CSA1101
System Analysis, Design, and Prototyping

Deliverable 2
Project Cost Estimation

Payroll Management System

Ma. Dhanicka Arevalo
Paulhan Cacnio
Pia Del Rosario
Maureen Espinosa
Kier Pascua

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UNADJUSTED FUNCTION POINT				
Components	***Low***	***Average***	***High***	***Total***
ILF	**3 x 7 = 21**	**2 x 10 = 20**	**0 x 15 = 0**	**41**
EIF	**0 x 5 = 0**	**2 x 7 = 14**	**0 x 10 = 0**	**14**
EI	**2 x 3 = 6**	**2 x 4 = 8**	**0 x 6 = 0**	**14**
EO	**1 x 4 = 4**	**2 x 5 = 10**	**0 x 7 = 0**	**14**
EQ	**2 x 3 = 6**	**2 × 4 = 8**	**0 x 6 = 0**	**14**
UFP				**97**

DISCUSSION:

Function Point Analysis (FPA) helps measure a system's size based on its features. In our Payroll Management System, we identified key components like employee records, payroll processing, tax calculations, and attendance tracking. Each was categorized as ILF, EIF, EI, EO, or EQ and assigned a complexity score.

After calculations, we got 97 Unadjusted Function Points (UFP). This helps estimate our project effort, duration, and team size.

BREAKDOWN FOR TABLE:

Internal Logical Files (ILF):

- **Employee Information Table** (stores employee details)
- **Payroll Records Table** (stores payroll history)
- **Deductions Table** (stores tax and benefit deductions)
- **Attendance Table** (tracks working hours)
- **User Accounts Table** (stores login credentials)
- **Total: 5 ILFs**

External Interface Files (EIF):

- **Tax Database Connection** (fetches tax rates from an external system)
- **Benefits System Integration** (fetches benefits details from a third-party HR system)
- **Total: 2 EIFs**

External Inputs (EI):

- **Employee Registration Form** (for new employees)
- **Payroll Entry Form** (for salary computation)
- **Tax & Deductions Input** (manages tax and other deductions)

- **Attendance Entry** (manual input for working hours/overtime)
- **Total: 4 EIs**

External Outputs (EO):
- **Pay slip Generation** (outputs employee salary breakdown)
- **Tax Report** (summarizes tax deductions)
- **Payroll Summary Report** (details salary processing)
- **Total: 3 Eos**

External Inquiries (EQ):
- **Employee Lookup** (retrieves employee data)
- **Payroll Record Search** (fetches payroll history)
- **Tax Deduction Inquiry** (shows tax calculations)
- **Attendance Verification** (shows attendance records)
- **Total: 4 EQs**

SCALE FOR DEGREE OF INFLUENCE:

0 = No Influence/Not Present
1 = Incidental Influence
2 = Moderate Influence
3 = Average Influence
4 = Significant Influence
5 = Strong Influence

GENERAL SYSTEM CHARACTERISTIC	*DEGREE OF INFLUENCE*
Data Communication	**2**
Distributed Data Processing	**3**
Performance	**2**
Heavily Used Configuration	**3**
Transaction Rate	**4**
On-line Data Entry	**1**
End User Efficiency	**3**
On-line Update	**3**
Complex Processing	**4**
Reusability	**0**
Installation Ease	**4**
Operational Ease	**3**
Multiple Sites	**0**
Facilitate Change	**3**
TOTAL DEGREES OF INFLUENCE (TDI)	**35**

VALUE ADJUSTMENT FACTOR COMPUTATION:

VAF = (TDI * 0.01) + 0.65
= (35 * 0.01) + 0.65

VAF = 1

FUNCTION POINT COMPUTATION:

FP = UAF * VAF
= 97 * 1

FP = 97

DISCUSSION:

The General System Characteristics (GSC) describes the nature of a system. The Degrees of Influence indicate its relevance or influence to its functionality. determined for each characteristic. After getting the Total Degrees of Influence (TDI), the Value Adjustment Factor has been computed by multiplying the TDI by 0.01, then adding it to 0.65. Once that's solved, the Function Point is computed.

COCOMO (Constructive Cost Model)

Our project is classified as Semi-Detached. The effort estimation formula is:
Effort(E) = 3.0 x $(KLOC)^{1.12}$
E = 3.0 x $(774)^{1.12}$
E ≈ 5158.35 Person-Months

The time required (T) is estimated using:
T = 2.5 x $(Effort)^{0.35}$
T = 2.5 x $(5158.35)^{0.35}$
T ≈ 49.81 Months

Total Time = $\frac{Effort}{Team\ Size}$
Total Time = $\frac{5158.35}{5}$
Total Time = 1031.67 Months

Parameter	Value
Project Type	Semi-Detached
Function Points	97
Estimated KDSI	774
Effort (Person-Months)	5158.35
Development Time (Months)	49.81 (4.15 years)
Team Size	5 people
Time per Person	1031.67 months (86 years)

Based on the Semi-Detached COCOMO Model, our Payroll System, with an estimated KDSI of 774, requires 5158.35 person-months of effort and 49.81 months (~4.15 years) for completion. However, with a 5-person team, each member would need ~86 years, which is unrealistic.

This suggests that the KDSI estimation might be too high, or the project complexity may need reevaluation. Adjusting the KDSI or reconsidering the project classification can help provide a more accurate and feasible estimate.