WIPO
WORLD
INTELLECTUAL PROPERTY
ORGANIZATION

Internal Oversight Division

Reference: IA 2017-03

Audit Report

Software Asset Management

December 28, 2017

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LIST OF ACRONYMS

|	
BCP	Business Continuity Planning
DAC	Desktop Application Catalogue
ERM	Enterprise Risk Management
ICT	Information and Communications Technology
ICTD	Information Communication and Technology Department
IIA	Institute of Internal Auditors
IPSAS	International Public Sector Accounting Standards
IOD	Internal Oversight Division
ISACA	Information Systems Audit and Control Association
ISO	International Organization for Standardization
ITIL	Information Technology Infrastructure Library
MDM	Mobile Device Management
PTD	Procurement and Travel Division
SaaS	Software as a Service
SAM	Software Asset Management
SIAD	Security and Information Assurance Division
SLAM	Software License Asset Management
UN	United Nations
UNICC	United Nations International Computing Centre
WIPO	World Intellectual Property Organization
WSR	WIPO Software Register

EXECUTIVE SUMMARY

1.   The World Intellectual Property Organization (WIPO) has yet to establish a policy for managing software assets, that outline goals and objectives, and means to achieve them, as well as setting roles, and related responsibilities and accountability. This is especially relevant within the current federated Information Technology (IT) structure, where other IT Units also manage certain software and related licenses independently of the Information Communication and Technology Department (ICTD).

2.   While comprehensive procedures and guidelines were put in place, these procedures and guidelines focus on license management, and a number of these documents that were developed in 2014, need to be updated to fully reflect structural and operational changes.

3.   A policy and updated procedures and guidelines on software asset management would help to:

(a)   Clearly establish a recognizable unit for managing software assets, with clear roles and responsibilities with regards to other IT Units;

(b)   Identify means to enhance license management, and adequately support and assist contract managers; and

(c)   Identify tools, systems and processes to provide a single source for software asset inventory, and simplify recoding software assets in WIPO's financial statements.

4.   As part of its IT strategic objectives, WIPO has decided to move some of its platform, infrastructure and software services to the Cloud. While the Cloud initiative is still in its initial stages, interviews with all IT Units of the Organization indicate that a move to the Cloud would require a robust governance structure and practices; including adapting software asset management to Cloud management practices.

5.   Going forward, WIPO Cloud governance structure, policies and procedures should feed into the software asset management policy in order to correctly reflect the changing practices, emerging risks and evolving software landscape, which will see an increase in infrastructure, platform and software as services contracts.

6.   Finally, formalizing the software assets risk management process through the Organization's Enterprise Risk Management (ERM) system would provide assurance that WIPO is aware and active in mitigating risks that could otherwise impact effective and efficient management of its software assets.

1.   BACKGROUND

7.   Software Asset Management (SAM) can be defined as, 'all of the infrastructure and processes necessary for the effective management, control, and protection of the software assets within an organisation throughout all stages of their lifecycle'[1]. In more detail, SAM is a business practice that involves managing and optimizing the purchase, deployment, maintenance, utilization, and disposal of software assets within an organization. The goals of SAM are to among others: reduce IT costs, mitigate operational, financial and legal risks related to the ownership and use of software, and provide relevant information to ensure that organizations have a full view of their software asset landscape, in order to support configuration and incident management, and organizational governance and strategies including resilience and information security.

Figure A: Software Asset Management and Related Processes
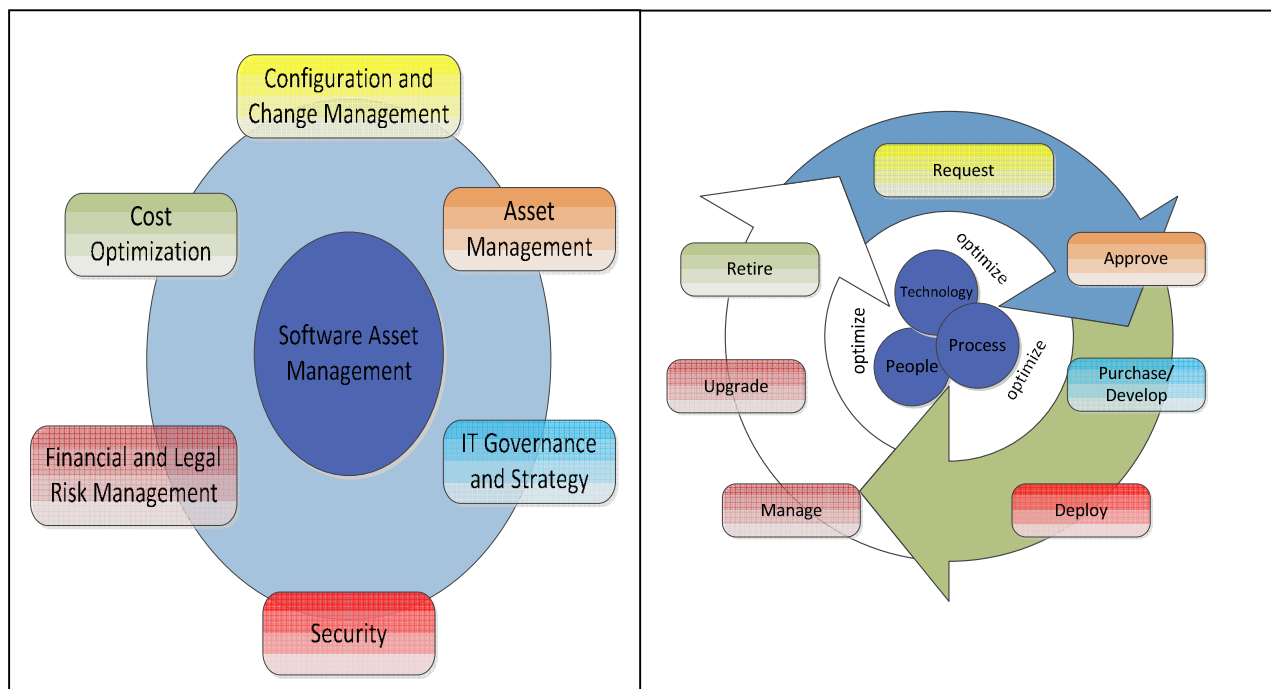
8.   International standards and guidelines to support effective management of software include the International Organization for Standardization (ISO) ISO/IEC 19770 series on IT and Software Asset management, and the Information Technology Infrastructure Library (ITIL) V3 guide to SAM.

9.   Software at WIPO can be classified as either commercial software or developed software, with each category allowing for server and client based software.

10.   Software types include non-proprietary (open source), and proprietary with varied licenses such as: freeware, workstation, concurrent, perpetual, and non- perpetual licenses.

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[1] Information Technology Infrastructure Library (ITIL) definition

11.   Whereas the ICTD is responsible for coordinating the requirements for software application purchases, managing a number of licenses, and coordinating upgrades and retirements of software, the federated structure of IT governance at WIPO has resulted in other IT related units also managing certain software licenses and related operations on their own.

Figure B: IT Related Entities at WIPO
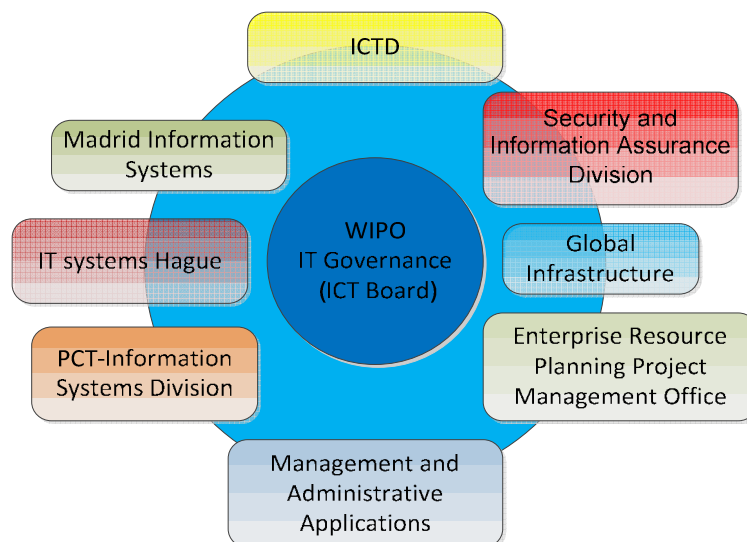
12.   The Organization maintains contractual relationships with major software providers including Microsoft Corporation, Oracle Corporation, and Adobe Systems Inc. WIPO also contracts the United Nations International Computing Centre (UNICC) to administer the majority of the Organization's servers as well as provide other related services including licenses for certain server based applications. The Organization further contracts specialized firms to custom-develop software, and engage external service providers for Software as a Service (SaaS) agreements.

13.   Within the ICTD, the IT Technical Division is the main unit involved in managing software assets. Other units that support software asset management include the Enterprise Architecture and Information and Communication Technology (ICT) Program Management Division, the Procurement and Travel Division (PTD), the Finance Division, the Security and Information Assurance Division (SIAD), and the various other IT Units within Programs.

14.   WIPO has implemented a Software License Asset Management (SLAM) process to ensure that the Organization has full control over its procured software licenses, with a view among others to: complying with legal requirements, and enhancing effective and efficient use of software assets.

15.   WIPO's SLAM process covers identification, request, procurement, receiving, deployment, reassignment, disposal, control and optimization, as well as auditing of software licenses installed on desktops, laptops, servers and mobile devices[2].

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[2]   While applications installed on WIPO's mobile devices are not in scope of the SLAM process, licenses both owned and used to manage the mobile devices are controlled within SLAM.

16.   *Observations that follow below, have been redacted due to security considerations*

17.   Real-time discovery and monitoring within SLAM include tools for:

(a)   Managing groups of computers running on various operating environments, that provide among others, remote control, patch management, software inventory and distribution, and operating system deployment;

(b)   Managing the enterprise environment on mobile devices, and to report on the number of deployed mobile devices; and

(c)   Tracking server-side installed applications (i.e. applications on Linux servers), as well as tracking the state of IT assets such as hardware, systems, software, facilities, and users; including establishing the relationships between these items.

18.   The ICT Service Desk is responsible for preparing computer workstations for general staff use with software applications available in the WIPO Desktop Application Catalogue (DAC). A process exists to request for non-catalogued software, which includes security clearance from SIAD.

19.   ICTD is responsible for determining whether licenses are available to fulfill requests, or otherwise initiates purchases for additional licenses; and has established a WIPO Software Register (WSR).

20.   IOD performed a review of Software Asset Management in 2011 (IA/07/2011), and all ten recommendations from this audit have been implemented.

A. OBJECTIVES

21.   The objectives of this audit are to:

(a)   Assess efficiency and effectiveness of governance, risk management and controls over software assets;

(b)   Verify effectiveness of the process for compliance with related ICT Policies and third party software contract obligations; and

(c)   Determine whether WIPO has implemented appropriate tools to effectively support software asset management.

B. SCOPE AND METHODOLOGY

22.   The audit scope covered inventory management of procured and developed software, as well as SaaS agreements between January 2016 and August 2017. While the audit did not specifically review software in the development environment, some observations made are also applicable to the development environment.

23.   The methodology included:

(a)   Reviewing policies, procedures and guidelines on effective software asset management in order to assess adequacy and completeness;

(b)   Verifying effectiveness and efficiency of software asset management practices and tools;

(c)   Verifying compliance with software license requirements and achieving optimized use of licenses;

(d)   Assessing controls to prevent unacceptable use of WIPO systems, such as installation of non-standard application on WIPO computers; and

(e)   Assessing overall risk management around software asset management, including effective use of escrow for custom-developed software where applicable.

24.   The audit was performed in accordance with the International Standards for the Professional Practice of Internal Auditing issued by the Institute of Internal Auditors (IIA)[3].

2.   AUDIT RESULTS

25.   The audit results address components that support effective management of software assets; notably governance, processes, people and technologies. The ensuing observations and recommendations are summarized below:

A. GOVERNANCE STRUCTURE

(i)   Software Asset Management Policy and Procedures

26.   IOD positively notes that ICTD has developed a series of documentation to support management of software assets, and in particular software licenses, including:

Document Title	Summary	Author
WIPO Software License Asset Management Implementation Document	This document is designed to provide information about the practical implementation of SLAM processes and procedures within WIPO.	ICTD (2014; updated 2016)
WIPO Software License Asset Management Operations Manual	The Operations Manual contains essential information and procedures on the set of tools used for managing software assets.	ICTD (2014)
WIPO Software License Asset Management Process Handbook	This handbook is designed to provide information about SLAM processes and procedures within WIPO.	ICTD (2014)
WIPO Software License Asset Management Process Evaluation Report	This report is designed to evaluate the performance of the WIPO implementation of SLAM processes, as part of the ITIL Continual Service Improvement process.	ICTD (2016)
Draft WIPO Asset and Configuration Management Standard	This standard lists the Information Security controls dedicated to Asset and Configuration Management. The document identifies controls related to the identification, classification, configuration, protection and use of WIPO Information Systems (hardware and software).	SIAD (2017)

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[3] Reference is also made to the IS Audit and Assurance Guidelines issued by the Information Systems Audit and Control Association (ISACA).

27.   While comprehensive procedures and guidelines were put in place and handed over to operations, in practice, software assets are still managed in an intuitive manner. Furthermore, these manuals, procedures and guidelines focus on license management, and a number of these documents that were developed in 2014, need to be updated to fully reflect structural and operational changes.

28.   IOD further notes that a policy for software asset management has not been established. The absence of a clear organization wide policy underpinning the procedures and guidelines, contribute to lack of clarity in understanding the importance and relevance of this process. Furthermore, the absence of a policy does not facilitate clarity on roles, responsibilities and accountability; especially within the current federated IT structure, where other IT Units also manage certain software and related licenses independently of ICTD.

29.   As part of its IT strategic objectives, WIPO has decided to move its platform, infrastructure and software services partially to the Cloud. While the Cloud initiative is still in its initial stages, interviews with all IT Units of the Organization indicate that a move to the Cloud would require robust governance structure and practices; including adapting software asset management to Cloud management practices.

30.   Establishing an overarching policy for software asset management, and reviewing existing procedures and guidelines with a view to ensuring alignment with organizational IT strategy, roles and responsibilities, would provide WIPO with a robust and updated framework for managing its software assets in an effective and efficient manner.

31.   In addition, WIPO Cloud governance structure, policies and procedures should feed into the software asset management policy in order to correctly reflect the changing practices, emerging risks and evolving software landscape, which will see an increase in infrastructure, platform and software as services contracts.

(ii)   Organizational Structure and Roles

32.   The management of software assets is part of the responsibilities of the Program Management Officer within ICTD, and supported by three staff members. In addition to this role, the Program Management Officer deals with project management, financial management of ICTD, and certain aspects of IT hardware management including the management of phones, and IT related training. However, the Job description of the incumbent does not include software asset management responsibilities.

33.   IOD further notes that while individuals have been identified to support software asset management, the organizational structure does not reflect this in the form of a clearly identifiable dedicated unit; this further reflects the unstructured manner in which software assets are managed.

34.   Given upcoming changes to software and technologies landscape, it would be beneficial to clearly establish a recognizable unit for managing software assets, supported by a clear policy that outlines the roles and responsibilities with regards to other IT Units, in order to clarify accountability among others.

35.   An external specialist firm is currently finalizing a review of ICTD that includes assessing the governance structure of the department, with a view to identifying opportunities for ICTD to better support the strategic objectives of the Organization.

(iii)   Contract Management

36.   Major Software asset contracts are managed by designated staff members in ICTD or in other IT Units. This concerns contracts such as the Microsoft enterprise Agreement, Oracle and PeopleSoft. Smaller individual contracts are managed by designated business focal points in Programs.

37.   While acknowledging that Programs should have designated persons to manage their contracts for specific software, adequate support should be available to assist these contract managers. This would be particularly relevant as use of Cloud intensifies, requiring specific knowledge of cloud service contract management.

38.   Going forward, the contract management role needs to be formalized including clear responsibilities, accountability and the right skillsets. PTD plans to organize training for designated contract managers; IOD supports this initiative, which should cover software assets, including addressing cloud services contract management, in order to cater for the future state of WIPO software asset landscape. A close collaboration between ICTD, PTD and other IT Units, in developing fit-for-purpose training adapted to the types of licenses in WIPO's portfolio, would enhance effectiveness and efficiency of software asset management in the Organization.

(iv)   Software Maintenance

39.   ICTD manages maintenance costs for software purchased through ICTD budget; and other Programs manage maintenance costs for software purchased through their budgets. Consequently, the list of software with maintenance costs held by ICTD is not complete, and each IT Unit has developed their own method to monitor maintenance costs.

40.   Furthermore, the current software landscape shows that different versions of the same application exist which would need to be analyzed and older versions phased out. While there is a process for decommissioning and clearing, this is not systematically requested, and the team responsible for managing software assets within ICTD is not systematically informed of upgrades. A more in depth analysis is required to assess whether these versions are still valid and useful.

(v)   Risk Management

41.   Effective risk management is a key enabler for successful and efficient management of software assets. A review of WIPO's ERM system indicates that risks related to software asset management are not regularly captured and monitored. While acknowledging the federated structure of IT at WIPO, the ICTD nevertheless is responsible for asset management and as such, should include relevant software related risks; for instance, contract and license risks, and portfolio rationalization risks.

42.   In addition, risk management can be further enhanced by identifying cross-cutting risks that could be managed across stakeholders of the software asset management process. Furthermore, the move to cloud for Infrastructure, platform and software services would introduce new risks to be monitored and mitigated.

43.   Disaster recovery and Business Continuity Planning (BCP) are expected to be an integral part of good IT management and governance. Disaster Recovery environments are sometimes considered as separate environments with regards to licensing, hence requiring additional agreements. Ensuring that the Organization's Disaster Recovery environment is covered by existing software contracts if and where applicable, would inform and help

reinforce Business Continuity Planning. Furthermore, including measures for adequate redundancies in contracts with SaaS providers would further support BCP and Disaster Recovery.

44.   Formalizing the software assets risk management process including alignment with organizational Disaster Recovery and BCP, would provide assurance that the Organization is aware and active in mitigating risks that could otherwise impact effective and efficient management of its software assets.

B. TOOLS AND PROCESSES

45.   *Information and observations made in this part of the report have been redacted/withheld, due to security considerations.*

46.   The main tools used to support software asset management include: a tool whose primary purpose is for deploying and discovery of software in a Microsoft environment; another tool that captures server side applications and relates all elements connected to WIPO's network, including printers, computers, software, and servers; and the application used to manage the mobile device environment, and provides information on the number of deployed mobile devices.

47.   IOD notes that the tool for deploying and discovery of software in a Microsoft environment is not a tool dedicated for software asset management, as it does not manage licenses and does not discover items on servers. The tool used to identify items in WIPO IT landscape, including servers and desktops, is currently undergoing an upgrade, in order to, among others, fully enable its discovery features. A comprehensive tool would provide automated updates of detailed information on WIPO's IT assets to a central repository, as well as be linked with the other relevant applications, such as WIPO's tool for managing incidents and change requests. Furthermore, modules exist that can be integrated to support software license management, and functionalities exist to access test environments, and public and private Clouds.

48.   With these enhancements, it would be possible to identify a single source for data on IT assets, allowing the Organization to more efficiently and effectively manage IT assets, configurations, incidents, change requests, as well as security among others; and support and comprehensive reporting.

49.   Limited tools and integrations have affected software assets management practices in the following manner:

(i)   WIPO Software Register (WSR)

50.   The WSR is manually maintained in Excel because there is no dedicated tool for that purpose. Furthermore, the WSR is not complete because some IT Divisions have software that they manage directly without coordination with ICTD; and there is currently no method in place to obtain a complete listing of software assets of the Organization.

51.   Also, information in the register is not presented in a manner that would effectively support identificationon of critical applications, applications with highest costs, or any business classification or categorization that would support software and business impact analyses.

(ii)   License and Usage Analyses

52.   The tool used to deploy software in the Microsoft environment is also used to run usage reports for optimizing software use and costs. Usage analysis is done to determine whether economies can be made by cancelling underutilized licenses for instance. However, this analysis is also manual because the current tooldoes not manage licenses, and the WSR is manually updated. Furthermore, there are no formal criteria or rate set for determining underutilization that would lead to de-installation. Also, it is not clear what actions and outcomes result from the analyses of under/over-assigned licenses.

53.   While acknowledging that Management focuses on major licenses, it is nevertheless important for asset management to cover other licensed software through the implementation of the software license asset management procedures and guidelines that exists.

54.   For instance, the WSR at end of August indicates 17 instances where the number of deployed software was inferior by at least 10, to the number of licenses purchased, with three instances where over 100 licenses were not assigned.

55.   Inversely, there are nine instances where the number of licenses purchased was inferior to the number of licenses assigned, with one instance where assigned licenses exceeded paid licenses by over 200.

56.   Effective monitoring and management of licenses would among others, avoid risk of liability from license violations.

(iii)   Desktop Application Catalogue

57.   The current software catalogue could be further enhanced to support the business through regular reviews, and proposing cost efficient and license free alternatives that could provide the same functionalities as paid software; and have been cleared by Information Security and Enterprise Architecture. Further, management efficiency could be gained for users, by also displaying the number of licenses available for each application in the catalogue. Going forward, software asset management can evolve to include new features such as self-service for license availability, transfer and procurement.

(iv)   Electronic Forms on Intranet

58.   A review of the various electronic forms available on the WIPO intranet, and related to software asset management, indicates that a number of forms need to be updated, with some having been created over 10 years ago. The project to replace the E-work[4] system is on-going, and includes updating these forms. Furthermore, it would be relevant to proactively identify new forms that would be useful for both the current and future state of software asset management at WIPO; for instance, IOD notes that no dedicated form exists to request for an upgrade of an existing software.

(v)   Software Asset Capitalization

59.   WIPO either purchases or develops software that can be capitalized in the Organization's financial statements if certain criteria are met in accordance with International Public Sector Accounting Standards (IPSAS) for Intangible Assets[5].

60.   These criteria[6] are applied differently depending on whether the software has been developed or purchased.

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[4]   WIPO's Electronic Workflow System.
[5]   IPSAS 31 – Intangible Assets.

61.   The Finance Division has implemented a series of procedures and practices, including developing an IPSAS guidance paper on accounting for capitalizing software costs[7], to support accounting for intangible assets; however, they have highlighted the following issues that need to be addressed:

(a)   There is no central point with complete information on software assets to support reconciliation;

(b)   Accounting looks at the general ledger to try to identify software acquisitions and projects - this is not efficient;

(c)   There is no process in place to timely remove software from both the operational software register and the intangible asset register; and

(d)   Methods for categorizing, capturing and reporting software project costs differ across the IT Units at WIPO; hence collecting information on research and development phases needed to assess capitalization amounts is neither efficient nor complete.

62.   Addressing the above conditions would enhance efficiency and effectiveness of software asset management and capitalization at WIPO. IOD recommendations on Project Managementt (IA 2016-04) at WIPO would help address some of the above issues.

63.   Finally, the move to Cloud will affect software that are currently capitalized if these are moved to the cloud; these will now be recorded as service costs. The number of software that fall within this scope is yet to be determined. Once known, the related impact on financial statements will have to be subsequently assessed. Finance Division will have to work closely with the External Auditors to ensure that software assets recorded in the financial statements are accurate and complete.

Recommendation

1.   The Information Communication and Technology Department (ICTD) should work with other IT Units to:

(a)   Develop an organization wide policy on software assets that is aligned with WIPO's IT strategy, considers the use of Cloud services, and clearly identifies roles, responsibilities and accountability within the federated IT structure;

(b)   Clearly delineate a Unit responsible for asset management, including software assets within the organizational structure of ICTD, clarifying the role of the Unit with regards to other IT Divisions and contract managers;

(c)   Update existing procedures and guidelines on software assets to correctly reflect and support the policy including updating procedures for decommissioning and clearing software from WIPO's software portfolio;

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[6] Criteria include: meet the IPSAS 31 definition of an intangible asset; meet the IPSAS 31 recognition criteria for an intangible asset; have an estimated useful life of more than one year; and exceed the WIPO cost thresholds for capitalization. For purchased software, WIPO may be able to capitalize the cost of the software where it meets the relevant cost thresholds. For internally developed software projects that meet the recognition criteria, it is necessary to determine the phase of the project in which costs have been incurred - the research phase and the development phase. All costs incurred during the research phase are expensed, and certain costs incurred during the development phase are capitalized.
[7] Guidance aligned with IPSAS 31 – Intangible Assets.

> (d)   Identify tools, systems and processes to: (i) provide a single source for software asset inventory; (ii) enhance license management, including managing under/over-assigned licenses; and (iii) simplify recoding software assets in WIPO's financial statements.
>
> (*Priority: High*)

2.   ICTD should update its risk register with software asset risks including risks that relate to the Cloud, organizational Disaster Recovery, and Business Continuity Planning, and work with the Procurement and Travel Division (PTD) to provide appropriate training for contract managers across the Organization, in order to enhance overall management of software related risks.

(*Priority: Medium*)

C. OTHER RELATED ISSUE

(i)   Enhancing Software Development

64.   WIPO's software assets include software developed through in-house staff and/or external consultants and service providers. While WIPO does not currently practice the use of escrow to secure codes for custom-developed software, since codes are provided to WIPO as part of the contract arrangements, there are however other related risks that have been identified by IT Units at WIPO. For instance, the Organization does not always have in-house knowledge to effectively manage software that has been developed by a third party; likewise, the choice of development platform does not always consider adequacy of in-house capacity to support and maintain. Consequently, certain IT Units rely more than others on external suppliers for maintenance.

65.   Within the software development process, IT Units note that time and resource restrictions have impacted efficient and effective testing and quality control of software prior to release in production. As a result, there are instances where the developers do their own testing. Furthermore, software documentation is not systematically provided or sought from third parties, before the software is released in production. These conditions could impact the effectiveness of these software once released in production.

66.   IT Units also highlighted opportunities for development teams to share code and other components of a generic nature in order to support standardization and harmonization of WIPO's software development platforms and architecture. With the initiation of the Global IP Platform Integration Program[8], there is a move towards establishing appropriate development environments to enhance sharing, efficiency and avoid duplicated efforts.

67.   IOD makes no recommendations as regards to software development in this report, and plans to conduct a review of Software Development Life Cycle at WIPO in the future.

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[8] The Director General has initiated a Program comprising portfolios of projects that aim at developing a Global IP Platform that integrates the various IP platforms already available at WIPO. The main objectives being among others to create one single client facing portal with features that enhance the overall customer experience.

ACKNOWLEDGMENT

IOD wishes to thank all relevant members of staff for their assistance, cooperation and interest during this assignment.

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Reviewed and Approved by: Rajesh Singh, Director, IOD

TABLE OF RECOMMENDATIONS

No	Recommendations	Priority	Person(s) Responsible	Other Stakeholders	Management Comments and Action Plan	Deadline
1.	The Information Communication and Technology Department (ICTD) should work with other IT Units to: 　(a)　Develop an organization wide policy on software assets that is aligned with WIPO's IT strategy, considers the use of Cloud services, and clearly identifies roles, responsibilities and accountability within the federated IT structure; 　(b)　Clearly delineate a Unit responsible for asset management, including software assets within the organizational structure of ICTD, clarifying the role of the Unit with regards to other IT Divisions and contract managers; 　(c)　Update existing procedures and guidelines on software assets to correctly reflect and support the policy including updating procedures for decommissioning and clearing software from WIPO's software portfolio; 　(d)　Identify tools, systems and processes to: (i) provide a single source for software asset inventory; (ii) enhance license management, including managing under/over-assigned licenses; and (iii) simplify recoding software assets in WIPO's financial statements. (*Priority: High*) *Related risks: Operational, IT, Governance*	High	Mr. Vuong	Mr. Makadi	All organizational wide software assets have already been properly managed to support the current service delivery models (SDMs). As the organization starts to experiment with Cloud, the current SDMs are expected to change over time. But no significant changes are expected within the next 12 months. Therefore, addressing this issue is a low priority for now. (a) Organizational wide software assets management policy and responsibilities will be considered as part of Cloud governance and ICT review. An effective policy can only be developed after implications of these changes have been properly understood. (b) Responsibilities within ICTD for managing software assets have already been defined. Minor editorial changes will be done after the ICT review to minimize potential confusions with terminologies. (c) Will be updated after the ICT review to reflect ICTD's needs for current operational requirements, rather than organizational wide policy. (d) The need for such a tool will be assessed once an organizational wide policy has been developed. (see also comments under (a) above)	(a) No action is expected in 2018 (b) By end of 2018 (c) By end of 2018 (d) No action is expected within 2018

No	Recommendations	Priority	Person(s) Responsible	Other Stakeholders	Management Comments and Action Plan	Deadline
2.	ICTD should update its risk register with software asset risks including risks that relate to the Cloud, organizational Disaster Recovery, and Business Continuity Planning, and work with the Procurement and Travel Division (PTD) to provide appropriate training for contract managers across the Organization, in order to enhance overall management of software related risks. (*Priority: Medium*) *Related risks*: Operational, IT, Reputation	Medium	Mr. Vuong	PTD, Mr. Makadi	Risks related to software assets are low under the current service delivery models. There is no practical benefit to include such risks in the risk registry. Risks related to the Cloud will be ascertained in the light of experience gained. ICTD will nevertheless work with PTD to identify the need, if any, for incorporation into contract management training.	30 June 2018

[Annex follows]

ANNEX I: RISK RATING AND PRIORITY OF AUDIT RECOMMENDATIONS

The risk ratings in the tables below are driven by the combination of likelihood of occurrence of events and the potential financial impact or harm to the Organization's reputation, which may result if the risks materialize. The ratings for audit recommendations are based on the control environment assessed during the audit.

Table 1.1: Effectiveness of Risks/ Controls and Residual Risk Rating

		Compound Risk Rating (Likelihood x Impact)			
		Low	Medium	High	Very High
Control Effectiveness	Low	Low	Medium	High	Very High
	Medium	Low	Medium	High	High
	High	Low	Low	Medium	Medium

Table 1.2: Priority of Audit Recommendations

Priority of Audit Recommendations	Residual Risk Rating
Requires Immediate Management Attention	Very High
Requires Urgent Management Attention	High
Requires Management Attention	Medium
Routine in Nature	Low

[End of Annex and of Document]