Audit of The Hague Platform Project

Internal Oversight Reports

WIPO
WORLD INTELLECTUAL PROPERTY ORGANIZATION

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(Parts of the original report were withheld or redacted due to the sensitive and confidential nature of issues raised).

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LIST OF ACRONYMS

ADTF	Architecture and Design Task Force
API	Application Programming Interface
CI/CD	Continuous Integration/ Continuous Deployment
CMU	Cloud Management Unit
GDD	Global Design Database
GIPP	Global Intellectual Property Platform
HBO	Hague Back Office
HDPS	Hague Development and Promotion Section
HEP	Hague Externalization Project
HISD	Hague Information Systems Division
HOS	Hague Operations Service
HPP	Hague Platform Project
HRMD	Human Resources Management Department
IB	International Bureau
ICT	Information and Communication Technology
ICTD	Information and Communication Technology Department
IOD	Internal Oversight Division
IP	Intellectual Property
IT	Information Technology
MVP	Minimum Viable Product
PCT	Patent Cooperation Treaty
PID	Project Initiation Documentation
PMO	Project Management Office
PO	Purchase Order
PRINCE2®	PRojects IN Controlled Environments
PTD	Procurement and Travel Division
TOM	Target Operating Model
TOR	Terms of Reference
WIPO	World Intellectual Property Organization

EXECUTIVE SUMMARY

1. The Hague Registry undertook The Hague Platform Project (HPP) over the course of 2017 and 2018, to among others, address the increasing workload and complexities of The Hague Information Technology (IT) core system and respond to the growing business needs of clients. This project would modernize the core back-office IT system of The Hague, with a new system based on modern Microservices technology. The Internal Oversight Division (IOD) notes a number non-compliant practices, inefficiencies, and communication and accountability failures that are further detailed below.

2. The HPP was initially launched as a 12 months project. In 2017, the project timeline was extended to two years when the scope was expanded. The expected completion date for the project was December 2018. The HPP End Project Report indicates that the project was completed within the revised timeline i.e., December 2018. However, a review of relevant project documents shows the project was formally closed in March 2019 i.e., three months after the reported completion time. The delay in completing the project was triggered by, among others, the postponement of the go-live date after issues in data migration. Further, the project did not have the requisite resources and budget to seamlessly transition into operations following the go-live.

3. At the time the HPP was initiated in November/December 2016, no budget was set for the project in the Program and Budget 2016/17. The project was financed by transfers of accrued savings and loans from other business areas within the Organization. Notably, from November 2016 to March 2017, a total of 550,900 Swiss francs was spent on project resources, and the process to procure these resources and associated costs were incurred before the formal appointment of the Project Board and approval of the Project Initiation Documentation (PID). Therefore, by approving the PID, the Project Board was effectively formally and retrospectively putting a stamp of approval on the costs for the HPP that were incurred before it was established. This is not sound management practice and not in compliance with project management budgeting procedures and practices.

4. The initial budget of the project was not clearly defined at the outset and there were inconsistencies in the project financial information. For example, the PID shows that the initial budget of the project was 4.23 million Swiss francs, but according to the End Project Report, approved by the Project Board in March 2019, the initial project budget was 5 million Swiss francs.

5. Furthermore, during the project implementation, the HPP team made projections and forecasts that were not aligned to the available budget. For example, in the first quarter of 2018, the HPP projected, using an experience-driven budget forecasting, that 8.42 million Swiss francs was required to complete the project. This projection included an updated estimate of 5.34 million Swiss francs for phase two of the project, which was initially estimated at 1.48 million Swiss francs in March 2017. It is clear that budget forecasting and monitoring was flawed.

6. The updated budgetary requirement for phase two of the project represented an increase of 3.86 million Swiss francs i.e., 261 per cent compared to the initial cost estimate which formed the basis for the 2018/19 Program and Budget. These fluctuations in cost estimates were driven by, among others, lack of effective project planning characterized by an imprecise estimation of costs and efforts to deliver the envisaged scope, a resource plan not linked to time-phased deliverables, and not having clear strategies on key deliverables e.g., data migration strategy. This prompted the Office of the Controller to seek reassurances that the cost estimates were based on the most cost-conscious approach.

7. To manage budget overruns, an “exceptional” process for allocating the budget was put in place by the Office of the Controller who also requested the Procurement and Travel Division (PTD) to negotiate a fixed price contract with the supplier. Whilst these interventions were crucial in managing the budget overruns, they may have contributed to delays in allocating the project budget, which in turn affected project efficiency. The total project expenditure at closure, amounted to 6.64 million Swiss francs.

8. IOD noted project management issues and deviations from the PRojects IN Controlled Environments (PRINCE2®) methodology that were both systemic and specific to the HPP. This is despite having a project management team and board that was composed of members trained and certified in PRINCE2® and Agile frameworks. For instance, the project included a project sponsor role, whose role is not defined in the PRINCE2® framework. This role may have created some initial communication and accountability challenges within the project team structure. Further, to ensure effective segregation of duties, the project executive is accountable for the project while the senior supplier is responsible for, among others, developing and delivering the project products. However, in the HPP, the executive was accountable for the project and responsible for the delivering the new Hague platform. Taking on these dual roles resulted in a conflict of roles and responsibilities, while creating an uneven balance in the project as it could have put IT in a driving role instead of the business.

9. Further, IOD noted that the governance structure was fragmented, with instructions being received from multiple sources, including the IP Portal Board (Steering committee) and the Office of the Director General. Thus, the project reporting lines were not streamlined to enhance transparency and effective communication within the team and with other relevant stakeholders.

10. The review of the HPP closure was based on a revised version of the PID, issued in October 2018, i.e., five months before the closure of the project. This updated version of the PID contained some significant changes, such as revised scope, expected benefits, and project product descriptions. This review deviated from PRINCE2® methodology, which recommends evaluating a project based on the project’s original intent as defined by the PID used to gain authorization for the project during the initiation stage (i.e. PID approved in March 2017).

11. IOD also noted a turnover of key personnel at significant stages in the project. For example, the project manager was changed after eight months and there was no documented handover. There were changes in the lead architects, and the data migration expert was relieved of his duties four months before the planned go-live. In addition, experienced staff who supported and maintained the legacy system had limited involvement in the HPP or their involvement exponentially reduced as the project progressed into the latter stages.

12. The data migration strategy and approach were not well planned and executed. In particular, the strategy was not consolidated until September 2018, a few months before the go-live date. The time and effort for the data migration were not estimated appropriately, and there was a budget overrun on the activity. For instance, 288,109 Swiss francs was allocated to the activity but the actual expenditure was 427,000 Swiss francs (48 per cent over expenditure). As a result, the system went live with a focus on operations but with incomplete data, resulting in increased service requests. Post go-live, a number of service requests related to data quality or blocked data were raised in The Hague Registry and this had an impact on the operations of the platform and on other stakeholders.

13. While the new Hague platform was implemented with an appropriate technology stack, which makes the system adaptable to cater to the current and future needs of The Hague Registry, there are however implications of higher maintenance and support costs, and lack of

requisite skill sets within the Registry that are associated with the stack and its sustained use. Further, the platform introduced novel technologies to the Organization's IT landscape.

14. Currently, The Hague relies largely on external providers and temporary staff for core IT support and maintenance. In 2019/2020, the non-personnel costs within The Hague Information System Division (HISD) amounted to almost two million Swiss francs which are relatively high and could result in non-sustainability on the platform in the long term. These costs were in respect to roles assigned exclusively to HISD. Therefore, there was no cost sharing or optimization of resources with other related business areas in the Organization.

15. As it stands, the HISD has limited means of retaining valuable IT skills and expertise in The Hague system. There is a risk of turnover of temporary staff and/or personnel from the external provider, including continued and undue dependency on these resources. This may hamper HISD's efforts to support The Hague system effectively. The internal resources in the Division do not possess the requisite specialized knowledge and practical expertise that the external resources possess. Therefore, a decision is required to consolidate the current IT structure and resources of the Hague Registry with a view of stabilizing operations in the long-term. This should prioritize internalization of key technical positions to the extent possible, and the use of internal resources to the Organization and other measures to reduce the dependency on external suppliers and the related high maintenance and support costs that are currently being incurred.

16. Equally, it would be beneficial for the Organization to consider establishing communities of practice comprising of competent personnel with the requisite skills and technical expertise in relevant World Intellectual Property Organization's (WIPO) processes/standards. The personnel may be loaned/attached to projects such as the HPP, on a short-term or long-term basis. In addition, they may provide useful and valuable insights to project teams on significant and technical aspects of projects, e.g., systems design and development. This would require the consolidation of a pool of expertise under a central point such as Information and Communication Technology Department (ICTD) that would serve the Organization.

17. To conclude, inadequate planning, several changes in scope, budgeting and timelines, less than optimal financial management that contributed to budget overruns, lack of clear strategies on critical aspects such as data migration and transition, affected the HPP implementation adversely. Furthermore, a governance structure that created parallel reporting lines with instructions from different sources impeded effective communication, alienated some board members and other stakeholders, and affected collaboration and accountability.

18. In addition, internal resources lacked the requisite skills and knowledge in the new solution which has resulted in continued costly and heavy reliance on external providers, thus affecting sustainability. Finally, while the technology stack can deliver, however, some novel technologies used in lieu of existing choices add to the IT landscape and affect optimization of costs, economies, and opportunity to share resources and tools.

19. IOD makes nine recommendations to help address the above issues. Considering the significant portfolio of projects including the Capital Master Plan projects, and the timeline since the last audit of the area, IOD will conduct an audit of Project Management in the near future to, among others, ensure that some issues raised in the HPP review are isolated cases, and assess the evolution of the project management framework and related risks.

1. BACKGROUND

20. The Hague Registry, under the Brands and Designs Sector of the International Bureau (IB), is responsible for managing The Hague System. The system offers natural persons or legal entities the possibility of obtaining protection for industrial designs in several Contracting Parties[1] by means of a single international application filed with the IB.

21. The system supports the registration of up to 100 designs within one application in over 65 territories. Therefore, under The Hague System, one international application replaces a whole series of applications that would otherwise have to be filed with different national offices. The IB maintains the International Register and publishes the International Designs Bulletin.

22. Prior to December 2018, the business processes related to protecting industrial designs were managed using The Hague IT core system. This custom-made IT system was based on IBM mainframe technologies. Features to support electronic filing, electronic data exchange with Contracting Parties, and publication of outputs generated by the system were added overtime via "satellite systems" using a variety of technological approaches.

23. Over time, the system became increasingly difficult and costly to maintain. Further, it exposed the business to operational risks, workflow inefficiencies, and operational issues caused by the weak links between the core system and its satellite components. Significant issues related to the internal numbering of "service requests" within The Hague IT core system were also an important risk factor.

24. Notably, the IBM mainframe system was a legacy technology and needed replacement. The system was becoming increasingly complex and costly to maintain from a technology, skills, and financial perspective. The legacy system was running an IBM mainframe hosted by United Nations International Computing Centre. The mainframe charges were approximately 670,000 Swiss francs per year, covering hosting, operations, maintenance and license costs. The Hague had become the last remaining customer of this service and was therefore shouldering all the mainframe charges, with no economies of scale.

25. In addition to the above conditions, and to address the increasing workload and complexities of The Hague IT core system and respond to the growing business needs of clients, The Hague Registry undertook the HPP over the course of 2017 and 2018. The aim of the HPP was to, among others, modernize its core back-office IT system with a new system based on modern Microservices technology. In addition, The Hague Registry wanted to set the foundation for a customer-focused and modern platform that was specifically developed for, and focused on, its specific requirements.

26. The HPP initiation and planning stage was based on the PRINCE2® project management framework. Software development was carried out using an agile methodology. Further, the project was divided into two phases. Phase one of the project was scheduled for 2017 and focused on analysis, planning, and core system component development. Phase two was scheduled for 2018 and focused on full platform component development and harmonization with Global Intellectual Property Platform (GIPP) objectives. The initial project costs were estimated at 2.75 million Swiss francs and 1.48 million Swiss francs for phases one and two, respectively. Following the completion of these two phases, the new Hague Platform went live in December 2018 while the HPP was formally closed in March 2019.

[1] Contracting Parties refers to "Countries" and in some cases Intergovernmental Organizations such as European Union Intellectual Property Office (EUIPO) and Organisation Africaine de la Propriété Intellectuelle (OAPI).

27. Figure A below provides a summary of the significant events as the HPP evolved from startup and initiation in November 2016 to closure in March 2019. These events had an impact on the timeline, scope, quality and costs of the project.

Figure A: Timeline for The Hague Platform Project

Source: Prepared by IOD based on Hague Platform Project documentation

28. The new Hague Platform was designed to be stable, maintainable, resilient, scalable, secure, multi-lingual, and responsive. The platform also needed to be accessible to other applications and systems to meet the growing needs of its internal and external customers.

29. From a business perspective, the clear and specific goal of the new platform was to reproduce the basic functionality and processes of the legacy system including reducing the related operational expenses of the shared mainframe. In addition, there was an increasing need for data granularity, resilience, and reliability–while still ensuring the integrity of existing registry data.

2. AUDIT OBJECTIVES

30. The objectives of the audit assignment were to:

(a) Review the HPP implementation to assess: effective and efficient project governance and management; and whether the objectives/expected benefits set out in the project documents have been achieved efficiently, including resources and time considerations;

(b) Verify compliance with the Organization's tailored PRINCE2® project management principles and practices, and WIPO Regulations, Rules and operating practices where applicable;

(c) Verify whether there are lessons learned from the project, that could benefit subsequent projects such as The Hague Externalization Project and other WIPO projects;

(d) Assess whether the platform design and technology choices are fit-for-purpose, and can cater for the evolving needs of The Hague Registry, as well as being aligned to the WIPO Technology strategy; and

(e) Verify whether The Hague Information Systems Division has adequate resources and skill-sets to sustainably and effectively operate and manage the platform going forward.

3. SCOPE AND METHODOLOGY

31. The internal audit assignment covered the period from January 2017 to December 2020. This period includes the development of the business case, project brief, project initiation, project implementation, project go-live and business as usual.

32. The project went live in December 2018. Therefore, the audit included assessing platform's business as usual, routine operations, maintenance and support from January 2019 to December 2020. IOD conducted the audit from March to September 2021.

33. The assignment was planned and conducted in such a way as to obtain reasonable assurance that audit objectives were achieved. The audit approach and methods included: (i) interviews with relevant stakeholders; and (ii) review of documents and records. To abide by the Coronavirus Disease 2019 safety measures, IOD optimized the use of Information and Communication Technologies (ICTs) such as telephone, tele/video conferences, and electronic mail exchanges.

34. IOD contracted the services of PwC Switzerland to support the engagement.

35. The audit was performed in accordance with the International Standards for the Professional Practice of Internal Auditing (the Standards) issued by the Institute of Internal Auditors.

4. AUDIT RESULTS – OUTCOME(S)

36. The objectives and outcomes of the engagement are summarized below. Further, IOD has made recommendations to address the outcomes of the audit.

S/n	Objective(s)	Outcome(s)
(a)	Review the HPP implementation to assess effective and efficient project governance and management; also to assess whether the objectives/expected benefits set out in the project documents have been achieved efficiently, including resources and time considerations.	The audit notes that the governance structure of the HPP did not facilitate the effective and efficient management of the project. Therefore, strengthening the role of the Project Board by embedding individual and collective responsibility would help improve project governance in the Organization. Equally, the role of steering committee needs to be clear at the outset of the project as this would enhance project governance and accountability. The HPP experienced challenges in assigning the right resources to project tasks at the outset, and on boarding of experienced internal technical resources, e.g., data management and data migration. Other challenges included setting realistic time frames and scope with quantifiable business benefits. Ultimately, these challenges impeded the efficient delivery of project products and optimal utilization of resources. In addition, Agile-driven project developments need to be aligned with the Organizational financial and administrative procedures. This was not the case in the HPP. Finally, the HPP experienced budget overruns, lack of strong monitoring and other inefficiencies that require that going forward, project budgets be clear and based on reliable and accurate cost estimate, and be supported by prudent financial management practices.
(b)	Verify compliance with Organization's tailored PRINCE2® project management principles and practices, and WIPO Regulations, Rules and operating practices where applicable.	The audit identified project management issues that were specific to the HPP as well as systemic issues which were highlighted in the 2016 report on Audit of Project Management (IA 2016-04). Specifically, the deviations from PRINCE2® were noted in the governance structure, assignment of project roles, Project Board discharging its responsibilities, and evaluating the project in the closing stage. The systemic issues observed in the HPP reinforce the need to develop an Organization-wide framework on project management that would include a definition of a project, establishing a fit-for-purpose project management office, clarifying the roles and responsibilities, and supporting project management through dynamic procedures and guidelines. Further, the active participation of relevant internal stakeholders in projects helps ensure compliance with the

		relevant WIPO Regulations and Rules and alignment with recommended Organizational practices.
(c)	Verify whether there are lessons learned from the project that could benefit subsequent projects such as The Hague Externalization Project, and other WIPO projects.	Data migration was not effectively planned. The simple "lift-and-shift" approach is not always possible, especially when there are changes to the data model. Therefore, prioritizing and overseeing the data migration strategy which is cardinal to designing and implementing a technologically sound solution was not done for HPP. Further, there was lack of active participation of experienced internal staff who possess the requisite technical and business knowledge to help to enhance project management. There are some key lessons learned from the HPP which have been subsequently applied in the Hague Externalization Project (HEP). The applicable lessons include simplifying the governance structure, having a clear project budget, scope, and timeline.
(d)	Assess whether platform design and technology choices are fit-for-purpose, and can cater for the evolving needs of The Hague Registry, as well as being aligned to WIPO Technology strategy.	The new Hague Platform was implemented with an appropriate technology stack but which resulted in higher costs than budgeted. The architecture and cloud solution make it possible to switch to serverless. The application and data storage is scalable. Therefore, the platform is adaptable and can cater to the current and future needs of The Hague Registry. However, there are high maintenance and support cost implications and a lack of requisite skill sets within the Registry that are associated with the stack and its sustained use. These costs can be reduced if they are shared among other business areas within the Organization. Further, The Hague Continuous Integration/ Continuous Deployment (CI/CD) Pipeline needs to be revised to comply with the WIPO Cloud Policy, and be aligned with new recommendations and practices in the Organization. Finally, alternative technology solutions exist within the Organization's IT landscape that could be used in place of some choices made for the HPP. A review of the back-office architecture is needed to determine which new technologies introduced by the HPP can be shared across the Organization for better efficiencies and cost optimization.
(e)	Verify whether the HISD has adequate resources and skill sets to sustainably and effectively operate and manage the platform going forward.	Long term benefits could be reached by reorganizing HISD resources, reducing dependency and costs related to external service providers, and by internalizing key resources. In addition, the Division needs to enhance efficiencies and synergies by optimizing support and maintenance activities with other internal IT structures such as ICTD. Finally, HISD needs to move from issue management and stabilization activities to focus on long term goals such as enhancing service management within The Hague Registry and with relevant internal stakeholders.

5. AUDIT RESULTS - POSITIVE DEVELOPMENTS

37. IOD notes positive developments in the HPP, which the Organization should continue to foster, optimize, and promote. These include, but are not limited to:

Area	Positive Development
Business Case	The business case of the HPP provided justifications for undertaking the project, desired outcomes, main risks, and expected benefits in line with the PRINCE2® project management methodology.
Project Management	The project adopted and tailored the Organization's PRINCE2® project management methodology. Generally, the methodology was followed, with some notable exceptions. Most of the project team members attended training in SCRUM, PRINCE2® Agile and some were fully trained and certified in the PRINCE2® methodology.
Technology Stack	The new Hague system was implemented using modern and up-to-date technologies. The system can cater to the current and future needs of The Hague Registry. The architecture and cloud solution make it possible to switch to serverless while the application and data storage are scalable.
Gender Balance	While acknowledging that it was not a specific project goal, it was noted that the gender distribution of the 18 on-site project resources was on average, 41 per cent females and 59 per cent males.

6. AUDIT RESULTS - OBSERVATIONS AND RECOMMENDATIONS

38. The ensuing observations and recommendations present opportunities to enhance the governance and efficient and effective management of projects in the Organization. In addition, the technology solution was reviewed, and the lessons learned are outlined in each relevant area.

(A) PROJECT SCOPE AND TIMELINE

(i) Lack of Organizational Guidance on Greenfield Approach

39. In IT projects, a greenfield approach involves introducing new technology without regard to previous (legacy) systems. In contrast, a brownfield approach involves evolving legacy systems with enhancements and new features. Choosing one approach over another requires careful analysis of the merits and demerits of each one.

40. The HPP started with a greenfield approach with the expectation of realizing benefits. The decision to use this approach was taken under time pressure. The approach did not include a complete view of what could be realized within reasonable economic boundaries. In addition, the risks of a budget overrun and over-engineering were underestimated.

41. The audit found that guidance on performing a study to decide between the possible uses of industry solutions (including customization) versus a greenfield approach was missing. In the absence of such guidance the key criteria for such a critical decision were not considered.

42. Key technology decisions should have been taken after an assessment of how the technology would, among others, best fit the identified needs, align with the Organization's relevant strategies, and how sustainable it is. Such guidance would have also shown the

boundaries for the approach and how the total cost of ownership must be calculated (including Hyper-care[2] phases after going live). In addition, an indication of supporting the use of existing technologies should have been provided, and milestones in the project life cycle should have been defined to make appropriate decisions regarding the technology.

(ii) Aligning Agile Development with Project Constraints and Deliverables

43. At the launch of the HPP, the Organization had limited experience in agile-driven developments and the development of a complete cloud solution based on Microservices architecture. The related guidance and technology standards, and technical boards, were not yet in place. Further, the project risk management did not sufficiently cover the agile development approach, particularly, the risk of misalignments with budget, time and technology.

44. Using an agile development methodology with the details of the functionalities developed iteratively potentially created misalignment with the project constraints i.e., budget, scope, quality, and time.

45. The audit found that the agile development methodology used by the HPP was not aligned with the budget, timeline, and the project deliverables. Further, considering the fixed deadline, the project was highly impacted when the budget was exhausted, in particular:

(a) Multiple functionalities had to be developed rapidly so that they would be completed before the deadline;

(b) The quality of migrated data was impacted, while parts of historical data were essentially not migrated;

(c) Nineteen “could have” requirements had to be descoped, including functionalities considered as “core” to The Hague operations and were available in the legacy system, although they were not frequently used; and

(d) The project went live with some functionalities still not implemented and several manual workarounds were required. Further, there was no roadmap for their future implementation.

46. A green light was given for the cutover under the assumption that appropriate budget, as discussed in the work planning and requested, would be granted so that defects and missing “could have” functionalities would be taken care of. Unfortunately, the normal hyper-care phase was under-resourced. The unsteadiness in resourcing resulted in the new platform taking over two years to stabilize, with “normality” only reached around 2021.

47. To enhance the efficient and effective management of projects in the Organization, the project methodology should be adapted to cover the risks of misaligning project constraints and deliverables with agile development.

(iii) Undefined Target Operating Model and Minimum Viable Product

48. When developing a new system with an agile approach, there should be a definition of the minimal functionalities to be delivered by the project, in order to allow the Operations team to perform its activities. When a system is developed with a greenfield approach, functionalities could and will be in part different from the current one. The Minimum Viable Product[3] (MVP)

[2] Hyper care phase allows for a smooth period of transition from implementation resources leading the project to support resources who will be supporting and assuring customers going forward. During this period, implementation resources work closely with the customer to track and resolve any production issues.
[3] The Minimum Viable Product (MVP) would then be the minimum set of functionalities allowing Operations to effectively operate, with the rest being then specified in an incremental agile mode.

would then be the minimum set of functionalities allowing Operations to effectively operate, with the rest being then specified in an incremental agile mode.

49. In the HPP, the MVP was not initially defined at an adequate level of granularity while the Product Status Account was introduced towards the end of 2017. In May 2018, the budgetary challenges resulted in the project classifying deliverables into, "must haves", "should haves", and "could haves". In addition, the size and profile of the IT support needed after cutover was not conclusively confirmed.

50. Further, the development of a new system with a greenfield approach allows for redefining and optimizing the processes. In that case, with business having the lead on the IT development, it is important to define how the Organization is expected to operate and work in the future i.e., define the Target Operating Model[4] (TOM). The IT project becomes a transformation project, with the definition of the operational objective followed by the change. The HPP did not have a defined TOM, and the detailed functionalities were designed "on-the-go" using an agile approach.

51. The HPP started off with the aim of replacing an end-of-life system with a flexible system based on new technology. Over the project life cycle, it became a transformation project. The perspective of being able to handle processes more efficiently created the expectation that new requirements could be included in the solution.

52. Projects that redefine functionalities using an agile approach provide the possibility of fulfilling customer needs better. However, when a solution is complex and descoping is necessary, it is a challenge for the user to assess such functionalities as "must haves", "should haves", or "could haves".

53. The efficient and effective management of projects in the Organization can be enhanced by ensuring that the project management methodology is adapted to include the definition of a MVP and a TOM.

(iv) Project Duration

54. The project did not meet its expected timeline. The HPP was initially launched as a 12 months project. In 2017, the project time line was extended to two years when the scope was expanded. The expected completion date for the project was December 2018.

55. The HPP End Project Report indicates that the project was completed within the revised timeline i.e., December 2018; however, a review of relevant project documents shows the project was formally closed in March 2019 i.e., three months after the reported completion time. The Project Board held a meeting in February 2019 to initiate closure of the project. In March 2019, the Project Board Members signed off the End Project Report to formally close the HPP.

(B) PROJECT BUDGET AND COSTS

(i) Linking Project Delivery to Budget Cycle

56. According to the PID for the HPP, the time for implementing the project was the least flexible due to the availability of financial resources in the 2017 budget cycle. The other driving factors regarding the project delivery time frame were the inability of the legacy system to deal with additional languages or data granularity and the necessity for the Organization to get off the legacy mainframe. The legacy system was expected to run out of available indexation numbers by the first quarter in 2019.

[4] A Target Operating Model defines how the Organization is expected to operate and work in the future.

57. A review of documents and discussions with the project management team showed that the initial time frame of 12 months, later on, extended to two years after expanding the scope, was not adequate.

58. In more detail, the initial scope of the project was wide given the time that was allocated. For example, besides developing The Hague Back Office (HBO), the development of a new front office application (for external customers) was included as one of the main products in the initial PID, which the board approved in March 2017. Further, a considerable amount of time in the initial phase of the project, about six months, was spent on definitively scoping the project. Later on, the external developers of the system needed a reasonable time period to understand not only the technical features of the system but also the business rules of The Hague Registry.

59. The time allocated for delivering the HPP was tied to a fixed period of budget availability. When the project delivery is tied to a fixed period of budget availability and other timely requirements, it could lead to undue pressure on the project team. Further, the team's project approach could be skewed towards reducing the scope, cost or quality of the product(s) to meet the deadline. Therefore, there should be emphasis on delivering a well-functioning and quality product within the constraints imposed by other project management parameters i.e., cost and time.

(ii) Exceptional Project Budgeting Process and Agile Software Development

60. In the HPP, the project initiation and planning were based on the PRINCE2® project management approach. The software development and delivery were carried out using an agile methodology (ScrumBan[5]) involving short iterations or sprints whose duration would range from two to six weeks.

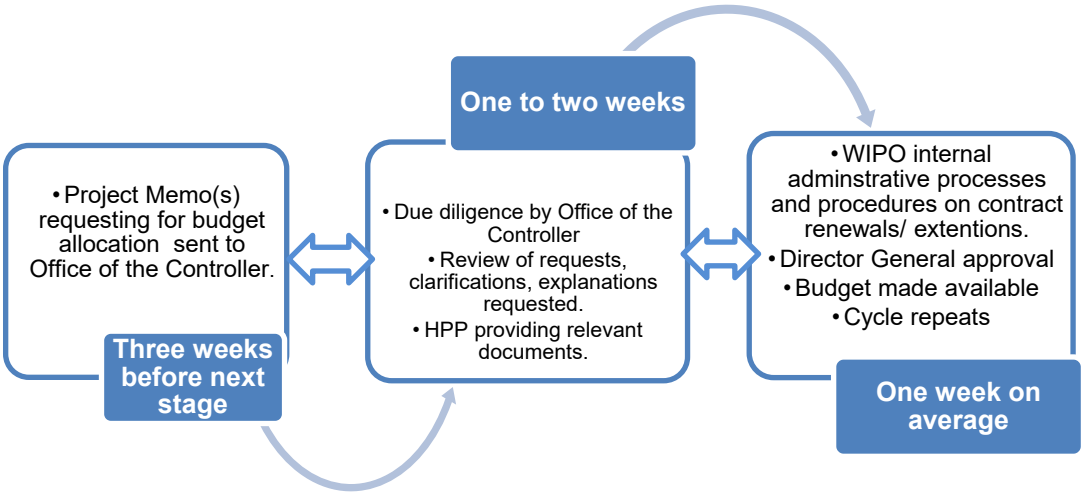
61. While an agile approach to software development adopted by HPP offers a number of benefits such as, speedy delivery and testing of essential features of the system, the exceptional process for allocating the budget to the project was not fully aligned to support this approach. A part of the challenge with providing timely cost estimations when using an agile approach is that the specific and detailed estimations may not be readily determinable to facilitate the efficient allocation of the budget.

62. In May 2018, the project manager raised an Exception report relating to the availability of the budget for stage four of the project. The concerns regarding the availability of the budget also meant that the external providers' contracts could not be extended/renewed until the budget was available. This effectively would have meant stopping current project activities and delaying the delivery of the project's stated objectives.

63. Figure B below illustrates the exceptional processes and procedures for allocating a working budget to the HPP based on the development work carried out by the external providers.

[5] Scrumban is a project management framework that combines important features of two agile methodologies: Scrum and Kanban. The Scrumban framework merges the structure and predictable routines of Scrum with Kanban's flexibility to make teams more agile, efficient, and productive.

Figure B: Exceptional Process for Allocating Budget to Hague Platform Project



Source: Prepared by IOD based on Hague Platform Project documentation

64. Further, the working budget for the project was allocated every six to nine weeks. A memo requesting for the budget would be raised three weeks prior to the deadline. This would be aligned with the Statements of Work for the developer and would cover the development, support needs for the following development period. As part of its mandate, the Office of the Controller would carry out internal reviews, due diligence, examining the details of the previous budget allocated and deliverables for that stage, including reviewing the requests for additional budget allocation.

65. It should be noted that the exceptional process for allocating the budget to the HPP, as depicted in figure B, was put in place after the Office of the Controller observed that the project had exhausted its annual budget which in turn resulted in budget overruns. Whilst the process was key to preventing and managing further budget overruns, it may have contributed to delays in allocating the project budget which in turn affected the agile methodology used for the project.

66. On average, it took more than three weeks to agree on requirements, the scope of works, obtaining the requisite quotations for the proposed work, conducting internal reviews and then processing the budget. More so, this process had to be repeated every six weeks on average. Further, there were also administrative processes and procedures associated with contract extensions and budget approvals. This misalignment between the software development approach, the exceptional budget process, and administrative procedures resulted in delays in allocating the budget to the project especially at the end of a project stage.

67. In addition, the overview of the progress of deliverables under agile development was lost at certain times. Deliverables were shifted across the two stages of the project.

68. The project budgeting process was not efficient and effective, and lacked in consistency. The linkage to the resource plan and time phased deliverables was weak, and communication to other stakeholders was not timely, in order ensure efficient budget allocation processes and related administrative procedures.

(iii) Project Costs incurred before Appointment of Project Board

69. According to PRINCE2®, during the start-up and initiation phase, the Project Board should, among others, authorize the project, approve the supplier contract, and approve the PID and its components. These components include, but are not limited to, the business case, the project related plans, approaches, and associated budget or cost estimates.

70. In the HPP, the Director General approved the project brief on December 15, 2016. The confirmation of the Project Board roles was conducted during the board's first meeting on February 23, 2017. Subsequently, the board approved the PID on March 3, 2017.

71. A review of the HPP costs and relevant documents showed that using the existing WIPO framework agreement, The Hague Registry had already begun sourcing resources and processing budget requests related to the project. From November 2016 to March 2017, a total of 550,900 Swiss francs had already been allocated for project resources that included database design, business analysis and systems design and development. The process to procure these resources and associated costs were incurred before the formal appointment of the Project Board and approval of the PID. Therefore, by approving the PID, the Board was effectively formally and retrospectively putting a stamp of approval on the costs for the HPP that were incurred before it was established.

72. The Project Board did not, at the outset of the HPP, have sufficient authority to make certain decisions, approve plans and allocate resources to the project. This hampered the board's ability to effectively discharge its roles and responsibilities as outlined in PRINCE2®, whilst engaging in meaningful discourse on critical project matters.

(iv) Inadequate Initial Project Budgeting

73. At the time the HPP was initiated in November/December 2016, there was no budget that was set for the project in the Program and Budget 2016/17. The initiation and implementation of the project started in 2017 i.e., in the second year of the 2016/17 biennium while the project went into production in December 2018 i.e., the first year of the 2018/19 biennium.

74. A review of the Program and Budget for 2016/2017 and 2018/2019 biennium shows that 400, 000 Swiss francs and 1.48 million Swiss francs, were approved as the budget for non-personnel costs, respectively. Therefore, HPP was financed by transfers of accrued savings and loans from other business areas within the Organization.

75. In March 2017, the HPP board approved the PID that included estimated project costs for phase one and two at 2.75 million Swiss francs and 1.48 million Swiss francs[6] in 2017 and 2018-2019, respectively. The table below shows the initial budget, actual expenditure and resulting budget variance of the HPP.

Table 1: Financial Analysis of The Hague Platform Project in 2017/18

Description	Initial Budget (Sfr.)	Actual Expenditure (Sfr.)	Budget Variance (Sfr.)
2017	2,750,000	2,521,148	228,852
2018	1,480,000	4,121,089	(2,641,089)
Total	**4,230,000**	**6,642,237**	**(2,412,237)**

Source: Prepared by IOD based on Hague Platform Project documentation

76. The table above shows that the actual expenditure of the HPP was 6.64 million Swiss francs compared to an initial budget of 4.23 million Swiss francs, resulting in an unfavorable budget variance of 2.41 million Swiss francs. The budget overrun resulted in the HPP having to request additional funds from the Director General in order to meet the project expenditure. The

[6] Estimated project costs for Phase two did not include projections for infrastructure costs (including maintenance, support, backups etc. as the approach had not yet been determined.

77. Office of the Controller allocated the additional funds to the project following the Director General's approval of the requests.

78. A further review of project documentation shows that the initial budget of the project was not clearly defined at the outset of the project and there were inconsistencies in the financial information for the project. Whereas the PID shows that the initial budget of the project was 4.23 million Swiss francs, according to the End Project Report, approved by the Project Board in March 2019, five million Swiss francs was indicated as the initial project budget.

79. A review of project documents and discussions with the project team including relevant internal stakeholders, IOD ascertained that the five million Swiss francs shown as the initial budget was a high-level indication of the project cost by the Director General, which was not supported by any project cost estimate.

80. The Project Board, as a key control mechanism, should have ensured that the project budget was used effectively and efficiently used. Further, the project team should have, from the outset, adopted a cost-conscious approach to project implementation, and limited possible budget overruns, whilst maintaining focus on delivering the agreed scope.

(v) Project Budget Allocations and Actual Costs

81. Table 2 below shows a summary of the HPP budget allocations and costs. The costs shown in the table relate to non-personnel costs only and do not take into account the cost of WIPO staff working on the project.

Table 2: The Hague Platform Project Budget Allocations and Actual Expenditure

Description	Budget Allocation (a)	Actual Expenditure (b)	Variance (a)–(b)	Budget Utilization Rate
	Sfr.	Sfr.	Sfr.	Per cent
2017	2,780,760	2,521,148	259,612	91
2018	4,316,501	4,048,382	268,119	94
2019 (Warranty closure payment)		72,708		
Total	**7,097,261**	**6,642,238**	**527,731**	**94**

Source: Prepared by IOD based on Hague Platform Project documentation

82. As seen in Table 2, in 2017/2018, a total of 7.1 million Swiss francs was allocated to the HPP. Out of the allocated budget, 6.64 million Swiss francs was spent, representing a budget utilization rate of 94 per cent and resulting in a variance of 527,731 Swiss francs. The budget utilization rates for 2017 and 2018 were relatively similar at 91 per cent and 94 per cent, respectively. In 2019, a final warranty closure payment of 72,708 Swiss francs was made to the external developer, bringing the total cost of the HPP to 6.64 million Swiss francs.

83. During the project implementation, the HPP team made projections and forecasts that were not aligned to the budget available. For example, IOD notes that in the first quarter of 2018, the HPP projected, using an experience - driven budget forecasting, that 8.42 million Swiss francs was required to complete the project. This projection included an updated estimate of 5.34 million Swiss francs for phase two of the project, which was initially estimated at 1.48 million Swiss francs in March 2017.

84. In more detail, the updated budgetary requirement for phase two of the project represented an increase of 3.86 million Swiss francs i.e., 261 per cent compared to the initial

cost estimate which formed the basis for the 2018/19 Program and Budget. These fluctuations in cost estimates for the initial and expanded scope prompted the Office of the Controller to seek reassurances that the cost estimates were based on the most cost-conscious approach. Following coordinated efforts by the Office of the Controller and PTD, the forecast amount of 8.42 million Swiss francs, for the revised and expanded scope, was eventually revised downwards to 7.0 million Swiss francs.

85. Notably, in July 2018, the Office of the Controller worked with the HPP to arrive at a shared understanding of the additional budgetary requirements for the remainder of the project. The work included a comprehensive budget and expenditure analysis of the HPP. This analysis was conducted as part of efforts to manage the projected budget overruns. The HPP worked with the Office of the Controller to change its approach to project development and implementation.

86. As part of the intervention by the Office of the Controller, PTD was requested to negotiate a fixed price contract with the supplier for developing the agreed “must haves” and “should haves”, including some “could haves” functionalities of the system. The fixed price contract included final warranty closure payment of 72,708 Swiss francs. Further, IOD notes the following on the budget and costs for the HPP:

(a) According to the End Project Report and discussions with some Project Board Members, the project costs reportedly increased because of instructions, (e.g., expansion of scope) made to the Project Board by the Director General and the IP Portal Board. However, IOD could not determine the additional costs relating to these instructions in the absence of sufficient and reliable documentary evidence. Further, there were no specific budget logs maintained to show the incremental costs relating to the instructions. As a result, these costs are subsumed into other project costs; and

(b) While 6.64 million Swiss francs was spent on the project, IOD notes that financial information in the End Project Report included terms such as: “budget expected”, “budget used”, “project budget (actual)”, which could lead to misunderstandings and misinterpretations. Therefore, it is important to present project financial information in a simple, reliable and clearly understandable manner.

87. There was no clear outline of the project budget based on a reliable and accurate cost estimate for the defined scope. Changes to the scope that lead to additional costs should be carefully monitored and quantified as well as escalated in Exception reports to the relevant governance mechanisms. Finally, project financial information should be presented in a simple, clear, accurate and understandable manner to enable interested stakeholders to arrive at a logical conclusion and make informed decisions.

(vi) Increased Post Go-Live Budget and Expenditure for The Hague System

88. From the end of 2018 to May 2019, the Management in Brands and Designs Sector held a number of formal and informal meetings with Office of the Controller and Human Resources Management Department (HRMD). The focus of the meetings were on the operational budget and resources (personnel and non-personnel) that the newly established HISD would need in its first year of operation including the subsequent years.

89. The approved budget, budget after transfers and expenditure during the post go live period i.e., 2019 and 2020 in respect of the HISD are shown in Table 3 below.

Table 3 : The Hague System Budget and Expenditure after Go-Live

	2019			2020		
Description	**Approved Budget**	**Actual Cost**	**Variance**	**Approved Budget**	**Actual Cost**	**Variance**
	Sfr.	**Sfr.**	**Sfr.**	**Sfr.**	**Sfr.**	**Sfr.**
Personnel	659,700	1,269,670	(609,970)	1,380,300	1,497,713	(117,413)
Non Personnel	740,000	998,254	(258,254)	500,000	899,773	(399,773)
Total	**1,399,700**	**2,267,924**	**(868,224)**	**1,880,300**	**2,397,486**	**(517,186)**

Source: Office of the Controller

90. As seen in Table 3 above, the personnel costs increased from 1.269 million Swiss francs in 2019 to 1.498 million Swiss francs in 2020, an increase of 18 per cent. In contrast, non-personnel costs decreased from 998,254 Swiss francs to 899,773 Swiss francs representing a decrease of 10 per cent. Overall, the total costs (personnel and non-personnel) increased by 129,562 Swiss francs (or six per cent increase) i.e., from 2.27 million Swiss francs in 2019 to 2.397 million Swiss francs in 2020.

91. In more detail, in 2019 the non-personnel costs were in respect of 12 different external resources having varying contract lengths. To procure these resources, HISD raised multiple budget requests, and Purchase Orders (POs). There were 57 individual POs that were raised, i.e., 45 POs under HISD budget and 12 POs under the other business areas in The Hague Registry.

92. Due to post-project planning taking place outside the project and its forecasts of post-project needs, HISD experienced the aforementioned budgetary constraints in 2019. This resulted in challenges for HISD to retain non-personnel resources to support and stabilize the system and an associated greater than expected loss of efficiency in operations. Notably, at the end of 2019, there was a high number of unresolved service requests. In 2020, there was a single budget allocation at the start of the year and as a result, the HISD was able to recruit, train and retain non-personnel resources for a relatively stable period.

93. Compared to the other international registration systems, such as the Patent Cooperation Treaty (PCT) and Madrid, the IT cost per application for The Hague system is currently and relatively high given the number of applications (registrations and renewals) that it handles in a year. It is noted that The Hague also handles decisions, a category which is not found in the PCT. Table 4 below provides the IT cost per application of the three registration systems for 2020.

Table 4: International Registration Systems - IT Cost per Application / Registration and Renewals[7]

S/n	Description	IT Expenditure[8] (Sfr.)	Demand Estimates[9] (applications, registrations and renewals)	Cost per Application/ Registration and Renewals (Sfr.)
1.	Hague Information Systems Division	2,397,486	10,860	221
2.	PCT Information Systems Division	10,194,614	273,500	37
3.	Madrid Information Systems Division	3,293,701	91,400	36

Source: Office of the Controller

94. As seen in Table 4 above, the cost per application/ registration for HISD is comparatively high at 221 Swiss francs while the cost for the other two more mature systems are relatively the same at 37 Swiss francs and 36 Swiss francs for the PCT Information Systems Division and Madrid Information Systems Division, respectively. The high cost per application/registration, and renewal is mainly due to the low volumes of demand for these services, compared to post-go live expenditures including costs relating to the dependency on external support for The Hague Platform compared to the staff available in the other two teams. At the end of 2020, the volume of demand for The Hague system has not yet sufficiently increased to reduce the ratio.

95. This highlights the need to find internal resourcing solutions, by exploiting the existing in-house expertise and tools to reduce IT expenditure, in particular non-personnel resources. More synergies should be identified to help contain costs, and streamline the IT landscape at WIPO.

(C) THE HAGUE PLATFORM TECHNOLOGY STACK

96. *Observations made in this part of the report were withheld due to the sensitive and confidential nature of issues raised.*

[7] The comparison in Table 4 does not take into account the relative complexities of each system (or all of the transactions actioned) but focuses solely on the IT expenditure and demand estimates of each respective system, noting that this is also The Hague's "hyper care/stabilization" time while the other two systems are long-established. For example, the sheer number and open nature of legal declarations that a joining member can make to tailor The Hague System to its specific needs result in complex programming and heavy maintenance. This necessity is a mere reflection of the fact that there exists a wide range of different philosophies regarding industrial design protection around the world, whilst there is fundamental convergence in the fields of utility patents and trademarks. Furthermore, a unique feature of The Hague System is that it is a multiple-object system, in the sense that a single registration may contain several designs (up to 100). These designs have independent data assigned to each of them and may be managed independently, calling for yet more complexity in the supporting system. Hence, if the demand estimates were based not on registered or renewed filings but on what users file for (an invention, a trademark or a design), the demand in 2020 under The Hague System, as contained in registrations and the renewals recorded that year, would amount to 45,230 units.

[8] Actual expenditure (post closure - subject to audit) for the PCT Information System Division, Madrid Information System Division, and Hague Information System Division.

[9] Demand Estimates for the PCT, Madrid and The Hague systems as per the October 2020 Forecast from the Department for Economics and Data Analytics.

(i) Greenfield vs Existing Solutions

97. *Observations made in this part of the report were withheld due to the sensitive and confidential nature of issues raised.*

(ii) Technology Choice

98. *Observations made in this part of the report were withheld due to the sensitive and confidential nature of issues raised.*

(iii) Issues with Scalability and Sustainability of the Technology

99. *Observations made in this part of the report were withheld due to the sensitive and confidential nature of issues raised.*

(iv) Misalignment between Hague Platform Continuous Integration/ Continuous Deployment (CI/CD) with the Cloud Policy

100. *Observations made in this part of the report were withheld due to the sensitive and confidential nature of issues raised.*

(D) INSUFFICIENT DATA MIGRATION AND TESTING STRATEGY

101. A Data migration strategy and tools were one of the primary products of the HPP as defined in the PID. The strategy would define how to migrate DMAPS data from the current to the new system whilst ensuring integrity of The Hague Registry and all open transactions. Further, tools would help support the implementation of the data migration strategy. This would ensure that the legacy data would be fully migrated to the new Hague system.

102. According to the PID, the estimated project cost for database design and data migration was 100,000 Swiss francs i.e., 80,000 Swiss francs and 20,000 Swiss francs in phases one (2017) and two (2018) respectively. However, as can be seen in the table below, 288,109 Swiss francs was allocated to the project. In addition, 427,200 Swiss francs (6.4 per cent of the total project cost) was expended on the activity resulting in an over expenditure of 139,091 Swiss francs.

Table 5: Budget Allocation and Costs for Data Migration in 2017/2018

Description	Budget Allocation Sfr. (a)	Costs Sfr. (b)	Over Expenditure Sfr. (a)-(b)	Variance Per cent
2017[10]	110,000	237,720	(127,720)	(116)
2018	178,109	189,480	(11,371)	(6)
Total	**288,109**	**427,200**	**(139,091)**	(48)

Source: Hague Platform Project Documentation

[10] In 2017 the budget allocation and costs for Database design and data migration were combined whilst the figures shown for 2018 are solely for data migration.

103. IOD's review of relevant project documentation and discussions with relevant internal stakeholders revealed that, the data migration process had a number of challenges. This is shown by the following observations:

(a) The cost and time required for data migration during the entire project were greater than initially budgeted, resulting in an over expenditure of 139,091 Swiss francs as shown in the table above. It should be noted that there was an assumption that DIRIS (a Hague intermediate database) that was produced by the MIRIS project for use by Hague but never put into production had indeed been completed and contained all relevant data;

(b) The Data Migration Expert, responsible for the data migration, was relieved of his duties four months before the planned go live. This expert reportedly failed to report encountered issues on time or engage with staff who would have been able to assist and clarify on fundamental aspects and intricate legacy data complexities. Further, the expert was managed by an external consultant (The Hague did not have internal IT staff to take on this role), who also did not fully grasp the data complexities and the gravity of the data migration exercise;

(c) The Data Migration strategy and approach were not well crafted and executed. In particular, the strategy was not consolidated until September 2018, a few months before the Go-live date. The updated strategy provided for data to be incrementally migrated in the new system;

(d) Legacy data migration was performed with seven types of data controls from DIRIS[11]. This specific business focus was on active registrations - approximately 42 per cent of existing registrations. Further, about 300 active "in progress" registrations were specifically excluded so as to reduce the risks associated with data migration in a transition phase and to mitigate any impact of a "big bang" approach. Therefore, the strategy involved a gradual and manual copying of data on an "on demand" basis;

(e) All images and documents related to registrations were in another system and were accordingly excluded from the data migration; and

(f) Business validation and testing of the migration tool and process were based on quality checks of 120 registrations that had been identified as the most complex data set out of 86,553 registrations. To have better quality checks and wider scope, it could have been prudent for this to have included other categories of data.

104. As a result of the challenges experienced during data migration, the system went live with a focus on operations but incomplete data. Post go-live, a number of service requests related to data quality or blocked data were raised in The Hague Registry. Addressing and cleaning up these issues was then in turn difficult due to the lack of stable resourcing.

105. One key element of the HPP was the definition of a new business-focused data model, which allowed for deeper granularity on the registered data. This new data model reflected the expectations of how the functionalities implemented would improve the handling of cases in The Hague Registry, and add more precision. The model was designed with limited analysis of its relation to the functionalities, thus causing some difficulties and leading to rework.

106. The major drawback was created by the forward-looking decision to increase the granularity and apply a new structure without sufficient consideration of how existing and historical data could be mapped to it. Additionally, it should be noted that the possibility of

[11] DIRIS was the project which was supposed to deliver the replacement of DMAPS and it was stopped. MAPS was the legacy system of the Madrid International Registry which ran on mainframe at United Nations International Computing Centre.

cleansing the data in order to map them against the new structure was limited by the need for the registry to keep data fundamentally unchanged.

107. Further, a key element of the data model, the historical financial data for the design was not migrated due to a lack of time. The workaround solution was a balance migration with a risk of accessibility to the data if the previous platform was decommissioned. It is noted that all this data has since been migrated. The audit notes that modifications of data structures are generally a challenge for any data migration exercise. For registries, integrity of data in the past and in the new data structure are key requirements, which limit the transformation techniques.

108. In the HPP, a Testing strategy was in place with the test cases primarily developed within the single developments. The strategy did not sufficiently take into account the data migration and the testing of functionalities with migrated data.

109. Developed functionalities were tested in the development cycles (Sprints) defined as per agile methodology. Since the migration of data occurred later in the project and the timeline was fixed, end-to-end/integration tests were difficult to conduct, leading to operational issues. Furthermore, insufficiencies in the testing strategy and the exceptional budgeting process put in place to limit overruns delayed the timely resolution of issues identified during the testing.

110. A data migration strategy should have been clearly defined at the outset, linked to a risk management strategy and quality criteria, and involved key internal staff who possessed the requisite business knowledge and technical skills to manage the risks associated with data migration. Furthermore, the strategy should have addressed the introduction of new data models requiring an impact analysis of newly defined data models. Likewise, a testing strategy for a project run with an agile approach should have been elaborated, covering aspect of end-to-end testing and the use of real/actual migrated data, even when an agile approach is planned.

111. IOD was informed that work has been done on developer practices within the context of the Global IP Portal that provides guidance including on some issues identified above (e.g. end-to-end testing and use of real migrated data). Going forward, it would be relevant to enforce these practices across the Organization for applicable projects.

(i) Generating the Weekly International Designs Bulletin

112. The International Designs Bulletin (or Hague Bulletin) is the official publication of the International Register of The Hague system. The Bulletin is published only in electronic format on the WIPO website and contains data regarding new international registrations, renewals, and modifications affecting existing international registrations.

113. One of the main products of the HPP, as documented in the PID, was that the new system would generate the weekly Hague XML, Hague Bulletin, and certificates. It should be noted that generating the weekly Bulletin is reliant on the technical preparation of the official information to publish. Further, a review of the HPP budget showed that 112,370 Swiss francs was allocated to delivering this product (as defined in the PID).

114. On December 3, 2018, the new Hague system went into production. However, it was noted that the first 15 weekly Bulletins were published using data generated from the legacy system (DMAPS).

115. At the time of going live, as part of the planned manual move of “in process work” and the transition planning, it was known that the new system specifically did not have the complete set of data to facilitate the generation of the Bulletin and relied on extracting data from the legacy system and some manual work. This controlled process was successful and at no time, despite the resource constraints in the go-live period, were any “unpublished” records inadvertently or mistakenly published – a critical business and legal objective of the transition process.

116. Additionally, there was a need to resolve an outstanding inherited issue on updating International registration data that was not being reflected in The Hague Express[12] and the Global Design Database[13] (GDD). Specifically, some renewed International registrations were not showing as expired in the GDD and some changes in the International registrations were not being reflected on the GDD. HISD informed IOD that these issues have now been resolved.

(E) PROJECT GOVERNANCE, ROLES AND RESPONSIBILITIES

117. The project initiation and planning stage of the HPP was carried out using the PRINCE® project management methodology. The methodology is used for managing projects within the Organization and defines, among others, key deliverables and a clear project governance structure that must be applied in projects.

118. Further, the project governance structure must include independence requirements that have to be considered and applied by the governance, the executive, and the operational ("run-the-business") parties.

119. The HPP was formally initiated based on a project brief issued by the Director, The Hague Registry, which was sent for approval to the Director General on December 15, 2016. The project governance structure was defined during the "start-up" phase and included the project sponsor, project executive, project manager and transition manager. The HPP board was formally convened in February 2017 and approved the PID in March 2017.

120. There are several areas in which the relevant governance, risk management, and internal controls relating to the HPP and other projects in the Organization needed improvement. These areas include, but are not limited to:

(i) Weak Project Board Accountability

121. The key roles and responsibilities of the HPP board were outlined in the PID as follows: (i) responsibility for delivery of the project; (ii) providing unified direction to the project; (iii) providing resources and requesting for funds for the project; and (iv) ensuring effective communication within the project team and with other stakeholders.

122. A review of HPP documentation and discussions with the project team revealed that there is a need to enhance the board members' awareness and understanding of the PRINCE2® methodology, specifically their roles and responsibilities at an individual and collective level.

123. As with PRINCE2® managed projects, the executive for the HPP, supported by the senior user(s) and senior supplier(s), had overall responsibility and was accountable for the project. The executive's accountability for the project cannot be delegated; however, it would be equally important to strengthen the role and accountability of the Project Board. It is noted that the project sponsor had no prior PRINCE2® experience or training. The executive, was for most of the project, not formally moved to the business area concerned and only part time assigned to the project, remaining in another full-time demanding role in the Organization.

124. The Project Board's accountability could have been be enhanced by embedding its collective accountability in specific or high-value projects, and for the Organization to be cognizant of the time staff members need to appropriately discharge project duties. This could

[12] The weekly updated Hague Express Database includes bibliographical data and – as far as international registrations governed exclusively or partly by the 1999 and/or by the 1960 Act(s) of The Hague Agreement are concerned – reproductions of industrial designs relating to published international registrations bearing a registration date as from January 3, 1985.
[13] Global Design Database is a world-wide collection of designs data; including WIPO Hague registrations and information from participating offices.

have been be done by tailoring the description of the PRINCE2® roles and responsibilities in the PID. Other measures and initiatives include:

(a) Providing all Project Board Members with Terms of Reference (TOR) that formalize their appointment. The TOR should, in sufficient detail, describe the roles and responsibilities of the board member, as well as an estimate of the time needed to discharge these duties. This would complement the brief description of roles for the board that is normally included in the PID;

(b) Encouraging prospective and serving Project Board Members to undertake introductory or foundation level training in PRINCE2®. Alternatively, organizing a group (project board) tailored training in PRINCE2® at the outset of the project would help familiarize the members with their roles and responsibilities; and

(c) The responsibilities and accountability of the Steering committee should also be clarified and confirmed at the outset of the project.

125. Implementing the measures highlighted above, would enhance the project management team's awareness, understanding, acceptance of designated roles and responsibilities, promote teamwork and shift the focus from finger-pointing to individual and collective accountability for the project.

(ii) Inadequate Project Board Decision Making Process

126. For the Project Board to be effective, it should, inter alia, provide unified direction to the project, follow a well-defined process in making key decisions and actively participate in making decisions, as well as possess sufficient authority to exercise their role. The board should engage, liaise, and communicate with relevant internal and external stakeholders. Further, the board should be cognizant of the implications of project-related decisions on other areas in the organization.

127. IOD notes the following on the board's decision-making process in the HPP:

(a) **Type of Decisions by the Board:** At the initial meeting of the Project Board, one of the participants sought clarity on the board's role, and in particular the type of decisions the board would be asked to make. Clarity on this issue would have helped define the board's role and facilitate the definition of the governance structure. However, clarification on this matter was neither provided in the meeting nor in subsequent ones;

(b) **Insufficient Decision Making:** Discussion with the project management team revealed that they had varying levels of involvement in making key decisions for the project. Specifically, the level of board members' engagement with the sponsor and executive in making key decisions was on a continuum of consensus to limited engagement. Whilst several decisions were arrived at through consultation and consensus, the board and the project management team was not entirely aligned on some issues;

(c) **Limited Awareness of Project Budget**: There is need for team members to be conversant with the financial matters of the project and effectively participate in discussions that lead up to signing off relevant project documents. The sentiments expressed by some project team members, on relevant project matters, e.g., budget, were not aligned with the project documents; and

(d) **Limited Engagement of Key Internal Stakeholders**: The Hague architecture proposal was submitted to several stakeholders for review, including the Security and Information Assurance Division, Enterprise Architecture, Madrid and ICTD staff who later formed part of the CMU.

Specifically, the Enterprise Architecture and ICT Program Management Division indicated that they had limited participation or input on the review of the proposed Hague architecture. Whilst some project documents showed that staff from the Division attended some meetings on the architecture review, the Division indicated that they felt they were not in position to adequately comment since either the proposed solution was either a work-in-progress or the selection and decision on the architecture were already perceived as already made.

128. More clarity on roles and responsibilities, and overall governance of projects is needed. Further, a project board should ensure that they actively include and regularly engage relevant internal stakeholders e.g., Office of the Controller and ICTD, whose mandate permeates the Organization. This is because some project-related decisions e.g., the selection of a technology stack, may have implications on the current and future technology landscape of the Organization. More importantly, the Organization is striving towards strategic alignment, cross-sector standardization, cost-effective maintenance and support, and sustainability of technology solutions. Hence, a decision in one project can influence subsequent decisions in another one.

129. To enhance the level of project management maturity in the Organization, the role of the project board should go beyond fulfilling project governance requirements and post-facto approval of key project decisions. Equally, all board members should be active, accountable, and empowered to leverage their collective competencies to deliver the envisaged value proposition from a project, program, or portfolio.

(iii) Inadequate Project Governance and Reporting Structure

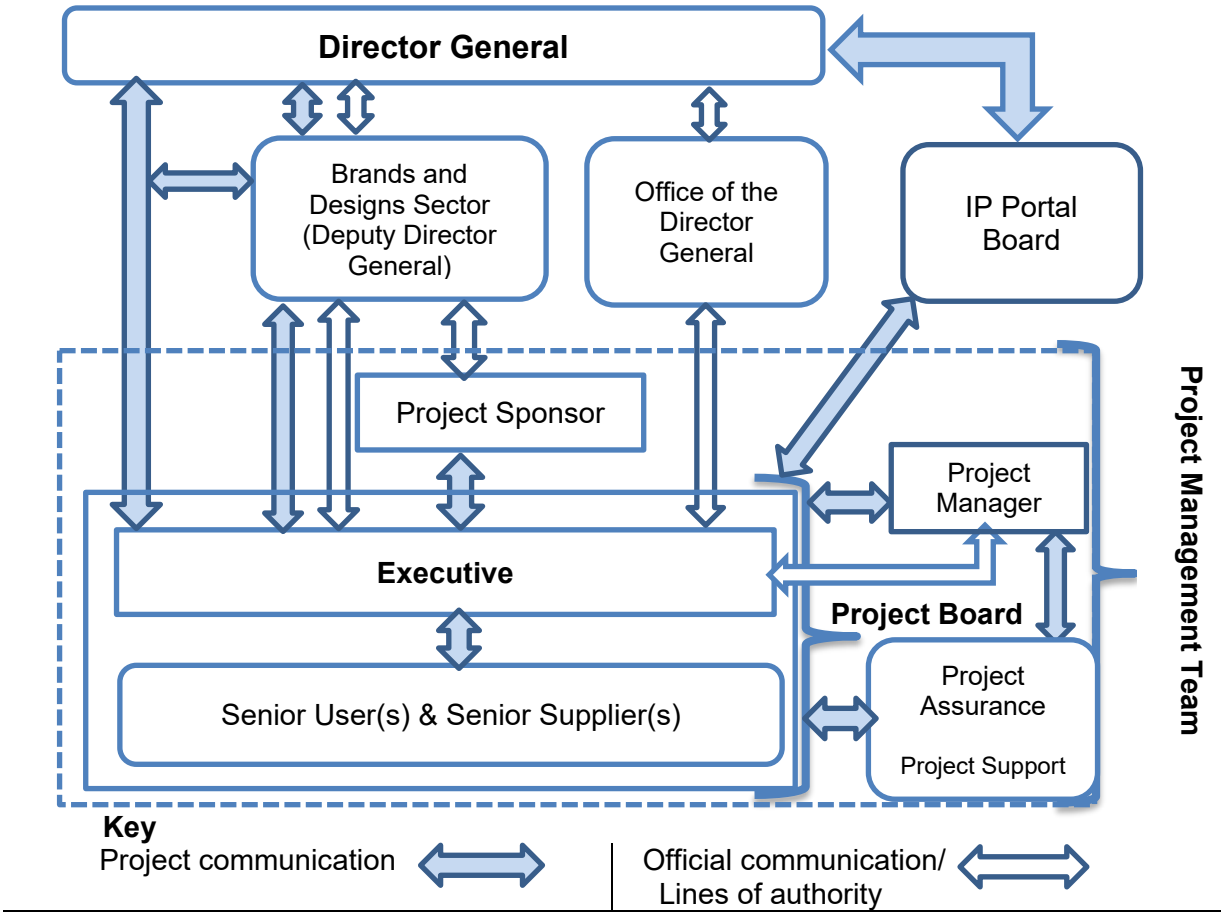
130. In February 2017, the HPP board was convened. The Board was part of the project management team that was set up to direct and manage the project. The team was composed of: project sponsor, project board, project manager, project assurance and project support.

131. In more detail, the Board was composed of an executive, two senior suppliers and two senior users, drawn from relevant business areas in the Organization. Further, the Board was responsible for communication between the project management team and other stakeholders.

132. Figure C below illustrates the HPP governance mechanisms, in particular the communication of project information and lines of authority of the key members of the project management team. As can be seen in the Figure, the lines of authority provided for the executive (Business Continuity Coordinator) and project sponsor (Director, The Hague Registry) to report to the Deputy Director General (DDG)14, Brands and Designs Sector.

[14] Office Instruction No. 36/2019, Internal Organization of WIPO: Brands and Designs Sector.

Figure C: The Hague Platform Project - Commmunication and Lines of Authority



Source: Prepared by IOD based on Hague Platform Project documentation

133. As can be seen in the Figure C, the Project Board was representative of the business, user and supplier interests as recommended in PRINCE2®. Further, the project manager coordinated work among the different stakeholders in the team in an effort to deliver the project within the constraints agreed with the Project Board. The project assurance provided the board with assurance on specific domains of the project, whilst the project support provided administrative support to the team. The Board interacted with other stakeholders, notably, the IP Portal board in its capacity as the Steering Committee, and external suppliers.

134. A review of the HPP governance mechanisms including discussions with various stakeholders revealed that:

(a) The project received and acted on instructions from the different sources within the Organization as depicted in the Figure above. For example, the Project Board reported that the timing of the HPP was extended over 2017/18 at the request of the GIPP. The role of the Steering Committee was not clearly defined at the outset of the project and kept evolving.

Therefore, the project did not consistently have a Steering Committee to provide an independent view and coordinate critical decisions, such as budget, at the start of the project, and this evolved and was rather done through regular structures and consultations. Notably, close to four months after the project was initiated, the GIPP board's role as a Steering Committee came into effect as evidenced by the reports which the Project Board was requested to provide, on specific project matters;

(b) The executive and project sponsor would, in coordination with the Deputy Director General, Brands and Designs Sector, communicate project matters to the Director

General. However, the project sponsor had irregular participation in these meetings. This created some communication challenges within the project team structure and with accountability; and

(c) Further, the executive was also the direct supervisor of the project manager, within the Organization hierarchy. There were no reported or documented challenges on the project manager having a dual direct reporting lines with the executive. However, such reporting lines potentially pose a challenge for project managers, impair their operations and distort their accountability. This is the case when a project manager has conflicting views on project issues, decides to adopt an overly cautious approach, is influenced by these dependencies or does not have adequate soft skills to manage the situation.

135. The above illustrates dysfunctionalities in reporting lines, communication, information sharing and subsequently, sound decision-making in the HPP.

(iv) Project Management Team Roles and Responsibilities

136. In PRINCE2® managed projects, the executive and senior user(s) share the responsibility of ensuring that a project is aligned with the objectives and requirements of the business. Specifically, the executive is accountable for the project and the key decisions. The senior supplier represents the interests of those designing, developing, facilitating and implementing the project including those who, in many cases, will provide maintenance and support services for the product after closure of the project.

137. A review of the project management team roles and responsibilities including discussions with relevant internal stakeholders revealed the following:

(a) **Undefined Project Sponsor Role:** The team included the role of a project sponsor. This role was assigned the responsibility of ensuring that the project was aligned with the objectives and requirements of The Hague Registry.

IOD noted that the project sponsor role is not defined in the PRINCE2® framework. Therefore, the governance structure of the HPP was not fully aligned with the framework. A review of project documents and discussions with the project team revealed that the role was included to ensure business involvement and leadership. However, this created a communication bottleneck for project team members and other relevant stakeholders;

(b) **Project Executive Role:** The executive was accountable for the project and, responsible for developing and delivering The Hague Platform. Taking on these two distinct roles (project accountability and delivery) can potentially result in a conflict of roles and responsibilities and created an uneven balance in the project as it put IT in a driving role instead of the business role. Thus, it is not generally a recommended practice in project management;

(c) **Project Manager Role and Conflict of Responsibilities:** According to PRINCE2®, the roles and responsibilities of the project manager should not be combined with those of the Project Board Members, such as those of an executive. Combining the roles potentially result in a conflict of responsibilities and create challenges for the project.

From July to August 2017, a project manager was not formally assigned to the HPP. During this transition period, the day-to-day activities and responsibilities related to the project manager were being performed by the project executive. This points out to a conflict of responsibilities and accountability within the project; and

(d) **Senior Supplier Role**: The HPP had four senior suppliers – two were drawn from the supplier/developer and two were drawn from business areas within the Organization. In line with PRINCE2® the four persons assigned to the role were accountable for the quality of products delivered by the supplier/developer, responsible for the technical integrity of the project, ensuring that proposals for designing and developing the products were feasible and realistic, the right people, tools, equipment and knowledge were in place, and that the products met the expected criteria, including quality criteria.

The HPP experienced challenges in assigning, maintaining and retaining appropriate personnel who were tasked to deliver specialist products e.g., lead architects, and data migration experts. This inevitably impacted the project products and the timely delivery thereof;

(e) **Unclear Quality Assurance Role:** A clear and independent quality assurance role would have helped to highlight key risks (such as timeline and budget issues) and implement mitigating measures during the project lifecycle. In addition, quality assurance provides a check that the project's direction and management are adequate for the nature of the project and that it complies with relevant corporate standards and policies.

The Organization has a Project Management Office (PMO) that is meant to support the effective and efficient management of projects including enhancing information and knowledge management. However, in order to effectively provide independent quality assurance, the PMO's roles and responsibilities need to be enhanced, aligned with the Organization's accountability framework and positioned at an appropriate organizational level.

138. The governance of the HPP and ensuing roles would have been streamlined if the executive was assigned the role of a senior supplier, and the project sponsor assumed the role of an executive. This would have ensured alignment of project and post-project roles thereby allowing for continuity of responsibility and technical accountability for The Hague system. Further, it would have facilitated a seamless transition from being a senior supplier in the project to providing maintenance and support services for the system in a post project role (as Director, HISD).

(v) Change of Project Manager - Handover Process

139. Towards the end of the first stage of development in August 2017, the project sponsor and executive informed the Project Board that in early September 2017 there would be a change in project roles and confirmation of each person's responsibilities.

140. The justification for the change in roles was that it would help the project management team to meet the project timings and business case objectives. Further, it was pointed out that the project was transitioning into the second development stage and therefore the changes were in response to concerns raised by the board on aligning project delivery, feedback, monitoring, and reporting.

141. In September 2017, the executive and the project sponsor informed the board that a new project manager was appointed in an interim capacity. The outgoing project manager had been on the project from November 2016 (project start up) to the end of June 2017, a period of eight months.

142. However, there was no formal or documented handover between the incoming and outgoing project managers of the HPP. This approach exposed the project to unnecessary risks of losing institutional knowledge and time due to the learning curve.

143. The project manager is a cardinal member of the project team and a single focus for the day-to-day management of the project. Therefore, it is a good practice to ensure that there is a

formally documented handover process to support the transition from one project manager to the next.

(F) PROJECT EXECUTION, RISK MANAGEMENT AND CONTROLS

(i) Management of Change and Knowledge Transfer

144. For PRINCE2® managed projects, contemporary change management approaches combine the psychological and technological views of the project in creating a change model that is aimed at engaging and gaining the support of those affected by implementing a project. To gain internal stakeholder support, activities such as mentoring, training, re-training and communication are cardinal in managing the expectations and perceptions of those impacted by the change and sometimes the transformation that projects create.

145. Experienced staff who supported and maintained the legacy system had limited involvement in the HPP. These staff members were initially involved in the startup phase of the project; however, their involvement exponentially reduced as the project progressed into the latter stages.

146. A review of project documents and discussions with relevant internal stakeholders revealed that the technical staff who used to manage the legacy system were knowledgeable in the technical aspects and business rules of the HBO. Further, it was ascertained that at the time of implementing the project, the external providers possessed specialized knowledge and skills in the technology stack selected for the HPP. At the time of the project, this specialized knowledge was not readily available within the Organization.

147. The limited expertise of experienced technical staff in the novel Hague platform technology contributed to heavy and costly reliance on external providers to develop the system and provide the post-project maintenance and support services. This approach also limits in-house retention of technical knowledge of the new Hague Platform.

148. Further, the solicitation of in-house knowledge was limited, and the approach for effective change management and internal capacity building was not effective. This contributed to the costly dependency on external resources. The absence of effective synergies, for instance a repository of in-house technical knowledge and skills will continue to potentially affect IT related expenditures. Going forward, more needs to be done to share information on internal skills and tools.

(ii) Incomplete Daily Log for Project Management Team

149. A daily log is used to record informal issues, required actions or significant events not captured by other PRINCE2® registers or logs. During the startup of the project, the log can act as a repository of issues and risks before other registers are set up.

150. Each project team member may elect to use a separate log, from that of the project manager. The entries in the log can be based on each team member's thoughts, conversations and observations during the different project stages. To be relevant, the log should include: date of entry, observation, action, event or comment.

151. A review of relevant project documentation and discussions with project team members revealed that:

(a) The project did not maintain a daily log during the initiation and planning phase of the project i.e., from November 2016 to June 2017; and

(b) Project team members would annotate project documents e.g., PIDs and End Project Report, with comments, perceived risks, observations and reservations on

specific aspects of the project. The individual observations may seem insignificant on their own, but when collated they were pointers to a significant issue or risk in the project. However, the annotations on the project documents do not provide a clear trail of how the highlighted issues or risks were subsequently followed up and resolved.

152. Going forward, the project team members including the project manager should maintain a daily log in the different stages of the project. The log should provide a coherent and logical account of their notes and observations on various project management issues and would be a useful reference and audit trail for post project reviews.

(iii) Risk Register – Review of Project Risks

153. As per PRINCE2®, the HPP had a Risk Management Strategy in place which was aligned with the Organization's Risk Management Strategy. Further, the project maintained a Risk register which provided a record of, among others, a description of the risks identified, mitigation measures, risk responses, probability, impact, and owner.

154. The project manager was assigned the responsibility of maintaining the register while project stakeholders and team members were responsible for raising, evaluating, and suggesting mitigation measures and responses.

155. The Risk register was regularly updated with relevant risks, mitigation measures, and responses as the project evolved. Notably, medium/high impact risks in the risk register were reviewed by the Project Board during its meetings, included in Highlight reports, and action initiated as required.

156. However, to strengthen the Risk Management approach of specific high value and time-constrained projects, like the HPP, the Organization and the project in particular, should:

(a) Have an independent person(s) or team periodically review the project risks and mitigation measures and actions. This is useful for projects where an objective viewpoint is required, the project is critical or subject to rapidly evolving risks with a high probability of occurrence and impact; and

(b) Identify and ring-fence an explicit risk budget within the project budget based on the aggregate cost of all the project's planned risk responses. The budget would only be used to fund specific responses to the project's threats should they materialize such as covering the cost of any contingent plans if and when a risk materializes.

(iv) Non-Compliant Evaluation of the Project- End Project Report

157. PRINCE2® recommends evaluating a project by reviewing the project's original intent as agreed in the initiation stage and defined by the PID, baselined at the time. This version of the PID which was used to gain authorization for the project is preserved as the basis against which performance will later be assessed when closing the project. The PID is a living document that is updated and re-baselined, as necessary, at the end of each stage, to reflect the current status of its constituent parts.

158. During project closure, an End Project Report is used to review how the project performed against the version of the PID used to authorize it. Further, the report allows for a review of the business case, products that were delivered and lessons learned.

159. In March 2017, the HPP board approved version 1.0 of the PID. During the life cycle of the project, the PID was updated and re-baselined, culminating in version 5.0 which was signed off in October 2018. In March 2019, the HPP was formally closed and an End Project Report was issued after the signing off by the Project Board.

160. The assessment/review of the performance of the project was based on version 5.0 of the PID, which was issued five months before the closure of the project. This updated version of the PID contained some significant changes to important aspects of the project such as, the revised scope, expected benefits and project product descriptions, following the decision to descope some lower criticality deliverables ("could haves") from the project.

161. While the report is a reflection of the end state and was approved by the board, it does not provide a complete and accurate assessment of the original intent of the initial scope of the project as envisioned in the initial PID that was used to gain authorization for the project. Therefore, the basis against which the performance of the HPP was assessed, as indicated in End Project Report, was not in accordance with the PRINCE2® framework.

(v) Benefits Management Approach

162. According to PRINCE2®, a Benefits management approach defines the benefits management actions and benefits reviews that will be put in place to ensure that the project's benefits are realized. The approach incudes, among others, the scope of benefits, which is accountable for the expected benefits, baseline and performance measures, and resources needed to realize the benefits.

163. The HPP Benefits review plan had 10 expected benefits, as per PID that was issued in March 2017. These benefits were later expanded to 14 in the PID that was updated in October 2018. Further, in the End Project Report, the Project Board indicated that all the benefits listed in the PID had been realized or would be realized in the first year of operations i.e., 2019 (based on assumptions of the resources that were discussed and agreed with relevant internal stakeholders) and that no deviations were identified.

164. The Internal Oversight Division's review of the Benefits review plan, which was further updated in February 2021, shows that Operations Service in The Hague Registry was designated as the Benefits owner for 10 out of 14 (71 per cent) of the expected benefits. The newly established HISD was assigned with the ownership of three benefits whilst the remaining benefit is jointly owned by the Hague Operations Service (HOS) and HISD.

165. Based on the assessment conducted within The Hague Registry, IOD ascertained that 78 per cent (11 out of 14) of the expected benefits have been realized in full or partially and 22 per cent (3 of 14) were not realized. However, while 78 per cent of expected benefits have been realized, this has been reached at a cost. For reference, the actual expenditure of the HPP was 6.64 million Swiss francs compared to an initial budget of 4.23 million Swiss francs, resulting in an unfavorable budget variance of 2.41 million Swiss francs.

166. IOD notes that the achievement of some of the key expected benefits is questionable given the realignment and rewording of the performance measurement baseline. For example, one of the expected benefits in the HPP was to "remove dependency on "end of life" technology, reduce "operational related expenses and risks" (as per approved PID dated March 2017). However, in the revised PID (dated October 2018) and the Benefits review plan (dated February 2021) the description of the same expected benefit does not include the monetary element related to "reducing operational expenses". The expected benefit was re-baselined and categorized as "technical" without including the monetary element relating to the 700,000 Swiss francs per annum that the Organization was incurring in maintaining the IBM mainframe and was seeking to reduce by implementing a new platform.

167. Further, the current benefits realization management has some inherent flaws. Specifically, there is no independent confirmation of the benefits realized from organizational investments such as the HPP. Therefore, internal stakeholders such as the PMO, as the Center of Excellence, should contribute to value realization by collaboratively working with the business areas in confirming the benefits realized from a specific project, program or portfolio.

(vi) Pending Recommendations on Project Management in the Organization

168. The Internal Oversight Division conducted an audit of Project Management in 2016[15], and for which three relevant recommendations are still pending to date. Notably, to develop an Organization-wide framework on project management that would include: A definition of a project and clarifying the roles and responsibilities; A governance structure with clear linkages to risk management and accountability framework of the Organization; and Procedures and standards for effective project management that address the main project management practices and themes.

169. Furthermore, IOD notes that certain systemic issues highlighted during the audit of the HPP can be addressed among others, through the implementation of the pending recommendations. While acknowledging that other issues raised may be isolated cases applicable only to the HPP project, it is nevertheless necessary to clearly identify and assess systemic and non-systemic issues. These issues include among others:

(a) Defining PRINCE2® guidance on future projects roles, responsibility and accountability of the Project Board;

(b) Establishing TOR to formalize the appointment of Project Board Members;

(c) Tailoring PRINCE2® training for Project Board Members;

(d) Defining the mandate of the Project Management Office to include, working with the business areas in confirming the benefits realized from a specific project, program or portfolio;

(e) Establishing guidance for future projects where a system, a solution or a platform must be introduced or redesigned as new, including guidance on the decision of a greenfield approach, and outlining key criteria for the decision;

(f) Identifying relevant improvements such as: setting project timelines based on defined scope of works, additional budgetary guidance, and introducing a template for presenting project related budgetary and financial information which covers all phases of the project, including the after Go -live / Hyper care phase[16]; and

(g) Adapting the project management methodology to cover risks of misalignments related to agile development including defining the Minimum Viable Product and Target Operating Model.

170. Given the material importance of projects including the Capital Master Plan projects, and the need to verify the degree to which issues identified in the HPP project are systemic, IOD will consider a follow-up audit of project management, to among others, assess consistency in project management and governance practices, verify how lessons learned benefit various projects, and assess effectiveness of any cross collaborations in enhancing efficiency gains and learning.

(G) INFORMATION TECHNOLOGY SERVICE MANAGEMENT

171. As part of the project closing process, the project product must be passed to an operational and maintenance environment. PRINCE2® recommends, among others, that the project team confirms that the correct operational and maintenance environment is in place when transferring the responsibility for the products from the project to the operations and

[15] IA 2016-04 - Audit of Project Management.
[16] Hyper care phase allows for a smooth period of transition from implementation resources leading the project to support resources who will be supporting and assuring customers going forward. During this period, implementation resources work closely with the customer to track and resolve any production issues.

maintenance team. In the case of the HPP, this was done by the Project Board, based on regular work plan discussions.

172. Generally, when a newly developed system potentially requires extensive support and maintenance, a suitable service agreement or contract should be in place between the organization and the external team/developers that will provide the maintenance and support. Such an agreement should be included as a product to be developed by the project. IOD makes the following observations on the IT service management of The Hague Platform.

(i) Inadequate Plan to Address Open Issues after Go-Live

173. The new Hague system was scheduled to go-live by the end of 2018 as the HPP entered the closure stage. The budgetary pressure and delays related to the data migration, resulted in the Product Owner and user descoping "could have" functionalities and specific business-views on testing of the data migration.

174. In particular, the difficulty with the data migration was initially seen as a showstopper for the go-live decision (June 29, 2018). However, one month later (July 30, 2018) the "Go-No Go Checklist Report Update" indicates that the Board was informed by the business operations (project user) that the decision was a "Go". The go-live took place by means of a detailed planned transition exercise. The approval for the go-live was given by the key stakeholders.

175. Further, the project was defined on a time and material basis with the contractors, rather than on the basis of a work contract with a fixed deliverable. Hence, at the end of the final stage five, the project was completed with limited support in place from external developers, to fix issues in the first operational phase, when system errors and bugs typically arise.

176. Even if the functionalities were tested during their development, they had not been used with real data. As a result, at the end of 2019, there were 1,223 service requests created one year after the project transitioned into operations (all as a single large bucket comprising issues, bug fixes, changes, legal changes such as implementation of three new accessions etc.). Whilst a budget was made available for brief interventions by the external suppliers, it was provided iteratively, and was limited and insufficient. This resulted in, among others, challenges in retaining the commitment of skilled experienced personnel.

177. The service and change requests that were created since going live were divided into several categories, such as "blocked cases" (due to migration), "corrections", and "improvements". Additionally, HISD has since added tickets related to technical maintenance of The Hague Platform and for other business change and improvement activities (such as the HEP, new accessions, legal rule changes, etc.).

(ii) Unresolved Service Requests

178. The support and maintenance model established by HISD to support the Operations Service and other relevant business areas, should be enhanced as it has core resources assigned to stable roles. These business areas largely depend on a well-functioning IT infrastructure to deliver accurate, reliable, and timely services to its clients. Therefore, the support model designed towards efficiently resolving operational issues and change requests needs to be understood by all parties. IOD makes the following observations:

(a) From September 2018 to January 2021, 116 issues remained unresolved until March 2021. By June 2021, over 60 per cent of these issues were resolved and closed and the current list of pending issues stands at around 40. Only three of these are over six months in age, and a majority of new issue requests are resolved within a week;

(b) Twenty "could have" functionalities that were descoped from the HPP in 2018 are unresolved, some of which did not exist in the legacy system (and for transactions that are

yet to be received), while some of these have workarounds, others have not yet been needed;

(c) Despite weekly coordination meeting between HISD and HOS there is a need to bridge the communication gap between HISD and other business areas within The Hague Registry. HISD should strike a balance between technical improvements and the resolution of operation issues that are currently being faced by the Operations Service;

(d) A resolution time for open issues is defined but not yet fully applied from the perspective of HOS, with only a priority list available. Therefore, there is a need for a common view on how to measure the resolution time for issues; and

(e) Ensuring that appropriate and stable resources are in place in HISD would help the support team move from a reactive approach to a proactive, streamlined and simplified service management model that is linked to the Organization's Results Based Management framework.

179. Out of all the service requests, there is a list that was developed and shared between HISD and HOS which has 115 "must-fix" service requests. As of June, 2021, HISD indicated that 85 per cent of the requests on the "must- fix" list were addressed. Further, HOS estimates that the full implementation of the "must-fix" list and of the current list of service requests could lead to a reduction of the operational burden by up to 25 per cent. This would allow HOS to cover the expected increase in the workload arising from onboarding of new Contracting Parties.

180. The current support model can be enhanced by making some changes to key roles that are responsible for supporting and resolving the ongoing operational issues, coordinating software changes and maintaining The Hague Platform. There is a need to optimize resources by transferring some of the support activities in HISD to the relevant business areas in ICTD. However, this needs to be carefully assessed to ensure that there is a strategic alignment between The Hague Registry and the long-term strategies of ICTD. The prioritization, categorization and resolution time of service requests need to be mutually agreed and understood by the relevant stakeholders.

181. Finally, The Hague Registry should take stock of the workarounds performed by the Operations Service and work towards minimizing them as some are complex, technical and time consuming.

(iii) Blocked Cases

182. Since May 2020, Operations Service and Hague Development and Promotion Section (HDPS) have been maintaining separate lists of examiner and client complaints concerning applications and other transactions. Specifically, there is a consolidated list of Hague blocked cases that the Operations Service created to keep track of the complaints and measure the extent to which HISD is resolving the tickets associated with these complaints. This list is maintained and updated on a daily basis by Operations Service while HISD reviews it periodically.

183. As of June 2021, there were 79 blocked cases. Out of these 79 cases, 48 relate to descoped service requests which have been pending since the launch of The Hague Platform in December 2018. The descoped service requests can be broken down as follows, refusal of change of ownership (five), merger (two), refusal of correction (18), and invalidation (23).

184. The number of blocked cases have reduced from 931 in January, 2021 to 79 in June 2021. The Hague Registry should address the pending developments in the back office, in particular cases that have been outstanding for a considerable period of time.

(iv) Customer Orientation - Feedback from Internal Clients

185. The HISD is an internal service provider to other business areas such as Operations Service, HDPS, Finance, and Translation. As a service provider and an integral part of The Hague Registry, HISD needs to measure the level and quality of services provided to its clients through established feedback mechanisms.

186. At the time of this engagement, The Hague Platform had been in operation for over two years. During this period, IOD noted that HISD has been focusing on fixing issues and has not formally sought feedback from its clients on how satisfied they were with their services, particularly on the quality of their work and the timeliness of their services. Further, whilst formal feedback has not been sought, both the Finance and Enterprise Solutions Divisions have held meetings with HISD staff to address and resolve issues since the go-live. These meetings were held weekly, fortnightly and then monthly basis.

187. The HISD should enhance service management in the Hague Registry following the recruitment of a service manager. Specifically, the Division should regularly solicit feedback from its clients to gain valuable insights on the level and quality of services it offers and identify opportunities for improvement from the customer's perspective. When combined with other mechanisms such as open forums and targeted workshops, a feedback mechanism in the form of a survey, for instance, can be a useful source of performance metrics for the HISD.

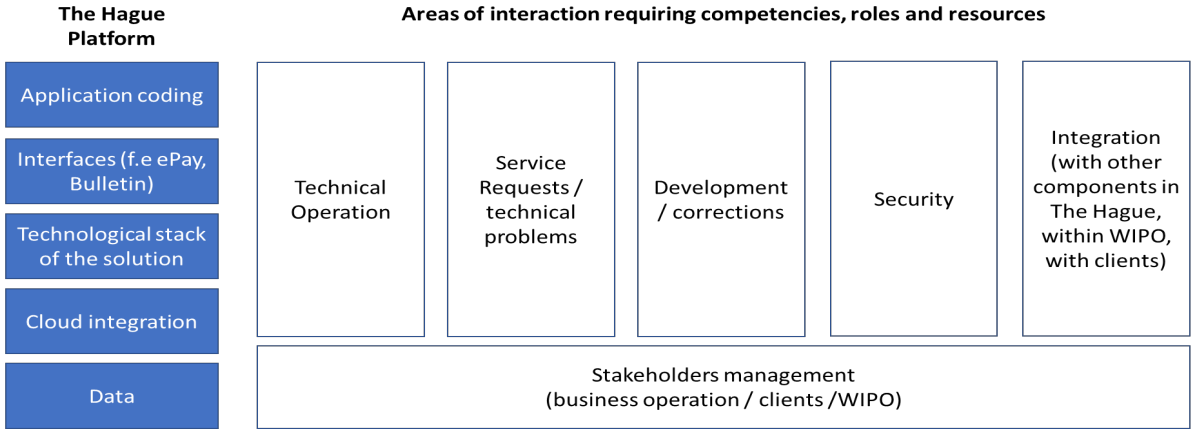
(H) SUSTAINABILITY OF THE HAGUE SUPPORT AND MAINTENANCE MODEL

(i) Current State of The Hague Support Model – Technical Elements

188. The Hague Platform is a customized solution designed to fulfill the needs of The Hague Registry, hosted in a Cloud platform entirely owned by The Hague. The platform includes several technical elements and requires that the structure of the HISD has specific competencies, roles, and resources available, to operate and maintain it over the long term, satisfying the needs of several stakeholders.

189. Figure D provides an overview of the technical elements of the platform and of the interaction areas needed to fulfill the needs of the stakeholders from an IT perspective.

Figure D: Technical Elements of The Hague Platform



Source: Prepared by IOD and PWC

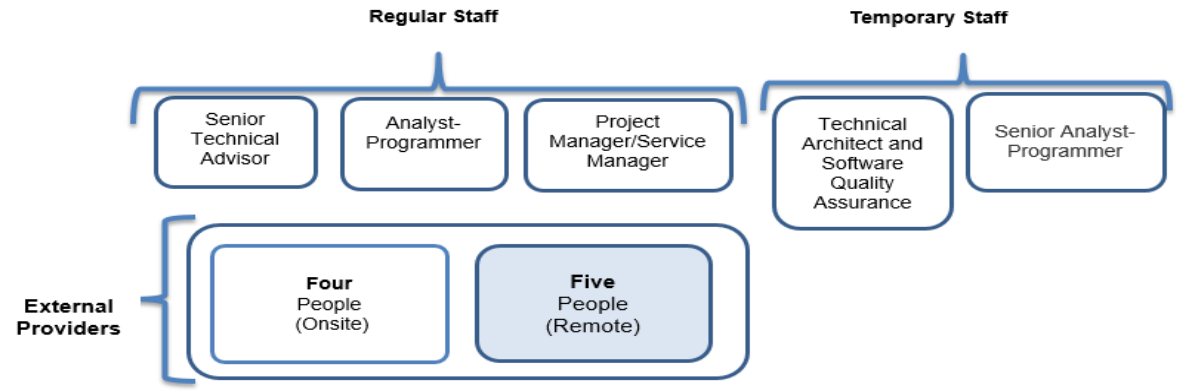
190. The platform is currently maintained by combining Development and Operations resources (DevOps) with an agile development approach. Since security is a key requirement for The Hague and has been embedded in the general approach, we can refer to the current support model as a DevSecOps.

191. HISD is working on reducing the backlog of issues while at the same time, working on improvements and related projects, such as the HEP, new accessions and rule changes. It is expected that DevSecOps activities, including maintenance and developments to correct errors, continuous improvements to the systems and the onboarding of offices with special technical requirements, will continue in the medium term.

(ii) Current State of The Hague Support Model – Resources and Costs

192. The Hague currently relies on external providers and temporary staff for core IT support and maintenance. As it stands, the HISD has limited means of retaining valuable IT skills and expertise in The Hague system. There is a risk of turnover and continued dependency on these resources, which will adversely hamper HISD's efforts to effectively and efficiently support The Hague system. More so, regular staff does not possess the same specialized knowledge and practical expertise that the external resources possess.

Figure E: The Hague Information Systems Division – Composition of Technical Personnel



Source: Prepared by IOD based on HISD documentation

193. As can be seen in the Figure above, out of 14 technical personnel who support The Hague Platform, three are regular staff, two are temporary resources whose two year contracts are drawing to an end, while nine are resources provided by the external providers.

194. The current support model, as depicted above shows that HISD is heavily dependent on the external providers' (non-personnel) i.e., 64 per cent (nine out of 14) resources. This dependency is also reflected in the distribution of costs for personnel and non-personnel resources in HISD as shown in the Table below.

Table 6: Hague Information Systems Division (HISD) – Personnel and Non-Personnel Costs

Year	Personnel Costs (Sfr.)	Non-Personnel Costs (Sfr.)	Total (Sfr.)	Proportion of Personnel costs	Proportion of Non-Personnel costs
2019	1,269,670	998,254	2,267,924	56%	44%
2020	1,497,713	899,773	2,397,486	62%	38%

Source: Prepared by IOD based on data from Office of the Controller

195. As seen in the Table 6 above, a total of 2.2 million Swiss francs and 2.4 million Swiss francs was spent by HISD in 2019 and 2020, respectively. Non personnel costs constituted 44 per cent and 38 per cent of the total costs for HISD in 2019 and 2020, respectively. HISD spends close to one million Swiss francs annually on external providers. These roles are exclusively assigned to the HISD and as such there is no cost sharing of resources or related costs with other related business areas in the Organization. Personnel costs which include the

HISD administration accounted for 56 per cent and 62 per cent of the total costs for 2019 and 2020, respectively.

196. During the post go-live period, The Hague Registry held formal and informal meetings with relevant internal stakeholders including the Director General, HRMD, and Office of the Controller, to emphasize the need to retain specialized and skilled IT expertise, without which HISD will not be able to meet customer expectations.

197. Going forward, IOD proposes that the Office of the Director General in coordination with relevant business areas should take measures to consolidate the current IT structure and resources of the Hague Registry with a view of stabilizing operations in the long-term.

(iii) Future State of The Hague Support Model – Expected Roles and Responsibilities

198. HISD is expected to protect the interests of various stakeholders (business areas in The Hague Registry, the members, onboarded operators and HOS) on the platform, represented by its business, IT strategies and the Organizations/boards in charge of those strategies.

199. These interests are protected by efficiently fulfilling long-term objectives. These include, maintaining operation of the solution and data integrity and security, sustaining the application solution on the technical level, and responding to service requests of HOS and other business areas in The Hague Registry. Other objectives include support of onboarding of new operators, continuous improvement of the platform, and the integration of the platform with other solutions of The Hague and of WIPO.

200. There are opportunities to optimize resources and enhance the support model of The Hague platform. In determining the optimized use of resources, roles and responsibilities, of the structure within HISD, IOD performed an assessment on the basis of a number of assumptions on the continued use of, and enhancement of the tool, as well as support and enhanced collaboration with other internal IT stakeholders, among others.

201. Further, the assessment assumes that several standard and adapted roles are expected to be present in the proposed IT structure, such as: Solution Architects, Cloud Architects, Service Manager, and Database Administrator, among others (see details under Annex III). Additionally, aligning the architecture of the solution with other solutions to optimize costs was considered. Interactions on the platform require a clear understanding of the overall platform and the basis, upon which, roles are assigned (including instance where roles are held within HISD or other IT structures of WIPO, and/or roles combined under one individual or shared among many).

202. Currently, IT operational roles are performed by temporary personnel, for example, the onboarding manager. Further, some roles within the Division have reached a point where they could be optimized by transferring responsibility to other business areas within the Organization (e.g., ICTD, SIAD).

203. Further, some key knowledge areas of the solution, such as eHague are important from a business perspective. Knowledge must be retained for support and possible improvements. Developments in these areas will require technical and business understanding to be combined.

204. Finally, there are also ongoing or expected infrastructure or cloud activities to align the cloud platform of HPP - the development of a CI/CD pipeline and the merging of the cloud accounts centrally managed by ICTD with the assistance and guidelines of CMU on the cloud platform, which are, and will be applied to all other applications already in, or moving to the cloud.

205. The extent and timeframe of all these activities impacts the dimensioning of the structure of HISD. Business and technology knowledge are key to maintain the performance of The Hague Platform. Therefore, the structure of HISD should have a stable number of fixed personnel to retain the requisite knowledge and competencies needed to ensure normal operation. Further, the scalability of activities, based on a regularly revised prioritization and budget allocation, could be achieved by leveraging temporary personnel and competencies from other business areas.

206. Table 7 below describes the expected operational roles to support the HISD including the assignment of primary and secondary responsibilities to ensure business continuity for The Hague Platform. The expected roles are compared with the proposed resource needs submitted by HISD as part of the 2022/2023 budgeting process. The Table further integrates other IT structures within the Organization, which can take on primary roles in a service management approach.

Table 7: Expected Operational Roles with Primary and Secondary Responsibilities

Expected operational roles vs job type as in budget		HISD Internal positions				temporary	Other WIPO organisations				Contractors	
							ICTD		HOS	Infosec		
		Senior Solution Architect	Senior developer	Senior developer	Service/ Project Manager	JPO (China)	Cloud	DBA			Senior Contractor	Junior Contractors
Key IT operation roles	Solution architect and technical lead for the software and the solution	Primary	Secondary									
	DevOps engineers and developers		Primary								Secondary	Secondary
	DevOps second level engineer with focus on development	Secondary	Primary	Secondary							Secondary	
	Release Manager	Primary	Secondary									
	Quality assurance	Secondary	Primary						Primary			
	Security	Secondary								Primary		
	Service Manager				Primary							
Temporary or roles to centralize	Cloud architect and technical lead on infrastructure		Secondary				Primary					
	Database Administrator							Primary				
	Data management	Primary		Secondary					Secondary			
	Onboarding manager					Primary						
Key competencies	eFiling / eRenewal Knowledge eNotification - Automation		Secondary	Primary					Primary		Secondary	
	Finance		Primary									
	Publication - support to office I/O			Primary	Secondary							

Source: Prepared by IOD and PWC

207. Based on the table above, the primary and secondary roles for supporting The Hague Platform can be managed as follows:

(a) The responsibility for the cloud architecture could be moved to the CMU within ICTD. The architecture for the cloud is defined and deployed. Current ongoing initiatives are aligning the implemented architecture with the CMU guidance. When changes are needed, CMU will need to provide the resources and competence;

(b) Knowledge of the solution architecture can be kept within HISD;

(c) The responsibility for database administration could be moved to ICTD. Support could be obtained from them, when needed;

(d) Three key temporary posts (Senior Solution Architect, Senior Developer and Service/Project Manager) and one of the key senior contractor positions could be internalized to ensure that, in the long-term, the technical knowledge is available to HISD and allows for the effective management of the contractor resources;

(e) Knowledge and responsibility in the business areas should be shared with HOS and HDPS addressing issues and improvements in a joint form: a technical lead in HISD can

manage a developer and someone with relevant business or legal knowledge, within The Hague Registry, to address issues and determine improvements;

(f) The extent and effort needed for data management is related to pending strategic decisions about the incomplete elements of data migration. If all data is migrated, then financing this effort could be made over time on a case by case basis, supported by internal or external contractors; and

(g) Assurance activities such as review or development of the security architecture, security testing, security monitoring post go-live, can be performed by SIAD. Certain operational activities such as security administration would remain with the CMU.

208. Some of the challenges identified in The Hague support model can be addressed by developing a pool of specialized resources in ICTD to service different business areas in the Organization including the Hague Registry.

(iv) Proposed Work plan for Resources

209. IOD notes that the HPP did not have a consolidated work plan for resources following the transition into operations. IOD proposes that a work plan be established, which includes three working areas for which to tie the expected operational roles that will be assigned primary and secondary responsibilities in the envisaged Hague support model. These areas are outlined below:

(a) **Ongoing support and prioritization** - this area encompasses normal maintenance, corrections of unresolved project issues, and the development of new functionalities to improve operations in The Hague business areas. These activities require joint prioritization and specifications by HISD and HOS and time commitment by HISD for the resolution;

(b) **Platform consolidation -** this area covers the efforts to bring the cloud platform under the overall guidance of the CMU (CI/CD pipeline) and the potential migration of the technical cloud account into the technical account of WIPO;

Further, this working area addresses the completion of the data migration, depending on decisions that still need to be formally taken. A decision will have to be made on whether all data records be migrated or whether only blocked data will be migrated on a needs basis. Other considerations are on whether HOS and HISD can cope with defined workarounds;

A balance between effort and result needs to be reached to keep costs reasonable, since some of the data migrations could imply large efforts. The effort for the technical support of onboarding other offices needs to be considered in this bucket. Additionally, after consolidation of the CI/CD pipelines, limited access for DevOps may require the development of tools to continue providing support, corrections, and improvements; and

(c) **Architecture improvements** – this area addresses potential changes in the solution's technology. Despite the solution being technologically consistent and sustainable, the deviations from related decisions taken after the project start by other WIPO projects, and by ICTD, could lead to unnecessary maintenance costs for the future.

210. Table 8 below provides a proposed consolidated work plan with tentative timeline for the three working areas, namely, ongoing support and prioritization, platform consolidation and architecture improvements.

Table 8: Proposed Workplan with Working Areas and Deliverables

	2021 – 2022				2022 – 2023			
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Deliverables	Work plan V1				Work plan V2			
		Major system release		Major system release		Major system release		Major system release
Ongoing support and prioritization	Issue and change request	Business requirement specification		Change request prioritization	Business requirement specification			
	Resolution of high and medium priorities issues							
		Resolution of low priority issues, Implementation of change requests						
Platform consolidation	Migrate to WIPO CICD							
	Re-assess migration of data	Migration of data accordingly to decided strategy						
	Improvements for system support (reduce unnecessary manual interventions)							
	Technical support for exchange between offices and IB							
Architecture Improvements	Architecture review							
		Proofs of concepts if needed						
		Improvements or replacements of system components as needed						

Source: Prepared by IOD and PWC

211. From the outset, all efforts should be evaluated and assigned a timeframe including necessary adjustments to budgeted resources; further, an annual re-evaluation should be conducted. The dimensioning of the HISD and the budget for the temporary/contractor workers will depend on strategic decisions, such as: completion of the data migration, implementation of the descoped functionalities, timeframe for the alignment of The Hague CI/CD with the Organization's CI/CD following the CMU guidance (for the CI/CD platform and for the transfer of the cloud technical account of HPP to a WIPO cloud technical account).

212. Based on the above considerations covering the platform, the currents resources, the work plan and deliverables, as well as the need to ensure sustainability, IOD identified the following key roles for the HISD, which are shown in Table 9 below.

Table 9: Expected Roles for an Effective Management of The Hague Platform

Senior technical lead	Service/Project Manager
Senior Developer	Senior/Junior contractors
Developer	Onboarding Coordinator/Manager
Senior Developer	

Source: Prepared by IOD and PWC

213. The Organization should, through the Office of the Director General and in collaboration with the Brands and Designs Sector, and other relevant stakeholders such as ICTD, make a decision on the resources required to effectively and efficiently manage The Hague platform.

(I) HAGUE EXTERNALIZATION PROJECT (HEP)

214. HEP is a Capital Master Plan project that was approved by the WIPO Member States in October 2019. The project has a budget of three million Swiss francs and is expected to run over two-and-a-half-year timeframe i.e., May 2020 to December 2022.

215. Further, the HEP is user-focused project that aims at delivering sustainable, user-driven services and enhanced standardized integrations with Offices. It seeks to address the IT developments required for modernizing and streamlining of all external-facing business

functions. Notably, functionality improvements, including enhanced services and features for Offices, applicants, and third parties as well as internal automations were not included as part of the HPP.

216. IOD notes the following with regards to the HEP, when viewed in the context of the HPP:

(a) One benefit under the HPP was deferred to the HEP in accordance with the Cloud Management Unit, Disaster Recovery Plan. The benefit relates to aligning the IT infrastructure with the Business Impact Assessment for The Hague Registry;

(b) The scope of the HEP includes consolidation of legacy Registry information to the new platform alongside associated granularization, specifically, the continued legacy data normalization and consolidation in line with operational business priorities. Data migration to the new Hague system was a challenge and, there are open issues relating to legacy data. In addition, the absence of some historic data could affect the usability of the new system and delay the realization of some benefits under the HEP;

Therefore, these data dependencies and unresolved issues can impact the deliverables of HEP. A well-functioning back office is essential to the operations of the front office applications; and

(c) Further, the resources (personnel) involved in resolving the back-office issues are also part of the project management team of the HEP. Thus, the personnel has to deliver on two fronts that are running in parallel with both activities requiring adequate attention.

217. Finally, the HPP identified several lessons learned which would benefit PRINCE2® managed projects in the Organization. For example, the project structure and assignment of roles and responsibilities in the HEP reflects one of the lessons learned in governing and managing the HPP. Several recommendations made in this report will benefit and support an effective implementation of the HEP and other future relevant projects within the Brands and Designs Sector and across the Organization.

Recommendation (s)

1. The Office of the Director General in collaboration with the Brands and Designs Sector and other relevant stakeholders, should take measures to consolidate the current IT structure and resources of the Hague Registry with a view of stabilizing operations in the long-term.

   (Priority: High)

2. *One recommendation made in this part of the report has been withheld due to its sensitive and confidential nature.*

3. The Hague Registry and the Information and Communication Technology Department (ICTD) should coordinate to complete the adjustments to align The Hague Continuous Integration/ Continuous Deployment (CI/CD) Pipeline. The revision should include the technical support processes and confirmation of ICTD Service Level Agreements (SLAs), confirmation of access to The Hague back office production environment and be undertaken within a defined work plan.

   (Priority: Medium)

4. The Brands and Designs Sector should work with the Administration, Finance and Management Sector, the Office of the Director General and other relevant stakeholders to review The Hague Back Office architecture, in conjunction with the Architecture and Design Task Force. The review should focus on enhancing the system's cost-effectiveness and on provision of tools that can be used for enhancing service management.

(Priority: Medium)

5. The Information and Communication Technology Department (ICTD) should in coordination with relevant internal stakeholders, formalize the need for software development activities including those in the projects to comply, to the extent feasible, with the IP Portal work on developer practices which cover shared and converged practices and include aspects such as end-to-end testing and the use of real migrated data, even when an agile approach is planned.

   (Priority: Medium)

6. The Hague Registry should agree on a service management approach that defines the expected resolution time for all the open issues and the reported statistics as this will facilitate a common understanding of the resolution timeframes and prioritization of service requests.

   (Priority: High)

7. The Hague Registry should make a formal decision on how to handle the remaining blocked cases, workarounds and on introducing changes and improvements by quantifying the associated cost/benefit. These decisions should be included in a formal work plan.

   (Priority: Medium)

8. The Hague Registry should establish a standardized service management feedback mechanism across its business lines. The mechanism should facilitate the qualitative and quantitative measuring of client satisfaction levels from one period to the next.

   (Priority: Medium)

9. The Brands and Designs Sector should work with the Administration, Finance and Management Sector, the Office of the Director General and other relevant stakeholders to:

   (a) Determine the key objectives for ongoing support, platform consolidation, and architecture improvements to the Hague IT system; and

   (b) Define a work plan (reassessed annually) to ensure that there is an appropriate balance and prudent use of resources/budget, and adherence to the defined timeframe.

   (Priority: High)

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Prepared by: Bevan Chishimba, Internal Audit Officer IOD, and PWC, External Consultants

Reviewed by: Alain Garba, Head, Internal Audit, IOD.

Approved by: Rajesh Singh, Director, IOD.

ANNEX: 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 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 I.1: Effectiveness of Risks/ Controls and Residual Risk Rating

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

Table I.2: Priority of Audit Recommendations

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

[End of Annexes and of Document]