Developing a Methodology for Designing New Recordkeeping Systems or Evaluating Existing Information Systems
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One of the major products of phase I of the IU Project was a methodology for evaluating information systems in terms of the recordkeeping requirements. In essence, this methodology was a response to the question: What set of activities, what type of methodology is required to use and implement the Pitt requirements as a means of reviewing and evaluating information systems? Our phase I methodology involved the following set of activities: 1) Analysis of business functions and transactions; 2) Review of existing record systems; 3) Evaluation of the information system as a recordkeeping system; 4) Recommendations designed to make the information system a better recordkeeping system. I was never really satisfied with this methodology, particularly our methodology for describing business processes and for identifying where records are created, and our definition of the level at which the analysis of the system occurs, i.e., at the record level, file level, class level, or system level.

Following the end of phase I and certainly throughout phase II, we methodically reexamined our model for analyzing business processes. We concluded that while the original IU methodology captured the essence of structured analysis, it failed to apply fully all the vital and relevant steps, particularly when it came to identifying inputs and outputs and the formation of records. In short, one of the major shortcomings of the original methodology was its inability to depict precisely how and when records were generated. Moreover, it was discovered that some of the terminology and definitions used in the IU methodology did not always conform to standard usage. Consequently, the Archives staff revised the set of activities undertaken in the methodology, modified the vocabulary used, and redefined the products created.

In accordance with “modern structured analysis” techniques, the revised IU methodology decomposes logical processes (business activities that must be undertaken no matter how one implements the system) into three components: Functions, Event Processes or Transactions, and Elementary Processes. In other words, business functions can be decomposed into business processes, which are comprised of business events or transactions, which normally represent a single process responding to external and temporal inputs and result in one or more outputs known as elementary processes.

Of course, the purpose of the decomposition exercise is to identify where records are created. After careful review and testing of its methodology, Archives personnel determined that the original methodology provided a less than satisfactory description of when this record creation occurred. The revised methodology is a much more precise and less ambiguous in defining when documentation enters the system and when records are generated. Record creation occurs at the event or transaction level, and the actual records to be analyzed are those documents received as inputs to the system and those records created as a result of the outputs or elementary processes generated in response to
the external or temporal event. For example: The business event “processing an appeal”
is initiated or triggered by a student or his/her parents, and the input document is the
appeal letter received from the student or the parents. The outputs or elementary
processes of this event are 1) Making and recording a decision on the appeal, 2) Modifying the student’s financial aid data based on the appeal decision, and 3) Notifying
the student about the decision. The appeal letter, the decision document, the modified
student record, and the notification are the records of the process.

Eventually all this business process information is described or depicted in models or
representations that illustrate, usually through the use of pictures or symbols, the various
components and relationships of the processes. Models designed to depict the system
independent of any technical implementation are known as logical models or essential
models. Of the various types of logical models, it is the opinion of the Archives staff that
the most valuable models for archivists are those that focus on system processes,
specifically business function decomposition diagrams, business event diagrams, and
business process data flow models. In the IU methodology, staff typically create
functional decomposition and business event diagrams.

Even in phase I we were concerned about the level at which the review and analysis of
information systems would occur. We recognized that if every record or item had to be
reviewed to determine if the requirements and specifications were met, the strategy
would simply not work. Just as with paper records, we realized that we had to find a way
to manage electronic records at the aggregate level. In phase II, we focused on this issue,
and I believe we have resolved the problem to some degree, at least theoretically.
Emphasizing the necessity of incorporating classification schemes into the system helped
immensely in addressing the problem. With a robust classification system in place, we
could then begin to manage records as groups – as files or classes of files. The next
problem we will need to resolve is determining how this will work in practice, i.e.,
decide based on experience which functional requirements and metadata specifications
require analysis at the record level, and which can be applied at the level of a file or a
class of files. We still have not totally resolved this issue, largely because we have not
had enough field tests of the methodology to determine what clearly works and does not
work. Theoretically, however, I am comfortable with our present approach.

In accordance with our revised approach toward the level of analysis, our methodology
has been changed to read as follows:

Step 2: Analyzing the Systems in Terms of the IU Recordkeeping System Requirements
The goal in this step is to determine how the system is managing the records under
review. To determine this, the analyst asks a series of questions derived from the IU
Functional Requirements document. The Functional Requirements are system level
requirements, and therefore are meant to be applied at a much higher level than the
individual record. In other words, when applying the Functional Requirements the
analyst will begin by reviewing and analyzing how the requirement is met at the highest-
level sub-function for the business function under review… If during the analysis it
becomes clear that the records produced in the course of completing lower-level sub-
functions are captured and managed differently than the records of related sub-functions,
the analyst will then proceed to analyze the records at the next lower level. For example, in reviewing the system for the requirement “Authenticity,” the analyst discovers that rules for modification of records for the sub-function “Enrollment Certification” are different than for the sub-function “Degree Certification.” Once this difference is discovered, the analyst would immediately adopt a strategy of reviewing separately the products of business processes for each of the lower-level sub-functions. Similarly, if different procedures are undertaken at the level of the business transaction, then the analyst will begin the analysis of the system for that requirement at the level of the business record. However, this will be a rare occurrence. In the vast majority of cases, the analysis of the system in terms of the IU Functional Requirements will be at the highest sub-function level.

Step 3: Analyzing How the System is Documenting Records in terms of the IU Metadata Specifications. The goal is to determine if the “evidence” required to document the business transactions exists and in what form. In other words, the primary objective is to determine whether the metadata category or element exists for that record or class of records. The goal is not to determine whether the value provided for that metadata element is correct or incorrect. Records within business events and even within business sub-functions often will include the same types of metadata. This is particularly true for so-called “management” metadata that document why and how records will be accessed and used, disposed of, and preserved. In most cases, the type of metadata collected to document these activities will be the same for many, many records within a business process. Even audit trail metadata documenting activities performed on individual records is predictable, because so much of this type of documentation is collected automatically by the system and applied to many records within a business process. Finally, even types of metadata that are unique to a specific record, such as the unique identifier, can be analyzed at the aggregate level by asking the question: for records of this class or function, does the system assign a unique identifier? Again, it is important to remember that what we are analyzing is whether the system collects or creates this category of metadata and not whether the metadata value is correct or not. Accordingly, as with the functional requirements, the analyst will begin by reviewing and analyzing how the metadata specification is met at the highest-level sub-function for the business function under review. If during the analysis it becomes clear that the records produced in the course of completing lower-level sub-functions are documented differently than the records of related sub-functions, the analyst will then proceed to analyze the records at the next lower level. For example, in reviewing the system for “Disposition” metadata, the analyst discovers that within the sub-function “Enrollment Certification” retention periods are specified, while for the related sub-function “Degree Certification” retention metadata is not present. Once this difference is discovered, the analyst would immediately adopt a strategy of reviewing separately the products of business processes for each of the lower-level sub-functions. Similarly, if types of metadata collected at the level of the business transaction are different, then the analyst will begin the analysis of the system for that specification at the level of the business event or record.

Another change we initiated in phase II was the creation of two methodologies, one for analyzing existing, legacy systems as recordkeeping systems, and a second for designing
new recordkeeping systems. In most cases, designing a new system is a two step process involving the description and modeling of business processes, followed by the insertion of recordkeeping requirements and specifications and the results of your business process models into the design of the new system. Analysis of existing systems is normally a more time consuming, more difficult process. It involves not only specifying requirements, metadata specifications and a list of records to be captured. It also requires an analysis of how the present system is managing the data. In essence, the process involves analysis of “what is” as depicted by models and system documentation with “what should be” as defined by the requirements, specifications and models. Although the methodologies for design of new systems and the analysis and modification of existing systems share common elements, we thought it made more sense to create two different documents outlining each methodology.

The final change in the IU methodology was made in the “Recommendations” section. We redefined the manner in which we would present our findings. In essence, we adopted the format and classification structure employed by the IU Internal Audit Department for presenting the results of its audits. The final report as described in our methodology will now include a brief introductory statement outlining the scope and objectives of the process, and then will list recommendation organized into three categories: “Highest Priority Recommendations, Concerns, and For Your Information.” As part of the process, we have also included a follow-up meeting to discuss the recommendations and plan implementation strategies.