**ProseTools: Microsoft Word Character Management Add‑in**

**1. Overview**

**ProseTools** is a Microsoft Word add‑in designed specifically for authors, editors, and scriptwriters to manage character metadata and streamline narrative consistency. By embedding character profiles directly into Word documents, ProseTools eliminates the need for external note‑taking tools or spreadsheets, allowing users to access and update character details (such as physical attributes, backstories, aliases, and relationships) directly within their writing environment.

The add‑in leverages the Office .NET API (VSTO) and is built for Microsoft Word on Windows (Office 2013 and later). It is built on .NET Framework 4.8.1 and has been tested with Word 2016 and Word 365.

**2. Key Features**

**2.1. Character Management**

* **Centralized Character Database:**  
  Manage character profiles, including names, aliases, and detailed metadata.
* **Linking & Navigation:**  
  Automatically scan documents to detect and link character mentions to their profiles, aiding consistency.

**2.2. Metadata Handling**

* **Embedded Metadata:**  
  Store character details as custom document properties or in a dedicated metadata structure embedded in the document file.
* **Import/Export Functionality:**  
  Easily export and import character metadata in XML or JSON format for portability and backup.

**2.3. AI Integration**

* **GenAI Configurations:**  
  Configure and manage integrations with various AI services (e.g., ChatGPT, Co‑Pilot, Gemini, Claude) for advanced features such as querying AI for writing assistance.
* **Standard Configurations:**  
  Predefined configurations for popular GenAI services can be added automatically and then customized by the user.

**2.4. Settings Management**

* **User, System, and Document Settings:**  
  A centralized settings system that stores:
  + **System Settings:** Global configurations (stored as the first entry in the settings list with username "SYSTEM").
  + **User Settings:** Personalized configurations tied to the current Windows user (retrieved via Environment.UserName).
  + **Document Settings:** Document-specific settings (e.g., show page numbers, default chapter style) that travel with each Word document.

**3. Architecture & Design**

**3.1. Add‑in Structure**

* **ThisAddIn Class:**  
  The entry point for the add‑in. It initializes the add‑in, loads settings, and handles document events (e.g., before save, document change). It also manages the task pane and the global metadata object.
* **ProseToolsRibbon:**  
  The ribbon UI that integrates ProseTools into Word. It includes buttons for starting new metadata, managing characters, scanning for character names, and AI configuration management.
  + **GenAIDropDown:** Combines system and user GenAI configurations, where user settings override system defaults if they share the same service name.
  + **ProseTypeDropDown:** Allows the selection of a prose type (Novel, Research Paper, Technical Paper, Screenplay) for metadata creation.

**3.2. Metadata and Settings**

* **ProseMetaData:**  
  An abstract base class for document metadata. Derived classes (e.g., NovelMetaData, ResearchPaperMetaData, TechnicalPaperMetaData, ScreenplayMetaData) manage specific metadata types.
* **ProseToolsSettings:**  
  Consolidates application settings into one object:
  + **UserSettingsList:** A list where the first element (with Username "SYSTEM") holds global configurations, and subsequent entries store per‑user configurations.
  + **DocumentSettings:** Stores document-specific settings.

Both UserSettings and DocumentSettings implement XML serialization (ToXML()) and deserialization (FromXML()) methods for persistence.

**3.3. AI Integration**

* **GenAIConfig & GenAIService:**  
  The GenAIConfig class stores configuration data for AI services (e.g., ChatGPT, Co‑Pilot, Gemini, Claude) and includes methods to serialize/deserialize settings.  
  GenAIService encapsulates the REST API call using RestSharp to query the AI service, returning a textual response that can be integrated into the document.

**3.4. UI Dialogs**

* **aiSettingsManagerDlg:**  
  Manages a combined list of system and user GenAI configurations. It allows users to add new configurations, delete existing ones, edit configurations via a GenAISettingsDlg, and quickly add standard AI service configurations.
* **GenAISettingsDlg:**  
  Provides a detailed form for editing the configuration of a single GenAI service, including fields for username, password, API key, authentication URL, model name, and a flag to choose between API key and username/password authentication.
* **AttributeManagerDlg:**  
  A dedicated dialog for managing key/value attribute pairs for character metadata. It prevents modification of reserved keys (e.g., "ProseType") and allows adding, editing, and deleting of attributes.
* **Character Management & ScanForCharacters:**  
  Separate dialogs (e.g., CharacterManagement, ScanForCharacters) that allow users to manage character profiles and automatically scan the document for potential character names.

**4. Installation & Deployment**

**4.1. Auto-Launch & Environment**

* **Auto-Launch:**  
  The add‑in is configured to auto-launch with Microsoft Word.
* **Target Platform:**  
  Microsoft Word for Windows (Office 2013 and later), tested with Word 2016 and Word 365.
* **Framework & Dependencies:**  
  .NET Framework 4.8.1, VSTO runtime, and (if using AI features) a valid Python runtime with necessary libraries.

**4.2. Deployment Methods**

* **ClickOnce Deployment:**  
  ProseTools can be published using ClickOnce, allowing easy installation and automatic updates.
* **Prerequisites:**  
  Users must have Microsoft Word (Office 2013 or later), .NET Framework 4.8.1, and the VSTO runtime installed on their Windows machines.

**5. Usage Instructions**

**5.1. Launching ProseTools**

* The add‑in auto-launches with Word. Look for the ProseTools tab in the ribbon.

**5.2. Managing Character Metadata**

* **Adding Metadata:**  
  Use the “Start Prose” button to begin a new metadata session for a document.
* **Editing Metadata:**  
  Use the Outline form to review and modify character details.
* **Scanning for Characters:**  
  Use the “Scan for Characters” function to detect potential character names in your document.

**5.3. AI Configuration**

* **Accessing AI Settings:**  
  Click the “AI Settings” button in the ribbon to open the AI Settings Manager dialog.
* **Editing AI Configurations:**  
  Use the provided dialogs to add, delete, or edit GenAI configurations. Standard configurations for ChatGPT, Co‑Pilot, Gemini, and Claude can be added with one click, with the option to further configure them.
* **Querying AI:**  
  Once configured, you can use the query interface (e.g., an AIQuery dialog) to send prompts to your selected GenAI service.

**5.4. Settings Management**

* **Global Settings:**  
  System and user settings are stored in a settings file (ProseToolsSettings.xml) and are automatically loaded when Word starts.
* **Document Settings:**  
  Settings specific to the document (such as page numbering and chapter style) are embedded in the document’s metadata.

**6. Troubleshooting & FAQs**

* **The add‑in does not load:**  
  Ensure that Microsoft Word is running on Windows and that the VSTO runtime is installed.
* **Metadata is not saved:**  
  Verify that the document is not protected and that you have write permissions.
* **AI query returns an error:**  
  Check your GenAI configuration (API key, Auth URL, Model Name) in the AI Settings dialog.
* **Settings are not persisting:**  
  Confirm that the settings file (ProseToolsSettings.xml) exists in the application directory and that there are no errors during load/save.
* **RestSharp or Python errors:**  
  Ensure that the proper versions of RestSharp and Python.NET are installed and that environment variables (PYTHONHOME, PYTHONNET\_PYDLL) are correctly configured.

**7. Developer Documentation**

**7.1. Code Structure Overview**

* **ThisAddIn.cs:**  
  Entry point for the add‑in; handles startup, shutdown, and event subscriptions.
* **ProseToolsRibbon.cs:**  
  Contains ribbon logic including dropdown population, button event handlers, and UI updates.
* **Metadata Classes (ProseMetaData and Derivatives):**  
  Handle serialization and deserialization of metadata and integration with Word.
* **Settings Classes (ProseToolsSettings, UserSettings, DocumentSettings):**  
  Centralized storage of global settings, with XML persistence.
* **AI Integration (GenAIConfig, GenAIService):**  
  Manage configuration and communication with external AI services.
* **UI Dialogs:**  
  Various forms (CharacterManagement, aiSettingsManagerDlg, GenAISettingsDlg, AttributeManagerDlg, etc.) for user interaction.

**7.2. Extending the Codebase**

* **Adding New Metadata Types:**  
  Create a new derived class of ProseMetaData and override necessary methods (e.g., ToXML, WriteToActiveDocument).
* **Adding New AI Services:**  
  Update GenAIConfig and GenAIService to support additional endpoints or authentication methods.
* **Settings Updates:**  
  If new global settings are required, extend ProseToolsSettings and update its ToXML/FromXML methods accordingly.

**8. Future Enhancements**

* **Real-Time Collaboration:**  
  Implement features to sync metadata across documents or via cloud services.
* **Advanced AI Features:**  
  Add AI-driven character generation, name suggestions, or dynamic narrative prompts.
* **Extended Plot and Scene Management:**  
  Integrate additional modules to manage plot outlines or scene details.
* **Enhanced UI/UX:**  
  Improve the visual design and user experience based on user feedback.
* **Cross-Platform Support:**  
  Explore possibilities for supporting Word Online or macOS in future versions.

**9. Support & Maintenance**

* **User Support:**  
  Provide a user manual and help documentation accessible through the add‑in and online.
* **Developer Support:**  
  Maintain developer documentation and version control notes to facilitate future enhancements.
* **Maintenance Plan:**  
  A minimum of one year of routine maintenance post-release, including bug fixes, compatibility updates, and performance improvements.

**10. Conclusion**

ProseTools aims to simplify the creative process for authors and scriptwriters by integrating robust character management and metadata functionality directly into Microsoft Word. With its deep integration into the Windows environment and a modular, extensible architecture, ProseTools is poised to improve workflow, ensure narrative consistency, and provide valuable AI-assisted writing support.