

Issues Impacting on the quality and the success of a National Dashboard – the Sri Lankan Case

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Abstract

This management report describes a dashboard built on national scale to capture the science, technology and innovation landscape of Sri Lanka. The rationale behind building the system, the major challenges faced, and the expected value it could bring to the user are discussed.

Keywords: Innovation, Dashboard, national landscape, information system

1.0 Background and Introduction

With the aim of accelerating the economic development of the country, a 5 year Science, Technology and Innovation (ST&I) Strategy was established in Sri Lanka in 2010. Innovation activities towards economic development cut across a number of line ministries and hence the implementation of the strategy also required the joint action of these ministries. However, the role to be played by each stakeholder was not worked out clearly and no action plan was created to operationalise the strategy. This slowed down the operationalising of the strategy to a level unforeseen at the early stages. In 2013 the Coordinating Secretariat for Science Technology and Innovation (COSTI) was established to overcome this weakness.

One of the goals of the National ST&I strategy is to ‘Establish a system for efficient and coordinated S&T Governance’. As part of the plan in achieving this goal, COSTI embarked on creating a national innovation dashboard for Sri Lanka to capture ST&I activities and research outputs across the country. The Dashboard will clearly facilitate the achievement of the following national goals:

- Establish a system for efficient and coordinated S&T Governance;
- Attract, build and retain strategic Human Capital needed to make Sri Lanka a leading knowledge and innovation hub in Asia;
- Ensure rationalised, increased Investment in R&D supported by facilitated utilisation;
- Facilitate International Partnerships in promoting high end technology and research.

At the moment there is no one location where ST&I information of Sri Lanka can be obtained. Complete and up to date information is essential if we are to use ST&I for the economic growth of the country. Availability of quality information can save time, cost, and help mobilise valuable resources where and when they are needed. Such information can also drastically reduce wastage and redundancy.

In order to overcome these drawbacks it was decided to develop a Dashboard which can capture ST&I information of the whole country. This Dashboard will make a difference: portray a true picture of Sri Lanka's research and innovation space; break the barrier of data inaccessibility and promote a culture of data sharing. When populated with data it can become the accepted central focal point for ST&I data in the country for both internal and external users.

This Management report is intended for both the internal users and external users, especially focusing on the value that it can bring. The following sections will give a brief introduction to the system and discuss the challenges faced and barriers that need to be broken for the system to be a success.

2.0 Introduction to the Sri Lanka Innovation Dashboard (SL_IDB)

The Dashboard is designed to reflect the Innovation eco system which consists of several elements (Figure 1): Publications, People, Position, Partnerships, Places, Patents, Financing, and National Research Repository.

Information is classified according to the OECD Classification System [1]. This enables all the data to relate to each other and facilitates data visualisation.

The main page is mostly interactive and has three main parts: The Innovation Eco System; The main four Dashboard views; and the current status of the system.

Each eco system element is clickable (see Figure 2). Clicking on an element displays its sub-components if there are any and a brief description of the sub-components (if there are no sub-components, a description of the element is given). Clicking on the icon of a sub component takes you to the corresponding dashboard.

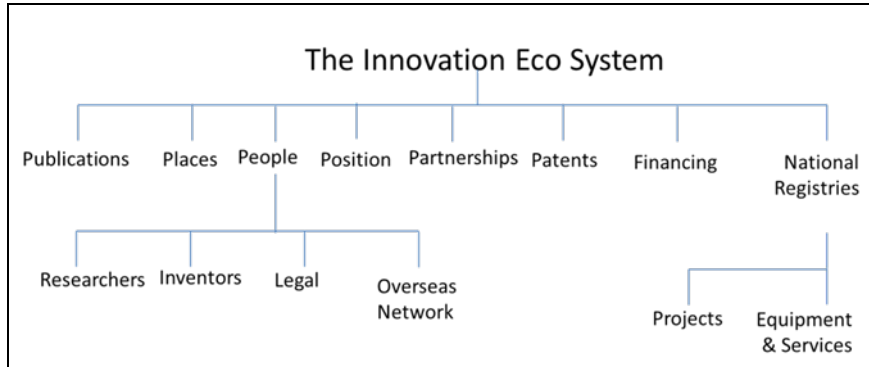


Figure 1: The components and the sub-components of the Innovation Eco System

Sri Lanka Innovation Dashboard for Science, Technology and Innovation

Current Data Profile

Researchers	3917	Publications	1401	Partnerships	931	GII Rank	85
Places	87	Patents	1476	Inventors	54	GII Score	30.8

News

- Project Loon: Google balloon that beams down internet...**
Sri Lankan government hopes the venture will provide high-speed internet with extensive coverage and cheaper rates for data. The balloons, once in L...
- The dependency of our independence**
Sri Lanka quite proudly celebrated the 68th anniversary of her independence and did introduce quite a few important variants too to the way it was ...

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Figure 2: The Main Page of the Dashboard

To facilitate easy navigation there are 4 pre-designed Dashboards: General, Academic & Research, Decision Makers, and Business. Clicking on a particular view will take the user to that Dashboard. For example, clicking on 'Academic & Research' will take the user to the Dashboard showing the human capital, research outputs, international collaborations etc. depicting the current research status in Sri Lanka (see Figure 3).

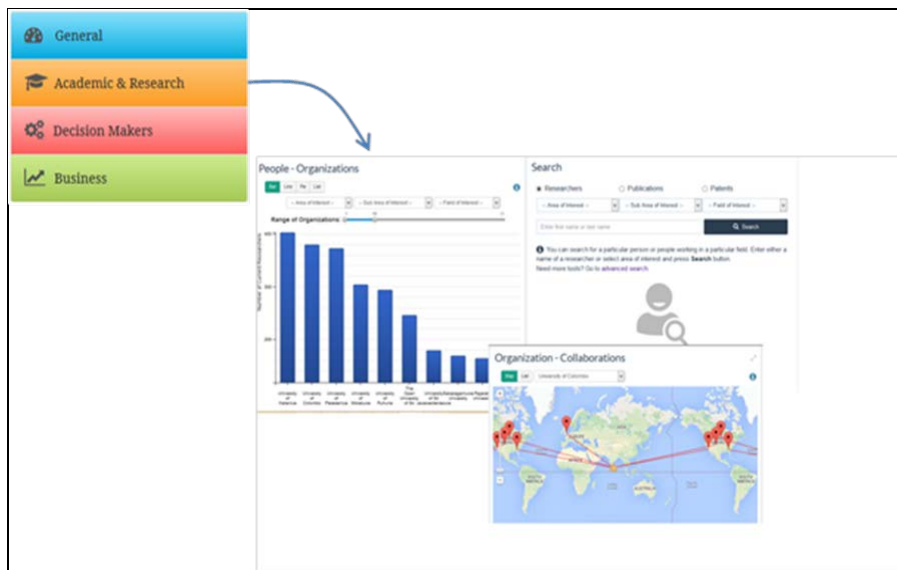


Figure 3: Linking to the Academic & Research Dashboard

The score board at the bottom of the main page shows the current status of the database (see Figure 2), in other words how much data has been captured at any given time.

3.0 Continuity and Sustainability of the Dashboard

The field of Information Systems (IS) is relatively young when compared to that of Information Technology (IT). However, the IS arena developed quite fast and today we find a plethora of different types of ISs deployed in organisations for various purposes. One reason being that the success stories have showcased the value adding capability of ISs. This wide variety of uses have made defining the success of IS difficult. The success stories have also shown that the benefits gained by IS are both tangible and intangible. This nature of IS adds to the complexity of measuring the success. Stacie Petter et al. [2] state that, “the impact of these systems are often indirect and influenced by human, organisational, and environmental factors; therefore, measurement of information systems (IS) success is both complex and illusive”.

Can the criteria for IS success also apply to dashboards? The users are what ultimately will make the Dashboard a success. Furthermore, real success of the dashboard can only be realised within a broader context of trust and respect of fundamental human rights and values, such as privacy, and respect for intellectual property.

We adopt a Collaborative Approach to data integrity which will have the following characteristics (adapted from [3]):

- **Collective Responsibility:** Users share a responsibility towards the system as a whole in its integrity, security, correctness of data, currency of data, etc.
- **Preserving the fundamental properties and values of the dashboard:** One of SL_IDB’s fundamental principles is openness. It adopts an open data culture encouraging transparency in research and development activities.
- **Evolution and Consensus:** Although security measures have been implemented, security relies on responsible use of the system and evolutionary steps will be taken based on the user behaviour and expert feedback of users and other stakeholders.
- **Fostering confidence:** The idea is to foster confidence in the Dashboard so that the responsibility of updating and keeping the data current is transferred to the user and this will ensure the continued success of the Dashboard as a driver for economic and social innovation.

4.0 The Challenges faced

Lamont in [4] states, ‘Modern dashboards however use new technological capabilities to pull data from multiple warehouses and databases, linking the

system directly to original sources'. The first challenge for SL_IDB was the *lack of digitised data*.

Dashboards drive a culture of transparency and accountability. Since users at all levels are expected to use the dashboard, those with little technical knowledge should also be able to get the information they need as easily as those with technical knowhow. *Designing the user interface* was a big challenge. It should be visually inviting to the user, easy to navigate to the desired point, and more importantly it should not discourage the user by its complexity. Implementing the changes suggested by expert feedback caused a major setback in the development plan.

One of the major challenges which continue to persist in developing the system is *collection of data*. The problem of unavailability and inaccessibility of data was sometimes insurmountable. This was partly due to the culture of non-sharing of data and information prevailing among individuals and organisations. There is also a very nonchalant attitude among many regarding copyright issues. Over the years this has worked as a deterrent for openness.

The difficulty in *finding experts and research outputs*: In its coordinating capacity COSTI needed to bring together experts, researchers, industry, policy makers, regulators and the user community related to a particular problem area. This was difficult as there was no one designated place or method to find people working in a domain. COSTI had to rely on the knowledge and experience of the scientists employed within, and bibliographic databases such as Scopus. The SL_IDB is expected to overcome this drawback facilitating coordination among people working in a particular field. However, collecting this information was difficult. Although academics were involved in research and published their findings, they are mostly not in the habit of updating their profile pages on their institutional web sites. There are very few existing policies enforcing or encouraging people to do so. However, some of them are in the habit of updating global research portals such as the ResearchGate and Google Scholar. Furthermore, government institutions including universities stipulated that permission from the governing head needs to be acquired before collecting personal and research information from individuals. This was a time consuming process most often hindered by individual enthusiasm or the lack of it. Therefore, collection of information was mainly based on web mining and printed documents, which was very time consuming.

An information system's success is mainly measured by the use of the system. For the Dashboard to be a success stakeholders need to realise the value of the system, and its contribution to the development of the national economy need to be understood.

What do we mean by value? Value in this case is what a user gets in exchange for the information shared; this also includes the time and effort spent. The user's

incentive to interact with the system is related to the perceived value s/he expects to receive from the system.

The expected value adding features of the system include:

- Availability of stable, reliable, and accessible collections of institutional and people data in electronic form;
- Availability of the country's current research landscape at a glance thus being able to locate his/her own research within that;
- Provide an integrated view of national research outputs;
- Improve direct access to research data for end-users;
- Provide valuable input to industry experts on what to avoid and where to channel their limited resources and how to align with existing resources to ensure better end results;
- Provide a vital platform for networking for those involved in ST&I;
- Provide high-level visibility to the utilisation of national funds, and projects;
- Support the national ST&I strategy by providing national ST&I information that can be an integral part of decision-making, competitive positioning, and focus on value-adding areas;
- Allows easy access to the information captured in the Dashboard which will provide critical information to decision makers and policy makers;
- Provide patent information registered with the National Intellectual Property organisation (NIPO) - those seeking crucial information about IP and patent registry will be able to know beforehand if someone has pre-empted their R&D initiative and quest for IP;
- Provide an excellent reference point for funders. They can seek relevant feedback and information before approving the allocation of funds by making sure that the proposed project has the potential of producing commercialisable outputs.
- Investors can use the Dashboard to select, approach researchers and network with project teams. Companies can select suitable projects which they would like to get involved with, increase their commitment to support research, and their corporate social responsibility.

Throughout the RD&C (Research, Development to Commercialisation) value chain there are many players e.g. researchers, lecturers, fund managers; industry etc. who have different questions that they need answers to. The Dashboard will facilitate answers to all kinds of questions sought by users, such as:

- Is this technology area worth pursuing?
- Has anyone done a similar project?
- Who or which organisation(s) can I collaborate with?
- What are possible sources of funds?

- What are the publications written and patents granted in this area which I can refer to?

The system is designed in such a way that the quality of the information is based on the user acceptance and usage.

In order for the system to become the focal point for data we need to break a number of barriers: cultural, political and even personal.

5.0 Summary

This management report describes a dashboard build on national scale to capture the science, technology and innovation landscape of the country. The Dashboard can become the national resource centre for data and information on R&D in ST&I and become the most accessed gateway in local research output. However, for this to happen people from all fields: researchers, innovators, policy makers, funders, decision makers, etc. need to understand and believe in the value the system can bring to the nation and individuals. This requires changes in attitude, culture, and even behavior. By becoming the central database and to attract registering all R&D output by local scientists, researchers and organisations, there should be policy level support. The Dashboard can act as the most powerful and comprehensive knowledge resource on research publications from both the public and private sector particularly from universities, research institutes and other RD&C and STI related organisations. For this to happen, the system needs the buy in of government agencies who have the power to create change in the country.

In short, the Sri Lanka Dashboard will become a one of its kind, the first national scale portal for recording of all RD&C and STI activities in Sri Lanka. It will become recognised as a reliable, and user-friendly resource-rich platform for all knowledge and information seekers. It will connect and network all those involved in Research, Development & Commercialisation (RD&C) and stretch to all those who seek the advancement of ST&I in the country. The constant on-going upgrading of its features and functionalities will keep on adding value to the users.

6.0 References

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