

# **EFFORT ESTIMATION ASSIGNMENT**

## **ALPHA SOLUTIONS IMS**

### **Identifying Functional Points:**

#### **External Inputs (EI):**

- User enters data into the system:
- Admin Login (credentials)
- Add Product (name, category, supplier, cost, price, stock)
- Update Product Details
- Add Supplier Details
- Add Customer Details
- Record Sale Transaction (customer, product, quantity, payment)
- Record Purchase Transaction (supplier, product, quantity, cost)
- Stock Adjustments (damage, loss, return)

#### **External Outputs (EO):**

- System produces and sends out data:
- Login confirmation + dashboard
- Low Stock Alert
- Daily/Weekly Sales Report
- Purchase Report
- Inventory Valuation Report
- Profit & Loss Summary
- Supplier Statement
- Customer Statement

#### **User Inquiries (EQ):**

- Queries that retrieve information:
- Search Product by Name/Category
- Search Supplier
- Search Customer
- Transaction Lookup
- Payment Status Inquiry

#### **Internal Files (ILF):**

- System maintains data internally:

- Product Database
- Supplier Database
- Customer Database
- Sales Database
- Purchase Database
- User Accounts Database

#### **External Interfaces (EIF):**

- Interfaces to external systems/services:
- Payment Gateway (e.g., Stripe/JazzCash)
- Email/Notification API (alerts & invoices)
- Cloud Hosting Service (deployment & storage)

#### **Function, Type And Complexity Table:**

Function	Type	Complexity	Weight
Admin Login	EI	Simple	3
Add Product	EI	Average	4
Update Product	EI	Average	4
Add Supplier	EI	Average	4
Add Customer	EI	Average	4
Record Sale Transaction	EI	Complex	6
Record Purchase Transaction	EI	Complex	6
Stock Adjustment	EI	Average	4
Login confirmation + dashboard	EO	Simple	4
Low Stock Alert	EO	Average	5
Sales Report	EO	Complex	7
Purchase Report	EO	Average	5
Inventory Valuation Report	EO	Complex	7

Profit & Loss Summary	EO	Complex	7
Supplier Statement	EO	Average	5
Customer Statement	EO	Average	5
Search Product	EQ	Simple	3
Search Supplier	EQ	Simple	3
Search Customer	EQ	Simple	3
Transaction Lookup	EQ	Average	4
Payment Status Inquiry	EQ	Average	4
Product Database	ILF	Average	10
Supplier Database	ILF	Average	10
Customer Database	ILF	Average	10
Sales Database	ILF	Average	10
Purchase Database	ILF	Average	10
User Accounts Database	ILF	Average	10
Payment Gateway	EIF	Complex	10
Email API	EIF	Average	7
Cloud Hosting	EIF	Simple	5

### **UNADJUSTED FUNCTION POINTS (UFP):**

$$EI = (3 + 4 + 4 + 4 + 4 + 6 + 6 + 4) = 35$$

$$EO = (4 + 5 + 7 + 5 + 7 + 7 + 5 + 5) = 45$$

$$EQ = (3 + 3 + 3 + 4 + 4) = 17$$

$$ILF = (10 \times 6) = 60$$

$$EIF = (10 + 7 + 5) = 22$$

$$\text{UFP} = 35 + 45 + 17 + 60 + 22 = 179$$

### **GENERAL SYSTEM CHARACTERISTICS (GSC):**

<b>GSC</b>	<b>Rating</b>	<b>Justification</b>
Data Communications	4	HTTPS, REST APIs, email alerts
Distributed Data Processing	3	Web-based client-server on cloud
Performance	3	Reports need fast response
Heavily Used Configuration	2	Multi-user but small business scale
Transaction Rate	3	Frequent stock/sales updates
Online Data Entry	4	Continuous product/customer/supplier entries
End-User Efficiency	3	Simple UI for SMBs
Online Update	4	Real-time inventory updates
Complex Processing	3	Profitability & valuation reports
Reusability	2	APIs reusable for future app
Installation Ease	3	SaaS cloud — easy setup
Operational Ease	3	Admin dashboard + alerts
Multiple Sites	2	Cloud accessible anywhere
Facilitate Change	3	Modular design allows quick changes

$$\Sigma \text{GSC} = 42$$

$$\text{CAF} = 0.65 + (0.01 \times 42) = 1.07$$

## **ADJUSTED FUNCTION POINTS (AFP):**

$$\text{AFP} = \text{UFP} \times \text{CAF}$$

$$\text{AFP} = 179 \times 1.07 = \mathbf{191.53 \approx 192}$$

## **EFFORT ESTIMATION:**

$$\text{Productivity} = \mathbf{10 \text{ hours / FP}}$$

$$\text{Effort} = 192 \times 10 = \mathbf{1920 \text{ hours}}$$

$$\text{Person-Months} = 1920 \div 160 = \mathbf{12 \text{ PM}}$$

**If 5 members (students, ~36 hrs/month each):**

$$1920 \div 36 = \mathbf{53.3 \approx 54 \text{ months (collectively)}}$$

With 5 people parallel  $\rightarrow$  **~11 months**

Industry Scale (1 dev full-time):

$$1920 \div 160 = \mathbf{12 \text{ months (1 year)}}$$

## **Final Result:**

- UFP = 179
- AFP = 192
- Effort = 1920 hours  $\approx$  12 PM