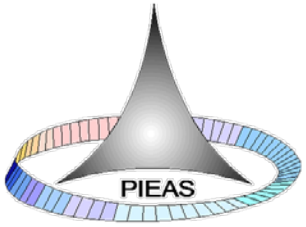

Basics of writing a Research Grant Proposal

Presented by

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A Quotation

- “If I have seen farther than others, it is by standing upon the shoulders of giants.”

-Isaac Newton

Layout of the Presentation

- Why we need a Project Grant

- Important points about a Project Grant
  - Novelty
  - What the Funder is Seeking

- Key Elements of a Project Grant
- SMART Analysis
- Processing and Evaluation of a Grant Proposal
- Details of Funding Sources

Question

- Why we need a Project Grant?

Need of a project grant

- Acceleration of research work
- Development of Lab and leadership skills
- Access to human resources (MS & Ph. D students, RAs, etc.)
- Collaboration with industry (Applied side)
- Potential Publications and Patents

Important Points

- Is the idea a Novel one?
  - Is the idea also important and feasible?
- What the funding agency wants from you?
- Is it a basic research or applied research?
- Did you follow the style of the funding agency?

Novel Idea for a Grant Proposal

"My project is simply this. I want to find out once and for all whether there's any truth in the belief that money can't buy happiness."

What the Funder Is Seeking (Applied Projects)

- What is the industrial need being addressed?
- What would an improved industrial situation look like?
- What can your organization do to improve the situation?
- How will your project document its success (are concrete measures provided)?
- How much will the project cost?
- How will the project be funded in the future?
- Would your project enhance interdisciplinary technologies?
  - Telesurgery; Surgeon, Tele Communication expert, Mechanical/ System Engineer

Important Points (continued…)

- Use simple and concise language.
- Proposals need to be Presentable and organized.
- Provide adequate Preliminary data and Sound experimental approach.
- Provide complete proposals that include all the information they asked for.

Key Elements of a Grant Proposal

- Title (Idea)
- Executive summary
- Introduction
  - Background and Related Concepts
- Research Plan (Methodology)
  - Details of the different phases (use Block diagrams)
- Timeline (GANT Chart)
- Evaluation method (Concrete Deliverables)
- Facilities and Equipment
- Staffing and Administration
- Future plans/Capacity building
- Budget
- Details of PI and Co-PI

Executive Summary; Grant Proposal

- State the Problem
- Identify the Solution
- Specify Objectives and methodology, and expected benefits
- Mention success indicators (concrete Deliverables)
- Team Experts
- Timeline

Introduction/Background

- Discuss why this area and this project is important.
- Review current state of existing knowledge, highlighting relevant data.
- Point out the gaps that the project will fill.

- Common mistakes:
  - Including irrelevant details
  - Excluding relevant information

Goals, Objectives, and Research Plan

- Goals
  - Qualitative
  - Abstract
  - Long-term

  (MS Comp. Science would help in improving the working of different institutes of Commission).
- Objectives
  - Quantitative
  - Specific
  - Short-term

  (At least 20 MS Students will be graduated each year)
- Research Plan
  - Use Block-diagram/Plots/Figures/ Images
  - Quarter-wise Planning
  - Coherence with Deliverables

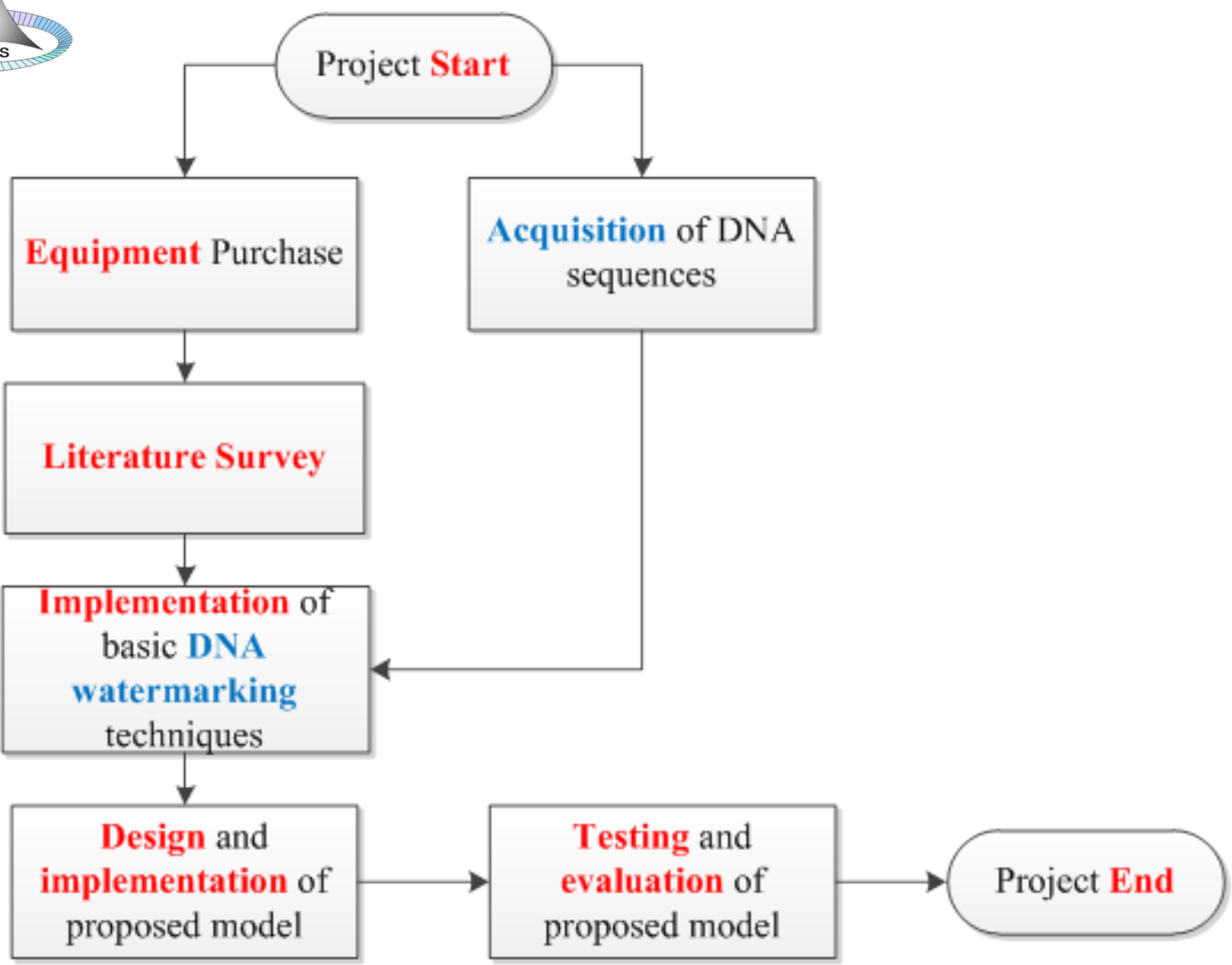
Research Plan (continued….)

- Provide details of specific phases of research plan.
- Provide Shortcomings of the existing & relevant technologies.
- Give Advantages and Disadvantages of the Proposed technology.
- Discuss the work to be carried by the collaborators.

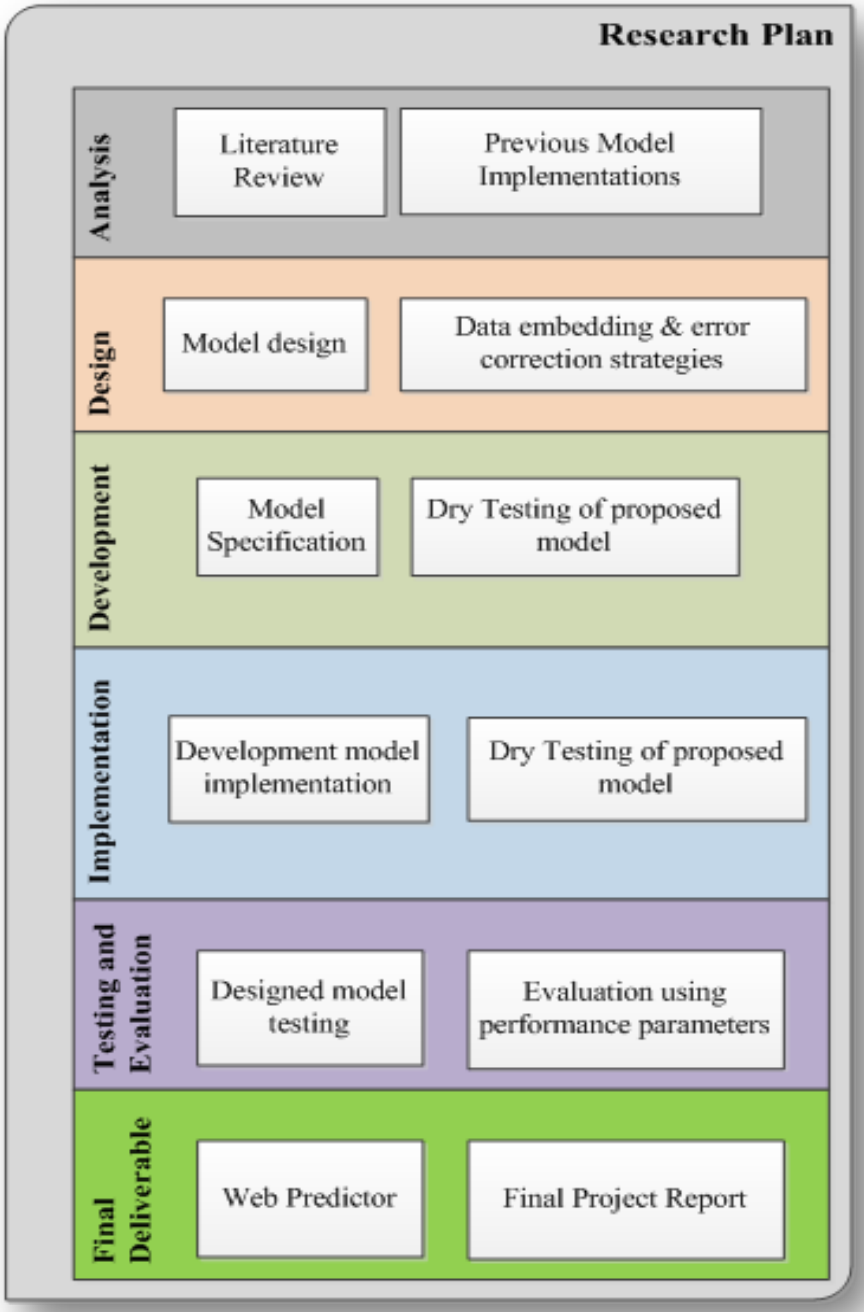
Research Plan (continued….)

- Discuss how the feed-back of the collaborators will be incorporated for the improvement of the technology?
- Explain why one approach or method is preferred over another in your plan.
- This shows that one has thought about alternative approaches.
- Not just How one will do it, but Why one chose that way.

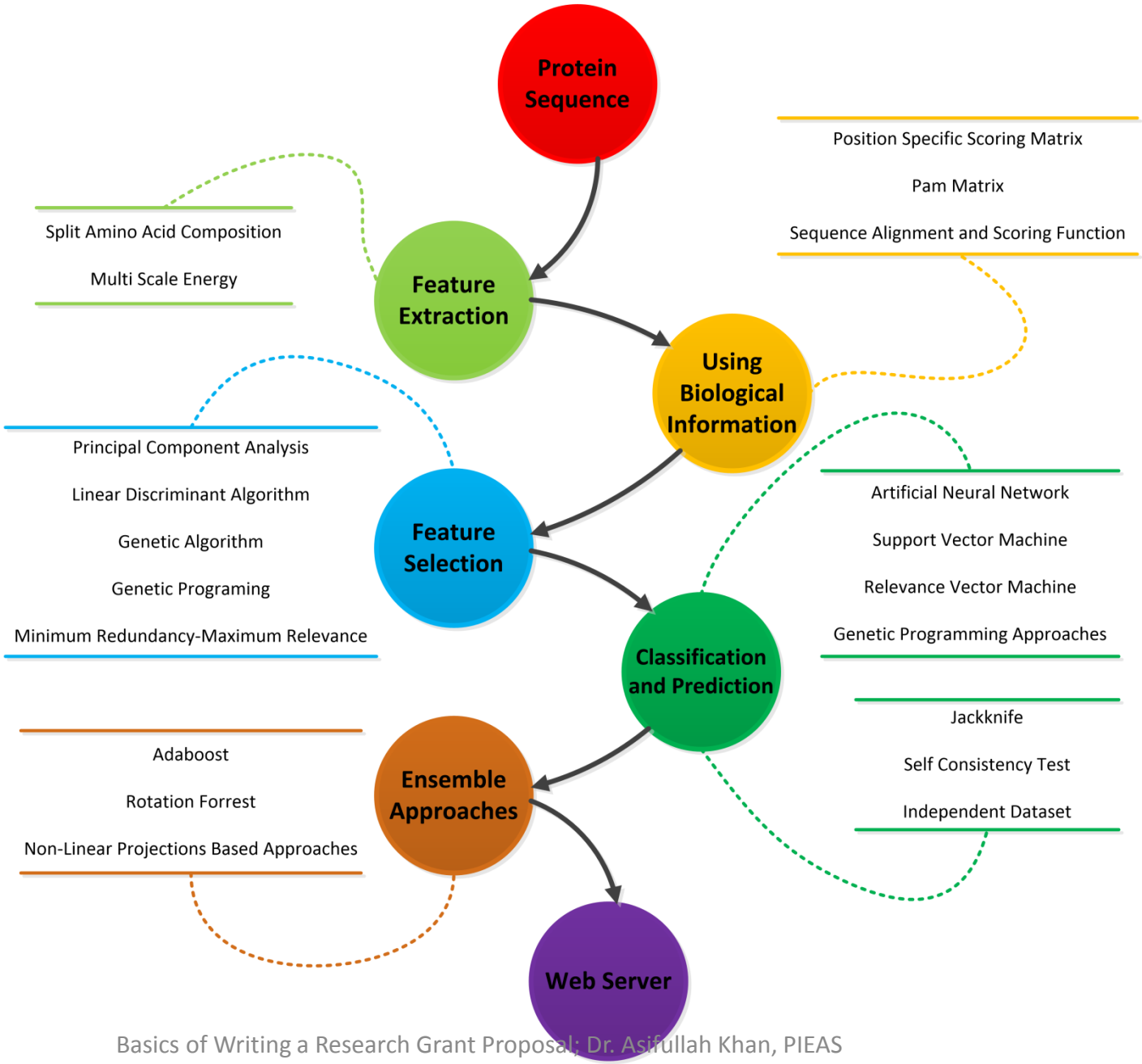
Research Plan; Block Diagram



Research Plan; Block Diagram



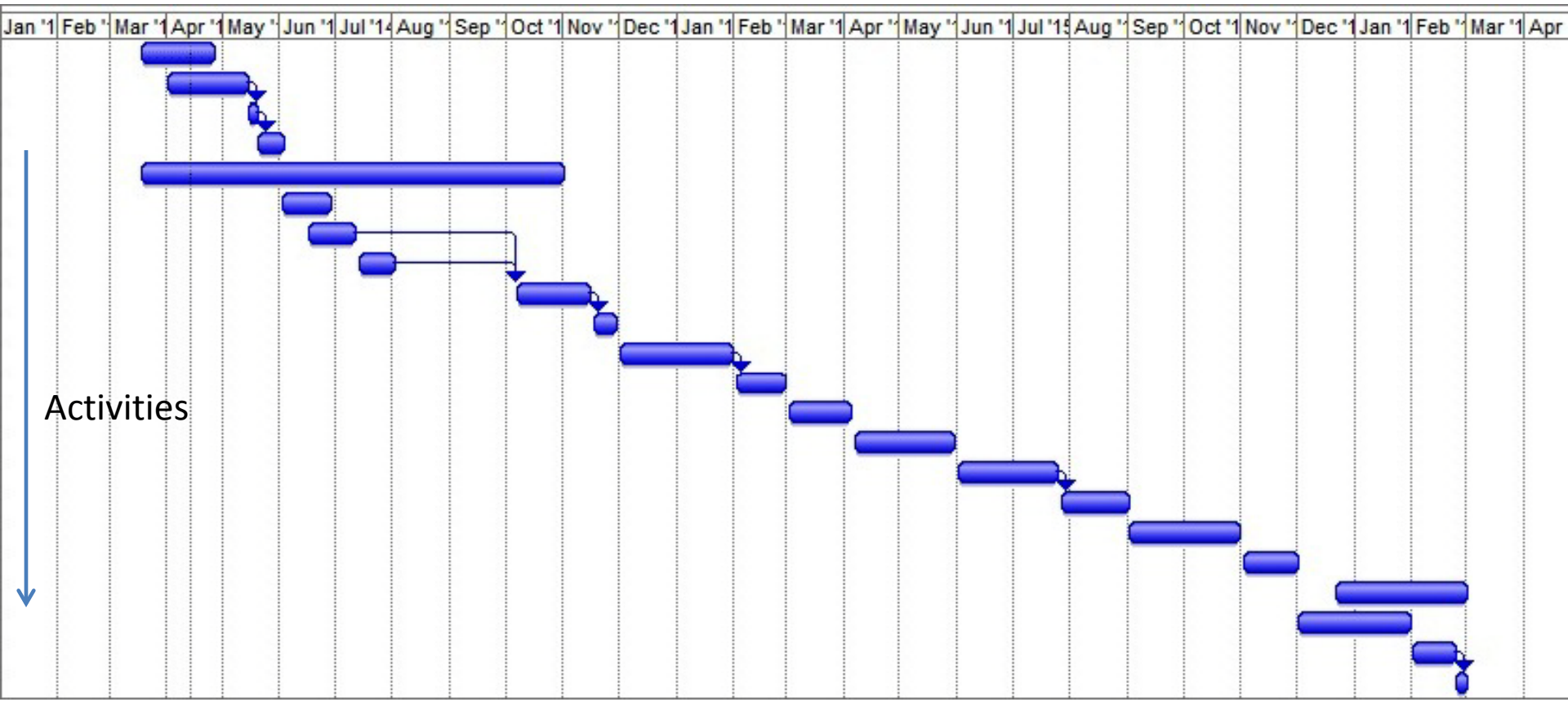
Methodology; Block Diagram



Identify Potential Problems and Alternate Approaches

- *While our preliminary data suggests A will interact directly with B,*
- Another possibility is that *there is an additional unidentified factor X.*
- If we fail to detect *a direct A: B interaction, we will determine if the candidate proteins Y and Z function in the pathway.*
- *Additionally, we will collaborate with Dr. Imtiaz (see letter attached) to perform mass spectroscopy.*
- *The Imtiaz laboratory has extensive experience in this technique.*

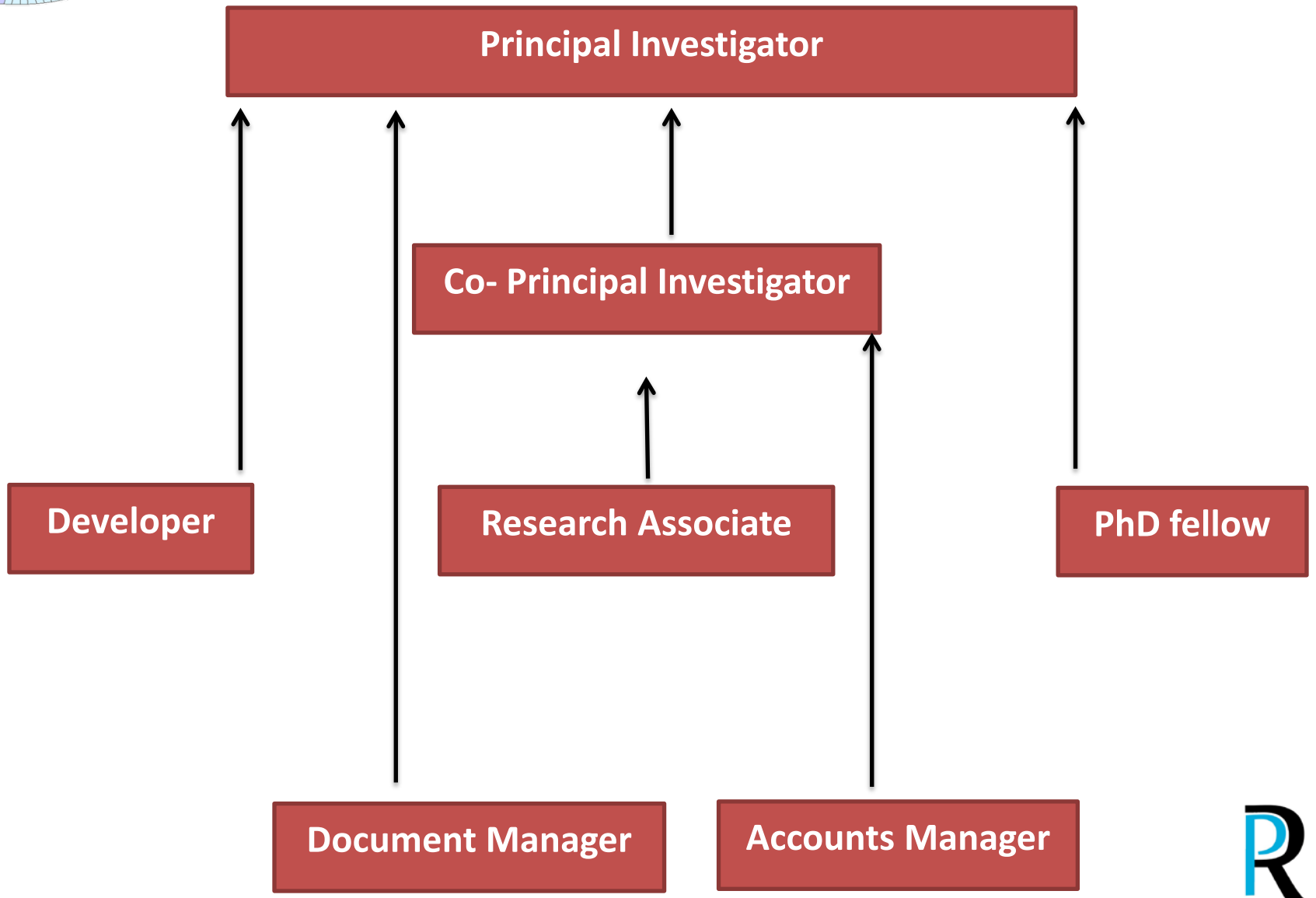
TimeLine (GANT Chart Example)



Team hierarchy/Structure

- Team Hierarchy Should be shown Graphically (Tree-structure)
- Should be pragmatic and Coherent with Deliverables/GANT-Chart
- PI and Co-PI must share the brunt of responsibilities.

Team hierarchy/Structure



Human resources for Project

Give the Related details (relevant experience) of the Human Resource

- Principal Investigator
- Co-Principal Investigator
- Consultant, etc.

- And mention that how the human resource would be trained (e.g., students, staff, etc.)

Stress on Organization Capacity (Principal Organization)

- Organization/capacity
  - Personnel
  - Facilities
  - Equipment
  - Experience
  - Partnerships
  - Unique or special resources
  - Sustainability/scalability

Show Your Institute and Lab Strength (Existing Equipment, facilities, etc.)

PCR Machine

Water Bath

Show Your Institute/Lab Strength (Human Resource , etc.)

Make them believe that it can be done

Benefits to Industry of Pakistan (For Applied Projects)

- Clearly state what benefit would the industry of Pakistan get from this project.
- Show the part of work the industrial partner will carry-out (e.g., Feedback on the developed item).
- Show Collaboration Letter from a Relevant Industry.
- Show possibility of a patent, if any.
- Remember; Interdisciplinary collaboration and Human resource training gets a high weightage in the eyes of Funding agencies.

Motivation for Collaborative Research

- To promote joint research, education, etc.
- Open Up new ideas and promote interdisciplinary technologies.
- To boost National & Internal Recognition of your Institute
- To enhance exchange and thus exposure of Faculty, students, etc.

Collaboration; Beware of Pitfalls

Budget of a Proposal

- Budget Should be Pragmatic and Concise
- Budget formats
  - Line-item budget
  - Budget narrative
- Budget components
  - Salaries and Stipends, etc. (Human Resource Cost)
  - Research materials and Supplies
  - Equipment (Major equipment, special equipment, etc)
  - Consultant/contractual fees
  - Traveling Cost
  - Construction [Not allowed in most]
  - Overhead/indirect costs
  - Miscellaneous, etc.

Budget Example (Equipment Related)

(Please provide specifications and justification for each equipment.)

Description	No.	Unit cost	Amount (Rs.)	Specifications	Justification
Major Equipment					
Laptop computer	4	Rs.70,000	Rs.280,000	Apple Macbook PRO or equivalent	Project management, Palnning, Development & Testing machine for PI/CPI
Descktop PC	1	Rs.85,000	Rs.85,000	Dell Precision T3500 Workstation, Ci7, 8 GB RAM, 1 TB HardDisk, Sound Card, 1GB Graphics Card, Wireless or equivalent	Development machine for the developers and for test setup as described in section 4.A
LED monitor 24''	1	Rs.24,000	Rs.24,000	Dell ST2420C or equivalent	To make the test setup as described in section 4.A
UPS	1	Rs.100,000		APC Smart UPS 4 kVA or equivalent	Ensuring uninterrupted power supply during long computer simulation processing.
Sub Total:			**Rs.389,000**		

SMART Analysis; Grant Proposal

- **SMART** objectives are **S**pecific, **M**easurable, **A**chievable, **R**ealistic, and **T**ime-related.
- Be **specific** means that you have to prepare yourself for in-depth research about the issue you want to address.
- Avoid general statements such as “this project will improve the employability of young people”.
- Your objectives must be **measurable**. Keep in mind that your donor wants to know how the success of your project can be evaluated.
- Therefore your objectives must enable the donor to monitor the progress of the project and assess the final results.

SMART Analysis; Grant Proposal (…continued)

- Your objectives must be **achievable** and **realistic**.
- Set realistic targets; do not claim that a yearlong project will produce radical change.

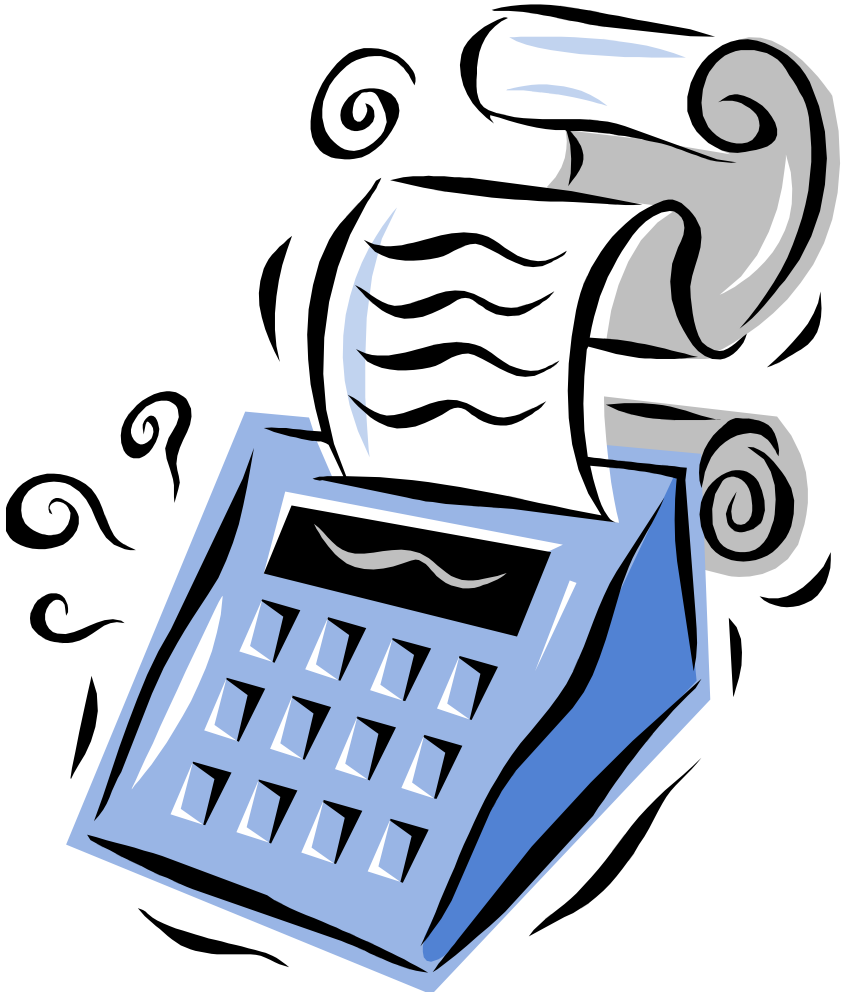
- Remember your objectives must be reached in a set **time-frame**.

- Draw on the results of similar projects and observe what is happening in your community in order to decide how long it will take to complete a task.

Pondering on some points before Submission

- Why Proposals Fail
- Seeing the Grant Proposal Through the Reviewer's Eyes
- Grant Writing Tips:
  - *It's clear!*
  - *It's precise!*
  - *It's persuasive!*

Triple check your numbers!



If Possible, First get an Independent Review

From a trusted Colleague only

Pattern Recognition Lab

Evaluation and What the Reviewer Looks For?

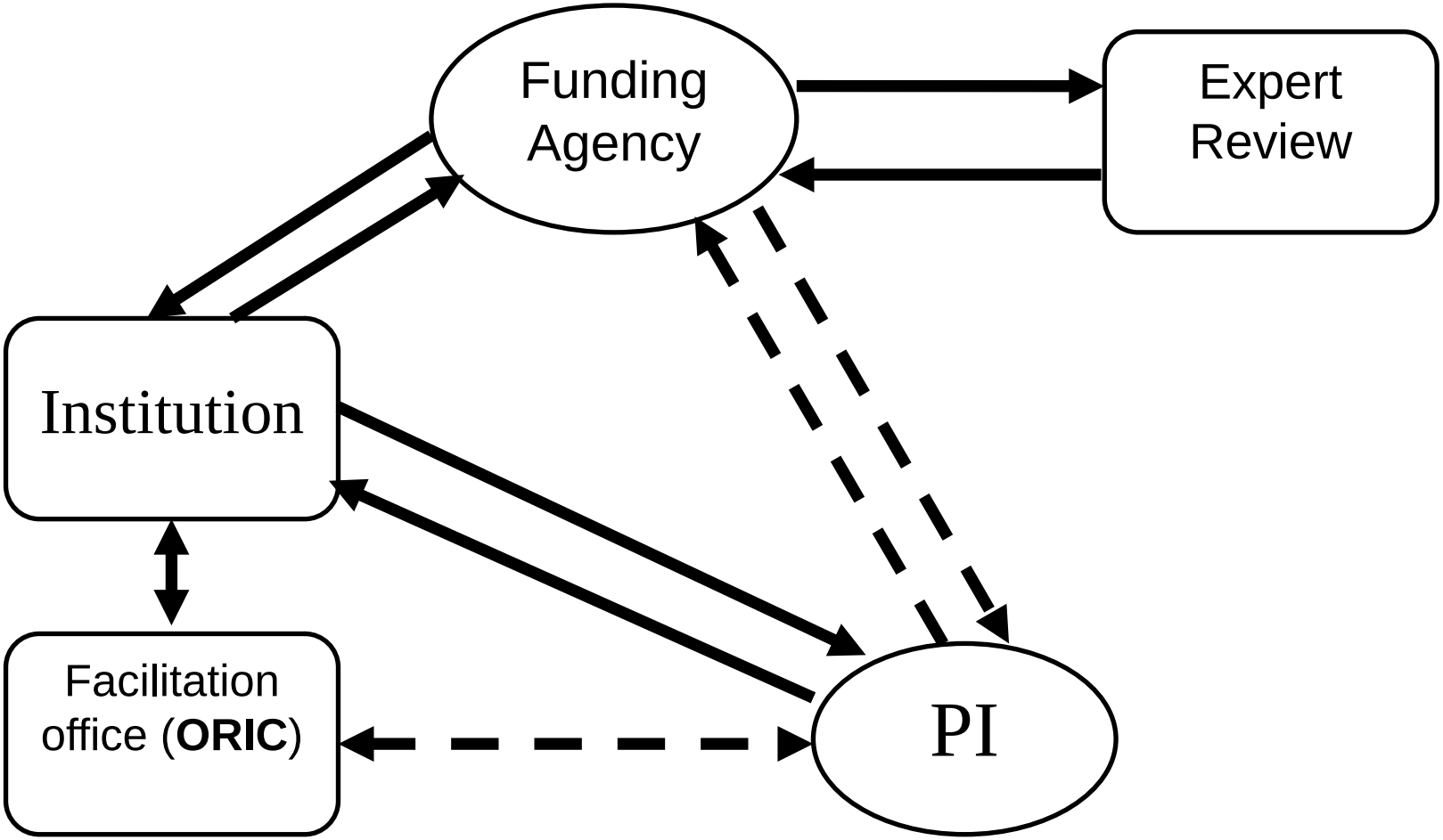
- If the funding Agency accepts that the proposal has a potential then, it sends it for an external review.
- But, before that, generally:
  - The executive decides by viewing the "Executive Summary".
  - and then the Internal Review comes in.
  - If you satisfy the internal reviewers, then it is sent to the external reviewers.
- Tips about a review:
  - Do not underestimate the reviewers
  - Make it easy and clear for the reviewer
  - Avoid exaggeration and support your claim with sound results, references, etc.

Make the Grant Write-up easy and clear for the reviewer

When they meet and bring their heads together

Ready To Submit

How Research Proposals are Processed

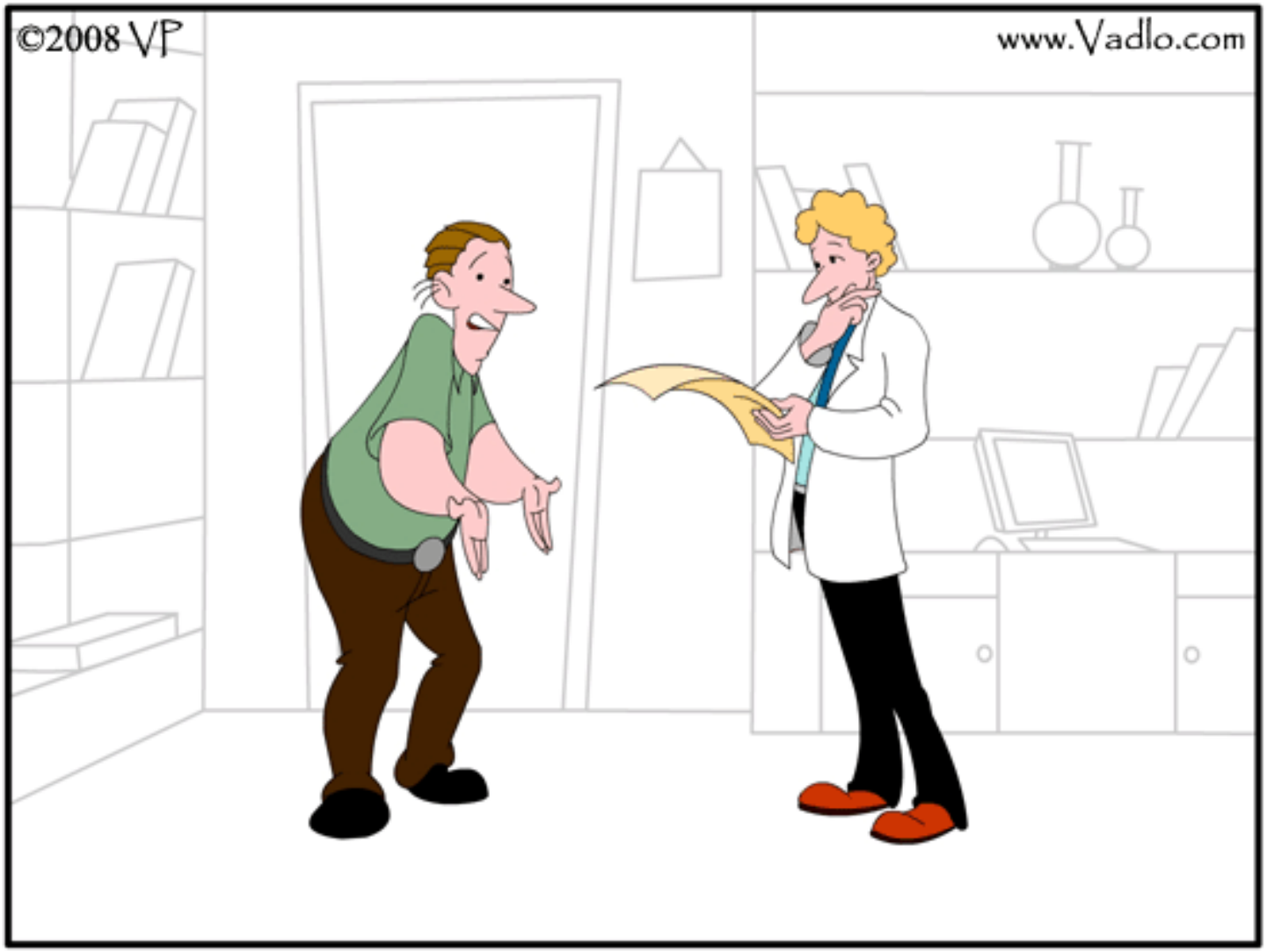


An interaction between the Funding Agency, Institution, ORIC, and PI

After You Submit the Grant Proposal

- Contact the funder
- Request feedback
- Send a thank-you letter
- Keep funders involved with program activities

If funds are reduced, even then work with it



*With this much grant money, only experiment we can do is "**flip a coin**"!*

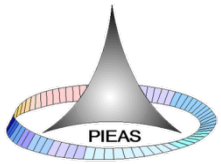
If rejected, Do not Loose hope

"His coffee's always crap for about a week after the MacArthur genius-grant winners are announced."

Improve and submit at some other Funding Agency

National and International Funding Agencies

NRPU	**http://www.hec.gov.pk/insidehec/divisions/rnd/researchgrants/nrpu/pages/NRPU.aspx**
ICT R&D funds	http://www.ictrdf.org.pk/
PAS	http://www.paspk.org/
INSPIRE, British Council	http://www.britishcouncil.org/learning-support-uk-providers-inspire.htm
Europe's Horizon	http://ec.europa.eu/research/horizon2020/index_en.cfm?pg=press
Pak-US Funds maintained by HEC	http://sites.nationalacademies.org/PGA/dsc/pakistan/
TWAS-COMSTECH	http://comstech.org/comstech-young-scients-programs.aspx
ISESCO	http://www.isesco.org.ma/index.php?lang=en
Japanese JICA	http://www.jica.go.jp/english/



That's All

Thanks

Any Questions?