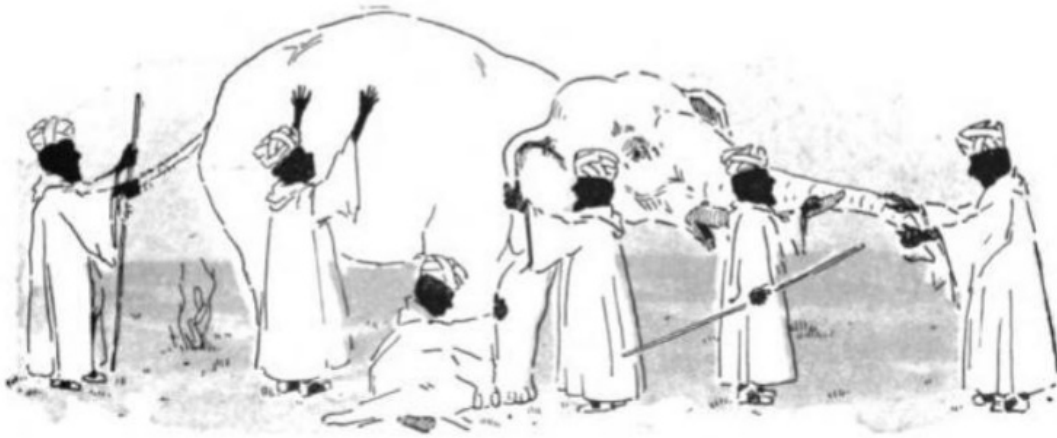


# The Internet Exists In Its Use

*Jana Iyengar*

**Abstract:** A user experiences the Internet through the applications that they use. Internet quality should therefore be defined in terms of a user's perceived quality of those applications' services. Different users will consequently have different perceptions of Internet quality; to be relevant, any metrics, measurement frameworks, or reporting frameworks that we develop must embrace this reality.



*(Image source: Charles Maurice Stebbins & Mary H. Coolidge, Golden Treasury Readers: Primer, American Book Co. (New York))*

*It was six men of Indostan  
to learning much inclined,  
who went to see the Elephant  
(though all of them were blind),  
that each by observation  
might satisfy his mind.*

*The First approached the Elephant,  
and happening to fall  
against his broad and sturdy side,  
at once began to bawl:  
"God bless me!—but the Elephant  
is very like a wall!"*

*The Second, feeling of the tusk,  
cried: "Ho!—what have we here  
so very round and smooth and sharp?  
To me 't is mighty clear  
this wonder of an Elephant  
is very like a spear!"*

*(The Blind Men and The Elephant -- A Hindoo Fable. By John Godfrey Saxe)*

The “Internet” is different things to different people. A user perceives Internet connectivity in the context of the user’s ability to use one or more applications that require Internet connectivity. A user defines Internet access as the ability to use one or more such applications. Consider a user in a country where voice and video calling services over IP are [blocked](#), or a user in public transport where streaming video sites are blocked. These users might not even consider these services when defining Internet access.

**Proposition: The Internet exists in slices. Every user sees only the slice of the Internet that their usage exercises.**

The Internet continues to evolve and its use is varied and evolving as well. It is an ever-changing elephant, with no real hope of us practically defining it as one whole and for all time. However, a user does perceive Internet quality through the applications that they use.

For instance, a user watching a movie end-to-end may not care about the initial load time of the movie, but a user searching for information in a video might care more about responsiveness and video start/restart times and less about video quality as they scrub through the video. The quality of the Internet is therefore defined for each user by their experience of the products that they use and the manner in which they use them.

While it is important and useful to consider the whole, Internet quality is inextricably tied to user perception of the quality of particular applications.

**Proposition: To be relevant to a user, the quality of the Internet must be measured and defined in terms of what it means for the various applications that the user might use over it.**

*And so these men of Indostan  
disputed loud and long,  
each in his own opinion  
exceeding stiff and strong,  
though each was partly in the right,  
and all were in the wrong!*

A program to find the set of metrics that defines “network quality” is intellectually attractive -- the complete and correct set seems important. Practically however, it is the network’s use that determines which of these metrics are important and relevant, and consequently, the metrics for which operators optimize the network. This is where we part ways with the parable of the elephant: as engineers building an artifact, we should care more about the use of the network than about the theoretical whole.

And the use of the network is not for abstract applications, but for specific products. A user’s choice of product -- and therefore their particular use of the network -- is not just shaped by technical possibilities, but by many other factors.

**Proposition: A user’s perceived quality of the Internet is inextricably tied to this evolving human artifact, the properties of which are defined locally in time and space by physical, social, political, and economic forces.**

In summary, a user uses products, and products use the Internet. Many forces shape the decisions embodied in products, and in turn, these decisions continually shape the Internet. Application-, product-, and service-specific metrics are more important to a user than metrics that seek to cover them all. To be relevant, any metrics that we come up with must be continually revisited as Internet slices and applications change.