An Investigation on the Relative Cost of Function Point Analysis Phases

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Abstract— **Function Point Analysis (FPA) is widely used, especially to quantify the size of applications in the early stages of development, when effort estimates are needed. However, the measurement process is often too long or too expensive, or it requires more knowledge than available when development effort estimates are due. To overcome these problems, early size estimation methods have been proposed, to get approximate estimates of Function Point (FP) measures. In general, early estimation methods (EEM's) adopt measurement processes that are simplified with respect to the standard process, in that one or more phases are skipped. EEM's are considered effective; however there is little evidence of the actual savings that they can guarantee. To this end, it is necessary to know the relative cost of each phase of the standard FP measurement process. This paper presents the results of a survey concerning the relative cost of the phases of the standard FP measurement process. It will be possible to use data provided in the paper to assess the expected savings that can be achieved by performing an early estimation of FP size, instead of properly measuring it.**

Keywords- functional size measurement; Function Point Analysis; IFPUG Function Points; measurement process; cost of measurement.

I. INTRODUCTION

FPA [1][2][3][4] is widely used. Among the reasons for the success of FPA is that it can provide measures of size in the early stages of software development, when they are most needed for cost estimation.

However, FPA performed by a certified FP consultant proceeds at a relatively slow pace: between 400 and 600 FP per day, according to Capers Jones [5], between 200 and 300 FP per day according to experts from Total Metrics [6]. Consequently, measuring the size of a moderately large application can take too long, if cost estimation is needed urgently. Also, the cost of measurement can be often considered excessive by software developers. In addition, cost estimates may be needed when requirements have not yet been specified in detail and completely.

To overcome the aforementioned problems, EEM's that provide approximate values of FP measures have been proposed. A quite comprehensive list of such methods is given in [7].

The goal of the work presented here is to assess the cost of the measurement activities (detailed in Section II.B). However, as mentioned in the introduction, there is little agreement on the cost of FP measurement: for instance, Capers Jones [5] and Total Metrics [6] provide quite different evaluations. Therefore, it appeared more viable to pursue an evaluation of the *relative* cost of the measurement phases. In this way, we will be able to assess how much we save -in terms of measurement effort, hence ultimately of money- by skipping a measurement phase, i.e., by not performing one of the activities of the standard measurement process. In fact, if a manger knows that applying the standard measurement process in her organization takes X PersonHours per FP, and a simplified measurement process allows for saving 70% of the effort, she can easily conclude that in her organization the application of the simplified process will take 0.7X PersonHours.

The paper is structured as follows. Section II reports a few basic concepts of FPA. Section III describes how the surveys was carried out, illustrates the results of the survey and discusses the threats to the validity of the study. Section IV accounts for related work. Finally, Section V draws conclusions and briefly sketches future work.

II. FUNCTION POINT ANALYSIS CONCEPTS

FPA aims at providing a measure of the size of the functional specifications of a given software application.

A. *The model of the software being measured according to FPA*

FPA addresses functional specifications that are represented according to a specific model. The model of functional specifications used by FPA is given in Fig. 1. Briefly, Logical files are the data processed by the application, and transactions are the operations available to users. The size measure in FP is computed as a weighted sum of the number of Logical files and Transactions. The weight of logical data files is computed based on the Record Elements Types (RET), i.e., subgroups of data belonging to a data file, and Data Element Types (DET), i.e., the elementary pieces of data; besides, the weight depends on whether the data file is within the boundaries of the application, i.e., it is an Internal Logic File (ILF) or it is outside such boundaries, i.e., it is an External Interface File (EIF). The weight of transactions is computed based on the Logical files involved –see the FTR (File Type Referenced) association in Fig. 1– and the DET used for I/O; besides, the weight depends on the "main intent" of the transaction. In fact, depending on the

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main intent, transactions are classified as External Inputs (EI), External Outputs (EO) or External Queries (EQ).

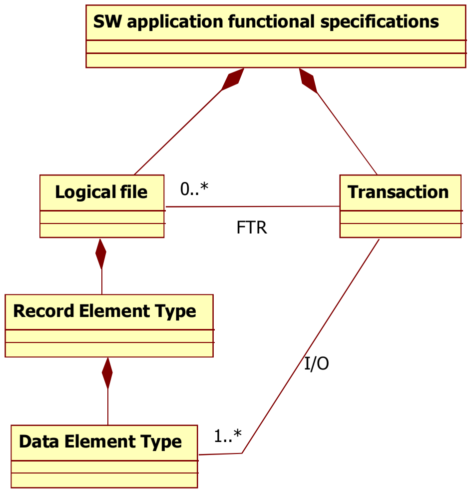

Figure 1. The model of software used in FPA.

B. The FPA measurement process

According to the International Function Point User Group (IFPUG) measurement manual [3][4], the measurement process includes the following phases:

1. Gathering the available documentation concerning functional user requirements;
2. Identifying application boundaries;
3. Determining the measurement goal and scope;
4. Identifying Elementary Processes (Transactions) and Logical Data Files;
5. Classifying transactions as EI, EO or EQ; classifying files as ILF or EIF; identifying RET, DET, FTR and determining complexity;
6. Calculating the functional size;
7. Documenting and presenting the measurement.

The EEM's tend to skip as many as possible of the steps listed above. The idea is straightforward: the less phases have to be performed, the faster and cheaper is the process. However, some activities –namely, those involved in phases 1, 2 and 4– are preparatory of the real measurement and cannot be skipped. Similarly, phase 7 can hardly be avoided. In any case, it should be noted that the simplification of the measurement process can affect phases 1 and 7 as well: on the one hand, a simplified process requires less documentation concerning Functional User Requirements (FUR); on the other hand, documenting and presenting a simplified measurement is easier and faster than documenting the full-fledged measurement.

As a final observation, the extent of phase 7 depends on the context and the goal of measurement: for instance, if an organization is measuring the size of the application to be developed for "internal" purposes, the documentation can be kept to a minimum; on the contrary, if the functional size measures have to be used in a bid or in establishing the price of a contract, the documentation to be produced has usually to be quite detailed, and the presentation of the measures and measurement has also to be accurate. In practice, the cost of phase 7 depends more on the context and goal of the measurement than on the fact that the standard process or a simplified process were used.

In conclusion, EEM's address mainly phases 4, 5 and 6. However, there is hardly any evidence of how much you save if you skip any of these phases. On the contrary, some evidence exists that by simplifying the measurement process, some measurement error is introduced [19].

III. EXPERIMENT AND RESULTS

A. The survey

The investigation described here was performed via a questionnaire, which was filled by people that are experienced in IFPUG Function Point measurement.

The questionnaire was published on the kwiksurveys site [20]. The questionnaire was publicized via several channels:

- An invitation to fill out the questionnaire was sent to the Italian Function Point User Association (www.gufpi-isma.org);
- A similar invitation was sent to the Nesma association [21];
- Finally, a question was published on ResearchGate [22], and experts were redirected to the questionnaire URL.

The questionnaire is reported in the appendix. It can be noticed that the questionnaire targets both the IFPUG [3][4] and the Nesma [9] measurement processes. In fact, according to Nesma, "*[Since 1994,] owing to [...] the intensive cooperation between the Nesma and the IFPUG, the counting guidelines of the NESMA and the IFPUG continuously came closer and closer. [...] With the publication of IFPUG CPM 4.2 (2004) the last major differences between IFPUG and NESMA disappeared."* Therefore, mixing data concerning the current IFPUG and Nesma measurement processes is perfectly safe, and the results found apply equally well to both measurement methods.

The questionnaire was published in November 2014, and answers were collected until April 2015.

B. The Results of the survey

31 answers were collected. Even if the number is not very large, it is nonetheless sufficient to get a reasonably reliable assessment of the relative cost of FP measurement activities.

Of the respondents, 21 are certified Function Point Specialist (CFPS), and 4 are certified Function Point Practitioner (CFPP). Only 6 have no certification; however, of these, 2 use NESMA Function Points, therefore it is reasonable that they do not need an IFPUG certification.

The experience of the respondents is also quite reassuring: 20 respondents have been using FP measurement for over 10 years; only two for less than 5 years.

It should be noted that the questionnaire does not ask for a specific percentage for each phase; instead, it asks to specify in what range the actual percentage of effort belongs. This choice was due to two reasons: 1) the free version of the questionnaire provided by kwiksurveys does not support the collection of numeric values, and 2) it is unlikely that a respondent knows the exact fraction of effort that is spent in each phase, while it is much more probable that he/she can indicate the correct range.

TABLE I. ANSWERS CONCERNING RELATIVE PHASE COSTS

Respondent	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
1	11-15%	0-5%	0-5%	26-30%	36-40%	0-5%	16-20%
2	16-20%	6-10%	0-5%	36-40%	6-10%	0-5%	16-20%
3	6-10%	0-5%	0-5%	6-10%	46-50%	0-5%	11-15%
4	0-5%	0-5%	0-5%	66-70%	0-5%	0-5%	0-5%
5	0-5%	6-10%	6-10%	36-40%	16-20%	0-5%	0-5%
6	0-5%	0-5%	46-50%	31-35%	0-5%	0-5%	0-5%
7	6-10%	6-10%	0-5%	21-25%	26-30%	0-5%	11-15%
8	26-30%	11-15%	6-10%	11-15%	11-15%	0-5%	11-15%
9	16-20%	0-5%	0-5%	21-25%	21-25%	0-5%	11-15%
10	0-5%	0-5%	0-5%	46-50%	31-35%	0-5%	0-5%
11	31-35%	0-5%	0-5%	21-25%	16-20%	11-15%	0-5%
12	0-5%	0-5%	0-5%	16-20%	0-5%	0-5%	11-15%
13	0-5%	0-5%	0-5%	21-25%	46-50%	0-5%	0-5%
14	0-5%	0-5%	0-5%	41-45%	26-30%	0-5%	0-5%
15	11-15%	6-10%	0-5%	36-40%	11-15%	0-5%	0-5%
16	6-10%	0-5%	0-5%	51-55%	16-20%	0-5%	0-5%
17	6-10%	6-10%	0-5%	26-30%	6-10%	36-40%	6-10%
18	0-5%	0-5%	0-5%	36-40%	36-40%	0-5%	0-5%
19	6-10%	6-10%	0-5%	11-15%	11-15%	0-5%	41-45%
20	31-35%	16-20%	6-10%	26-30%	11-15%	0-5%	0-5%
21	16-20%	6-10%	6-10%	16-20%	11-15%	6-10%	16-20%
22	16-20%	0-5%	0-5%	61-65%	0-5%	0-5%	0-5%
23	0-5%	56-60%	16-20%	66-70%	51-55%	0-5%	11-15%
24	6-10%	6-10%	11-15%	26-30%	11-15%	11-15%	0-5%
25	11-15%	6-10%	0-5%	21-25%	21-25%	11-15%	6-10%
26	6-10%	0-5%	0-5%	41-45%	21-25%	0-5%	6-10%
27	41-45%	6-10%	0-5%	6-10%	6-10%	6-10%	11-15%
28	6-10%	16-20%	6-10%	31-35%	11-15%	0-5%	16-20%
29	11-15%	0-5%	0-5%	66-70%	11-15%	0-5%	0-5%
30	21-25%	0-5%	0-5%	21-25%	21-25%	6-10%	0-5%
31	0-5%	0-5%	0-5%	6-10%	6-10%	0-5%	0-5%

The collected data concerning the relative effort required by each measurement phase are given in Table I.

When information is collected via questionnaires, it is always possible that some respondents do not provide correct data. Therefore, before proceeding to the analysis of the collected data, it is necessary to remove unreliable answers from the dataset. In our case, the following problems were considered:

1) The sum of the efforts spent in each phase must be 100%. Having asked for ranges, we expect that the sum of the lower bounds of the ranges is ≤ 100% (but close to 100%) and that the sum of the upper bounds is ≥ 100% (but close to 100%). Respondents 12, 23 and 31 do not satisfy these conditions: total effort is in [27%, 60%] range for respondent 12, in [200%, 230%] range for respondent 23 and in [12%, 45%] range for respondent 31. These are clearly meaningless indications, therefore they have been excluded from the dataset.
2) Among the remaining respondents, it is easy to spot a few outliers. Respondent 19 declared a fraction of effort for phase 7 (Documenting and presenting the measurement) that is almost half the total effort and more than double than the other respondents'. Respondent 27 declared an abnormally large amount of effort dedicated to phase 1 (Gathering the available documentation concerning FUR): such a large effort may be required in specific contexts, but is not representative of the general case (as other respondents clearly show). To preserve the representativeness of the data, the answers provided by the mentioned respondents have been excluded from the dataset.
3) Respondents 4 and 5 declared that they use (EEM's). Their answers were removed from the dataset, since we

are interested in the relative cost of the standard measurement process.

To analyze the data in Table I, the following procedure was adopted:

1) For every phase, the mean values of the lower bound and upper bound of the given ranges were computed. Let MLB_i and MUB_i be the means of the upper and lower bound, respectively, for phase i.
2) For every phase, $M_i = (MLB_i + MUB_i)/2$ was computed. Being the midpoint between MLB_i and MUB_i, M_i indicates the more likely value for the fraction of effort spent in the ith phase, according to respondents.
3) It was then found that $\Sigma_{i=1,7}\ M_i = 91.4\%$. This is not acceptable, since the sum of the efforts dedicated to the measurement phases must equal the total measurement effort. Therefore, we computed a weighted version of M_i: $WM_i = 100\ Mi/91.4$, so that $\Sigma_{i=1,7}\ WM_i = 100\%$. WM_i is assumed to indicate the most likely value for the fraction of effort spent in the ith phase.

The values of MLB_i, MUB_i M_i and WM_i are given in Table II.

TABLE II. MEAN VALUES OF PHASE RELATIVE COSTS

Phase	MLB_i	MUB_i	M_i	WM_i
1	10.8%	15.0%	12.9%	14.1%
2	3.5%	8.1%	5.8%	6.4%
3	3.4%	8.1%	5.8%	6.3%
4	30.8%	34.8%	32.8%	35.9%
5	18.8%	22.9%	20.9%	22.8%
6	3.4%	8.1%	5.8%	6.3%
7	5.3%	9.8%	7.5%	8.2%

Since in general the mean is affected by the smallest and largest values in the observed population, we repeated the procedure described above using the medians of upper and lower bounds. The results obtained are given in Table III.

TABLE III. MEDIAN VALUES OF PHASE RELATIVE COSTS

Phase	MLB_i	MUB_i	M_i	WM_i
1	8.5%	12.5%	10.5%	15.8%
2	0.0%	5.0%	2.5%	3.8%
3	0.0%	5.0%	2.5%	3.8%
4	26.0%	30.0%	28.0%	42.1%
5	16.0%	20.0%	18.0%	27.1%
6	0.0%	5.0%	2.5%	3.8%
7	0.0%	5.0%	2.5%	3.8%

The results of the analyses provide some useful indications concerning the relative cost of the phases of FP measurement, performed according to the IFPUG or Nesma process.

The results concerning the relative efforts derived using the means and the medians are fairly close: this fact supports the hypothesis that values reported in Tables II and III are actually representative of the real relative effort per phase.

The fact that more than half the effort is concentrated in phases 4 and 5 also appears to confirm the reliability of results. In fact, it is popular wisdom that most measurement effort is required by the analysis of data and processes, which is concentrated in phases 4 and 5.

C. Threats to validity

A first threat to the validity of the study is due to the number of datapoints that were collected. Although it was possible to collect only 31 datapoints, we strived to guarantee the representativeness of the collected data by eliminating outliers, as well as data that appear incorrect. In any case, the size of the dataset that was finally analyzed (containing 24 datapoints) is not smaller than many datasets used for empirical software engineering studies.

Concerning the statistical analyses that were performed in this study, they are so simple that it is unlikely that any serious threat to statistically validity actually applies. One could observe that confidence intervals for the mean values could have been computed, but having already asked for ranges rather than specific values, computing confidence intervals would have been sort of overkilling.

Most respondents (23) are from Italy, four are form the Netherlands and the remaining ones are from Brazil, Switzerland and Belgium. The lack of geographic dispersion could be a limit for the generalizability of results. However, most respondents are certified Function Point Specialists or certified Function Point Practitioners, thus we can assume that they all follow the process specified in the official manuals [3][4][8][9]. If so, our results should be applicable to all the measurements performed according to the standard counting practices.

IV. RELATED WORK

There is not much literature concerning the cost of functional size measurement. A couple of documents report about the total cost of FP measurement [5][6], but none provides information concerning how the total effort is spread among the various measurement phases.

Some indications are provided by the proposers of EEM's. For instance, it was reported that "*the E&Q size estimation technique has been proved in practice to be quite effective, providing a response within ± 10% of the real size in most real cases, while the savings in time (and costs) can be between 50% and 90% (depending on the comprised aggregation level) with respect to corresponding standard measurement procedures.*" [18]

It was also reported that "*the results found with NESMA estimated fall within a reach of -6% to +15% of the corresponding result found with a NESMA detailed approach, and NESMA estimated FSM is performed 1,5 times as fast as a NESMA detailed FSM.*" [12]

These evaluations are probably optimistic to some extent. However, they are not precise enough to be used for decision making: for instance, it is not clear if the reported savings are evaluated with respect to the whole measurement process or only with respect to the core part (phases 4-6).

V. Conclusions

The measurement process of IFPUG (and Nesma) FP is often considered too expensive and time consuming. To overcome this problem, EEM's have been proposed, to obtain faster and cheaper approximate measure estimates.

However, it is quite difficult to estimate how much measurement effort can be actually saved by using an EEM instead of the standard measurement process. This knowledge would be clearly quite important for managers who have to choose whether to perform a full-fledged measurement or an approximate estimation.

Since EEM's indicate what phases of the measurement process they allow to skip, to be able to evaluate the saving yielded by EEM's we need to know the relative cost of the measurement phases that compose the standard IFPUG measurement process. To this end, a questionnaire was proposed to professional measurers, and the collected answers were analyzed.

The results of the analysis are reported in this paper (see Section B).

Most EEM's allow for skipping phases 5 and 6. Among such methods are the NESMA estimated [8][11][12], Early&Quick Function Point [10], simplified Function Point [14] (not to be confused with the Simple Function Point method, which is a proper functional size measurement method, not an EEM method[17][15][16]), ISBSG average weights (which assigns to each basic functional component the average weight that type of component has in the ISBSG dataset [13]).

According to the values given in Tables II and III, we can see that EEM's that allow to skip phases 5 and 6 are expected to save 28–30% of the measurement effort. Actually, as previously mentioned, also phases 1 and 7 are expected to become faster and simpler when EEM's are used. However, the analysis reported here does not support the evaluation of savings in phases 1 and 7, which are largely dependent on the context.

Future work includes:

- Extending the dataset, especially with answers from non-European countries, to make the dataset representative of a larger community of IFPUG users.
- If possible, collecting real effort data from the field, instead of subjective indications provided by measurers. This would make it possible to analyze not only the relative cost of measurement phases, but also the actual cost of measurement.
- Characterizing the contexts in which measurement is performed, to support the empirical evaluation of the dependency of the relative cost of measurement phases on the context.

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References

[1] A. J. Albrecht, “Measuring Application Development Productivity”, Joint SHARE/ GUIDE/IBM Application Development Symposium, pp 83–92, 1979.

[2] A. J. Albrecht and J. E. Gaffney, “Software function, lines of code and development effort prediction: a software science validation”, IEEE Trans. on Software Eng., vol. 9, pp. 639–648, 1983.

[3] International Function Point Users Group, “Function Point Counting Practices Manual - Release 4.3.1”, 2010.

[4] ISO/IEC 20926: 2003, “Software engineering – IFPUG 4.1 Unadjusted functional size measurement method – Counting Practices Manual”, ISO, Geneva, 2003.

[5] C. Jones, “A new business model for function point metrics”, http://concepts.gilb.com/dl185, 2008. Last access June 12th, 2016.

[6] “Methods for Software Sizing – How to Decide which Method to Use”, Total Metrics, www.totalmetrics.com/ function-point-resources/downloads/R185_Why-use-Function-Points.pdf, August 2007. Last access June 12th, 2016.

[7] L. Santillo, “Easy Function Points – ‘Smart’ Approximation Technique for the IFPUG and COSMIC Methods”, IWSM-MENSURA, pp. 137–142, 2012.

[8] ISO/IEC, ISO/IEC 24750:2005, Software Engineering “NESMA Functional Size Measurement Method, Version 2.1, Definitions and counting guidelines for the application of Function Point Analysis. International Organization for Standardization, Geneva, 2005.

[9] NESMA, “Counting Practice Manual, Version 2.1”, 2004.

[10] “Early & Quick Function Points for IFPUG methods v. 3.1 Reference Manual 1.1”, April 2012.

[11] nesma, Early Function Point Analysis, July 15, 2015, http://nesma.org/freedocs/early-function-point-analysis/ Last access June 12th, 2016.

[12] H. S. van Heeringen, E. W. M. van Gorp, and T. G. Prins, Functional size measurement accuracy versus costs is it really worth it? Software Measurement European Forum, May 2009.

[13] ISBSG, Worldwide Software Development–the Benchmark. Release 5, International Software Benchmarking Standards Group, 1998.

[14] R. Meli and L. Santillo, Function Point Estimation Methods: a Comparative Overview, FESMA conference, pp. 2009.

[15] L. Lavazza and R. Meli. "An Evaluation of Simple Function Point as a Replacement of IFPUG Function Point." IWSM-MENSURA 2014. IEEE, pp. 196–206, 2014.

[16] F. Ferrucci, C. Gravino, and L. Lavazza, “Assessing Simple Function Points for Effort Estimation: an Empirical Study”, 31st ACM Symposium on Applied Computing – SAC 2016, Pisa, April 4-8, pp. 1428–1433, 2016.

[17] Simple Function Point Association, Simple Function Point - Functional Size Measurement Method Reference Manual v01.01, March 2014, http://www.sifpa.org/en/sifp-method/manual.htm. Last access June 12th, 2016.

[18] L. Santillo, M. Conte, and R. Meli. "Early & Quick function point: sizing more with less." 11th IEEE International Symposium on Software Metrics, 2005. IEEE, 2005.

[19] L. Lavazza and G. Liu, An Empirical Evaluation of Simplified Function Point Measurement Processes, Int. Journal on Advances in Software, vol. 6, n. 1-2, pp. 1-13, 2013.

[20] Kwiksurveys site, https://kwiksurveys.com/s.asp?sid=aazttngx1iibno6450647#/ Last accessed June 12th, 2016.

[21] nesma association, www.nesma.org. Last accessed June 12th, 2016.

[22] ResearchGate, http://www.researchgate.net/ Last accessed June 12th, 2016.

APPENDIX - THE QUESTIONNAIRE

A survey about the relative effort required by the phases of Functional Size Measurement

A. *About you...*

Question	Possible answers
Are you a certified Function Point Specialist (CFPS)?	Yes/No
Are you a certified Function Point Practitioner (CFPP)?	Yes/No
How many years of experience do have in FP counting?	Less than 5 Between 5 and 10 More than 10
How many FP per year do you count on average?	No more than 200 Between 200 and 1000 Between 1000 and 5000 More than 5000

B. *Relative effort required by the phases of functional size measurement*

According to your experience, what is the relative effort required by the phases of functional size measurement? Please, specify how big is the percentage effort for each phase, according to your experience. Please note that here we consider the measurement performed at the beginning of the project, based on functional user requirements.

Thanks a lot for your answers! If you have any additional comment or remark, or if you want to be informed on the results of the survey, please send an email to: luigi.lavazza@uninsubria.it

Question	Possible answers
Phase 1: gathering the available documentation concerning functional user requirements	0-5%, 6-10%, 11-15%, 16-20%, 21-25%, 26-30%, 31-35%, 36-40%, 41-45%, 46-50%, 51-55%, 56-60%, 61-65%, 66-70%, 71-75%, 76-80%, 81-85%, 86-90%, 91-95%, 96-100%
Phase 2: Identifying application boundaries	0-5%, 6-10%, 11-15%, 16-20%, 21-25%, 26-30%, 31-35%, 36-40%, 41-45%, 46-50%, 51-55%, 56-60%, 61-65%, 66-70%, 71-75%, 76-80%, 81-85%, 86-90%, 91-95%, 96-100%
Phase 3: Determining the measurement goal and scope	0-5%, 6-10%, 11-15%, 16-20%, 21-25%, 26-30%, 31-35%, 36-40%, 41-45%, 46-50%, 51-55%, 56-60%, 61-65%, 66-70%, 71-75%, 76-80%, 81-85%, 86-90%, 91-95%, 96-100%
Phase 4: Identifying Elementary Processes (Transactions) and Logical Data Files	0-5%, 6-10%, 11-15%, 16-20%, 21-25%, 26-30%, 31-35%, 36-40%, 41-45%, 46-50%, 51-55%, 56-60%, 61-65%, 66-70%, 71-75%, 76-80%, 81-85%, 86-90%, 91-95%, 96-100%
Phase 5: Classifying transactions as EI, EO or EQ; classifying files as ILF or EIF; identifying RET, DET, FTR and determining complexity	0-5%, 6-10%, 11-15%, 16-20%, 21-25%, 26-30%, 31-35%, 36-40%, 41-45%, 46-50%, 51-55%, 56-60%, 61-65%, 66-70%, 71-75%, 76-80%, 81-85%, 86-90%, 91-95%, 96-100%
Phase 6: Calculating the functional size	0-5%, 6-10%, 11-15%, 16-20%, 21-25%, 26-30%, 31-35%, 36-40%, 41-45%, 46-50%, 51-55%, 56-60%, 61-65%, 66-70%, 71-75%, 76-80%, 81-85%, 86-90%, 91-95%, 96-100%
Phase 7: Documenting and presenting the measurement	0-5%, 6-10%, 11-15%, 16-20%, 21-25%, 26-30%, 31-35%, 36-40%, 41-45%, 46-50%, 51-55%, 56-60%, 61-65%, 66-70%, 71-75%, 76-80%, 81-85%, 86-90%, 91-95%, 96-100%
Please, specify what measurement method the given data you gave apply to	IFPUG NESMA Other
Please, specify if the given data take into account some type of simplification	No simplification Nesma estimated Nesma indicative Early & Quick FP Other