**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 inferrable from the PUID alone |
| 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 | Compatability | Identifiers already assigned to entities (e.g. Accession Numbers) shall be preserved |
| 10 | Multiple resolution | The list of links to multiple destinations shall be returned in the resolution response. Moreover, filtering of destinations according to some metadata description shall 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 | Being the PUID type 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. Being the PUID 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 availablity 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 as functions and services that are designed in the PUID type are likely to be more reliable, powerful and interoperable compared to areas that are not specified |
| 19 | Metadata | The ability to incorporate different metadata descriptions is critical as GLIS is expected to grow to include, beside Accessions, geneomics, 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 PUID is considered a plus, especially for gene sequences or phenomics |