iGo: Ticket Vending Machine

SOEN 6461 - SOFTWARE DESIGN METHODOLOGIES - WINTER 2023

Team - D

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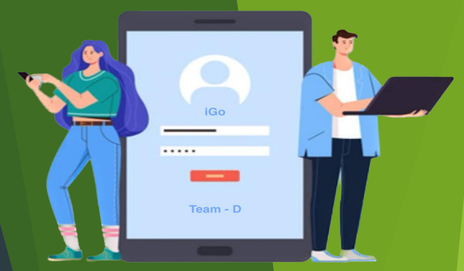
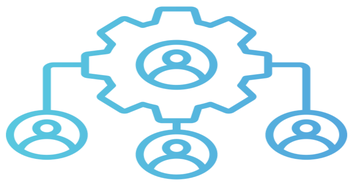
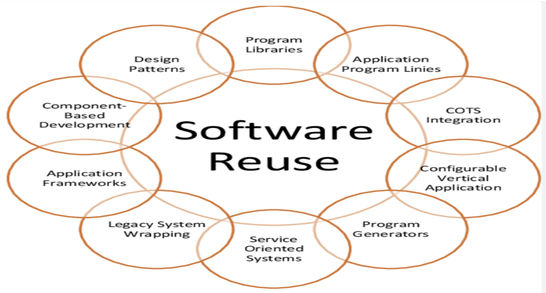


Collaboration patterns

- The main collaboration patterns that were used in the project were **group meetings**
- To make everyone notified of any changes we used in the project were **group meetings** collaborated on **Google Docs** and also maintained our work updated on **GitHub.**
- Meetings were conducted at the beginning of each deliverable **to discuss the deliverable problems, solutions, and confusions**.
- During the work on iGo project we followed Parallel Collaboration.



Reuse Potential



- **Total Reuse:** An iGo smart card system can be relocated to a new location to provide contactless payment services.
- **Partial Reuse:** RFID chips or readers maybe removed and used in other applications.
- **Upcycling:** The smart cards used can also be upcycled to create new products with different functions or designs.
- **Recycling:** Cannot be reused in any form, can still be recycled to recover valuable materials.

Lessons Learnt

- **Communication and collaboration are key**: Effective communication and collaboration are essential for the success of any software development project.
- **Prioritize the most important features:** With limited time and resources, it's critical to focus on the most important features of a software system. The team identified the top use cases and prioritized them based on their impact on the user experience.
- **Use the right tools:**Choosing appropriate tools for the job and being open to new ones is essential, as demonstrated by the team's effective use of PlantUML and LaTeX for diagramming and report writing.
- **Iterative is Key:**Iterative refinement of the design based on feedback and testing is key to improving the overall quality of the software development process.

Scope in different Programming Language

- Solution domain model uses standard OOD principles.
- Syntax-agnostic.
- No language-specific features or constructs (e.g., no multiple inheritance). Strong typed attributes (data types supported by most OOD languages).
- Methods have standard signatures (in modern OOD languages).

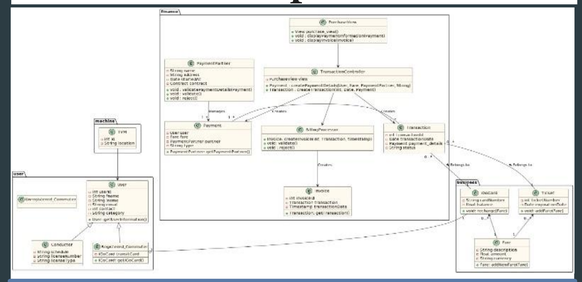
Critical Decisions

- **Designing the class diagram and domain model:** To determine the system's structure and component's interaction.
- **Coordinating communication and collaboration:** Effective communication and collaboration was a key to smooth work over the project tenure.
- **Choosing the right diagramming tool:** As it effectively visualized and communicated the system design, and ability to generate high-quality output.
- **Choosing the right technology stack:** To avoid poor performance, security vulnerabilities, and maintenance and scalability issues.

Limitations

- **Limited Design Options of Tkinter**
- **Limited Platform Support:** includes only
- desktop applications.
- **Limited Graphics Capabilities**
- **Performance:** May not be a good fit for real-time applications.
- **Lack of Compatibility:** Tkinter may not be compatible with other Python GUI libraries.

Insulated Implementation



- **Modular Approach.**
- **Well-defined interfaces interacting without loss of privacy.**
- **MVC Design pattern to isolate GUI, Controller and Database for easy updation.**
- **Module testing.**
- **Use of versioning control tool such as Git**

References

- PANKAJ KAMTHAN (2023) "Introduction To Domain Modeling" - Section 14,15,16.
  PANKAJ KAMTHAN (2023) "Introduction To Use Case Modeling" - Section 11, 12.
- http://www.stm.info/en

Acknowledgements

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Tools Used

UML Designer · IJ · Tkinter · jupyter