May - 2015

Pan-Hispanic and English Engineering Reference Dictionaries

Executive Summary

- The Royal Academy of Engineering (RAE) is an active Academy:

    - Creates value for the Spanish Society through services to their institutions, universities and companies.

    - Promotes the quality and competence of Spanish Engineering.

- RAE fosters:

    - Education, research, innovation, discussion forums.

    - Dissemination of technology.

    - Prominent work that advances Engineering.

Executive Summary

- The development of a Spanish Dictionary of Engineering is a **statutory objectives** of RAE:

  - Spanish language as an important instrument for engineering.

  - The enormous technical vocabulary in Spanish requires to be compiled.

- This objective was accomplished in In 2014, with the first comprehensive and multidisciplinary Spanish Dictionary of Engineering

  - More than 51,000 terms and definitions.

  - All disciplines of engineering.

  - Already in use by thousands of people globally.

  - Presently, 1,000,000 € has been invested.

Executive Summary

- Currently, the Spanish Dictionary of Engineering has 51,753 terms distributed in the following areas:
  - Astronautics, naval y transportation
  - Agroforestal
  - Construction
  - Information and communication technologies
  - Security and defense
  - Industrial chemistry
  - Energy
  - Biomedical engineering
  - General engineering

Executive Summary

- It is of great interest to develop a new Pan-Hispanic and English Engineering Reference Dictionaries (PEER) that includes:
  - Regional equivalents and definitions of technical words in Spanish and English.
  - Bidirectional translation.
  - Make it **a world reference** in engineering.
  - Raise the Spanish language in engineering.

- International collaboration is fundamental for the success of the project.
  - UNM, MIT, UC3M, UPM, other international partners.
  - Industry.
  - Multilateral organizations.
  - Foundations, NGOs.
  - Government agencies.

Executive Summary

- This international project is a major extension of the SDE
  - Cloud-based
  - Multidisciplinary
  - Computational Intelligence based self updated

- The project will:
  - Merge Information Technologies and International Linguistics.
  - Develop R+D in Language Engineering.
  - Generate entrepreneurial activities.
  - Continue the methodology developed for the SDE.

Objectives

- **Pan-Hispanic** Dictionary of Engineering:
  - Collect and define all Pan-Hispanic engineering terms.

- **English** translation of the SDE terms:
  - Translation will be peer review validated.

- **Infrastructure** for maintenance and update:
  - Real time virtual collaborative environment.
  - Cloud Computational intelligence for language engineering.

- **Sustainability** of the project:
  - Sponsors.
  - Research and development.
  - Entrepreneurial activities.
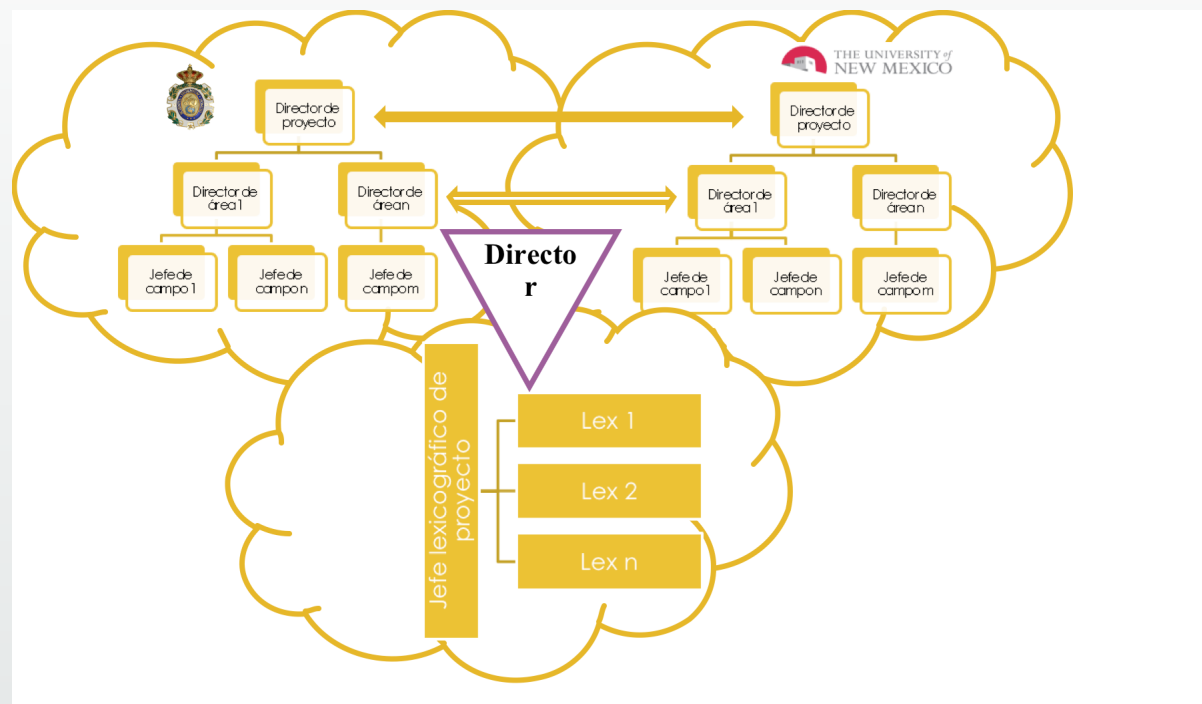 - Value added services.

R&D

- Language Engineering
    - Natural Language Processing, Artificial Intelligence and Machine Learning: detection of new terms, their review (acceptance, rejection), definitions, and determination of equivalents per region or country.

- Value Added Services
    - Translation of documents
    - Real-time speech translation
    - Accent recognition
    - Customization and development of Internet applications

- Big Data, Data Analytics, Security, Internet of Things

- Entrepreneurial Activities
    - Crowd Funding
    - Proposals

Ibero-American Networks

- First Phase:
  - Spain
  - USA
  - Argentina
  - Brazil
  - Mexico
  - Costa Rica
  - Cuba
  - Colombia
  - Chile

- Second Phase
  - USA
  - Panama
  - Ecuador
  - Bolivia
  - Uruguay
  - Venezuela
  - Peru

- Spain
  - UPM
  - UC3M

- USA
  - UNM
  - MIT
  - USF
  - UT Austin
  - UC Berkeley
  - Harvard
  - Georgetown

- Canada
  - Waterloo
  - University of Toronto

Work breakdown structure

Budget

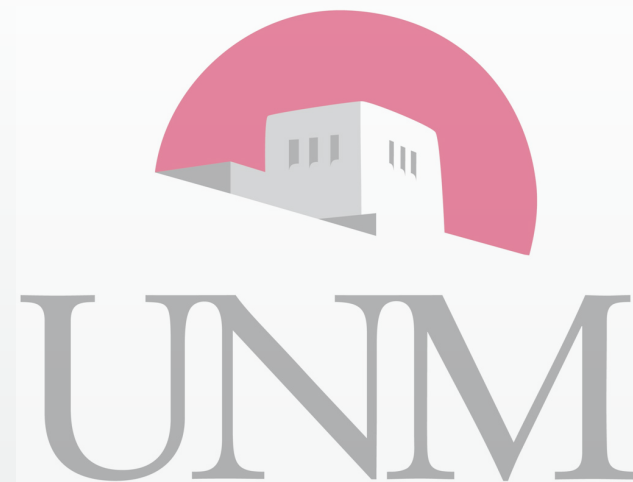|	0*	1	2	3	4	5
Personnel						
Admin.		40,000	40,000	40,000	40,000	40,000
Faculty		175,000	175,000	175,000	175,000	175,000
Students		525,000	525,000	525,000	525,000	525,000
Infrastruc.		120,000	25,000	25,000	25,000	25,000
Tr & conf.		70,000	50,000	50,000	50,000	50,000
Total	1,000M	930,000	815,000	815,000	815,000	815,000

Three year program: $2,560,000
Five year program: $4,190,000

* Budget of year 0 corresponds to the already invested quantity.

Budget

- Administration (per year): $321K
  - USA: $60,000
  - Spain: $45,000
  - Ibero-America: $36,000 x 6 nodes

- Scholarships (per year): $468K
  - USA: $1,500 x 2 institutions x 2 scholarships
  - Spain: $1,500 x 2 institutions x 2 scholarships
  - Ibero-America: $1,500 x 7 institutions x 2 scholarships

- Travel and miscellaneous (per year): $100K

- ICT (every three years): $250K
  - Computing resources
  - Networks
  - Licences

- This budget covers only the first phase. In the second phase, participating members must provide local or regional matching funds to cover for Administration costs, ICT and scholarships by 50%. Individuals with scholarships will also receive funding to cover their tuition costs.

Thank you - Gracias