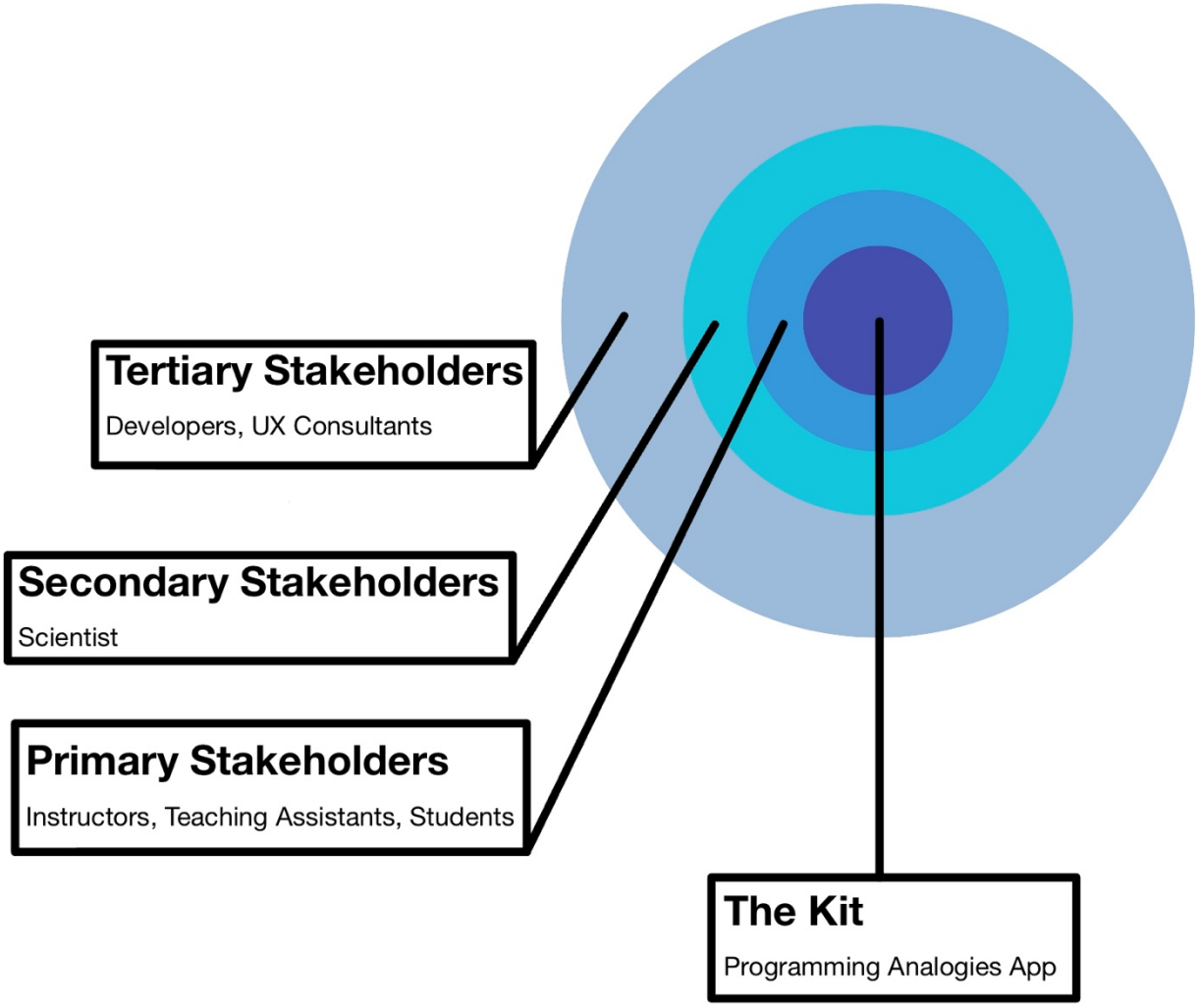
CS5760
Human-Computer Interaction

Evaluation Assignment 4: Design Support Document
Stakeholder Analysis, Goals, Personas, Hierarchical Task Analysis

Kirk Thelen
Team 1 – Programming Languages (Dr. Briana Bettin)
January 2023

01. Stakeholder Analysis

a. Onion model of each stakeholder



b. Description of each stakeholder

Primary Stakeholders: The users of the app.

01. Instructors
    a. These stakeholders want the app to help them translate their knowledge about programming concepts into useful, real-world analogies that students will understand in order to facilitate learning. They want to use the app to find new analogies, create new analogies, and rate past analogies that they've used.
02. Teaching Assistants
    a. These stakeholders want the app for similar reasons to Instructors but will have different levels of background information that may result in them utilizing the app in different ways than Instructors. Notably, they want the app mostly for finding new analogies as opposed to making new analogies.
03. Students
    a. These stakeholders are the ones that rely on the success of the app and the usefulness of the analogies. The primary users want to use the app to help teach these secondary users the programming concepts, so these stakeholders want the analogies to be effective at communicating the concepts.

Secondary Stakeholders: The stakeholders who will not directly use the app but that have specified the app and depend on results from it.

01. Scientist
    a. This stakeholder (or stakeholders, in the case of multiple Scientists) created the concept for the app, as well as the initial programming analogies in the app. This user wants to know how effective individual analogies are as well as how effective the app is as a whole to facilitating learning programming concepts in this way.

Tertiary Stakeholders: The stakeholders that affect the design and development of the app, but that don't necessarily interact directly with the app as users.

01. Developers
    a. These stakeholders are creating the app to the specification laid out by the Scientist. They want the app to match the expectations of the Scientist and be usable to create, search, and rate programming analogies.
02. UX Consultants
    a. These stakeholders are helping the Developers with the app, not on development but on testing. They want the app to be as usable and accessible as possible in order to help it be successful at communicating programming analogies to as many people as possible.

c. Stakeholders' goal-influence table

Users	Goals	Influences: Contributing	Influences: Constraining
Instructors, Teaching Assistants	▪ Create, search, and rate programming analogies ▪ Use programming analogies to teach programming concepts to Students	▪ Ability to create new programming analogies ▪ Ability to rate existing programming analogies ▪ Knowledge about programming concepts that can be used to create and assess analogies	▪ Knowledge of the material used in the analogy (i.e., might encounter an analogy they do not understand) ▪ Experience with the app itself (is it usable?) ▪ Possible lack of time or motivation to use the app
Scientist	▪ Design and facilitate the development of the app ▪ Collect and analyze user analogy feedback to determine what makes an analogy effective	▪ Knowledge on programming concepts ▪ Knowledge on analogies, particularly on using analogies with programming concepts ▪ Ability to design and communicate the specifications of the app	▪ Time ▪ Limited/no interaction directly with the app's code
Students	▪ Learn programming concepts via analogy	▪ Limited/no previous experience with specific programming concepts allows them to try to learn those concepts via analogy ▪ Assess whether they feel the analogy was effective for their learning or not	▪ Time ▪ Wants to learn the material but could feel frustrated over ineffective analogies (could ineffective analogies be more harmful than helpful?)
Developers, UX Consultants	▪ Create an app that follows the Scientist's specification and meets the Goals of the users ▪ Ensure the app is accessible and usable	▪ Technical experience and knowledge around app development ▪ Ability to analyze the functionality of the app ▪ Ability to analyze the usability of the app	▪ Development experience, time, manpower ▪ Ability to survey and communicate directly with users

02. Personas for the primary stakeholders

Persona 1: Dr. Douglas Brockmeier, Instructor (Primary user)

- 38 years old
- 6’2”
- 175 lbs.
- Left-handed
- Ph.D. in Computer Science
- Married with two children
- Tenured faculty at University of Superior

Dr. Brockmeier received the University of Superior Distinguished Teaching Award in 2020. He is a favorite professor of first and second-year computer science students, and he is the only instructor at his university that teaches Introduction to Programming I, which teaches students C++.

Dr. Brockmeier is extremely busy, as he currently has two Ph.D. students of his own that he is an advisor to. His Introduction to Programming course is always over 200 students and he’s noticed that there are some concepts that a majority of students struggle with. He is looking for a way to communicate these concepts more effectively to students, but he doesn’t have a lot of time to spend trying to come up with new ideas on his own.

At home, Douglas is just like any other dad who loves his kids and helps his wife around the house. He is a handyman who spends some of his free time making home improvements, much to the surprise of his friends.

Persona 2: Alaina Ragatz, Teaching Assistant (Primary user)

- 22 years old
- 5’6”
- 155 lbs.
- Right-handed
- Computer Science Ph.D. student
- Unmarried, but has been with her girlfriend for 4 years
- Teaching assistant for Introduction to Programming I at the University of Superior

Alaina is an excellent student and an even better teaching assistant. She finished her undergraduate degree in computer science summa cum laude and received funding as a teaching assistant to pursue her Ph.D.

Alaina is very confident in her abilities to communicate programming concepts, especially to other students, but she has noticed that some students are not as engaged during her labs as she would like. Alaina is looking for a more engaging or exciting way to help her teach these concepts to students.

Alaina is very busy since she runs multiple labs per week and has her own coursework to do, but she is very technologically savvy and likes learning new things. In her free time, she likes to watch Netflix originals (her favorite is *Stranger Things*), listen to Korean pop music, and read fantasy novels.

Persona 3: Jennie Zhang, Student (Secondary user)

- 18 years old
- 5’4”
- 130 lbs.
- Right-handed
- First-year Computer Science undergraduate student
- Single

Although Jennie excelled in high school, she’s been struggling so far in her first year at the University of Superior. She is an out-of-state student, and this is her first time living away from her family, the stress of which has resulted in her skipping some of her lectures.

Jennie has been struggling to understand classes and objects in C++ and has made an appointment with her teaching assistant. She is embarrassed to ask her teaching assistant for help with this concept because she is not used to struggling with academics. She does well with real-world examples and is hoping her teaching assistant can help her make sense out of the code in the textbook.

Outside of her coursework, Jennie loves sports and she used to play lacrosse in high school. She has two dogs back home in California that she misses very much, and she likes to start her mornings with some homemade matcha.

Persona 4: Tyler Durnen, Student (Secondary user)

- 20 years old
- 5’10”
- 160 lbs.
- Right-handed
- Third-year Computer Science undergraduate student
- Unmarried, but has been with his girlfriend for 6 months

Tyler is a third-year student at the University of Superior and recently switched majors from mechanical engineering to computer science. Tyler is an above-average student, so he doesn’t think Introduction to Programming I is going to be very much of a challenge. Despite this, he wants to succeed and is looking for something he can utilize to help his own learning on the side.

Tyler isn’t interested in going to office hours or seeing his teaching assistant unless he thinks it’s absolutely necessary. He is independent and hardworking, and just wants something that can help him confirm that he understands the concepts he's learning in class.

Outside of his coursework, Tyler likes to play board games with his friends, watch reality TV with his girlfriend (they have seen every season of *Too Hot to Handle*), and take long naps.

03. Hierarchial Task Analysis

Home Screen:

- Displays popular analogies/list of all analogies
- "Search" button, which opens "Search View"
- "New" button, which opens "New Analogy View"
- "Log in" button, which opens "Log in View"
- "Sign up" button, which opens "Sign up View"

Search View:

- Search by programming concept or by analogy
- Search only among analogies with a certain rating
- Search by keyword match
- Search by analogy context:
  - Misconceptions, desired knowledge, domain, precondition, etc.
- Shows "Results View" after search is completed

Results View:

- Shows analogies that matched search query if any
- User can open the analogy to see the entire analogy context
- User can favorite analogy
- User can rate analogy
- User can report analogy
- "Compare" button, which opens "Compare View"

Compare View:

- User can search for another analogy/insert the ID of another analogy to compare it to the selected analogy
- Shows the analogy contexts side by side

New Analogy View:

- Inputs for the analogy context
  - Misconceptions, desired knowledge, domain, precondition, etc.
- Possible that not all fields are necessary for every analogy

Log in View:

- Inputs for username and password
- "Sign up" button, which opens "Sign up View"

Sign up View:

- Inputs for username and password
- Inputs for any other necessary account information

04. Notes from interview with the scientist

- Opal/Analogy Context format
- Emphasizing certain sections of the context
    - Some elements of context may be unnecessary or empty for some analogies
- Some analogies already exist
    - They may or may not be good
    - Developers can come up with new analogies
- Users:
    - Demographics vary among users (native language, age, ethnicity, background, etc.)
    - Instructors (may be CS but may not be)
        - Technically could even be HS
    - TAs
    - Students
        - May want to use the app as a resource for their own learning
- App:
    - Create new programming analogies
    - Browse/search existing programming analogies
    - Rate/review/report existing programming analogies
    - Favorite analogies
    - View the context of programming analogies
    - Compare programming analogies
    - User notes for programming analogies
    - Analogies shouldn't necessarily just be "beginner" concepts, the domain of the app should encompass all of programming so advanced concepts can be included
- Unique challenges:
    - How to display the analogies/display the creation of analogies
    - How to come up with new analogies/direct users to come up with new analogies
    - How to decide which analogies are "useful"
    - Analogy comparison view
    - The app should be usable by people without accounts (Students don't necessarily have accounts/"Student view")