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Abstract

This report documents the methodology and results of a Feasibility Study. The study determines the applicability, desirability and impact of certification services for third-party tools within the Planets Testbed. Certification is meant as an informational cue, external to the service itself. Consumers can use this cue to form an opinion about the quality of a given service. Evidence was collected from surveys and interviews with representatives of the target market, members of the Planets Community and analysis of Planets publications. The study identifies a number problematic areas and concludes with an alternative to certification services for third-party tools as a user rating scheme.

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EXECUTIVE SUMMARY

This report documents the methodology and results of a Feasibility Study. The study determines the applicability, desirability and impact of certification services for third-party tools within the Planets Testbed (PTB). The Planets Testbed is a controlled environment for experimentation and evaluation. It offers metrics and benchmark content that permit comparison of preservation strategies and tools. These tools are not embedded in the main Testbed application. Instead, they are provided by some third-party source. The study focuses on the feasibility of providing certification for the PTB tools. Certification is meant as an informational cue, external to the service itself. Consumers can use this cue to form an opinion about the quality of a given service.

The feasibility study is divided into four main parts:

1. Product Analysis provides an overview of the Testbed and the incorporation of tools within the Testbed. It also explains the meaning of software certification and the nature of its application on preservation tools in the PTB.
2. Intended Market Analysis describes the target market where the PTB is situated. This includes the projected user communities that it is meant to attract and alternative solutions. This part concludes with a needs assessment conducted with representatives of heritage institutions and the tool developers' community.
3. Legal Analysis outlines the regulations related to certification services. These derive from licensing and the implications of software certification processes.
4. Findings and Recommendations presents the results of the Feasibility Study regarding the viability of implementing certification services for third-party tools in the PTB.

We collected evidence from surveys and interviews with representatives of the target market and members of the Planets Community. The findings were complemented by document analysis of Planets publications. In particular, we reviewed previous surveys on the Testbed and the Planets project in general. This evidence suggests that the Testbed user community is aware of certification processes and exhibits a general interest in the process as a trust and quality indicator. However, the feedback revealed little need for certification services for third-party tools in the PTB . The survey participants would still use the application regardless of formal certification services. Instead, participants proposed some form of community consensus in evaluating the suitability and efficiency of preservation tools.

The study identified two problematic areas that hamper the potential success and viability of certification services:

1. The lack of agreement on a specific software certification model that will guide the process and direct the functionality of the services.
2. The current lack of a software license covering the PTB. A software license would govern the usage of the application and determine liability and responsibility between the parties entering into the agreement.

At present, these issues create an unfavourable situation for the implementation of certification services and constitute the overall concept unfeasible.

We conclude that an alternative to certification services for third-party tools would be a user rating scheme. The scheme delegates the evaluation of preservation tools to the group of users. This accords with the target market feedback and presents less risks from legal implications associated with formal certification.

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1. Introduction

This technical report documents the methodology and results of a Feasibility Study. The study determines the applicability, desirability and impact of certification services for third-party tools within the Planets Testbed (PTB). The study addresses the scope and goal of certification services. We have therefore evaluated their viability from a technical, legal and market perspective. The study is expected to:

- Support decision-making for the introduction of certification services.
- Provide a benchmark framework for measuring how well third-party tools address their intended purposes.
- Contribute to the current knowledge of parameters that can affect the outreach, dissemination and adoption of the Planets Testbed.

The Digital Curation Centre (DCC)[i] has contributed to the authoring of this document. The DCC is currently working to promote the use of the Planets Testbed for curation and preservation experiments amongst the UK HEI research community. The DCC wholeheartedly supports the use of the PTB for empirical analysis of curation and preservation.

1.1 Study Objectives

The overall aim of the study is to objectively assess the feasibility of certification services for third-party tools. Furthermore, we distinguish the key issues involved in the go/no-go decision to implement such services. In order to achieve this, we have identified six feasibility factors that are associated with third-party tool certification. These include:

1. The situations under which certification services could operate as part of the Planets Testbed environment.
2. The opportunities for certification offered by the current market environment, the related legal framework and the Testbed itself.
3. The amount of support from tool providers that can be reasonably expected for certification of their software products.
4. The need for certification services as indicated by the PTB stakeholders.
5. Potential problems arising from the introduction of certification services.
6. Limitations and benefits from incorporating certification functionality in the Testbed.

The feasibility factors are not independent of one another. They collectively judge the viability of certification services in the PTB. The factors also provide a roadmap to decision-making for potential implementation.

1.2 Study Methodology

The study methodology has been developed to ensure a suitable balance between market potential, technical affordability, legal compliance and user needs. It is guided by the requirements of the implementation process in terms of both timeline constraints and funding availability. It provides an understanding of the value derived from introducing third-party tools certification for the stakeholders. The feasibility study model has been identified as an appropriate method to achieve the study objectives. In general, feasibility studies are analytical tools that follow a controlled evidence-based procedure to determine the viability of a concept, by highlighting recommendations and limitations. This evidence can be used to inform decision-making processes (Thomson, 2005a). The results of the study show how a specific concept would perform under a pre-defined set of assumptions. These assumptions include the technology to be used, the market environment and financial aspects. Moreover, the results assess the potential of the concept to evolve into a successful endeavour (Matson, 2000). Feasibility studies are common in business project planning, but their suitability spans to other domains. Emphasis can be placed on specific sections, depending on the needs of the project and the body commissioning the study.

Before using the results, we should consider the limitations of feasibility studies that also apply here:

- The study by itself does not decide the worth of a concept. However, it provides information that can assist in risk assessment prior to undertaking a project.
- The study is tailored to the dimensions that identify the viability of one specific concept. The results can therefore not be extrapolated to other projects.
- The study is not a means to generate new ideas for a concept. Although the results may reveal uncaptured ideas, the study focuses on the pre-defined assumptions.
- The results of the study should be objective. The results should not represent the desire to support the success of the concept. In fact, understanding that a concept is unfeasible can avert inappropriate investment of resources and is thus a positive result.

Bearing these limitations in mind, the methodological approach for this study is represented in the following structural outline:

1. **Product Analysis** describes the Planets Testbed and its functionality. We discuss the role of third-party tools and the manner of their deployment within the Testbed environment. We also define software certification in the context of this study.
2. **Intended Market Environment Analysis** describes the target market where the PTB is situated. We explain the projected user communities that it is meant to attract, based on findings of previous studies conducted by Planets ((Rog *et al.*, 2008), (Sinclair & Jardine, 2009)). We also review alternatives to the PTB and how certification was addressed in these cases. The Market Environment Analysis concludes with the findings of a needs assessment survey conducted for this study. The survey was addressed to Heritage Institutions, current PTB tool suppliers and preservation software developers.
3. **Legal Issues and Intellectual Property Analysis** discusses the license agreement under which the PTB is currently operating. We assess the potential implications from using third-party tools within the Testbed environment from an intellectual property/copyright perspective. We also outline the regulations that might affect certification services. These regulations derive from the legal implications of software product certification processes and allocation of certification marks.
4. **Findings and Recommendations** presents the results of the Feasibility Study regarding the viability of implementing certification services for third-party tools in the PTB. These findings and recommendations arise from the analysis of the Market, Technical and Legal Dimensions of Viability as defined in (Thomson, 2005b). In order to measure the contribution and weight of each dimension to the overall viability of the studied concept, we are using the Dimensions of Business Viability Model devised by Thomson (*Ibid.)*. The model is a generic framework for identifying individual tasks to validate the studied concept. It presents a flexible solution that can be customised to the needs of this feasibility study. This part concludes with recommendations on the likelihood of success of certification services, projected return on investment and moderation of possible risks from implementation.

The PTB is a sub-project of the Planets Suite and therefore bound by the management and funding procedures of the greater project. We have therefore excluded from our analysis such factors as: Business Model viability, marketing and sales strategies, and management and personnel requirements. These factors have been considered as equal to zero in our calculations, although some of them might be pertinent to a favourable outcome of the studied concept.

2. Product Analysis

2.1 Overview of the Planets Testbed

The Planets Testbed is a web-based application for digital preservation. It provides a solution to the lack of "reliable comparative information about the effectiveness of different strategies [and tools] for preservation" (Rog *et al.*, 2008). The Testbed offers a controlled environment for experimentation and evaluation. Its metrics and benchmark content permit comparison of preservation tools and strategies (Kaiser, 2009). The results of these comparisons inform users on the applicability and usability of the tools featured in the PTB. Additional services allow for practical experimentation with many data types in various settings. The experiments are conducted on existing corpora of data so that the suitability of preservation strategies can be tested before adopting them for an organisation's own data. At the same time, mechanisms exist in the PTB to repeat experiments and validate their results. The aggregated set of finalised experiments forms a knowledge base. This knowledge base promotes a common understanding on best practices and creates a community of users who share similar concerns in digital preservation (Kaiser, 2009, p. 8).

From a technical point of view, the Planets Testbed achieves cross-platform interoperability and independency due to the use of open standards and Java technology. The PTB largely depends on infrastructure and external software modules developed within the Interoperability Framework (IF) sub-project (Aitken *et al.*, 2007). The IF infrastructure supports digital preservation activities through distributed services, which are deployed via a Service Oriented Architecture (SOA) (Roberts *et al.*, 2006). This approach helps users to locate preservation tools as integrated services of the Testbed, alleviating the need for local deployment in a given institution.

2.2 Third-party Tools in the Planets Testbed

As mentioned above, the Interoperability Framework is responsible for enabling components and services to interact within a distributed network. In particular, the Service Registry is a key component of the overall IF infrastructure. The Service Registry enables the registration and management of preservation tools within the Planets Suite and therefore within the PTB. These tools are not embedded in the main Testbed application. Instead, they are provided by some third-party source (see Figure 1).

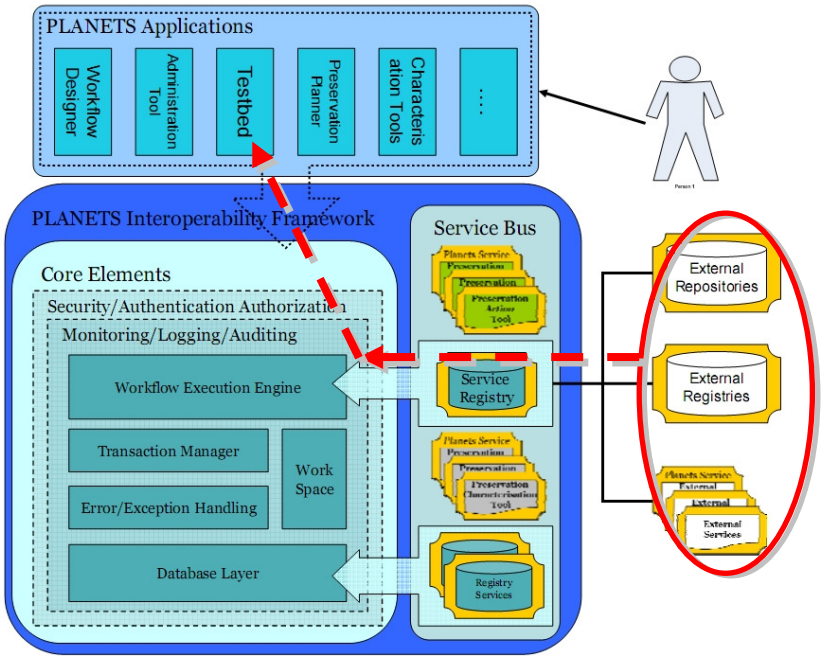


Figure 1: Main Components of the Interoperability Framework (Roberts *et al.*, 2006)

External services, registries and repositories (marked by a red circle) are registered with Planets applications, such as the Testbed, through the Service Registry component of the IF.

All preservation tools required for experimentation in the PTB are "wrapped" and deployed as Web Services. These are registered with the Testbed and accessed by users through service templates to initiate the usage of a specific tool. Helwig *et al.* (2007, p. 8) clarify that the PTB does not provide the means to test tools but services (wrapped tools). These can be reused so that the same tool can be employed in more than one service through different parameterisation. At present, available functionality in the Testbed involves Characterisation, Emulation, Identification, Migration and Validation services for preservation. Indicative tool providers include the National Library of New Zealand, ImageMagick, the GIMP image manipulation software, the National Archives (UK), JSTOR and the Harvard University Library.

2.3 The Meaning of Software Certification

Certification as a concept has its roots in the Marketing profession. It is considered as a *signal*, a marketer-controlled easy-to-acquire informational cue, external to the service itself. Consumers use it to form an opinion about the value and quality of that product (Bloom & Reve, 1990).

Certification confirms the compliance of a product or service with certain criteria. These criteria reinforce its accordance with pre-defined minimum standards. Certification can add value to a service and benefit both producers and users. It promotes economies of trust and reassures users of the service quality. Furthermore, certification gives producers incentives to deliver on quality promises and maintain high levels of service provision (Mishra, 2006). This focus on quality is the driving force for seeking and acquiring certification. On the other hand, the high initial and on-going costs often prevent the large-scale adoption of the process. In the case of software certification, evidence suggest a good deal of interest in the process (for instance, cf. (Ortega *et al.*, 2003)). However, the concept is not widespread and the demand for certification equally not widely expressed. This is due to the diversity of existing software and digital documents, and the subjectivity in measuring conformance with criteria (Varmesan, 1998).

A number of software certification models exist on which the process can be based. Comprehensive reviews can be found in (Schäbe, 2001) and (Ortega *et al.*, 2003). However, their adoption is neither universal nor compulsory. This is due to the lack of an agreement upon specific standards for specific certification purposes. The conduct of certification can practically vary between different settings. It ranges between:

- *self-certification* - when the producers themselves declare the conformity of a product to specified standards;
- *user-driven certification* - the situation when the user/consumer of a product requires its submission for certification by a specified body; and
- *Third-party certification* - occurring when an independent body that is external to both the producer and the user undertakes the conduct of the certification process (Varmesan, 1998).

It has also been suggested that certification should be the result of massive amounts of operational usage. It should therefore based on user experience with the software product (Voas, 1999).

2.4 Certification of Third-party Tools in the Planets Testbed

In this study, we examine the certification of third-party tools which are registered with the Testbed (as outlined in Section 2.2). The certification of tool suitability for specific preservation purposes is viewed here as part of the registration process with the PTB. For instance, consider the following use scenario:

> Preservation Tool X provides functionality to migrate documents from JPEG format to PDF format The developer of the tool wants to register it with the Planets Testbed. Before being made available to PTB users, the tool is audited by a certification body on its suitability for the intended preservation purposes. Once certified, the tool is made available to PTB users endorsed with a certification mark. This mark signifies the success of the process and hence the suitability of the tool for its intended outcome.

Any preservation tool developer can be a third-party tool provider. The only condition is to register their tools with the Testbed. Certification would occur after third-party tool providers/developers have submitted their tools to the Testbed application. Certification would occur before the tool is registered as a service within the Interoperability Framework. The process would be based on

benchmarking criteria. These benchmarks would make use of the Testbed Corpora, data supplied by users and the preservation plan assessment components.

3. Intended Market Analysis

The purpose of this section is to establish the market environment in which the Planets Testbed operates. We describe the target market and user community of the Planets Testbed. We further establish the approaches to certification taken by other existing Testbeds. Finally we present the results of a survey addressed to the projected user communities. The survey evaluates the **market viability** of certification of third-party tools in the Planets Testbed.

3.1 Target Market and User Communities

The target market for the Planets Testbed is "anyone with an interest in digital preservation issues and tools…content holders, museums, archives, documentations centres, libraries, service providers, software developers" (Farquhar, 2009). Members of the target market are not limited by the quantity of data they hold in carrying out experiments. Within the Testbed, they will have access to the Planets Testbed Corpora on which to experiment.

A number of roles and actors have been defined within the Planets Testbed. The roles of 'Testbed supporter' and 'Testbed administrator' have been assigned within the Testbed team. The 'Testbed supporter' provides advice and guidance on Testbed procedures and experiments. The 'Testbed administrator' provides technical support, managing the system, solving any technical issues and scheduling experiments. The users of the Testbed are then divided into four roles:

- An 'experimenter' is either a content experimenter who wishes to experiment both with content and tools or test tools.
- A 'reader' is a user who reads experiment settings and results but has no rights to perform experiments.
- A 'scientific validator' has authority to make the Go-decision in experiments. This role and the role of 'experimenter' could be held by the same person.
- A 'service provider' will provide a tool or tools to Planets as a service but will not conduct experiments.

An older survey on usage of the PTB addressed to Planets partners (Rog *et al.*, 2008) revealed increasing numbers of Testbed users per participating institution. The most frequent roles were 'Testbed Administrator' and 'Experimenter'. A more recent survey was conducted to ensure the suitability of the Planets technology and services for digital preservation needs (Sinclair & Jardine, 2009). The survey shows that user competences interested in the Planets Suite can range from Digital Preservation Specialists, Archivists and Librarians to IT Managers, Researchers and Service providers. The same survey documents that the majority of the target market for Planets products comes from National and Academic Libraries, Government departments and Archives. In terms of geographical location, the survey found that 70% of the target audience for Planets services comes from Europe, with North America being the second most popular location (17%).

In July 2008, Testbed services were released for use and testing to Planets Partners only. The beta version of the Testbed was opened up in May 2009 to a small community of external institutions. The institutions had expressed an interest in conducting experiments and providing feedback on their experiences. This group includes Ministerie van Justitie[ii], DANS[iii], Deutsche Nationalbibliothek[iv], Bundesarchiv Berlin[v] and UKOLN[vi]. It is currently planned that in Autumn 2009 large scale experimentation by selected external partners will begin. It will be followed by a full external release in early 2010.

3.2 Alternatives

This summary of certification approaches by other existing Testbeds is not intended to be exhaustive. It rather present a representative sample of the most relevant initiatives to the Planets Testbed.

The Planets Testbed is one of a number of Testbeds both in development and in operation in the digital preservation research community. The Planets Testbed has built upon and was inspired by the Dutch digital preservation Testbed and the work of the DELOS digital preservation Testbed. These can be considered the first serious attempts to create an environment facilitating the scientific evaluation of digital preservation experiments (Aitken *et al.*, 2008). The Dutch digital preservation Testbed was founded in October 2000 following the recommendations of Jeff Rothenburg in his report to the Dutch government in 1999 (Rothenberg, 1999). The DELOS digital preservation Testbed built on the experiences of the Dutch (Hofman, 2004). A contemporary of the Dutch Testbed, the D-Lib test suite[vii] developed by DARPA[viii], is a group of six Testbeds made available via the Internet. Their aim was to lower barriers for researchers in the digital library and related fields. This was achieved by providing them with access to large datasets for quantitative and comparative research (Lannom, 2000). As pioneers in the development of the Testbed concept in this field, it is perhaps unsurprising that none of these initiatives incorporated a certification element.

More recently, the EC funded CASPAR project has developed the cultural-, contemporary performing arts- and scientific- Testbeds (Giaretta, 2009). In the CASPAR draft Testbed implementation plan, certification of tools is not directly discussed. However, the authors state that "[f]or the most part only Designated Community members can really evaluate the preservation results by access to manipulation of the data; therefore individuals will have to be identified to provide this level of validation" (Giaretta, 2009). We can therefore say that the focus of the three CASPAR Testbeds is internal rather than external. They are to validate the CASPAR framework preservation solutions and tools developed within the CASPAR project. Their potential application to third-party tools and services is not excluded. Nonetheless, it is not part of the core work or aims and objectives of the project. Indeed the Principle Investigator of the project, David Giaretta, has informed us through email correspondence that "the purpose of the CASPAR Testbeds was to validate [that] the tools that CASPAR has produced were capable of enabling the preservation of a wide variety of digitally encoded objects against changes in hardware, software, environment and knowledgebase of the designated community" (D. Giaretta, personal communication, August 1, 2009). It is reasonable to conclude that the CASPAR project does not consider it feasible or desirable at this stage to implement a certification element to their Testbed.

Like CASPAR , the DCC believes that curation and preservation activities cannot be evaluated independently of context. The DCC has extended the Planets Testbed methodology to produce a use-case driven methodology. It considers the usefulness of curation and preservation tools and approaches within specific frames of reference. Using this approach, user needs and disciplinary requirements are identified and used to inform the evaluation process and metrics for success. The DCC has developed a series of methodology overviews and guidance documents to assist with the use-case driven experimentation process . This approach may offer value for use within the Planets project in the absence of third party tools certification.

Another approach to certification is taken by DigitalPreservationEurope[ix] as part of its Digital Repository Audit Method Based On Risk Assessment (DRAMBORA) initiative[x]. While not in the context of a Testbed, this approach is of interest here. It was initially planned that DPE would "Develop, test and roll out the scheme for conducting silver and gold level audits for repositories requiring external validation of their practices." (Ross, 2006) However, it was considered that such an objective test was not desirable (McHugh *et al.*, 2008). This decision was based on extensive development of the DRAMBORA audit method and consultation with its user community (Innocenti *et al.*, 2008a; Innocenti *et al.*, 2008b; Ross *et al.*, 2008). It was considered more beneficial to the community to accredit individual auditors.

3.3 User Needs Assessment

We conducted a user needs assessment in order to understand the needs of different stakeholders for certification of third-party tools. The needs assessment consisted of a survey. We used two different but interrelated on-line questionnaires, which were sent to Heritage Institutions and Tool Developers/Providers.

The design of the survey was guided by the study aim and objectives reviewed in the Introduction . Individual questionnaire items were tailored to reflect the concepts that these objectives represent. The questionnaires were administered for a period of three weeks. They invited an aggregate total of forty individuals to participate. In order to ensure sufficient numbers of responses, three reminder e-mails were sent to the survey recipients. Twenty six recipients responded to the survey invitation. Representativeness of the sample in statistical terms was not essential. This is because the purpose of the needs assessment is to provide information about acceptance, desirability and feasibility of the studied concept as perceived by the two target groups. Thus, we employed a purposeful sampling technique to identify potential respondents. The selection criterion was previously expressed interest in digital preservation and/or the PTB.

The suitability of purposeful sampling for this study is twofold. Firstly, this technique selects information rich cases for in-depth study This gives the opportunity to focus on participants with solid reasons for inclusion in the study and therefore more critical influence on the results (Dane, 1990). Second, the study can concentrate on cases with high variability so that the process is more feasible and economical. The aim is to explore the quality of the data and not quantity (Frankfort-Nachmias & Nachmias, 1996).

The invited individuals were drawn for convenience from samples of Heritage Institutions previously employed for the DRAMBORA project. Preservation tool developers were selected through contacts with Planets Community members and the DCC Digital Curation Tools online resources[xi]. A sample of the final questionnaire forms can be found in Appendix A. A complete summary of results from the survey is included in Appendix B. The next two sections review the needs assessment findings in more detail.

3.3.1 Heritage Institutions

This questionnaire was directed to representatives of heritage institutions. All fourteen received responses represent national and academic libraries, national and academic archives, commercial organisations, public sector organisations and one from the category *Other.* Half of the respondents come from Europe. A quarter comes from North America. Eight countries were represented in the sample (Figure 2).

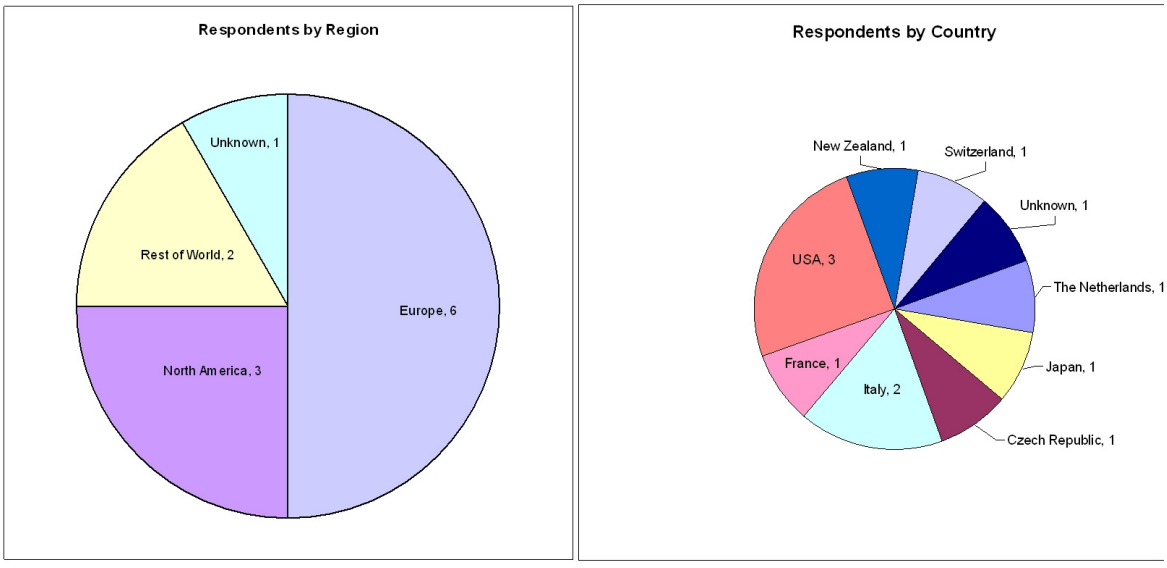


Figure 2: Respondents by Region and Country (Heritage Institutions)

The questionnaire was divided into four sections. The first section explores the respondents' awareness and attitude regarding software certification in general. The second focuses on the certification of third party tools within the Planets Testbed. The third section looks at the current digital preservation practices of the respondents' organisations. The final section gathers some general information about the respondents and their organisations.

61.5 % of respondents were aware of certification as gauge of software reliability. When we break this down by sector, we find that there is a roughly equal split between those that are aware and not aware both within the library and archive sectors (Figure 3).

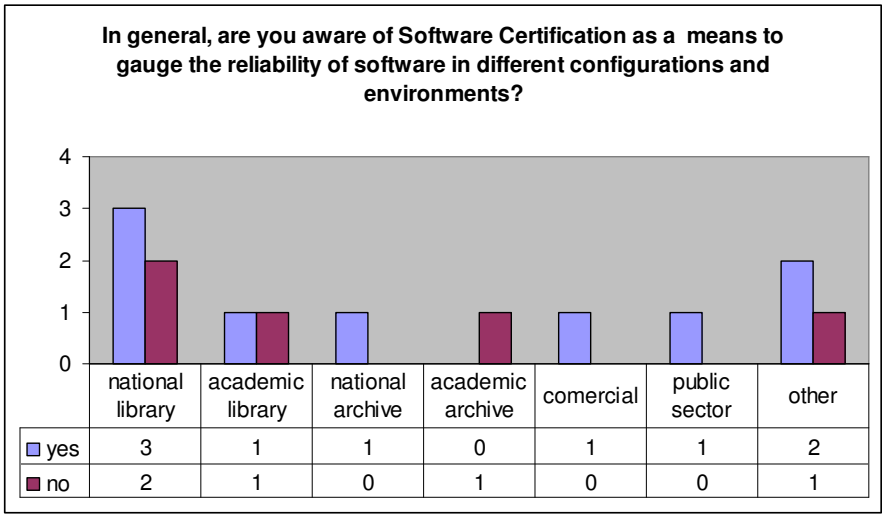


Figure 3: Awareness of Software Certification (Heritage Institutions)

80% of respondents reported that they are influenced by certification in their selection of software for their organisation. When we break this down by sector we find that all respondents based in libraries and national archives would be influenced by this (Figure 4).

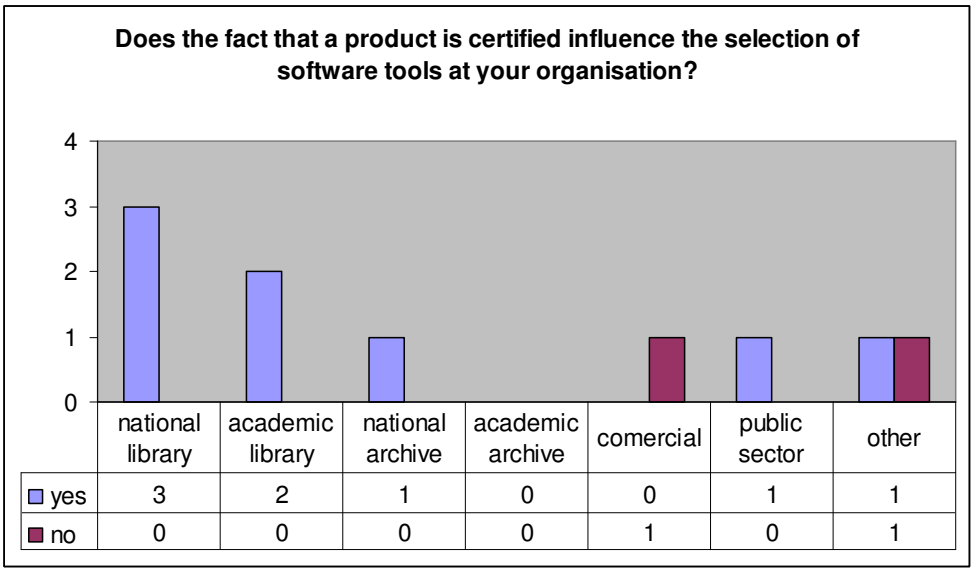
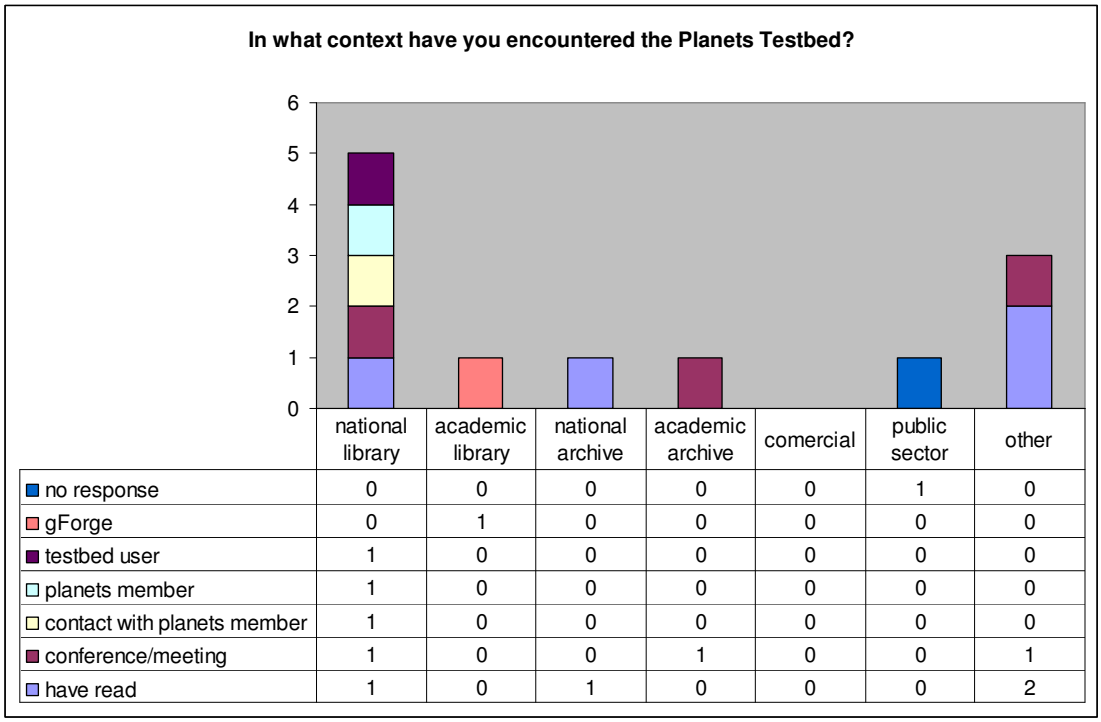


Figure 4: Influence of certification in software selection (Heritage Institutions)

78.6% of respondents reported that they were aware of the Planets Testbed. Of those, 18.2% knew about the Testbed because they were a Planets member or through contacts with Planets partners. Others cited meetings, conferences, literature and GForge, demonstrating the effectiveness of Planets dissemination strategies (Figure 5).

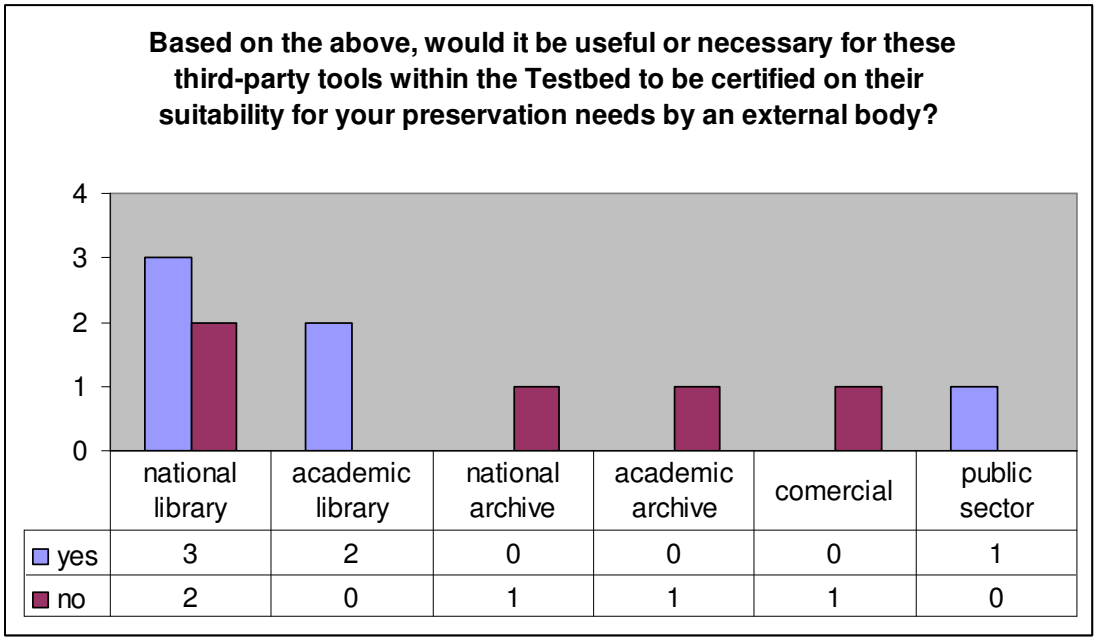


	national library	academic library	national archive	academic archive	comercial	public sector	other
no response	0	0	0	0	0	1	0
gForge	0	1	0	0	0	0	0
testbed user	1	0	0	0	0	0	0
planets member	1	0	0	0	0	0	0
contact with planets member	1	0	0	0	0	0	0
conference/meeting	1	0	0	1	0	0	1
have read	1	0	1	0	0	0	2

Figure 5: Context of encounter with Planets Testbed (Heritage Institutions)

The respondents that were not aware of the Planets Testbed found that software certification would fit their organisational needs.

Participants were asked if it would be useful or necessary for tools within the Testbed to be certified on their suitability by an external body. The highest interest was reported by national and academic libraries (Figure 6).



	national library	academic library	national archive	academic archive	comercial	public sector
yes	3	2	0	0	0	1
no	2	0	1	1	1	0

Figure 6: Desirability of third-party tools certification in the PTB (Heritage Institutions)

We then focused on those respondents that identified the certification of third-party tools within the Planets Testbed as necessary or useful. They were asked to detail what they saw as the benefits of this. Responses highlighted the importance of a community consensus:

"Known about public availability of the software (different tools) that members of the wider digital preservation community will be able to use."

Respondents also underlined the importance of previous experiments in this process:

"Certification is best performed using the results of previous preservation experiments as a benchmark."

We also asked this group to outline what they saw as potential problems related to certification of third-party tools. They identified the possible difficulty of securing take up from vendors:

"the main problem I can see is how to push tool developers to apply for Planets certification".

They also highlighted the complexity of certifying preservation tools as a potential problem:

"…accuracy of the certification taking into account the differences between the perspective of different tools".

This shows that while certification remains attractive and there is an appetite for it from the potential consumers, they see it as complex and difficult to implement.

We then centred on respondents that stated that the certification of third-party tools within the Planets Testbed would not be useful or necessary for their organisations. They were asked to provide justification for their point of view. Respondents highlighted that the sustainability of a certification scheme provided by a research project was questionable. The complexity of allowing for different contexts within a certification standard was also identified as an issue:

"…I question whether an independent certifying agent would understand my particular preservation needs. Since the tools are available for experimenting with, I could assess myself if they met my needs".

*O*thers highlighted the pace of change within the field as a problematic:

"Critical evaluation could provide more information than 'certification'. Quickly changing nature of both software and requirements make certification a temporary thing - at best."

The importance of a community consensus was also highlighted here:

"This is a question of trust. If the tools are used by a lot of people then you would trust them. You do not need certification…"

The importance of community consensus and an evidence base of previous experiments is again evident from the responses. This would suggest that an approach combining these two factors would have a large appeal to the heritage sector. It would also serve as a valuable alternative to certification.

Respondents were asked to rank certain factors in terms of importance in influencing the certification of third-party tools. The top three factors overall were:

- Quality assurance for tools and services
- The certified suitability of a tool for the intended purpose, and
- The public availability of evidence to justify a certification

Interestingly, 'legal coverage in the event that a certified tool failed to produce the expected digital objects' was ranked as unimportant. This question divided opinion among respondents with equal numbers rating this factor as important or unimportant (Figure 7).

Respondents were asked whether they agreed or disagreed with a set of statements. Responses to these statements show a positive attitude overall to the certification of third-party tools within the heritage sector. The responses were weighted to determine their relative importance. It was found that the following statements were considered most important: 'Third-party tool certification could augment the experience offered by the Testbed'; 'I would trust the Testbed results more if the preservation tools were certified'; and finally 'Certification marks for third-party tools make the Testbed more prestigious'. The least important statement according to this analysis was: 'I am worried about legal implications deriving from certification of third-party tools' closely followed by: 'I am aware of certification models and standards that could be used to certify third-party tools' (Figure 8).

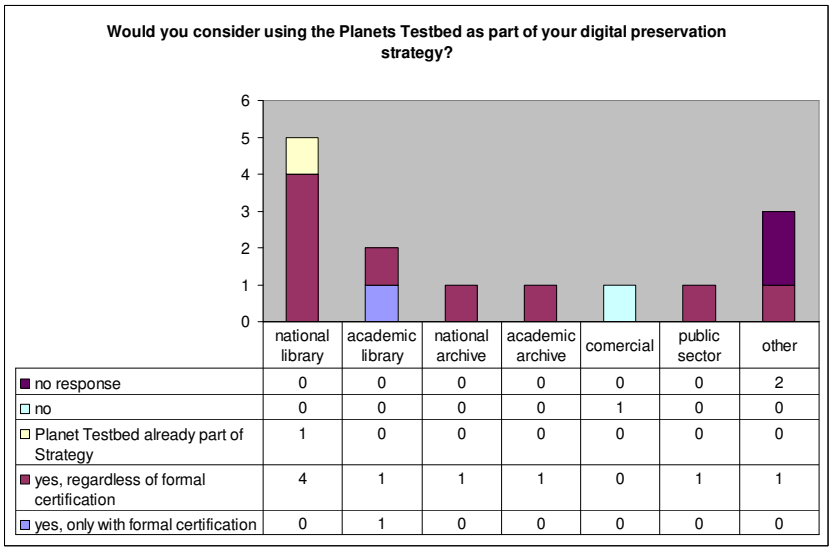
	very important	important	neutral	unimportant	very unimportant	weighting
Identity of the certification awarding body	3	**6**	4	0	0	12
No charge associated with the award of certification	3	3	**5**	1	0	8
Legal coverage in case a certified tool fails to produce the expected digital objects	1	**5**	2	**5**	0	2
Frequency of audits	1	**6**	5	0	0	8
Quality assurance for tools and services	**9**	2	2	0	0	20
Public availability of evidence to demonstrate the legitimacy of the experiments justifying a certification award	**7**	4	1	1	0	17
Elimination of mistakes	3	**8**	1	0	0	14
Fitness for purpose	6	**7**	0	0	0	19
Limitation of liabilities	1	3	**7**	1	1	2

Figure 7: Importance of factors influencing certification (Heritage Institutions)

	strongly agree	agree	neutral	disagree	strongly disagree	weighting
I would pay for certified preservation tools	2	2	**7**	1	1	3
I would trust the Testbed results more if the preservation tools were certified	4	4	4	1	0	11
Third-party tool certification could augment the experience offered by the Testbed	2	**9**	2	0	0	13
I am worried about legal implications deriving from certification of third-party tools	1	3	**6**	2	1	1
Certification marks for third-party tools make the Testbed more prestigious	3	**6**	3	1	0	11
There is not enough experience in digital preservation to establish requirements for certification of preservation tools	3	**4**	3	3	0	7
There is a risk in formally certifying the suitability of third-party tools within a research project such as Planets Testbed	1	4	**6**	2	0	4
I am aware of certification models and standards that could be used to certify third-party tools	1	3	**6**	3	0	2

Figure 8: Aspects of third-party tool certification (Heritage Institutions)

75% would be happy to use the Testbed regardless of formal certification. For a further 8.3% the Testbed is already part of their strategy. Only 8.3% of respondents would consider using the Planets Testbed as part of their digital preservation strategy *only if* third-party tools were certified. None of the respondents based in the library or archive sector made this stipulation (Figure 9).



	national library	academic library	national archive	academic archive	comercial	public sector	other
no response	0	0	0	0	0	0	2
no	0	0	0	0	1	0	0
Planet Testbed already part of Strategy	1	0	0	0	0	0	0
yes, regardless of formal certification	4	1	1	1	0	1	1
yes, only with formal certification	0	1	0	0	0	0	0

Figure 9: PTB as part of preservation strategy (Heritage Institutions)

3.3.2 Preservation Tool Developers

Another questionnaire was addressed to preservation tool developers. This was sent to a total of eighteen individuals with varying roles in the preservation environment. Specifically, nine cases have registered their software products with the Testbed or have been responsible for wrapping freely distributed tools as part of the Interoperability Framework (cf. sections 2.1 and 2.2 of this document). The remaining nine cases are developers of preservation tools not currently featured in the PTB. On the closing date, the survey had collected twelve responses. Only four provided complete feedback to all questionnaire items. In particular, the low response rate in the last part of the questionnaire, *About You and Your Organisation*, does not allow for meaningful stratification of the results by organisation type. Of the four respondents that provided an answer to this part, 25% reported that they work for an organisation active in software development / sales. 75% positioned their organisation in the *Other* category as a National Library / Archive. The role of the respondents in the organisation varied from technical managers and digital archivists to software engineers and IT researchers.

The first part of the survey elicited general information about the respondents' opinion about software certification. The majority of respondents knew about certification. In fact, the existence of the certification within a preservation service can affect their position towards a preservation service. Participants were asked to identify their awareness of software certification in general. Of those familiar with the concept (83.3%), 88.9% agreed to the statement that the requirement for their product to undergo formal certification would influence their decision to register it with a preservation service. The participants not aware of certification were given a brief definition of the process to base their answer on the influence of formal certification in the decision to register their products. The results show a 50/50 split on this item (Figure 10).

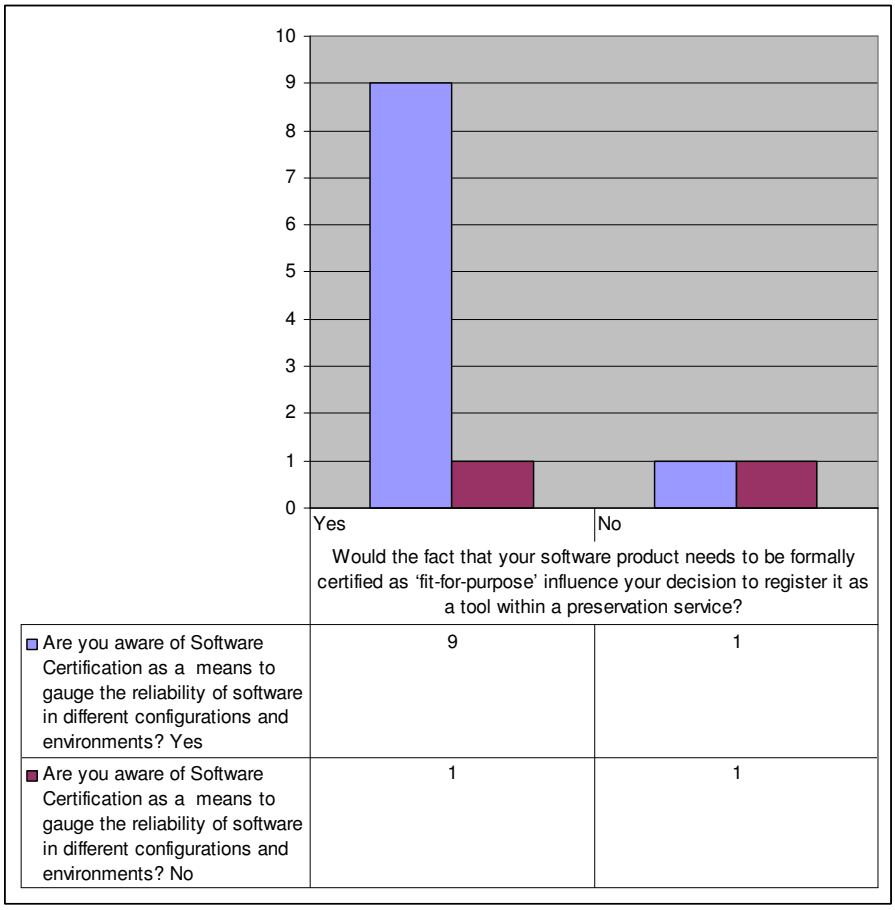


Figure 10: Awareness of Software Certification * Influence of certification in software selection Crosstab (Tool Developers)

The second part of the survey focused on certification services for third-party tools within the Planets Testbed. We asked participants about awareness of the PTB, desirability of certification services, and perceived benefits and limitations stemming from certification. 72.2% of the respondents were aware of the Planets Testbed, with the encounter as a Planets Member being the most common reason (50%). The remainder is distributed between the rest of the response alternatives as shown in Figure 11. Both cases not aware of the PTB expressed – after a brief outline of the mission and functionality of the Testbed – their interest in registering their software products with this preservation service. This part of the survey is not directly connected to the aim of the feasibility study. However, it provides basic information on the familiarity of the participating preservation tool developers with the Testbed. It also shows their willingness to contribute their tools as PTB services. The results are of a small scale and therefore the inferences that can be drawn are limited. It is still somewhat reassuring though that negative responses regarding interest in the PTB were not given.

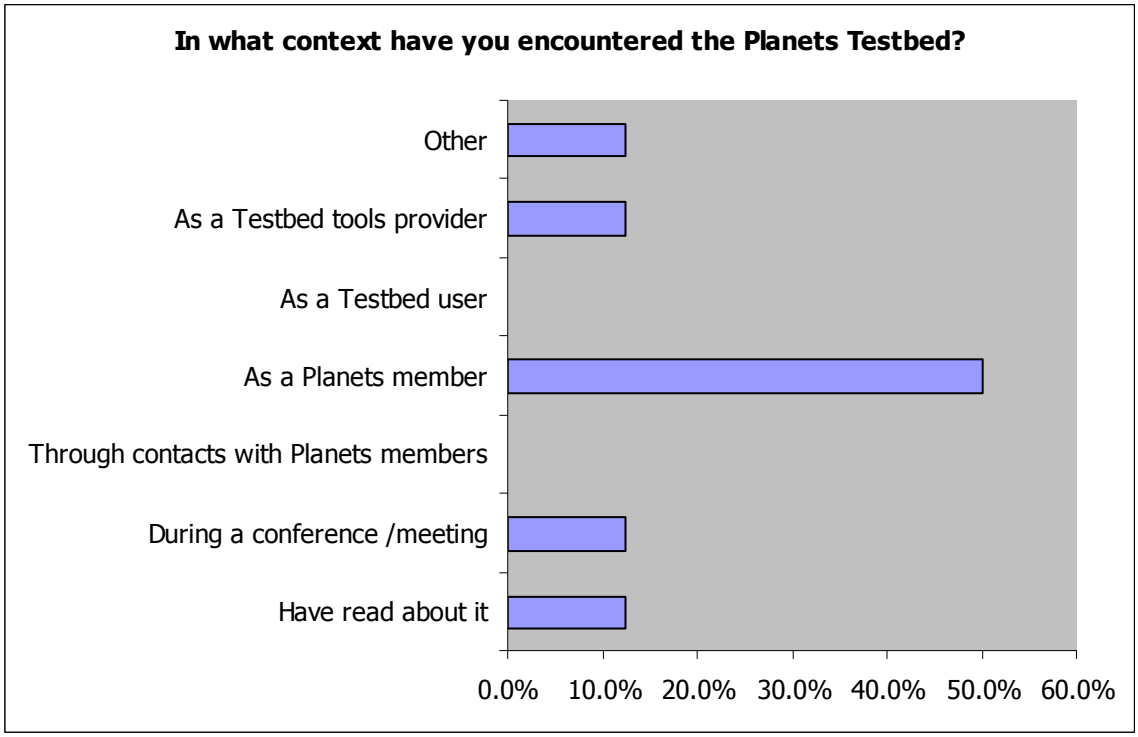


Figure 11: Context of encounter with Planets Testbed (Tool Developers)

We further asked respondents to identify their desire for certification of their tools when registering them with the PTB. The majority (88.9%) replied in agreement with desirability for certification services in the PTB. Only one case gave a negative reply. Both groups were asked to justify their viewpoint in terms of benefits and potential problems related to certification of their preservation tools in the PTB.

Regarding benefits, responses from the first group (agreement with certification) focused on the issues of trust and quality, stating that certification:

"helps establish trust with end-users, for both the individual service and the provider"

They also stated that certification:

"helps publicise services and emphasises good practice", while "peer scrutiny improves the probability of 3rd-party software being usable and functional".

Regarding potential problems, this group highlighted the difficulty to objectively measure subjective aspects of preservation services:

"What does it mean to certify a Migration service, when things like 'image quality' are so subjective?"

Issues arising from the identity of the certification body we also mentioned:

"Any certification not recognised by the community will most probably fail".

Time-dependency and persistence were often mentioned as problems:

"Certification is very situation-specific, in order to ensure reliability certification should be itself maintained and preserved over time".

This shows that certification is attractive to tool developers/providers and there are perceived benefits stemming from the process. However, the problems of subjectivity and time-dependency inhibit them from actually having their products certified.

On the other hand, the response concerning the reasons why certification is not desirable centred on the fact that certification services might:

"discourage preservation tool developers to register their products with the PTB, raising unnecessary barriers with a process that should be user-oriented rather than service-oriented".

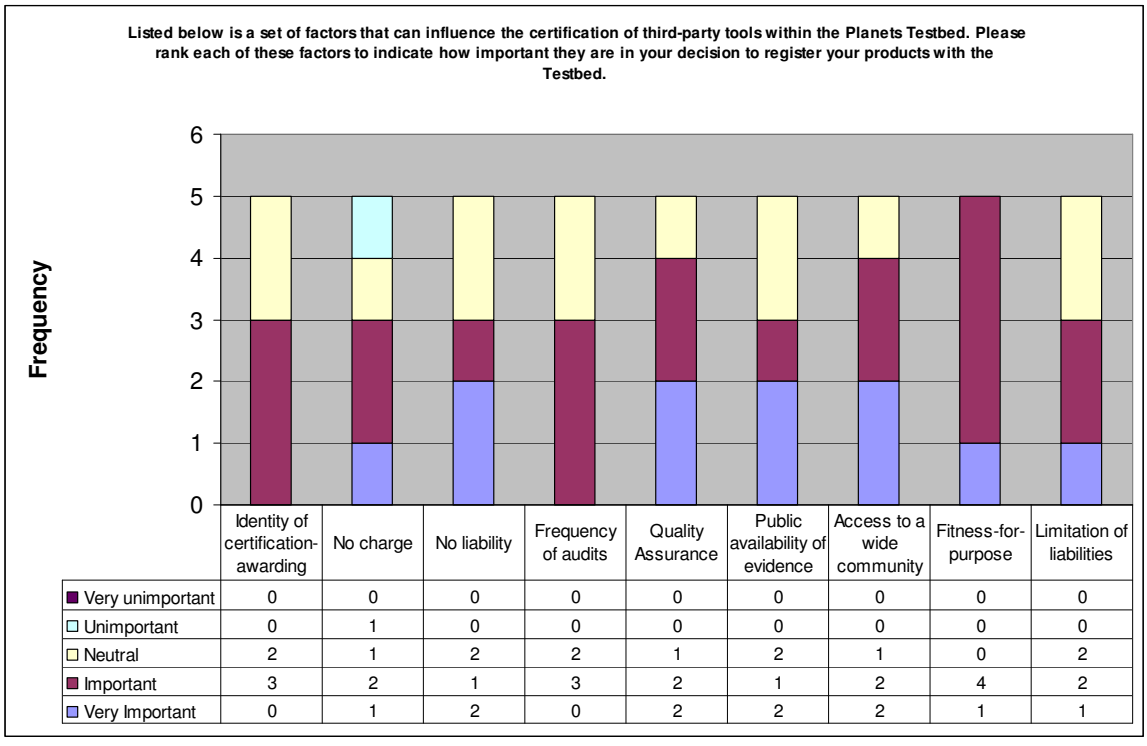
In an e-mail correspondence, one of the PTB tool developers offered the opinion that the Testbed currently provides the means to 'certify' the suitability and reliability of already registered preservation tools through the evaluation results of experiments conducted by users. However, the PTB tool developer argued that certification of tools prior to deployment on the Testbed implies that the process occurs *'behind closed doors'* and negates the true mission of the Testbed:

"The whole point of the PTB is to publically evaluate tools against the competition, using corpora of documents with known properties. If all of the services are known to be perfect, there is no need for the Planets Testbed!".

These responses bring the debate back to the community consensus notion witnessed in the Heritage Institutions' feedback. In this sense, preservation tools are certified by the community of users *in the open*, based on experimental results to support any 'fitness-for-purpose' statements. As one participant notes:

"External certification means that we need someone with more knowledge than the users themselves to tell them whether a tool is good […] If certification means 'it will migrate your files perfectly' then I'm afraid [users] are going to be very disappointed."

Similarly to the questionnaire for Heritage Institutions, participating tool providers/developers were asked to rank the importance of factors that influence certification in their decision to register their software with the PTB. The results (Figure 12) show that responses toward the lower ends of the scale (Unimportant and Very Unimportant response alternatives) were scarcely selected, hence giving each factor at least some degree of importance.



	Identity of certification-awarding	No charge	No liability	Frequency of audits	Quality Assurance	Public availability of evidence	Access to a wide community	Fitness-for-purpose	Limitation of liabilities
Very unimportant	0	0	0	0	0	0	0	0	0
Unimportant	0	1	0	0	0	0	0	0	0
Neutral	2	1	2	2	1	2	1	0	2
Important	3	2	1	3	2	1	2	4	2
Very Important	0	1	2	0	2	2	2	1	1

Figure 12: Importance of factors influencing certification (Tool Providers)

Nevertheless, the rating averages for the above factors (Figure 13) show that the most highly rated factors are:

- Access to a wide community
- Fitness for purpose, and
- Quality assurance (albeit with marginal variation with other factors).

Frequency of audits, no charge associated with the award of certification and the identity of the certification body scored lower on the scale. Their response average positions them between the Neutral and Important ranks. The results also highlight that, in line with representatives from

Heritage Institutions who are less keen on legal coverage in case of tool failure, tool developers/providers are equally less keen to claim liability in case a certified tool fails to produce the promised results. Similarly, the top rated factors from both survey groups coincide.

	Rating Average
Access to a wide community of users	4.2
Fitness-for-purpose (certified suitability of a tool for the intended purposes)	4.2
Quality Assurance for tools and services	4.2
No liability in case a certified tool fails to produce the expected digital objects	4
Public availability of evidence to demonstrate the legitimacy of the experiments justifying a certification award	4
Limitation of liabilities	3.8
Frequency of audits	3.6
No charge associated with the award of certification	3.6
The identity of the certification-awarding body	3.6

Figure 13: Rating Averages for Importance of factors influencing certification (Tool Providers)

The respondents were further asked to express their level of agreement with a set of statements regarding certification of their software tools as part of the registration process with the PTB. There was a general accord that certification could enhance the quality of the offered user experience from both the Testbed and the individual registered tools (Figure 15). The issues of trustworthiness and reliability were again highly rated by the respondents, but as factors that would not be positively influenced by certification. This contradicts previous statements regarding benefits stemming from formally certifying preservation tools (cf. page 18), but this could be attributed to the number of participants who skipped this questionnaire item.

The table of rating averages (Figure 14) reports that the statements with the highest average scores are:

- 'Certification would not make my products more efficient for digital preservation'
- 'Certification would not change the reliability and trustworthiness of my products' and
- 'There is not enough experience in digital preservation to establish requirements for certification of preservation tools'.

The last statement was among the four most highly rated statements by representatives of heritage institutions. This common agreement corroborates, to an extent, the acceptance from both survey groups that the field of digital preservation is possibly not ready at this point to affirm objective measures for formal certification of preservation tools.

	Rating Average
Certification would not make my products more efficient for digital preservation	4.2
Certification would not change the reliability and trustworthiness of my products	4
There is not enough experience in digital preservation to establish requirements for certification of preservation tools	4
Certification marks make the Testbed and my products more prestigious	3.8
The certification of my products could augment the user experience offered by the Testbed	3.6
I would trust the Testbed environment more if my products went through a formal certification process	3.2
There is risk in formally certifying the suitability of third-party tools within a research project such as the Planets Testbed	3.2
I am worried about legal implications deriving from certification of my products	3
I am aware of certification models and standards that could be used to certify third-party tools	2.6
I would pay to have my software certified	2.2

Figure 14: Rating averages for Aspects of third-party tool certification (Tool Providers)

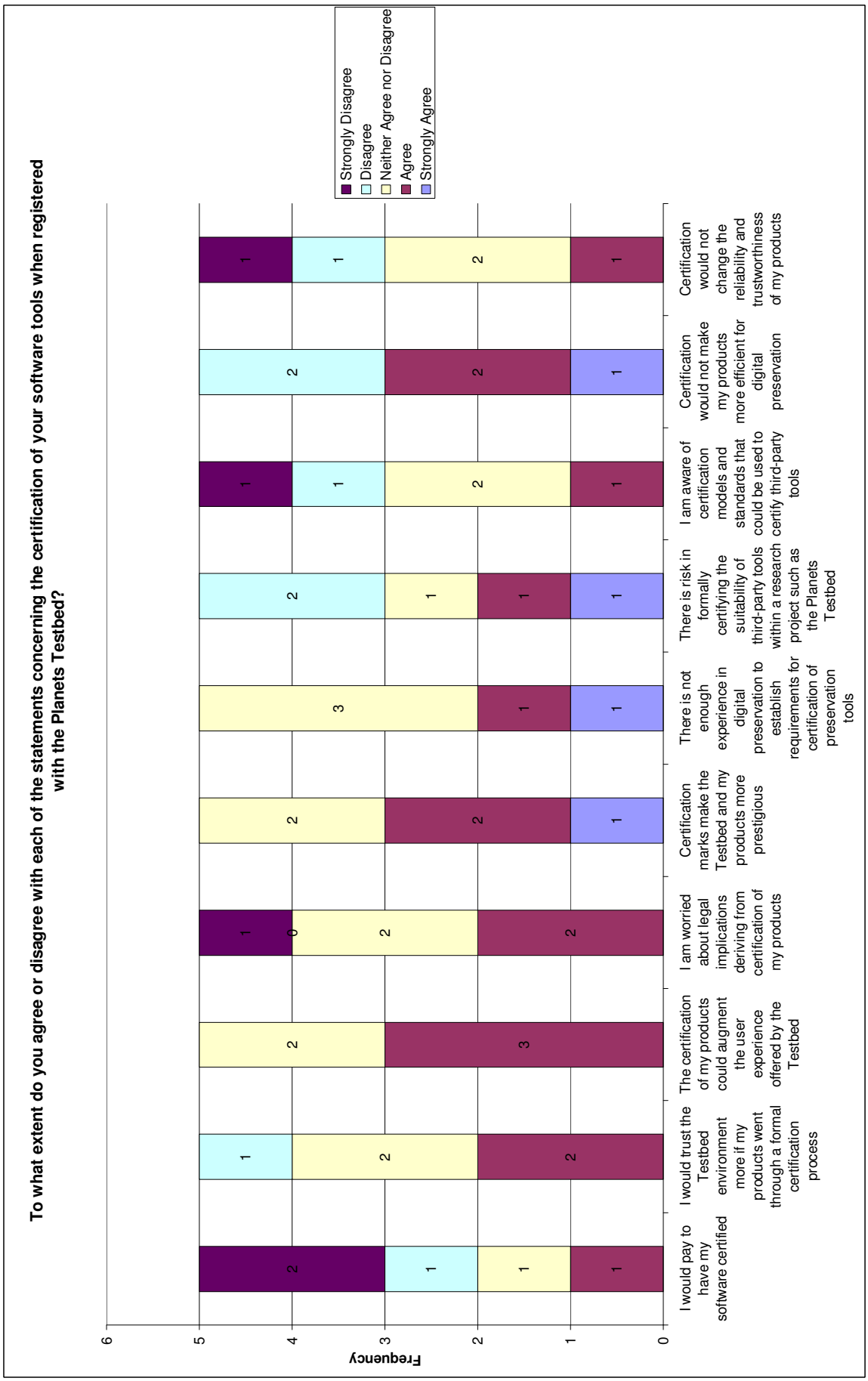
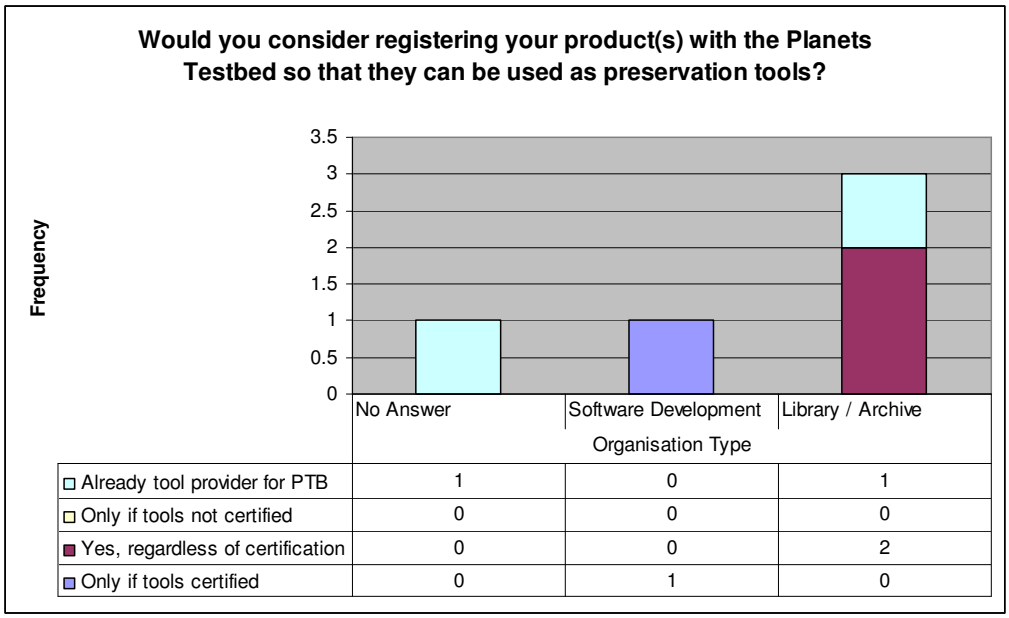


Figure 15: Aspects of third-party tool certification (Tool Providers)

Similarly, the items with the lowest average scores coincided for both groups, with the least favoured statements being: 'I am aware of certification models and standards that could be used to certify third-party tools' and 'I would pay to have my software certified'.

Out of the five respondents who fully completed the questionnaire, two would consider registering their preservation tools with the Testbed regardless of formal certification. Two respondents were already providing software for the PTB. Only one would consider supplying their products only if formal certification took place. Figure 16 shows a break-down of the results to this item by organisation type only for reference, as the limited number of responses does not permit further analysis.



	No Answer	Software Development	Library / Archive
Already tool provider for PTB	1	0	1
Only if tools not certified	0	0	0
Yes, regardless of certification	0	0	2
Only if tools certified	0	1	0

Figure 16: PTB as part of preservation strategy (Tool Providers)

4. Legal Issues and Intellectual Property Analysis

In its current version no license relating to tools has been formally applied to the Testbed. Therefore it is not possible to draw conclusions regarding the legal and intellectual property implications of a certification service for third-party tools.

Nevertheless there are a number of legal issues, which are independent of the license agreement for the Testbed. These issues are implicit in the certification process. They should therefore be taken into consideration. Certification of a software product indicates the presence of a product certification agreement between the manufacturer and the body carrying out the testing and certification. Especially when considering proprietary software, it is important that the software manufacturer has agreed to submit their tool to the certification process.

There should also be evidence that:

- the product was successfully tested
- the product tested is identical to that being offered to the public.

In addition to this there should be an assurance that the certification listing, resulting from successful tests, is considered public information. The listing sets out the tolerances and conditions of use for the certified product. Should this testing be carried out negligently the Planets project could be held liable for any loss or damage as a result of an undetected defect. However, this liability can be reduced. This is possible if we show that comprehensive guidance covering the method of certification existed at the time of issue and that this was adhered to in its entirety (Gao, 2003).

Finally assurances should be provided that manufacturers of accredited software are regularly audited. This ensures that the process standard of the tested specimen is maintained. Should a manufacturer fail such an audit, existing items bearing the certification mark should be recalled. All stakeholders should be informed that the product has been de-listed.

5. Feasibility Study Findings

This section presents the findings of the feasibility study as these arise from the Product, Market and Legal Issues analyses. Where applicable, we report on data collected through interviews with the PTB developers and Planets Community members. Section 5.4 includes an interpretation of the results in numerical terms. It is based on the methodology for determining collective viability of a concept suggested in (Thomson, 2005b).

5.1 Technical Viability

First we needed to understand whether certification services for third-party tools in the PTB are viable from a technical point-of-view. To this end, an interview was conducted with two of the developers based at the Humanities Advanced Technology and Information Institute (HATII). The interview focused on four key areas, namely:

- the possibilities offered by the Testbed for certification of tools
- the manner that certification services can be implemented in the system
- potential implications in the development chain; and
- prerequisites for implementation.

Both interviewees stated that preservation tools can be accredited based on the results and analysis of experiments. This notion was also expressed in the feedback from the questionnaires. The interviewees said that unctionality already exists for a user-centric approach in certifying the effectiveness of individual tools through a user rating scheme. At present, the PTB application provides a formal guarantee for successful wrapping of software tools into preservation services. This could be used as a basic measure for the efficiency of a service from a strictly system based viewpoint. However, certification of tools by an external body was not seen as a possibility offered by the current state of the PTB. The interviewees noticed that any such process could be possible beyond the Planets Project environment.

We then asked about potential implementation strategies and implications in the development chain. The interviewees replied that if certification services were to be incorporated in the PTB, then careful planning would be necessary. However, they refrained from providing any “armchair speculations” about implementation and development issues that would be arbitrary and not based on facts from such planning. They did notice though that maintenance of certification services would be hindered by the fact that the process is time-dependent and situation-specific. Hence it would be almost impossible to guarantee the suitability and effectiveness of any given tool, when there exists a vast amount of different files and settings that users may experiment with. One interviewee commented that certification services in the PTB would work best as a benchmarking service. The benchmarking service should use fixed tests and specific documents to procure a measurement of the competence and suitability of preservation tools.

The interview then focused on prerequisites for implementation. The interviewees suggested that the first step in incorporating the certification services in the PTB would be to decide upon a specific software certification model (or set of models). The model will provide the attributes to be considered as the basis of certification. However, the Product Analysis in this study revealed that there is currently no agreement in certification models for digital preservation services (cf. page 8). Similarly, the results from both needs assessment groups clearly show that the target market is not aware of particular certification models and standards that could be used to certify third-party tools (cf. pages 15 and 20). Thus, technical viability of certification services in the PTB cannot be guaranteed until two conditions are satisfied:

- the existence of a certification model suitable for preservation tools is established
- the community agrees upon a certification model

This hindrance in the implementation prerequisites is reduced to a certain degree by the presence of other necessary components currently featured in the Testbed. These include a corpus of data for testing and the functionality provided by the Interoperability Framework for registering and using services within the Planets Suite.

Based on the preceding analysis, the Planets Testbed would be technically capable of incorporating certification services. They could be registered via the IF infrastructure as any other Web Service presently deployed in the Planets Suite. However, the content and structure of these services is unknown. The lack of a widely accepted model to form the foundation for the certification procedure impedes any progress towards actual implementation. Other identified problems include the difficulty in achieving a time-persistent and situation-independent solution for certification services. Such solution would alleviate the maintenance overhead and would provide a certification method encompassing all possible digital preservation needs. In this sense, certification services for third-party tools in the PTB are judged as technologically viable in the future, but technologically infeasible at present.

5.2 Market Viability

The evaluation of market viability for certification services in the PTB is based on factors examined in Section 3. One is the size of the market and its potential to render the implementation of such services economically expedient in terms of allocation of necessary funds, time and development effort. The second is the nature of alternatives products in the digital preservation market. The third is the expression of a requirement for certification services in the PTB by the representatives of heritage institutions and the tool developers that participated in the needs assessment. Finally, the need for promotion and advertising following potential implementation has been considered as a factor influencing the market viability of the examined services.

The market size equals the adoption of the PTB – and consequently certification services – if it were to capture 100% of its particular market niche. The direction of the Planets Testbed team is to attract “anyone with an interest in digital preservation issues and tools…” (Farquhar, 2009) There is a challenge in defining a relevant market. The digital preservation field is relatively new and still evolving. Conducting an in-depth analysis for the emerging market of the PTB is restricted by the inexistence of such data as user demographics and employment of certification in products similar to the Planets Testbed. The information collected from this study and previous surveys about Planets and the Testbed show that the main pool of users would come from libraries, archives and the public sector. Digital preservation tool developers would play a vital role as well. Although not straightforwardly quantifiable[xii], the size of this market is ample enough to ensure that certification services in the PTB would not be left without an audience.

In terms of alternatives, our findings are based on the review in Section 3.2. It would seem clear that the initiatives within the preservation arena most directly comparable to the PTB have concluded that the field is not yet mature enough to support objective certification of digital preservation tools and services. This has further been confirmed by the needs assessment, whereby respondents reported a lack of experience to allow for certification of preservation tools. This is not to say however that such a service is not desirable. Rather it would appear that nobody has yet had the confidence to assert that they are able to judge incontrovertibly that any tool or service is ‘preservation ready’.

,The survey results from this study are of similar nature. The results that respondents drawn from all domains of the target market find the notion of certification attractive. However, there are still problematic areas that – until solved and surpassed – will prevent the implementation and success of certification services for third-party tools in the PTB. The vast majority of respondents ratified their interest in using the Testbed regardless of certification services. This fact denotes little need at present for such provisions. This is also evidenced in the survey by Sinclair & Jardine (2009, p. 55) in which certification of preservation tools as a value-added service achieved a medium rating average, thus signifying a neutral position of the respondents towards the concept.

If certification services are eventually implemented in the Testbed, actions will need to be taken to ensure that the new functionality is sufficiently communicated to current users. Furthermore, this functionality will need to be efficiently promoted as an incentive to attract a wider audience. The aptitude of the Planets dissemination strategies demonstrated in this study and elsewhere (Sinclair & Jardine, 2009, p. 54) allows for a safe assumption that certification services as part of the PTB functionality can be conveniently communicated to the audience. This could be achieved as part of the overall advertising policy of the Planets project.

5.3 Legal Viability

The PTB is not currently covered by a software license to dictate restrictions on the type of use. The legal issues analysis in Section 4 reveals that the aspects relating to certification can influence the incorporation of such services in the Testbed. In particular, liabilities in case a certified tool fails to perform as expected introduce a high level of risk in the PTB. Even more so, the PTB is in its very nature an experimental project where users can *test* the efficiency of preservation tools and strategies. Formal accreditation and legal assurances may be possible beyond the Testbed's status as a part of the Planets Suite. This should come with the understanding that the application's objective shifts from a testing environment to a preservation solutions software.

Furthermore, periodic audits to maintain the certification standard are normally costly processes that will impose an additional overhead on PTB funds. The entire sample of survey respondents rejected the idea of paying for certified preservation tools. Time persistency of the certification for third-party tools is therefore infeasible – unless funding can be allocated exclusively for this task.

Overall, the implications of the legal framework and interrelated issues surrounding certification represent some of the most fundamental barriers in implementing certification services in the Planets Testbed. These hindrances can be more effectively dealt with after the establishment of a license agreement. This legal document will prescribe the extent of liabilities and the possibility of accepting payments for certified services.

Planets is not itself a discrete legal entity. |t is a Consortium of organisations formed for the specific purpose of delivering a number of products to the European Commission. Apart from the single contract with the Commission, all other legal agreements with third parties are entered into by individual members of the Consortium. Each member applies their own terms and conditions of contract and accept liability for that agreement. There is no capability to create an implied 'joint and several liability' with other partners. 'Planets' is not therefore a legally competent body capable of entering into any form of legal agreement.

As a result, any legal liability would fall, at least initially on the partners with responsibility for issuing the certification. Given that the majority of partners are either public or academic institutions, it seems highly unlikely that they would be willing to accept such individual liability.

5.4 Viability Assessment

The calculation of an overall feasibility score follows Thomson's Dimensions of Business Viability Model (2005b). It has been based on a weighting scheme to determine the viability of individual dimensions. The process comprises of seven stages, namely:

1. *Identification of Viability Dimensions* that will be used to measure the feasibility of the studied concept. It has been displayed earlier in this report that the dimensions pertinent to the feasibility of certification services for third-party tools in the PTB are Technical, Market and Legal Viability.
2. *Measures of Viability Dimensions* identify the actual criteria (characteristics) of each dimension that will be examined. Based on the analysis in this Section, the measures of viability dimensions include:
    - **Market Viability:**
      Market size
      Competition
      Target Market need for Certification Services (Heritage Institutions)
      Target Market need for Certification Services (Tool Developers)
      Promotion / Advertising

- **Technical Viability:**
  Capacity of PTB to incorporate Certification Services
  Existence of prerequisites for implementation
  Maintenance of Certification Services
  Development Chain implications
  Agreement on Software Certification Model

- **Legal Viability:**
  Licensing
  Liability from incorporation of Certification Services
  Payment incurred for certified services
  Time Persistency of Certification

3. *Component Weighting to Dimensions* determines the overall contribution of each dimension to the calculation of the project viability score. This score (expressed in percentages) represents the significance of each dimension to the feasibility of the concept. It is a means to collectively assess the viability of the overall project. In this case, Market Viability has been judged as of higher importance and has been granted a weighting of 60%. That is because in an open marketplace such as that of certification services for digital preservation tools, the adoption of the new technology is driven by consumer demand. The success of the concept is therefore based primarily on the potential benefits as seen by the users. These are compared against the other dimensions that influence overall viability of the concept. The remaining 40% of the total component weighting has been evenly distributed between Technical and Legal Viability. Both these dimensions evaluate the degree that the studied project can successfully address pertinent technical and legal issues. In do so, we can avoid debilitating respective difficulties when the demand for the proposed service has been established.

4. *Weighting to Measures* determines the overall contribution of an individual measure to the cumulative scoring of the dimension it belongs to. Same as above, this has a cumulative score out of one hundred. Figure 17 (fourth column) shows the weights assigned for each measure. For Market Viability, the target market need for certification services captures the lion's share for the reasons outlined above. In Technical Viability, the fundamental issues identified from the Product Analysis, needs assessment and interviews occupy the majority of the overall score for this dimension. Weighting for the Legal Viability measures emphasises the importance of the licensing agreement under which the PTB services will be provided, as this factor influences the status of the remaining three measures.

5. *Measure Assessment* and *Score Assignment* is a record of the score assigned to a measure after assessment of data collected throughout the feasibility study (fifth column in Figure 17).

   Concerning Market Viability, the low score for the target market need reflects the conclusions from the needs assessment. We have assigned a slightly higher score for the tool developers' group, as they reported a marginally higher interest in certification services than heritage institutions. The adequate size of the market, the lack of competitive products and the ease to promote certification services represent more feasible factors and have therefore been assigned high scores.

   Regarding Technical Viability, the most feasible measure is the capacity of the PTB to incorporate certification services through the Interoperability Framework. Some implementation prerequisites exist, so this measure has been assigned half the possible marks. The most infeasible measure at present is the agreement on a software certification model to guide the certification process. Thus, this measure we have assigned zero points to this measure. The remaining measures are partially feasible from a technical viewpoint and have achieved some points in the weighting assessment.

   As mentioned previously (Section 5.3), the legal part of the viability assessment is infeasible. This is due to the lack of a licensing agreement and the hindrance this presents in assessing the viability of the remaining legal issues. We have therefore assigned zero points to the entire dimension.

6. *Critical Validation* converts the 100/base scoring from the individual measures of each dimension to the weighting percentage that this dimension contributes to the overall project viability score. The calculations for weighting each dimension's viability have been based on the following formula:

$$\frac{DimensionWeighting * \sum WeightingAssessment}{\sum MeasureWeighting}$$

7. *Determination of Collective Viability* uses the weighed scores from the previous step to represent the outcome of the overall weighed scoring of each dimension.

The critical validation scores describe a situation where the viability dimensions can be judged as neither strong nor feasible[xiii]. Market Viability has an overall rating of 30%. This rating is predominantly induced by the low demand for certification services, recognised in the feedback of the target market groups. Technical Viability has accumulated an overall score of 9.2%. The lack of an agreement on software certification models greatly impedes the feasibility of this dimension. The concept is currently legally infeasible. Hence the Legal Viability dimension does not contribute towards a positive outcome regarding the success of the studied concept.

Judging by the Collective Viability Score of 39.2%, we strongly suggest that at present certification services for third-party tools in the PTB are not a desirable, feasible and successful endeavour..

Dimension of Viability	Dimension Weighting	Measure of Viability	Measure Weighting	Weighting Assessment	Critical Validation
Market Viability	60%	Market size	10	8	30.0%
		Competition	10	7	
		Target Market need for Certification Services (Heritage Institutions)	35	10	
		Target Market need for Certification Services (Tool Developers)	35	15	
		Promotion / Advertising	10	10	
		Total:	100	50	
Technical Viability	20%	Capacity of PTB to incorporate Certification Services	30	25	9.2%
		Existence of prerequisites for implementation	30	15	
		Maintenance of Certification Services	5	3	
		Development Chain issues	5	3	
		Agreement on Software Certification Model	30	0	
		Total:	100	53	
Legal Viability	20%	Licensing	70	0	0.0%
		Liability from incorporation of Certification Services	10	0	
		Payment incurred for certified services	10	0	
		Time Persistency of Certification	10	0	
		Total:	100	0	
				Collective Viability Score:	**39.2%**

Figure 17: Viability Assessment Summary

6. Conclusions and Recommendations

This study has investigated the feasibility of incorporating certification services for third-party tools in the Planets Testbed. The results of the study show little potential for the studied concept. The results take into account the analysis of technical, legal and market-related issues pertaining to the content and implementation of these services. At present, the legal prerequisites for the inclusion of certification services in the PTB are lacking, if not inexistent. It is recommended that a software license or an equivalent legal instrument be established. This will govern the usage of the application and dictate the provisions which allocate liability and responsibility between the parties entering into the agreement. The current status of the PTB as part of the EC-funded Planets Project restricts actions that could raise the success perspectives of the studied concept. These actions include payment of usage fees that would cover the cost of certifying preservation tools registered with the PTB. The prospects of the application should be therefore examined beyond the overall Planets lifecycle and independently from the Planets Suite.

From a technical viewpoint, it has been recommended that the agreement on a software certification model is necessary. The model will guide the certification process before the design and development of any respective services. Although the model need not be specifically formulated for use with preservation tools, it should still cover a pre-defined set of specifications as agreed by the Planets community and the target market. It is recommended that the knowledge and acceptance of any selected model by the user community should be explored and established as a further measure to ensure successful take-up of certification functionality. Once this step has been completed, the services can be deployed through the Interoperability Framework and utilise the existing corpora of data and tools to run certification tests. Any issues regarding development chain implications and long-term maintenance of certification awards can be pragmatically judged after the implementation of the services.

The study has shown that certification services as part of the PTB could address a market large enough to ascertain the existence of a potential audience that would make use of this provision. In addition, competition from applications similar to the Planets Testbed has been judged as negligible. None of the studied cases has clearly incorporated certification of third-party tools as part of the offered functionality[xiv]. Nevertheless, our needs assessment has concluded that – although there is an appetite for certification in general – heritage institutions and preservation tool developers have expressed little need for certification services in the Planets Testbed. On the other hand, a recurring notion of a community consensus has been noted in the feedback. It calls for a user ratting scheme to assess the suitability of preservation tools. In this sense, an external body to provide formal accreditation is not required.

It is therefore highly recommended that the Planets Testbed stakeholders pursue the possibilities offered by a user rating scheme. This could be a suitable alternative to certification services of third-party tools. The use case driven workflow developed by the DCC could provide an excellent framework for such a user rating scheme. This approach focuses more closely on the experimenters context. This approach also helps to maximise the reuse potential of experimentation results across the digital preservation community, by making it easier to determine which tools have performed best in operational contexts most closely matching that of the re-user.

Discussion with PTB developers showed that the user rating scheme would be technologically compliant with the current Testbed infrastructure. It also alleviates the risks associated with legal implications from formal certification and the award of certification marks. Furthermore, the user rating scheme seems to accord more with the mission and nature of the Testbed as a controlled environment for experimentation. After all, the PTB is not about offering "off-the-shelf" digital preservation solutions software. The main focus of the PTB is on evaluating the success and suitability of specific tools for specific preservation purposes.

Appendix A – Questionnaire Forms

A.1 Heritage Institutions

Planets Testbed: Certification of 3rd Party Tools Survey

Introduction

The Planets Testbed is a controlled environment for experimentation and evaluation, with metrics and benchmark content that allow comparison of preservation tools and strategies. The Testbed provides information on the usability of preservations tools and their applicability in various organisational settings.

The Testbed is part of Planets, a four-year project co-funded by the European Commission and 16 National Libraries, Archives, research and technology institutions in Europe. The project will deliver a sustainable framework to support long-term preservation of digital content and increase Europe's ability to access it in the long-term.

This survey is designed to provide an appreciation of the need for certification of Testbed tools offered by third-party suppliers. The information from the questionnaire will be used as input to a report that will help to identify certification needs and ensure that the Testbed technology is able to meet them. The report will be made available to Planets partners.

All responses will be treated confidentially and no individual or institution will be identified by name. Under no circumstances will the provided information be disclosed to third parties or used for purposes other than the stated. Participation is entirely voluntary; if you decide to complete this questionnaire, your time and effort is greatly appreciated.

For more information about the Testbed visit: http://testbed.planets-project.eu/testbed/
You can find out more about Planets at: http://www.planets-project.eu

A. Software Certification

A1. In general, are you aware of Software Certification as a means to gauge the reliability of software in different configurations and environments?

- ❍ Yes (go to A1a)
- ❍ No (go to A1b)

A1a. Does the fact that a product is certified influence the selection of software tools at your organisation?

- ❍ Yes
- ❍ No

A1b. *Software Certification is the process of validating that a software product complies with a set of regulations governing quality and minimum performance requirements. This validation is provided by an external review or assessment.*

In this sense, would the fact that a product is certified influence the selection of software tools at your organisation?

- ❍ Yes
- ❍ No

A2. Are you aware of the Planets Testbed?

- ❍ Yes (go to A2a)
- ❍ No (go to A2b)

A2a. In what context have you encountered the Planets Testbed?

- ❍ Have read about it
- ❍ During a conference /meeting
- ❍ Through contacts with Planets members
- ❍ As a Planets member
- ❍ As a Testbed user
- ❍ Other, please specify

A2b. *The Testbed provides users with a scientific evidence-base for the objective evaluation of different protocols, tools, services and preservation plans. It allows organisations to understand which tools best suit their preservation needs and to locate these tools as integrated services of the Testbed rather than have to deploy them locally. Currently available services include Characterisation, Migration, Emulation and Automatic Comparisons of technical properties between input and output digital objects.*

Would such functionality be expedient for your organisation's needs?

- ❍ Yes
- ❍ No

B. Certification of 3rd Party Tools

In the Planets Testbed, all preservation tools required for experimentation are deployed and accessed as Web Services, which are registered with the Testbed and thus made available to a wide community of users. These tools are not embedded in the main Testbed software, but are registered through agreements with third-party tool suppliers and thus bound by their intellectual property and copyright regulations.

B1. Based on the above, would it be useful or necessary for these third-party tools within the Testbed to be certified on their suitability for your preservation needs by an external body?

- ❍ Yes (go to B1a, B1b)
- ❍ No (go to B1c)

B1a. What would you say are the benefits stemming from certification of third-party tools within the Planets Testbed?

open-ended question

B1b. What would you say are potential problems related to the certification of third-party tools within the Planets Testbed?

open-ended question

B1c. What are the reasons why certification of third-party tools within the Planets Testbed is not useful or necessary for your organisation's needs?

open-ended question

B2. Listed below is a set of factors that can influence the certification of third-party tools within the Planets Testbed. Please rank each of these factors to indicate how important they are for the preservation needs of your organisation.

	Very Important	Important	Neither nor	Unimportant	Very unimportant
The identity of the certification-awarding body	❍	❍	❍	❍	❍
No charge associated with the award of certification	❍	❍	❍	❍	❍
Legal coverage in case a certified tool fails to produce the expected digital objects	❍	❍	❍	❍	❍
Frequency of audits	❍	❍	❍	❍	❍
Quality Assurance for tools and services	❍	❍	❍	❍	❍
Public availability of evidence to demonstrate the legitimacy of the experiments justifying a certification award	❍	❍	❍	❍	❍
Elimination of mistakes	❍	❍	❍	❍	❍
Fitness-for-purpose (certified suitability of a tool for the intended purposes)	❍	❍	❍	❍	❍
Limitation of liabilities	❍	❍	❍	❍	❍

B3. To what extent do you agree or disagree with each of the statements concerning the certification of third-party tools within the Planets Testbed?

	Strongly Agree	Agree	Neither nor	Disagree	Strongly Disagree
I would pay for certified preservation tools	❍	❍	❍	❍	❍
I would trust the Testbed results more if the preservation tools were certified	❍	❍	❍	❍	❍
Third-party tool certification could augment the experience offered by the Testbed	❍	❍	❍	❍	❍
I am worried about legal implications deriving from certification of third-party tools	❍	❍	❍	❍	❍
Certification marks for third-party tools make the Testbed more prestigious	❍	❍	❍	❍	❍
There is not enough experience in digital preservation to establish requirements for certification of preservation tools	❍	❍	❍	❍	❍
There is risk in formally certifying the suitability of third-party tools within a research project such as the Planets Testbed	❍	❍	❍	❍	❍
I am aware of certification models and standards that could be used to certify third-party tools	❍	❍	❍	❍	❍

B4. Please use the space below to suggest any additional information regarding your views on certification of third-party tools within the Planets Testbed. Where possible, state how these issues influence your opinion about the Testbed.

open-ended question

C. Current Practices

C1. Does your organisation have a digital preservation strategy?

- ❍ Yes
- ❍ No

C2. Would you consider using the Planets Testbed as part of your digital preservation strategy?

- ❍ Yes, only if third-party tools were certified by a formal certification and accreditation body
- ❍ Yes, regardless of formal certification for third-party tools
- ❍ The Planets Testbed is already part of my organisation's digital preservation strategy
- ❍ No

D. About you and your organisation

D1. Which title would best describe your organisation?

- ❍ National Library
- ❍ National Archive
- ❍ Academic Archive
- ❍ Academic Library
- ❍ Museum
- ❍ Commercial Organisation
- ❍ Public Sector
- ❍ Other, please specify

D2. What is your role in the organisation you work for?

Open ended

D3. Please enter your contact information. This is for internal reference only and will not be disclosed in the report or shared with any third-parties.

Name:

Organisation:

City:

Country:

Email Address:

A.2 Third-party Tools Providers

Planets Testbed: Certification of 3rd Party Tools Survey

Introduction

The Planets Testbed is a controlled environment for experimentation and evaluation, with metrics and benchmark content that allow comparison of preservation tools and strategies. The Testbed provides information on the usability of preservations tools and their applicability in various organisational settings.

The Testbed is part of Planets, a four-year project co-funded by the European Commission and 16 National Libraries, Archives, research and technology institutions in Europe. The project will deliver a sustainable framework to support long-term preservation of digital content and increase Europe's ability to access it in the long-term.

This survey is designed to provide an appreciation of the need for certification of Testbed tools offered by third-party suppliers. The information from the questionnaire will be used as input to a report that will help to identify certification needs and ensure that the Testbed technology is able to meet them. The report will be made available to Planets partners.

All responses will be treated confidentially and no individual or institution will be identified by name. Under no circumstances will the provided information be disclosed to third parties or used for purposes other than the stated. Participation is entirely voluntary; if you decide to complete this questionnaire, your time and effort is greatly appreciated.

For more information about the Testbed visit: http://testbed.planets-project.eu/testbed/
You can find out more about Planets at: http://www.planets-project.eu

A. Software Certification

A1. In general, are you aware of Software Certification as a means to gauge the reliability of software in different configurations and environments?

- ❍ Yes (go to A1a)
- ❍ No (go to A1b)

A1a. Would the fact that your software product needs to be formally certified as 'fit-for-purpose' influence your decision to register it as a tool within a preservation service?

- ❍ Yes
- ❍ No

A1b. *Software Certification is the process of validating that a software product complies with a set of regulations governing quality and minimum performance requirements. This validation is provided by an external review or assessment.*

In this sense, would the fact that your software product needs to be formally certified as 'fit-for-purpose' influence your decision to register it as a tool within a preservation service?

- ❍ Yes
- ❍ No

A2. Are you aware of the Planets Testbed?

- ❍ Yes (go to A2a)
- ❍ No (go to A2b)

A2a. In what context have you encountered the Planets Testbed?

- ❍ Have read about it
- ❍ During a conference /meeting
- ❍ Through contacts with Planets members
- ❍ As a Planets member
- ❍ As a Testbed user
- ❍ As a Testbed tools provider
- ❍ Other, please specify

A2b. *The Testbed provides users with a scientific evidence-base for the objective evaluation of different protocols, tools, services and preservation plans. It allows organisations to understand which tools best suit their preservation needs and to locate these tools as integrated services of the Testbed rather than have to deploy them locally. Currently available services include Characterisation, Migration, Emulation and Automatic Comparisons of technical properties between input and output digital objects.*

Would you be interested in registering your software tools with this service?

- ❍ Yes
- ❍ No

B. Certification of 3rd Party Tools

In the Planets Testbed, all preservation tools required for experimentation are deployed and accessed as Web Services, which are registered with the Testbed and thus made available to a wide community of users. These tools are not embedded in the main Testbed software, but are registered through agreements with third-party tool providers.

B1. Based on the above, would it be desirable for your software tools to be certified on their suitability for digital preservation needs when registered with the Testbed?

- ❍ Yes (go to B1a, B1b)
- ❍ No (go to B1c)

B1a. What would you say are the benefits stemming from certification of your software tools when registered with the Planets Testbed?

open-ended question

B1b. What would you say are potential problems related to the certification of your software tools when registered with the Planets Testbed?

open-ended question

B1c. What are the reasons why certification of your software tools registered with the Planets Testbed is not desirable?

open-ended question

B2. Listed below is a set of factors that can influence the certification of third-party tools within the Planets Testbed. Please rank each of these factors to indicate how important they are in your decision to register your products with the Testbed.

	Very Important	Important	Neither nor	Unimportant	Very unimportant
The identity of the certification-awarding body	❍	❍	❍	❍	❍
No charge associated with the award of certification	❍	❍	❍	❍	❍
No liability in case a certified tool fails to produce the expected digital objects	❍	❍	❍	❍	❍
Frequency of audits	❍	❍	❍	❍	❍
Quality Assurance for tools and services	❍	❍	❍	❍	❍
Public availability of evidence to demonstrate the legitimacy of the experiments justifying a certification award	❍	❍	❍	❍	❍
Access to a wide community of users	❍	❍	❍	❍	❍
Fitness-for-purpose (certified suitability of a tool for the intended purposes)	❍	❍	❍	❍	❍
Limitation of liabilities	❍	❍	❍	❍	❍

B3. To what extent do you agree or disagree with each of the statements concerning the certification of your software tools when registered with the Planets Testbed?

	Strongly Agree	Agree	Neither nor	Disagree	Strongly Disagree
I would pay to have my software certified	❍	❍	❍	❍	❍
I would trust the Testbed environment more if my products went through a formal certification process	❍	❍	❍	❍	❍
The certification of my products could augment the user experience offered by the Testbed	❍	❍	❍	❍	❍
I am worried about legal implications deriving from certification of my products	❍	❍	❍	❍	❍
Certification marks make the Testbed and my products more prestigious	❍	❍	❍	❍	❍
There is not enough experience in digital preservation to establish requirements for certification of preservation tools	❍	❍	❍	❍	❍
There is risk in formally certifying the suitability of third-party tools within a research project such as the Planets Testbed	❍	❍	❍	❍	❍
I am aware of certification models and standards that could be used to certify third-party tools	❍	❍	❍	❍	❍

Certification would not make my products more efficient for digital preservation	❍	❍	❍	❍	❍
Certification would not change the reliability and trustworthiness of my products	❍	❍	❍	❍	❍

B4. Please use the space below to suggest any additional information regarding your views on certification of tools within the Planets Testbed. Where possible, state how these issues influence your opinion about registering your products with the Testbed.

open-ended question

C. Current Practices

C1. Does your organisation have a software certification strategy?

❍ Yes
❍ No

C2. Would you consider registering your product(s) with the Planets Testbed so that they can be used as preservation tools?

❍ Yes, only if my product(s) are certified by a formal certification and accreditation body
❍ Yes, regardless of formal certification
❍ Yes, only if my product(s) do not go through a formal certification process
❍ I am already a tools provider for the Planets Testbed
❍ No

D. About you and your organisation

D1. Which title would best describe your organisation?

❍ Software Developer / Vendor
❍ Systems Consultancy / Systems Integration
❍ Repository Services Provider

D2. What is your role in the organisation you work for?

Open ended

D3. Please enter your contact information. This is for internal reference only and will not be disclosed in the report or shared with any third-parties.

Name:

Organisation:

City:

Country:

Email Address:

Appendix B – Summary of Results

B.1 Heritage Institutions

1. In general, are you aware of Software Certification as a means to gauge the reliability of software in different configurations and environments?		
Answer Options	**Response Percent**	**Response Count**
Yes	61.5%	8
No	38.5%	5
answered question		**13**
skipped question		**1**

2. Does the fact that a product is certified influence the selection of software tools at your organisation?		
Answer Options	**Response Percent**	**Response Count**
Yes	80.0%	8
No	20.0%	2
answered question		**10**
skipped question		**4**

2. In this sense, would the fact that a product is certified influence the selection of software tools at your organisation?		
Answer Options	**Response Percent**	**Response Count**
Yes	80.0%	4
No	20.0%	1
answered question		**5**
skipped question		**9**

3. Are you aware of the Planets Testbed?		
Answer Options	**Response Percent**	**Response Count**
Yes	78.6%	11
No	21.4%	3
answered question		**14**
skipped question		**0**

4. In what context have you encountered the Planets Testbed?

Answer Options	Response Percent	Response Count
Have read about it	36.4%	4
During a conference /meeting	27.3%	3
Through contacts with Planets members	9.1%	1
As a Planets member	9.1%	1
As a Testbed user	0.0%	0
Other (please specify)	18.2%	2
answered question		**11**
skipped question		**3**

4. Would such functionality be expedient for your organisation's needs?

Answer Options	Response Percent	Response Count
Yes	100.0%	3
No	0.0%	0
answered question		**3**
skipped question		**11**

5. Based on the above, would it be useful or necessary for these third-party tools within the Testbed to be certified on their suitability for your preservation needs by an external body?

Answer Options	Response Percent	Response Count
Yes	50.0%	7
No	50.0%	7
answered question		**14**
skipped question		**0**

6. What would you say are the benefits stemming from certification of third-party tools within the Planets Testbed?

Answer Options	Response Count
	6
answered question	**6**
skipped question	**8**

7. What would you say are potential problems related to the certification of third-party tools within the Planets Testbed?

Answer Options	Response Count
	5
answered question	**5**
skipped question	**9**

6. What are the reasons why certification of third-party tools within the Planets Testbed is not useful or necessary for your organisation's needs?	
Answer Options	**Response Count**
	6
answered question	**6**
skipped question	**8**

8. Listed below is a set of factors that can influence the certification of third-party tools within the Planets Testbed. Please rank each of these factors to indicate how important they are for the preservation needs of your organisation.						
Answer Options	**Very Important**	**Important**	**Neutral**	**Unimportant**	**Very unimportant**	**Response Count**
The identity of the certification-awarding body	3	6	4	0	0	13
No charge associated with the award of certification	3	3	5	1	0	12
Legal coverage in case a certified tool fails to produce the expected digital objects	1	5	2	5	0	13
Frequency of audits	1	6	5	0	0	12
Quality Assurance for tools and services	9	2	2	0	0	13
Public availability of evidence to demonstrate the legitimacy of the experiments justifying a certification award	7	4	1	1	0	13
Elimination of mistakes	3	8	1	0	0	12

Fitness-for-purpose (certified suitability of a tool for the intended purposes)	6	7	0	0	0	13
Limitation of liabilities	1	3	7	1	1	13
					answered question	**13**
					skipped question	**1**

9. To what extent do you agree or disagree with each of the statements concerning the certification of third-party tools within the Planets Testbed?

Answer Options	**Strongly Agree**	**Agree**	**Neither Agree nor Disagree**	**Disagree**	**Strongly Disagree**	**Response Count**
I would pay for certified preservation tools	2	2	7	1	1	13
I would trust the Testbed results more if the preservation tools were certified	4	4	4	1	0	13
Third-party tool certification could augment the experience offered by the Testbed	2	9	2	0	0	13
I am worried about legal implications deriving from certification of third-party tools	1	3	6	2	1	13
Certification marks for third-party tools make the Testbed more prestigious	3	6	3	1	0	13
There is not enough experience in digital preservation to establish requirements for certification of preservation tools	3	4	3	3	0	13
There is risk in formally certifying the suitability of third-party tools within a research project such as the Planets Testbed	1	4	6	2	0	13
I am aware of certification models and standards that could be used to certify third-party tools	1	3	6	3	0	13
					answered question	**13**
					skipped question	**1**

10. Please use the space below to suggest any additional information regarding your views on certification of third-party tools within the Planets Testbed. Where possible, state how these issues influence your opinion about the Testbed.	
Answer Options	**Response Count**
	5
answered question	**5**
skipped question	**9**

11. Does your organisation have a digital preservation strategy?		
Answer Options	**Response Percent**	**Response Count**
Yes	61.5%	8
No	38.5%	5
answered question		**13**
skipped question		**1**

12. Would you consider using the Planets Testbed as part of your digital preservation strategy?		
Answer Options	**Response Percent**	**Response Count**
Yes, only if third-party tools were certified by a formal certification and accreditation body	8.3%	1
Yes, regardless of formal certification for third-party tools	75.0%	9
The Planets Testbed is already part of my organisation's digital preservation strategy	8.3%	1
No	8.3%	1
answered question		**12**
skipped question		**2**

13. Which title would best describe your organisation?		
Answer Options	**Response Percent**	**Response Count**
National Library	41.7%	5
National Archive	8.3%	1
Academic Archive	8.3%	1
Academic Library	16.7%	2
Museum	0.0%	0
Commercial Organisation	8.3%	1
Public Sector	8.3%	1
Other (please specify)	8.3%	1
answered question		**12**
skipped question		**2**

14. What is your role in the organisation you work for?	
Answer Options	**Response Count**
	12
answered question	**12**
skipped question	**2**

15. Please enter your contact information. This is for internal reference only and will not be disclosed in the report or shared with any third-parties.		
Answer Options	**Response Percent**	**Response Count**
Name:	100.0%	12
Organisation:	100.0%	12
City:	91.7%	11
Country:	91.7%	11
Email Address:	100.0%	12
answered question		**12**
skipped question		**2**

B.2 Third-party Tools Providers

1. In general, are you aware of Software Certification as a means to gauge the reliability of software in different configurations and environments?

Answer Options	Response Percent	Response Count
Yes	83.3%	10
No	16.7%	2
answered question		**12**
skipped question		**0**

2. Would the fact that your software product needs to be formally certified as 'fit-for-purpose' influence your decision to register it as a tool within a preservation service?

Answer Options	Response Percent	Response Count
Yes	88.9%	8
No	11.1%	1
answered question		**9**
skipped question		**3**

2. In this sense, would the fact that your software product needs to be formally certified as 'fit-for-purpose' influence your decision to register it as a tool within a preservation service?

Answer Options	Response Percent	Response Count
Yes	50.0%	1
No	50.0%	1
answered question		**2**
skipped question		**10**

3. Are you aware of the Planets Testbed?

Answer Options	Response Percent	Response Count
Yes	72.7%	8
No	27.3%	3
answered question		**11**
skipped question		**1**

4. In what context have you encountered the Planets Testbed?

Answer Options	Response Percent	Response Count
Have read about it	12.5%	1
During a conference /meeting	12.5%	1
Through contacts with Planets members	0.0%	0
As a Planets member	50.0%	4
As a Testbed user	0.0%	0
As a Testbed tools provider	12.5%	1
Other (please specify)	12.5%	1
answered question		**8**

skipped question	**4**

4. Would you be interested in registering your software tools with this service?

Answer Options	Response Percent	Response Count
Yes	100.0%	2
No	0.0%	0
answered question		**2**
skipped question		**10**

5. Based on the above, would it be desirable for your software tools to be certified on their suitability for digital preservation when registered with the Testbed?

Answer Options	Response Percent	Response Count
Yes	88.9%	8
No	11.1%	1
answered question		**9**
skipped question		**3**

6. What would you say are the benefits stemming from certification of your software tools when registered with the Planets Testbed?

Answer Options	Response Count
	5
answered question	**5**
skipped question	**7**

7. What would you say are potential problems related to the certification of your software tools when registered with the Planets Testbed?

Answer Options	Response Count
	5
answered question	**5**
skipped question	**7**

6. What are the reasons why certification of your software tools is not desirable when registered with the Planets Testbed?

Answer Options	Response Count
	1
answered question	**1**
skipped question	**12**

8. Listed below is a set of factors that can influence the certification of third-party tools within the Planets Testbed. Please rank each of these factors to indicate how important they are in your decision to register your products with the Testbed.

Answer Options	Very Important	Important	Neutral	Unimportant	Very unimportant	Response Count
The identity of the certification-awarding body	0	3	2	0	0	5

No charge associated with the award of certification	1	2	1	1	0	5
No liability in case a certified tool fails to produce the expected digital objects	2	1	2	0	0	5
Frequency of audits	0	3	2	0	0	5
Quality Assurance for tools and services	2	2	1	0	0	5
Public availability of evidence to demonstrate the legitimacy of the experiments justifying a certification award	2	1	2	0	0	5
Access to a wide community of users	2	2	1	0	0	5
Fitness-for-purpose (certified suitability of a tool for the intended purposes)	1	4	0	0	0	5
Limitation of liabilities	1	2	2	0	0	5
					answered question	**5**
					skipped question	**7**

9. To what extent do you agree or disagree with each of the statements concerning the certification of your software tools when registered with the Planets Testbed?

Answer Options	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree	Response Count
I would pay to have my software certified	0	1	1	1	2	5

I would trust the Testbed environment more if my products went through a formal certification process	0	2	2	1	0	5
The certification of my products could augment the user experience offered by the Testbed	0	3	2	0	0	5
I am worried about legal implications deriving from certification of my products	0	2	2	0	1	5
Certification marks make the Testbed and my products more prestigious	1	2	2	0	0	5
There is not enough experience in digital preservation to establish requirements for certification of preservation tools	2	1	2	0	0	5
There is risk in formally certifying the suitability of third-party tools within a research project such as the Planets Testbed	1	1	1	2	0	5
I am aware of certification models and standards that could be used to certify third-party tools	0	1	2	1	1	5

Certification would not make my products more efficient for digital preservation	2	2	1	0	0	5
Certification would not change the reliability and trustworthiness of my products	2	2	0	1	0	5
					answered question	**5**
					skipped question	**7**

10. Please use the space below to suggest any additional information regarding your views on certification of tools within the Planets Testbed. Where possible, state how these issues influence your opinion about registering your products with the Testbed.

Answer Options	**Response Count**
	0
answered question	**0**
skipped question	**12**

11. Does your organisation have a software certification strategy?

Answer Options	**Response Percent**	**Response Count**
Yes	0.0%	0
No	100.0%	5
answered question		**5**
skipped question		**7**

12. Would you consider registering your product(s) with the Planets Testbed so that they can be used as preservation tools?

Answer Options	**Response Percent**	**Response Count**
Yes, only if my product(s) are certified by a formal certification and accreditation body	20.0%	1
Yes, regardless of formal certification	40.0%	2
Yes, only if my product(s) do <u>not</u> go through a formal certification process	0.0%	0
I am already a tools provider for the Planets Testbed	40.0%	2
No	0.0%	0
answered question		**5**
skipped question		**7**

13. Which title would best describe your organisation?

Answer Options	Response Percent	Response Count
Software Developer / Vendor	25.0%	1
Systems Consultancy / Systems Integration	0.0%	0
Repository Services Provider	0.0%	0
Other (please specify)	75.0%	3
answered question		**4**
skipped question		**8**

14. What is your role in the organisation you work for?

Answer Options	Response Count
	4
answered question	**4**
skipped question	**8**

15. Please enter your contact information. This is for internal reference only and will not be disclosed in the report or shared with any third-parties.

Answer Options	Response Percent	Response Count
Name:	100.0%	4
Organisation:	100.0%	4
City:	100.0%	4
Country:	100.0%	4
Email Address:	100.0%	4
answered question		**4**
skipped question		**8**

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Notes

[i] http://www.dcc.ac.uk

[ii] http://www.justid.nl/

[iii] http://www.dans.knaw.nl/en/

[iv] http://www.d-nb.de/

[v] http://www.bundesarchiv.de/aufgaben_organisation/dienstorte/berlin/index.html

[vi] http://www.ukoln.ac.uk/

[vii] http://www.dlib.org/test-suite/

[viii] http://www.darpa.mil/index.html

[ix] http://www.digitalpreservationeurope.eu/

[x] http://www.repositoryaudit.eu

[xi] http://www.dcc.ac.uk/tools/digital-curation-tools/

[xii] For instance, a 2003 report by the Online Computer Library Center documents one million libraries worldwide, but this figure cannot be corroborated.

Source: http://www5.oclc.org/downloads/community/librariesstackup.pdf

[xiii] Thomson (2005b, p. 177) suggests that in order to recommend a concept as viable, the critical validation scores should be above 80%. In cases where only individual dimensions fall below the critical validation rating, a recommendation could be made that the concept is strong rather than viable.

[xiv] Caution is advised with respect to this finding, as emerging technologies from new projects might radically change the current market environment. For instance, the PrestoPRIME project has announced the development of a Testbed to validate preservation actions, tools and processes.

Source: http://www.prestoprime.org/project/objectives.en.html