March 29, 1988

MEMORANDUM

TO: Norman Latker

FROM: John Fraser

RE: Lambright's Memo (3/9/88)
Cost/Time Estimate For Technology Project Entry

I have talked to Vic Medina, Director, Sponsored Programs at UMCP, Sandy Schulte (Vic's equivalent at UCONN), consulted NSF statistics and obtained comments from Carl, David, Jake and Wayne.

It is necessary to correct the logic flow before commenting on her assumptions.

The starting point for any such calculation is tied to the dollars of externally supported research at the university. This will lead to what she calls science and technology projects/grants, in both dollars and numbers. The Contract Office of each university maintains this information and usually a modest amount of data on each project is already computerized. This may facilitate input into the USET database.

My next key assumption is that there will be one disclosure per million dollars of external research. Disclosures are equivalent to what she calls "potential technologies". Information on disclosures is generally not available on the campus and arises either through the action of our TLOs or the reaction of faculty to disclosure policies on the campus.

The end result is an estimation of 10.9 months to input data at a school like UMCP. Given start-up time, etc., a full year of full time effort is required. Of this effort, 1/2 is already undertaken by the TLO and Assistant. Thus, a 1/2 time professional would have to be added to a school the size of UMCP to screen and input. This effort would be repeated each year.

Comments on Lambright's Memo

This document follows her memo line for line.

I. ASSUMPTIONS/FORMULAS

Take the total university R&D budget - the best source is the NSF Statistical Summaries or the Carnegie Commission reports. Even here, according to my campus contacts, a few numbers are very hard to verify and rely upon. Thus, at Maryland although the NSF number for 1986 is $106 million, Vic Medina routinely uses $80 million. This is an unusual difference.

Subtract overhead/indirect costs (percent varies with each university, but 50% is the national average). Use 50%.
Equals working R&D budget - correct.
Subtract privately sponsored research (30% is much too high, national average from NSF numbers of 100 best financed universities is 6%. Use 6%.
Equals public R&D budget
Subtract non-science - 20% is too high. NSF gives 10% for top 100 schools. Use 10%.
Equals available science and technology budget (ASTB)
Number of principal investigators equals ASTB divided by 75,000 - this is too general. UCONN tells me they have about 1,000 PI's and Vic tells me they 600-800 PIs.
Number of ongoing projects equals ASTB times 2 - Maryland has approximately 1,000-1,200 new projects per year.
Number of potential technologies equals number of projects times 50%. A much better assumption is 1 potential technology per $1 million of externally financed research.

II. UNIVERSITY TASKS

In this section we'll review the amount of time taken to input information.

A. Time to input Projects/Grants.
1. Screen grant to ensure it represents science project - 5 minutes - okay, use as is.
2. Enter the appropriate grant information into the database (Investigator/project title and summary) - 15 minutes per projects - okay, use as is.

B. Amount of time required to enter Potential Technologies (Disclosures) beginning with the initial disclosure process.
Section 1 to 3 - Lambright's assumption is approximately 45 minutes. Swann's estimate is 75 minutes, use 75 minutes.
4 - no comment.
5 - 6 - Her estimate is 1-1/2 hours, Swann's estimate is 2-1/2, use 2.5 hours.
7. Generate technical package. Lambright's estimate is 1.5 hours, Swann's estimate is 8 hours. Technical Packages are used only 50% of the time.

The times given above include secretarial and programmer's time in addition to the time of professional managers.

III. SCREENS/EVALUATIONS

At each step there will be a screen to remove information and prevent its being put into the database.

The first substantial screen is applied during the review of all university computerized Projects/Grants. Reject only 6% for industrial + 10% for nonscience = 16%.

The next screen is in the identification of potential technologies, i.e., disclosures. Only 1 disclosure per million dollars of research gets through the filter.

The next screen is the number of disclosures for which a technical package is put together, i.e., 50%.

IV. EXAMPLE

Using a university with a $110 million total research budget.

One difference between this calculation and Lambright's is that the percentages are applied to the total R&D budget not the diminishing total that she uses.

1.	Total R&D budget -	$110,000,000
2.	Minus overhead/indirect costs (50%)	36,666,667
3.	Equals working R&D budget -	73,333,333
4.	Minus privately sponsored research (6.0%)	6,600,000
5.	Equals public R&D budget	66,733,333
6.	Minus nonscience/technology research - (10%)	11,000,000
7.	Available science and technology budget	55,440,000

As you can see, these assumption make an enormous difference over her calculations.

Number of PI's equals 700, Number of projects equals 1,200, Number of potential technologies equals 15% x 1200 = 180.

A. Time required to enter grants/projects (minus 16% excluded)
   1. Screen/verify/computer enter
      30 minutes x 1,200 = 600 hours

B. Time required to enter potential technologies (disclosures)
   1. Screening/verification and keyword assignment
   2. Computer entry of data
   3. Generate government reports
   4. Submission to UTC LE for action

   } 75 x 15% x 1,200 x 84% = 758 hours.

   5. Interview PI/generate Executive Summary/review and input to database
      2-1/2 hours x 15% x 1200 x 84% = 378 hours.
   6. Generate Technical Package
      8 hours x 15% x 50% x 84% x 1200 disclosures = 605 hours.

Total time: A + B = 2341 hours.
Of this time 605 hours are not relevant to the input process.
Estimation of time required = 1736 hours
Equivalent from Lambright's Memo = 1403 hours

Summary:

Thus, one school will require 10.9 man months of time, full time. Lambright estimated 8.8 man months, a 20% difference. Not an enormous difference at all.