



# *Document control*

The following table summarizes the changes to this document

DATE	REVIEWER	Modifications / Additions
99-08-31	Serge Oligny	First draft
99-09-01	Alain Abran	Change title, review introduction
99-11-12	P. Grant Rule	<p>Change: date of document and added version number; page layout to European Standard A4 Portrait; fixed text re-flow in Table Of Contents; made standard headings into consistent style, section heading numbers to style 'Heading1' &amp; section heading titles to style 'Heading1a'; altered to permit auto-creation/update of the Table Of Contents; fixed paging to prevent 'widows &amp; orphans';</p> <p>Change: 'FFP' to 'COSMIC-FFP'; para 2.2.6 change 'went' to 'go'; change 'person-hour' to 'work-hour' for consistency with ISBSG; para 5.1 change 'focus' to 'focuses'; para 5.1.1 remove unnecessary word 'that'; para 5.2.2 change 'was' to 'were', add word 'that'; para 5.3.1 remove extraneous paragraph mark;</p> <p>Add: para 4.2 – add note to indicate that the 'functional size summary table' will need to be supported by 'details of the base counts listing function types and including #DETs per Entry, Exit, etc'</p> <p>Remove: extraneous 'out-of-style' paragraph-marks at the end of sections and at the end of document</p>
99-11-30	Alain Abran	<p>Addition of 2 paragraphs towards the end of the Introduction section:</p> <ul style="list-style-type: none"><li>• In addition to this minimal set of data, some organizations may wish to enter all the fields recommended by the International Software Benchmarking and Standard Group (ISBSG). The ISBSG data collection protocol can then be substituted to sections 2 and 3 Please refer to: <a href="http://www.isbsg.org.au/">http://www.isbsg.org.au/</a></li><li>• Completed questionnaires should be sent to: Serge Oligny Software Engineering Management Research Lab., Université du Québec à Montréal (Canada) Email: <a href="mailto:oligny.serge@uqam.ca">oligny.serge@uqam.ca</a> Phone: (+1) 514-987-3000 extension 7745 Fax: (+1) 514-987-8477</li></ul>

# ***Acknowledgments***

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<sup>1</sup> Public domain version of the COSMIC-FFP measurement manual and other technical reports can be found on the Web at URL: <http://www.lrgl.uqam.ca/ffp.html> or <http://www.lmagl.qc.ca>

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## INTRODUCTION

The Full Function Points (FFP) measurement method, for measuring the functional size of software, was first introduced in 1997. Version 2 of the COSMIC-FFP measurement method is the most recent version. It is ready for technology transitioning trials, which means that the method is coherent and usable. A public version will be released after the technology transitioning trials which might incorporate a few changes. It might be possible that the functional size of some software will slightly differ when measured with the interim version of the method.

The goals of COSMIC-FFP technology transitioning trials are:

- To qualify the applicability of the method to different types of software,
- To qualify the ease of use and ease of learning of the method by practitioners in organizations,
- To fine tune the method's rules,
- To fine tune the method's measurement function
- To gather a significant sample of project data to build estimation models.

It is deemed important to collect project data using the COSMIC-FFP measurement method at this point in time to a) explore the relations involved in the measurement phase of the method and, thus, refine the measurement function and b) supply the practitioners with a usable sample for the purpose of jumpstarting the production of estimation models.

All data collected through this questionnaire will be handled with a research protocol to ensure complete confidentiality. Only highly sanitized data will be made available through the International Software Benchmarking and Standard Group (ISBSG).

In addition to this minimal set of data, some organizations may wish to enter all the fields recommended by the International Software Benchmarking and Standard Group (ISBSG). The ISBSG data collection protocol can then be substituted to sections 2 and 3. Please refer to:

<http://www.isbsg.org.au/>

Authors would like to thank you for taking the time to fill this questionnaire. Your effort will contribute to the enhancement of the COSMIC-FFP measurement method.

Completed questionnaires should be sent to:

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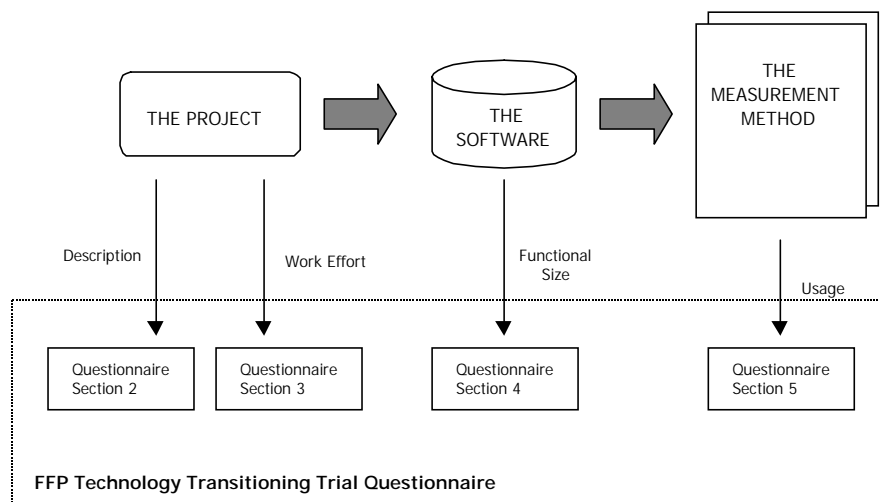
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## QUESTIONNAIRE ROADMAP

The COSMIC-FFP Technology Transitioning Trial Questionnaire is organized into four sections, as illustrated in Figure 1 below.



**Figure 1 – COSMIC-FFP Technology Transitioning Trial Questionnaire roadmap**

Section 2 and 3 relates to the project, that is the process by which the measured software was produced. Section 2 collects a minimum of information on the organization where most of the work was performed and on the project itself. Section 3 collects specific information about the work effort that went into the production of the measured software.

Section 4 relates to the product of the project: the delivered software. The only information collected about the software is related to its functional size, measured using the COSMIC-FFP measurement method, release 2.0.

Section 5 relates to the COSMIC-FFP measurement method. This data collected in this section will be used to assess various aspect of the method like its ease of use and its ease of learning.

## PROJECT ATTRIBUTES

The purpose of this section is to record some basic information about a) the organization and context into which the project has been conducted and b) the general nature of the project that has been completed.

### 2.1 ORGANIZATION

#### 2.1.1 What is the primary business area of the organization ?

- |    |                           |    |                        |
|----|---------------------------|----|------------------------|
| a) | Financial (excl. Banking) | i) | Telecommunications     |
| b) | Accounting                | j) | Sales                  |
| c) | Personnel                 | k) | Marketing              |
| d) | Manufacturing             | l) | Logistics              |
| e) | Inventory                 | m) | Insurance              |
| f) | Banking                   | n) | Engineering            |
| g) | Legal                     | o) | Research & Development |
| h) | Other _____               |    |                        |

#### 2.1.2 What is the type of software being measured ?

- a) Decision support system
- b) Executive information system
- c) Fault tolerance
- d) Management information system
- e) Office information system
- f) Process control
- g) Transaction/production system
- h) Artificial Intelligence
- i) Network Management
- j) Electronic Data Interchange
- k) Other (specify): \_\_\_\_\_

### 2.2 PROJECT

#### 2.2.1 What was the project development type ?

- a) New development,
- b) Enhancement,
- c) Re-development,
- d) Other: \_\_\_\_\_

#### 2.2.2 Describe briefly the development platform:

Hardware	Operating system	DBMS	Language

2.2.3 Describe briefly the target platform:

- a) Same as the development platform
- b)

Hardware	Operating system	DBMS	Language

2.2.4 What was the project ELAPSED time:

\_\_\_\_\_ calendar months

2.2.5 What was the project TOTAL INACTIVE time:

\_\_\_\_\_ calendar months

2.2.6 When did the project's product go into production:

YEAR: \_\_\_\_\_ MONTH: \_\_\_\_\_



## PROJECT WORK EFFORT

The purpose of this section is to record some basic information about the scope and size of the work effort expended on the project as well as some qualification of these data.

**3.1 What was the method used to record work effort ?**

- a) Recorded staff hours,
- b) Derived staff hours,
- c) Recorded "productive" time only.

**3.2 Has all of the work effort (e.g. paid, unpaid, work done from home, or work on Feasibility Studies) been included in these figures?**

Yes                      No                      Don't Know

**If no, the uncollected PROJECT WORK EFFORT is estimated to be:**

- (a) Less than 5% of that recorded
- (b) Between 5% and 10% of that recorded
- (c) \_\_\_\_\_ % over that recorded
- (d) Unable to estimate

**3.3 As an expression of your confidence in this data, how would you rate the data you have provided in relation to Project Work Effort and Project Work Effort Levels as defined in the glossary?**

(LOW) 1                      2                      3                      4                      (HIGH)

Explanation of degree of confidence (to assist validation):

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**3.2 What was the project work effort (in work-hours) ?**

Plan & Track	Specify	Build	Test	Impl.	TOTAL

What is the level of effort included in these figures ?

Development Team	Dev. Support team	Operation support	User support

## PRODUCT SIZE

The purpose of this section is to record some basic information about the size of the software delivered by the project.

### 4.1 Describe the layers in the delivered software:

LAYER	Description

### 4.2 Fill in the COSMIC-FFP sizing information:

Layer	No. of funct. processes	No. of data groups	Total size of ENTRIES	Total size of EXITS	Total size of READS	Total size of WRITES

Note that the information summarized in the above table will need to be supported by detailed base counts recorded in, for example, a spreadsheet. These base counts will need to list the function types that compose the summary totals and to include the number of Data Element Types used in each Entry, Exit, Read or Write function type.

## COSMIC-FFP METHOD USAGE

The purpose of this section is to record some basic information about the usage of the COSMIC-FFP measurement method.

### 5.1 Relevance

This sub-section focuses on the relevance of the COSMIC-FFP measurement method in the context of the organization where the project has been measured.

5.1.1 How many functional processes did you expect should have been included within the measured software before applying COSMIC-FFP ?

\_\_\_\_\_ Functional processes

5.1.2 How many functional processes were captured by applying the COSMIC-FFP measurement method ?

\_\_\_\_\_ Functional processes

5.1.3 Which type of functionality was NOT captured by the COSMIC-FFP measurement method ?

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5.1.4 Any recommendation that would help capture more functionality ?

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### 5.2 Measurement manual

This sub-section focus on the ease of use of the COSMIC-FFP measurement manual.

5.2.1 In your opinion, how easy was it to use the COSMIC-FFP measurement manual ?

(EASY) 1            2            3            4            (DIFFICULT)

5.2.2 Were there any section where principles / rules that were found to be ambiguous ? (if yes, please indicate which ones):

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5.2.3 Any recommendations that would, in your opinion, improve the COSMIC-FFP measurement manual ?

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**5.3 Measurement practice**

This sub-section focus on some key aspects of measuring with the COSMIC-FFP measurement method.

5.3.1 In your opinion, how easy was it to learn the COSMIC-FFP measurement method ?

(EASY) 1            2            3            4            (DIFFICULT)

5.3.2 In your opinion, how easy is it to become proficient with the COSMIC-FFP measurement method ?

(EASY) 1            2            3            4            (DIFFICULT)

5.3.3 What was the work effort (in work-hour) necessary...

EFFORT	
... to collect the information necessary for the measurement ?	
... to structure the missing documentation ?	
... to perform the mapping phase ?	
... to perform the measurement phase ?	

# ***Appendices***

## GLOSSARY<sup>2</sup>

**Artificial Intelligence system:** Used to solve a particular problem by modeling the skill, judgement and expertise of human beings in solving problems in a particular domain. This includes knowledge based systems artificial neural network technology and natural language systems.

**Build:** Physical Design / Internal Design / Coding / Programming / Package Customization / Interfaces

**Decision support system:** These are interactive information systems that employ database technology to support “what if” scenario testing. These applications are primarily used by middle managers to provide them with information which is tailored to support semi-structured and unstructured decisions. These applications provide the user with ad hoc, interactive reporting which is based upon an analytical model that is continually refined in order to solve business problems. For example Share portfolio management.

**Derived staff-hours:** It is possible to derive the WORK EFFORT where it has not been collected on an daily basis, it may have only been recorded in weeks, months or years. It can then be converted into hours by using constants.

**Development support team:** The development team support is responsible for providing specialist services to the development team. Support comprises Data Base Administration, Data Administration, Quality Assurance, Data Security, Standards Support, Audit & Control, Technical Support.

**Development team:** The development team consists of those responsible for the delivery of the application under development. It comprises the project team staff, project management staff and project administration staff.

**Elapsed time:** The calendar period in months between the project start and end including any period of inactivity (i.e. end date minus start date).

**Electronic Data Interchange system:** The transmission of business data and documents between organizations or hardware using an OSI protocol.

**Enhancement:** Changes made to an existing application where new functionality has been added, or existing functionality has been changed or deleted. This would include adding a module to an existing application, irrespective of whether any of the existing functionality is changed or deleted.

**Executive Information system:** These systems commonly answer a query by combining information from both internal and external databases. The information is required by top executive to identify problems, opportunities, planning and critical success factor information for the company.

**Fault Tolerance system:** A continuously available hardware platform and operating system for critical on-line applications. These systems are able to continue running even when errors are occurring. The foundation of the continuous processing is hardware-based fault tolerance, achieved through: a) Self checking logic on each major circuit board to detect failures, b) Duplicate boards to continue processing in the event of board failure and c) Hardware components can be upgraded on-line without interruptions. Used for specialized application in telecommunications and retail, travel, banking etc.

**Implement:** Implementation / Installation / User Training.

**Inactive time:** Total time (rounded to whole months) during the project elapsed time, in which no project activity took place.

**Management Information system:** Provides users with predefined management reports via a reporting system where the user selects the criteria from a limited selection and can usually store the criteria. The report information assists with performance management of a department or business.

**Network management system:** Software which monitors and reports on the status of all components of telecommunication networks including communication links and nodes.

**New development:** Full analysis of the application area is performed, followed by the complete development life cycle (planning/ feasibility, analysis, design, construction and implementation). For instance: a) a project which delivers new function to the business or client. The project addresses an area of business (or provides a new utility) which has not been addressed before and, b) total replacement of an existing system with inclusion of new functionality.

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<sup>2</sup> Most of the definitions found in this Appendix were taken from ISBSG “Data Collection Package”

**Office Automation system:** These combine text processing, image processing, telecommunications and other technologies to develop computer-based information systems that collect, process, store and transmit information in the form of electronic office communications. e.g. Word processing, electronic mail, desktop publishing, teleconferencing, voice mail, facsimile, image processing.

**Operation support:** operations support is responsible for the on-going support and maintenance of the operating environment. Operations Support comprises Software Support, Hardware Support, Information Center Support.

**Plan & track:** Feasibility Study / Cost Benefit Study/ Project Initiation Rep / Terms of Reference.

**Process control system:** Systems that make routine decisions to control operational processes by automatically adjusting physical processes. The software is written for the purpose of controlling, monitoring or manipulating devices such as instruments e.g. temperature control, manufacturing process control, device or instrument control.

**Productive time:** The daily recording of only the "productive" effort (including overtime) expended by a person on project related tasks; e.g. using the same example as "Recorded time" below, when the "non-productive" tasks have been removed (coffee, liaise with other teams, administration, read magazine, etc.) only 5.5 hours may be recorded.

**Recorded staff-hours:** The daily recording of all of the WORK EFFORT expended by each person on Project related tasks; e.g. a person who works on a specific project from 8 am until 5 p.m. with a 1 hour lunch break will record 8 hours of WORK EFFORT.

**Re-development:** The re-development of an existing application. The functional requirements of the application are known and will require a minimum or no change. Re-development may involve a change to either the hardware or software platform. Automated tools may be used to generate the application. This includes a project to re-structure or re-engineer an application to improve efficiency on the same hardware or software platform. For re-development, normally only technical analysis is required.

**Specify:** Systems Analysis / Functional Design / External Design / Requirements Definition / Package selection.

**Test:** Integration testing / user acceptance.

**Transaction / production system:** The majority of business systems in use today fit into this category. These systems can be batch or on-line and process business transactions in a logical sequence within a business area. The system consists of a set of inputs to which the transaction/production system adds value and outputs customer or corporate requirements. Examples include: payroll, order entry/processing, general ledger, inventory, case management

**User support:** user support is responsible for defining the requirements of the applications and sponsoring/championing the development of the application. User support comprises: Application Users/Clients, User Liaison, User Training.

**Work effort:** All personnel effort that is directed towards the completion of a particular project including out-of-hours effort, whether paid or unpaid. It includes the effort of Client representatives in addition to that of Information Technology personnel. A good test as to whether an activity constitutes PROJECT WORK EFFORT is to ask the question: "Would the activity be undertaken if there was no project?". It excludes NON-PROJECT ACTIVITIES, these being: Public Holidays, Annual Leave, Sick Leave, Training (Non-Project). It is measured in whole HOURS.