ANNUAL REPORT
FY 1971

ACME Computing Facility
Stanford University School of Medicine

Primary support from
Biotechnology Resources Branch,
National Institutes of Health
INTRODUCTION

I. SUMMARY

PART 1: ACME FACILITY DEVELOPMENTS

II. ACME FACILITY ACCOMPLISHMENTS - FY1971

III. ACME'S FUTURE DIRECTION

PART 2: ACME USER DEVELOPMENTS

IV. PROJECT DESCRIPTIONS: CORE RESEARCH AND MAJOR USERS

V. USER CORE RESEARCH

PART 3: UTILIZATION AND COST DATA

VI. BUDGET

VII. UTILIZATION DATA

PART 4: REFERENCE DATA

VIII. REPRESENTATIVE SAMPLE OF USER PROJECT DESCRIPTIONS

IX. SUMMARY OF COMPUTER RESOURCE USAGE

X. MEDICAL CENTER SURVEY

XI. PUBLICATIONS - FY1971

XII. TABLE A
TABLE OF CONTENTS

INTRODUCTION .......................................................... 1

I. SUMMARY ............................................................. 2
   A. Fiscal Year 1971 - In Retrospect ........................... 2
      1. ACME System ............................................ 2
      2. User Projects ......................................... 2
   B. Fiscal Year 1971 - Looking Ahead ........................ 3
      1. ACME System ............................................ 3
      2. User Projects ......................................... 3
   C. Request for Grant Extension ................................. 4
   D. Overview of Five-Year ACME Experiment ................. 4

PART 1: ACME FACILITY DEVELOPMENTS

II. ACME FACILITY ACCOMPLISHMENTS - FY1971 .................. 7
   A. Software Modifications .................................... 7
      1. Improvements in Reliability ........................... 7
      2. Long Length Records ................................... 7
      3. LISP Compiler .......................................... 7
      4. Small Machine Support .................................. 8
      5. Other Software Developments ............................ 8
   B. Hardware Modifications .................................... 9
      1. Improvements in Reliability ........................... 9
      2. Addition of PDP-11 ..................................... 9
      3. Addition of Displays and Printer ....................... 10
      4. Modification of 1800 .................................. 10
      5. Other Hardware Changes ................................ 10

i
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. User Services</td>
<td>10</td>
</tr>
<tr>
<td>1. Consulting</td>
<td>11</td>
</tr>
<tr>
<td>2. Education</td>
<td>11</td>
</tr>
<tr>
<td>3. Documentation</td>
<td>11</td>
</tr>
<tr>
<td>4. User Tape Service Report</td>
<td>12</td>
</tr>
<tr>
<td>D. ACME Personnel</td>
<td>13</td>
</tr>
<tr>
<td>E. ACME Organization</td>
<td>16</td>
</tr>
<tr>
<td>III. ACME's Future Direction</td>
<td>17</td>
</tr>
<tr>
<td>A. The Transition Problem</td>
<td>17</td>
</tr>
<tr>
<td>1. Statement of the Problem</td>
<td>17</td>
</tr>
<tr>
<td>2. Discussion of Alternatives to be Explored</td>
<td>18</td>
</tr>
<tr>
<td>a. Path 1: Retain a Stand-Alone Facility in the Medical School</td>
<td>18</td>
</tr>
<tr>
<td>b. Path 2: Move Time-Sharing to 360/67; Add Front-End Processor for Realtime Needs</td>
<td>19</td>
</tr>
<tr>
<td>c. Path 3: Sharing of Facilities Between ACME and Hospital ADP Group</td>
<td>21</td>
</tr>
<tr>
<td>3. Goal: Model System for Biomedical Computing</td>
<td>21</td>
</tr>
<tr>
<td>a. Realtime Capability</td>
<td>21</td>
</tr>
<tr>
<td>b. Interactive/Batch Environment</td>
<td>22</td>
</tr>
<tr>
<td>c. Language Considerations</td>
<td>22</td>
</tr>
<tr>
<td>d. Small Machine Support</td>
<td>22</td>
</tr>
<tr>
<td>e. Access to Storage</td>
<td>23</td>
</tr>
<tr>
<td>f. Graphics</td>
<td>23</td>
</tr>
<tr>
<td>g. System Measurement</td>
<td>23</td>
</tr>
<tr>
<td>h. User Support</td>
<td>23</td>
</tr>
<tr>
<td>i. Reliability and Availability</td>
<td>25</td>
</tr>
<tr>
<td>B. Extensions to PL/ACME Services</td>
<td>24</td>
</tr>
<tr>
<td>1. Funding Priority</td>
<td>24</td>
</tr>
<tr>
<td>2. New Services</td>
<td>24</td>
</tr>
<tr>
<td>a. Small Machine Equipment Pool</td>
<td>24</td>
</tr>
<tr>
<td>b. Investigation of National Networks</td>
<td>24</td>
</tr>
</tbody>
</table>
PART 2: ACME USER DEVELOPMENTS

IV. PROJECT DESCRIPTIONS: CORE RESEARCH AND MAJOR USERS

A. Core Research Descriptions

B. Major Users

V. USER CORE RESEARCH

A. Current Core Research Projects
   1. DENDRAL
   2. Drug Interaction Program
   3. Clinical Laboratory

B. Proposed Core Research
   1. Arrhythmia Detection
   2. Other Projects
   3. Realtime Programs

PART 3: UTILIZATION AND COST DATA

VI. BUDGET

A. Resource Expenditures
   1. Personnel
   2. Consultant Services
3. Equipment .................................................. 52
4. Consumable Supplies ...................................... 53
5. Travel ..................................................... 53
6. Engineering Service ..................................... 54
7. Publication Costs ....................................... 54
8. Computer Services ...................................... 54
9. Other Expenditures .................................... 54

B. Summary of Resource Funding ............................ 55
C. Resource Equipment List .................................. 56
D. Budget Justification ..................................... 59
E. Income Basis for Extension Request ..................... 61
F. AWE Estimated Income Rate By End of FY1973 ............ 62

VII. UTILIZATION DATA ........................................ 64
A. Interpreting ACME Utilization .......................... 64
   1. Charging Units ....................................... 64
   2. User Categories ..................................... 64
B. Utilization Trends ....................................... 66
   1. Page Minutes and Terminal Hours ..................... 67
   2. ACME Utilization By Department ..................... 68
   3. ACME Facility Income ................................ 69

PART 4: REFERENCE DATA ......................................

VIII. REPRESENTATIVE SAMPLE OF USER PROJECT DESCRIPTIONS .......... 71
IX. SUMMARY OF COMPUTER RESOURCES USAGE .................... 91
X. MEDICAL CENTER SURVEY ................................ 111
XI. PUBLICATIONS - FY1971 .................................. 116
XII. TABLE A .................................................. 121