Writing A Successful Proposal
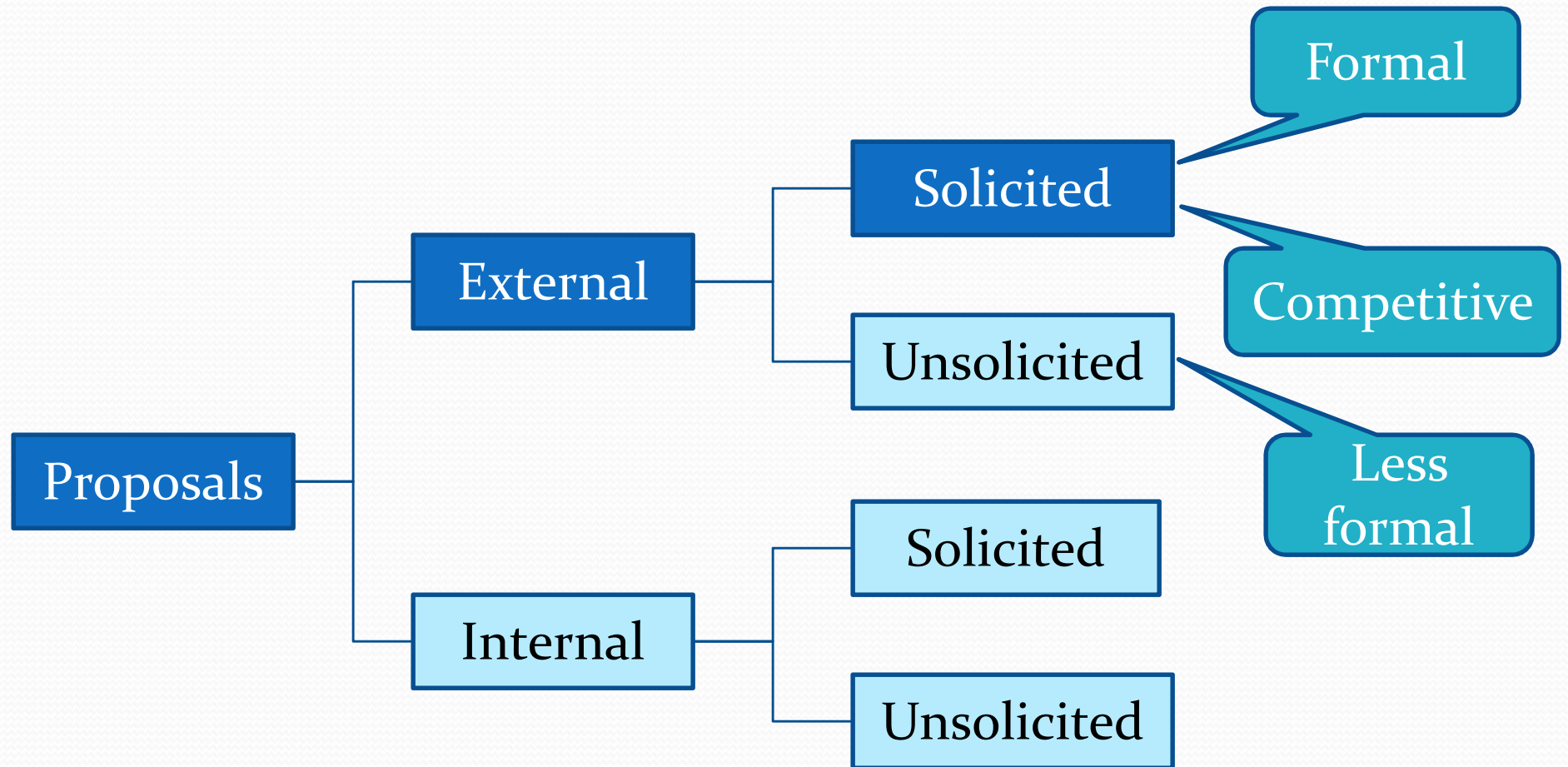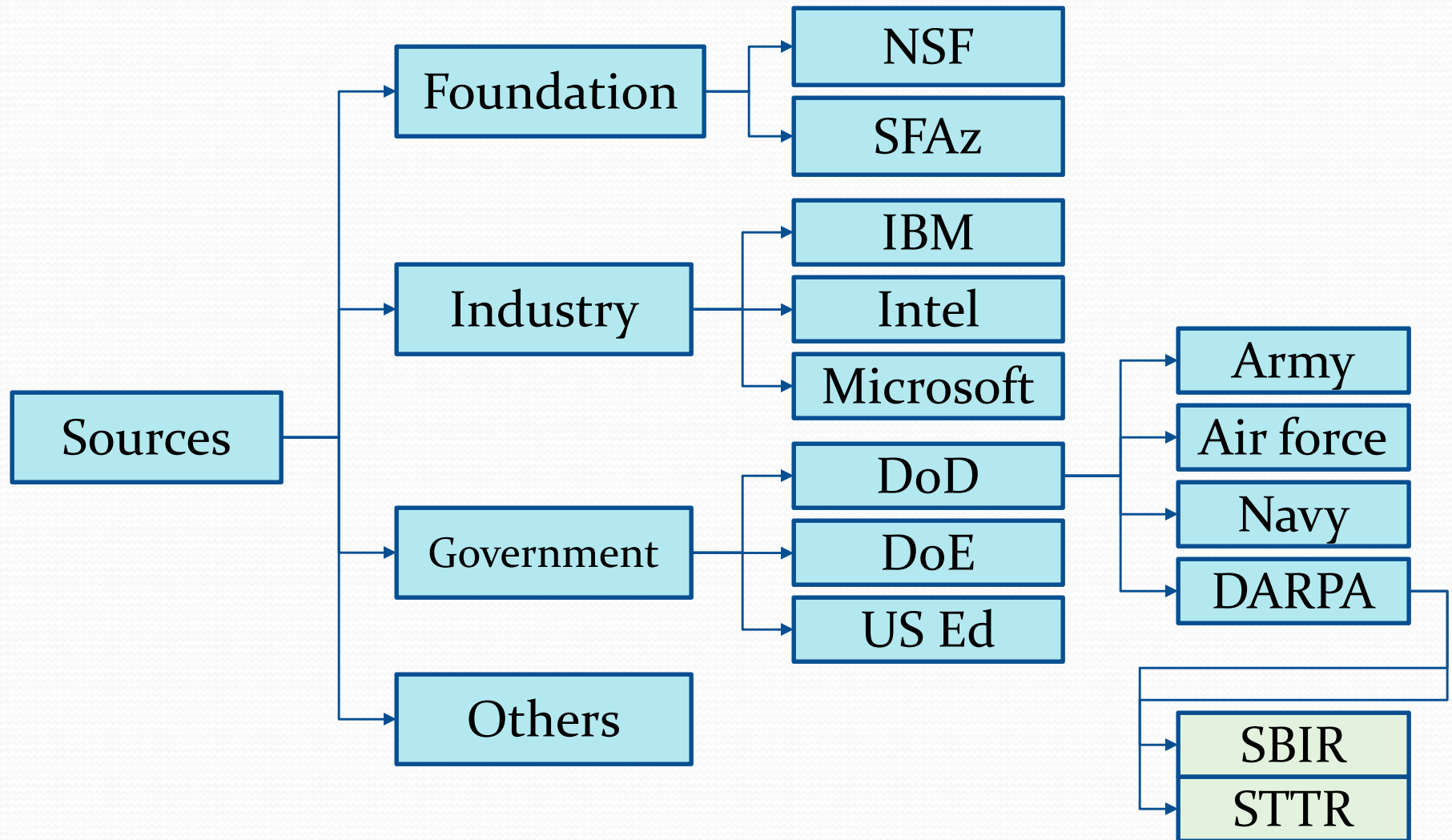
Prepared for CSE Capstone Course

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Types of Proposals

National Sources of Funding (examples)

Sources
- Foundation
  - NSF
  - SFAz
- Industry
  - IBM
  - Intel
  - Microsoft
- Government
  - DoD
    - Army
    - Air force
    - Navy
    - DARPA
 - DoE
  - US Ed
  - SBIR
  - STTR
- Others

What is SBIR and STTR?

- DARPA: Defense Advanced Research Projects Agency
- SBIR: Small Business Innovation Research (**SBIR**) program
- STTR: Small business Technology Transfer (STTR) program
- SBIR and STTR
  - provide more than $2 billion a year to small companies that are developing leading-edge technologies of interest to federal agencies.
  - provide companies with seed capital of up to $850,000 to develop technologies than can lead to commercial products.

SBIR and STTR Sponsored Projects

- GTVS: Glass Turret Visualization System: A Pathfinder
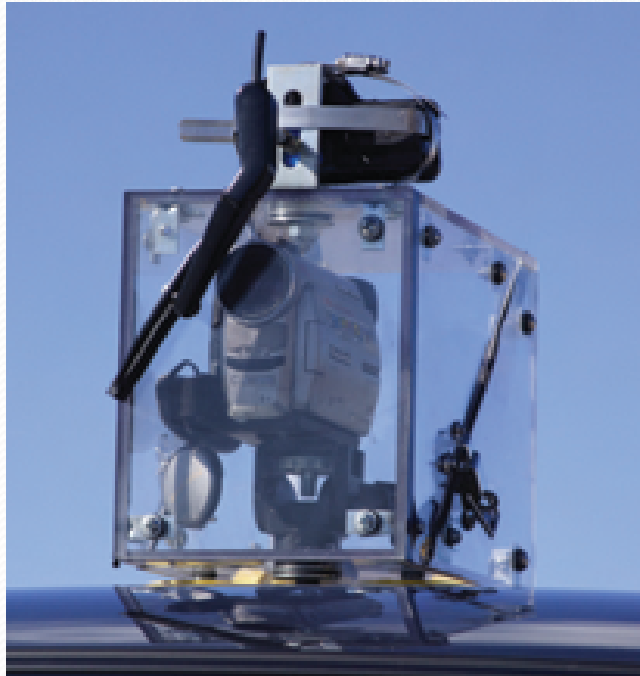
http://www.darpa.mil/sbir/pdf_files/Pathfinder_Long_03_18_07_low_res.pdf

SBIR and STTR Sponsored Projects

- Smart Robots Create Value by Increasing Personal Safety:

  Omnitech Robotics International LLC focused on development of a miniature robotic vehicle, which led to the development of TOUGHBOT, a robot being used in Iraq to aid in surveillance, building entry, and clearing operations

http://www.darpa.mil/sbir/pdf_files/Omnitech_Long_03_18_07_low_res.pdf

SBIR and STTR Sponsored Projects

- Ground Motion Detection Sensor:

  While there are numerous products available when selecting ground sensors for detecting the movement of people, these options are often relatively expensive. Under this SBIR, Time Domain Corporation developed a low-cost, long endurance unattended ground sensor (UGS) that has a low incidence of false alarms, has its own communications system, and can self-locate.

  http://www.darpa.mil/sbir/pdf_files/Time_Domain_08_17_07_low_res.pdf

SBIR and STTR Sponsored Projects

- Real-Time Language Translation Tools Assist:

After the events of 9/11 and the military's initiation of operations in Afghanistan, there was an immediate need for a small handheld device that would allow U.S. military personnel to communicate with local people in areas of deployment
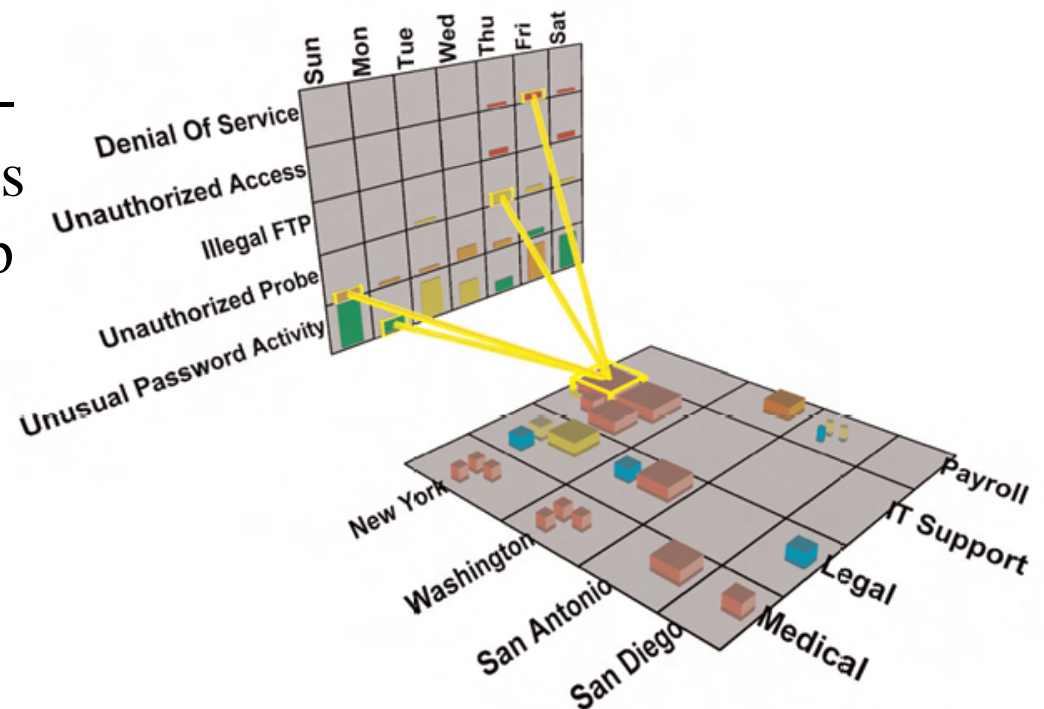
http://www.darpa.mil/sbir/pdf_files/VoxTec_Long_05_08_07_low_res.pdf

SBIR and STTR Sponsored Projects

- 3-D Images Help Thwart Attacks:

SecureScope takes security data that comes from many sources and, by way of a data-rich 3-D presentation, displays it in the proper context to help information security analysts make informed decisions about potential threats and the subsequent impact of information security breaches

http://www.darpa.mil/sbir/pdf_files/Secure_Decisions_08_17_07_low_res.pdf

SBIR and STTR Sponsored Projects

- Enhanced Search Engine:

developed by Insightful Corporation (Insightful) under SBIR helps analysts work through document-ation more quickly and efficiently than traditional technologies, such as keyword search or simple entity extraction software.
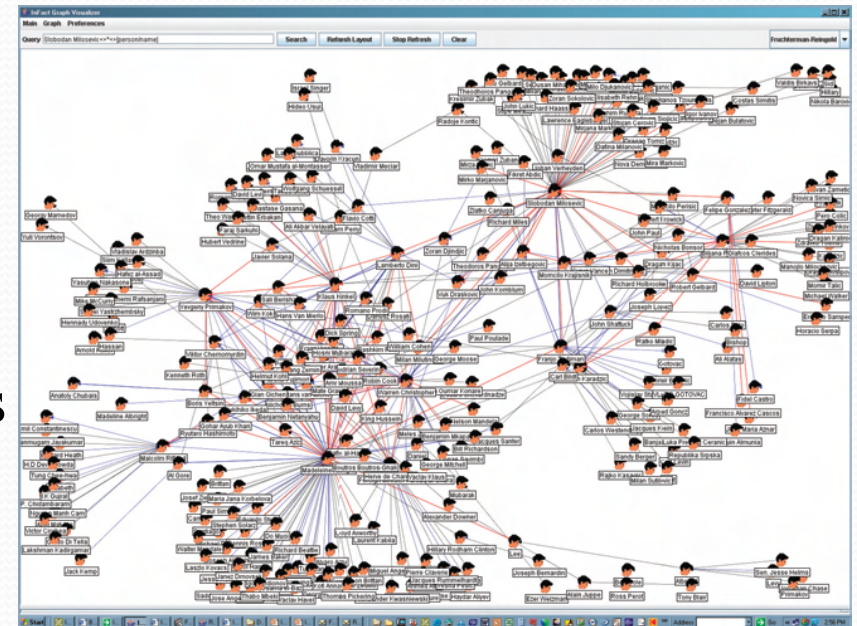
The program comprises two distinct parts:
(1) a new algorithm for latent semantic analysis, and
(2) deep parsing technology for relationship extraction from unstructured information

http://www.darpa.mil/sbir/pdf_files/Insightful_Long_02_05_07_low_res.pdf

What to Propose?

- What are needed, and what you can do?
- FOCUS on your strengths – not just the current trend of the day ("Nano", "9-11", or something interesting you saw on the Discovery Channel)
- Establish a plan for yourself based upon your expertise:
  - Where are the frontiers of knowledge/how can your approach be innovative?/what contribution will you make?
  - Who else is tackling these issues?
  - What recent awards have been made/what funding sources are available?
  - Have there been recent advances/breakthroughs?
  - What has been published - globally?
  - Is there a broader interest than just defense?

How to Write: One Page Summary
The Most Important Page

- What: Clearly state the research objectives

- Why: Is this research/product needed? Justification!

- How: Describe the major research/development tasks and how they meets intellectual merit and broader impacts
  - What is the intellectual merit of the project
    - How important is the proposed activity to advancing knowledge and understanding within its own field or across different fields?
    - To what extent does the proposed activity explore creative and original concepts?
  - What are the broader impacts?
    - Will the results be disseminated broadly to enhance scientific and technological understanding?
    - What may be the benefits to the community and the society?

How to Write the Main Part of the Proposal

Solicited proposals always have a given format and limit in length

- Use the space wisely - clarity of thought and brevity of word - more is not always better.

- On **Page 1** - state what you are going to do and why - don't make reviewers wait until page 7, it shouldn't be a mystery.

- Can elaborate the summary, but not simply repeat

- Make at least the introduction understandable to any technically educated person. Not all members of the panel will be expert in your sub-discipline.

- Page limits/fonts/margins ARE important - don't use small fonts to get more stuff in your proposal - don't disqualify your proposal ! ! !

How to Write the Main Part of the Proposal

Pages 2-15

- ### LAY THE GROUNDWORK (Introduction)
  - Discuss and acknowledge the work of others
  - Demonstrate your prior work
  - Explain the strength of your work

- ### THEN
  - Lay out your research plan (an idea is not enough)
  - Method of validating results
  - How you handle obstacles
  - Broader impacts, including education, environment, energy, economics, and safety and security

Other Parts of the Proposal
(No page limit)

- Budget

- Budget Justification

- List of reference cited in the main proposal

- CVs of investigators

- Other supporting documents

What makes a proposal competitive?

- Original ideas
- Succinct and focused project plan
- Cost effective
- Knowledge and experience in the discipline
- Experience in essential methodology
- Realistic amount of work
- Sufficient detail
- Strong rationale or evidence of potential effectiveness

Common Reasons for High Ratings

- "This proposal suggests a clear, elegant, well-documented approach to a problem that has plagued this field for decades."

- "The investigator has a beautiful plan. Students can step right into this work, yet it solves a major problem and will be publishable in a first-rate journal."

- "This is certainly adventurous, and I frankly would have doubted it could be done. Yet the investigator has proven the method in preliminary work AND had it accepted by a peer-reviewed journal!"

- "This reads like a dream. I have rarely seen a proposal, even from long-established investigators, that shows such careful thought and meticulous presentation."

Common Reasons for Low Ratings

- No well defined hypotheses or tests of same. Lack of focus. "Why all the rambling, this seems like a fishing expedition."

- "What does that component have to do with the central focus of the proposal?"

- Important information on experimental and sampling procedures is omitted. "I really can't tell what is going to be done and how."

- The work can certainly be carried out, but it doesn't address any topic of broad current interest. "I would probably not read a paper describing the results."

- Scope of the work is out of proportion to the budget and amount of time needed to do the work.