

Program Management for the David Livingstone Diaries Digitization Project

Building on over a decade of manuscript imaging work and over 25 years of experience in managing advanced technical programs, program management throughout the David Livingstone 1871 Field Diary Digitization Project was the responsibility of Program Manager Michael B. Toth. His responsibilities included the planning and testing that took place prior to the study itself, as well as the imaging and processing at the National Library of Scotland by the imaging team, and the processing that followed the imaging. All management was conducted in conjunction with the Project Director and the users and stakeholders at the David Livingstone Center and National Library of Scotland, as well as EMEL and the NEH.

The spectral imaging team that conducted the June 2010 spectral imaging studies of the David Livingstone 1871 Field Diary owes its success to not only the application of new technologies to 19th century documents, but also the effective management and integration of work processes and skilled people developed during over a decade of advanced digital imaging studies. The imaging team has developed complex integrated programs for the study, preservation, storage and display of historic parchment, paper and other artifacts, in close collaboration with members of the preservation, technical, religious, scholarly and scientific disciplines. Integration of multidisciplinary teams and technologies, especially for a program in as important an institution as the National Library of Scotland, requires effective program management to ensure the users have access to the needed data in the time available and within budget proposed to the NEH.

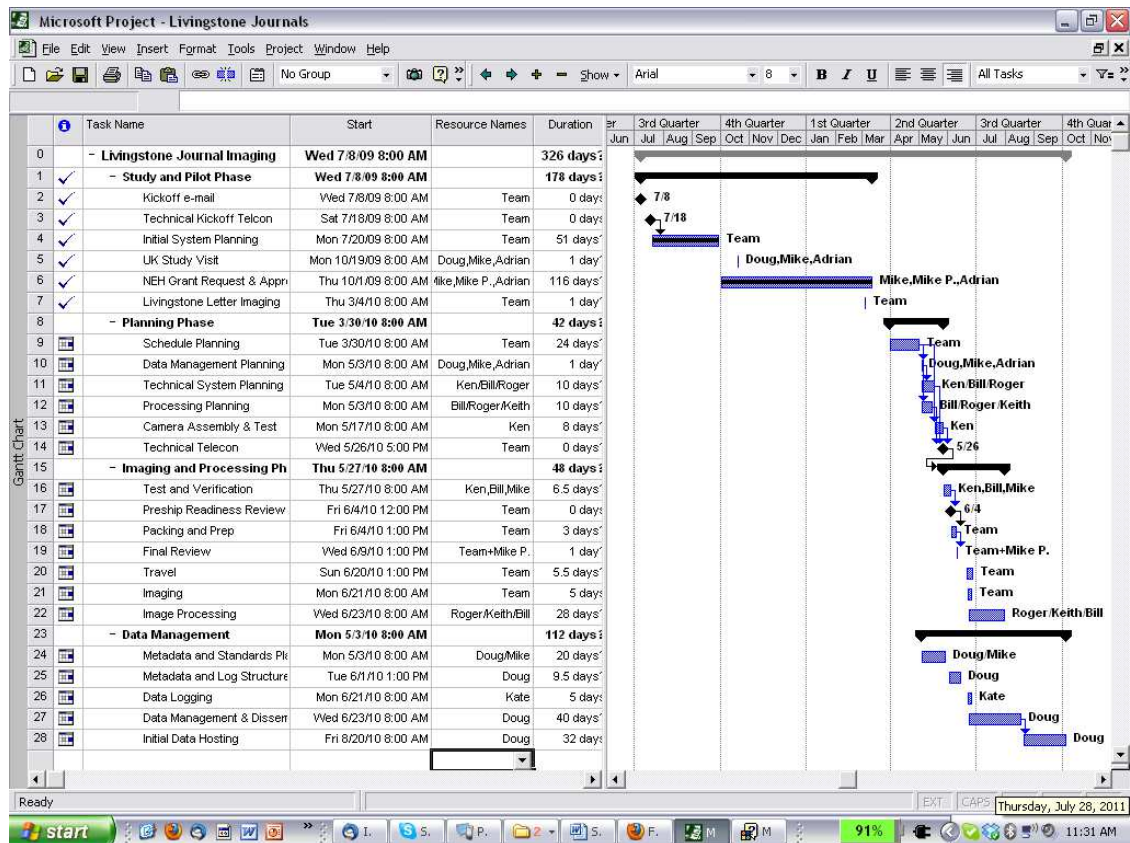
Project Planning:

To properly prepare and implement an imaging plan for the Livingstone Diary at the National Library of Scotland, the Program Manager developed a program plan to proceed in several interdependent phases, some of which proceeded in parallel. With this phased approach, the most appropriate and efficient technical methods and work processes could be implemented:

- 1. Assessment and Pilot Phase** – Initial assessment of the Livingstone Diary at the David Livingstone Center in Blantyre, including photos and test spectral images. Pilot imaging of a Livingstone letter in the United States to assess imaging and processing methodologies with the spectral camera system.
- 2. Planning Phase** – Define the manuscripts to be imaged and the time available for imaging. Based on this information and consultations with the host personnel, develop a draft handling and imaging plan for imaging at the National Library of Scotland. Review the cost estimate based on prior experience and the needs of this particular project.
- 3. Imaging and Processing Phase** – Based on the handling and imaging plans, image all leaves of the Livingstone Diary and additional documents. Process images during and following the imaging for retention on Livingstone Online and to support academic or scientific study.

4. Data Management Phase – Throughout this process the imaging data and metadata must be stored and distributed for processing and study. This data and metadata ultimately will be required to track and catalog each manuscript leaf (recto and verso), and link the image to the respective leaf in Livingstone Online.

Once the imaging team was given approval for an imaging study of the David Livingstone Diary, the program manager developed a planning and implementation schedule to ensure all technologies and work processes would be fully functional, integrated and tested on time for shipment and use at the National Library of Scotland, including contingency planning and spares. This included not only the integration of the camera, lights and computers for operation and data capture and storage, but also the integration of new technical imaging techniques that offered potential to yield even more text. Each capability was tasked to a member of the team, with tasks scheduled for completion prior to travel. An example of the high-level scheduling and tasking for the planning, imaging and initial data preparation follows for the period 1 July 2009 through 1 October 2010:



The program manager based the schedules and plans on the user and stakeholder needs cited in advance in the NEH Grant Proposal, and further developed in coordination with the Project Director, the David Livingstone Center and the National Library of Scotland. Coordination took place in regular teleconferences prior to deployment, and the program manager maintained a checklist of critical tasks and the schedule milestones throughout

the program. These were only implemented with precise planning with a very tight schedule to ensure the equipment, personnel and work processes were all ready for imaging studies beginning in mid-June 2010, and completed within the time available.

The availability of additional David Livingstone manuscripts from the National Library of Scotland required replanning the imaging and processing to take advantage of the opportunity to image all the available David Livingstone materials during the imaging and processing phase. To devote the time for additional imaging of the additional David Livingstone materials, some planned experimental imaging techniques could not be implemented. All the diaries were imaged and all images processed, since the image data are somewhat homogeneous. The data sets are more heterogeneous with additional cataloging information and metadata, requiring additional data management.

On-site Program Management: Program plans were adjusted to meet the changing user needs raised on site by the management and staff of the National Library of Scotland. This required flexibility in scheduling, work processes and plans to ensure the program met schedules while continuing to produce the needed data. The program manager monitored and managed the following tasks carried out by the team on a daily basis:

- Image Planning and Document Preparation
- Equipment Maintenance and Setup
- Image, Data and Metadata Collection
- Image and Data Processing
- Data Validation and Storage

Daily team meetings following each day's imaging to review the results of the day's imaging and processing, task the needed image processing and equipment setup and operation, and adjust schedules based on user needs. Based on the days imaging, a daily image processing priority list was sent to offsite image scientist Keith Knox in Maui, Hawaii. The data log, imaging list and metadata were sent to Data Manager Doug Emery in Baltimore, Maryland. These remote team members provided offsite support overnight, with e-mail recommendations and updates by the start of business the next morning. The program manager closely monitored imaging operations in conjunction with the time available for imaging. In coordination with the Project Director, he would recommend changes to the prioritized imaging list. A compliance matrix was also prepared to track progress against the program scope as defined in the NEH Grant Request.

Data Management: Without effective data management, the 3,032 "raw" data files with 750 GB of data would have been incomprehensible to the scientist, scholar or user, instead of the clearly linked 202 image sets with integrated metadata. This program builds on decades of pioneering data management developed for palimpsest imaging studies based on broadly accepted metadata standards. This ensured all needed metadata about each image – including the content, spectral information, file identification and technical data – were captured during each imaging session to support subsequent

processing and study. To allow processing by the three image scientists and protect against data corruption, the data had to be copied to additional hard disks each evening. Since this study did not include a dedicated onsite data manager, these tasks were carried out by the program manager and imaging scientists during the overnight hours.

Future Integration and Management: Many technologies are available for digital imaging of manuscripts. Only careful assessment and application of the appropriate technology based on imaging studies, integration with effective work processes, and application of the capabilities of skilled individuals who have worked with the technologies, disciplines and manuscript studies over the years can ensure results that meet the needs of stakeholders and users. Only with effective management and integration of these technologies, skills and work processes into an integrated program can a manuscript imaging program successfully proceed while meeting schedule, budget and performance goals.