**Data Flow Diagram & User Stories**

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Team ID: LTVIP2025TMID22707

Project Name: SmartSDLC: AI-Enhanced Software Development Lifecycle

**Level 0 DFD**

The user interacts with the SmartSDLC system through a Streamlit interface. Inputs like requirement documents or code are processed using Python backend logic. IBM Watsonx Granite 3.3 model handles classification, generation, and summarization, returning output to the user interface. Temporary data is managed via session state.

**Level 1 DFD**

* User input → Input Handler → Language Detector
* If correction: to Grammar Checker → receive corrections → UI
* If exercises: to Exercise Generator → UI
* Text → Analysis → Visual Renderer → UI

**User Stories**

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| --- | --- | --- | --- | --- |
| **User Type** | **Feature** | **User Story ID** | **User Story** | **Priority / Sprint** |
| **Learner** | **Real‑time Correction** | **US‑01** | **As a language learner, I want to submit a paragraph and receive corrected text with explanations.** | **High / Sprint 1** |
| **Learner** | **Grammar & Spelling Practice** | **US‑02** | **As a learner, I want to fix grammar and spelling errors in real time so I improve my writing.** | **High / Sprint 1** |
| **Learner** | **Multilingual Learning Selection** | **US‑03** | **As a learner, I want to choose one of 6 languages to practice in my preferred language.** | **Medium / Sprint 2** |
| **Learner** | **Grammar Exercise** | **US‑04** | **As a learner, I want to do grammar exercises to learn rules through practice.** | **Medium / Sprint 2** |
| **Learner** | **Sentence Formation Exercise** | **US‑05** | **As a learner, I want sentence formation drills to improve word order skills.** | **Medium / Sprint 2** |
| **Learner** | **Verb Tense Drill** | **US‑06** | **As a learner, I want verb tense exercises to master conjugations.** | **Medium / Sprint 3** |
| **Learner** | **Text Analysis Metrics** | **US‑07** | **As a learner, I want to view text metrics (word count, complexity) to understand my writing level.** | **Medium / Sprint 3** |
| **Learner** | **Visual Feedback (Bar Chart)** | **US‑08** | **As a learner, I want a bar chart of my writing metrics for clear visual feedback.** | **Low / Sprint 4** |
| **Learner** | **Visual Feedback (Radar Chart)** | **US‑09** | **As a learner, I want a radar chart to visualize language competency dimensions.** | **Low / Sprint 4** |
| **Learner** | **Language Detection** | **US‑10** | **As a learner, I want the system to detect language and show confidence before correction.** | **High / Sprint 1** |
| **Learner** | **Edge‑Case Handling** | **US‑11** | **As a learner, I want graceful handling of empty/invalid input with helpful prompts.** | **High / Sprint 1** |
| **Learner** | **Real‑time Performance** | **US‑12** | **As a learner, I want corrections within 2 seconds for real‑time usability.** | **Medium / Sprint 3** |