AMERICAN INTERNATIONAL UNIVERSITY–BANGLADESH (AIUB)

FACULTY OF SCIENCE & TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE

SOFTWARE ENGINEERING

PROCESS MODEL SPECIFICATION ON

Robo Hatch - A Robotics Development Platform

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Selected Model for Robo Hatch: Spiral Process Model

We selected the Spiral Model for our Robotics Project Platform because it features adjustable design while maintaining risk management order and multiple iteration capabilities. The platform combines three user groups (freelancers, companies and administrators) while requiring steady platform development and user feedback admission. The Spiral Model enables phased development which permits evaluations along with risk analysis at short intervals.

Comparison with other models (Why not other models for Robo Hatch?)

Waterfall Model:

- **Reason not suitable**: The process has limitations because it operates with strict sequential direction. Any phase that ends becomes resistant to alterations which must be harder to implement.
- **Impact on our project:** The Robotics Platform must deal with frequent updates because it requires dynamic user responses. A multi-user evolving system requires iterative feedback and modifications since the Waterfall Model does not provide these capabilities.

Agile Model:

- **Reason Not Suitable:** Agile promotes flexibility and quick iteration but lacks formal documentation and strong risk management.
- **Impact on Our Project:** The project faces restrictions due to legal and national requirements such as GDPR and IP laws that need structured planning and traceable documentation which could be compromised by Agile.

Incremental Model:

- **Reason Not Suitable:** The method lacks an effective risk management framework that should be implemented from the start of development.
- **Impact on Our Project:** The assessment of potential dangers including legal requirements and payment security and user data privacy protection should take place in advance of both platform development and individual feature implementation.

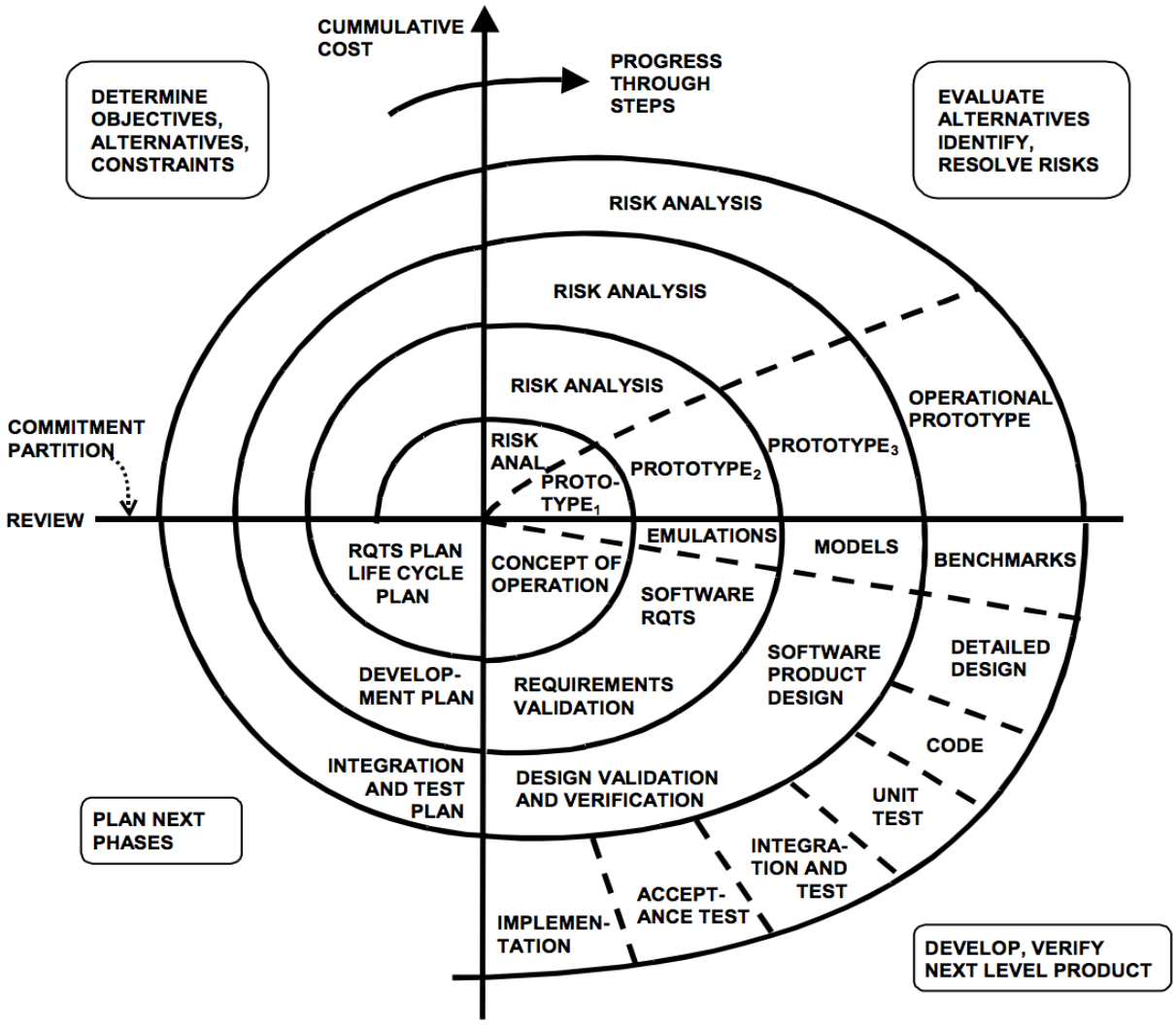
V-Model:

- **Reason Not Suitable**: The V-Model enforces rigid planning and assumes all requirements are fixed from the beginning.
- **Impact on our project**: Evolution of requirements needs to be enabled by the Robotics Platform according to emerging technologies and user feedback, but the V-Model lacks this capability.

Advantages of the Spiral Model for Robo Hatch

- **Iterative Development:** The system builds progressively through successive iterations to introduce programming steps that start with AI recommendations followed by project
- tracking capabilities and secure messaging functions.

- **Risk Management:** Each spiral cycle entails both the discovery of possible risks including legal problems and data security incidents and system capability failures and their subsequent prevention measures.
- **User Feedback Integration:** A continuous feedback loop from stakeholders directs the future development steps to improve the system by implementing actual organizational requirements.
- **Support for Complex Systems:** The Spiral Model serves projects featuring massive development risks where artificial intelligence (AI) meets cloud platforms along with user interface integration.



Role identification and responsibility allocation

Role	Responsibilities
Project Manager	The project leader guarantees both task completion deadlines and achievement of milestones while maintaining team-wide communication.
System Analyst	Collects requirements, interprets user needs, and translates them into technical documentation.
UI/UX Designer	Designs user-friendly interfaces that reduce complexity and improve task efficiency.
Frontend Developer	Implements responsive and functional user interfaces using React or ASP.NET Razor Pages.
Backend Developer	Secure implementation of APIs and data integration, server-side programming logic along with business logic elements will follow.
Database Administrator	The implementation of data models and schemas by the data engineer ensures secure storage of users, projects, payments together with transactions.
AI/ML Engineer	Trains and maintain recommendation algorithms for project-user matching.
Quality Assurance (QA)	Performs manual and automated testing using tools like Selenium; ensures feature integrity before releases.
DevOps Engineer	Handles cloud deployment (AWS/Azure), CI/CD pipelines, and system scaling.
Security Analyst	Ensures GDPR compliance, data encryption, and role-based access controls.

Impact Identification

Freelancer:

- Defined project development stages (displaying design then prototype and deployment sections) can be accessed for verification.
- The system provides AI-generated project-to-skills-history recommendations.

Companies:

- Streamlined hiring and collaboration process.
- Centralized platform reduces time and costs for prototyping and delivery.

Industry impact:

- Facilitates legal and technical collaboration among verified entities.
- The platform promotes both modular robotics advancement together with shared innovation projects.

Student and researchers:

- Exposure to real-world applications and professional environments.

- Opportunities to monetize research and gain experience.

Economic impact:

- Boosts local tech economies by connecting talent to demand.
- Secure and legal outsourcing within national boundaries reduces risk

Technological impact:

- Encourages real-world AI use in project matchmaking.
- Cloud-native development for scalable robotics infrastructure.

Conclusion

The Spiral Model best suits the Robotics Project Platform because it effectively balances control measures with flexibility and continuous development needs.

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