

## **RNP Working Groups – New Way to Innovate**

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### *Abstract*

RNP, the Brazilian NREN, has a 20-year-old R,D&I program known as Working Groups whose main goal along these years is to deliver technological solutions in collaboration with the Brazilian academic and research community. To faster deliver value as new products and services to RNP customers (collectively known as 'RNP System'), the Working Groups program has been reformulated in 2019 to include business development aspects in order to shorten development lifecycle of new products and services. Today, it runs a 2-year cycle within a new approach that joins research groups and startups to accelerate the process of introducing into the market a technology-based innovation coming from the academia. One of the solutions developed in this Working Groups program is LiteCampus, an energy metering dashboard that aggregates data from diverse IoT sensors deployed on universities campuses. LiteCampus is a collaboration among RNP, Smartiks, and Campina Grande Federal University and is commercialized in the market by LiteMe, a spin-off of the development project.

### *1. Introduction*

RNP (Rede Nacional de Ensino e Pesquisa) is the Brazilian National Research and Education Network (NREN). RNP's vision is to be recognized by the Brazilian society as the institution that, by innovative use of Information and Communication Technology (ICT), leads to the integration of the academic community, contributing to the improvement of the quality of education and research, and collaborating to the technological, social, and economic development of the country.

Our pioneering spirit in bringing the Internet to Brazil was accompanied by the need to promote the advanced use of networks, including the creation of products and services in partnership with the Brazilian academic and research community through an Open Innovation process.

The Working Groups program, originally named as 'GT-RNP', is RNP's main activity in the creation of new products and services, currently called 'Advanced Services Research, Development and Innovation (RD&I) Program.' It is structured in two annual cycles, referred from now on as 'Phase 1' and 'Phase 2'. Introduced in 2002, this program is associated with one of the Key Performance Indicator of RNP's management contract. Up to December 2021, some of its results include: 17 public Call for Projects; 553 received project proposals; 106 prototypes; 62 pilots; 34 experimental services; and 15 startups.

The solutions developed as part of the program aim to tackle actual problems of the RNP System. Such a system is composed of the academic national Internet backbone ('Rede Ipê') and its Points of Presences (PoPs) operating in all Brazilian states; metropolitan networks, based on an associative model of User Organizations (*e.g.*, Rio de Janeiro's 'Rede Rio'); User Organizations, public or private higher education institutions (*e.g.*, Federal University of Rio Grande do Sul); and others Collaboration Networks.

## *2. Working Groups Program*

The Working Groups Program, now called Advanced Services RD&I Program, was reformulated in 2019, adding to R&D projects, originally and exclusively focused on technological development, a business development trail.

Our motivation to this evolution was the then too long time-to-market development cycle for new products and services. By incorporating business development as part of the R&D management process, and bringing research groups and startups together from the beginning of the development cycle, we are enabling a reduced time-to-market for the potential new products and services that are initially formatted as MVPs (Minimum Viable Products) for to the RNP System.

There is a main game changer as part of all projects: an entrepreneurial training that covers theory and practice in Phase 1 as a Customer Discovery/Validation process and in Phase 2 as Growth Hacking experiments. The main goal is to develop an entrepreneurial mindset throughout the project, to accelerate the development process and shorten the introduction of a technology-based innovation coming from academia into the market.

Compared to the original program, the reformulated Advanced Services RD&I Program has a lean approach in relation to the deliverables made by the working groups. The original RD&I program was focused on technical and academic deliverables that were evaluated quarterly. In the original approach, Phase 1 projects aimed to generate a prototype and eventually in Phase 2, to develop a pilot, focusing primarily on technology development.

Today, all projects must build a Minimal Viable Product (MVP) in Phase 1, by carrying out activities related to the business and the product simultaneously. In Phase 2, all projects have to overcome the challenge to conquest Early Adopters and evolve the MVP. Along this journey, research groups are encouraged to form partnerships with

startups and/or incorporate entrepreneurial competencies into their teams to create a startup if there is none as part of the original project.

At the beginning Phase 1, an entrepreneurial training based on the methodology of the National Science Foundation (NSF) I-Corps is carried out, in order to disseminate the business development tools and techniques for the project teams. In this training, teams must design and validate the initial business model of the solution through interviews with potential customers. At this stage, the groups also count on the support of business mentors. Product development must be based on a continuous validation process that is managed by the RNP team.

In Phase 2, a new process of training and additional mentoring is carried out, complementing the entrepreneurial development of the project teams. The focus of Phase 2 is to achieve early adopters and build experiments of its business model through the Growth Hacking method.

These training help the project team validate the business hypotheses to support the construction of the minimum viable product (MVP) focused to solve actual RNP System's problems. In addition, all startups are encouraged to prospect and target broader markets.

The program is currently in its third edition, and its two phases are well consolidated in terms of deliverables and objectives, with incremental improvements being implemented in each new edition. Three entrepreneurial courses have been completed since 2019, for a total of sixteen working groups. In summary, in 2019 there were eight new projects, in 2020 four new projects, and in 2022 another four new projects.

A successful project of this program is LiteCampus, an energy metering dashboard that aggregates data from diverse IoT sensors deployed in universities campuses. LiteCampus is a joint collaboration among RNP, Smartiks, and Campina Grande Federal University and is commercialized in the market by LiteMe, a spin-off of the development project. LiteMe has the potential to be a new RNP partner and offer a new service that maybe evolve to RNP's service catalog for the RNP System, called 'Nasnuvens' (<https://www.rnp.br/servicos/nasnuvens>).

This solution is an example of a new way to innovate through RNP's R&D program. We now pursue to overcome the challenge of building MVPs (minimum viable products) and achieving early adopters in a 2-year development cycle.

### *3. Case of Success: LiteCampus*

The LiteCampus project was developed in partnership with the Campina Grande Federal University and the startup Smartiks. LiteCampus is a georeferenced dashboard solution for data management of meters and actuators devoted to controlling the energy consumption of large consumers (composed of several consumer units). LiteCampus was built to integrate any meter or actuator model of the market. Given market conditions, a spin-off startup called LiteMe is in the process of licensing to commercialize the technical solution in the market.

The main features delivered by this dashboard consists of:

- Navigation in consumption history;
- Comparison of consumption of different consumer units;
- Programmable alerts (*e.g.*, instant demand exceeded, inadequate voltage level, target consumption exceeded);
- Visualization of alerts and consumption on the map;
- Easy integration with meters and actuators.

The main benefits of the service offerings to the RNP System include:

- Better understanding of the environment's energy consumption;
- Monitoring of energy efficiency campaigns;
- Early detection of consumption problems (*e.g.*, inappropriate habits, faulty devices);
- Better control of ambient energy consumption;
- Scheduled action to avoid waste;
- Predictability of energy consumption and cost.

LiteCampus is currently a potential solution to be part in the near future of RNP's service catalog and maybe be exploited in three different offerings approaches: Freemium, Campus, and Campus Premium.

The free offer allows customers to try the Dashboard for only one metering device for no cost and a three-months-long historic data, besides access to the dashboard containing the map of the campus and daily and monthly consumption.

The campus offering is an annually paid offering that delivers a complete set of features, including actuators, billing prediction, consumption management, contracted demand management, alerts, real-time monitoring, analytics, and automated reports. This is a complete set offering.

The campus premium offering includes all the campus features, adding an energy efficiency analysis and monthly report done by experts in the field, providing insights on how to improve the management of the campus' energetic area. This brings intelligence and efficiency to the energy consumption and management of the university campus.

#### *4. Conclusion*

This reformulated program is an important evolution in the advance of national technical and business competitiveness. A well-known difficulty in the Brazilian academic environment today is the difficulty of generating innovative businesses from solutions created by research groups. This new way to innovate of this program is shortening the gap between academic applied research and University and the Market.

In this sense, one of the main impacts is the training of the teaching and research community in tools related to business development and innovation. As a result, researchers have managed to bring their research closer to the actual needs of society.

In addition to the direct impacts related to the technologies developed, the creation of new startups contributes positively to the country's economic development, generating new jobs, with a high level of complexity.