**Requirements of**

**Permanent Unique Identifiers (PUIDs)**

**in the context of the Global Information System (GLIS)**

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| **#** | **Requirement** | **Description** |
| 1 | Uniqueness | Each PUID shall be associated to one and only one entity |
| 2 | Permanence | The association between the PUID and the entity shall be maintained without any time limit |
| 3 | Opacity | No information on the entity should be inferable from the PUID alone. (Not human-readable). |
| 4 | Resolvability | Given the PUID, a web page exists where it can be entered to obtain a description of the associated entity |
| 5 | Discoverability | Given one or more attributes of the entity, a web page exists where those attributes can be entered to obtain the list of entities matching those attributes along with the associated PUIDs |
| 6 | Security | Access to PUID management functions (e.g. editing of associated metadata) shall be allowed only to authorized users |
| 7 | Scalability | The adopted PUID type shall be designed to handle very large number of identifiers (hundreds of millions) |
| 8 | Interoperability | Interoperability with other PUID types shall be ensured |
| 9 | Compatibility | Non-unique and local identifiers already assigned to entities (e.g. Accession Numbers) shall be preserved and provided as an attribute of the new PUID in the resolution service |
| 10 | Multiple resolution (optional?) | A list of links to multiple destinations can be returned in the resolution response. Moreover, filtering of destinations according to some metadata description can be supported |
| 11 | Content negotiation | Client applications shall be able to specify the preferred format to be used in the response (e.g. XML, RDF, JSON) |
| 12 | Accepted standard | Selecting a PUID type that follows an internationally accepted standard is considered a plus because it will guarantee a coordinated development of the framework |
| 13 | Acquisition cost | The cost of acquiring licenses or registration with a central authority, as well as any other cost associated in acquiring the PUID technology (e.g. software tools) should be assessed |
| 14 | Acceptance by publishers | It is expected that GLIS entities will be cited in journals, books and papers. Selecting a PUID type that is widely accepted by publishers is considered a plus |
| 15 | Popularity | Adopting a PUID type that is widely used facilitates acceptance by users |
| 16 | Availability of tools | Software tools available in the most common programming languages (e.g. PHP or Java) will facilitate integration in GLIS |
| 17 | Resolution service | The availability of a reliable, global resolution service is considered a plus because it will allow users outside the GLIS community to resolve GLIS PUIDs from third party websites |
| 18 | Framework design | The detail and completeness of the logical and technical design framework should be evaluated because functions and services that are designed and specified for the PUID types in such frameworks are likely to be more reliable, powerful and interoperable compared to areas that are not specified |
| 19 | Metadata | The ability to incorporate different entity types and metadata descriptions is critical as GLIS is expected to grow to include accessions, genomics, phenomics, institutions, people, regulations, technologies and more |
| 20 | Relations | The PUID shall support modeling of complex relations among entities such as instantiation, hierarchy, derivation, inclusion and so on |
| 21 | Identification of fragments | The possibility of identifying individual attributes or fragments of an entity without having to register individual PUIDs for each attribute or fragment is considered a plus, especially for gene sequences or phenomics |