An Economic Evaluation of gTLD Performance Metrics

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1 Introduction

ICANN is a nonprofit organization, tasked with managing the "namespaces of the Internet" with the goal of ensuring stable and secure operation of the Internet. Namespace management is achieved by controlling the set of top-level domains (TLDs), and managing the procedures and entities involved in domain name assignment, registration and management. A TLD is the final part of a domain name (e.g., .com in united.com or .edu in ucdavis.edu). There are several types of TLDs, including *generic top-level domains* (gTLDs, such as .aero, .tv, or .biz) and those that signify countries (e.g., .ca for Canada). This article is specifically about gTLDs, i.e., TLDs other than those corresponding to a country code.

For the purpose of this document the term `gTLD-set`(t) will refer to the set of global top-level domains available on the Internet at a particular time t.

1.1 Background

In the early years, before the World Wide Web, `gTLD-set` consisted of .edu, .mil and .gov sites; then expanded to .com as commercial activity began on the Internet in the early 1990s. A small further expansion to TLDs such as .net and .org occurred to enable some sites (e.g., non-profit organizations) to distinguish themselves as being neither commercially-oriented nor educational (or military/governmental) institutions. During these phases, introduction of new TLDs was extremely selective. Around 2012 onwards, there has been a push to allow proliferation of gTLDs, and to make expansion of `gTLD-set` a lot more open, easy and market-driven. ICANN, which controls the creation of TLDs and approval of requests for creation of new TLDs, has developed a process for such requests and approvals. This process leads to inclusion of new TLDs into `gTLD-set`, and possibly removal of defunct TLDs. Given the `gTLD-set`(t) at any time t, namespace management is performed by a number of outside parties that work in association with ICANN (see Fig. 1).

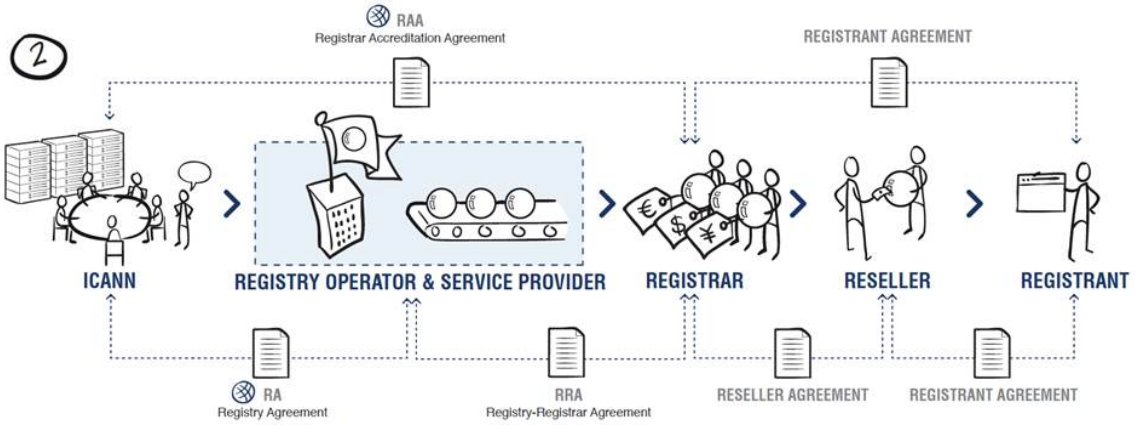

Figure 1: Namespace management on the Internet. (Source: Amy Bivins, ICANN.)

1.2 Objectives

As the `gTLD-set` has evolved and grown over time, it becomes meaningful to ask whether this evolution occurred in a manner that satisfies certain desirable objectives. ICANN has defined three categories of objectives, *robust competition*, *trust* and *marketplace stability* (see Appendix A). ICANN has also drafted a set of detailed "beta" metrics for measuring the health of the generic top-level domain marketplace with respect to these desired objectives. In order to track progress against its objectives, ICANN aims to publish metric statistics in a semi-annual health index.

This note reviews these proposed metrics from an economic perspective, and evaluates whether the category definitions and the detailed metrics are suitable with respect the desired objectives. In the present effort, the intent is that the metrics rely on data that ICANN holds or puts together from external reporting, vs. data that might require reliance on external sources. It is also explicit in this effort that the proposed metrics are in "beta" form and that this evaluation is not the "final word." Rather, a key requirement at this time is to evaluate if the metrics capture *relevant* factors, and that more sophistication in the measurement and normalization of these factors be pushed out into subsequent phases of metric development, validation and analysis.

1.3 Evaluation Framework

A key purpose of a metric, or a set of metrics, is to provide a quick snapshot of the "health" of some system or entity. As shown in the left panel Fig. 2, the choice of design or decision element influences some broad organizational goal, the measurement of which is encapsulated into one or more metrics; conversely the value of the metric provides a status of system health, and reflects the quality of the design. Hence, a metric reflects both (a) how well the system or entity is functioning, and also (b) how well the system or entity (or its production system) was designed. In the present context, the purpose is to get an indication of how well the gTLD marketplace is functioning, and how well elements of the gTLD marketplace were designed. The

right panel of Fig. 2 represents an expanded view of the general influence diagram, where the decision and metric nodes are expanded into their set of potential values.

After a preliminary review of the metrics and category definitions (provided by ICANN), this effort recognizes, at the outset, that the evaluation of metrics must be done with respect to their ability to measure the "health" of three separate elements of the gTLD marketplace.

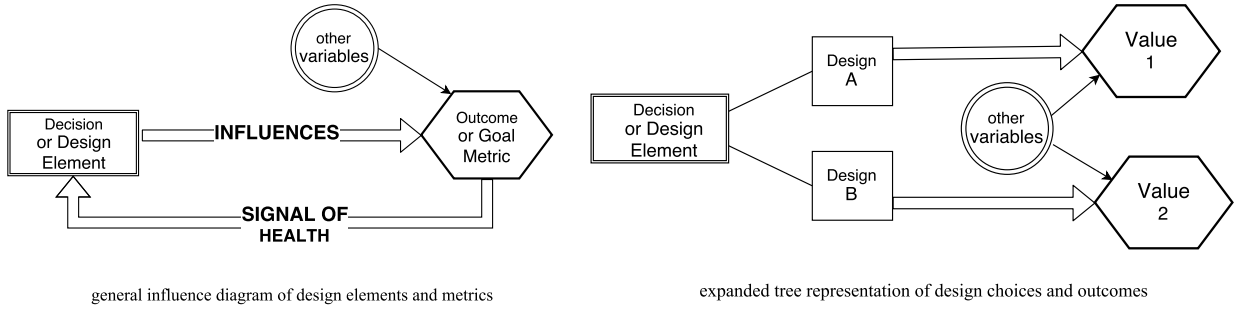

Figure 2: Design elements and Metrics

`gTLD-set`(market elements): its size, the specific elements in it, and the frequency with which it is updated. Is the set of gTLDs suitably serving the needs of Internet users and organizations?

Governance mechanisms (ICANN policies and processes for modification of `gTLD-set`): the norms and procedures for managing or evolving the `gTLD-set` (e.g., for approval, de-accreditation, appeals and dispute resolution). Are applications for new TLDs sought and handled in an appropriate way? Are new TLDs priced suitably and allocated in the best way (i.e., to a registrant who derives the highest value from them)?

Namespace management (for any given `gTLD-set`): processes and related institutions for appointing and managing gTLD marketplace partners (registrars/resellers, and registry operator services). How they are appointed? Are they providing suitable service quality and availability, and pricing predictability?

Initially, the main driver of the evaluation appeared to be the first item above, `gTLD-set`. The pivot to a three-part evaluation is motivated by the preliminary observation that some of the metrics included in the working statement, although they appear meaningful, seemed not strongly related to the design of `gTLD-set`. More generally, it is important to recognize that, collectively, the set of metrics (i.e., their values) will send a signal about not just one element above but all of them. It is important, therefore, to recognize which metric is providing a signal regarding which element of the overall gTLD marketplace.

1.4 Principles for Metric Design

Just like glancing at the vital signs of a patient gives a physician a quick and largely accurate (but not perfect) sense of the patient's health, or just like glancing at a dashboard for an electricity grid can give

the grid manager a quick sense of the grid's performance in matching demand and supply, the idea is that glancing at the gTLD metrics should give the reviewer a quick impression of the suitability of `gTLD-set`, the process for its evolution, and/or the mechanisms for namespace management. This gives rise to a few fundamental principles in metric design.

1. a metric should link back to an organizational design (or decision) element.
2. a metric should be a good signal of the design being evaluated ... i.e., its value should vary "strongly"[1] as the design itself varies.
3. a metric should be amenable to comparison against baseline or benchmark values.[2]
4. a metric should be suitably normalized, so that variations on account of other exogenous factors (e.g., time or other dimension) are canceled out, thereby highlighting variations (or lack of them) owing to the design element.
5. ideally, a metric's value should provide a trace back to a single decision element (rather than a collection of elements). If a collection of elements has a strong joint effect on the value of a metric, then that value provides little guidance regarding the "health" of any element.
6. a metric should be simple and reasonably accurate, vs. perfect and highly complex or compound (that said, it is often useful to employ normalized metrics vs. absolute counts).
7. measurability: it should be measurable and auditable, and ideally, automated rather than self-reported
8. behaviors motivated by the metric should be consistent with the underlying organizational and social objectives.

2 Proposed Metrics

An initial set of 17 metrics was provided as part of the work statement (see "Draft Proposed Metrics (Beta)"). These metrics were placed under the three evaluation categories of *Robust Competition*, *Marketplace Stability*, and *Trust* (see §A). As a sidenote, definitions of these metric categories seem quite robust and comprehensive, hence this report makes no further discussion of these category definitions.

After preliminary review and discussions, this draft was revised as well as annotated to provide a more elaborate description and justification of the metrics, including associating each metric to one or more decision elements (`gTLD-set`, governance, namespace management). It was then revised multiple times

[1] Informally speaking, this means the metric should vary in a visible or substantial way; otherwise if the definition merely requires *any, non-zero* variation, then that would not be meaningful.

[2] Caution: the benchmarks need not—and, in some cases, should not, be provided by the institution that provides the metrics and data. The primary role of the institution is to provide the data that enables other stakeholders to make comparisons against benchmarks and reach suitable interpretations.

after further review and discussions, including an expansion to 19 metrics. This latest version of draft metrics, identified as Appendix "Revised Set of Metrics and Decision Elements (v3)", forms the basis of the evaluation report in the following section.

3 Evaluation of Metrics

This section evaluates the revised set of proposed beta metrics with respect to (a) how well they reflect the three evaluation categories related to marketplace competition, stability and trust, and (b) how well they signal quality of the three design elements that they purport to represent.

3.1 Jurisdictions with Local Registrars and Registry Operators

The first two metrics are a count of legal jurisdictions with at least one ICANN-accredited (a) gTLD registrar and (b) gTLD registry operator, respectively.

- **Purpose**: Tracking these metrics across time will demonstrate the global penetration and spread of namespace management services (a desirable goal), and will signal how well the design elements have been configured to achieve this goal.

  The metric is amenable to both standard visualizations (e.g., a bar-chart) as well as geo-visualizations, e.g., marking up jurisdictions with new registrars or registry operators on a visual global map.

  Design Elements: The metric's value will be affected primarily by `gTLD-set`. As `gTLD-set` expands to include more geo-specific TLDs (e.g., .london or .delhi) or business categories that have geographic relevance (e.g., .yoga, .reef), it should cause entry by registrars and by registry operators in those, potentially unserved, jurisdictions. The metric's value may also be influenced by the namespace management protocols (reflecting ease or difficulty implied in the process), however this influence is subject to substantial noise from aspects that ICANN does not control (e.g., legal and regulatory environment in various jurisdictions).

  Caveats: These metrics reflect approximate associations, and are subject to both false positives and false negatives. False positives indicate that even when a particular `gTLD-set` is introduced it may not lead to entry in that jurisdiction (because of unfavorable economic or regulatory environment), or that certain new gTLDs may have no geo-specificity. False negatives indicate that the metric value may remain unchanged upon introduction of new gTLDs, when the affected jurisdictions *already* have registrars or registry operators. In that sense, the metric is too coarse (it only measures a change from 0 to 1, but not from, say, 1 to 10 or 12 to 15) and will therefore miss other more subtle effects.

  Another limitation is that the metric treats every jurisdiction as equal, even though these jurisdictions differ hugely on several dimensions, e.g., population, Internet users, Internet usage, Internet-friendliness (high-speed broadband or mobile connections).

Next Steps: These concerns can be mitigated, in subsequent analysis, by developing a more compound and sophisticated measure using the above counts and their variation across time and across other dimensions of variation. For instance, one could measure the change in the number of Internet users who have a registrar (or registry operator, respectively) based in their own jurisdiction.

3.2 Distinct Registrars and Registry Operators: Absolute and Relative

Metrics 3-4 are frequency tables representing the *absolute count* of registrars (and registry operators, respectively) in each ICANN region, adjusted for ownership, i.e., treating all registrars (or operators) with the same ownership as one.

- **Purpose**: The "distinct" aspect of the metric measures the true level of marketplace competition in each region. Chiefly, it recognizes that merely the number of registrars (or operators) in a region is not a good measure of the level of competition when multiple registrars have the same owner. Because each metric is a frequency table (rather than an average) it provides a snapshot view of underserved regions or those with limited competition.

  The metric can be represented as a frequency table, or visualized via a (sorted) bar chart or a histogram.

  Design Elements: The metric's value will be affected primarily by `gTLD-set`. As `gTLD-set` expands, the increase in overall market service opportunities should motivate more entities to enter the marketplace. Fewer owners would imply high profits, creating incentives for entry. However, if regions with high levels of activity (e.g., large number of Internet users and domains) have few distinct registrars (or operators) that would indicate existence of entry barriers, which might be caused by external factors specific to the region. The metric will also be affected by time (increase in internet activity), ICANN policy and contractual requirements.

  Caveats: The two metrics are quite robust, however one should exercise caution in employing them to interpret the level of competition. For instance, a region with 10 registrars may be less competitive than a region with 5, depending on the distribution of market shares across the owner entities. Moreover, passage of time may be necessary to get a stable set of metric values, because new owner entrants will initially have very low market share.

  Next Steps: These concerns can be mitigated, in subsequent analysis, by employing a more sophisticated index that reflects the distribution of market shares of distinct registrars (or operators) vs. merely the count of the same (e.g., the Herfindahl-Hirschman index, or a variant thereof that is robust to a large expansion in the set of registrars and registry operators).

Metrics 5-6 are frequency tables representing the *relative count* of registrars (and registry operators,

respectively) in each ICANN region, i.e., the ratio

$$100 \times \frac{\text{number of distinct registrars (or operators)}}{\text{total number of registrars (or operators)}}$$

for each ICANN region. It is a sensible normalization of metrics 3-4, because it irons out differences in region size. While metrics 3-4 merely count number of distinct owners, those numbers are not comparable across regions, whereas metrics 5-6 are. It might, however, be more useful to invert these measures, hence defining the metrics as

$$\frac{\text{total number of registrars (or operators)}}{\text{number of distinct registrars (or operators)}}$$

which can then be interpreted as the average level of registrars (or operators) per owner.

Metrics 7-8 are single values representing the same concept at the global level (vs. dis-aggregated by region).

3.3 Domain name: deletions, new registrations, total count

Metric 9 measures the percentage of second-level gTLDs (SLDs) that were deleted, representing the entire set of gTLDs (or, just the "new ones")? Metric 10 measures the total number of SLDs that were added. Metric 11 is the overall count of second-level gTLDs registered.

- **Purpose**: deletion or creation of new SLDs is a direct indicator of the efficacy of the `gTLD-set`. It also provides a weak indication of the process for namespace management.

  Design Elements: The metric's value will be affected primarily by `gTLD-set`. A sufficiently rich set should increase demand for domain registrations. Lack of suitable gTLDs may cause more deletions.

  The value may also be affected by the processes for namespace management. For instance, businesses may create new domains as "placeholders" either when the creation process is very onerous or to foreclose another entity from capturing that name; such rushed creation raises the probability of relinquishing the name in the future.

  Caveats: For both metrics, a simple direct measure may be subject to noise. For instance, it makes sense that a sufficiently rich `gTLD-set` should cause more domain registrations; but it is also possible that too few elements in `gTLD-set` may create a frenzy to own domains and hence lead to high demand in the short term.

  Next Steps: These concerns can be mitigated, in subsequent analysis, by normalizing these metrics, for instance, by the age(s) of the corresponding gTLDs. A domain registration for a "young" gTLD may provide a greater signal of the efficacy of changes to `gTLD-set` than a domain registration for an "old" gTLD (whereas, in the current form, the metric would treat the two equally).

A more general issue here might be to understand the diffusion process for an arbitrary gTLD. That is, when a new gTLD is created, what is the relationship between time since creation and number of new domains registered? This understand might be vital to developing suitable forms for this metric.

Metric 12 computes a similar measure for *internationalized* domain name registrations. It is subject to the same caveats discussed above, and may additionally require non-identical treatment of different international regions.

3.4 Newly Accredited, and de-Accredited, Registrars and Registry Operators

Metrics 13-15 are self-explanatory, and measure the changes in number of Registrars.

- **Purpose**: Introduction of new registrars reflects the vitality of both the `gTLD-set` marketplace and processes for namespace management.

  Design Elements: For metric 13 (new registrars), the value signals health of the `gTLD-set`. A big leap in the number of new registrars value may reflect positive changes in `gTLD-set`. Metric 14 reflects the inverse: voluntary de-accreditations may indicate a correction following a previous over-subscription, or marketplace consolidation. However, metric 11 may also carry a signal about namespace management procedures: de-accreditations due to contractual violations may suggest a less than thorough vetting process in the appointment of new registrars. Similar observations apply to metric 15 for registry operators.

  Caveats: As with most other metrics that measure overall marketplace activity or size, these metrics are also heavily influenced by external factors such as changes in the number of Internet users, Internet activity (which may be affected by penetration and availability of high-speed Internet connections in different regions).

  Metrics 14-15 which measure de-accreditations do not differentiate between voluntary de-accreditations (which may reflect marketplace weakness) vs. de-accreditations due to contractual violations; both are counted equally in computing the metric value, hence may limit the information value of the metric.

  Next Steps: For metrics 14-15, it might be useful to maintain separate counts of voluntary de-accreditations vs. those on account of contractual violations. For metric 13, it would be useful to examine the information value of an absolute count (current definition) vs. a relative value (e.g., percentage increase), or perhaps even to create an index (e.g., average age of registrars).

3.5 Disputes and Terminations

UDRP (Uniform Domain-Name Dispute-Resolution Policy) is a process established by ICANN for resolution of trademark-related disputes regarding internet domain names (SLDs). More clear-cut cases of infringement are dealt with under a Uniform Rapid Suspension (URS) system.

Metric 16 measures the number of adverse decisions (UDRP and URS) reached against SLD registrants. Metrics 17-18 measure the number of *involuntary* terminations (i.e., indicating fraud or incorrect actions) of Registrars, and Registry Operators, respectively.

- **Purpose**: Tracking metrics 16-18 over time provides a snapshot of smooth functioning and trust in the gTLD marketplace and governance mechanisms.
- **Design Elements** Metric 16 is a reflection primarily of the governance mechanisms around namespace management. However, it might convey two opposite signals. First, the mere occurrence of disputes (which is NOT what the metric counts) reflects failure to recognize potential infringements during the SLD registration process itself, but it also recognizes participants' trust in the overall governance process. Secondly, successful resolution of such disputes, especially negative decisions that recognize infringements, reflects positively on the appeals and dispute resolution process.

  Similar reasoning applies to metric 17 (concerned with termination of registrars). It also applies to termination of registry operators (metric 18), but this is likely to be a rare occurence because of the limited number of registry operators and their tighter institutional linkages with ICANN.
- **Caveats**: Metric data should be interpreted with caution due to mixing of two conflicting signals.
- **Next Steps**: It should be useful to separate occurrence of disputes (i.e., new metric, a count of complaints filed) vs. resolution of disputes (what the metric presently does). Further, it might be useful to compute these metrics as rates rather than absolute values, hence normalizing against total number of registrations (for metric 16; or registrars for metric 17) by period and/or by region. It might also be useful to limit the count of complaints to registrations only up to a certain age.

3.6 Registration Data (Whois) Accuracy

Metric 19 measures the percentage of domain registrations found to have accurate data, as detected by the Whois Accuracy Reporting System.

- **Purpose**: Tracking this metric across time provides a snapshot of marketplace trust based on accuracy of Whois data, which enables other parties to get in touch with domain registrants.
- **Design Elements**: The metric's value provides a signal of the efficacy of namespace management processes.
- **Caveats**: This is a fairly straightforward metric and should function smoothly. It is possible that certain data fields lose accuracy, however this could be managed via contractual obligations and automated and recurrent checks of data accuracy.
- **Next Steps**: It might be possible to cover the caveat noted above by separating inaccuracies for recently registered domains (an inaccuracy points to a failure during registration) vs. older registrations (detection provides a positive signal).

4 Summary and General Observations

This note has reviewed a set of 19 metrics proposed for measuring the health of the gTLD marketplace. The metrics are listed in the table "Revised Set of Metrics and Decision Elements (v3)" appended to this report. All 19 metrics capture data that are *relevant* to understanding the health of the marketplace, along three design elements: the prevailing set of gTLDs, governance mechanisms for the gTLD set, and processes and mechanisms for namespace management. They contain information that, when tracked across time, enables evaluators to judge healthy functioning of the gTLD marketplace and derive signals regarding the quality of the three design elements.

While all metrics provide *relevant* data, this note emphasizes caution in making interpretations of marketplace health or design quality. With the present formulation of the metrics, a shift in one direction (e.g., an increase) can signal either an improvement or worsening of marketplace health, or reflect positively or poorly on the design elements. This is because a design element could potentially affect a metric's value in multiple, conflicting ways, mediated through additional factors not captured in the metric. Metric values will be influenced by several factors not related to the decision or design elements that ICANN controls, or by changes in ICANN policy or implementation approach. Some of the key influencing factors for each metric are listed in the table. The interpretation of particular values of metrics, or deviations across time, must be conducted in light of these influences. Interpretive models of design elements might need to consider multiple metrics simultaneously, while also incorporating and controlling for other variables that affect the metrics. A desirable goal would be to develop models that produce and compute new metrics, "rates" or "coefficients" whose value provides a monotonic signal about the design element.

A Category Definitions (Source: ICANN)

Robust Competition: diversity in choice of service provider (including geography, service model, languages and scripts offered, etc); a commercially thriving marketplace (demand for gTLDs is demonstrated by growth in new gTLDs and across all gTLDs); the market is open to new players and competition is fair among existing players; the market is not dependent on one or a small number of players.

Marketplace Stability: a gTLD marketplace environment that is experiencing more market entrances than exits and in which service providers are reliable, giving registrants, internet users, and the global community (including registries, registrars, law enforcement, IP holders, and all others) consistent expectations and levels of service.

Trust: the perception of marketplace stability and quantified measures of risk (such as adverse incidents detected and/or reported to ICANN) demonstrate that service providers (registries, registrars, resellers, backend providers, etc.) and registrants are trustworthy and compliant with their contractual obligations.

A slightly different presentation of the same information was given in a related document, "gTLD Marketplace Health Index," which presents statistics and trends related to generic top level domains (gTLD).

Robust Competition

- Diversity exists in the choice of a service provider (including geography, service model, languages and scripts offered).
- The commercial marketplace is thriving - demonstrated by a growth in new gTLDs and across all gTLDs.
- The market is open to new players, and competition is fair among existing players.
- The market is not dependent on one or a small number of players.

Marketplace Stability

- More registrars and registries are entering the gTLD marketplace than are leaving.
- Service providers are reliable, setting consistent expectations and meeting levels of service to: registrants, Internet users and the global community (including registries, registrars, law enforcement and intellectual property holders).

Trust

- Service providers, registries, registrars and registrants are trustworthy and compliant with their contractual obligations.

B Selected Glossary

Registrant. Person or entity holding the rights to a domain name for a specified period of time.

Registrar. ICANN accredited company that registers domain names.

Registry. Master database of all domain names registered in each top-level domain.

Registry operator. Entity that has entered into a Registry Agreement with ICANN. Registry operators set up and maintain the registry for a top-level domain.

Service provider. Generic reference to a registry operator, registrar or reseller.

TLD : Top-level domain.

gTLD : Generic Top-level domain.

SLD : Second-level domain.

Revised Set of Metrics and Decision Elements (v3)

Metrics and Decision Elements (v3)

Metric #	Category	Metric	Rationale	Influencing Factors	gtld-set	governance	namespace management
1	Robust Competition	# legal jurisdictions with at least one ICANN-accredited gTLD registrar	shows diversity of service providers, availability of local offerings for registrants. Hypothesis could be validated in future that domains in jurisdiction grow when there is an accredited gTLD registrar in the same jurisdiction.	Time, internet expansion, ICANN policy and contractual requirements	x		
2	Robust Competition	# legal jurisdictions with at least one gTLD registry operator	shows diversity of service providers, availability of local offerings for registrants. Hypothesis could be validated in future that domains in jurisdiction grow when there is a gTLD registry operator in the jurisdiction	Time, internet expansion, ICANN policy and contractual requirements	x		
3	Robust Competition	Number of distinct gTLD registrars, by ICANN region	shows diversity of service providers, availability of local offerings for registrants, possibly growth in global marketplace. Provides a view of underserved markets.	Time, internet expansion, ICANN policy and contractual requirements	x		
4	Robust Competition	Number of distinct gTLD registry operators, by ICANN region	shows diversity of service providers, availability of local offerings for registrants, possibly growth in global marketplace. Provides a view of underserved markets.	Time, internet expansion, ICANN policy and contractual requirements	x		
5	Robust Competition	% of distinct gTLD registrars, by ICANN region	shows diversity of service providers, availability of local offerings for registrants, possibly growth in global marketplace. Provides a view of underserved markets.	Time, internet expansion, ICANN policy and contractual requirements	x		
6	Robust Competition	% of distinct gTLD registrary operators, by ICANN region	shows diversity of service providers, availability of local offerings for registrants, possibly growth in global marketplace. Provides a view of underserved markets.	Time, internet expansion, ICANN policy and contractual requirements	x		

Metric #	Category	Metric	Rationale	Influencing Factors	gtld-set	governance	namespace management
7	Robust Competition	Ratio of distinct registrars (% of registrars that are "distinct")	Shows concentration of the marketplace, possibly barriers to entry for smaller distinct entities, possible market incentives for forming larger groups.	ICANN and gTLD registry policies (and fees and contractual requirements), other marketplace factors	x		
8	Robust Competition	Ratio of distinct registry operators (% of registry operators that are "distinct")	Shows concentration of the marketplace, possibly barriers to entry for smaller distinct entities, possible market incentives for forming larger groups	ICANN policies and contractual requirements, other marketplace factors (including, possibly, burdens associated with overhead for operating smaller standalone registries)	x		
9	Robust Competition	Percentage of second-level gTLDs deleted	Functions as a measure of the value registrants place on their gTLD registrations (deletions could indicate a lack of value or utility)	Market prices, internet users' uptake and recognition of gTLDs, other marketplace factors	x		
10	Robust Competition	Total number of second-level gTLD net adds during measurement period	Functions as a measure of growth and as a comparison of growth among different types of gTLDs	Time, pricing, ICANN policies and contractual requirements, other marketplace factors	x		
11	Robust Competition	Total number of second-level gTLDs registered	Will presumably show growth and rate of growth of gTLDs over time as different changes are made in governance, availability, etc.	Market demands, prices, ICANN policies and contracts, application windows for new gTLds	x	x	

Metric #	Category	Metric	Rationale	Influencing Factors	gtld-set	governance	namespace management
12	Robust Competition	Total number of IDN registrations	A measure of growth in diversity in the gTLD marketplace (more IDNs=more diversity and options for domain registrants and internet users who can access domains in their own script)	ICANN policies and contractual requirements, registry/registrar policies and contractual requirements, marketplace uptake and trust of domains in different scripts, other marketplace factors			x
13	Marketplace Stability	Number of distinct gTLD registrars newly accredited	Functions as a measure of marketplace stability. New players in the marketplace may expand market diversity, service offerings and models for registrants.	ICANN policies and contractual requirements, financial burdens of (and incentives for) running a registrar business, time	x		
14	Marketplace Stability	Number of gTLD registrars de-accredited (voluntary + contractual violations)	Functions as a measure of stability. Exits could impact stability, disrupt service for internet users and registrants, etc.	Time, ICANN contractual and policy requirements (and enforcement of the same), financial burdens in running a registrar business	x		
15	Marketplace Stability	Number of gTLD registry operators de-accredited (voluntary + contractual violations)	Functions as a measure of stability. Exits could impact stability, disrupt service for internet users and registrants, etc. (in theory. This has never happened before so would only publish this begins to happen)	Time, ICANN contractual and policy requirements (and enforcement of the same), financial burdens in running a registry business	x		

Metric #	Category	Metric	Rationale	Influencing Factors	gtld-set	governance	namespace management
16	Trust	Number of UDRP and URS decisions decided against gTLD registrants (e.g. misspelledbrand.industry) (annual total)	These decisions mean that a registrant of a SLD has been found to have engaged in trademark infringement. This could be interpreted multiple ways: (a) that the dispute resolution processes are providing an effective remedy in cases of infringement, and/or that, (b) if the number of decisions is going up at a higher rate than the growth of SLDs, that infringement could be increasing (and there are possibly other interpretations as well).	Time, the amount of infringement in the marketplace, the level of complaints filed, and the receptiveness to these types of claims by arbitrators		x	
17	Trust	Number of involuntary gTLD registrar terminations	When registrars are terminated for contractual violations, this could be interpreted multiple ways. This could be interpreted as the system "working" to get bad actors out of the market, or as a sign of a lack of trust based on increasing numbers of bad actors (if the number goes up)	ICANN contractual and policy requirements, ICANN's attention to compliance enforcement, the level of non-compliant activity in the marketplace, the number of complaints filed		x	
18	Trust	Number of involuntary gTLD registry terminations	(In theory. This has never happened and would only be reported if these started to occur). When registry operators are terminated for contractual violations, this could be interpreted multiple ways. This could be interpreted as the system "working" to get bad actors out of the market, or as a sign of a lack of trust based on increasing numbers of bad actors (if the number goes up)	ICANN contractual and policy requirements, ICANN's attention to compliance enforcement, the level of non-compliant activity in the marketplace, the number of complaints filed		x	

Metric #	Category	Metric	Rationale	Influencing Factors	gtld-set	governance	namespace management
19	Trust	Percentage of accurate/valud Whois records detected by the Whois Accuracy Reporting System	The higher the percentage of Whois Accuracy, the more accurate the Whois contact information is from a syntactical and operational perspective. This could mean that an increasing level of accuracy means a more trustworthy marketplace of registrants, and that registrants can more easily be located when needed. However, there are other factors in play, including the use of privacy and proxy registration services, that have an impact on the ability to identify and locate the beneficial user of a second-level domain name.	ICANN contractual and policy requirements, other marketplace factors			x