

Rethinking Regulatory Architecture



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The words 'Regulatory Architecture' are normally used in connection with the inter-regulatory arrangement as to who supervises which kind of entities. There has been much rearrangement of regulatory blocks, both pre and post Global Financial Crisis. However, equally potent shifts in financial markets and entities have taken place and are still happening in

an accelerated timeframe, thanks to unprecedented development in digital technologies. Yet bigger changes are on the anvil, as the existing technologies are going to go past their tipping points, both on account of the classical computing being augmented by the unlimited raw computing power of quantum computers and the likely development of newer quantum algorithms that are intuitive like human reasoning rather than mechanistic like current ones, dependent upon deductive logic. These developments are likely to make the present day regulators gasp for breath in the headwinds of change unless they prepare themselves with a suitable internal architecture. However, this article is not about technology per se. We look back at author's thirty-five year regulatory experience to understand the practical difficulties that regulators face and how embracing newer technologies with an altered internal architecture can help the regulators to perform effectively. A regulator, more often than not, feels like an air traffic controller directing an aircraft in dense fog. This article advocates installation of an equivalent of the Instrument Landing System.

The first and most important issue is the severe limitation imposed by lack of domain knowledge. For example, Export Division is rather a modest part of the Foreign Exchange Department of RBI. Export in itself is an activity that comprises of scores of fields like certifications, clearing and forwarding etc., each of which involves a life-time of learning. Problems reach RBI when they are unusual. The personnel have to first understand what a normal situation is and then think how to deal with the unusual situation without giving undue advantage to anyone while ensuring that the business does not suffer. The task is complicated by the fact that the regulator depends mainly on what is told to it by the affected party. Employees don't remain in the same division or even the department for more than a couple of years, so personal knowledge is rather limited. It is not

practical to seek independent expert advice as it will be both expensive and time consuming. The officers base their decisions on rather incomplete knowledge with a liberal dose of intuition and guess work. It is easy to criticize them for a howler they commit, even if rarely. In coming days the number of domains are sure to multiply and each domain is going to become deeper and more technical. The present day internal architecture of the regulators was designed for a much less complicated world where most people worked in the same department for their lifetime.

Lack of domain knowledge by regulators has been an issue that has been raised time and again. We look west when we look for solutions. Industry knowledge is sought to be brought into regulatory bodies by mid and senior level recruitment of industry personnel and regulators' stint in the private sector. There are advantages of such a policy and there are criticisms. It is not necessary to give credence to the allegations that even while in the regulatory role, incumbents still look after the interests of their former employers and are not tough enough with the industry as some day they might want to go back. High moral values are not the preserve of public sector alone. The problem is inherent with the nature of domain knowledge itself. First, the Industry changes fast and the knowledge becomes outdated soon and second, the regulators keep flitting from one domain to another during the course of a day and the industry knowledge one brought in from one domain is not sufficient.

Second constraint that regulators face is the flood of written material. Forty years back, the case files were thin. Photo-copies were uncommon. If applicants wanted to attach a supporting document, they would have to get the contents typed on a plain sheet of paper and get it attested. An application rarely had more than five or six sheets of paper. It took a few minutes to go through the entire case file and one was fairly confident that whatever has been put into the file has been taken into consideration. Come cheap photocopiers, there was a pandemic of obesity in the applications. After a decade, the applications became so thick that careless handling of these could lead to a dislocated wrist while the time one got for deciding on a case remained more or less the same. Any officer wants at least to thumb through the sheaf of papers lest it should contain a piece that may altogether change the complexion of the case. Reading through such volumes is practically not possible. Speed reading does help but not much. Experience in such a situation is at a premium as old hands can decide on the importance of a document in a one single glance. Though photocopies were cheap, still they involved much effort in making copies and physically compiling the application. Things changed dramatically for worse with electronic applications, when huge documents could be attached to an application without any effort on the part of the

applicant while it remains imperative that the regulators look into files running into scores of megabytes. Technology as of date has only been exponentially increasing the workload of the regulators.

Third difficulty concerns the staleness of data. Water, water everywhere but not a drop to drink, could have been the cry of a regulator when in the process of making policy decisions. There are petabytes of data sitting in the data warehouses of regulatory bodies. It is of great use to researchers who may write scholarly articles analyzing the data. However it is of scant use to the person who is going to take a policy decision, as it is stale. Reporting cycles are quite long. Even after reporting, the processing takes much time. Stale data is a poor guide to current reality. Further there are datasets that are survey based and are especially prone to delays. Events are fast moving and as a regulator one is forced to take action on stale data and hunches, surely it feels like navigating in deep fog.

Fourth difficulty that the regulators face is severe limitation of sources of data. In the last ten years, insider trading has become increasingly a focus area of securities markets regulators. The easier part is to write regulations and it is much more difficult to discern connections to find out whether there has been insider trading. Traditionally, investigation function sought to establish connections through commonality of relations, addresses and telephone numbers. Partly because of societal changes and partly because of people becoming wiser, such sources do not yield satisfactory results any longer. Increasingly connections are to be searched in virtual space. Yet with prolific social media information, searching for connections in virtual space turns into a hunt for the proverbial needle in the haystack. Connections are also very important to Central Banks. Systemic risk depends upon interconnectedness. However, it is difficult to establish connections on the go.

Finally, there is the problem of unknown-unknowns. Regulators don't know what to look for. Trends have still not emerged. The problem will be known through a complaint or a newspaper report, but by that time damage would have been already done. It requires a kind of clairvoyance to read tea-leaves. We know that big data contains those tea-leaves, yet the issue is to do the reading on a regular basis.

There is no prize for guessing that there is single word solution for all these problems, technology. For lack of knowledge, there are expert systems. These can be developed to answer unstructured questions in several domain areas. It is true that informally, regulators have been using google searches for understanding new domain areas, but the effectiveness of a self-learning expert system cannot be over-emphasized. The answer to the flood of written material is Natural Language Processing which can summarize voluminous written material and text mining that can flag areas of concern. Perhaps, when it becomes well known that the documents may be machine read, applicants will carefully prune documents before sending them. Natural Language

Processing will be invaluable for assessing documents like offer documents.

For staleness of data, technology is already being used for pruning the gap between happening of events and their inclusion in the datasets. A good example is the Billion Prices Project that seeks to glean prices directly from internet trading to give price indices. For securities market regulators, the Stock Exchange and RTA data can give usable information to the regulator almost as it happens. On the fourth issue, technologies doing web crawling can cull out immense information from Social Media through Natural Language Processing and Image Processing. The problems of divining interconnectedness is tackled very well by technologies using neural networks. The unknowns can become visible through techniques of clustering.

By now, knowledgeable readers would have got impatient, muttering under their breath, "it's all very well known, yes we know regulators should invest more in technology and augment their IT Departments". But that is what the regulators have been doing all along, keeping technology firmly in its place, in IT Departments and the Departments of Statistics. IT and statistics have been traditionally treated as service departments. The heart of the regulatory bodies lay in their liberal arts educated generalists, even as the entities they regulated changed beyond recognition. Today a bank is a fintech company. It is a technology company that deals with finance. Those banks that have still not realized this simple fact will be soon forced to realize it by market forces. In securities markets, there is no doubt left that almost all players are basically technology companies, be it Stock Exchanges, Depositories, Registrar and Transfer Agents or Brokers. At their core lies technology and the functions like sales, legal or compliance assume peripheral functions.

The present day internal architecture of regulator that treats IT as a service department to functions like registration, inspection and enforcement was designed to regulate traditional regulated entities. Now that the regulated entities have turned into technology companies, regulators cannot afford to be so much behind the curve. Technology companies can be regulated only by regulators who are essentially technology entities where other functions become peripheral.

As a note of caution, let me hurry to add that converting regulators into technology entities does not at all mean that the business of regulation can be given less importance. A depository may be essentially a technology company but its business lies in getting people to open DP accounts. Even if technology lies at the centre of the organization, the generalists who understand and carry out the business of regulation will have their importance undiminished.

The path for this transformation will not be easy. There will be major HR issues in trying to effect such changes. However, it must be admitted that one single article is not sufficient to solve all the problems.