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VITHEA Virtual Therapist for Aphasia treatment

INESC-ID and FM/UL
PI: Alberto Abad

RIPD/ADA/109646/2009



Introduction

Plan and methods

Tasks

Milestones

Timeline

Budget and Funding

Management Structure

About aphasia...

- Aphasia is a language disorder that occurs after brain injuries:
 - Can affect to speech production, hearing comprehension, reading, writing...
 - 500000 news CVA + 100000 relapses per year in the EU.
 - A third of them present language deficiencies.
- Several speech therapy methods have shown effective for rehabilitation:
 - Intensity positively influences the recovery.
- Difficulty to recall words or names is the most common feature of aphasia:
 - In some cases it is the only residual effect after rehabilitation.

Computer assisted treatment

- Computers for treatment of Aphasia have been used from early 80s (without SLT).
- SLT has been applied to speech disorders, but:
 - Mostly in classification, diagnosis, accesability, control and/or communication.
 - Few in treament.
- Some recent commercial/research products:
 - Aphasia Tutor – Kind of recall (choosing option).
 - SentenceShaper – Help to build phrases.
 - Lingraphica – Communication by pressing icons (TTS)
 - Sentactics and AphasiaScripts – Virtual Therapist (lab)

Objectives and novelty

- Development of a **software program for the treatment of aphasic patients** --particularly those that show difficulties when recalling words-- incorporating recent advances of speech and language technology:
 - The software must act as a "virtual therapist", asking for the patient to recall the contents of a picture that is shown.
 - Use of ASR to recognize what was said by the patient and to validate if it was correct or not.
 - The "virtual therapist" must be able to provide help both semantically and phonologically (TTS).
- The main **novelty** of the project is the use of speech recognition technology for the treatment of aphasia.
- Intensive treatment “**anywhere**” and “**any time**”

- VITHEA is a FCT project submitted in 31st of July to:
 - “Concurso de Projectos de Investigação Científica e Desenvolvimento Tecnológico no domínio da reabilitação e integração de pessoas com deficiência”.
 - Current status: TA signed and sent. Waiting for homologation
 - Official Starting Date: 1st June 2010
 - Duration: 2 years
- Participating Institutions:
 - L2F, Laboratório de Processamento da Língua Fala of INESC-ID.
 - LEL, Laboratório de Estudos da Linguagem of FM-UL.

T1 Word Recall Confidence Research

T2 Design and Specifications

T3 Prototype development

T4 Clinic evaluation

T5 Management and Dissemination

T1 Word Recall Confidence Research

- Description:
 - Study best performing/more efficient techniques for IWR
 - Generation of a reliable confidence result for providing feed-back to patients in word recall exercises.
 - Study influence of particular characteristics of aphasic individuals
- Duration: M1-M16
- Person*months: 20
- Participants: **L2F**,
- Research members: BI-1, A. Abad, H. Meinedo, ZD. Lopes

T2 Design and Specifications

- Description:
 - Plan and prepare the therapy exercises.
 - Propose a series of desired user specifications for the prototype.
 - Data collection.
- Duration: M1-M6
- Person*months: 7.5
- Participants: **LEL**,L2F
- Research members: Z. Fonseca, G. Leal, A. Serralheiro, I. Trancoso, A. Abad.

T3 Prototype development

- Description: Implement the VITHEA prototype according to the conditions imposed by the desired exercises, the user specifications and the speech technology adopted. Sub-tasks:
 - Sub-task 1 Architecture definition and front-end development
 - Sub-task 2 Speech and Language Technology integration
 - Sub-task 3 Data Management
- Duration: M6-M24
- Person*months: 32
- Participants: **L2F**
- Research members: BI-2, BI-3, A. Abad, D. Matos, H. Meinedo, T. Pellegrini.

T4 Clinic evaluation

- Description:
 - The clinic application of the developed prototype.
 - Comparative study of the usefulness of the program.
- Duration: M16-M22
- Person*months: 6
- Participants: **LEL**
- Research members: Z. Fonseca, G. Leal, I. Pavão, ML. Farrajota

T5 Management and Dissemination

- Description:
 - Coordination and supervision.
 - Assure deliverables production.
 - External dissemination.
- Duration: M1-M24
- Person*months: 3
- Participants: L2F,LEL
- Research members: A. Abad, Z. Fonseca

M1 Specifications deliverable

The training exercises are designed and the final users specifications document is written.

M2 First VITHEA prototype

A first prototype application is released. Start of clinic evaluation application

M3 End of Evaluation

The evaluation results are obtained.

M4 Final VITHEA Prototype

The final prototype and the user's manual are released. This prototype will be improved thanks to the users comments and the evaluation experience.

Timeline

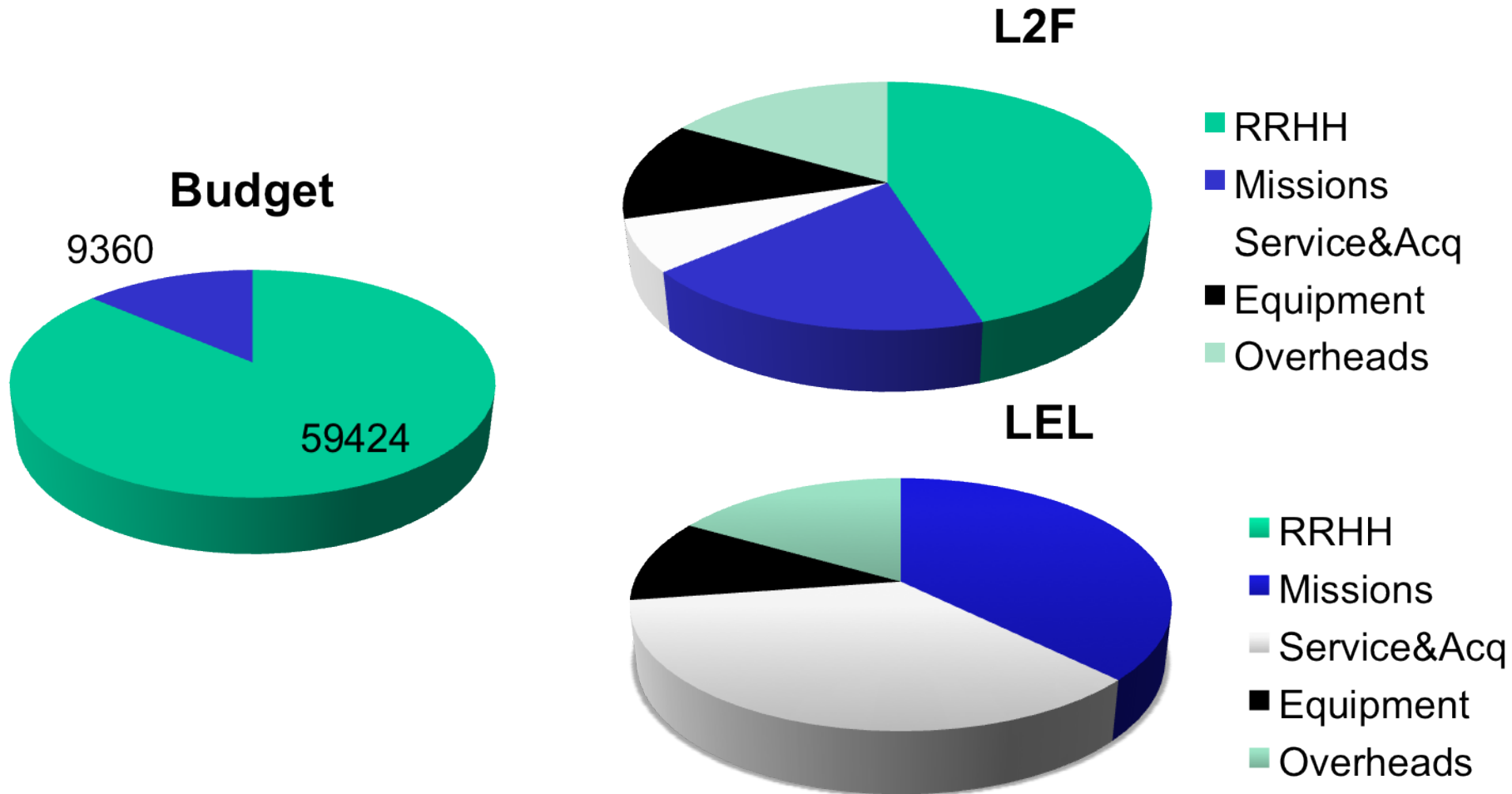


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Project reference : RIPD/ADA/109646/2009
Project title: VITHEA

Task N°	Task Denomination	Person*month	Participant responsible for task	Acronyms of partners involved in task	Year 1												Year 2																	
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24						
1	T1 Word Recall Confidence	20.00	Hugo Meinedo	L2F	█						█						█																	
2	T2 Design and Specifications	7.50	Jose Fonseca	L2F/LEL	█																													
3	T3 Prototype development	32.00	Alberto Abad	L2F							█						█																	
4	T4 Clinic Evaluation	6.00	Gabriela Leal	LEL													█																	
5	T5 Management and dissemination	3.00	Alberto Abad	L2F/LEL	█						█						█																	
		68.50									M1						M2						M3						M4					
					1st Progress Report												Final Report																	

Budget summary (as in the proposal)

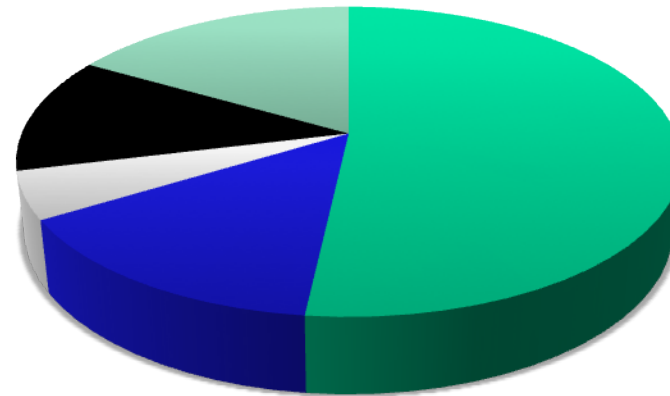


Funding summary (as accepted)

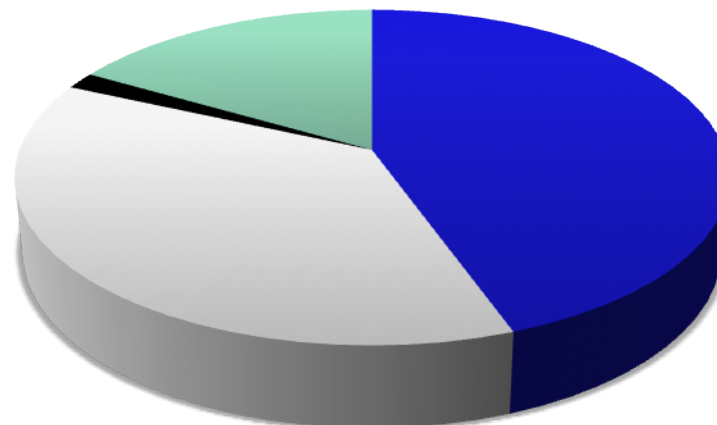


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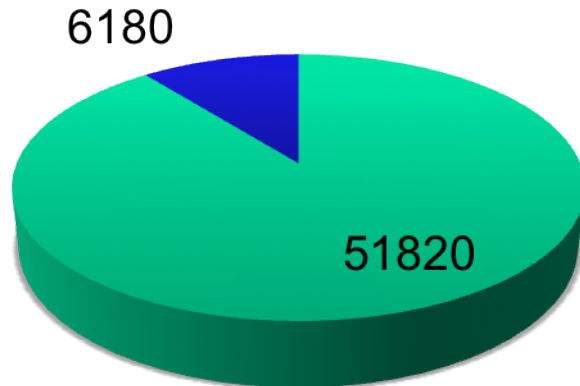
L2F



LEL



Budget



- RRHH
- Missions
- Service&Acq
- Equipment
- Overheads

- RRHH
- Missions
- Service&Acq
- Equipment
- Overheads

People

PI: Alberto

L2F Group coordinator: Alberto

LEL Group coordinator: Zé Fonseca

Meetings

1 Kick-off

2 Annual meeting

Several at the task level

Dissemination

Internal

Mail lists: {vithea-all, vithea-l2f, vithea-lel} @googlegroups.com

Wiki/Web page

External

Project web-page

Deliverables

End of each Task

End of each year

User's documentation manual



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Instituto de Engenharia de Sistemas e Computadores
Investigação e Desenvolvimento em Lisboa
Laboratório de Sistemas de Língua Falada

L²F - Spoken Language Systems Laboratory