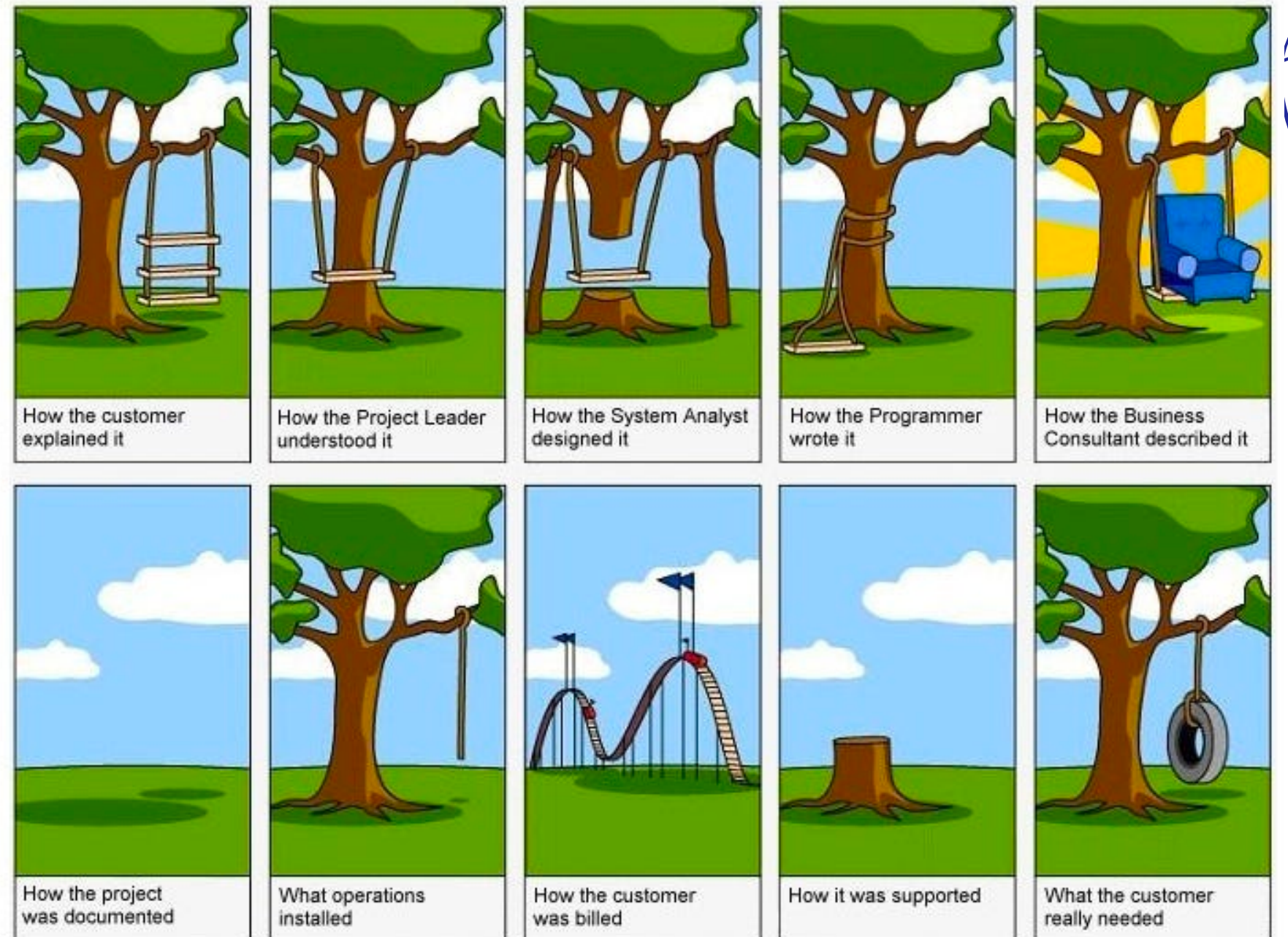# Rock the Software Stage: The Electrifying Band Chemistry of ChatGPT and Humans in User Requirements

An "Empirical" Study by Deborah Etsenake

Background/Motivation

- **Thesis**: The extent of LLMs(ChatGPT) within the educational sector.

- **For this project**: The extent to which we can use chatGPT in user research

- Why the disparity between how the customer explained it and what they really needed?

- **Implications**: Cutting down time to do RE? (Well, D requirements)
-> Saving development costs as well

In this Presentation

Overview

Key Terms

Requirements Engineering
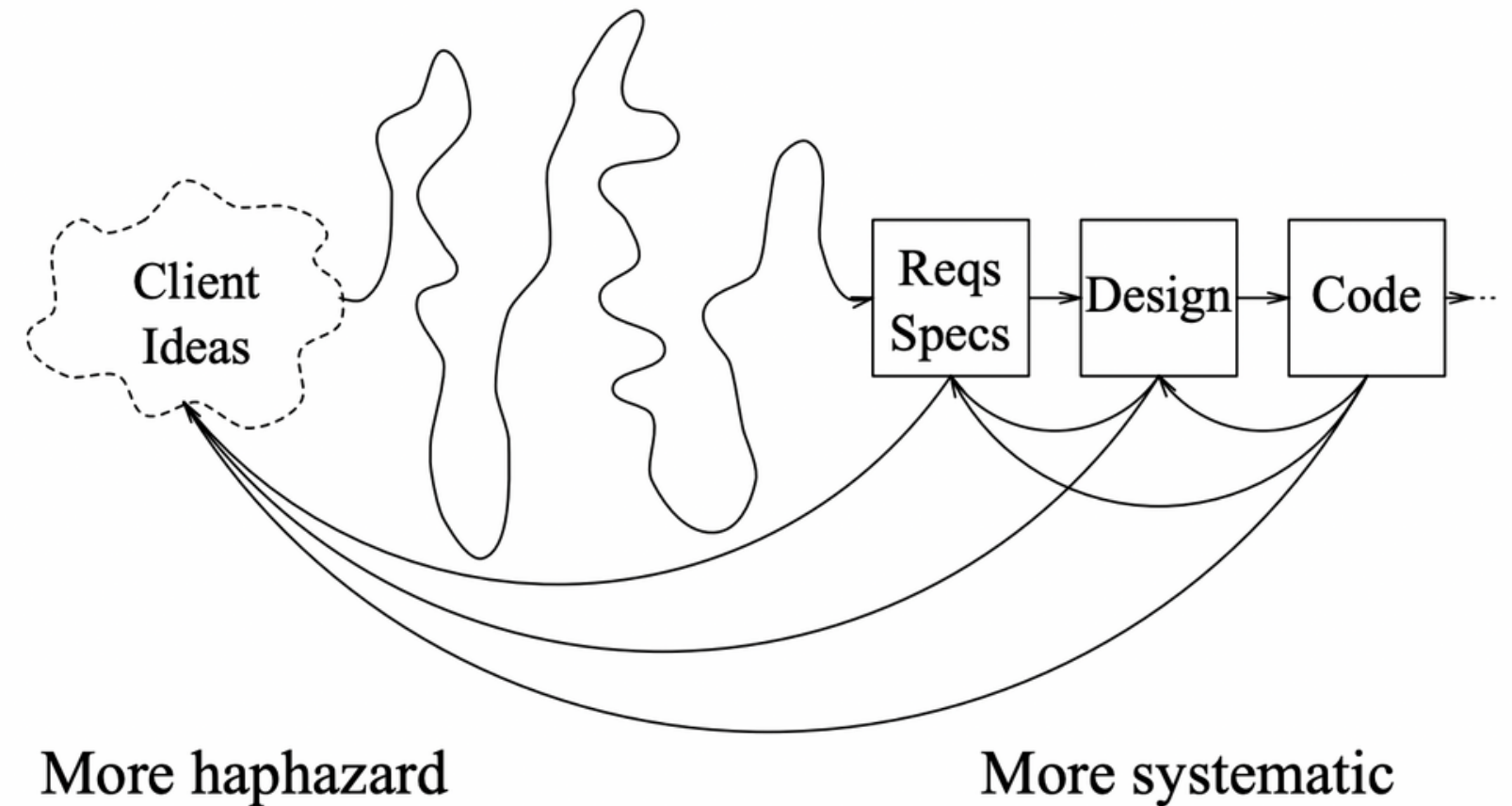
User Research

Prompt Engineering

Requirements Engineering

- Requirements Elicitation & Analysis

- Requirements Specification

- Requirements Validation

- *"That wavy line between Client Ideas and Requirements Specifications is RE"* - Dan Berry

REAL Lifecycle for One Sweep

More difficult than thought to be

Client Ideas → Reqs Specs → Design → Code

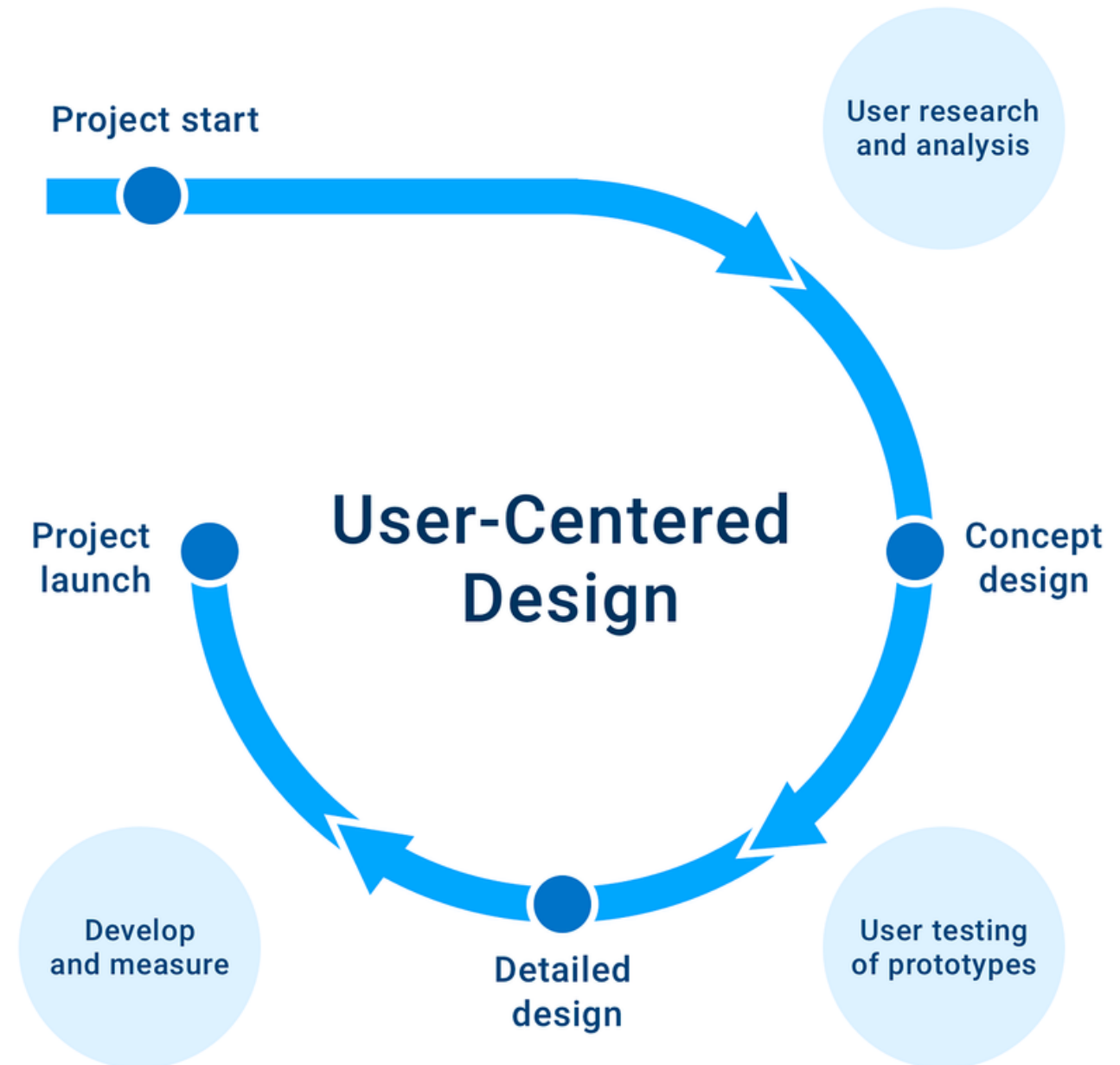More haphazard   More systematic

Dan Berry's Requirements Iceberg Slides

User Research
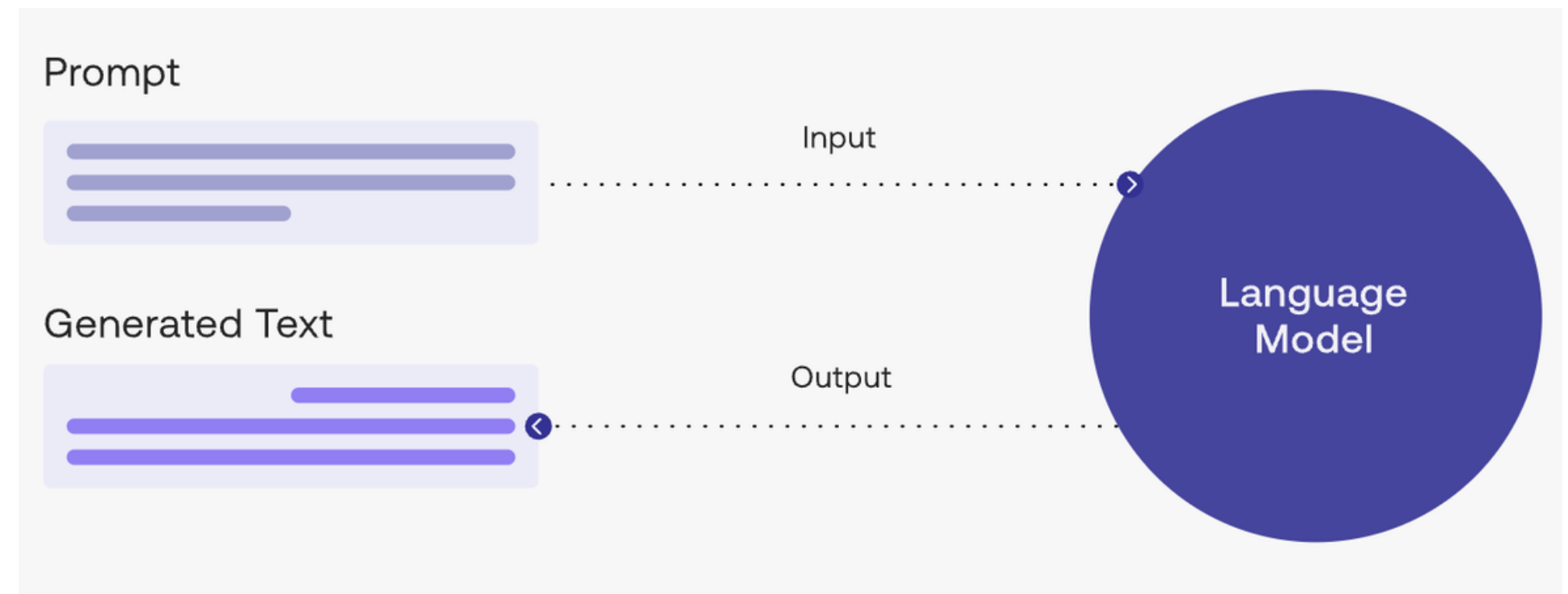
- What is User-Centered Design?

- User research methods:
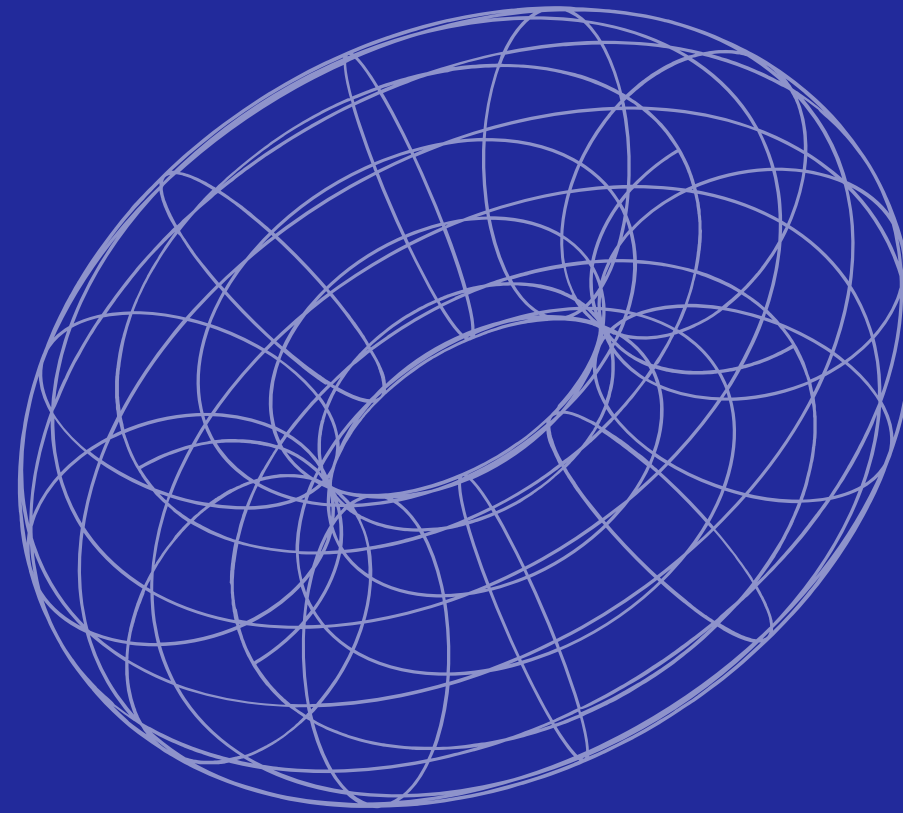 - Focus groups, interviews, surveys, etc.

- Creation of Personas

Prompt Engineering

- Method for getting output from LLMs

- ChatGPT, BloombergGPT, coPilot and all the other kinds you've heard of.

Prompt

Generated Text

Input

Output

Language Model

https://github.com/promptslab/Awesome-Prompt-Engineering

7

Related Work

Towards Human-Bot Collaborative Software Architecting with ChatGPT

- Used ChatGPT to specify requirements as it relates to the architectural style.

- Used an expert with domain knowledge for the software architecting process.

- Limitations: Not user-centered.

1. Aakash Ahmad, Muhammad Waseem, Peng Liang, Mahdi Fahmideh, Mst Shamima Aktar, and Tommi Mikkonen. 2023. Towards Human-Bot Collaborative Software Architecting with ChatGPT. In Proceedings of the 27th International Conference on Evaluation and Assessment in Software Engineering (EASE '23). Association for Computing Machinery, New York, NY, USA, 279–285. https://doi.org/10.1145/3593434.3593468
2. https://www.google.com/url?sa=i&url=https%3A%2F%2Fsloanreview.mit.edu%2Farticle%2Fthe-future-of-customer-service-is-ai-human-collaboration%2F&psig=AOvVaw3MbWO0esEO6pdtZMJ-BYZn&ust=16903163134670000&source=images&cd=vfe&opi=89978449&ved=0CBEQjRxqFwoTCOjikI2VqIADFQAAAAAdAAAAABAE

Conversational AI-Powered Design: ChatGPT as Designer, User, and Product

- Simulated the requirements elicitation and analysis phases with ChatGPT.
  -> Generated user scenarios and simulated interviews with those users.

- Limitations: Also not user-centered

1. A. Baki Kocaballi. 2023. Conversational AI-Powered Design: ChatGPT as Designer, User, and Product
2. https://www.techieclues.com/Images/article/276/Chat%20GPT.png

Research Questions

RQ 1   Can ChatGPT, given a user persona generate requirements in line with that user's needs?

RQ 2   Can the explanation details from ChatGPT be used to aid the process of requirement analysis?

RQ 3   Can we use only ChatGPT to generate user requirements?

What system should I use as a case study?

What system should I use as a case study?

A Church Choir System!
One of my many interests outside of academia :)

https://guardian.ng/wp-content/uploads/2018/10/Fountain-
-1062x598.jpg

14

Aspects of Being in a Church Choir/Band

Scheduling
Rehearsal times/structure, retreats, singing schedules, yearly calendar

Membership Management
active members? inactive members, etc

Song Management
Managing old songs, introducing new songs, learning new songs, Choosing songs

Member Improvement
Singing & instrument capabilities, worship capabilities, leading capabilities, boldness in leading/backup

Community Building
Spiritual improvement, having fun together

Communication
concerns, issues, feedback process, conflict resolution, connecting with rest of church.
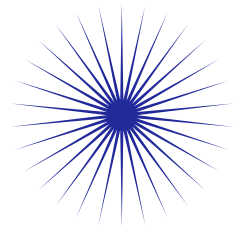
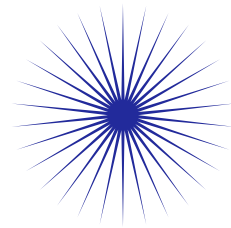Participants?

Participants?
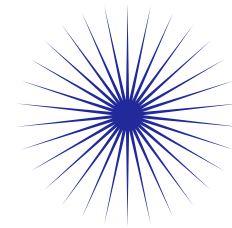
The Jubilee Voices, of course!
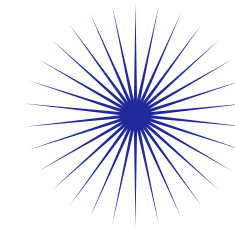
Participants

Choir Members

Sumana as
The Choir Leader

Toyeka as
The keyboardist

Jolewa as
The Backup Singer

ChatGPT 3.5 as
ChatGPT

Can stand in for anyone; just can't actually play any instrument or sing but it sure can teach you how to.

Data Collection

A lot different stuff here, Brace yourself...

Interview Questions for Human Participants

1. **Personal Details:**
   Name, age, stage of life, work, comfort level singing, technical know-how, experience with choirs/bands.

2. **Value Question:**
   What do you think are the important aspects of being in a choir?

3. **Context: Description of Current System**
   Scheduling, member improvement, member management, song management, communication and community building.

4. **Issues with the Current System**

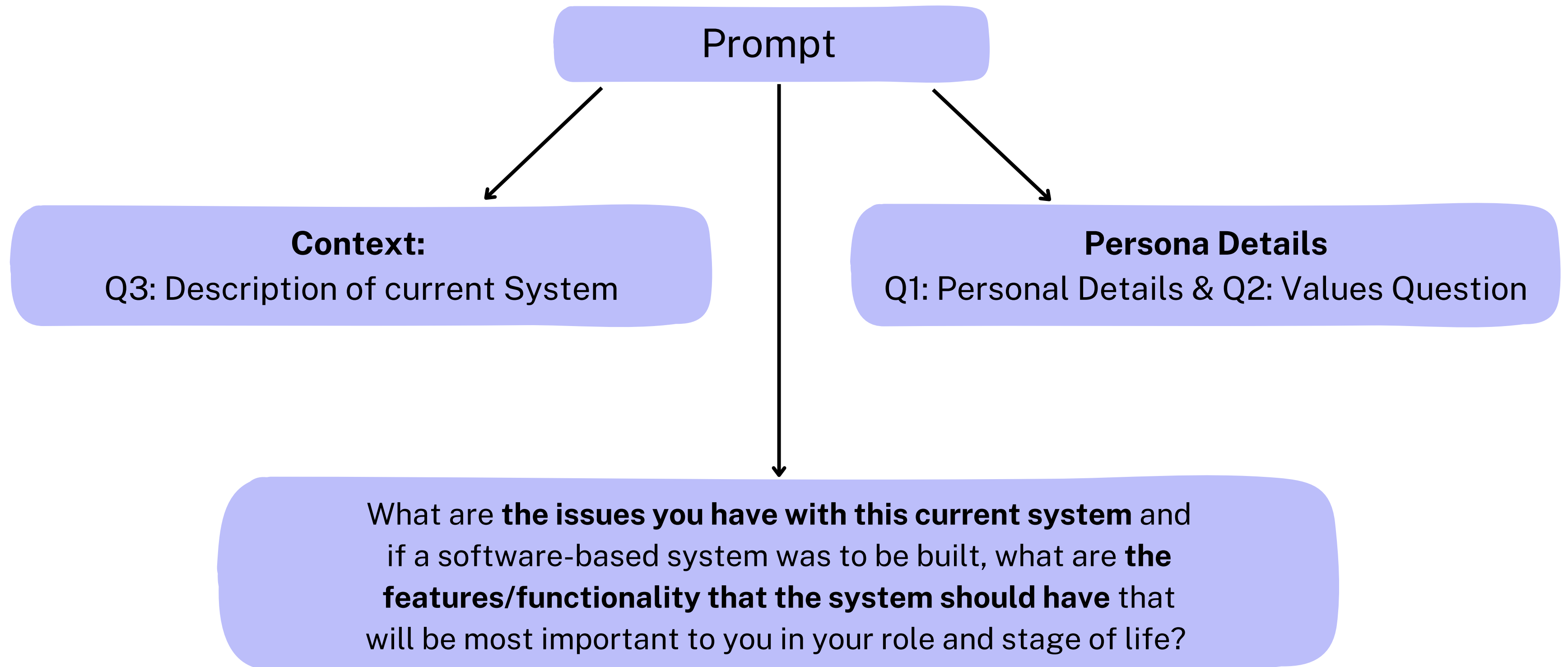5. **Features/funtionality most important to this user.**

ChatGPT Baseline

Prompt

If you were to build a software-based system that does everything related to the needs of a church choir, what will be the features/functionality of the system?

ChatGPT Impersonation

Prompt

Context:
Q3: Description of current System

Persona Details
Q1: Personal Details & Q2: Values Question

What are **the issues you have with this current system** and
if a software-based system was to be built, what are **the
features/functionality that the system should have** that
will be most important to you in your role and stage of life?

ChatGPT Impersonation Verification

Asked users to rate the usefulness of the requirements that ChatGPT had generated in line with their own profile.

Categories Generated

Membership Management

Instrument Augmentation

Scheduling

Member Improvement

Song Management

Performance Logistics

Easily Accessible

Worship Section Planning

Communication & Collaboration

Analytics for leaders

RQ1

Can ChatGPT, given a user persona generate requirements in line with that user's needs?

GPT Vs The Backup Singer

The BackUp Singer

ChatGPT

Scheduling

Scheduling

Member Improvement

Member Improvement

Song Management

Song Management

Communication & Collaboration

Communication & Collaboration

Instrument Augmentation

Easily Accessible

GPT Vs The Choir Leader

The Choir Leader

Member Improvement

Easily Accessible

Analytics for Leaders

Communication & Collaboration

Song Management

Member Management

Instrument Augmentation

Scheduling

ChatGPT

Member Improvement

Easily Accessible

Analytics for Leaders

Communication & Collaboration

Song Management

GPT Vs The Keyboardist

The Keyboardist

ChatGPT

Member Improvement

Member Improvement

Scheduling

Scheduling

Song Management

Song Management

Communication & Collaboration

Instrument Augmentation

Easily Accessible

Do GPT details aid in requirement analysis?

The Backup Singer

Member Improvement

"Something I find important is voice training. For myself, I find that I loose my voice easily when I sing so I think if I have someone to train me on how to treat my voice, I feel I would be much better."

ChatGPT

Member Improvement

"Voice training: As someone with limited experience in singing, I am keen on improving my vocal skills. It would be valuable to have a dedicated section within the software-based system for vocal training resources. This could include vocal warm-up exercises, tutorials, and practice materials specifically tailored to the choir's singing style. Additionally, the system could track and monitor individual progress in voice training, providing personalized recommendations and feedback. and preferences."

Is this a guide to what the user actually wants?

RQ2

Can ChatGPT details be used to aid the process of requirement analysis?

GPT Vs The backup Singer

ChatGPT Specific Categories

Timeliness of Rehearsals
5

Instrumentalist Scheduling
5

Voice Training
5

Personalized practise Schedule
3

Song Suggestions and Notations
5

Skill Development Tracking
5

Communication and Conflict Resolution
2

Event Reminders and Updates
5

The Backup singer mostly loved it.

GPT Vs The keyboardist

ChatGPT Specific Categories

Centralized Communication Platform
5

Automated scheduling and instrumentalist rotation management
5

Dedicated song management and digital setlist creation
5

Audio or video references for learning new songs
5

Recording functionality for self-improvement and experimentation
5

Mobile app or accessible web interface for convenient access
5

Community-building features to facilitate coordination and celebration among choir members
5

The Keyboardist loved it!

GPT Vs The Choir Leader

ChatGPT Specific Categories

Communication
5

Scheduling and Event Management
5

Song Management
5

Skill Development
5

Quick Adjustments to songlist
5

Member Management
5

Conflict Resolution and Support
5

Collaborative Song Management
4

User-Friendly Interface
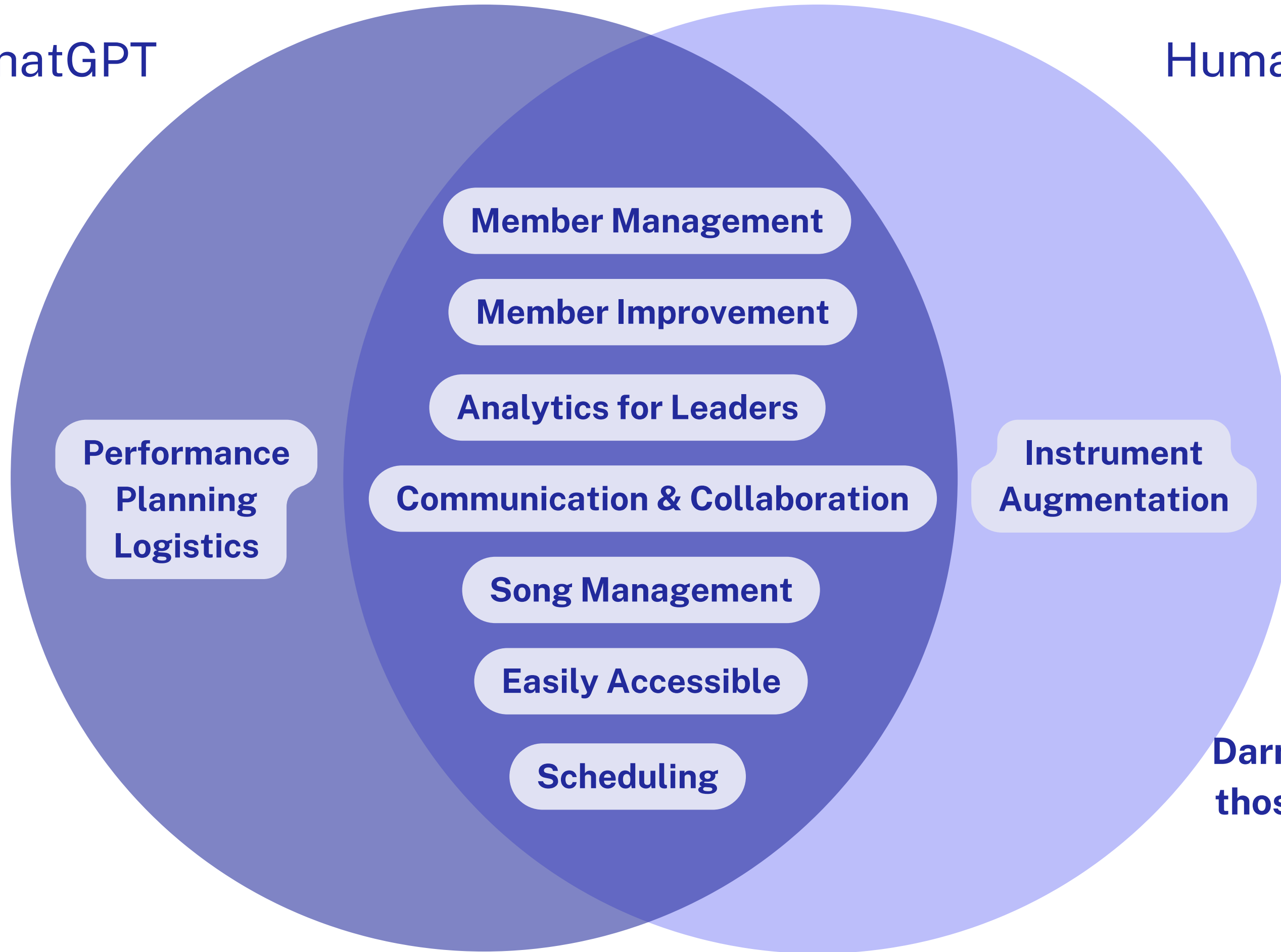5

The Leader mostly loved it!

33

RQ3

Can we use only ChatGPT to generate user requirements?
(Maybe we don't need the humans to build tools for the humans)

ChatGPT Vs Humans

ChatGPT

Humans

Member Management

Member Improvement

Analytics for Leaders

Performance Planning Logistics

Communication & Collaboration

Instrument Augmentation

Song Management

Easily Accessible

Scheduling

Darn it! We still need those pesky humans

Performance Planning Logistics

Anything that has to do with planning out the order of song performance and singing at other venues. Anything logistics related.

The Backup Singer
2

The Keyboardist
5

Choir Leader
4

They seem to disagree on its usefulness

Instrument Augmentation

- Electronically adding musical elements to a live performance.

- Usually not something present in choir management tools.

- There are such tools actually but they are more existent to create ambience and are available in music production.

Limitations

I did say "empirical" in quotes

1   Small sample size.

2   GPT-3.5 and not GPT-4 (the authors say GPT-4 is better at "creative" tasks)

Future Work

For myself or anyone else who would like
to go into this stuff

1   Prototyping! (the fun stuff)

2   Try out GPT-4

3   Leveraging prompt patterns

Bringing it All Together

What does all this Mean?

RQ1

Can GPT, given a user persona generate requirements in line with that user's needs?

Answer:
Sort of; It missed some stuff.

RQ 2

Can the explanation details from ChatGPT be used to aid the process of requirement analysis?

Answer:
It seems so; the users seem to like its elicitation details.

RQ 3

Can we use only ChatGPT to generate user requirements?

Answer:
Unfortunately, GPT alone misses some stuff :(

What does all this Mean?

RQ1

Can GPT, given a user persona generate requirements in line with that user's needs?

Answer:
Sort of; It missed some stuff

RQ 2

Can the explanation details from ChatGPT be used to aid the process of requirement analysis?

Answer:
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RQ 3

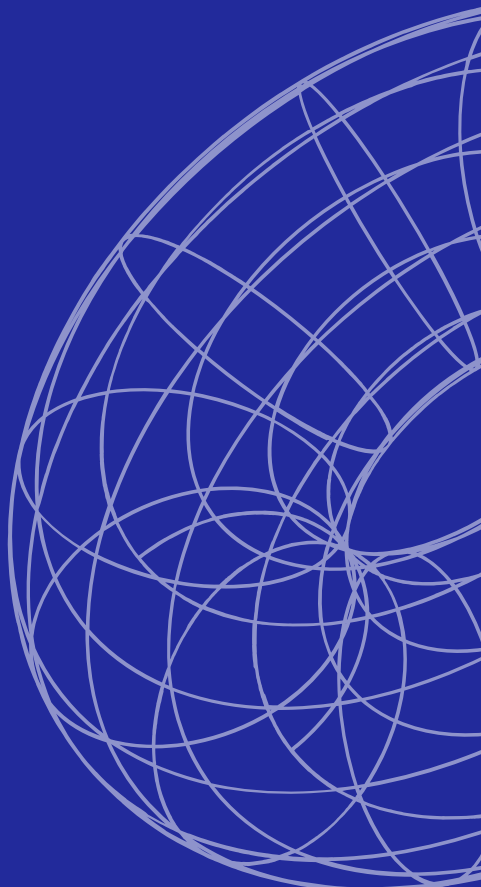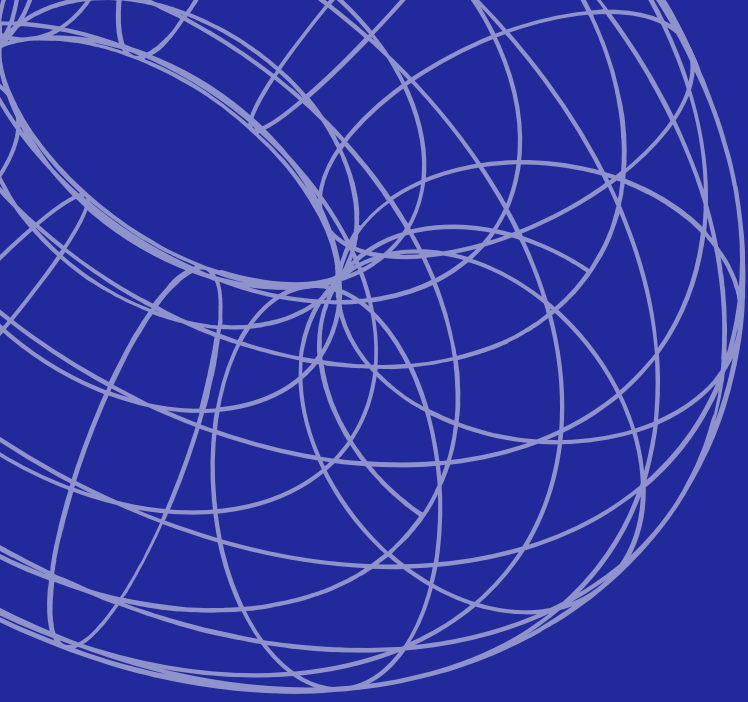Can we use only ChatGPT to generate user requirements?

Answer:
Unfortunately, GPT alone misses some stuff :(

Conclusion:

Just like a band needs all its members to jam together, ChatGPT isn't meant to hog the spotlight solo. It's the groovy collaboration between humans and AI that creates the ultimate showstopper! - ChatGPT

ありがとう

Wę kobiruo

Merci

Thank You!

Gracias

Obrigado

Eshe Gan

Grazie

谢谢

Imiete

Questions?

Be Nice please :)