Appendix H – Function Point Analysis Data

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The Function Point Analysis (FPA) methodology utilized for the TAAA project is an internationally recognized methodology for determining the overall size of a software application. Function point analysis centers around seven basic steps: 1) Determining the type of function point count; 2) Identifying the counting scope or boundary; 3) Identifying data functions; 4) Identifying the transactional functions; 5) Determining the unadjusted count; 6) Determining the adjustment for complexity; and 7) Calculating the adjusted function point count. We used these results to size the current CWS/CMS application and then to develop estimates for the software development projects in terms of effort, scheduling, and costs. The following paragraphs provide some basic information on function point counting and the results of our sizing estimations for the current CWS/CMS or base system, the base system plus each of the missing SACWIS functions, and the base system plus all of the missing SACWIS functionality as shown below.

- Current CWS/CMS or Base System
- Base System with Adoptions
- Base System with Title IV-E Eligibility Determination Implemented with an Interface Model
- Base System with Financial Management
- Base System with Interfaces
- Base System with All SACWIS Functionality

Function Point Basic Information

In its simplest terms, function points count the externally visible aspects of software products: inputs to an application, outputs from an application, user inquiries, the data files updated by the application, and the number of interfaces to other applications. These items are then weighted by their complexity – the relative difficulty of implementing each. Once adjusted by their complexity factors, the total of all these represent the function point count of the application.

There are 5 essential elements of function point analysis.
1. Internal Logical Files (ILF) – logical data maintained by the application
2. External Interface Files (EIF) – logical data maintained by another application
3. External Inputs (EI) – user input to the application
4. External Outputs (EO) – user created output that required processing
5. External Inquiries (EQ) – user created output from searched files

ILF – Internal Logical File

An internal logical file (ILF) is a _user-identifiable_ group of _logically related data_ or _control information maintained_ within the boundary of the application. Examples taken from the database design in CWS/CMS:

- ADDRESS   Address information
- ADOPTION   Adoption information
- AGENCY   Agency information
- ALLEGATN   Allegation information
- ARCHIVE   Archive information

External Interface File

An external interface file (EIF) is a _user-identifiable_ group of _logically related_ _data_ or _control information_ referenced by the application but _maintained_ within the boundary of a different application. Examples taken from the database design in CWS/CMS:

- HELP-FLD   Field-level help
- HELP-SYS   System-level help
- REFERNC   Reference data
- TEMPLATE   Report template information

External Inputs

An external input (EI) is an _elementary process_ of the application that processes _data_ or _control information_ that enters from outside the boundary of the application. Examples taken from CWS/CMS:

- Change Password
- Create Cross Report Notebook
- Modify Case Plan Notebook
- Create Client Notebook

External Outputs

An external output (EO) is an _elementary process_ of the application that generates _data_ or _control information_ that exits the boundary of the application. The primary intent of an external output is to present information to a user through _processing logic_ other than, or in addition to, the retrieval of data or control information. The processing logic must contain at least one mathematical formula or calculation, create _derived data,_ _maintain_ one or more ILFs, and/or alter the behavior of the system. Examples taken from CWS/CMS:

- Submit For Approval
- Print Report
- Court Order Summary
- Caseload Court Calendar

External Inquiries

An external inquiry (EQ) is an _elementary process_ of the application that results in retrieval of _data_ or _control information_ that is sent outside the application boundary. The primary intent is to present information to a user through the retrieval of data or control information from an ILF or EIF. Examples taken from CWS/CMS:

- Open Reminder Notebook
- Display Cross Report Notebook
- Open Document – Case Notebook
- Search Attorneys

Definitions

Term	Definition
User-identifiable	Refers to defined requirements for processes and/or groups of data that are agreed on, and understood by, both user(s) and software developer(s).

Term	Definition
Logically related	Refers to the requirement that each group should fit logically together within the descriptions provided. An ILF should not be dependent on or attributive to another ILF in order to maintain its existence. Entity types in second or third normal form typically represent ILFs.
Data	Refers to the collection of facts maintained within the application. Data is viewed as a logical grouping of information that is user-identifiable.
Control information	Refers to the user-identifiable data used by the application to influence an elementary process of the application. It specifies what, how, or when data is to be processed.
Maintained	Refers to the process of user-identifiable data modification (add, change, delete) by an elementary process of the application. The same user-identifiable data may be maintained by multiple applications, but may be counted only once per application.
Elementary process	The smallest unit of activity that is meaningful to a user. As an example, a particular activity may be decomposed into various subprocesses by the developer (create, read, update, and display) and touch numerous data and control information, but it is considered a single elementary process.
Processing logic	The required data manipulation needed to complete an elementary process. Processing logic include such items as: data validation, mathematical calculation, data conversion, derived data creation, data retrieval and update.
Derived data	Refers to data that requires processing other than direct retrieval, conversion, or editing of current data. Created by the transformation of existing data into new or additional data.
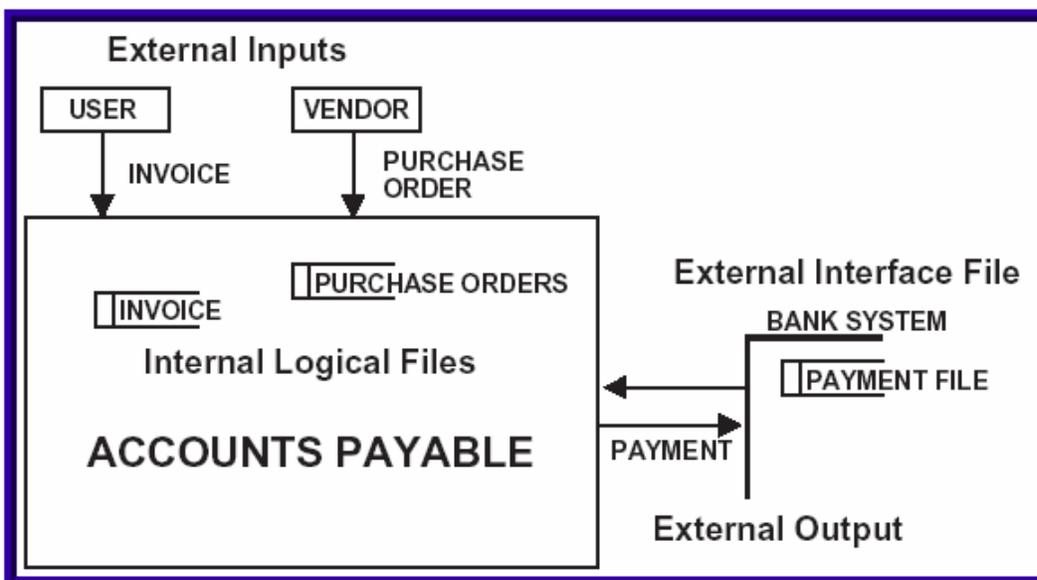
Base CWS/CMS System

Function Type	Complexity Rating		Number of Functions	Function Points Awarded	Total Function Points
External Inputs (EI)	Low		7	3	21
	Average		88	4	352
	High		62	6	372
		Subtotal	157		745
External Outputs (EO)	Low		1	4	4
	Average		103	5	515
	High		88	7	616
		Subtotal	192		1135
External Inquiries (EQ)	Low		89	3	267
	Average		62	4	248
	High		51	6	306
		Subtotal	202		821
Internal Logical Files (ILF)	Low		8	7	56
	Average		18	10	180
	High		8	15	120
		Subtotal	34		356
External Interface Files (EIF)	Low		3	5	15
	Average		3	7	21
	High		0	10	0
		Subtotal	6		36
			Unadjusted function points		3,093
			Value adjustment factor		1.19
			Adjusted function points		**3,681**

Base System with Adoptions

Function Type	Complexity Rating		Number of Functions	Function Points Awarded	Total Function Points
External Inputs (EI)	Low		22	3	66
	Average		112	4	448
	High		82	6	492
		Subtotal	216		1006
External Outputs (EO)	Low		1	4	4
	Average		157	5	785
	High		88	7	616
		Subtotal	246		1405
External Inquiries (EQ)	Low		91	3	273
	Average		86	4	344
	High		66	6	396
		Subtotal	202		1013
Internal Logical Files (ILF)	Low		9	7	63
	Average		18	10	180
	High		11	15	165
		Subtotal	38		408
External Interface Files (EIF)	Low		3	5	15
	Average		3	7	21
	High		0	10	0
		Subtotal	6		36
			Unadjusted function points		3,868
			Value adjustment factor		1.19
			Adjusted function points		**4,603**

Base System with Title IV-E Eligibility Determination Implemented with an Interface Model

Function Type	Complexity Rating		Number of Functions	Function Points Awarded	Total Function Points
External Inputs (EI)	Low		8	3	24
	Average		92	4	368
	High		76	6	456
		Subtotal	176		848
External Outputs (EO)	Low		1	4	4
	Average		103	5	515
	High		90	7	630
		Subtotal	194		1149
External Inquiries (EQ)	Low		89	3	267
	Average		69	4	276
	High		58	6	348
		Subtotal	216		891
Internal Logical Files (ILF)	Low		9	7	63
	Average		19	10	190
	High		9	15	135
		Subtotal	37		388
External Interface Files (EIF)	Low		3	5	15
	Average		3	7	21
	High		1	10	10
		Subtotal	7		46
			Unadjusted function points		3,322
			Value adjustment factor		1.19
			Adjusted function points		**3,953**

Base System with Financial Management

Function Type	Complexity Rating		Number of Functions	Function Points Awarded	Total Function Points
External Inputs (EI)	Low		7	3	21
	Average		92	4	368
	High		62	6	372
		Subtotal	161		761
External Outputs (EO)	Low		1	4	4
	Average		103	5	515
	High		88	7	616
		Subtotal	192		1135
External Inquiries (EQ)	Low		89	3	267
	Average		66	4	264
	High		51	6	306
		Subtotal	206		837
Internal Logical Files (ILF)	Low		8	7	56
	Average		19	10	190
	High		8	15	120
		Subtotal	35		366
External Interface Files (EIF)	Low		11	5	55
	Average		3	7	21
	High		0	10	0
		Subtotal	14		76
			Unadjusted function points		3,175
			Value adjustment factor		1.19
			Adjusted function points		**3,778**

Base System with Interfaces

Function Type	Complexity Rating		Number of Functions	Function Points Awarded	Total Function Points
External Inputs (EI)	Low		7	3	21
	Average		90	4	360
	High		62	6	372
		Subtotal	159		753
External Outputs (EO)	Low		1	4	4
	Average		105	5	525
	High		88	7	616
		Subtotal	194		1,145
External Inquiries (EQ)	Low		89	3	267
	Average		64	4	256
	High		51	6	306
		Subtotal	204		829
Internal Logical Files (ILF)	Low		8	7	56
	Average		18	10	180
	High		8	15	120
		Subtotal	34		356
External Interface Files (EIF)	Low		6	5	30
	Average		9	7	63
	High		3	10	30
		Subtotal	18		123
			Unadjusted function points		3,206
			Value adjustment factor		1.19
			Adjusted function points		**3,815**

Base System with All SACWIS Technical Functionality

Function Type	Complexity Rating		Number of Functions	Function Points Awarded	Total Function Points
External Inputs (EI)	Low		27	3	81
	Average		116	4	464
	High		96	6	576
		Subtotal	239		1,121
External Outputs (EO)	Low		1	4	4
	Average		157	5	785
	High		90	7	630
		Subtotal	248		1419
External Inquiries (EQ)	Low		95	3	285
	Average		93	4	372
	High		73	6	438
		Subtotal	261		1095
Internal Logical Files (ILF)	Low		10	7	70
	Average		20	10	200
	High		12	15	180
		Subtotal	42		450
External Interface Files (EIF)	Low		14	5	70
	Average		9	7	63
	High		3	10	30
		Subtotal	26		163
			Unadjusted function points		4,248
			Value adjustment factor		1.19
			Adjusted function points		**5,055**