipedia.org/wiki/Interoperability
[17] http://www.lisa.org/info/faqs.html#gil
[18] http://en.wikipedia.org/wiki/Open_standard
[19] http://xml.coverpages.org/openStandards.html
[20] http://www.itu.int/ITU-T/othergroups/ipr-adhoc/openstandards.html
[21] TRADE/CEFACT/2000/32, para. 59.
[22] TRADE/CEFACT/2000/22.
[23] Ibid., para. 5.

applications that can be implemented the same way, and give the same results, on all hardware platforms and operating systems".[24]

21. The current version (version 1.0 issued in 2004)[25] of EIF provides a definition by which the minimal characteristics for a specification to be considered as open standard are as follows:

- The standard is adopted and will be maintained by a not-for-profit organisation, and its ongoing development occurs on the basis of an open decision-making procedure available to all interested parties (consensus or majority decision etc.).

- The standard has been published and the standard specification document is available either freely or at a nominal charge. It must be permissible to all to copy, distribute and use it for no fee or at a nominal fee.

- The intellectual property─i.e. patents possibly present─of (parts of) the standard is made irrevocably available on a royalty-free basis.[26]

- There are no constraints on the re-use of the standard.

22. Different standards organizations as well as the Business Software Alliance (BSA)[27]─a trade group representing some of the world's largest software companies ─ have their own definition of open standards and a number of them have been reviewed in a white paper published by the United States National Information Standards Organization (NISO).[28] The paper notes inter alia that since the 1970s, the policy of standards-setting organizations has been the requirement of the so-called reasonable and non-discriminatory (RAND) terms and that the OSS community strongly opposes RAND licensing terms and prefers the so-called Royalty Free (RF) licensing which is also supported by the World Wide Web Consortium (W3C). As underlined in that document, the "impossibility of defining 'reasonable' fees was a major objection: what is reasonable to IBM or Hewlett Packard may not be reasonable to a small startup company or an open source developer".[29]

23. Requiring open standards contributes not only to improving interoperability but also fosters competition by allowing new entrants to access the specifications for a particular type of product. Indeed, standards can also be proprietary (many of them are) and that implies that an organization or individual company owns the copyright and/or patents used by the standard, and can decide not to publish the related specifications or to prevent potential competitors or new entrants from capturing a share of the market by using restrictive licensing conditions. This being said, and while many OSS implement open standards, not all of them do. Similarly, proprietary software does not necessarily equate with proprietary standards. HTML (hypertext markup language) or PDF (portable document format) are examples of open standards.

Open formats

24. A file format is considered as open when its specification is publicly available and can be copied, reused or redistributed free of charge and without copyright or patent restrictions.[30] The goal of an open format is to allow users to read and write a file without being obliged to use specific proprietary software. By opposition, a proprietary format is developed by a software company to encode data in a file format that only their own software can read correctly and completely. In case such software becomes obsolete, access to the data is rendered more difficult if not impossible. Owing to their features, using open formats promotes diversity and interoperability but also guarantees access to, and the permanence of, data, a primordial consideration for the archiving of public records.

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[24] Ibid., para 8.
[25] http://europa.eu.int/idabc/en/document/3761
[26] This particular provision is hotly contested by some key software industry players.
[27] www.bsa.org
[28] Priscilla Caplan, "Patents and open standards", http://www.niso.org/press/whitepapers/Patents_Caplan.pdf
[29] Ibid.
[30] http://www.openformats.org/en1

Total cost of ownership

25. The TCO concept applied to software is based on the fact that, besides the acquisition cost for hardware and software including licence fees, other costs are incurred during the life cycle of the product, such as labour costs related to maintenance, integration, support and training. There is an ongoing debate on whether OSS has a lower TCO compared with CSS and the issue has been covered by numerous reviews with contradictory results used by both camps as supportive of their position. Owing to its contextual nature, a TCO model may be valid for one set-up but may not apply to another. Some analysts point out that licence fees and associated costs represent around 15–40 per cent against 60–85 per cent for the second category of costs and they argue that the share of licence fees and associated costs is small in countries where labour costs are high (most TCO calculations have been made in such environments) whereas it is proportionally much more important in low-income countries.[31] Furthermore, TCO models based exclusively on economic factors may not grant enough weight to the strategic and social benefits which many Governments consider to be important features of their ICT policies.

Unauthorized copying of software or software piracy

26. The unauthorized copying, reproduction, use, or manufacture of software is also called software piracy and, according to a July 2004 research study sponsored by BSA, this worldwide phenomenon generates substantial loss of revenues estimated to be over US$ 28 billion,[32] although some have contested the reliability of those figures and the methodology used to compute them.[33] Weak copyright laws and poor enforcement of those laws are often cited among the reasons for this situation, but it has also been argued that the cost of software relative to income does come into play. For instance, on the basis of respective countries' gross domestic product (GDP) per capita, a licensing cost of US$ 560 for a single legal copy of Windows XP Standard Edition and Windows Office represents an average in GDP months of 0.2 to 0.3 in North America and the European Union compared with 2.3 in Brazil and 10.3 in Africa.[34] Some proponents of OSS consider such a disparity as an additional reason why Governments in developing countries should actively promote or mandate the use of OSS, lest they spend limited resources to protect the IPR of CSS companies from developed countries in order to abide by their obligations under the WTO TRIPS Agreement.

B. Examples of open source software and corresponding closed source software

27. There are close to 100,000 OSS projects registered mainly on the website of two open source forums, i.e. SourceForge[35] and Freshmeat[36]. Some (115) of them are included in the list of software "generally recognized as safe" (GRAS) compiled in a report on the use of OSS in the United States Department of Defense (DoD) (referred to below in paragraph 32) and some are inventoried in a list of 39 OSS "generally recognized as mature" (GRAM) accessible on the Internet.[37] The table below provides for indicative purposes a sample of some of this OSS and the corresponding CSS.

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[31] Rishab Ghosh, "The economics of free software", http://flosspols.org/research.php
[32] http://www.bsa.org/globalstudy/
[33] *The Economist*, 19 May 2005.
[34] Ghosh, "Why developing countries need to use and create Free Software (and how it promotes Gross National Happiness)", http://flosspols.org/research.php
[35] http://sourceforge.net/index.php
[36] http://freshmeat.net/
[37] http://www.dwheeler.com/gram.html

Table 1. Examples of open source software replacements for popular proprietary software

Type of software	Closed source software	Open source software
Office suite	Microsoft Office Corel Office	Open Office/StarOffice KOffice
Operating system (OS)	Microsoft Windows Apple OS/X	GNU/Linux (various distributions) FreeBSD/NetBSD/OpenBSD
Web server	Microsoft Internet Information Server (IIS)	Apache
Web browser	Microsoft Internet Explorer (IE)	Mozilla Firefox
Database	Oracle Database IBM DB2 MS SQL Server	SAP DB MySQL PostgreSQL
E-mail client	Microsoft Outlook Express (OE) Novell GroupWise Lotus Notes E-mail client	Novell Evolution Mozilla Thunderbird KMail
Image editing	Adobe Photoshop	The Gimp

C.   Risks and benefits associated with open source software

28. With a rapidly changing ICT environment due to technological innovation, there is always a potential risk in implementing any new software platform including proprietary ones. The United States Federal Financial Institutions Examination Council (FFIEC)─a formal inter-agency body empowered to make recommendations to promote uniformity in the supervision of financial institutions─and the Federal Deposit Insurance Corporation (FDIC) issued a guide entitled "Risk management of free and open source software", which concludes that the "use of FOSS is increasing within the mainstream information technology and financial services industries", adding that "the use of FOSS does not pose risks that are fundamentally different from the risks presented by the use of proprietary or self-developed software".[38] They caution however that its adoption and use does require the implementation of specific risk management practices, covering strategic risks (compatibility and interoperability, maturity, system integration and support, TCO), operational risks (code integrity, documentation, external support) and legal risks such as licensing, IPR infringement, warranties and indemnities.

29. Concerning the benefits associated with OSS, there is a wealth of supportive data explaining or justifying how they accrue. According to a comprehensive review sponsored by the European Union,[39] the three main drivers for organizations adopting OSS are performance/stability (83 per cent), security (75 per cent) and lower licence fees (71 per cent). For its part, IOSN published a policy primer on FOSS[40] in which such benefits are classified in three categories, i.e. strategic benefits (developing local capacity/industry, reducing imports/conserving foreign exchange, enhancing national security and reducing copyright infringements), economic benefits (increasing competition, reducing TCO, enhancing security and achieving vendor independence) and social benefits (increasing access to information). Proponents of proprietary software have questioned the validity of some of these potential benefits.

30. The strategic and social benefits will be further explored in part two of the review. Among the economic benefits, more scrutiny was given to the potential of OSS for cost savings or reduced TCO as well as for being at least as secure (some reviews show that it is more secure) as the corresponding CSS. Concerning the cost benefits of OSS, the case of the Beaumont Hospital

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[38] http://www.fdic.gov/news/news/financial/2004/fil11404a.html
[39] "Free/libre and open source software: survey and study", http://flossproject.org/report/
[40] Kenneth Wong, "Free/open source software. government policy" (UNDP-APDIP, 2004).

is a telling illustration.[41] With an IT environment characterized by heterogeneity of application platforms and associated servers, and being under a significant IT budget contraction (an expected 17 million euro shortfall for 2003), this Irish public hospital based in Dublin with a staff of 3,000 planned a phased migration to OSS starting in February 2002. Phase one was expected to generate savings close to 13 million euros over a five-year period. As a result, a second phase is being envisaged in which OSS will be used for implementing an overall hospital information system, a financial systems suite, and possibly a payroll system.

31. With organizations relying increasingly on mission-critical IT applications, the issue of security has become crucial for correcting software vulnerabilities as soon as they are detected. During 2000, a worm (i.e. a computer program that replicates independently by sending itself to other systems) known as "LoveLetter" or "lovebug" was designed to take advantage of the vulnerabilities of Windows Outlook and infected many Windows 98 and Windows 2000 systems. According to the Chief Information Officer (CIO) of the German Federal Ministry of the Interior,[42] "LoveLetter" caused so much damage and was able to spread so quickly only because so many people all over the world were using the same e-mail program. He therefore considered that an IT monoculture represented a security risk, besides creating vendor dependence, a viewpoint also shared by some other Governments. Thus, for public administrations in general and departments entrusted with State mission-critical responsibilities in particular, achieving software diversity became a strategic goal besides the fact that it helps to maintain interoperability among diverse systems.

32. Whether OSS is at least as secure or more secure than proprietary software is therefore an important issue on which there are contradictory claims. In that connection, one can only note as a useful benchmark the fact that a number of ministries responsible for defence or home affairs have found OSS secure enough to be adopted. The most quoted example comes from the United States where a report prepared for the Defense Information Systems Agency (DISA), released in January 2003, found out inter alia that OSS was widely used in DoD[43] and concluded that banning it in this area "would have immediate, broad and in some cases strongly negative impacts on the ability of DoD to analyse and protect its own networks against hostile intrusion".[44] Since then, DISA has certified an OSS operating system (Red Hat Linux server) as compliant with the DoD Information Infrastructure Common Operating Environment, meaning that it meets the Agency's software security and interoperability specifications.

D. Open source software impact on the software ecosystem

Open source software has become mainstream

33. All analysts of the software industry agree that OSS has become mainstream and that it has to be reckoned with. Some consider that, as with any innovation, the adoption trend of OSS will follow the Everett Rogers adoption curve[45] (fig. 1 below) according to which adopters of any new technology fall into five groups, i.e. innovators, early adopters, early majority, late majority and laggards. According to this theory, an innovation reaches a critical mass of adoption when its acceptance curve covers the early adopters and early majority categories. By implication, this means that laggards may be missing the opportunities attached to the innovation concerned and that their overcautious approach also translates into costly maintenance of legacy systems.

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[41] http://europa.eu.int/idabc/en/document/3304/470

[42] "Linux: an opportunity for more software diversity in public administration", http://www.kbst.bund.de/doc,-304105/Federal-Government-Co-ordinati.htm

[43] *Use of Free and Open-Source Software (FOSS) in the U.S. Department of Defense* (The Mitre Corporation, January 2003), http://www.egovos.org.

[44] Ibid., pp. 17–18, sect. 1.7.3.

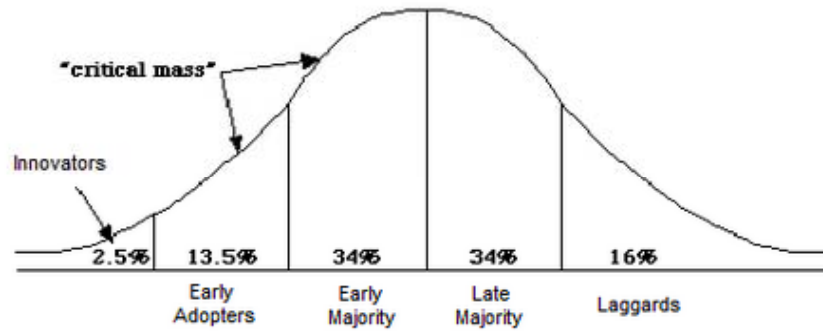[45] Everett M. Rogers, *Diffusion of Innovations*, 5th ed.

FIG. 1:   Everett Rogers Adoption Curve

34. The monthly web server survey published by Netcraft[46] shows that in April 2005, there were more than 62 million websites on the Internet, an exponential growth compared to the 50 million mark reached in May 2004. The market share of the OSS web server Apache grew from only 3.5 per cent in August 1995 to 69.32 per cent in April 2005 against 20.45 per cent for Microsoft IIS. As shown in table 2 under paragraph 45 below, OSS is now the number one operating system used by Member States according to the *Global E-Government Readiness Report 2004*[47] by the United Nations . As many inhibitors based on fear, uncertainty and doubt (FUD) are falling apart, the growing professionalism of some OSS applications is attracting more and more users. Indeed, some of the concerns about the lack of external support and legal risks due to possible IPR infringements are being mitigated by the availability of support services from well-established companies such as IBM, Hewlett Packard (HP), Sun Microsystems or Novell whereas indemnification (legal protection against lawsuits) can be secured from some companies such as Open Source Risk Management (OSRM).[48]

35. Even Microsoft admits that "[o]pen source software has played a critical role in the software ecosystem for the past 30 years and will continue to be important in the future", while emphasizing that "[c]ommercial software companies, however, have provided the vast majority of software research and development investment and produced the lion's share of software innovation".[49] It also recognizes that, "[t]raditionally, commercial software developers relied on licenses that protected ownership rights by limiting access to source code, while open-source developers employed licenses that restricted developer control in favour of universal access. However, the market now requires that each camp embraces each other's principles, driving adherents of both models toward neutral, hybrid ground".[50] The leader in the software market considers that "this migration toward the middle from both sides demonstrates the ability of unfettered market pressure to orchestrate the most suitable system of software development. Ultimately, the demands of software consumers will bring about the most innovative and cost-effective software products and services."[51]

Open source software is an attractive business venture

36. Within a few years, OSS has become an attractive business venture and the trend is increasing. According to some estimates,[52] there are more than 60 companies participating actively in the OSS industry, with sales estimated at US$ 18.2 billion in 2002. Sales of Linux-based servers are expected to reach US$ 9.1 billion by 2009, growing annually by 22.8 per cent

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[46] http://news.netcraft.com/archives/web_server_survey.html
[47] http://www.unpan.org/egovernment4.asp
[48] http://www.osriskmanagement.com/news.shtml
[49] http://www.microsoft.com/resources/sharedsource/Initiative/speeches/OReilly.mspx
[50] http://www.microsoft.com/resources/sharedsource/Initiative/Initiative.mspx
[51] Ibid.
[52] http://sterneco.editme.com/

compared with 3.8 per cent growth for the overall server market. IBM announced in 2000 that it planned to invest US$ 1 billion on Linux in 2001 alone because it "is convinced that Linux can do for business applications what the Internet did for networking and communications".[53] Both IBM and HP are reported to have claimed respectively revenues of more than US$ 2 billion each on their OSS sales in 2003.[54] In February 2005 IBM announced plans to invest US$ 100 million to expand its support for Linux[55] and contributed 500 of its patent portfolios to the open-source community.[56]

Open source software fosters competition

37. OSS has proved to be a disruptive technology to the extent that it has contributed, inter alia, to widen the choice of solutions and foster competition in a software market, which used to be monopolized by proprietary software solutions. To highlight the impact of such competition with regard to CSS, OSS enthusiasts often make reference to a quote attributed to Mahatma Gandhi, i.e. "First, they ignore you. Then they laugh at you. Then they fight you. Then you win".[57] If winning means to be recognized as a player on the market by other competitors, they may have a point.

38.   Despite being at the top of the software industry with revenues of US$ 36.84 billion reported for fiscal year 2004,[58] Microsoft undertook a number of policy initiatives which could hardly not be considered as aimed at reacting to the challenge of growing competition from OSS vendors. A public relations campaign called "Get the facts on Windows and Linux"[59] claims that "more and more independent analysts and leading companies find that Windows Server System outperforms Linux on TCO, reliability, security, and indemnification". The campaign highlights favourable findings in research reports some of which have been sponsored by the company, as well as case studies from satisfied consumers. In February 2005, Novell launched a counter campaign in support of OSS,[60] aimed at "unbending the truth" and "setting the record straight".

39.   In 2001, Microsoft announced changes in its software licensing and pricing terms which entailed cost increases and many clients had no choice but to accept, being sometimes 100 per cent dependent on this single provider. For some clients, the prospect for cost savings became therefore an important driver for adopting OSS or for using the possibility of migrating from CSS (mainly Microsoft) to OSS as a bargaining chip to get discounts. According to a number of case studies, some clients were indeed able to get important discounts (the figure of a 60 per cent discount was reported in news media concerning the city of Paris).[61]

40.   In August 2004 Microsoft launched a five-country pilot program for a Windows XP Starter Edition, a low-cost introduction to and stripped down version of the Windows XP operating system "designed for first-time desktop PC users in developing technology markets".[62] Initially, the programme covered Indonesia, Malaysia, and Thailand and was extended to India and the Russian Federation. All five countries happen to be strong emerging markets for OSS.

41.   In addition in 2001, Microsoft had launched its Shared Source Initiative (SSI), with the declared objective, inter alia, to"[b]olster the freedom and success of customers, partners, researchers, and developers by affording them expanded access to source code" and to"[e]nable

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[53] http://news.com.com/2100-1001-249750.html
[54] David A. Wheeler, "Why open source software/free software (OSS/FS, FLOSS, or FOSS? Look at the numbers!", http://www.dwheeler.com/contactme.html.
[55] http://www.vnunet.com/news/1161354
[56] http://www-1.ibm.com/businesscenter/venturedevelopment/us/en/xslpage/xmlid/26770
[57] http://features.linuxtoday.com/news_story.php3?ltsn=1999-05-18-011-05-NW-LF
[58] http://www.microsoft.com/presspass/press/2004/jul04/07-22fy04q4earnings.asp
[59] http://www.microsoft.com/windowsserversystem/facts/default.mspx
[60] http://www.novell.com/linux/truth/
[61] http://www.rentalinux.com/fr/affiliate/rentalinux/news/pr14
[62] http://www.microsoft.com/presspass/newsroom/winxp/08-1OWinXPStarterFS.mspx

Windows users to ensure the integrity and security of their computing environments".[63] SSI is meant to provide eligible enterprise customers, State and local governments with access to the source code without however the possibility of modifying it. One element of SSI is the Government Security Programme (GSP), which aims more specifically to help national Governments and international organizations "address the unique security concerns they face in the digital age". GSP is said to be available to "more than 60 geographic markets with intellectual property regimes that meet international standards". It is not yet available to any of the United Nations system organizations and besides Australia, Japan, New Zealand and the Republic of Korea, most of the countries concerned are from North America and Western Europe.

42.   In order to improve the localization of some its products, Microsoft announced in March 2004 its Local Language Program (LLP) aimed at "providing the tools and technologies required to develop, enhance, and expand local IT economies and to enable language groups of all sizes to participate in this growth".[64] LLP has two components, i.e. a "Community Glossary" developed as a collaborative project involving local governments, universities and volunteer groups in selected language communities, and a Language Interface Pack (LIP) available as a free download to be installed on a licensed copy of Windows XP and Office 2003 Standard Edition. When reviewed at the end of April 2005, active community glossaries were shown to cover 12 languages.[65]

Open source on the software stack: the next frontier

43.   While OSS has definitely made its mark on the server market, its use for business applications is still very marginal. Developments to be followed in that regard concern first and foremost the use of OSS on the desktop as it has been making headlines in the last few years. Recent examples, for instance, include the decision of the city of Munich[66] and the Gendarmerie Nationale of France[67] to migrate respectively 14,000 PCs and 70,000 PCs to OSS. In the case of the Gendarmerie Nationale, it is estimated that the migration will generate savings of 2 million euros per year on licence fees alone. Some public entities are compelled to switch to OSS because they cannot afford the cost of upgrading obsolete CSS systems to new and more expensive applications. According to one review, 75 per cent of United States municipalities and schools are in such a situation.[68] In that regard, as Microsoft has stopped support for Windows 95 and will do so for Windows 98 by 2006, upgrading will apply not only to software but also to hardware because the newest software requires more powerful machines. For local governments, such upgrades translate into levying additional taxes, a proposition usually unpopular among voters. More generally, it has also been argued that a large majority of end-users in public administrations use their PCs mainly for text-processing, for e-mail and access to the Internet, all of which can be properly served by OSS office suites currently available on the market.

44.   For more complex applications such as ERP, while the leaders on the market continue to be SAP and Oracle, there are a number of OSS projects available for mid-market ERP such as Compiere[69] or ERP5[70]. As different projects mature, they may also take an increasing share of the market. Both SAP and Oracle already provide applications running on open source operating systems in order to adapt their solutions better to their clients needs.

[63] http://www.microsoft.com/resources/sharedsource/Initiative/Initiative.mspx
[64] http://www.microsoft.com/Resources/Government/LocalLanguage.aspx
[65] http://members.microsoft.com/wincg/
[66] http://europa.eu.int/idabc/en/document/3657
[67] http://www.zdnet.fr/actualites/informatique/0,39040745,39203431,00.htm
[68] Tom Adelstein, "The open source dilemma for Governments", http://consultingtimes.com/osgov.html
(4 January 2004).
[69] http://www.compiere.org/
[70] http://www.erp5.org/

**CHAPTER II: MEMBER STATES POLICIES ON OPEN SOURCE SOFTWARE:
                     SELECTED CASE STUDIES**

A.   Worldwide, Governments show a growing interest in open source software

45.   OSS presents significant opportunities for Governments and many reviews appear to confirm that the public sector is leading the private sector in its adoption. As indicated in table 2 below, the United Nations *Global E-Government Readiness Report 2004* shows that a majority of Member States prefer to use OSS for operating systems and web servers.

<p align="center">Table 2.   Extract from United Nations Global E-Government Readiness Report 2004
National web server hosting technology</p>

	Number of countries	*Total* (*Percentage*)
Operating system		
Linux/FreeBSD/Open source	84	47
Windows(98/NT/2000/2003)	64	36
Solaris	23	13
Other/Unix/Mac/Not available	7	4
Total countries	178	100
Web server		
Apache	91	51
Microsoft IIS	58	33
Netscape	8	4
Lotus Domino	4	2
Other/Not available	17	10
Total countries	178	100
Note: Web server technology assessment was conducted on 3 August 2004. Thirteen countries did not have websites.		

<p align="center">Source: United Nations, Global E-Government Readiness Report 2004.</p>

46.   There is indeed a growing trend in the use of OSS by public administrations of Member States, not only at national or central level, but also at regional (State, province or region) and local (cities, counties) level. Many Governments have also commissioned reports on the use of OSS or issued relevant policy guidelines. The Inspector has reviewed in particular the following case studies at national level.

<p align="center">(a)   North America</p>

Canada

47.   The principles guiding the development of information technology (IT) and systems within the federal Government are contained in a "Federated Architecture Program" run by the Treasury Board of Canada Secretariat. Four of these principles apply to the acquisition of software including OSS and are detailed as follows on the website of the Board dedicated to the Government's OSS policy:[71] (*a*) reducing complexity and enabling integration to the greatest extent possible; (*b*) respecting Government security, confidentiality and privacy policies and laws; (*c*) choosing solutions which use commercially viable standards-based technologies; and (*d*) ensuring that the TCO for applications and technologies balance development, support, disaster recovery and retirement costs as well as those of flexibility, scalability and ease of use/support over the life cycle of the application or technology.

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[71] http://www.tbs-sct.gc.ca/fap-paf/oss-ll/oss-ll_e.asp

48.   The Canadian Government commissioned a study on OSS,[72] which was completed in 2003 and contributed to providing a better understanding of the opportunities, barriers and conditions for the adoption of OSS in the federal Administration. Following that report, Defence Research and Development Canada (DRDC) also made public in December 2004 a report on the use of OSS by the Government[73] where it was concluded inter alia that (*a*) "Many FOSS programs have achieved a level of maturity and of recognition that raises them to a position of superiority over their commercial equivalents" and (b) "With the migration of many governments around the world, it is expected that FOSS quality and diversity will continue to improve".[74] Hence, the report proposed to the Government guiding principles for a way ahead in the use of OSS.

United States of America

49.   It is estimated that federal, State, and local governments combined spend upwards of US$ 34 billion a year on software and that the federal Government alone spends annually in excess of US$ 100 million in licence fees.[75] While the opportunity of reducing costs may have prompted the use of OSS in some instances, its other features including security and flexibility have also been heralded on other occasions as the main drivers for making a choice. This has prompted a number of departments to review or clarify applicable rules for procuring software in general and OSS in particular.

50.   As a follow-up to the report on the use of OSS in DoD mentioned in paragraph 32 above, and in order to ensure that all such applications meet the necessary requirements of the Department, the CIO issued a memorandum on 28 May 2003[76] which stated that "DoD Components acquiring, using or developing OSS must ensure that the OSS complies with the same DoD policies that govern Commercial off the Shelf (COTS) and Government off the Shelf (GOTS) software". For its part, on 1 July 2004 the Office of Management and Budget (OMB) which is part of the Executive Office of the President, issued a memorandum addressed to all Senior Procurement Executives and CIOs related to software acquisition.[77] It recalled that applicable regulations guiding IT investments were "intentionally technology and vendor neutral, and to the maximum extent practicable, agency implementation should be similarly neutral" and that agency IT investment decisions, including software whether proprietary or OSS, "must be made consistent with the agency's enterprise architecture and the Federal Enterprise Architecture".

(*b*)   Europe

The European Union

51.   The Council of the European Union and the Commission of the European Communities drew up an action plan in June 2000, stating inter alia that, during 2001, the Commission and member States would "promote the use of open source software in the public sector and e-government best practice through exchange of experiences across the Union".[78] At their summit in Seville, Spain, in 2002, the Heads of State and Governments endorsed the e-Europe 2005 Action Plan, in which the Commission was called upon to "issue an agreed interoperability framework to support the delivery of pan-European e-government services to citizens and enterprises" and which would "be based on open standards and encourage the use of open source

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[72] e-Cology Corporation, *Open Source Software in Canada─Open Source Business Opportunities for Canada's Information and Communications Technology Sector: A Collaborative Fact Finding Study*, http://www.e-cology.ca/canfloss/report

[73] Robert Charpentier and R. Carbone, "Free and open source software: overview and preliminary guidelines for the Government of Canada", http://www.tbs-sct.gc.ca/fap-paf/oss-ll/foss-llo/foss-llo00_e.asp

[74] Ibid.

[75] http://oss-institute.org/newspdf/walker_oss_white_paper_2292004.pdf

[76] http://www.egovos.org/search/?SearchString=DoD+memo

[77] http://www.whitehouse.gov/omb/memoranda/fy04/m04-16.html

[78] http://europa.eu.int/information_society/eeurope/2002/action_plan/index_en.htm

software".[79] In the EIF thus established,[80] eight principles were recommended to be considered for any e-government services being set up at a pan-European level, among which the use of open standards and an assessment of the benefits of OSS.

52.   A European Community programme was started in 1995 under the name Interchange of Data between Administrations[81] (IDA) and evolved over the years to become in January 2005 the Interoperable Delivery of European e-Government Services to public Administrations, Businesses and Citizens (IDABC). It has played a significant role in providing public administrations of member States of the European Union with the necessary tools to consider and assess OSS on an equal footing with proprietary solutions, in particular through its publications (several reviews and a migration guideline) and the maintenance of an Open Source Observatory (OSO)[82] which provides an introduction to OSS, regularly updated news, case studies and a useful OSS inventory of replicable software solutions for e-government.[83]

Belgium

53.   The Belgian Federal Public Service on ICT (FEDICT) published a white book in October 2004 containing a set of guidelines and recommendations concerning the use of open standards and/or open specifications for software purchased by the public sector.[84] It mandates that (*a*) all new applications for archiving and transmitting electronic documents to third parties (other departments, citizens and businesses) should use open standards and/or open specifications; (*b*) pre-existing applications should undertake a planned migration to adhere to the prescribed norms; (*c*) federal administrations should retain co-ownership of bespoke software and such software should be freely available with its source code for reuse, with the possibility of putting it at the disposal of other federal administrations as OSS. While the use of OSS is not mandatory, all new software customized for any civil service unit should be owned or co-owned by it and made available along with the source code to other departments.

Denmark

54.   The Danish Board of Technology issued a report in 2002 entitled "Open-source software in e-government"[85] which concluded inter alia that (*a*) OSS is a serious alternative to proprietary software; (*b*) various estimates on using OSS in the Danish public sector indicate extensive economic benefits in terms of potential savings, and (*c*) a cost-effective implementation of e-government requires the adoption of a strategy based on open standards and a competitive environment. Following the recommendations made in the report, the Government issued a Danish software strategy[86] based on four principles, i.e. maximum value for money irrespective of the type of software; competition, independence and freedom of choice; interoperability and flexibility; and development and innovation. In support of the policy, a number of initiatives were envisaged, among which were the development of a TCO model, pilot projects at different levels of government, the use of open standards including XML, W3C standards and standards for accessibility for the disabled, information gathering and dissemination, etc.

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[79] http://europa.eu.int/information_society/eeurope/2002/action_plan/mid-term_review/index_en.htm

[80] *European Interoperability Framework for Pan-European e-Government Services*, http://europa.eu.int/idabc/en/document/3761

[81] http://europa.eu.int/idabc/en/document/2586/10#What

[82] http://europa.eu.int/idabc/en/chapter/452

[83] http://europa.eu.int/idabc/en/chapter/5649

[84] "Directives et recommandations pour l'usage de standards ouverts et/ou spécifications ouvertes dans les administrations fédérales", http://www.belgium.be/eportal/application?origin=searchResults.jsp&event=bea.portal.framework.internal.refresh&pageid=contentPage&docId=36436

[85] http://www.tekno.dk/pdf/projekter/p03_opensource_paper_english.pdf

[86] http://www.oio.dk/software/english

France

55. OSS is already used for operating systems and at the server level by several public administrations including the Ministry of Defence. The main drivers are cost savings, ensuring interoperability and transparency; improving security and control over software. The Government of France also started the installation of OSS on the desktop as part of a project called ADELE (ADministration ELEctronique), a plan for the extensive computerization of the country's administration by 2007. An "E-Government Strategic Plan" for 2004–2007[87] is being implemented under the leadership of the Agence pour le Développement de l'Administration Électronique (ADAE), an interministerial agency established in 2003[88] under the authority of the Prime Minister's Office and placed at the disposal of the ministry in charge of State reform. The strategy addresses inter alia the need for "setting up a real policy on software use" and states that the

aim of the French government is not to impose systematic recourse to free software and open standards in the administration, but to ensure that the whole offer─including the part based on free software─is taken into account at the moment of choice, while interoperability and mutualisation must remain the founding principles of this choice.[89]It also highlights some of the benefits that could be derived from the use of free software by State administrations and civil service information systems, such as (*a*) "[a]ccess to a considerable capital of software which is often of high quality and complies with the standards"; or (*b*) capitalizing on the many developments by and for the civil service, so that software of general interest developed for any given public entity benefits all departments. Accordingly, the Plan concludes that

France therefore intends to adopt a pragmatic but resolute approach with regard to the use of software: setting up a real competition on all sectors of the market (workstation and servers) and integration of products and services free from rights when the relevance of their use is demonstrated, especially in the context of mutualisation.[90]

Germany

56. The use of OSS is encouraged in various public administrations ranging from the Bundestag (Parliament) to different departments and institutions at federal, State and local level. Support for OSS has benefited from strong political backing both from the Bundestag itself that adopted a resolution in November 2001 calling for the "promotion of open source software and the rapid creation of all conditions needed to implement open source software within the federal administration", and from the Conference of Interior Ministers who resolved that "in the future, the public sector shall increasingly make use of software with open source code."[91] The policy supporting OSS is fostered by the leadership exercised by the Federal Government Co-ordination and Advisory Agency for IT in the Federal Administration (KBSt)[92] and by the fact that, under an initiative called BundOnline, the Government of Germany is committed to delivering all federal administration services online by the end of 2005. As an interministerial unit located within the Federal Ministry of the Interior responsible for ensuring that the federal Administration optimizes its use of IT in specific fields, KBSt published *Standards and Architectures for e-Government Applications* (SAGA) which is the central document on software strategy. Other publications include a newsletter extolling the benefits of OSS[93] and a comprehensive 418–page *Migration Guide*.[94]

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[87] "The E-Government Strategic Plan (PSAE) 2004–2007 ",
http://www.adae.gouv.fr/article.php3?id_article=315&
[88] Decree of 21 February 2003, published in the *Journal Officiel* of 22 February 2003.
[89] "The E-Government Strategic Plan (PSAE) 2004–2007", p. 31.
[90] Ibid., p. 32.
[91] http://www.kbst.bund.de/Anlage304109/pdf_datei.pdf
[92] http://www.kbst.bund.de/doc,-304105/Federal-Government-Co-ordinati.htm
[93] *Open-Source Software in the Federal Administration*,
http://www.kbst.bund.de/Anlage304108/pdf_datei.pdf
[94] See footnote 87 above.

57.   Of particular interest is the case of the German Federal Foreign Office (Auswärtiges Amt or AA for short) listed among the case studies in the European Commission's Open Source Observatory:[95] AA employs 10,000 staff stationed in Berlin and in some 220 offices away from headquarters. A decision was made to implement an important project aimed at connecting securely the entire network of embassies and consulates, with the requirement to use (*a*) only open standards, proprietary standards being explicitly excluded; (*b*) OSS wherever possible, and (*c*) certified and secure encryption technology. The AA CIO confirmed to the Inspector that the new set-up is more cost-effective.

Italy

58.   In October 2002 the Government of Italy established a Committee of Experts on Open Source Software. In its report issued in June 2003,[96] the Committee found out that overall, Government spending on software at national and local level reached 675 million euros in 2001, with 61 per cent of this amount allocated to the development, maintenance, and management of customized software while the remaining 39 per cent was used to purchase COTS packages. From the total expenditure on COTS, 63 million euros were spent on purchasing operating systems, about 30 million euros on database management systems (DBMS) and 17 million euros on office automation. Based on the Committee's findings and recommendations summarized below (box 1), a Government directive on the development and use of computer programs by public administrations[97] was issued on 19 December 2003. It contains a set of rules and criteria governing the acquisition and reuse of software by public sector bodies and invites them officially to consider OSS as an alternative to proprietary solutions.

Box 1:   Extract from the main recommendations of Italy's OSS policy
• Government should not penalize/prohibit the use of OSS. The criteria used when selecting a software package should be based on *value for money*.
• Custom software should be fully owned (although not necessarily exclusively) by Government. Outsourcing contracts should include appropriate protection clauses.
• It is necessary to encourage and facilitate the reuse of custom software owned by Government, as well as the dissemination of results and best practices throughout all Italian Government bodies.
• All software licences owned should be available for inspection and traceable by Government. Government must be protected in the event a software provider is no longer able to provide support.
• Government information systems should interact through standard interfaces which are not bound to a single provider.
• Government documents should be available in a variety of formats. Of these formats, at least one must be open, while the others can be either open or proprietary at the discretion of the Government.
• The transfer of custom software and software licences between Government bodies must be encouraged and free from limitations.

Source: "Survey of Open Source Software in Government", http://www.innovazione.gov.it/eng/news/survey_os.shtml (May 2003).

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[95] http://europa.eu.int/idabc/en/document/2204/470

[96] "Survey of Open Source Software in Government", http://www.innovazione.gov.it/eng/news/survey_os.shtml

[97] Directive of 19 December 2003, "Sviluppo ed utilizzazione dei programmi informatici da parte delle pubbliche amministrazioni", *Gazzetta Ufficiale*, No. 31 (7 February 2004), p. 14, http://www.guritel.it/free-sum/ARTI/2004/02/07/sommario.html#

Netherlands

59.   The Government of the Netherlands has established a Programme for Open Standards and Open Source Software (OSOSS)[98] with a mandate to encourage the use of open standards and to provide information about OSS by creating awareness among the public sector of the Netherlands "that open source software should be considered as a fully fledged alternative to closed source (i.e. proprietary) software". Concerning OSS in particular, the Programme is based on five policy intentions,[99] i.e. to (*a*) reduce the dependence on external software suppliers; (*b*) combat monopoly positions in the software market in order to prevent abuse of dominant market positions; (*c*) enhance the quality of Government information systems; (*d*) reduce the costs of software development and software implementation; and (*e*) improve the exchange of data between Government domains, between Government and citizens and between Government and the private sector.

United Kingdom

60.   In response to the e-Europe 2000 Action Plan, in September 2001 the British Government issued an e-Government Interoperability Framework (e-GIF)[100] mandating the use of XML as the cornerstone of its interoperability strategy. The Government considered that a key element in the development of XML schemata was an agreed set of standards adhering to the W3C XML schema recommendation. E-GIF was followed in July 2002 by a new policy on the use of OSS. The policy was further validated by OSS trials undertaken by the Office of Government Commerce (OGC) which resulted in a new report issued in October 2004.[101] Among its main findings, OGC concluded that (*a*) "Open Source software is a viable and credible alternative to proprietary software for infrastructure implementations, and for meeting the requirements of the majority of desktop users" and (*b*) adoption of OSS "can generate significant savings in hardware and software costs for infrastructure implementation, and reduce the licensing costs and hardware refresh requirements for desktop implementation". In October 2004 the OSS policy was slightly amended[102] (box 2 below).

Box 2:   United Kingdom Government policy on OSS (version 2)

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Contracts will be awarded on a value for money basis.

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specifications in all future IT developments.

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COTS (Commercial Off The Shelf) software it procures wherever this achieves value for money.

-
software exploitation route at the start of the project. At the completion of the project, the software shall be exploited either commercially or within an academic community or as OSS.*
      *In version 1, this provision read initially as follows: "UK Government will explore further the possibilities of using OSS as the default exploitation route for Government funded R&D software".

Source: "Open Source Software—use within UK Government",
http://www.govtalk.gov.uk/documents/OSS_policy_version2.pdf

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[98] http://www.ososs.nl/index.jsp?alias=english
[99] http://www.ososs.nl/attachment.db?6946
[100] e-Government Interoperability Framework, http://www.govtalk.gov.uk/schemasstandards/egif.asp
[101] http://www.ogc.gov.uk/index.asp?docid=2190#finalreport
[102] http://www.govtalk.gov.uk/policydocs/policydocs.asp

61.   During 2001–2002, the Office of the Deputy Prime Minister funded the APLAWS project,[103] an OSS-based content management system specifically designed for use by local authorities. A recent survey (May 2005)[104] found out that more than 60 per cent of local authorities intended to increase their use of OSS. In the education sector, the British Educational Communications and Technology Agency (BECTA)[105]─the Government's key partner in the strategic development and delivery of its ICT and e-learning strategy for the schools and the learning and skills sectors─released on 13 May 2005[106] a report showing that British primary schools could make significant savings by switching from proprietary software to OSS.

Switzerland

62.   On 23 February 2004 the IT Council of the Swiss Confederation approved a three-year (2004–2007) OSS strategy for the federal Administration[107] aiming at defining how OSS should be dealt with and how it could become a valid alternative to proprietary software. The strategy is based on three priorities: (*a*) equal treatment of OSS and proprietary software in the procurement process; (*b*) reuse of software developed in-house and assessment of whether it can be shared with   other Swiss public administrations; and (*c*) creation of the necessary conditions for the successful deployment of OSS.

63.   Such conditions would include inter alia (*a*) an assessment of OSS alternatives concerning ERP systems, databases, content management systems, document management systems and office suites; (*b*) training and awareness-raising; (*c*) development of a TCO model (applicable both to OSS and CSS) and (*d*) review of legal aspects.

(*c*)   Asia-Pacific region

64.   Member States from the Asia-Pacific region have been at the forefront of the trend towards more use of OSS. They have benefited from the very active IOSN programme run by UNDP/APDIP, which, besides fostering awareness-raising and information-sharing about OSS policies within the region, has made a valuable contribution through training and provision of OSS modules.

Australia

65.   The Australian 2002 e-Government strategy paper identified OSS as "providing opportunities for innovation, greater sharing of information technology systems, improved interoperability and cost savings".[108] In August 2004, the Government of Australia made public its policy on OSS that aims to (*a*) "provide a level playing field for all suppliers of software solutions to government"; (b) facilitate "access to open source solutions already developed in government agencies"; and (*c*) prepare "a range of tools" (such as an OSS sourcing guide and information seminars) "to help government agencies evaluate emerging open source solutions against more familiar proprietary software on an informed basis and appropriately assessing value for money and fit for purpose".[109] The Australian Government Information Management Office (AGIMO) plays a leading role in the implementation of the OSS policy. On 18 April 2005 it released a guide to OSS[110] with a foreword acknowledging that (*a*) the increasing maturity of

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[103] http://www.aplaws.org.uk/project/pathfinder.php

[104] http://news.ft.com/cms/s/4d4e2928-bfdc-11d9-b376-00000e2511c8.html

[105] http://www.becta.org.uk/

[106] http://www.becta.org.uk/corporate/press_out.cfm?id=4681

[107] "Open source software strategy of the Swiss federal administration", http://www.isb.admin.ch/internet/strategien/00665/01491/index.html?lang=fr

[108] "Government leads the way on Open Source Software", http://www.agimo.gov.au/media/2004/08/35491.html

[109] Ibid.

[110] *A Guide to Open Source Software for Australian Government Agencies─Developing and Executing an ICT Sourcing Strategy*, http://www.agimo.gov.au/_sourceit/sourceit/oss

OSS and open source platforms "offers significant potential benefits to the Australian Government and the wider community"; (*b*) OSS "development, using open standards, can support greater interoperability between systems and enable system sharing"; and (*c*) OSS "can offer original solutions to problems not addressed by proprietary software and it has the potential to lead to significant savings in Government expenditure" on ICT. The *Guide* also recognizes that OSS is a viable option which should be considered when undertaking government software procurement, and establishes new procurement rules requesting government offices to ensure that "[a]ll solutions ─open source or proprietary─ which can meet an agency's functional specifications should be considered by an agency when it is undertaking software procurement".

China

66.   The State Council of the People's Republic of China decided in 2004 on a new software policy whereby all ministries and public entities are required to acquire on a preferential basis domestic software products including OSS distributed locally. The new policy is bound in the near future to have a deep impact on the use of OSS in the country and in the region, considering that a Chinese company bought the PC branch of IBM and, more importantly, China, Japan and the Republic of Korea have undertaken a joint venture which could encompass desktop applications, embedded programs, middleware and operating systems. A first output of this joint venture will be the release in July 2005 of a Linux-based software called Asianux.[111]

Indonesia

67.   On 30 June 2004, the Ministry of Research and Technology, the Ministry of Communication and Information and the Indonesian Institute of Sciences issued a Joint Declaration[112] related to the launching of the "Indonesia Go Open Source" (IGOS) project which aims inter alia to (*a*) reduce the digital divide through the use of OSS; (*b*) improve innovation and the creativity of national software developers; and (*c*) improve and create the Government's IT programmes which would have an impact on accelerating e-government, reducing the State's spending on software licences, increasing the number of computer users and improving national defence and security. In order to reach the above goals, the Government intends through IGOS to take the following actions: (i) disseminate OSS usage in the entire country; (ii) prepare guidelines for the development and use of OSS; (iii) establish OSS competency training centres and business incubator centres, and (iv) foster the optimum utilization of OSS in Government and civil society.

Japan

68.   The policy of Japan on OSS is described on the website of the Ministry of Economy, Trade and Industry (METI)[113] and it is based on three main considerations, i.e. (*a*) too much dependence on one single software is not secure; (*b*) procurement of software should be opened to any new technology and company and, although market and users should be free to decide, there is a need to increase the availability of viable alternatives; and (*c*) industrial policy should foster interoperability and innovation. The activities of METI in relation to the above policy included an allocation of one billion yen both in financial year (FY) 2003 and FY 2004 for OSS development and support, a feasibility study on OSS desktop environment, and support to the Asia OSS Symposium which held its first and second meetings in 2003, in Thailand and Singapore respectively, and its third meeting in Viet Nam. Future work will include the enhancement of the collaboration with China and the Republic of Korea. In that regard, an international symposium, the "Japan-China-Korea Open Source Business Talks" was held in Osaka, Japan, in November 2003, during which the establishment of a Japan Open Source Software Promotion Forum was announced.

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[111] http://news.zdnet.co.uk/software/linuxunix/0,39020390,39183084,00.htm
[112] http://www.igos.web.id/english/declaration.htm
[113] http://www.meti.go.jp/english/information/data/IT-policy/oss1.htm

Malaysia

69.   The Government of Malaysia has taken a very proactive attitude in promoting the development of OSS in the country and its use in the public sector, as confirmed on site from information gathered during interviews with officials from Government, academia, researchers, and representatives from the IT industry and OSS user groups. The main architects of the current open-source governmental policy are the Malaysian Administration Modernisation and Management Planning Unit (MAMPU)[114] in the Prime Minister's Office and MIMOS Berhad,[115] a State-owned corporation specialized in ICT research and development (R & D). The policy is in line with the Malaysian Government Interoperability Framework for OSS (MyGIFOSS).

70.   MAMPU developed a public-sector open-source Master Plan,[116] officially announced in July 2004. Its declared objectives are to (*a*) increase the choice of software usage, interoperability and the capability to maintain and support software; (*b*) reduce TCO; (*c*) reduce vendor lock-in; and (*d*) increase security and enforce sovereignty. The Plan is based on seven strategic thrust areas which encompass the development of an OSS Technical Implementation Plan for the public sector, the designation of a governing body to champion, monitor and drive OSS implementation, training, R & D, the provision of legal direction and incentives to enable the development of OSS solutions and encouraging partnerships with relevant organizations.

71.   An Open Source Competency Centre (OSCC) was established in June 2004 to guide, facilitate, coordinate and monitor the implementation of OSS in the public sector along the following principles: (*a*) adoption of OSS should comply with the OSS Technical Implementation Plan and be based on the least disruptive and fit-for-purpose implementation; (*b*) OSS procurement should be based on merit, value for money, transparency, security and interoperability, and should adhere to governmental procurement policies and procedures, preference being given to OSS when both OSS and proprietary solutions have equal ratings; (*c*) acquired or OSS solutions developed in-house should be licensed under GPL, Berkeley Software Distribution (BSD) or an equivalent licence formulated by the Government; (*d*) OSS technology to be used in the public sector should comply with worldwide open standards and should not be dependent on a single support provider; (*e*) agencies implementing OSS must register their initiatives in a knowledge bank which shall serve as a platform for sharing information and expertise; (*f*) OSS education should be introduced through structured programmes in school IT laboratories at primary, secondary and tertiary education levels; and (*g*) agencies must be committed to educating and reskilling their personnel in order to provide OSS-competent staff.

Viet Nam

72.   In March 2004, the Government of Viet Nam approved a plan for the implementation and development of OSS in the country for the period 2004–2008.[117] The main objectives were to (*a*) accelerate the application and development of OSS with a view to contributing to the protection of copyright and the reduction of software procurement expenses as well as to promote the development of the IT industry in general and Viet Nam's software industry in particular; (*b*) build up a contingent of qualified technicians who would be able to develop OSS applications, and (*c*) create special applications based on OSS for the domestic market. For the implementation of the above project, measures envisaged will include, inter alia, the promulgation of policies for the use of OSS in the State sector, the creation of favourable conditions inciting overseas Vietnamese, foreign companies and international organizations to invest in OSS projects, training programmes for State officials and employees as well as for the education sector, R & D and localization of software to meet Viet Nam's basic applications needs.

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[114] http://www.mampu.gov.my/
[115] http://www.mimos.my
[116] http://opensource.mampu.gov.my/
[117] http://www.mpt.gov.vn/english/legal_doc/?op=3&thucdon=vb&id=VB2010436240

(*d*) Latin America

Brazil

73.   In recent years in particular, the Government of Brazil has been a prominent promoter of OSS, with the active involvement of several federal institutions and the leadership of the National Information Technology Institute (ITI),[118] which is part of the President's Office. In October 2003, a decree signed by the President entrusted a Technical Committee chaired by the ITI Director-General with the responsibility of coordinating and articulating the planning and implementation of OSS, digital inclusion and IT systems integration.[119] For the implementation of OSS, the Committee intends to pursue a number of objectives such as (*a*) giving priority to solutions, programmes and services based on OSS which optimize IT resources and investments; (*b*) popularizing the use of OSS and promoting the acquisition of hardware compatible with OSS; (*c*) guaranteeing to all citizens the right to access public services without the obligation of using a specific platform; (*d*) using OSS as a springboard for digital inclusion; (*e*) providing incentives for the national IT industry to adopt business models based on OSS; (*f*) promoting public administrations' capacity to use OSS; and (*g*) formulating a national OSS policy. A dedicated OSS portal provides useful information about OSS[120] and a migration guide was released in 2004.[121] Many State agencies are currently migrating to OSS and in April 2005, the Government announced a new digital-inclusion initiative called "PC Conectado",[122] through which it would invest some US\$ 73.3 million per year to subsidize the purchase of one million OSS-based computers by low-income Brazilians and small-business owners.

Cuba

74.   The fact that software users in Cuba cannot legally acquire United States-made proprietary software owing to the trade embargo contributed to the widespread use of unauthorized copies and, paradoxically, to de facto standardization. There is, however, a growing trend in the promotion of OSS. In July 2001, an open-source workshop was held in Havana[123] under the co-sponsorship of the Government of Cuba and the regional office of the United Nations Educational, Scientific and Cultural Organization (UNESCO), with the participation of representatives from Brazil, Colombia, Ecuador and Uruguay. The workshop recommended inter alia that Governments in the region should establish policies promoting the use of OSS in public administrations, the development of OSS studies in the education sector, etc. In 2002, a strategy for the use of OSS was prepared by the Ministry of Information and Communication (MIC).[124] It aims inter alia to promote the increased usage of OSS in public administrations and the education sector.

Venezuela

75.   Following the issuance of a Yellow Book on OSS by the Ministry of Science and Technology (MCT),[125] the President of Venezuela signed a decree in December 2004[126] mandating that all national public administrations should on a priority basis use OSS developed under open standards. To that effect, all administrative entities concerned should undertake the progressive migration to such OSS applications. MCT is responsible for the implementation of the decree and was called upon to submit a plan of action to the Presidency within 90 days and administrative units will have a maximum of 24 months therefrom to migrate to the required platforms.

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[118] http://www.iti.br/
[119] http://www.iti.br/twiki/bin/view/Main/PressRelease2003Oct30A
[120] http://www.softwarelivre.gov.br/
[121] http://www.serpro.gov.br/servicos/downloads/Guia_Livre_Ipiranga.pdf
[122] http://www.softwarelivre.gov.br/noticias/News_Item.2005-03-29.2402
[123] http://www.softwarelivre.org/articles/43
[124] http://www.linux.cu/documentos/
[125] http://www.mct.gov.ve/uploads/biblio/amarillo2.pdf
[126] http://www.mct.gov.ve/uploads/biblio/Decreto%203.390%20Software%20%20Libre.pdf

(*e*)   Africa

76.   At the time of this review, South Africa and Tunisia appeared to be the only countries in Africa to have formally addressed the issue of OSS with a holistic approach. Other countries may follow suit as a resolution adopted in 2003 by the Committee on Development Information (CODI) of the United Nations Economic Commission for Africa (ECA)[127] noted that "[f]ree and open source software can provide cost-effective solutions to African member States and society" and called on member States inter alia to adopt OSS "as an important tool in promoting ICT and good governance" and to "play a key role" in the promotion of OSS including through the introduction of "appropriate policies and legislation".

South Africa

77.   In South Africa, the Open Source Working Group of the National Advisory Council on Innovation (NACI) published in January 2002 the first assessment of OSS and open standards in the country.[128] This document played a critical role in raising awareness of the potential benefits of OSS in the South African context and served as a basis for a more focused review by the Government Information Officers' Council (GITOC)[129] on the use of OSS in Government. The review concluded that the e-government policy should take into account the role of OSS and it therefore proposed a strategic framework subsequently endorsed by the Government. The main features of the South African OSS policy in public administrations provide that: (*a*) the improvement of efficiency and effectiveness of services rendered to the citizens should remain the primary criterion for selecting software; (*b*) as appropriate, preference will be given to OSS over proprietary software whenever it offers equal advantages; (*c*) steps will be taken by the Government to create an enabling environment for the implementation of OSS, including through the promotion of fair and impartial treatment of OSS in the procurement process; (*d*) OSS will be integrated into the broader e-government policy and related strategies for the ICT sector. Besides the activities carried out by NACI and GITOC, the Council for Scientific and Industrial Research (CSIR) has set up an Open Source Centre which will play an enabling role through interactions with the private sector, Government and civil society.[130]

Tunisia

78.   In July 2001, the Government of Tunisia defined an OSS policy with the objective of (*a*) encouraging the migration from proprietary platforms to OSS; (*b*) including training on OSS in the curriculum of secondary and tertiary levels of education; (*c*) providing incentives to OSS-based start-up enterprises; and (*d*) ensuring that the procurement policies of public-sector entities give equal treatment to OSS solutions, in particular by avoiding specific requests for proprietary software.

79.   A Secretariat of State for Informatics, the Internet and OSS (Secrétariat d'État chargé de l'informatique, de l'Internet et des logiciels libres) has been established under the authority of the Ministry for Communication Technologies and entrusted with the responsibility of implementing a plan of action[131] which aims, inter alia, to (*a*) create an enabling environment to foster the development of the ICT sector and reinforce local competencies in R & D and local production capacity for equipment and software (about 48 per cent of PCs used in the country are assembled locally); (*b*) develop national and international partnerships with the private sector; (*c*) launch a "family PC programme" in order to help poor families acquire a computer through low-interest bank loans; and (*d*) promote e-government and e-commerce.

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[127] http://www.uneca.org/codi/
[128] "Open source software & open standards in South Africa—a critical issue in addressing the digital divide", http://www.naci.org.za/pdfs/oss_v_1_0.pdf/
[129] "Using open source software in the South African Government", http://www.oss.gov.za/
[130] http://www.csir.co.za/plsql/ptl0002/ptl0002_pge001_home
[131] "Open source software: *les enjeux et les perspectives à travers l'analyse de l'exemple tunisien*", http://r0.unctad.org/ecommerce/event_docs/estrategies/nciri.ppt

B. Lessons to be learned from Member States' experiences

80. The above case studies are just a sample of governmental policies on OSS. The Center for Strategic and International Studies (CSIS) ─a United States-based research institute─ issued a report in September 2004 on Government open source policies.[132] The report provides information on more than 90 OSS initiatives or projects undertaken worldwide by Governments and other public administrations. Not counting Governments without a defined policy, attitudes towards OSS vary from mandating the use of OSS, giving preference to OSS, or levelling the playing field by ensuring that equal consideration is given to mature OSS in the procurement process.

81. Lessons to be learned from most of the case studies highlighted above include the following:

- OSS has become in many instances a valid alternative for corresponding closed source software.

- Policies on OSS have been defined within the wider context of e-government policies and related ICT interoperability frameworks based on open standards and open file formats, the objective being to ensure equal access to information for all stakeholders and to preserve public data.

- It is incumbent on public administrations to avoid vendor lock-in, to foster competition, and on that basis, to review their procurement processes accordingly.

- Implementation of OSS policies requires leadership and the designation of a governing body to champion, monitor and drive the implementation process. Such a body must be accountable at a high level of Government structure.

- Public entities should claim ownership of customized software and as appropriate, encourage the reuse of source codes and the sharing of applications.

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[132] http://www.csis.org/tech/OpenSource/0408_ospolicies.pdf

CHAPTER III: OPEN SOURCE SOFTWARE IN THE UNITED NATIONS SYSTEM ENVIRONMENT

A. Information and communication technologies policy frameworks and their implications

Access to information is recognized as a fundamental human right

82.   Some analysts consider that access to information is a right implicitly recognized by the international community. Indeed, article 19 of the Universal Declaration of Human Rights adopted by General Assembly resolution 217 A (III) of 10 December 1948 proclaims that "Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers".[133] Furthermore, article 19, paragraph 2, of the 1966 International Covenant on Civil and Political Rights also states that "Everyone shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in writing or in print, in the form of art, or through any other media of his choice".[134]

Statement of the Administrative Committee on Coordination on universal access to basic communication and information services

83.   In April 1997, the executive heads of United Nations system organizations adopted a statement on universal access to basic communication and information services[135] in the framework of the former Administrative Committee on Coordination (ACC), now the United Nations System Chief Executives Board for Coordination (CEB). Expressing their concern that the information and technology gap and related inequities between industrialized and developing countries was widening and creating a new type of poverty, the information poverty, which affects most developing countries and especially the least developed countries, they committed their organizations to assist developing countries in redressing this alarming trend and affirmed their intention to "to ensure the compatibility, accessibility and convergence of communications and computer-based systems".[136]

The Economic and Social Council 2000 ministerial declaration and the United Nations Millennium Declaration

84.   The high-level segment of the Economic and Social Council adopted a ministerial declaration at its July 2000 meeting which emphasized "the importance of universal access to knowledge and information for promoting development" and called for "a coherent system-wide ICT strategy that would ensure coordination and synergy among programmes and activities of individual organizations of the system and transform it into a knowledge-based system of organizations".[137]

85.   In the United Nations Millennium Declaration contained in General Assembly resolution 55/2 of 8 September 2000, the Heads of State and Government attending the Millennium Summit resolved, inter alia, to ensure that the benefits of new technologies and especially ICTs were available to all in conformity with the Economic and Social Council ministerial declaration.[138]

General Assembly resolution 57/295

86.   In line with the ministerial declaration of the high-level segment of the Economic and Social Council and the United Nations Millennium Declaration, the General Assembly adopted

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[133] http://www.unhchr.ch/udhr/index.htm
[134] http://www.ohchr.org/english/law/ccpr.htm
[135] A/52/354.
[136] Ibid., p. 23, para. 17.
[137] A/55/3/Rev.1, p. 22, para. 15.
[138] Part III, para. 20.

resolution 57/295 of 20 December 2002 in which it requested the Secretary-General as Chairman of CEB to "work closely with organizations of the United Nations system and with the Information and Communication Technologies Task Force to develop a comprehensive information and communication technologies strategy for the United Nations system". Elements to be taken into account in the strategy included the need for (*a*) the system-wide application and use of ICT to strengthen the United Nations capacity "to create, share and disseminate knowledge" and to improve its efficiency and effectiveness in delivering services to Member States; (*b*) broader ICT integration into development and technical cooperation activities; (*c*) creating collaborative networks and communities of practice among organizations of the system; (*d*) developing common platforms for services; (*e*) using ICT to promote best practices and to enhance information-sharing among organizations of the system and between the organizations and Member States; and (*f*) developing comprehensive system-wide ICT training programmes for capacity-building within the United Nations system.

The 2003 World Summit on the Information Society Declaration of Principles and Plan of Action

87.   The 2003 Geneva phase of WSIS adopted a Declaration of Principles[139] and a Plan of Action[140] translating the objectives of the Declaration into concrete action lines. Action line C3 on access to information and knowledge affirms that "ICTs allow people, anywhere in the world, to access information and knowledge almost instantaneously" and that "individuals, organizations and communities should benefit from access to knowledge and information". In that connection, Governments are encouraged to provide access to public information through different means including the Internet as well as to pass legislation on access to information and for the preservation of public data notably with regard to new technologies. Of particular relevance to this review is the call to "[e]ncourage research and promote awareness among all stakeholders of the possibilities offered by different software models, and the means of their creation, including proprietary, open-source and free software, in order to increase competition, freedom of choice and affordability, and to enable all stakeholders to evaluate which solution best meets their requirements".[141]

88.   OSS was also referred to by some of the regional conferences held prior to the Geneva phase of WSIS. The Bucharest Declaration[142] adopted by the Pan-European Conference included open source among the issues to be addressed with the participation of all stakeholders. The Asia-Pacific Regional Conference approved the Tokyo Declaration in which it is estimated that the "[d]evelopment and deployment of open-source software should be encouraged, as appropriate, as should open standards for ICT networking".[143]

The United Nations system-wide information and communication technologies strategy

89.   In a report issued in 2004,[144] the Board of Auditors noted that, "[in] recent years, all major entities of the United Nations system have developed and published information and communication strategies in relative isolation from each other and from United Nations Headquarters". The Board considered also that "[o]nly a minority of organizations have documented ICT strategies. The formats varied, and estimated costs or benefits are not provided for all strategies". It concluded that such a situation "creates the risk that ICT expenditures would not be focused on adding value to the organization and therefore would not support the achievement of mission objectives".

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[139] http://www.itu.int/wsis/docs/geneva/official/dop.html
[140] http://www.itu.int/wsis/docs/geneva/official/poa.html
[141] Ibid., para. 10 (e).
[142] http://www.wsis-romania.ro/
[143] http://www.itu.int/wsis/documents/listing-all.asp?lang=en&c_event=rc|as&c_type=all|
[144] A/59/162, paras. 93 and 97.

90.   As requested in General Assembly resolution 57/295, the Secretary-General submitted at its fifty-ninth session a United Nations system ICT strategy[145] which was arrived at through a process of consultations involving ICT managers, programme and management officials of United Nations organizations of the system, members of the United Nations Information and Communication Technologies Task Force, and experts. As initially proposed, the strategy comprised a United Nations ICT Charter which specifically recognized the need to "further exploit opportunities to mitigate software costs through increased usage of appropriate open source software", and 15 strategic initiatives including one on OSS.

91.   The strategy is based on a very detailed and substantive background document prepared by the CEB ICT Network Working Group and endorsed by the High Level Committee on Management (HLCM). For each of the 15 initiatives "an outline business case" was drawn up, "identifying the opportunity, elaborating the target position, describing the advantages and constraints and proposing an action plan".[146] According to the one concerning OSS details of which appear in annex II below, the outline asserts that the "opportunity exists to achieve a very positive ROI [return on investment], with major savings in software licensing and, over a modest timescale, reduced total costs of ownership, notwithstanding start-up costs", and that the United Nations system "has an opportunity to make financial and performance gains on a significant scale".

92.   For public administrations in general and the secretariats of United Nations organizations in particular, all the above-mentioned policy statements by Member States have implications in terms of ensuring universal access to information for all, and ensuring the successful implementation of e-government policies and related ICT strategies. For the different stakeholders concerned, access to information and knowledge should not be hindered by the choice of IT systems or products made by the organizations responsible for delivering such services. Many Member States have adopted an e-GIF as a way to circumvent the fragmentation of their public sector through the establishment of a set of agreed policies and standards to be used for sharing and integrating their data.

93.   While interoperability is not an end in itself, lack of it can translate into negative and costly effects on the efficient delivery of services by United Nations system organizations, particularly as their individual ICT strategies have been adopted without sufficient coordination. Besides its comments mentioned in paragraph 89 above, the Board of Auditors had previously expressed its "concern and reservations about the concurrence of a number of costly information and communication technologies (ICT) systems within the United Nations system, at the expense of the same stakeholders—the Member States—covering the same geographical areas, under similar rules and regulations, and working towards the same global ends".[147] In their background document referred to in paragraph 91, and as a justification for the initiatives selected to be implemented in the context of the proposed system-wide ICT strategy, ICT managers themselves identified a number of problem areas such as the following:

- The lack of standards is among the reasons that do not facilitate the establishment of a single United Nations Development network, thus necessitating expensive and varied expertise.

- A set of common United Nations standards would help tremendously for the introduction of United Nations best practice in ICT governance.

- There is an urgent and immediate need to develop United Nations best practice guidelines and minimum standards for information security, disaster recovery and business continuity.

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[145] A/59/563.

[146] A/59/563, annex II, para. 1.

[147] A/57/201, para. 62.

- Current practices in choosing ERP solutions have led to major investments without coordination despite the fact that organizations share a significant commonality of business processes.

- In the area of finance and human resources management such as payroll or records management, substantial cost savings could have been derived from organizations sharing common applications.[148]

- Although they have a wealth of development and operational knowledge, access to this source of knowledge is not always possible owing to the lack of standards for tagging information or sharing it over the Internet.

- The lack of coordination in web management and content has led to non-integrated systems, confusing experiences for users and has resulted in costly duplications.

- Even an apparently simple undertaking such as a system-wide staff directory is difficult to implement as current directories of individual organizations are largely based on incompatible technologies.

94.   Implementing the different initiatives envisaged in the system-wide ICT strategy could help to provide more coherence to the system but this would not be enough if the organizations continue doing business as usual in other areas. It would be more cost-effective for the entire system for secretariats to agree first on an interoperability framework underpinning all future ICT investments and to commit themselves to abide by accepted guiding principles (**recommendations 1 and 2**).

95.   At its fifty-ninth session the General Assembly did not pronounce itself on the system-wide ICT strategy but requested instead a further report to be submitted at the sixtieth session.[149] It is vital for all organizations concerned to be able to claim ownership of the system-wide ICT strategy, particularly so because its successful implementation will require a change of culture involving all the players. Moreover, any ICT strategy has medium to long-term financial implications to be considered by the relevant committees in charge of administrative and budgetary matters. In that regard, once the proposed system-wide strategy is reviewed and endorsed by the General Assembly of the United Nations, it should also be submitted to the governing bodies of other organizations concerned, in particular where amendments to existing ICT strategies of individual organizations might be required (**recommendation 3**).

B.   The current software environment

96.   United Nations system organizations have made important ICT investments based almost exclusively on proprietary software and they continue to depend largely on these existing platforms. This situation is not different from the findings of most of the reviews on the use of OSS in the public administrations of Member States or relating to other international organizations. It prevails for instance in most of the European Union administrations in Brussels despite the proactive OSS policies in the Union.

97.   Considering the fact that there is now more choice for some software applications, and that in April 2004 United Nations Headquarters signed a three-year umbrella licensing agreement with Microsoft on behalf of system organizations, secretariats were asked in a JIU questionnaire whether they intended to take advantage of such an agreement and to provide data on their current or planned expenditures on software licences for the 2002–2003, 2004–2005 and 2006–2007 bienniums as well as estimates on the magnitude of potential savings they foresaw from the increased use of OSS.

98.   While the replies received were too sketchy to allow an overall assessment, they do indicate that (*a*) most organizations signed or intend to sign a licensing agreement on the basis of the

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[148] In that connection, JIU will be submitting a report on a common payroll system in 2005.
[149] A/59/480, draft decision I (*b*).

umbrella agreement;(*b*) some ICT managers were of the opinion that more favourable terms could have been negotiated under the umbrella agreement, considering important discounts reported to have been secured later on by some other big clients which were considering a migration to OSS; (*c*) a few organizations opted for a type of licensing agreement which was initially signed by the Office of the United Nations High Commissioner for Refugees (UNHCR) because it suited them better; (*d*) UNESCO was granted the so-called campus agreement status which is much more favourable than the terms of the umbrella agreement; (*e*) the United Nations Children's Fund (UNICEF) would not indicate the type of licensing agreement it was using and would neither confirm nor deny whether it benefited from better terms than the umbrella agreement; and (*f*) the United Nations Industrial Development Organization (UNIDO) does not intend to take advantage of the agreement for the time being, because its licence requirements for Microsoft OS and Office are already covered for purchased PCs and the requirements for the few Microsoft servers are purchased on an as needed basis.

99.   As for savings, only UNIDO estimated that, from a total expenditure of 400,000 euros on software and maintenance each biennium, it saved the equivalent of about 10–15 per cent of the software budget each biennium by using OSS.

100. In 2004 the ICT Network Working Group made an assessment of the use of OSS in the United Nations system. Secretariats were asked to indicate the type of OSS applications, the deployment status (test, development or production) and their conclusions or comments (advantages/disadvantages). From the replies made available to JIU, it is possible to conclude that (*a*) different OSS applications are in different phases of usage; (*b*) many of those which are mature have been qualified as being "stable", "reliable", "brilliant", "free", "low-cost", "secure and well supported by the OSS community", etc.; and (*c*) a few were found "not easy to configure" or "not user-friendly".

101. Depending on their degree of vendor lock-in resulting from past investments and on other factors, organizations will have more or less flexibility to consider widening their use of OSS. Replies to the JIU questionnaire indicate that, while there are many instances where OSS applications are being used, by and large the situation depended more on individual initiatives and except in limited cases, seldom is there an organization-wide corporate policy.

102. The United Nations Office at Vienna (UNOV) and the United Nations Office on Drugs and Crime (UNODC) have an OSS policy detailed as follows: (*a*) OSS and other Internet offerings with a similar sustainability horizon to OSS are to be located and evaluated before, or simultaneously with, any commercial software, such evaluation taking into account the suitability to task of the software being considered, TCO and security features among other case-specific criteria; (*b*) existing software which exhibits significant TCO, management or security issues is to be replaced by OSS if practical; (*c*) the above policies are mandatory, but in no way preclude the use of commercial packages; and (*d*) the use of Linux at the server level is a strategy.

103. The International Labour Organization (ILO) indicated that it supports the use of OSS for mission critical applications, as long as they provide the same functionalities as proprietary products. It has been using Linux on servers for more than eight years and some essential enterprise systems such as the ILO website have been running under Linux since 2000. ILO considers that, in addition to the significant cost benefits of running Linux servers, they have proved to be better performing and more reliable. ILO welcomes an initiative that would encourage and promote wider use of open standards and open content, as this will create enough demand to secure lower licensing costs.

104. The Food and Agriculture Organization of the United Nations (FAO) makes considerable use of OSS covering application development, web applications, and systems administration tools. This trend is expected to grow as the market expands and more mature products become available. Linux is now a standard operating system for application and web server platforms within the organization. FAO is in agreement with the principles and objectives of ensuring

interoperability across products and platforms, and to the use of OSS solutions, where cost-effective.

105. UNIDO indicated that OSS is widely deployed for key-server side functions and that Linux is currently used on some desktops but with no preliminary conclusions. The organization has a strategy of leveraging OSS and considers that the main niches for future savings would be the continuation of the strategy of using OSS for key-server side functions and choosing OSS-compatible commercial software.

106. The International Computing Centre (ICC) provides operational IT services on various platforms as well as IT training to many United Nations system organizations. It has deployed several OSS products selected for implementation when they have met a number of criteria such as a high level of maturity, broad acceptance in the IT community, added business advantage to ICC customers and availability of adequate support inside ICC and from vendors.

107. The inventory of OSS applications used by United Nations system organizations can serve to establish a useful repository of mature OSS solutions tested in the United Nations environment. Access to such a repository should be free and open to all system organizations as well as to other stakeholders (**recommendation 4**).

C.   Increased use of open source software requires an enabling environment

108. In its outline business case for an OSS initiative (see annex II), the ICT Network Working Group estimated that, while OSS will not replace all commercial software, it must be recognized that "in some areas, a switch to OSS can represent a major cultural change, with significant start-up costs". Other factors also come into play and although some do not specifically affect policies on the use of OSS, they do have an indirect bearing on them.

Responsibilities for the management of information and communication technologies

109. Commenting on the ICT strategy of the United Nations itself, the Advisory Committee on Administrative and Budgetary Questions (ACABQ) expressed the view that its implementation "would require effective central leadership for policy, strategic guidance and standard setting, as well as the commitment of department heads to implement central decisions at the operational level".[150] Back in 2002, a JIU report on management information systems (MIS) in the United Nations system[151] recommended, inter alia, that all United Nations system organizations should consider the appointment of a CIO reporting directly to the executive head or to the deputy responsible for programmes. For its part, a member of the United Nations ICT Task Force expressed to the Secretary-General the view that "the role of ICT should be elevated to a strategic level within the UN system. It is strongly recommended that the position of a UN Chief Information Officer (CIO) be established. There is a need to bring such a person into the decision-making process preferably at the cabinet level. This is the case in most private enterprises and increasingly in many governments. This would ensure that ICT issues are an integral part of the decision-making processes and programs rather than an afterthought".[152]

110. So far, only a few organizations have appointed a CIO and in a majority of organizations, the ICT function continues to be perceived rather more as a support function than a strategic one. Some ICT managers confirmed in their replies that in their organization, the IT function was considered as a "plumbing service" and that they had basically no influence on organizational activities nor how to implement them. They believed that the situation represented not only a risk area, but constituted an effective roadblock to ICT strategic planning and the implementation of ICT initiatives, as departmental conflicts of interest hampered most enterprise-centric projects. The Inspector shares those concerns.

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[150] A/58/7, para. 115.
[151] JIU/REP/2002/9, recommendation 2.
[152] Brendan Tuohy (Ireland), "United Nations ICT strategy—background document to the report of the ICT Network Working Group", annex 2.

Investments in information and communication technologies

111. A 2004 report by the Board of Auditors related to "more than $700 million in direct ICT expenditures for the biennium 2002–2003"[153] for the 23 United Nations departments, funds, programmes and institutes covered in the Board's annual or biennial reports to the General Assembly. It concluded inter alia that "there is no United Nations system-wide formal method for the evaluation of ICT investments and expenditures".[154] JIU estimated in its report referred to in paragraph 109 above that, on a system-wide basis, organizations had spent US$ 1 billion on MIS over a 10-year period. For its part, in its comments on the proposed programme budget of the United Nations for 2004–2005, ACABQ was concerned that the Organization's spending on ICT might be "in excess of $1 billion (including peacekeeping) in the next five years"[155] if the current trend continued.

112. From their vantage point, ICT directors recognize that the United Nations system faces increasing demands for ICT investment and that the total amount of the budget devoted by the organizations to that purpose is generally increasing at a much higher rate than their operating budgets. They also admit that, with most organizations applying zero nominal growth (ZNG) or zero real growth (ZRG) policies to their budgets, the demand for more ICT investments can only be met from an improved use of the funds invested, the other options being either cutbacks in other services or a net reduction in ICT services. From data provided in the CEB statistical report on the budgetary and financial situation of the organizations of the United Nations system,[156] it is estimated that the total resources of the organizations reached more than US$ 27 billion for the 2002–2003 biennium. The current JIU review initially intended to assess how total expenditures on ICT compared with total overall resources. The exercise proved impossible partly because the submission of related data was too limited.

113. All the initiatives envisaged in the system-wide ICT strategy will require upfront investment. In particular, the increased use of OSS will entail migration costs, which will vary depending on the status of the current vendor lock-in of each organization. In addition, some training and reskilling of IT staff and end-users may be required. Against such a background and although it has been argued sometimes that United Nations system organizations spend too much on ICT, such spending should be related to their overall resources. In the private sector, and according to a July 2004 survey of 240 IT executives,[157] 63 per cent said their departments were inadequately staffed and 65 per cent were cross-training staff to fill in the gaps. Another survey issued in January 2005 covered 1,300 CIOs representing 30 countries and more than US$ 57 billion in IT spending. It found out inter alia that only 39 per cent of them believed they had the right people to meet current and future business needs while 51 per cent were concerned about an ageing workforce as a result of difficulty in attracting and maintaining new staff with the right skills to meet the new business requirements.[158] The situation in most organizations of the United Nations system is at best comparable if not worse, particularly as human resources management policies and funding do not provide the same flexibility compared to the private sector.

Resistance to change

114. In March 2005, the CEB ICT directors undertook a review of the 15 initiatives (mentioned in paragraph 90 above) in terms of savings potential, risk, effectiveness and organizational interest and recommended eight initiatives ultimately endorsed by HLCM at its ninth session.[159] As a result, the OSS initiative is no longer part of the list, as it ranked respectively 11th for cost savings, 14th for low risk, 13th for ICT effectiveness, and 14th for organizational interest. While

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[153] A/59/162, para. 89.
[154] Ibid., para. 99.
[155] A/58/7, para. 125.
[156] A/59/315
[157] http://www.cio.com/go/index.html?ID=268&PMID=17541&s=1&f=1
[158] http://www4.gartner.com/press_releases/asset_117739_11.html
[159] CEB/2005/3, http://ceb.unsystem.org/hlcm/session.reports.htm

the ICT Network Working Group may have been overoptimistic in its initial assessment of the potential of OSS, as described in the business outline in annex II below, this change of mind among CEB members and the very low ranking now given to the OSS initiative also appear to stem from a resistance to change in some organizations. With the ICT Charter as currently drafted, it becomes unclear how the declared objective of mitigating cost increases through an increased used of OSS could then materialize if no initiative is undertaken to support the business case.

115. As pointed out in a previous JIU report,[160] "quite often, pertinent information technology initiatives or projects suffer from lack of a wider perspective, adequate funding, and timely implementation**".** Concerning OSS**,** the actual situation may vary from one organization to the other and smaller organizations have probably less flexibility than the larger ones. The challenge for ICT directors and CEB is therefore to provide governing bodies with relevant information on how savings, if any, can be made, including from increased use of OSS, in order to be eventually reallocated to cover other needs. The Inspector reviewed submissions related to ICT in the programme budgets for 2002–2003 and 2004–2005. Only the ITU draft budget document for 2004–2005 makes reference to the fact that the IT Department is "studying the possibility of using the open-source software to reduce software licence costs"[161] (**recommendation 5**).

D.   Coordination on matters related to information and communication technologies

116. Knowledge-sharing has figured for more than a decade on the agenda of many governing bodies of United Nations system organizations. It was also often debated at meetings of CEB and its predecessor, ACC. A quick search made at the end of April 2005 on the database of the Official Document System (ODS) of the United Nations[162] showed that the expression "knowledge-sharing" appeared in more than 450 entries, out of which 54 and 57 were in association with the abbreviations ACC and CEB respectively.

117. The United Nations ICT Charter recognizes the need for "a high-level governance structure that would promote change and champion the delivery of the strategy".[163] Past experiences with coordination on ICT matters in the United Nations system show a long history of repeated statements on the need to cooperate and coordinate, but limited results in terms of achievements. This has led to the establishment of successive mechanisms, from the Inter-Organization Board for Information Systems (IOB) to the Advisory Committee for the Coordination of Information Systems (ACCIS) and the Information Systems Coordination Committee (ISCC). Contrary to its predecessors, ISCC was empowered as a standing committee of ACC to recommend, inter alia, limited areas of standardization with mandatory force. Although it was closed down in 2001, its effectiveness suffered more from the lack of implementation of approved recommendations than from the relevance of such recommendations. It has been replaced by the informal ICT Directors Network, which meets once a year.

118. Among lessons to be learned from previous efforts at ICT coordination, it should be recognized that, too often, secretariats have used the diverse mandates and governing structures of their organizations as a pretext not to commit themselves to comply with common objectives agreed upon at technical level. Unless there is a change from the "we are different" culture to a more dedicated commitment to achieve common goals fully supported by top management and the respective legislative bodies, no initiative, however well-resourced, can succeed in a sustainable manner in correcting the deficiencies diagnosed. Upon inquiry as to what measures should be taken to ensure that the proposed new mechanism is more viable than its predecessors, some of the replies received from ICT managers underlined inter alia the fact that coordination requires an effort from all organizations, but in that regard executive management has not been proactive in promoting initiatives, particularly if it means a change for their organization. Some

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[160] JIU/REP/99/1, para. 71.
[161] Document CO3-Add/2-E.
[162] http://documents.un.org/
[163] A/59/563, annex I, United Nations Information and Communication Technologies Charter, para. 2 (*n*).

also consider that there is a big gap between the ICT Network and the bodies to which it reports (HLCM and the High-Level Committee on Programmes (HLCP)) and that the Chairman of the ICT Network should be a permanent member of these bodies. Others expressed the view that agencies will not invest in change without compelling business cases for doing so. Preparing such business cases requires collecting consistent and verifiable information across agencies as well as gaining an understanding of the cost drivers in the various agencies and various locations, an exercise currently difficult to undertake satisfactorily.

119.   There is a consensus that using OSS cannot be a panacea and that there is a need to focus on "opening the mind" to alternative solutions including OSS, a process which would require access to trustworthy and relevant information such as TCO of OSS in the United Nations environment and/or indication of areas ripe for investment. Awareness-raising has been highlighted as a must in all reviews on the use of OSS in Member States. As currently structured, the CEB machinery is simply incapable of contributing enough to such awareness-raising among its membership. This being said, there may not be enough interest or willingness to build on experiences or business cases from other organizations including outside the United Nations system. The Open Source Observatory maintained by the European Commission provides a list of tested OSS applications classified according to a taxonomy that is specific to public administrations. Ways could be found to avoid duplicating efforts that have already been made elsewhere and take better advantage of lessons learned by organizations facing the same challenge as the United Nations system organizations. In that regard, the particular experience of the European Union could serve as a source of inspiration. For United Nations system organizations, agreeing first on how information should be encoded and shared appears to be a prerequisite that has not been properly addressed in a holistic manner in the past. Adopting the United Nations Interoperability Framework (UNIF), as proposed in recommendation 2 above, and using it as a baseline for future investments in ICT, should therefore be the foundation on which to anchor any new inter-agency mechanism.

120.   The Inspector notes that HLCM decided at its ninth session to establish an ICT strategy steering group composed of representatives of the members of HLCM, HLCP, and the ICT Network, to provide oversight and direction for further work on the development of the ICT strategy framework. It also decided to fund the development of business cases under the strategy, beginning with US$ 200,000 for the ICT development network.[164] ICC indicated that its Management Committee requested it to perform feasibility studies related to five of the initiatives identified in the ICT strategy for each of which a task force has been established with representatives from interested organizations. ICC will submit the feasibility studies to the October 2005 session of the Management Committee showing, inter alia, costs, savings and other benefits, if there are any. All possibilities provided by current mechanisms should be explored first and fully within existing resources before any new mechanism is considered. Setting up such a mechanism should be conditional upon a prior agreement within CEB on the suggested UNIF (**recommendation 6 (*a*)**).

121.   In their background paper mentioned in paragraph 91, ICT directors also made the assessment that the system-wide ICT strategy "cannot be effectively introduced without a major and substantial UN-specific training programme". It is envisaged under one of the initiatives (initiative 15) that the United Nations Staff College would provide such training as part of the senior management development programme. In such case, the training should also cover OSS. Training modules on OSS for other stakeholders concerned could also be provided within their respective mandates by UNITAR and UNU through its International Institute for Software Technology (IIST)[165] (**recommendation 6 (*b*)**).

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[164] CEB/2005/3, para. 32.
[165] http://www.iist.unu.edu/

Annex I: United Nations Information and Communication Technologies Charter
(A/59/563)

1.   The United Nations Information and Communication Technologies Charter provides a framework for maximizing the value of investments in information and communication technologies (ICT) through a systemic approach to the management of technological and organizational change. It recognizes that this will require a strengthening of governance and leadership arrangements, including the provision of an institutional mechanism, to drive the reforms, assess the results achieved and apply the lessons learned.

2.   The United Nations Information and Communication Technologies Charter states that the United Nations system recognizes the need:

(a)   For greater coordination and synergy between programmes and activities of the United Nations system and the pivotal role of ICT in facilitating such coordination;

(b)   To integrate ICT into the broader strategic management process as an agent of organizational transformation and change;

(c)   To integrate ICT in development project and programme formulation, to achieve clarity and coordination in the use of technology in United Nations development programmes and to avoid repetitive investment in the field;

(d)   For the organizations of the United Nations system to work to a set of agreed best practice guidelines in ICT matters, based on industry standards, and that minimum standards should be established and adhered to for information governance, including disaster recovery and business continuity;

(e)   For the United Nations system to establish common standards and guidelines for the development of business cases for ICT investment proposals and for ICT project costing;

(f)   To exploit opportunities in the sourcing and management of ICT services and infrastructure to achieve efficiency savings, contribute to capacity-building in developing countries and make a direct contribution to the Millennium Development Goals and to the wider development agenda;

(g)   To exploit opportunities to maximize the return on investments made in Enterprise Resource Planning (ERP) solutions by developing best practice procedures for common United Nations processes and seeking streamlining and effectiveness savings across common administrative processes;

(h)   To promote opportunities for sharing computer applications across agencies in areas where United Nations system requirements are common, or close to common;

(i)   To further exploit opportunities to mitigate software costs through increased usage of appropriate open source software;

(j)   To adopt a systematic approach, across agencies, to gather, distil, organize, retrieve and present development information for dissemination internally within the United Nations family and externally to partner agencies and other stakeholders;

(k)   To extend common United Nations procurement actions to obtain improved economy in the United Nations system purchasing for "common" information software/ICT products;

(l)   For a major programme of ICT training for United Nations managers to be made available through the United Nations Staff College to support the introduction and sustain the ongoing benefits of the United Nations ICT strategy;

(m)   For an unprecedented degree of cooperation among agencies on ICT matters to achieve these objectives;

(n)   For a high-level governance structure that would promote change and champion the delivery of the strategy.

Annex II: The Open Source Software (OSS) Initiative
(*Source*: "United Nations ICT strategy: background document to the report of the ICT Network Working Group", annex 1.10)

Problem:	Organizations in the United Nations system spend millions of dollars every year on purchasing and maintaining software licences.
Opportunity:	An opportunity exists to mitigate these costs through increased usage of appropriate open source software (OSS).
	OSS is by and large available free of charge under the General Public Licence (GPL). Even where such software is packaged and sold within a larger commercial distribution, the OSS components are still freely available under the GPL terms. There is a growing recognition that much OSS is of equal or superior performance, reliability and security when compared to commercially available software.
Target position:	*Target 1*: Adoption of specified OSS (as identified in the Action Plan).
	Target 2: Ongoing exercise to monitor, trial and assess other OSS. Adopt as it matures to agreed status.
Advantages:	The opportunity exists to achieve a very positive return on investment (ROI), with major savings in software licensing and, over a modest timescale, reduced total costs of ownership, notwithstanding start-up costs. The United Nations system has an opportunity to make financial and performance gains on a significant scale.
Constraints:	OSS will not replace all commercial software, much of which is the best of its class. Furthermore, it must be recognized that in some areas a switch to OSS can represent a major cultural change, with significant start-up costs.
	Currently most United Nations organizations do not have a proactive policy for examining the growing opportunities afforded by OSS from a financial or technical perspective.
Time frame:	Quick wins can be achieved almost immediately. In many areas it is possible to contemplate overlapping and non-synchronous transition across platforms since there is considerable opportunity for interchange of output from disparate sources. Even for major change decisions that could, for example, affect an organization's desktop strategy, a two-year planning horizon is feasible.
Action plan:	This is an area which would benefit from an imaginative inter-agency action group. But implementation will require a certain degree of "breaking the mould" and will require a clear-eyed but committed approach on the part of senior management within ICT and in the user community.
	Phase 1: Inter-agency group charged with initiating project, largely by identifying the best-win scenarios.
	Phase 2: Individual agencies take lead roles in pioneering and reporting. A lead agency concept would be appropriate for different OSS component areas (OS, desktop, Office, etc.), taking account of the retooling, learning and training costs, and time commitments.
	The ICT Network has already commenced an exercise to ascertain the current take-up of OSS among its participants. Next steps would include obtaining commitment from same to exploit the opportunities on a structured basis.
Sustainability:	OSS is more sustainable than commercial software where compliance with the vendors' latest offerings becomes mandatory (and expensive) after "end of support" declarations, or where a vendor ceases to trade. By definition OSS allows users access to the source code for all releases.