

Function Point Analysis: InnoVest Project

This document presents a detailed Function Point Analysis (FPA) for the InnoVest platform, a comprehensive ecosystem for startups and investors.

1. Foundational Principles of Function Point Analysis

1.1. Core Concepts of Function Point Analysis (FPA)

Function Point Analysis (FPA) is an industry-standard method for measuring the functional size of a software application, independent of the underlying technology or programming language. It quantifies the functionality delivered to the end-user by assessing the application's logical design and primary functional requirements. This measurement, known as the Function Point (FP) count, is derived from five key components:

1. **Internal Logical Files (ILF):** User-identifiable groups of logically related data maintained within the application's boundary.
2. **External Interface Files (EIF):** User-identifiable groups of logically related data that are referenced by the application but maintained by another system.
3. **External Inputs (EI):** Elementary processes that handle data or control information entering the application from an external source.
4. **External Outputs (EO):** Elementary processes that generate and deliver data or control information to an external entity.
5. **External Inquiries (EQ):** Elementary processes involving user inputs and system outputs for the primary purpose of data retrieval.

The final Function Point (FP) count is calculated by first determining the Unadjusted Function Point (UFP) count and then refining it with a Technical Complexity Factor (TCF) to account for the system's technical characteristics.

$$FP = UFP * TCF$$

1.2. FPA Component Definitions

- **Internal Logical File (ILF):** Represents the logical data stores managed by InnoVest. For example, the `Companies` entity, which stores all startup profile information, or the `Users` entity, containing data for founders, investors, and administrators.
- **External Interface File (EIF):** Refers to data logically recognized by the user but maintained outside of InnoVest. A prime example is the interface with the **SSLCommerz Payment Gateway**, which processes transactions externally.
- **External Input (EI):** An elementary process where data crosses the application boundary from the outside. In InnoVest, this includes a startup founder submitting the **"Create Company" form** or an investor providing details for **KYC Verification**.

- **External Output (EO):** An elementary process that presents information to the user, often involving calculations or data processing. Examples include generating a "**Business Analysis Report**" for a startup or sending a "**Payment Confirmation Email**" to an investor.
- **External Inquiry (EQ):** A direct data retrieval process combining an input and an output. For instance, an investor using the search bar to "**Find Companies by Industry**" is an EQ, as it involves an input (search criteria) and an immediate, unprocessed output (the list of companies).

1.3. Merits and Limitations of FPA

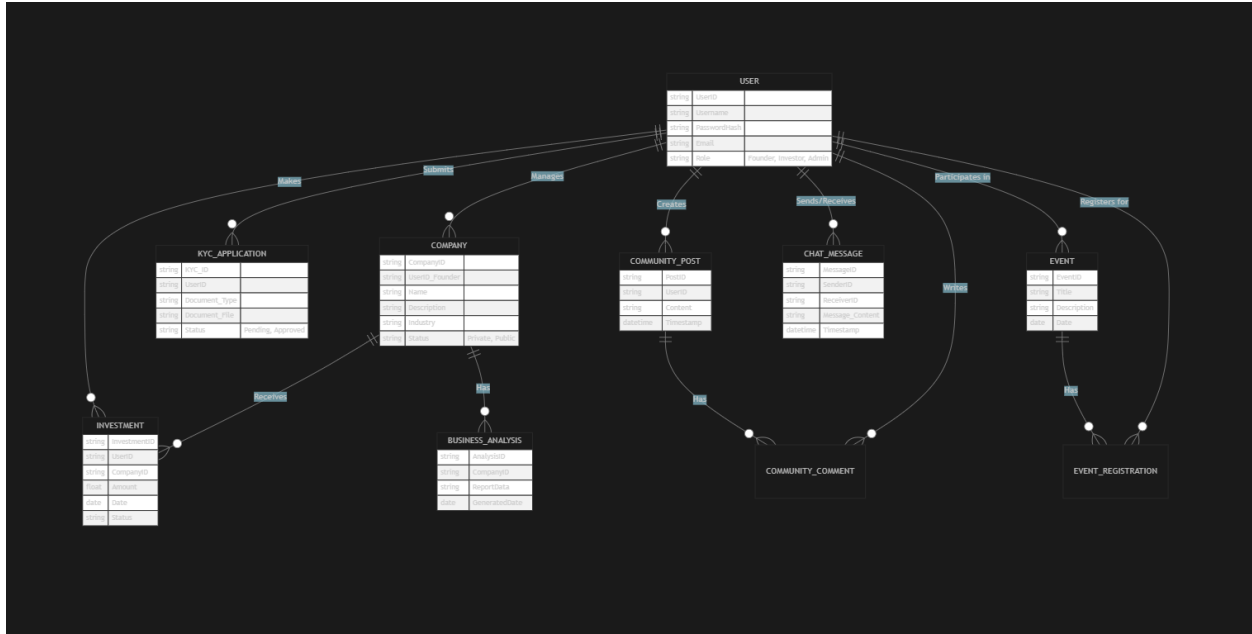
Advantages:

- FPA can be applied early in the software development lifecycle, using functional specifications before any code is written.
- It provides a reliable basis for estimating project cost, effort, and timelines.
- Being technology-agnostic, FPA results can be used for benchmarking projects across different platforms and languages.
- It offers a clear, function-oriented perspective that is valuable in contract negotiations and project scope management.

Disadvantages:

- The assignment of complexity ratings involves a degree of subjectivity, which can lead to variations in results.
- Accurate FPA requires complete and detailed system specifications, which may not be available in the initial stages of agile projects.
- The methodology is less suited for scientifically or algorithmically intensive systems where functionality is not easily broken down into discrete user functions.

2. Conceptual ER-Diagram for InnoVest



3. Function Point Calculation for InnoVest

This section outlines the calculation of the total Function Points for the InnoVest platform. The process begins with calculating the Unadjusted Function Point (UFP) count and the Technical Complexity Factor (TCF).

3.1. Unadjusted Function Point (UFP) Count

The UFP is calculated by identifying and categorizing all major functions within InnoVest into the five component types and then assigning a weighted value based on complexity.

Function Name	EI (3)	EO (4)	EQ (4)	ILF (10)	EIF (7)
1. User & Profile Management	4	3	2	2	0
2. Company Management	5	4	3	3	0
3. KYC Verification	2	3	2	1	0
4. Investment & Payment	3	3	2	2	1

Function Name	EI (3)	EO (4)	EQ (4)	ILF (10)	EIF (7)
5. Community & Collaboration	4	3	2	2	0
6. Event Management	3	3	2	2	0
7. Chat System	1	1	1	1	0
8. Business Analysis	2	3	2	1	0
9. Admin Dashboard & Controls	4	5	4	0	0
TOTAL FP COUNT	28	28	20	14	1

The equation for calculating the UFP is: $UFP = (28 * 3) + (28 * 4) + (20 * 4) + (14 * 10) + (1 * 7) = 423$

So, the Unadjusted Function Point Count is 423.

3.2. Weighting & Complexity Tables

Item	Simple	Average	Complex
EI	3	4	6
EO	4	5	7
EQ	3	4	6

Item	Simple	Average	Complex
ILF	7	10	15
EIF	5	7	10

3.3. Technical Complexity Factor (TCF)

Code	Technical Factors	Factor Points
F1	Reliable Backup and Recovery	5
F2	Data Communications	5
F3	Distributed Functions	3
F4	Performance	4
F5	Heavily Used Configuration	3
F6	Online Data Entry	5
F7	Operational Ease	4
F8	Online Update	5
F9	Complex Interface	4

Code	Technical Factors	Factor Points
F10	Complex Processing	5
F11	Reusability	4
F12	Installation Ease	3
F13	Multiple Sites	2
F14	Facilitate Change	4
	ΣF (Total Summation)	55

The TCF formula is: $TCF = 0.65 + (0.01 * \Sigma F)$. With $\Sigma F = 55$, the TCF is **1.20**.

3.4. Final Function Point (FP) Calculation

$$FP = UFP * TCF = 423 * 1.20 = 507.6$$

The Final Estimated Function Point for the InnoVest project is 508 (rounded).

4. Explanation of Terminologies

This section explains the specific functions within each module from Section 3.1.

1. User & Profile Management

- **EI:** User Registration Form; Login Form; Update Profile Information; Forgot Password Request.
- **EO:** User Registration Confirmation; Profile Update Success Message; Password Reset Email.
- **EQ:** View User Profile; View User Activity Log.

2. Company Management

- **EI:** Create Company Profile; Update Company Details; Add Progress Updates; Add Financial Data; Upload Company Documents/Slides.

- **EO:** Display Company Profile; List of Interested Investors; Progress Update Notifications; Confirmation of Company Creation.
- **EQ:** View Specific Company Details; Search for a Company; View Backed Companies List (Investor side).
- 3. **KYC Verification**
 - **EI:** Submit KYC Form with Personal Details; Upload ID and Address Proof Documents.
 - **EO:** KYC Submission Confirmation; KYC Status Update Notification (Approved/Rejected); Display of KYC Status.
 - **EQ:** Check Current KYC Status; Admin Views Submitted KYC Application.
- 4. **Investment & Payment**
 - **EI:** Enter Investment Amount; Submit Payment Information (via SSLCommerz interface); Confirm Investment.
 - **EO:** Payment Confirmation Screen; Investment Confirmation Email; Display of Transaction History.
 - **EQ:** View Investment Portfolio; Look up a Specific Transaction.
- 5. **Community & Collaboration**
 - **EI:** Create a New Discussion Post; Write a Comment; Upvote/Downvote a Post or Comment; Send Connection Request.
 - **EO:** Display Community Feed with Posts and Comments; Display User Notifications (new comment, new connection); User's Network/Connections List.
 - **EQ:** Search for a Post or Topic; View a Specific User's Posts.
- 6. **Event Management**
 - **EI:** Create New Event (Admin/Founder); Register for an Event; Update Event Details.
 - **EO:** Display List of Upcoming Events; Event Details Page; Event Registration Confirmation Email.
 - **EQ:** Search for an Event; View List of Attendees for an Event.
- 7. **Chat System**
 - **EI:** Send a Text Message.
 - **EO:** Display New Message Notification.
 - **EQ:** View Chat History with a User.
- 8. **Business Analysis**
 - **EI:** Input data for P&L prediction; Select metrics for analytics view.
 - **EO:** Display Predicted Profit & Loss Report; Generate and Display Business Analytics Charts; Export Analytics Report.
 - **EQ:** Query Specific Business Metrics; View Historical Analytics Data.
- 9. **Admin Dashboard & Controls**
 - **EI:** Approve/Reject KYC; Manage User Roles; Disable/Enable a Company Profile; Post Site-wide Announcements.
 - **EO:** Display System-wide Statistics (new users, total investments); Show a Log of Admin Actions; Generate User/Company Reports.
 - **EQ:** Search for a User; Search for a Company; Filter KYC applications by status; View system logs.

5. Justification of Complexity Weights

For InnoVest, the complexity weights for the five functional components were assigned as follows:

- **External Input (EI) -> Simple (3):** Most inputs in InnoVest consist of simple forms with basic validation. They do not involve complex data structures or logic before processing.
- **External Output (EO) -> Simple (4):** The majority of outputs are direct data presentations or simple confirmations. While some reports exist, they do not constitute the bulk of the EO functions.
- **External Inquiry (EQ) -> Average (4):** Inquiries range from simple searches to more complex filtered queries (e.g., browsing companies with multiple filters). This variability justifies an "Average" complexity rating.
- **Internal Logical File (ILF) -> Average (10):** The system's data model is moderately complex. Entities like `Company` and `User` have numerous attributes and logical subgroups. The relationships between ILFs (Users, Companies, Events, Investments) are non-trivial, warranting an "Average" rating.
- **External Interface File (EIF) -> Average (7):** The primary EIF is the payment gateway. Interfacing with such a system requires handling multiple data elements (transaction ID, status, amount, user info) and file types (request, response, confirmation), which aligns with "Average" complexity.