

Proposal Writing: A Key to R&D Funding

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Objective

- To motivate researchers for conducting R&D to help Pakistan Transition towards a Knowledge based economy
 - Where the use of knowledge plays the predominant role in the creation of wealth or saving foreign exchange
- To develop Technology that is a key enabler in improving
 - National unity, harmony & security
 - Knowledge dissemination
 - Healthcare etc

Outline

- Broader perspective
- Proposal Development Lifecycle
 - Spectrum of funding agencies and opportunities
 - Area and topic identification
 - Collaboration
 - Proposal writing
 - Project execution
 - Product development
- Why Proposals fail?
- Revising proposal
- Case studies

Broader Perspective

- A long term commitment, start of a long journey
- A strategic plan for 5-10 years or a life time activities
- A direct contribution to society in general and Pakistan in particular
- A contribution to your personal profile and to the repute of your institution
- It is NOT a scholarship to earn a little more
- It is NOT to get paid workers to uplift your research profile

Make a plan: Funding Agencies

- Venture Capitalist
- National Funding Organizations
 - ICT R&D fund
 - HEC
 - PSF
- Government Organizations
 - DGMP, MVRD, NESCOM
- Regulatory authorities etc
 - PTA, PTCL
- Private Sector Organization
 - Telecom Operators, Textile Industry, SMEs, Automotive Industry
- International Funding opportunities
 - British Council, WHO, NSF, Cisco System, Intel, IBM, TI

Identification & Selection of Funding Agencies

- **The Most Valuable:** Venture Capitalist
- **The Easiest:** National Funding Organizations
 - ICT R&D fund
 - HEC
 - PSF
- **The Most Difficult:** Government Organizations
 - DGMP, MVRD, NESCOM
- **The Most Time Consuming:** Regulatory authorities etc
 - PTA, PTCL
- **The Most Clueless:** Private Sector Organizations
 - Textile industry, automotive industry, Telecom operators
- **The Most Prestigious:** International Funding agencies
 - WHO, NSF, Cisco System, Intel, IBM, TI
- **The Most Rewarding:** Foreign countries especially GULF

Before you Write

- Identification of funding agency
- Establish contacts in the agency
- The most critical is the selection of an area and innovative topic for the proposal
- Establish strategic collaborations
- Try linking final outcome with a business plan
- Learn engineering management skills before writing a proposal

Case Studies

- Three proposals funded by ICT R&D fund
- One research proposal funded by Cisco System URP
- Several proposals funded by HEC
- Several projects funded by DGMP /Army/Air force
 - SDR, DSCR, Network Monitoring, Autoloader,
- A project funded by PTCL
- Raised US \$17 Million in venture funding for a high tech startup in 2000
- Projects from NESCOM organizations

CARE the most celebrated engineering organization of Pakistan

Center For Advanced Research In Engineering

7 Asia Pacific ICT Alliance (APICTA) Awards and 9 P@SHA Awards in last two
years

Some of these projects are in collaboration with College of EME



Find out the focus of the funding agency and align it with your background and experience

FUNDING AGENCY & RESEARCH AREA SELECTION



National ICT R&D Fund

Ministry of Information Technology



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The following R&D themes have been approved by Board of Directors of National ICT R&D Fund.

1. Design and development of innovative services and management systems for **next generation telecom networks**
2. Leverage **ICT** to:
 - i. Develop scalable and sustainable solutions to **deliver international quality education**
 - ii. Enhance **security** for all citizens
 - iii. Improve productivity and quality of products in **SME**
 - iv. Improve productivity and quality of products in **agriculture**
 - v. Develop scalable and sustainable solutions to deliver a minimum level of **health care** to all citizens
3. Design and develop cost effective and **sustainable energy production and distribution systems**



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The Cisco Research Center (CRC) connects university researchers with Cisco. The CRC supports gift awards to universities based on research proposals from faculty and helps graduate students to identify internships and full-time employment opportunities.



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Ask questions and provide feedback related to Cisco Research Center.

We welcome your feedback via

research@cisco.com

Area of Interest

Description of Cisco Requests for Proposals (RFPs) category

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RFP

Cisco Requests for Proposals (RFPs) - Complete list of current RFPs

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Submit a Proposal

- [Cisco RFP Proposal](#)
- [Unsolicited Proposal](#)

Overview

Researchers

Students

The Cisco Research Center (CRC) is dedicated to matching researchers to Cisco engineers — and vice versa — to foster research relationships. To develop relationships

Research at Cisco

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Areas of Interest

[Collaboration](#)

[Data Center, Virtualization & Cloud](#)

[Mobility](#)

[Power](#)

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Cisco is interested in these research topics:

Collaboration



Collaboration is the combination of technology and culture to increase the effectiveness of individuals working together. Models and tools for collaboration are changing the way we work, live, play, and learn.

[Learn more](#)

Data Center, Virtualization & Cloud



Virtualization of resources and services enables on-demand provisioning and geographic mobility of complete applications, networks, data centers, and systems. Prominent features of virtualization include fault tolerance, scalability, and reduced cost of acquisition and ownership.

[Learn more](#)

Mobility



Mobile computing is assuming new dimensions with applications that incorporate multimedia, collaboration, sharing, gaming, mCommerce, location, and social networking.

[Learn more](#)

Power



The world is shifting towards sustainability and energy efficiency. With the rise of green initiatives and carbon emission credits – markets and regulations are the drivers for a massive shift in the world economy. In recognition of these drivers - research is essential to enhance the efficiency of hardware components, device-level integration, systems power management, and future paradigms for power.

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Distributed Traffic Monitoring

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[RFP-BASED RESEARCH PROPOSAL](#)

Distributed Traffic Monitoring

Project ID:

RFP-2009-053

Title:

Distributed Traffic Monitoring

Summary:

Traditional traffic monitoring systems such as Intrusion Detection Systems have a number of shortcomings. These shortcomings can potentially be overcome through a distributed system. A distributed system is of particular interest because it can often achieve a degree of comprehensiveness and scalability that is hard to match in a centralized system.

The central question is how to quickly and efficiently use information available at various nodes of a distributed system. A related question is how to manage and configure such a distributed system without requiring extensive change in mindset.

Cisco seeks proposals for research that will contribute to the theoretical understanding of the design, provisioning, management, and efficient use of distributed traffic monitoring systems, with emphasis on intrusion detection.

Full Description:

Proposals should focus on the basic principles and constraints of distributed traffic monitoring systems. Distributed intrusion detection systems are of particular interest. Possible topics include, but are not limited to:

Distributed system architectures, platforms, tools, algorithms that support:

- Distributed Policy Specification and Dissemination: Traditional approaches have been to configure each sensor individually or to configure all sensors alike. There are number of defects in these approaches; e.g., excessive operational overhead in the former, and inflexibility in the latter. Any new thinking that leads to more effective configuration methods will be of interest.

URP Goals

- Promote and encourage directed research at universities internationally
- Provide a venue for “risky” or orphaned research topics (25% of URP budget)
- Encourage research faculty to stay in academia
- Recruit top industry bound students



Country/region [select]

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IBM University Research & Collaboration

University Awards

Collaborative Research Initiatives

Related links

- IBM Academic Initiative
- IBM Student Portal
- IBM developerWorks
- alphaWorks (emerging technologies)

IBM University Research & Collaboration



Why IBM for academic research and collaboration?

IBM has a strong tradition of research collaboration with academia. We go beyond the boundaries of our IBM labs to work with colleagues in universities around the world. We also foster collaborative relationships through fellowships, grants and funding for programs of shared interest.

What IBM offers

University Awards

IBM offers awards that support research, curriculum development, and educational assistance in areas key to innovation.

Collaborative Research Initiatives

The results of these initiatives are freely available. You can use the research principles and example agreements to jump-start your own projects.

Other IBM research programs

Centers for Advanced Studies

Programs at these worldwide centers foster

IBM Research

IBM Research labs around the world work

Service Science, Management & Engineering



→ [Learn about SSME](#)

Collaborative research podcasts

→ [Listen to IBM and university researchers talk about their open source projects](#)

IBM University Research & Collaboration

University Awards

Collaborative Research Initiatives

Related links

- IBM Academic Initiative
- IBM Student Portal
- IBM developerWorks
- alphaWorks (emerging technologies)

IBM University Research & Collaboration >

University Awards

Supporting research, curriculum innovation and educational assistance



Overview

Ph.D. Fellowship

Innovation

Faculty

Shared Univ. Research

IBM University Awards support basic research, curriculum innovation, and educational assistance in focus areas, which are fundamental to innovation in the 21st Century and strategic to IBM's core business.

These focus areas include five game-changing technologies of particular interest:

- Services Science, Engineering, and Management
- Information-based medicine
- Event-driven computing
- Cell architecture
- Frontiers in supercomputing

We provide funding under two engagement models:

By open submission

For these awards, we invite submission of proposals in response to solicited, published program

At a

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TI DSP University Research Program

Description

- ◆ As part of Texas Instruments ongoing investment in Digital Signal Processing Solutions, we initiated a \$25 million investment in research at universities worldwide focused on applications for high performance digital signal processors (DSPs).



www.ti.com/sc/univfund

Other Opportunities

- RFPs floated by PTCL, PTA and other organizations
- Visit organizations to explore R&D opportunities

Guideline

Each funding organization has its own focus, format and procedure, follow it.

(source internet)

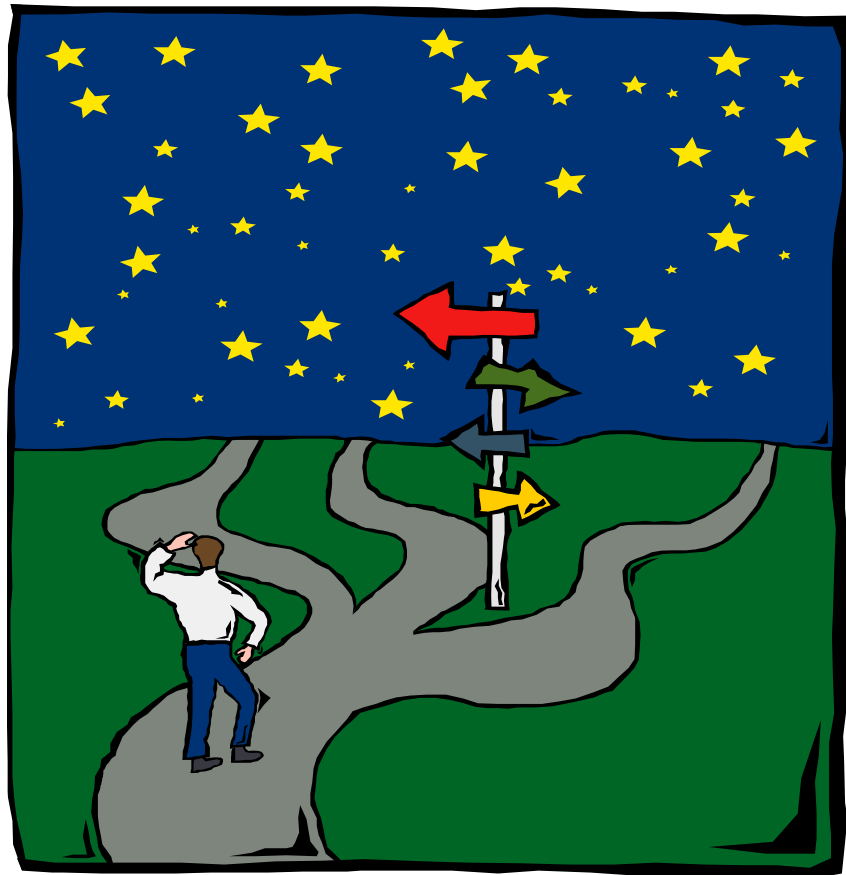


Find out the focus of the funding agency and align it with you background and experience

PROPOSAL TOPIC SELECTION

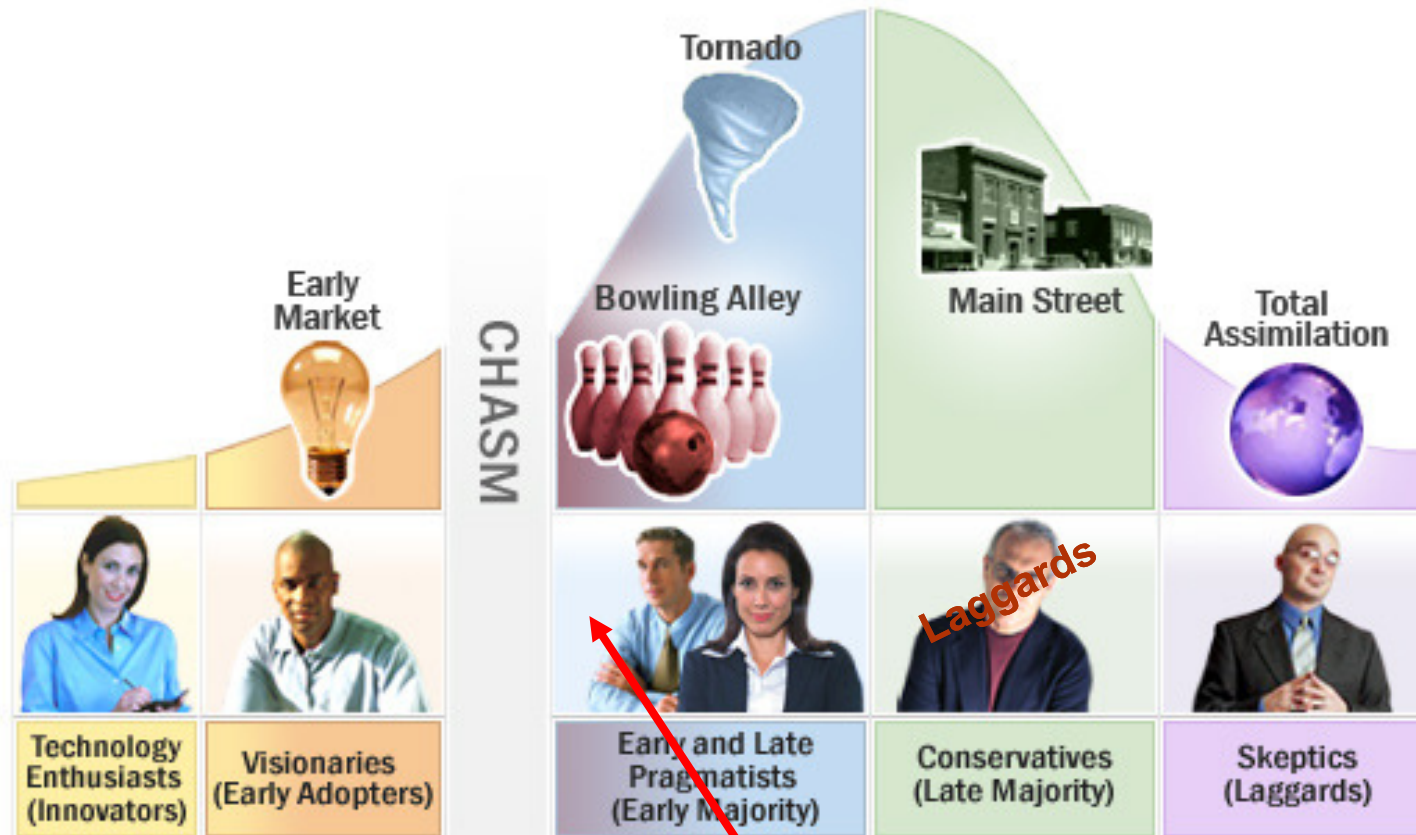
(source internet)

Finalizing a Research Topic



(source internet)

Technology Adoption Life Cycle



Early Majority

Late Majority

Find the best area and time to pursue funding

Writing a proposal

- Answer four fundamental questions
 - What is it about (objectives)?
 - How will you do it (methodology)?
 - Can you do it (your profile and collaboration)?
 - Is it worth doing (potential)?

Examples

CASE STUDY

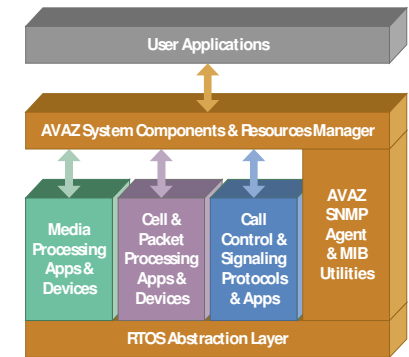
Area of Specialization: VLSI & DSP



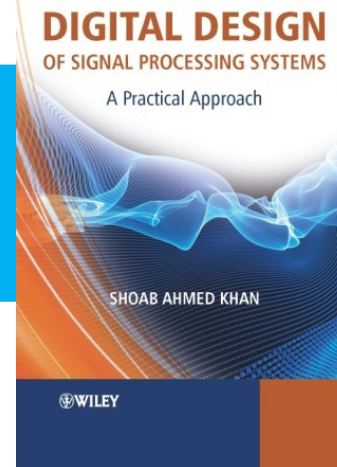
Delivered seven first-time right ASICs/Solutions to NEC, Scientific Atlanta, Nortel Networks, STM Wireless

Developed world highest density media processor chip

Hold patents on multiprocessor based SoC design

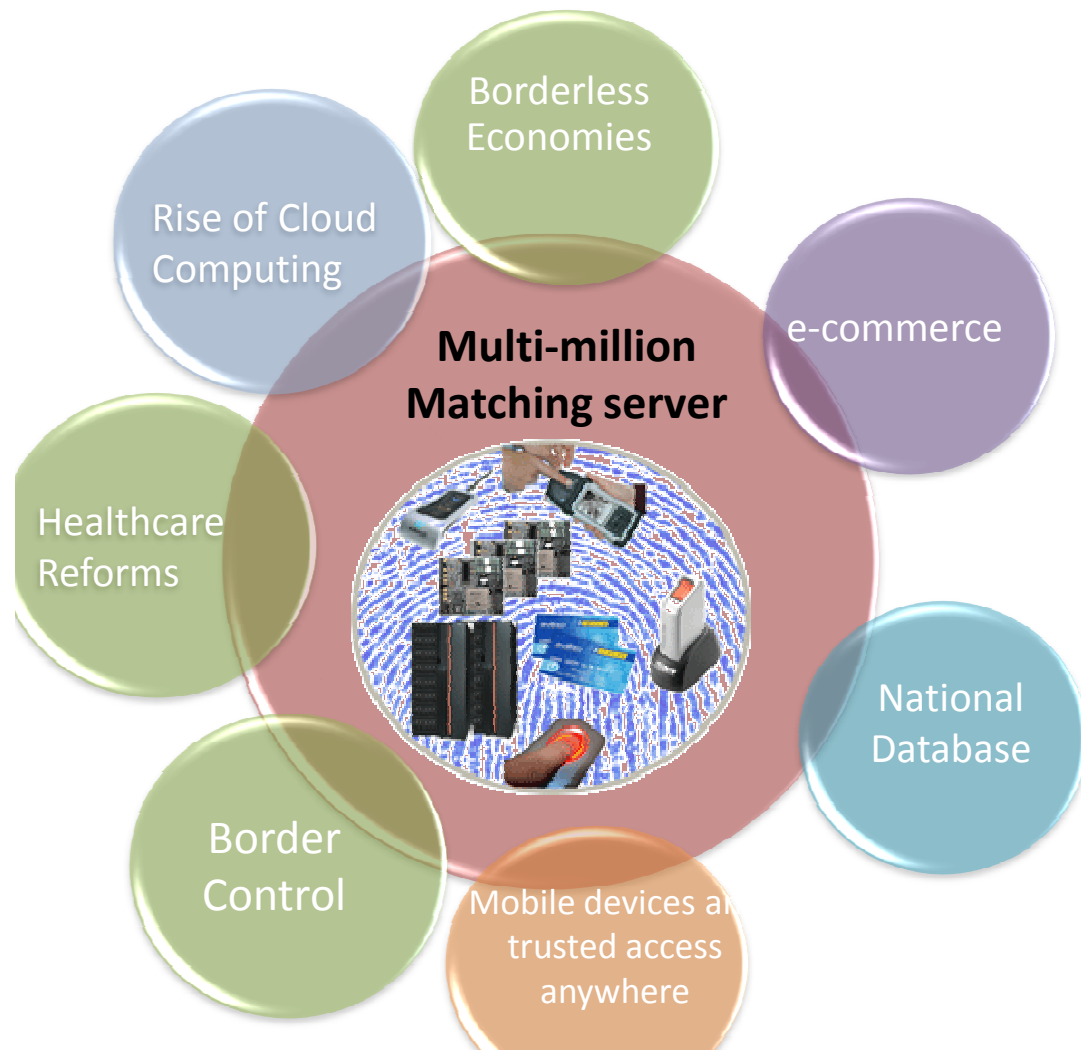


World Highest Density Media Processing Chip Developed in Pakistan in 2000



Massively Parallel Fingerprint Recognition System

for Authenticated Service Delivery in Cloud Environment



PKR 14.94 million
September, 2008

NUST College of E&ME
CASE/CARE

National ICT R&D Fund

A collaborating partner in US




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Making Real Time Biometrics Matching a Reality

MORE SCALABILITY,
MORE ACCURACY,
MORE SPEED,
NO LIMITS.

A large graphic of a hand composed of many small black dots, set against a light gray background with faint wavy lines at the bottom.

Discover the Allweb Technologies Difference

Allweb Technologies Inc.



ONE-LINE PITCH

We offer a cohesive, secure and convenient cloud based solution to address password overload and identity fraud issues for online users.

COMPANY SUMMARY

A start up focused on becoming the leading cloud based service provider for real time identity verification and secure single sign-on password management for online users. We provide the security and convenience of 2-step verification, using real time biometrics and cell phone based user identification. We have been recognized for our innovative technology as the "Best Information Technology Company" at the 2012 NJTC Venture Conference.

EDC Companies

Alphabetical

By category

[Enterprise Development Center](#) > EDC Companies



Company Listing

[<< Back to Company List](#)

Allweb Technologies Inc.

Allweb Technologies is one of the leading startup companies focused on addressing the password overload and identity fraud issues for online web users and enterprises. The company was established with the vision to create an online identity management eco-system that would eliminate the need to remember passwords. During the next few months, the team at Allweb Technologies will launch the first and only cloud-based service for password management with the security and convenience of 2-step user identity authentication in real time, using biometrics based user identification.

We have raised the technology bar for online identity and password management, and have recently won the award for the "Best Information Technology Company" at the 2012 NJTC Venture Conference.

A Tele-Cardiac & i-Diagnostic System

PKR 13.55 million

April, 2010

A Collaborative Project

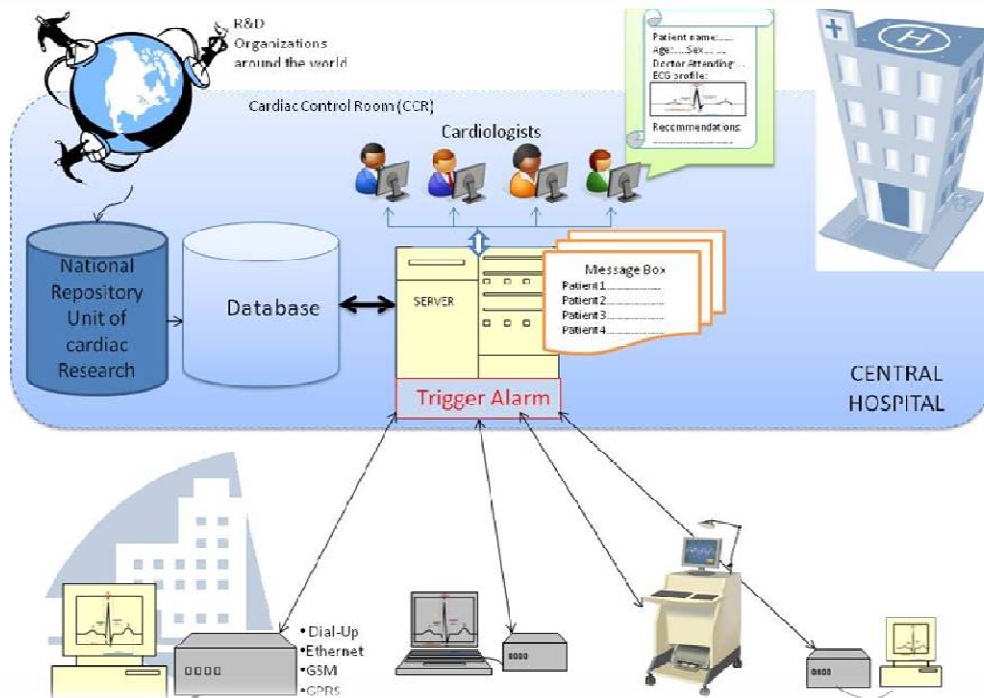
AFIC / NIHD

NUST, College of EME

National ICT R&D Fund

C@RE

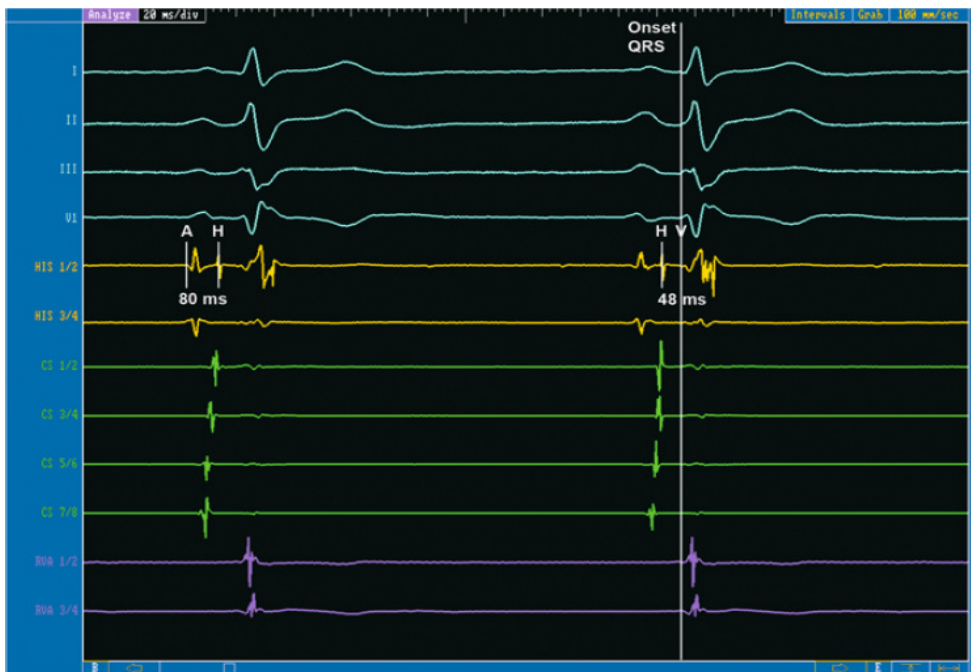
Center for Advanced Research In Engineering



APICTA-2011 GOLD AWARD in Thailand



Intra-cardiac Signal Acquisition, Analysis & Display System



PKR

A Collaborative Project

AFIC / NIHD

NUST, College of EME

National ICT R&D Fund

C@RE

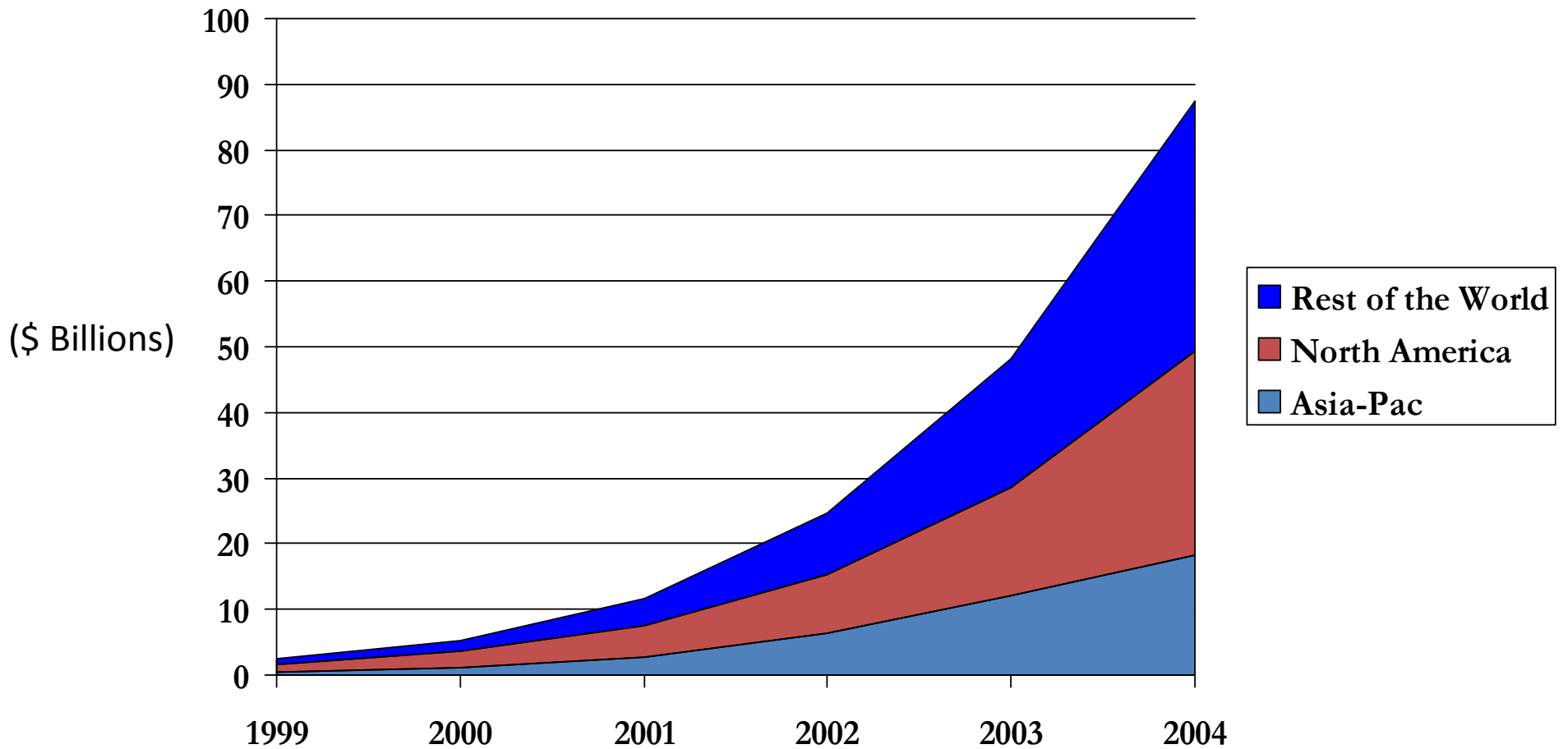
Center for Advanced Research in Engineering

First Venture in Proposal Writing

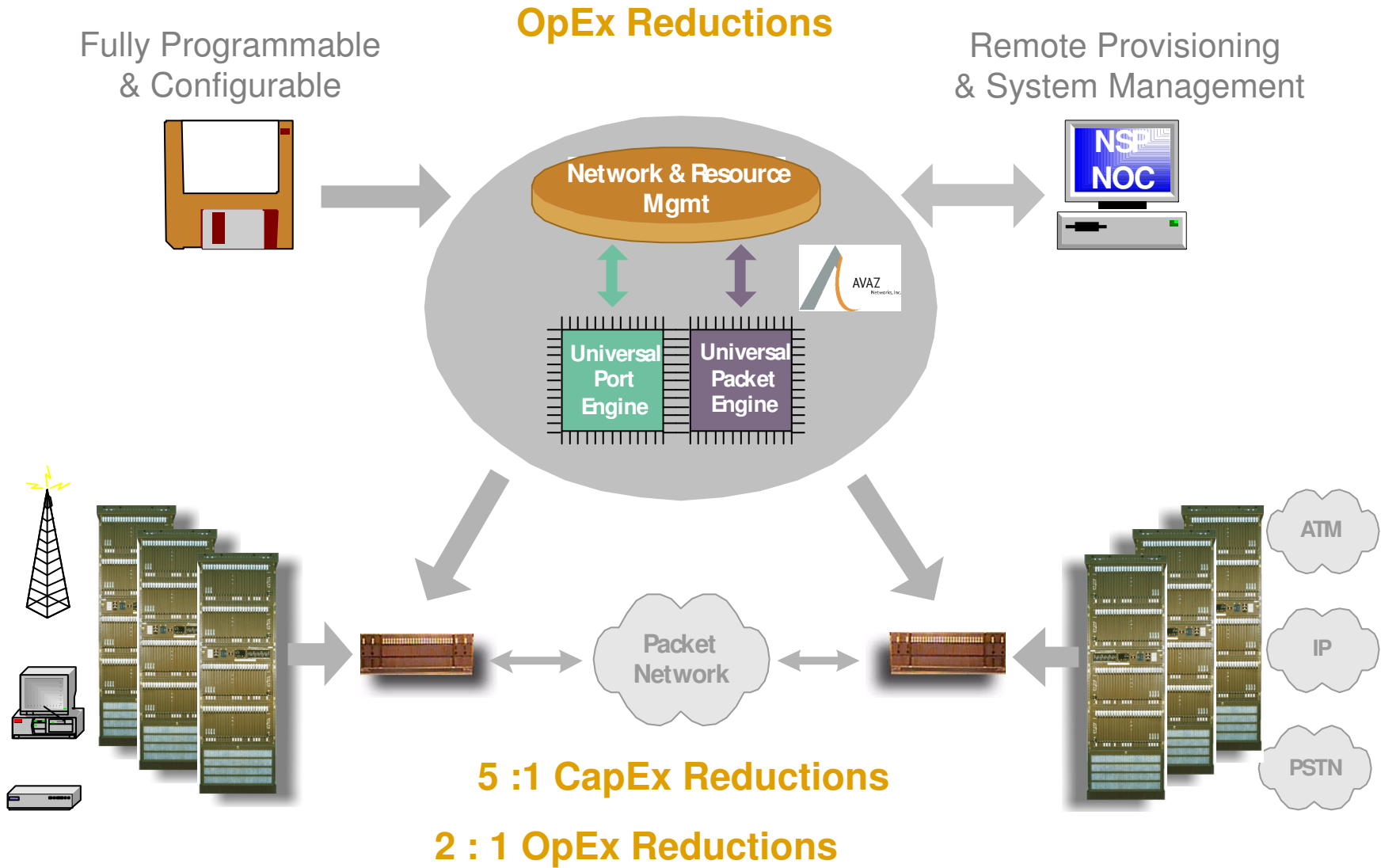
CARRIER CLASS VOIP SOLUTION

World Wide VoIP Market

Learn about emerging **technologies** and their impact for innovators and business leaders



Network Challenges: Convergence, Density, Scalability & Cost



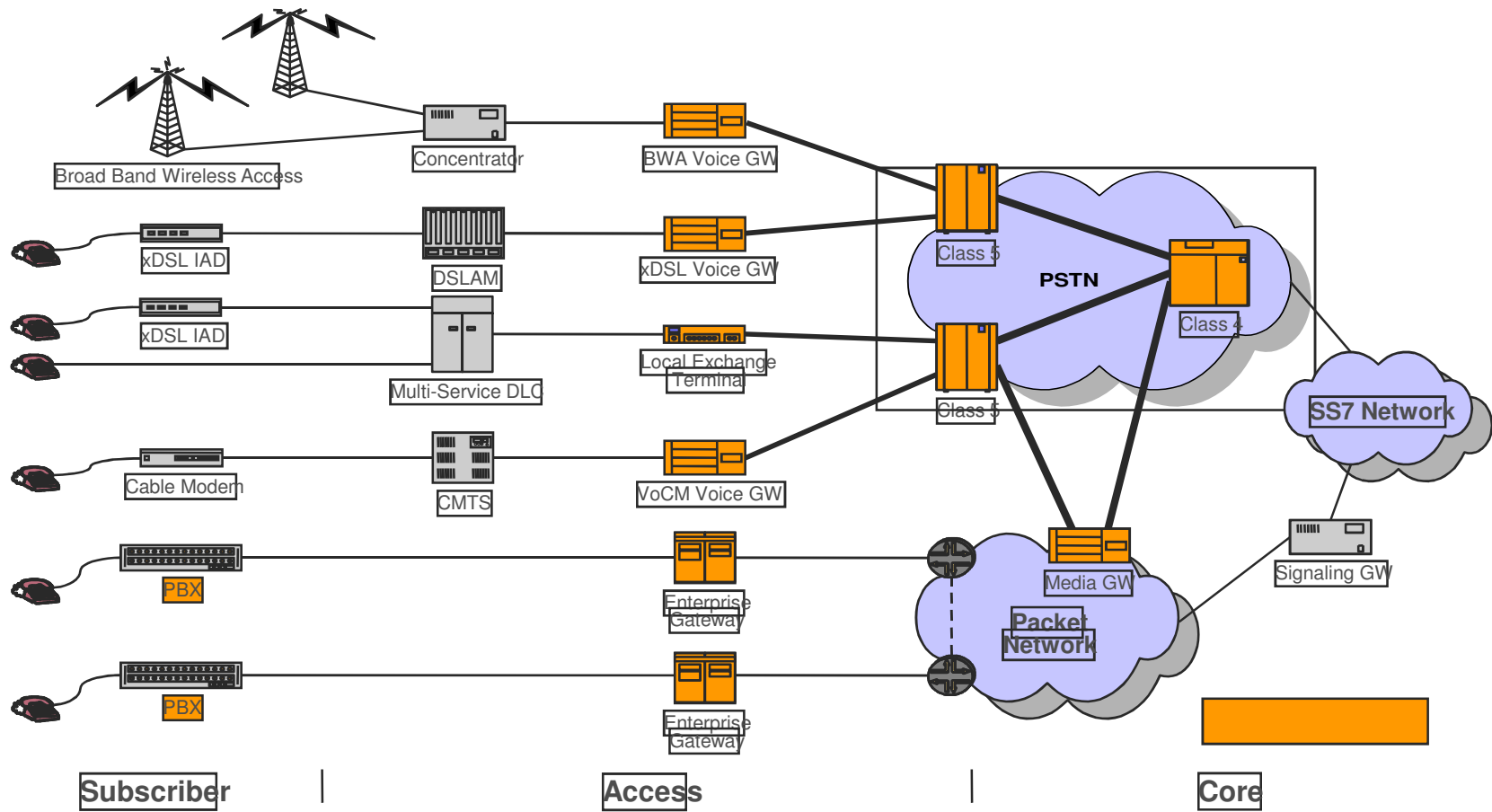
VoP Requirement on a Single Chip

Market Drivers

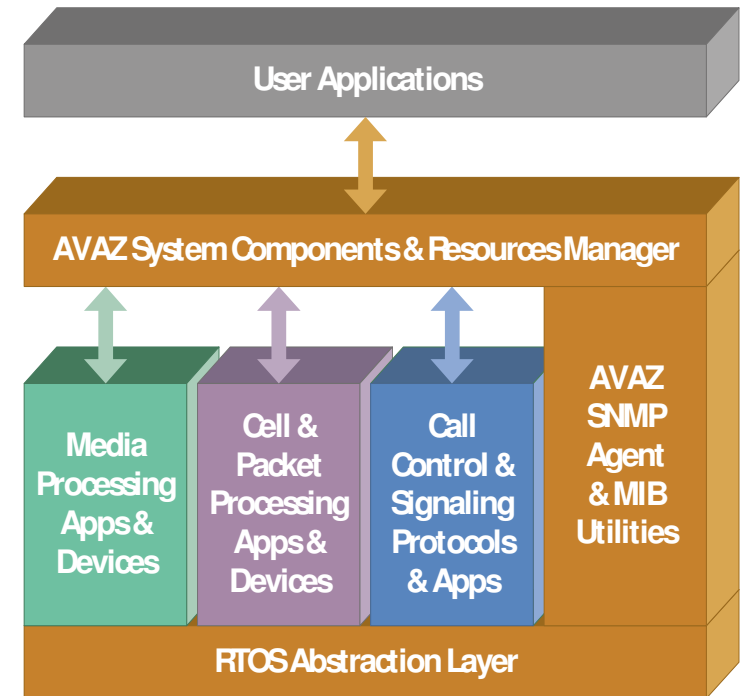
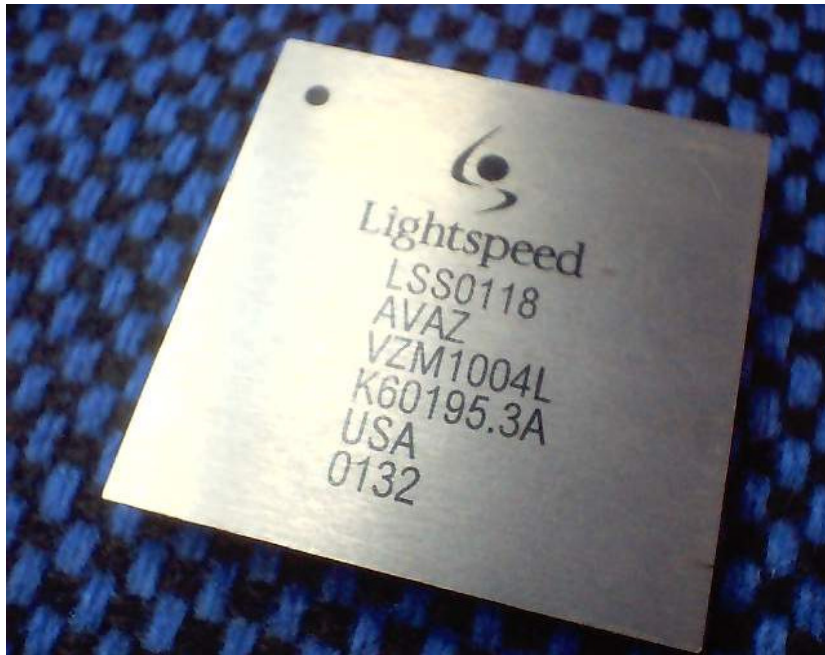
AVAZ Response

Port Density	OC-3 VoP / 256
Power Dissipation	2mW/ch
Footprint	5" x 5" OC-12 Subsystem
Scalability	N x T1 to OC-12
Manageability	Non-service affecting/Remote debug
Future Proofed	Fully programmable/Remote upgrade
Time-to-Market	Complete solutions
Interworking	ATM / IP / PSTN
Price/Performance	> 10x = Higher Margins \$\$

VoIP Products



Best in class HW/SW VOIP Technology



- Voice processing @ 32 ms LEC
 - VZM1004L, 256 x G.711 or 168 x G.726
- VAD, CNG & LPC (Lost Packet Compensation)
- Voice band signaling: CAS, DTMF, MF
- ~6 mw/channel in .18 μ Standard Cell

(STP)
ISLAMABAD



16 2 2001

Guidelines

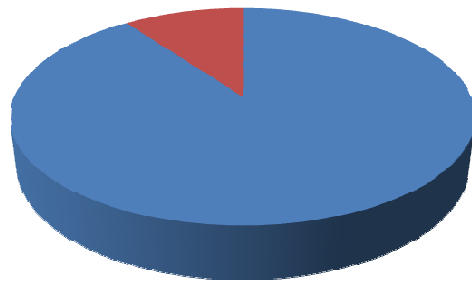
- The area must be one of the focus areas of the funding agency
- The topic must address high impact emerging technology and should be innovative
- Identify the need and its criticality
- Preferable solve an important local problem with global scope
- It should fit into your strategic plan
- It must lend itself into a viable proposal
- You must feel comfortable that it can be accomplished

Is the topic innovative?

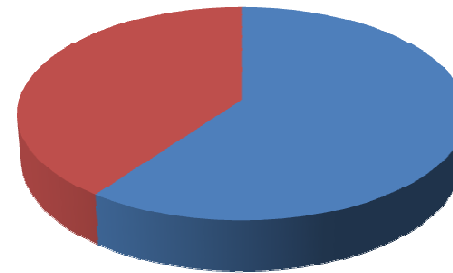
- Search for current state of the art
 - Recent publications
 - Products in the market
- Identify key / open issues
- Set your objectives that add value to the current state of the art
- Add features specific to local need
- Make a comparative statement

Need

- Dearth of cardiologists in Pakistan



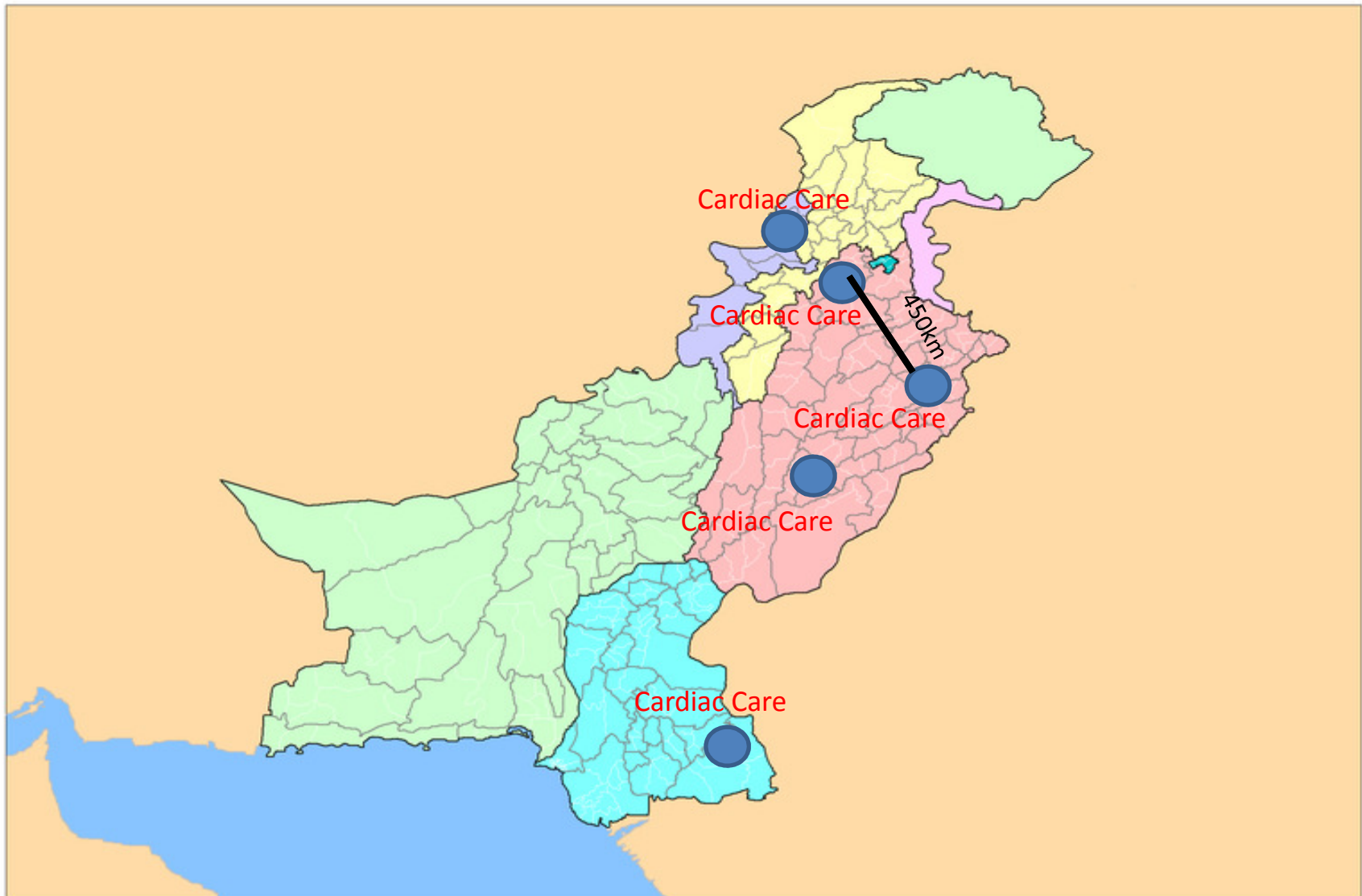
■ Percentage of patients visiting Cardiac Center with False Alarm



■ Percentage of Patients visiting from out of town

- Unnecessary delays
 - Patients needing immediate cardiac care
 - 15 to 20 mins can make difference between life and death

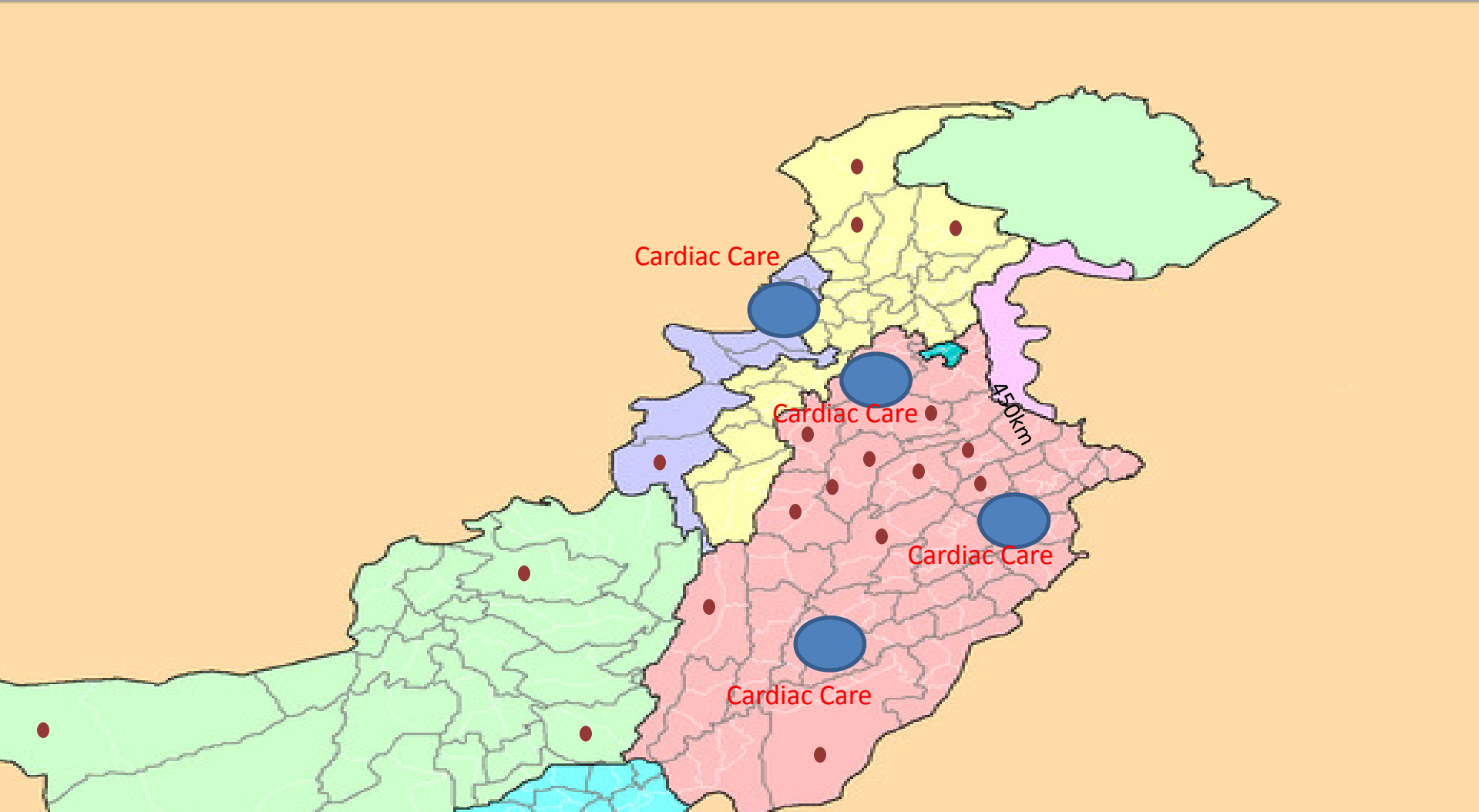
Cardiac Care Facilities



Master Plan to Address the Issue

- Collaborative effort to develop solution to the problem
- Taking Cardiac care to district level through innovative Tele-cardiac care units
 - 106 units for District Hospitals
 - 20 units for Ambulances
 - 10 units for disaster management systems

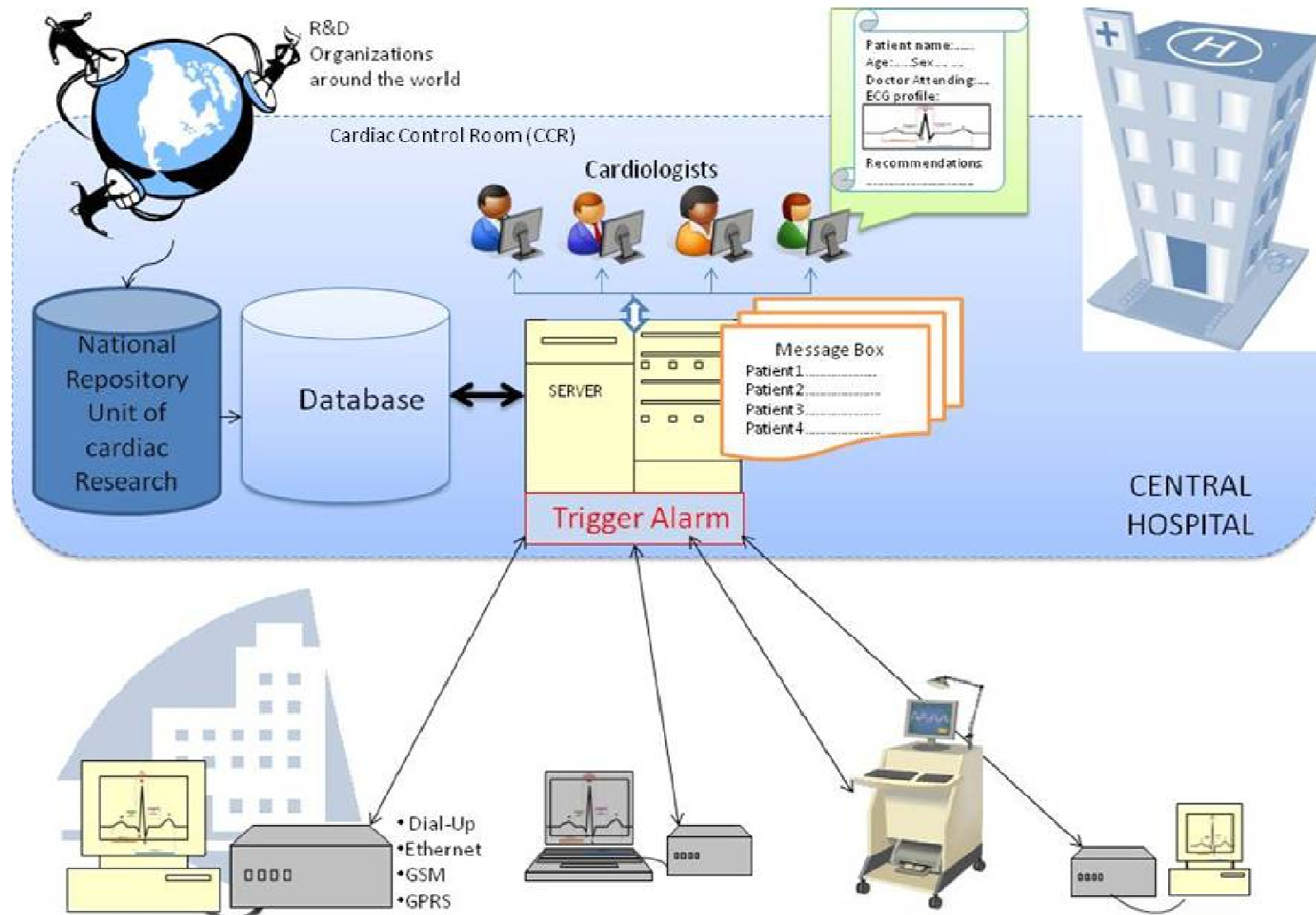
Collaborative Master Plan (Phase-I)



Innovative Solution Parameters

- To develop a Smart ECG machine
 - high resolution with 12 leads
 - Arrhythmia detection
 - Sudden death syndrome detection
 - Network enabled
 - Rugged battery operated
 - Integrates with the work flow of a national level tele-Cardiac Care System
 - Video conferencing, real-time video streaming
- Developing Cardiac Area Network
- Defining complete workflow

System Level Design



Guideline

- Make initial contact with the funding agency's program officer
- Build relationship with concerned people in the agency
- Make calls, pay visits, send emails
- Make presentation of your idea
- Get feedback and improve your thoughts
- Read the guidelines carefully for proposal format

Components

- Title
- Executive Summary / Abstract (Objective / Problem Statement)
- Introduction
- Literature Review
- Existing Solution
- Challenges
- Motivation
- Methodology
- Milestones
- Team
- Financial

The most critical part of the proposal

TITLE AND OBJECTIVES

Title

- Write after finalizing your draft
- Title should reflect the central theme
- Informative, assertive, attractive, precise and comprehensible
- Example:

**Arrhythmia and Sudden Death Syndrome
Detection: A Hybrid Network Based
Telemedicine System**

Executive Summary / Abstract

- The most important part of the proposal
- First impression to the reviewers
- Proposals are rejected for poor executive summaries
- Should be written after finalizing the draft

Executive Summary

- Start with, “The document proposes to develop”
- Be assertive in fewest possible words
- Complete, comprehensible and precise statement of objective
- Make sure the statement lends itself to a viable proposal
- Start you document (executive summary / abstract) with this statement

Executive Summary

- List your research objective
- Describe your approach / methodology
 - Outline — just few sentences
- Mention your contribution (the intellectual merit)
- If developed, what will be the benefit

Executive Summary

The project proposes to develop a prototype system to demonstrate geographically distributed installation of network enabled ECG recording and analysis stations with normal and High Resolution digital ECG machines capable of self diagnosing a patient for different arrhythmic abnormalities as well as early detection of risks associated with fatal arrhythmias which can lead to sudden cardiac death. The system will provide 24/7 ECG recording and analysis facility with universal connectivity through dialup, Ethernet, GPRS, Radio and Satellite for connection to the central server located in the Cardiac Control Center (CCC) of a Central Hospital. Here the expert cardiologists will receive ECG data and profile of patients with severe arrhythmic abnormalities and suggest treatment in real time. Offline storage capability is also proposed for later analysis in case a cardiologist is not on duty. The ECG record and the patient profile would be stored at the server and a database for patients and their cardiac history would be managed for future reference as well as for off-line analysis and data-mining. This database would be connected to the National Repository of Cardiac Research which could be accessed by R&D organizations worldwide.

Research Proposal Cisco URP

HW/SW Solution of an Optimal Multi-DSP Scheduler for VoIP Media Gateway

Primary Investigator: Shoab A. Khan,
PhD Georgia Institute of Technology Atlanta, GA
shoab@case.edu.pk

Co-Investigator: M. Mohsin Rahmatullah,
MSEE Georgia Institute of Technology Atlanta, GA

Abstract

This document presents a proposal for an optimal scheduler. The scheduler minimizes the code and data transfer overhead, maximizes the resource utilization and minimizes end-to-end delay while scheduling periodic tasks on multiple parallel Digital Signal Processors in multi-channel VoIP media gateway application. In real-time applications individual tasks have individual time constraints that must be met for system to perform correctly. The real-time tasks are characterized by their deadlines, resource requirements, and worst-case computation times. Tasks in the real-time system share the resources and therefore, semaphore like operations may also be necessary to guarantee their mutually exclusive access to shared data. Correct functioning of time constraint real-time system depends on the hardware and software components and their co-ordination. In VoIP application, periodic tasks of multiple channels are scheduled on the same set of resources at different time instances. These periodic tasks with soft deadlines consist of finite sequence of identical jobs that are regularly activated at a constant rate.

Introduction

- Introduction sets the context, defines the problem, motivates the work, and summarizes the structure of the rest of the proposal

Literature Review

- Summarize what all has been done internationally in the proposed area
- Quote references and bibliography

Current State of the Art

- The current state of the art in the proposed area
- Products in the market
- Preferably a table listing key solutions
 - Existing capabilities
 - Short comings

Challenges

- *Describe the challenges faced by research community*
 - *Cost*
 - *Sub Optimal solution*
 - *Area/Power*

Motivation

- List motivations
- Motivations should link with the challenges
- To provide cost effective solution
- To solve the problem of computational complexity

Research Methodology

- A phased approach to meet the objectives
- Develop logical flow with distinct phases
- The outcome of each phase should be measurable for monitoring agency
- The phased outcome should feed to the next phase for the development of the project

Key Milestones and Deliverables

- List and describe the timeline, principal milestones and associated deliverables
- A key milestone should complete a measurable objective
- It is reached when a significant phase in the project is concluded
- The timing of milestones is to be shown in the Gantt chart

Risks

- Describe the factors that may cause delays, or prevent implementation
- Estimate the degree of risk
- Propose a mitigation strategy

Project Team

- Prove that you can do it
- Attach the customized CVs of PD and JPD(s).
- Attach the CVs of key research/ development personnel & collaborating partners

Team Structure

- Define the team structure
- Should have a reporting hierarchy
 - Project director
 - Project Manager
 - Tasks leads
 - Developers
 - Accounts
- Define role/key responsibilities of each member

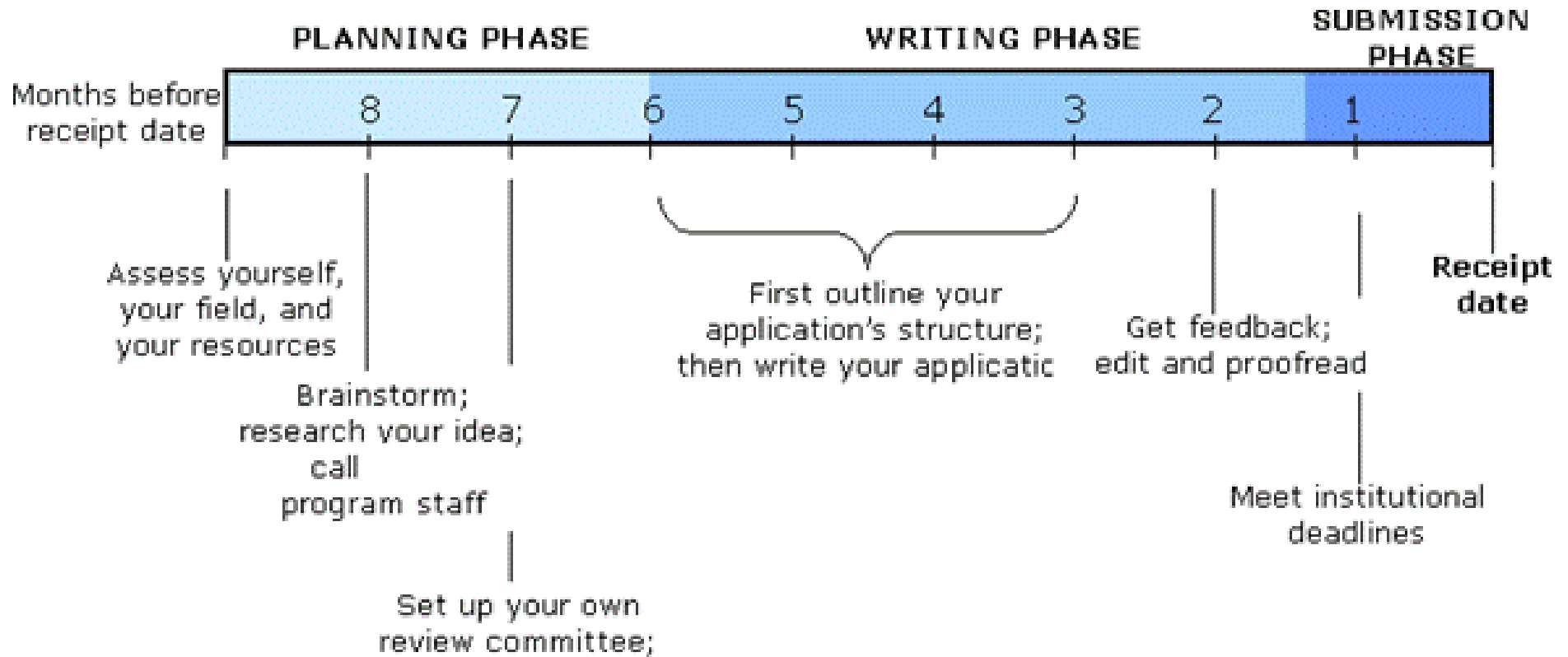
Proposed Budget

- The most critical part of the proposal
- Justify the financial proposal or cost structure



Proposal writing timeline

(ref: internet)



(source internet)




**You will find
“Proposal Writing without
Failure” under fiction.**

Revise your proposal

- Usually the reviewers will suggest modifications
- You may get many negative comments
- Don't get disheartened or give up
- Revise your proposal according to the likes of the reviewers
- Or contest if you strongly believe he is wrong

Examples

PROJECTS



**These projects are taken out from
the presentation**

Summary

- Moving towards knowledge based economy should be the prime objective of Pakistan
- The researchers can help Pakistan to align knowledge creation with socio-economic benefits
- Proposal writing is very critical for researchers to focus on an area of specialization
- The area should have growth potential
- A good proposal should be like a good story, that should have a beginning, a middle and an end where moral of the story is very critical

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سفال ہندسہ
میں فلجی پیداکر
کرانہ فن کے ارجمان