NATIONAL ADVISORY COUNCIL ON INNOVATION

NATIONAL SCIENCE, TECHNOLOGY AND INNOVATION INFORMATION PORTAL HACKATHON

SAINT GEORGE CONFERENCE VENUE, PRETORIA

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science & innovation

Department:
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NATIONAL ADVISORY COUNCIL ON INNOVATION

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SUMMARY PROCEEDINGS REPORT

1. BACKGROUND

The National Advisory Council on Innovation (NACI) hosted a two-day hackathon on 24 and 25 July 2019 focused on its recently developed national science, technology and innovation information portal (NSTIIP).

The event brought together diverse, multidisciplinary teams of coders, programmers, innovation policymakers, and researchers to draw on each other`s expertise and devise solutions to upscale the NSTIIP to a fully functional system. The hackathon included background information, i.e. presentations on the event, expectations and assembling of teams on day one. As time was limited, participants started working on their ideas on the first day, pitching these to a panel of mentors and receiving feedback. This was done at such an early stage to allow teams enough time to refine ideas. Day two saw the teams working further to mature their solutions to the hackathon challenges being solved in preparation to the final pitching to all participants that was done at the end of the day before a panel of judges. Awards were presented to two winning teams at the 2019 NACI Symposium on the 26 July 2019.

2. PARTICIPANTS

Team participants included students, graphic designers, web developers, economists, marketers, data scientists, research and development (R&D) and innovation policymakers. The participants were grouped into teams representing a spread of skills. Each team chose a challenge from four pre-identified challenges and formulated solutions with guidance from mentors and facilitators.

Table 1: NSTIIP Hackathon teams and challenges

TEAM 1: Challenge – science, technology and innovation (STI) statistics			
	Name	**Surname**	**Institution**
1.	Siphiwe	Ngwenya	African Intelligence
2.	Sephula	Mokoena	Umuzi Academy
3.	Nomahlubi	Marweshi	Rosebank College
4.	Phodisho	Khoza	Rosebank College
5.	Theresa	Baloyi	Department of Science and Innovation (DSI)
6.	Mamohlala	Mafokoane	DSI
TEAM 2: Challenge - directory of experts			
	Name	**Surname**	**Institution**
1.	Wandile	Nxumalo	Umuzi Academy
2.	Trevor	Senyane	African Intelligence
3.	Andile	Skhosana	African Intelligence
4.	Vibishan	Govender	Varsity College
5.	Leason	Rykaart	Varsity College
6.	Manini	Tshoma	DSI
7.	Chuma	Mapisa	DSI
TEAM 3: Challenge – communities of practice			
	Name	**Surname**	**Institution**
1.	Tshepo	Dibe	Universidade Iqauce
2.	Mpho Jan	Kubeka	Kubeka Advanced Industries
3.	Hlokoma	Manqalaza	Technology Innovation Agency (TIA)
4.	Siphephelo	Msibi	Umuzi Academy
5.	Axel	Bukasa	Umuzi Academy
6.	Amukelani	Baloyi	DSI
TEAM 4: Challenge – indexing of documents			
	Name	**Surname**	**Institution**
1.	Dineo	Mahabo	Square Kilometre Array (SKA) South Africa
2.	Mpho	Mathabathe	Student
3.	Adric	Maplanka	Umuzi Academy
4.	Modikoe	Patjane	DSI
5.	Elikana	Maroge	NACI Secretariat
TEAM 5: Challenge – indexing of documents			
	Name	**Surname**	**Institution**
1.	Kutloano	Mokgethwa	Grid Serv
2.	Alisha	Reddy	SKA South Africa
3.	Jake	Ruele	Explore AI

3. CHALLENGES AND SUPPORT PROVIDED

The teams were given an opportunity to debate all the challenges and agree on one.

Supporting information was provided for each challenge. Given that the hackathon was only two days, dummy information (reports etc) and data (statistics) were provided to avoid time-wasting searches.

The four challenges were:

- Improvement of the current STI statistics section of the NSTIIP.
- Indexing of documents in the NSTIIP repositories.
- Development of a prototype for and/or shaping a central directory of experts for universities, science councils etc.
- Development of a prototype for and/or shaping an online communities of practice platform.

4. HACKATHON OUTCOMES

Each of the five teams presented its challenge, ideas and proposed solution to a panel of five judges and fellow participants. The judging panel comprised Ms Kgomotso Matlapeng, Senior Policy Analyst: DSI; Mr Senzo Dlamini, Deputy Director: Information Systems and Applications Development, DSI; Mr Garth Williams, Research Specialist: Intelligence, TIA; Dr Thiambi Netshiluvhi, Senior Specialist: Policy Analysis and Advice, NACI Secretariat and Ms Lindelweyizizwe Manqele, Scientific Researcher: Meraka Institute, Council for Scientific and Industrial Research. The judges questioned the teams about their proposed solutions.

Table 2: Judging criteria

	Criteria	Key questions	Scoring
1.	Interactivity	How flexibly does the solution allow users to use the data according to their needs?	/15
2.	Visual appeal	How finely has the team considered the visual impact of the solution?	/15
3.	Scientific content and rigour	Is the data presented in a scientifically coherent and rigorous way that respects its origin?	/10
4.	Technology	Did the team consider other technologies? Is the technology selected well justified given the challenges?	/20
5.	Extent of data use	Has the team applied itself to using the fullest possible range of data provided?	/15
6.	Overall solution	Does the overall solution respond to all the identified challenges?	/25
	TOTAL		**/100**

The winning teams were:

- Runner-up: team 2 (created a directory of experts for all researchers and entrepreneurs in South Africa) – awarded a cash price of R2 000 each.
- Winning: team 4 (indexing of documents for an online portal) awarded a cash price of R5 000 each.

5. STAKEHOLDER SURVEY ON NSTIIP REBRANDING

Before the NSTIIP hackathon, the NACI secretariat conducted an online stakeholder survey among a wide range of respondents to gather views of users on their experiences of using and ideas on improving the NSTIIP.

The questionnaire covered general information such as gender, race, age and sector, knowledge and understanding of the NSTIIP, expectations and suggestions on a new name for the rebranded NSTIIP.

Feedback was positive and was shared with hackathon participants. Thirty-five percent of survey participants were from the higher education sector, with 25% aged between 35 and 44 years and 30% over 55 years. Forty-eight percent were male and 37% African. Gauteng accounted for 42% of respondents.

Annexure 1
NSTIIP online rebranding survey results

1. General information on respondents

1.1. Sector representation

Sector	
Higher education	35%
Government	20%
Science council	11%
Business	6%
Other	9%

1.2. Provincial distribution

Province	
Eastern Cape	1%
Free State	3%
Gauteng	42%
KwaZulu-Natal	7%
Limpopo	2%
Mpumalanga	4%
North West	1%
Northern Cape	0%
Western Cape	21%

1.3. Age categories

Age	Percentage
18 to 24 years	1%
25 to 34 years	8%
35 to 44 years	25%
45 to years	17%
Over 55 years	30%

1.4. Gender representation

Gender	Percentage
Female	33%
Male	48%

1.5. Racial distribution

Race	Percentage
African	37%
Coloured	3%
Indian	5%
White	28%
Other	7%

2. Understanding of the purpose of the NSTIIP

Response	
A central repository of STI data and information	31%
An online search engine for STI data and information	8%
An online marketplace to facilitate technology commercialisation	1%
Other*	1%

* NACI should inform policy on technology commercialisation

3. Uniqueness of the NSTIIP value offering compared to related portals

Is the NSTIIP unique compared to similar portals?	
Strongly disagree	5%
Disagree	3%
Neutral	15%
Agree	14%
Strongly agree	2%

Observations

- The NSTIIP is focused in its approach, open and free to access and will be a live portal with continuous inputs.
- No comparable portal exists in the country.
- It should be a one-stop-shop bringing together all components of the value chain for the country's available intellectual property seeking partners for development and commercialisation.
- Is the NSTIIP offering indicators for the National System of Innovation (NSI) or STI sector? Other sectors have been collecting their own data for various reasons.
- The NSTIIP consolidates data from various other data sources and provides users access to other databases.
- It is not different from other sector portals as it borrows data from sectors, rather than generates new statistics.
- Access to so much differentiated information from a single location is wonderful.
- The NSTIIP should be a comprehensive repository of information relevant to South Africa.
- Many people, programmes, events, datasets and research outputs comprise the national science, technology and innovation information landscape. This landscape is of course dynamic, which means the information is, too. Different information providers, public and private, exist in this landscape - with different goals, but sometimes similar products. The NSTIIP aims to bring this together, where perhaps no other portal has done, and perhaps that makes it unique. However, it doesn't offer unique information, or a necessarily unique set of pathways to find the information that others provide.
- There are many databases internationally, but a South African research database or repository will be welcome.
- The system needs such a central repository of STI data and information.

4. How should the NSTIIP differentiate itself? What other functionalities should be added to this portal?

- Consider the value add.
- There are many portals.
- Offer on the portal what is unique to NSTIIP; funding options should be an attraction of the portal.
- It should provide data for in-depth analysis of the state of science, technology and innovation in South Africa longitudinally. The portal should flag either positive or negative trends in indicators as an early warning of systemic changes. It should have inherent flexibility to adapt to external changes.
- There should be more interactive graphs.
- A participant with a commercial background would like to see how to take advantage of the offering - perhaps an overview of commercial applications - summary overview at each entry, definitely contact people and related forums or events; a simple dashboard that allows quick searches - especially from mobile devices; notifications of new entries - perhaps via newsletters or emails; and features to optimise searches for narrow research purposes.
- Open access.
- It should offer detailed local information first and then related information from the continent.
- Make things simpler.
- It is a universal resource - not exclusive.
- Links to other South African portals.
- It should offer storage space for the data, so it doesn't have to be kept 'at home' after it has been analysed and published.
- An access site to a comprehensive aggregation of data and databases on R&D in the STI sector.
- Search function.

- Be NSI-wide in terms of information.
- Should focus on NSI-level content.
- Should have chat rooms.
- Should post events related to NSI.
- Truly comprehensive.
- The value of the portal thus far has not been realised nor is it of the standard of other sector databases. It must get the basics right before it offers added value such as interactive dataset, graphs etc.
- Include some unique functionalities that other portals do not have.
- Better searchability.
- It must generate data relevant to the functioning of the NSI.
- Be more aware of platforms - for instance, google Chrome does not show the page very well. Cannot see under 'useful data sources' – it should be more prominent from the beginning and the info infographic should take up 40% less space.
- Provide locally relevant information.
- The NSTIIP - as a concept and a nascent platform - may be over-ambitious and may be trying to do too many things at once. As a general strategic point, the portal should do a few things really well. Many have tried to offer such a resource and have failed because they are outstripped by the deep pockets of Silicon Valley firms, such as LinkedIn, which do this type of thing well. So, a lot of effort - and money - can be wasted if the nature of the problem is not clearly defined. The portal can differentiate itself by the type of 'user experience' it creates – this is about the language the portal uses, the colours, the images, the style, the type of emotion it evokes (or doesn't in the user). It's also about using a service online to get something done - think internet banking, think tweeting, etc. The services offered by the portal should help people do their jobs better, or be more effective at lobbying with evidence, or better at finding critical data. It also needs a South African flair - the types of images, words, concepts used in the copywriting of the portal should reflect local realities - and not try to mimic a global standard.
- Is it possible to add some artificial intelligence functionality at a later stage, i.e. the ability to 'answer questions' or 'interpret results'?
- More data on innovation - currently only R&D stats are displayed.
- It should guide policy on technology commercialisation.
- Put 'South African' somewhere in the name so that local and international scholars can find the portal.
- It should be more than just a repository. It should be interactive, linked to other repositories and have social media.
- Market itself better.
- NSTIIP must be user friendly and information must be easier to access. Users must not struggle when looking or searching for specific data unless it is not available.

5. Is the name National Science, Technology and Innovation Information Portal suitable for this system?

	Percentage response
Strongly disagree	6%
Disagree	8%
Neutral	10%
Agree	14%
Strongly agree	1%

Suggested alternatives/comments

- Tsumbandila
- The name is too long.
- A name will help, not an acronym.
- NUTSHELL - National Repository for STI Health.
- National STI Data Hub.
- Technology Innovation and Science Access Portal.
- Emthonjeni.
- The problem is not the name but the marketing of it.
- Innovation Information SA.
- Know the earth.
- Citizen science
- Sci-Go.
- Avoid the details. Think Google.
- It's descriptive but too long and a silly acronym.
- South African Scientific DAta Repository - SASDAR
- STI Portal
- National System of Innovation Information Portal.
- The name is fine.
- NACI portal.
- 'Information' seems limiting, so replacing it with 'data' may be more appropriate in terms of broadness. We may call it NSTIDP.
- SA Science Online.
- Innovation Portal.
- The NSTIIP is easy to remember but not identifiable.
- NSI Portal.
- Please do not use 'portal'. There was once a joke about 'portal proliferation syndrome' in international EU-funding programming. People don't want another portal, but they do want a service that will help them in exactly the way they want to be helped.
- Isango (means gateway in Xhosa and Zulu).
- It should be distinguished as a South African portal.
- Science Information Portal.

6. What should be reflected by the new NSTIIP brand

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	No answer
Traditional	9%	4%	15%	8%	1%	4%
Simplicity	4%	1%	5%	7%	21%	3%
Technical	3%	0%	14%	14%	7%	3%
Disruptiveness	7%	3%	14%	11%	2%	4%
Seriousness	3%	1%	14%	14%	5%	4%
Familiarity	5%	2%	13%	11%	6%	4%
Friendliness	3%	1%	11%	11%	11%	4%
Boldness	3%	3%	16%	12%	3%	4%
Dynamic	3%	0%	9%	16%	9%	4%
Fun/playful	8%	2%	17%	8%	3%	3%
Professional	3%	0%	4%	11%	20%	3%
Honorary	9%	2%	19%	7%	0%	4%
Symbolic	8%	2%	16%	9%	2%	4%
Uniqueness	4%	0%	14%	9%	10%	4%
Innovativeness	4%	0%	6%	12%	16%	3%

Observations

- Avoid clichés please.
- Simplicity and utility are preferred. People don't look for innovation or uniqueness in what is essentially a repository. They want ease of access and the data to be readily available under an obvious heading.
- Should be a compelling brand that reflects the new NSI in line with White Paper aspirations.
- It has to be absolutely clear that this brand is the authority on information about South Africa's science, technology and innovation. That means it has to be error-free, rigorous, analytical, clear, current, convincing, context-specific.
- One doesn't look for fun in a portal - it is serious and professional.

7. Suggested slogan for the portal

- Tsumbandila
- There is no need for a slogan. A portal of this nature should not require slogans.
- Science information at your fingertip!
- Reflecting the health of the science system for national growth.
- Serving all your STI data needs.
- Making innovation accessible to all.
- Just big data it...
- Navel for innovators.
- The place for SA innovation data.
- The earth - our only home.
- Citizens are scientists.
- Data-driven innovation.
- Store and disseminate your scientific data.
- All you want to know about science, technology and innovation.
- Innovation is indispensable for societal transformation.
- Innovation for the people.
- Indicating our future.
- Your one-stop portal partner that enables analytics and evidence-based advice.
- Science alive.
- Innovation for a better future.
- Access to knowledge to empower people.
- Innovation statistics and indicators for South Africa.
- Isango - the gateway to SA innovation information!
- Your one-stop shop for technology commercialisation.
- Something with South African in it...
- Knowledge at your fingertip.
- Innovation information in the palm of your hands.

8. Rating on the 'look and feel' of the NSTIIP

Rating	
Very Bad	0%
Bad	4%
Neutral	22%
Impressive	5%
Very Impressive	0%

Suggested improvements/comments

- Pop-ups with latest information.
- Must be fun to navigate.
- The landing page is a bit busy with the funky colours and changes. Otherwise it's plain and simple.
- There are some glitches in moving around - the page 'shudders' sometimes when selecting a tab, on the far right top three-line tab - when opening it opens half screen and not easy to reach the left side of page.
- It's nice and clear and there seem to be useful sources of information. Easy to read and find tabs.
- Looks good.

- Look and feel have to speak to people who can read and make sense. While one cannot assume an advanced understanding of vocabulary and syntax, even 'illiterate' adults are sophisticated thinkers and presentation should not assume low understanding. The semiotic disruption is crucial.
- Simplicity and usability should be the first principles in design.
- It's way too complicated and the pulldown menus are full of unclear link descriptions. For example: Why doesn't 'knowledge base' contain knowledge? Who determines what are 'useful' STI data sources?
- Be more dynamic.
- Apply user-friendly page styles to ensure an attractive layout for a logical flow of information.
- Needs updating, a fresher look and feel.
- It does not represent a government brand.
- Google Chrome makes it difficult to assess this. Zooming out make it better. From this point of view, the page does not look attractive. The infographic is lovely, but it is all the page has.
- More colour and trimming would make a big difference.
- NACI logo is blurry. Font used is not a standard web font that most people recognise easily - and it makes the words look funny. Stick to standard Arial. Videos on home page are a bit blurry too. Links are slow.
- Some of the text appears unedited, giving a non-professional feel, for example http://www.naci.org.za/nstiip/index.php/knowledge-base/policy-briefs. 'brief analysis...' should be 'Brief analysis...'
- More user friendly – seems an outdated format compared to what other data repositories around the world offer.
- The colours are bit hard on the eye.
- Introduce latest features and constant updates on the system.

9. Rating of what the 'look and feel' communicates

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Traditional	2%	1%	18%	8%	2%
Simplicity	4%	5%	12%	6%	4%
Technical	2%	3%	14%	11%	1%
Disruptiveness	6%	6%	15%	3%	1%
Seriousness	3%	1%	13%	13%	1%
Familiarity	2%	7%	16%	5%	1%
Friendliness	4%	4%	15%	5%	3%
Boldness	3%	6%	16%	5%	1%
Dynamic	2%	7%	11%	9%	2%
Fun/playful	3%	7%	15%	5%	1%
Professional	2%	3%	10%	12%	4%
Honorary	2%	5%	16%	7%	1%
Uniqueness	4%	5%	14%	7%	1%
Innovativeness	5%	4%	11%	9%	2%

Responses

- To be disruptive, it will need to radically rethink the internet, or webpages or interaction thereof. Therefore, the humanoid interface should take me directly to a bespoke innovationist humanoid or bot. Bot would work best due to capacity. Let the bot direct users deep into the matrix - this would personalise their journey. Perhaps I can create my own bot (as per gaming) so that every time I go to site my buddy bot is waiting eagerly for me to tell about new stuff. this would link to artificial intelligence that tracks my interests and buddy bot would link me to useful contacts, events etc. So, it mustn't be a generic, one-size-fits-all website, but consider my preferences. This would apply to both mobile and static devices, especially mobile. When I have downtime, I want to visit my site instead of negative news media sites. I must feel like I can't wait to get onto my site so that I can further explore what is hidden, what's waiting for me, potential projects, new friends I can make etc.
- Avoid clichés. Fun is not always good. Be wary of too much playfulness. People are seriously concerned about water and food.
- Very traditional at the moment.
- Things are a bit too colourful – one just wants clarity and functionality.
- More can still be done to improve the system.