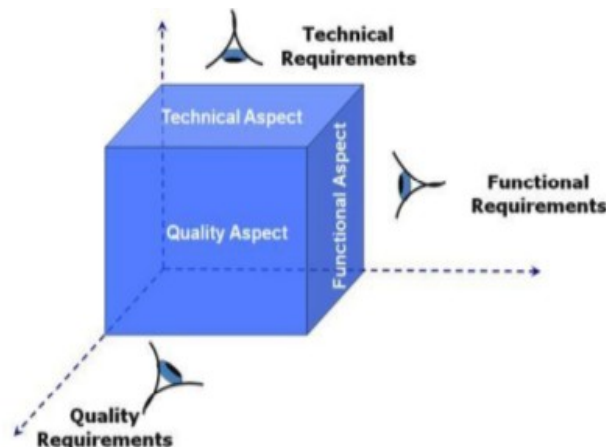


SNAP (Software Non-functional Assessment Process)

(Snap-apm-22.pdf)

Pg.31



1.The Framework and Requirements

The dimension for the functional requirements (FUR) and the functional perspective of the software development project are currently covered by the functional size measure – IFPUG function points as defined in the IFPUG Counting Practice Manual. The dimensions of the non-functional requirements (both technical and quality) and the non-functional perspectives of the software development project are defined in this manual.

The following are the standards organizations definitions of technical requirements:

- ISO – requirements relating to the technology and environment, for the development, maintenance, support, and execution of the software.
- IEEE – combination of design, implementation, interface, performance, and physical requirements.

The Quality Requirements are requirements that are not defined as functional or technical, and relate to the quality of the system or components. The following are available definitions:

- ISO – The following characteristics form part of the quality model: Functionality, Reliability, Usability, Efficiency, Maintainability, and Portability.
- IFPUG – Quality includes: conformity to user expectations, user requirements, customer satisfaction, reliability, and level of defects present.

SNAP Objectives and Benefits

Objectives

SNAP measures software by quantifying the size of non-functional requirements. With this in mind, the objectives of SNAP are to:

- Measure the non-functional size of the software that the user requests and receives
- Demonstrate the full economic value of the application, including its functional aspects as well as the non-functional aspects (have the non-functional baseline as well as the functional baseline, to demonstrate the full economic value)
- Measure software development and maintenance based on the non-functional requirements (such as technology used for implementation)
- Size technical projects, in which FPA is not applicable
- In addition to meeting the above objectives, the process of assessing non-functional requirements should be:

- Simple enough to minimize the overhead of the measurement process.
- A consistent measure among various projects and organizations. SNAP allows to determine (by counting each of the four categories, from each one of the sub-characteristics) the possibility to size and therefore better estimate a project with/without FPs, according to the set of user requirements received for a project.
- Benefits
- A non-functional assessment will assist IT organizations in multiple ways. It will provide insight into the delivery of projects and maintenance of applications to assist in estimating and in the analysis of quality and productivity. Used in conjunction with FP measures, the non-functional assessment will provide information that can identify items impacting quality and productivity in a positive or negative way.
- Having this information enables software professionals to:
 - Better plan and estimate projects.
 - Identify areas of process improvement.
 - Assist in determining future non-functional strategies.
 - Quantify the impacts of the current non-functional strategies.
 - Provide specific data when communicating non-functional issues to various audiences.
- Organizations can apply SNAP as:
 - A methodology to measure the non-functional size of a software product to support quality and productivity analysis.
 - A methodology to estimate cost and resources required for software development and maintenance.
 - A methodology to measure cost reduction for software development and maintenance, in addition to FPA.
- Part 1 – The SNAP Method Introduction to SNAP
- April 2014 Assessment Practices Manual 1-11
- A normalization factor for software comparison.
- A methodology to determine the non-functional size of a purchased application package by assessing all the portions and categories included in the package.
- A methodology to help users determine the benefit of an application package to their organization by assessing portions or categories that specifically match their requirements.

Note:

“FP + SNAP points” are not equal to the overall product size.

As of the date of this publication, the size of a software application is considered to have two distinct parts: the size of the FURs and the size of the NFRs. For example, if an application’s functional size is 700 function points and non-functional size is 200 SNAP points, then the entire size could be stated as “700 function points, and 200 SNAP points.” The two sizes do not sum up to one single size such as “900 points.”

The IFPUG functional sizing methodology does not change when measuring the non-functional requirements using SNAP.

A project may have 0 FP and non-zero number of SNAP points, or 0 SNAP Points and non-zero number of FP, or any combination of FP and SP

Further research is needed to determine if function points and SNAP points can be somehow combined as part of single metric.

Pg.100

SNAP Calculation Case Study

Project scope ‘StarTrek’ is the code name for an enhancement project that the ‘Alpha’ team was

commissioned to deliver. Being a relatively small project (in terms of budget), StarTrek had requirements to enhance the performance of the company's flagship application, 'Centra-One', along with minor changes to some of its existing functionalities.

SNAP

Meeting The brainstorming sessions held between the project's Chief architect, the Lead developer and the client resulted in the following set of requirements:

In order to boost the performance of the "invoice update" transaction (current average response time: 8-12 seconds), and bring the response time down under 3 seconds, a multi-pronged strategy was adopted.

Requirements relevant for SNAP are identified and reviewed
Relevant for SNAP

Requirement 1:

Create an additional interface for receiving "update invoice" transactions – Automated Fax interface (to divert a portion of the web update transactions and lessen the load that the server was facing). A separate server was installed to handle fax requests and was equipped to read and decode the incoming fax forms which were in a predetermined format.

Requirement 2:

a) Modify the validation logic of the current 'update invoice' online transaction to reduce its processing time.

The new validation needs one additional DET. This is considered as a functional change, generating a High EI (3 FTRs, 10 DETs)
(The validation is considered as a non-functional change)

b) Create a cache file that stores the list of most-commonly accessed customer records, which was internally referenced before updating the invoice. This, it was predicted, will result in further improvement in performance. This cache was refreshed at regular intervals.

c) Make some cosmetic changes to the 'update invoice' online screen and the 'home screen' to inform the users of the new setup.

The Alpha team wanted to size these requirements, to provide as an input to the estimation process and also to track the size change over the life cycle to indicate scope-creep. They naturally decide to use SNAP together with IFPUG FP as that allowed them the capability to size all functional and non-functional aspects of the project.

Purpose &
Scope

Calculate Non-functional Size (SNAP Points)

Purpose of the sizing: to size the enhancement project and use it for project estimation and to track scope creep.

Type of count: Enhancement

Scope: Requirements 1 & 2 (a, b & c)

Boundary SNAP assessment will assume the same boundary as that used by the IFPUG FP methodology. Though the Centra-One application had 3 layers in itself, the boundary was fixed at the same level as that for the FP methodology.

Assessment During the high level design phase, the Alpha team did an impact analysis and found that the following SCUs would be impacted. The SCUs were determined as per the rules of SNAP.

Notes:

1. Identify sub-categories
2. Identify the SCUs

3. Per sub-category, assess the complexity of each SCU, and calculate SNAP score.

One requirement that includes both functional and non-functional aspects may impact both function points and SNAP (See 2a above)

One requirement may impact more than one elementary process and one SCU can be impacted by more than one requirement (functional/non-functional). While assessing, care must be taken to ensure that the SCUs are not double assessed in SNAP.

The definition of SCUs according to SNAP may be identical, for some sub-categories, to the traditional IFPUG elementary process. In other cases, sub-categories are assessed within different counting units (SCUs) level.

In addition to IFPUG FP counting, which has determined a count of 6 FP to this project, SNAP assesses it as 200 SP (38+34+31+41+24+32) based on the analysis in table 1-25 below.

The Alpha team used both the functional size (6 FP) and the non-functional size (200 SP) as input into their estimation process.

Req. #	SCU Type	Impacted SCU	FP counted	# of FP	SNAP counted	1.1 Data Entry Validation	1.3 Data Formatting	2.1 User Interfaces	2.3 Multiple Input methods	3.2 Database Technology
1	Elementary process	Update invoice	No	0	Yes	-	30	-	4	-
2a	Elementary process	Update invoice	Yes	6	Yes	8	-	-	-	-
2b	Elementary process	1. View customer 2. Update customer details	No	0	Yes	-	-	-	-	18
2c	Elementary process	1. Updates Invoice 2. Home screen	No	0	Yes	-	-	25	-	-

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