

3) Function Point Metrics (FPM)

This metric overcomes the Shortcoming of the LOC Metric

Why we use it?

Because it can be used to easily estimate the size of the Software product directly from the problem specification.

The Conceptual idea behind the **FPM** is that **Size of the Software Product** is directly dependent on the number of **different functions or features** it supports.

Steps to Compute Function point



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When function is invoked, Reads some input data and transforms it to corresponding output data.

Eg The issue book feature of a library Automation Software takes the name of the book as input and displays its location and the number of copies available.

- Beside using the number of the input and output data values Function Point metric computes the **size of a software product (in unit of function Points or FPs)**.

Function point is Computed in Two Steps

1) **Computing the unadjusted Function Point (UFP)**

UFP is refined to reflect the differences in the Complexities of

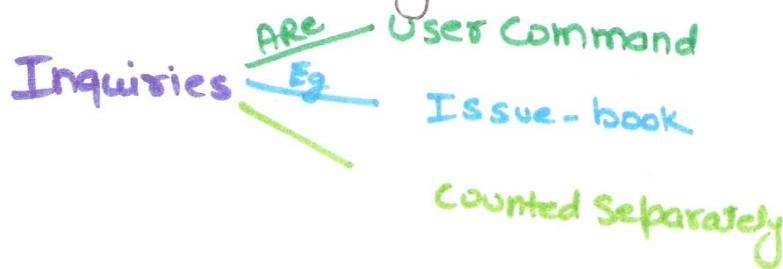
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the different parameters.

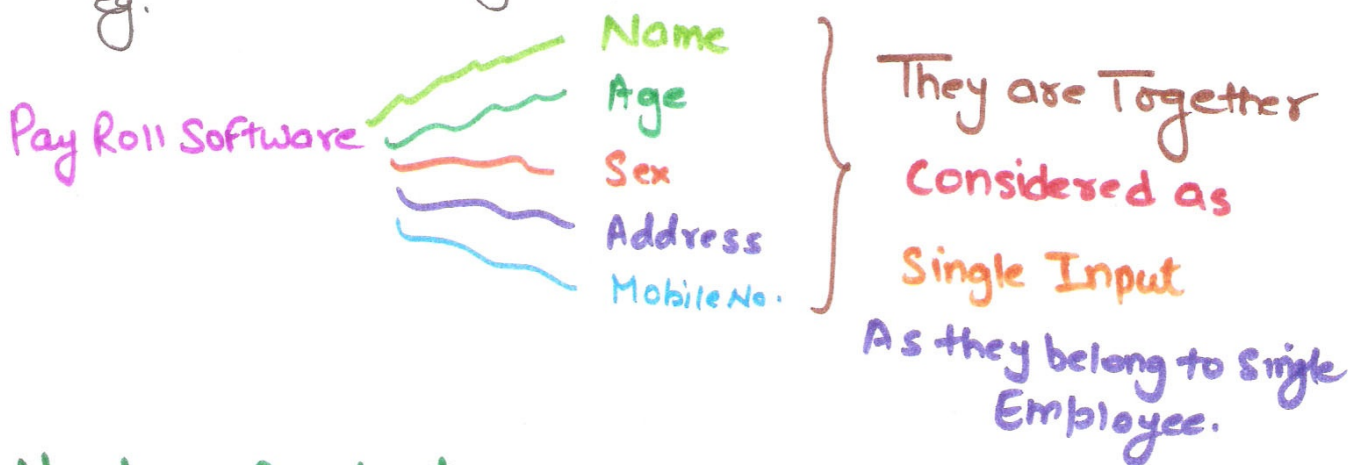
$$UFP = (\text{Number of inputs}) * 4 + (\text{Number of outputs}) * 5 + (\text{Number of inquiries}) * 4 + (\text{Number of files}) * 10 + (\text{Number of interfaces}) * 10$$

→ **Number of Inputs:**

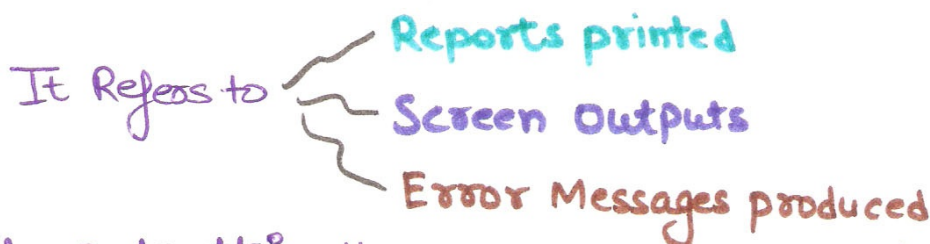
In this Each data item input by the user is counted. Data inputs should be distinguished from user inquiries.



Individual data items input by the user are not considered in the calculation of the number of input, but a group of related inputs are considered as a single input.
 Eg.



→ **Number of Outputs:**



While outputting the number of outputs the individual data items within a report are not considered, but a set of related

data items is counted as one input.

3) Number of Inquiries :

Distinct interactive queries which can be made by the users. These inquiries are the user commands which require specific action by the system.

4) Number of Files :



Each logical file is counted.

Logical file

Means groups of logically Related Data

Data structure

Physical Files

5) Number of Interface

Interfaces used to exchange information with other systems.

Interfaces
Ex:-

Data files on Tapes

Disks

Communication links
with other systems

Once the unadjusted function point is computed, the **Technical Complexity Factor (TCF)** is computed next.

TCF refines the UFP measure by considering fourteen other factors such as **High Transaction Rates**, **Throughput**, and **response Time requirements** etc.

Each of these 14 factors is assigned from 0 (Not present or No)

influence) to 6 (strong influence). The resulting numbers are summed, yielding the total degree of influence (DI).

Now

TCF is computed as

$$= (0.65 + 0.1 * DI)$$

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and DI vary from 0-84

and TCF vary from 0.65 - 1.35



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So

$$FP = UFP * TCF$$

Shortcomings of Function Point Metric

a) Subjective Evaluations :

It needs subjective evaluations with a lot of judgement involved.

b) Conversion Need:

Many efforts and cost models are based on LOC, so function points need to be converted.

c) Less Research Data :

Less Research Data is available on function points as compared to LOC.

d) Late Performance :

It is performed after creation of **Design Specification**

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e) Low Accuracy:

It has low accuracy of evaluating as a subjective judgement is involved.

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f) Long Learning Curve:

As the learning curve is quite long it's not easy to gain proficiency.

g) Time Consuming:

It is a time consuming method as less research data is available which generate low accuracy and less effective results.



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Feature Point Metric:

A function point extension called **Feature Points**, is a superset of the function point measure that can be applied to systems and engineering software applications.

The feature point measure accommodates applications in which **Algorithm complexity is high.**

To compute the Feature Point:-

Information domain values are again counted and weighted. In addition, another software characteristic - **Algorithms Counted.**

Algorithms Example

- Investing a matrix
- Decoding a bit string
- Handling an interrupt