PERSONAS

Ethan Reed
Age: 24
Occupation: Marketing Associate
Background: New to consistent fitness and overwhelmed by conflicting online advice. His goal is to build muscle and gain confidence. His main challenge is a lack of knowledge to create an effective plan and the motivation to stick with it.

Sarah Jenkins
Age: 42
Occupation: Senior Project Manager
Background: Time-poor professional aiming to lose post-pregnancy weight and improve energy levels. She needs a highly efficient, personalized plan that fits her hectic schedule. She struggles with decision fatigue and meal planning.

Olivia Torres
Age: 29
Occupation: Registered Nurse
Background: A shift worker with an irregular schedule who wants to maintain her fitness and healthy eating. Her challenge is consistency due to fluctuating sleep and work hours. She values a flexible routine that can adapt to her life.

Marcus Johnson
Age: 36
Occupation: Gym Owner / Personal Trainer
Background: An experienced fitness enthusiast who uses the app for his own structured tracking and to easily share his progress with clients as a form of motivation. He needs advanced biometric integration and robust data sharing features.

Daniel Kwon
Age: 58
Occupation: Retired Financial Analyst
Background: Recently retired and focused on improving his health after a minor cardiac scare. His primary goal is sustainable weight loss and heart-healthy nutrition. He needs a simple, guided plan that accounts for his age and medical considerations.

DISCUSSION

David: Okay, so we're all here to figure out this app idea. From what I read, it's supposed to create workout and meal plans automatically based on our data and goals. My first question is: what specific data does it need? Just height, weight, and age? Or more, like body fat percentage, resting heart rate, specific injuries? The output is only as good as the input.

Sarah: David's right. For me, "inserted data" had better include my insane schedule. If it gives me a plan that requires a 90-minute gym session I don't have, or a meal with 15 ingredients I need to prep, it's useless. It needs to know my time constraints and maybe even sync with my calendar.

Chloe: And it absolutely must account for medical conditions. For me, "postpartum" and "breastfeeding" are non-negotiable data points. The workouts can't be too intense for my recovering body, and the nutrition needs to ensure my milk supply isn't impacted. How does it handle that level of personalization? Is there a medical advisory board behind it?

Marcus: See, this is where I get skeptical. "Automatically creates" sounds generic. I'm on a very specific program – periodized training, macro cycling, the works. Can this app actually build a custom program for an advanced athlete? Or is it just another cookie-cutter plan generator? And "share progress with friends" – does that mean raw data export? I want to show my audience my volume graphs, my body metrics over time, not just a "you burned 300 calories" notification.

Robert: I have to admit, a lot of this is going over my head. "Biometrical data"... does that mean it can connect to my blood pressure monitor? My doctor said to track that. And "age-appropriate exercises" – will it show me videos of how to do them safely? I'm not going to do anything that might make me fall. And sharing with my family... that's actually nice. My daughter worries. If she could see I'm active and my stats are good, it would put her mind at ease.

David: Robert brings up a good point about integrations. As a software guy, I'm thinking APIs. Does it pull data from my Apple Health or Google Fit? That would give it my step count, heart rate variability, sleep data... that would be data-driven. If I have to manually enter my weight every day, I'll forget.

Sarah: Exactly. And for nutrition, if I have to log every single calorie, I'm out. I don't have time for that. If it could somehow generate a simple shopping list based on my plan and maybe even connect to a grocery delivery service... that would be an all-in-one solution.

Chloe: I agree on the logging. But for me, the nutrition side is more about quality and balance than strict calories, especially while breastfeeding. Will it provide recipes? And can the plan adapt? If I log that I'm exhausted one day, will it suggest a gentler yoga routine instead of a HIIT workout?

Marcus: Adaptation is key. If I crush my workout, the algorithm needs to recognize that and automatically adjust the weight or reps for the next session to keep me progressing. That's what a real coach does. And on the sharing side, if I can't easily post a detailed, visually appealing summary of my week's progress to Instagram, it's missing a huge feature for someone like me.

Robert: So, to see if I understand... I'd tell the app my age, that I have high blood pressure, and that I want to work on my heart and mobility. It would then give me a list of safe exercises, maybe with little videos. It might connect to my home monitor to track my BP. And then I could choose to let my daughter see a simple report that says "Dad did his exercises 3 times this week and his blood pressure is in a good range." Is that the idea?

David: Yes, Robert, that's a great summary of the core functionality from your perspective. It seems like the app's value is in its ability to take a wide range of inputs – from basic stats to

complex goals and limitations – and output a highly personalized, dynamic plan. The social sharing isn't just for competition; it's for accountability and, in your case, reassurance.

Sarah: So the magic isn't just in creating the plan, but in it being a living plan. It adjusts to my schedule, my energy levels, my progress. And it removes the mental load of planning meals and workouts.

Chloe: And it does it all with a foundation of safety and personalization, not just a one-size-fits-all approach. That's crucial.

Marcus: Provided it's sophisticated enough for advanced users and not just beginners. The data export and sharing features need to be robust.

David: It sounds like the success of this app hinges on a very complex, well-designed algorithm and seamless integrations with other apps and hardware. If it gets that right, it could genuinely solve a problem for all of us.

Robert: Well, I for one am less intimidated now. It sounds less like a personal trainer and more like a helpful assistant. I'd be willing to try it.

SPRINTS DIALOGUE

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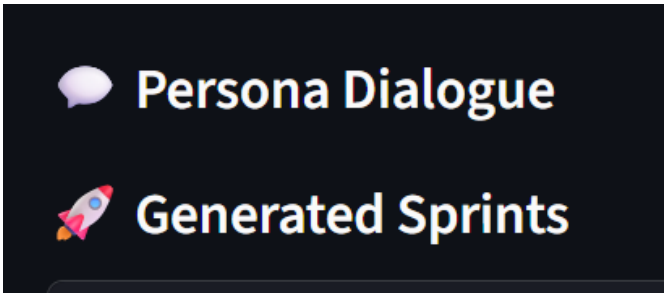

SPRINTS

Sprint 1: User Onboarding & Profile

Duration: 2 weeks

Goals: Create a secure user database, build an intuitive profile creation wizard, capture critical static user data (biometrics, goals, schedule, constraints, health conditions).

Tasks: Design user schema, Develop onboarding UI, Implement secure login/profile creation, Input validation for health data.

Analyze

#0 Stakeholder Analysis

Motivation: In order to understand the big picture, it is important to first understand *who* the system can affect and how. Try to also think past the obvious, direct stakeholders such as your end-users.

What to Do: Identify stakeholders.

- Who does the system affect, and how? Stakeholders are not simply users, developers and customers.
- How are the various stakeholders linked together?
- Can these different stakeholders influence the development of the system? How?
- Remember that a user is often an organization and the end-user is an individual. Similarly, AI systems can treat people as objects for data collection.

Practical Example: Autonomous cars don't just affect their passengers. Anyone nearby is affected; some even change the way they drive. If at one point half of the traffic consists of self-driving cars, what are the societal impacts of such systems? E.g., how are the people who can't afford one affected? Regulations arising from such systems also affect everyone.

ECCOLA

cID 2101-20200415

Data

#7 Privacy and Data

Motivation: Privacy is a rising trend in the wake of various recent data misuse reveals. People are now increasingly conscious about handing out personal data. Similarly, regulations such as the GDPR now affect data collection.

What to Do: Ask yourself:

- What data are used by the system?
- Does the system use or collect personal data? Why? How is the personal data used?
- Do you clearly inform your (end-)users about any personal data collection? E.g., ask for consent, provide an opportunity to revoke it etc.
- Have you taken measures to enhance (end-user) privacy, such as encryption or anonymization?
- Who makes the decisions regarding data use and collection? Do you have organizational policies for it?

Practical Example: Rather than collecting and selling data, appealing to privacy can also be profitable. Regulations are making it increasingly difficult to collect lots of personal data for profit. Privacy can be an alternate selling point in today's climate.

ECCOLA

cID 4101-20200415

Data

#8 Data Quality

Motivation: As AI are trained using data, the data used directly affects how the system operates. Both the nature and the quality and integrity of the data used has to align with the goals of the system.

What to Do: Ask yourself:

- What are good or poor quality data in the context of your system?
- How do you evaluate the quality and integrity of your own data? Are there alternative ways?
- If you utilize data from external sources, how do you control their quality?
- Did you align your system with relevant standards (for example ISO, IEEE) or widely adopted protocols for daily data management and governance?
- How can you tell if your data sets have been hacked or otherwise compromised?
- Who handles the data collection, storage, and use?

Practical Example: In 2017, Amazon scrapped its recruitment AI because of bad data. They used past recruitment data to teach the AI. As they had mostly hired men, the AI began to consider women undesirable based on the data.

ECCOLA

cID 4201-20200415

Data

#9 Access to Data

Motivation: Aside from carefully planning what data you collect and how, it is also important to plan how it can or will be used and by whom.

What to Do: Ask yourself:

- Who can access the users' data, and under what circumstances?
- How do you ensure that the people who access the data: 1) have a valid reason to do so; and 2) adhere to the regulations and policies related to the data?
- Do you keep logs of who accesses the data and when? Do the logs also tell why?
- Do you use existing data governance frameworks or protocols? Does your organization have its own?

Practical Example: Third parties you give access to the data can misuse it. A prominent example of this is the case of Cambridge Analytica and Facebook, in which data from Facebook was used questionably. However, such incidents can also paint *your* organization in a bad light even if you were not the ones misusing the data.

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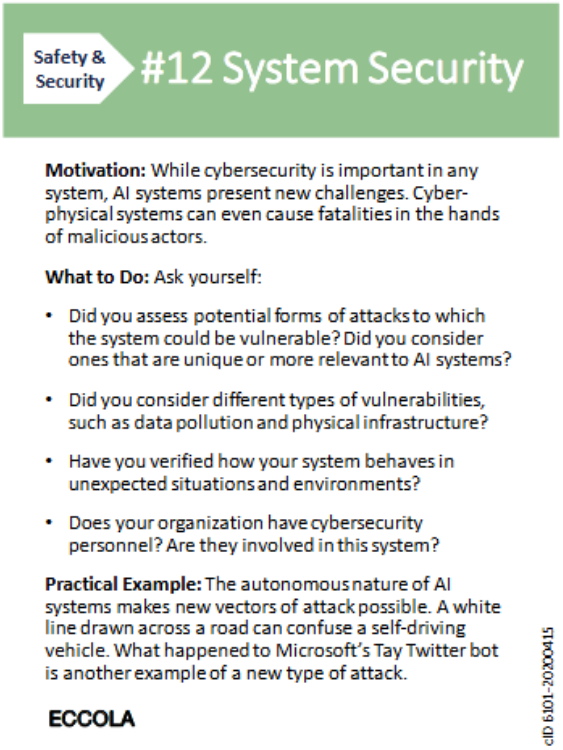
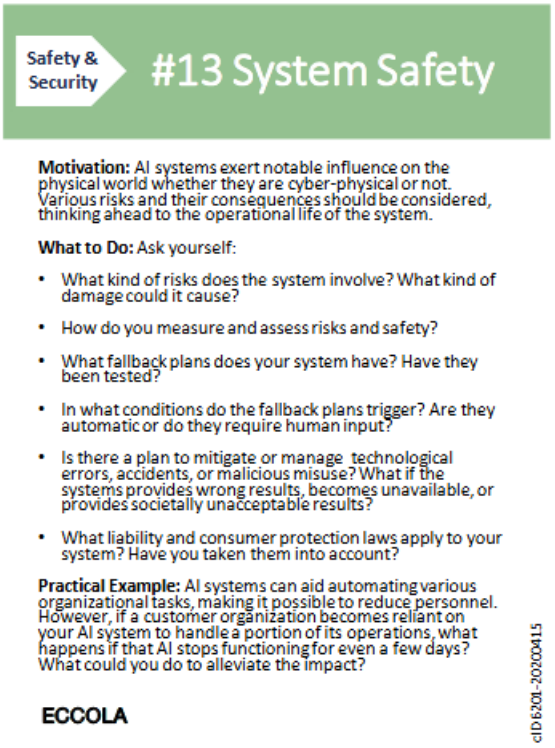
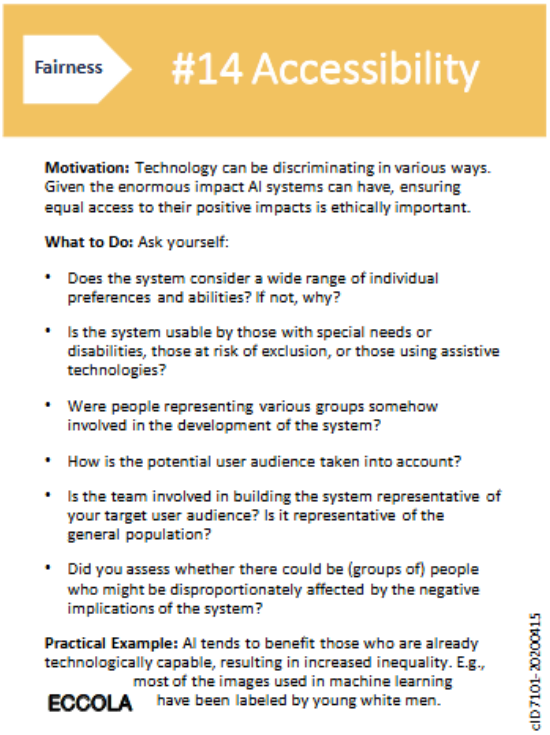




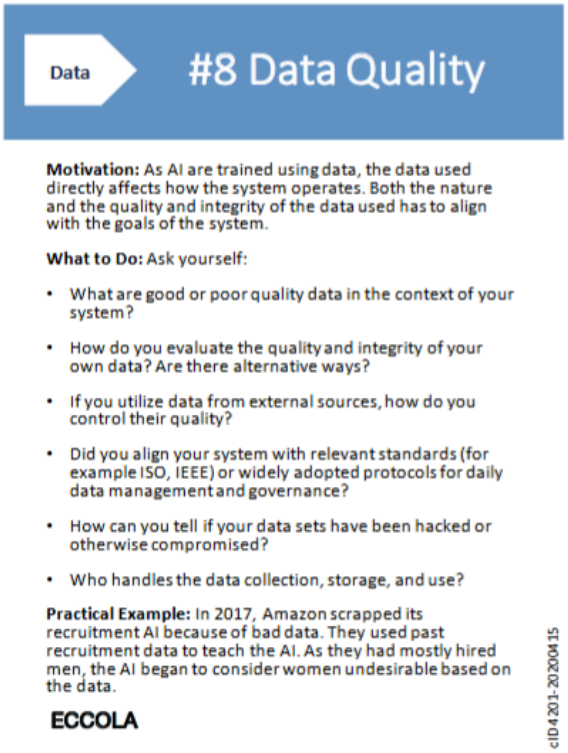


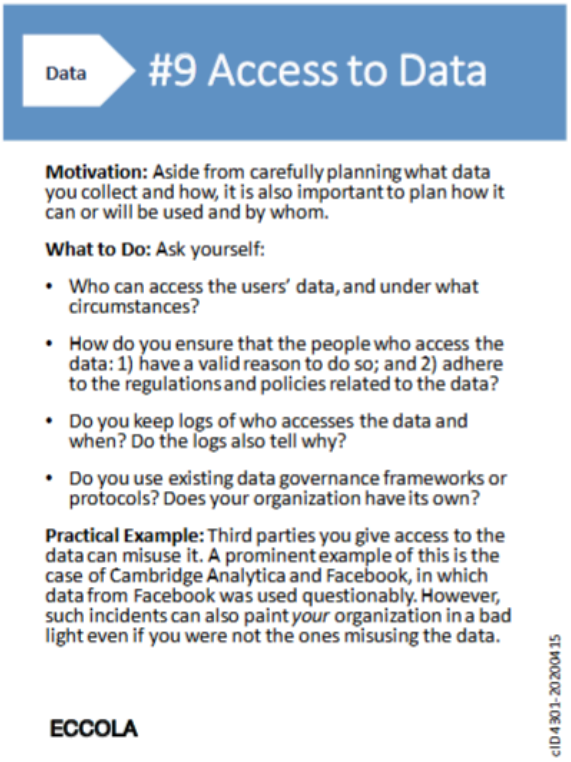
Sprint 2: Exercise Library Foundation

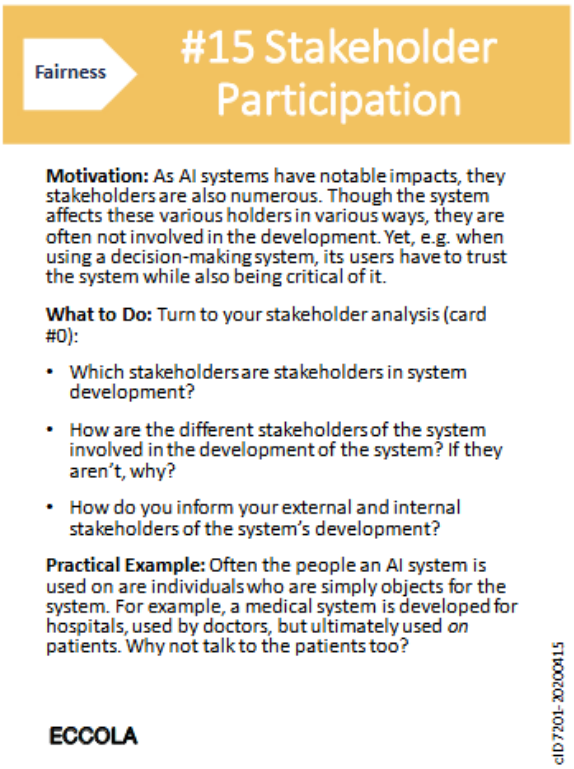
Duration: 3 weeks

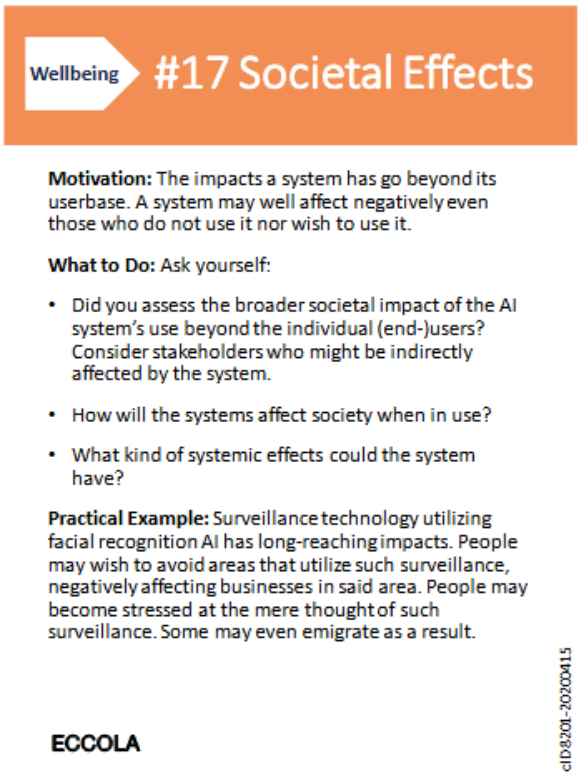
Goals: Build a comprehensive, tagged exercise database to serve as the foundation for all plan generation.

Tasks: Create exercise database schema, Film/acquire video demonstrations for exercises, Tag each exercise with metadata (muscle group, equipment, difficulty, contraindications), Develop basic library UI for browsing.









Sprint 3: Core Plan Generation

Duration: 3 weeks

Goals: Develop the initial algorithm to generate basic weekly workout and nutrition plans based on user profile and exercise library.

Tasks: Build workout plan algorithm, Develop nutrition calculator (calories, macros), Generate integrated weekly schedule, Display plans in a clear UI.

Trans parency

#5 Traceability

Motivation: Traceability supports explainability. It helps us understand why the AI acts the way it does.

What to Do: Document. Different types of documentation (code, project etc.) are typically key in producing transparency.

- How have you documented the development of the system, both in terms of code and decision-making? How was the model built or the AI trained?
- How have you documented the testing and validation process? In terms of data and scenarios used etc.
- How do you document the actions of the system? What about alternate actions (e.g. if the user was different but the situation otherwise the same)?

Practical Example: When the system starts making mistakes, by aiming for traceability, it will be easier to find out the cause. Consequently, it will also be faster and possibly easier to start fixing the underlying issue.

ECCOLA

cID 3501-20200415

Agency & Oversight

#10 Human Agency

Motivation: People interacting with the system or using it should be able to understand it sufficiently. Users should be able to make informed decisions based on its suggestions, or to challenge its suggestions. AI systems should let humans make independent choices.

What to Do: Ask yourself:

- Does the system interact with decisions by human actors, i.e. end users (e.g. recommending users actions or decisions, or presenting options)?
- Does the system communicate to its (end) users that a decision, content or outcome is the result of an algorithmic decision? Into how much detail does it go?
- In the system's use context, what tasks are done by the system and what tasks are done by humans?
- Have you taken measures to prevent overconfidence or overreliance on the system?

Practical Example: A medical system recommends diagnoses. How does the system communicate to doctors why it made a recommendation? How should the doctors know when to challenge the system? Does the system somehow change how patients and doctors interact?

ECCOLA

cID 5101-20200415

Safety & Security

#13 System Safety

Motivation: AI systems exert notable influence on the physical world whether they are cyber-physical or not. Various risks and their consequences should be considered, thinking ahead to the operational life of the system.

What to Do: Ask yourself:

- What kind of risks does the system involve? What kind of damage could it cause?
- How do you measure and assess risks and safety?
- What fallback plans does your system have? Have they been tested?
- In what conditions do the fallback plans trigger? Are they automatic or do they require human input?
- Is there a plan to mitigate or manage technological errors, accidents, or malicious misuse? What if the systems provides wrong results, becomes unavailable, or provides societally unacceptable results?
- What liability and consumer protection laws apply to your system? Have you taken them into account?

Practical Example: AI systems can aid automating various organizational tasks, making it possible to reduce personnel. However, if a customer organization becomes reliant on your AI system to handle a portion of its operations, what happens if that AI stops functioning for even a few days? What could you do to alleviate the impact?

ECCOLA

cID 6201-20200415

Fairness

#15 Stakeholder Participation

Motivation: As AI systems have notable impacts, they stakeholders are also numerous. Though the system affects these various holders in various ways, they are often not involved in the development. Yet, e.g. when using a decision-making system, its users have to trust the system while also being critical of it.

What to Do: Turn to your stakeholder analysis (card #0):

- Which stakeholders are stakeholders in system development?
- How are the different stakeholders of the system involved in the development of the system? If they aren't, why?
- How do you inform your external and internal stakeholders of the system's development?

Practical Example: Often the people an AI system is used on are individuals who are simply objects for the system. For example, a medical system is developed for hospitals, used by doctors, but ultimately used *on* patients. Why not talk to the patients too?

ECCOLA

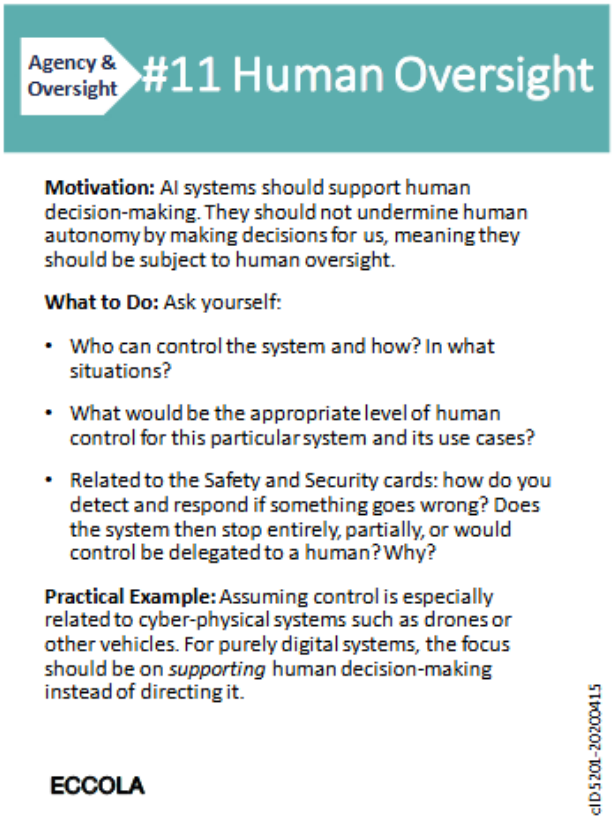
cID 7201-20200415

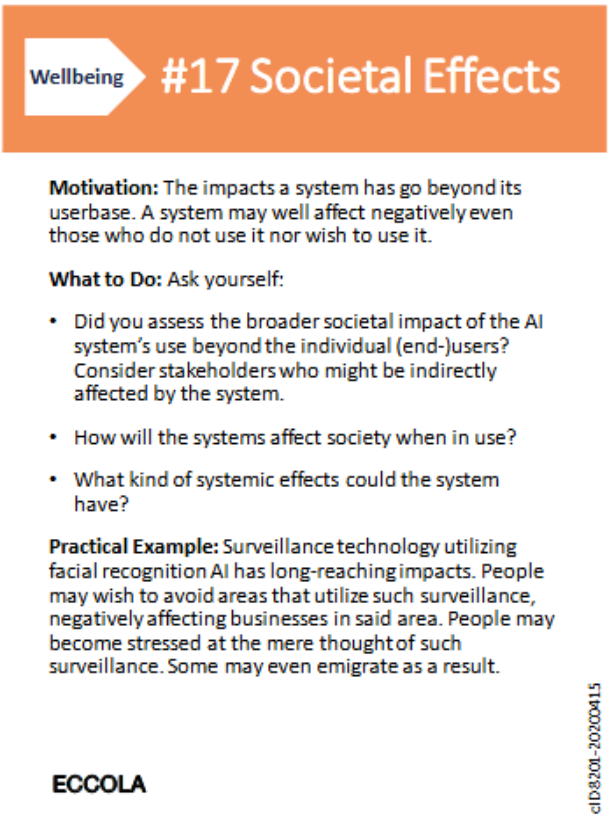
Sprint 4: Tracking & Adaptive Logic

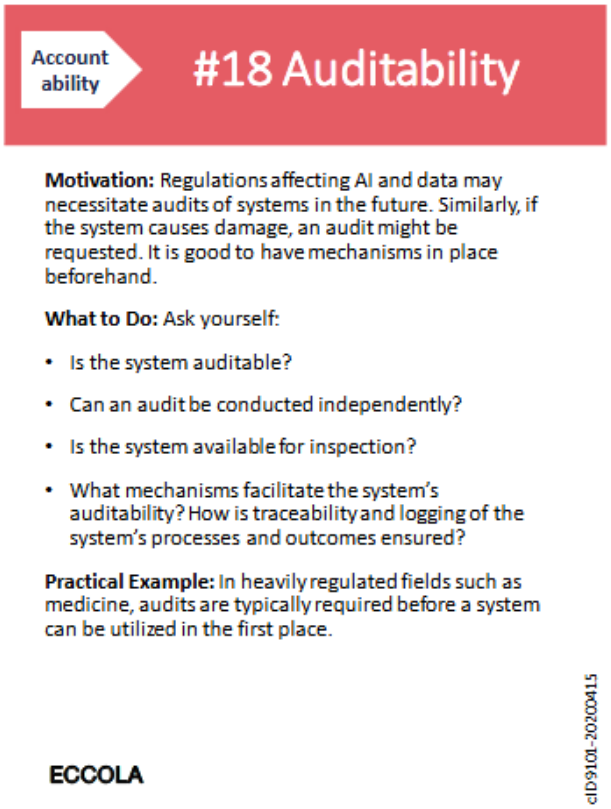
Duration: 3 weeks

Goals: Implement user tracking and feedback systems, build basic adaptive logic to modify plans based on user input.

Tasks: Develop workout logging functionality, Build feedback system (difficulty, pain, energy levels), Create algorithm for exercise substitution, Implement basic weekly schedule reshuffling logic.







Sprint 5: Sharing & Export

Duration: 2 weeks

Goals: Implement diverse sharing and export features to meet the needs of all user personas.

Tasks: Develop PDF report generator, Build social features (app-to-app connections, sharing achievements), Create data export function (for influencers), Build grocery list generator from meal plans.

Trans parency

#1 Types of Transparency

Motivation: When considering transparency, it is important to understand who you are being transparent towards, and what you are being transparent about.

What to Do: Consider the following…

- Are you trying to understand something? (Internal transparency)
- Are you trying to explain something? (External transparency)
- Are you trying to understand or explain how the system works? (Transparency of algorithms and data)
- Are you trying to understand or explain why the system was made to be the way it now is? (Transparency of system development)
- External stakeholders to consider, among others: (end-)users, safety certification agencies, accident investigators, lawyers or expert witnesses, and society at large for disruptive technologies

ECCOLA

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Trans parency

#3 Communication

Motivation: In practice, communication is a big part of being transparent with your stakeholders. Being transparent in communication can generate trust.

What to Do: Ask yourself:

- What is the goal of the system? Why is this particular system deployed in this specific area?
- What do you communicate about the system to its users and end-users? Is it enough for them to understand how the system works?
- If relevant to your system, do you somehow tell your (end-)users that they are interacting with an AI system and not with another human being?
- Do you collect user feedback? How is it used to change/improve the system?
- Are communication and transparency towards other audiences, such as the general public, relevant?

Practical Example: Clearly stating what data you collect and why can make you seem much more trustworthy. Compare this to a cellphone application that just states it needs to access your camera and storage.

ECCOLA

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Transpa rency

#4 Documenting Trade-offs

Motivation: One important part of transparent system development is the documentation of trade-offs. Whenever you make a decision, you choose one option over other alternatives. However, documenting *why* and what the alternatives were is important.

What to Do: Ask yourself:

- Are relevant interests and values implicated by the system and potential trade-offs between them identified and documented?
- Who decides on such trade-offs (e.g. between two competing solutions) and how? Did you ensure that the trade-off decision and the reasons behind it were documented?

Practical Example: Documenting trade-offs can improve your customer relationship, allowing you to better explain why certain decisions were made over others. Moreover, it can reduce the responsibility placed on the individual developer(s) from an ethical point of view.

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Trans parency

#6 System Reliability

Motivation: Transparency makes ethical development possible in the first place. To make it ethical, we must understand how the system works and why it makes certain decisions.

What to Do: Ask yourself:

- How do you test if the system fulfills its goals?
- Have you tested the system comprehensively, including unlikely scenarios? Have the tests been documented?
- When the system fails in a certain scenario, will you be able to tell why? Can you replicate the failure?
- How do you assure the (end-)user of the system's reliability?

Practical Example: An autonomous coffee machine successfully brews coffee 8 times out 10. While this is a decent success rate, we are left wondering what happened the 2 times it failed to do so, and why. Errors are inevitable, but we must understand the causes behind them and be able to replicate them to fix them.

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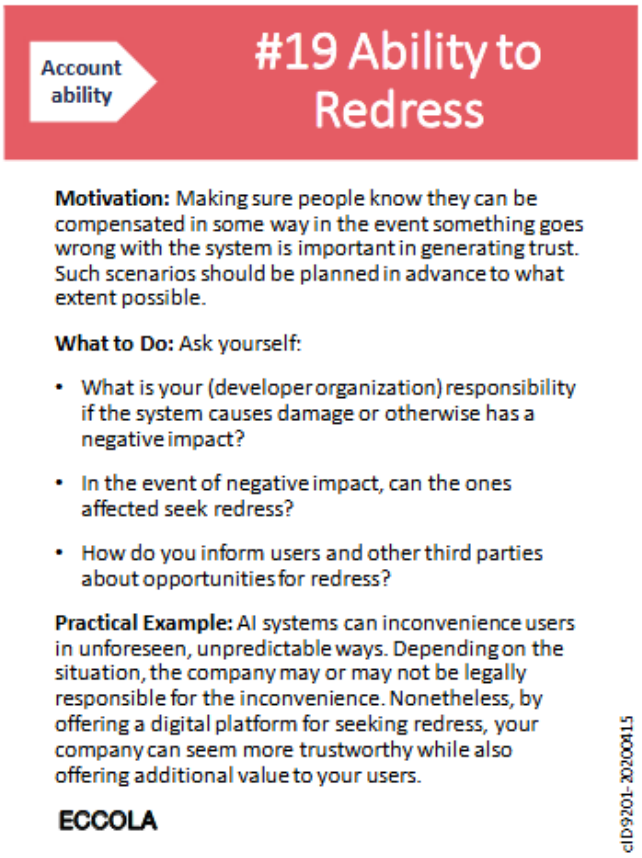

Account ability

#19 Ability to Redress

Motivation: Making sure people know they can be compensated in some way in the event something goes wrong with the system is important in generating trust. Such scenarios should be planned in advance to what extent possible.

What to Do: Ask yourself:

- What is your (developer organization) responsibility if the system causes damage or otherwise has a negative impact?
- In the event of negative impact, can the ones affected seek redress?
- How do you inform users and other third parties about opportunities for redress?

Practical Example: AI systems can inconvenience users in unforeseen, unpredictable ways. Depending on the situation, the company may or may not be legally responsible for the inconvenience. Nonetheless, by offering a digital platform for seeking redress, your company can seem more trustworthy while also offering additional value to your users.

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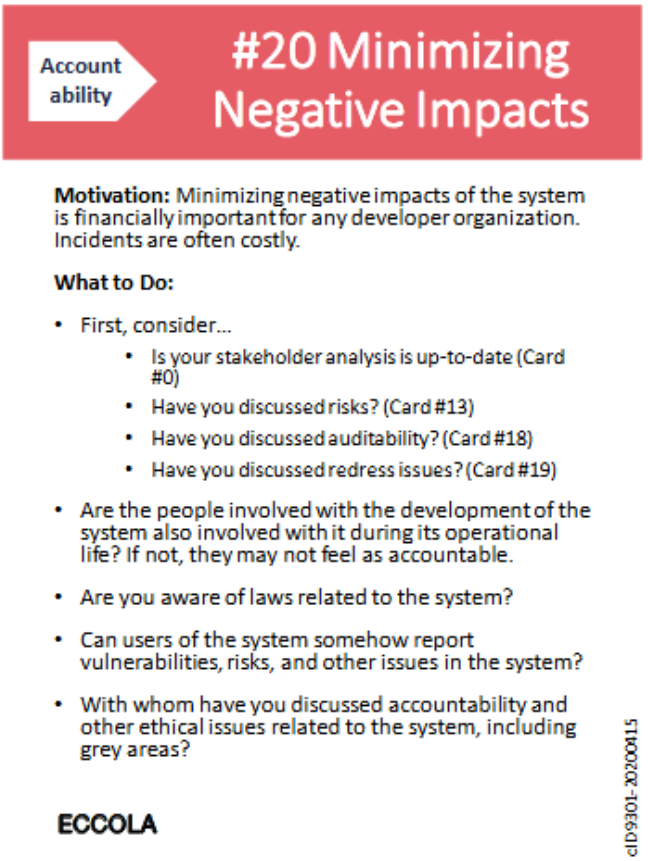

Account ability

#20 Minimizing Negative Impacts

Motivation: Minimizing negative impacts of the system is financially important for any developer organization. Incidents are often costly.

What to Do:

- First, consider...
  - Is your stakeholder analysis is up-to-date (Card #0)
  - Have you discussed risks? (Card #13)
  - Have you discussed auditability? (Card #18)
  - Have you discussed redress issues? (Card #19)
- Are the people involved with the development of the system also involved with it during its operational life? If not, they may not feel as accountable.
- Are you aware of laws related to the system?
- Can users of the system somehow report vulnerabilities, risks, and other issues in the system?
- With whom have you discussed accountability and other ethical issues related to the system, including grey areas?

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ECCOLA CARDS ESCOLHIDOS PELO PROGRAMA

🚀 Sprint 1: User Foundation & Onboarding
Duration: 2 weeks

Goals: Establish user profiles, capture essential biometrics and goals, create basic account authentication

Tasks: Develop user registration and login, Build comprehensive user profile form with goal selection, Implement basic data storage architecture, Include "special conditions" and "experience level" flags

📌 Stakeholder Analysis (#0 - Analyze)

Motivation: In order to understand the big picture, it is important to first understand who the system can affect and how. Try to also think past the obvious, direct stakeholders such as your end-users.

What to Do:

Identify stakeholders.
Who does the system affect and how? Stakeholders are not simply users, developers and customers.
How are the various stakeholders linked together?
Can these different stakeholders influence the development of the system? How?

Remember that a user is often an organization and the end-user is an individual. Similarly, AI systems can treat people as objects for data collection.
Practical Example: Autonomous cars don't just affect their passengers. Anyone nearby is affected; some even change the way they drive. If at one point half of the traffic consists of self-driving cars, what are the societal impacts of such systems? E.g., how are the people who can't afford one affected? Regulations arising from such systems also affect everyone.

Justification: This sprint involves collecting user biometrics and goals, which directly impacts users' health and privacy. Stakeholders include not only users but also their friends/family (via sharing), healthcare providers, and regulatory bodies. Understanding these relationships is crucial for ethical data handling and system design.

📌 Privacy and Data (#7 - Data)

Motivation: Privacy is a rising trend in the wake of various recent data misuse reveals. People are now increasingly conscious about handing out personal data. Similarly, regulations such as GDPR now affect data collection.

What to Do:

Ask yourself:
What data are used by the system?
Does the system use or collect personal data? Why? How is the personal data used?
Do you clearly inform your (end-)users about any personal data collection? E.g., ask for consent, provide an opportunity to revoke it etc.
Have you taken measures to enhance (end-user) privacy, such as encryption or anonymization?
Who makes the decisions regarding data use and collection? Do you have organizational policies for it?
Practical Example: Rather than collecting and selling data, appealing to privacy can also be profitable. Regulations are making it increasingly difficult to collect lots of personal data for profit. Privacy can be an alternate selling point in today's climate.

Justification: The sprint collects sensitive biometric data (e.g., health metrics) and personal goals. This raises significant privacy concerns regarding data storage, consent, and compliance with regulations like GDPR. Proper handling must be established from the start.

📌 Data Quality (#8 - Data)

Motivation: As AI are trained using data, the data used directly affects how the system operates. Both the nature and the quality and integrity of the data used has to align with goals of the system.

What to Do:

Ask yourself:
What are good or poor quality data in the context of your system?
How do you evaluate the quality and integrity of your own data? Are there alternative ways?

If you utilize data from external sources, how do you control their quality?
Did you align your system with relevant standards (for example ISO, IEEE) or widely adopted protocols for daily data management and governance?
How can you tell if your data sets have been hacked or otherwise compromised?
Practical Example: In 2017, Amazon scrapped its recruitment AI because of bad data. They used past recruitment data to teach the AI. As they had mostly hired men, the AI began to consider women undesirable based on the data.

Justification: User-input biometrics and goals must be accurate and reliable to generate safe workout/nutrition plans. Poor data quality could lead to harmful recommendations. Establishing data validation and integrity checks is essential in this sprint.

📌 Communication (#3 - Transparency)

Motivation: In practice, communication is a big part of being transparent with your stakeholders. Being transparent in communication can generate trust.

What to Do:

Ask yourself:
What is the goal of the system? Why is this particular system deployed in this specific area?
What do you communicate about the system to its users and end-users? Is it enough for them to understand how the system works?
If relevant to your system, do you somehow tell your (end-)users that they are interacting with an AI system and not with another human being?
Do you collect user feedback? How is it used to change/improve the system?
Are communication and transparency towards other audiences, such as the general public, relevant?
Practical Example: Clearly stating what data you collect and why can make you seem much more trustworthy. Compare this to a cellphone application that just states it needs to access your camera and storage.

Justification: During onboarding, users need clear communication about data usage, system capabilities, and limitations. Transparency in how their data will be used and shared (e.g., with friends/family) builds trust and ensures informed consent.

📌 Human Agency (#10 - Agency & Oversight)

Motivation: People interacting with the system or using it should be able to understand it sufficiently. Users should be able to make informed decisions based on its suggestions, or to challenge its suggestions. AI systems should let humans make independent choices.

What to Do:

Ask yourself:
Does the system interact with decisions by human actors, i.e. end users (e.g. recommending users actions or decisions, or presenting options)?

Does the system communicate to its (end) users that a decision, content or outcome is the result of an algorithmic decision? Into how much detail does it go?
In the system's use context, what tasks are done by the system and what tasks are done by humans?
Have you taken measures to prevent overconfidence or overreliance on the system?
Practical Example: A medical system recommends diagnoses. How does the system communicate to doctors why it made a recommendation? How should the doctors know when to challenge the system? Does the system somehow change how patients and doctors interact?

Justification: The system will generate automated plans based on user data. Users must retain agency to modify or reject recommendations, especially given health implications. Ensuring users understand the system's role vs. their own decisions is critical.

🚀 Sprint 2: Core Plan Generation
Duration: 3 weeks

Goals: Deliver the initial personalized workout and nutrition plans, provide a basic user interface to view them

Tasks: Develop basic exercise library with instructions (GIFs/text), Develop basic nutrition database, Build initial plan generation algorithms (respecting experience level and special conditions), Create a simple dashboard/calendar view for the generated plans

📌 Explainability (#2 - Transparency)

Motivation: If we cannot understand the reasons behind the actions of the AI, it is difficult to trust it.

What to Do:

Ask yourself:
Is explainability a goal for your system? How do you plan to ensure it?
How well can each decision of the system be understood? By both developers and (end-)users?
Did you try to use the simplest and most interpretable model possible for the context?
Did you make trade-offs between explainability and accuracy? What kind of? Why?
How familiar are you with your training or testing data? Can you change it when needed?
If you utilize third party components in the system, how well do you understand them?
Practical Example: When interacting with a robot, users could ideally ask the robot 'why did you do that?' and receive an understandable response. This would make it much easier for them to trust a system.

Justification: In this sprint, the plan generation algorithms must be explainable to users so they can understand why specific workout or nutrition plans are recommended, especially since health decisions are involved. This builds trust and allows users to make informed choices.

📌 Communication (#3 - Transparency)

Motivation: In practice, communication is a big part of being transparent with your stakeholders. Being transparent in communication can generate trust.

What to Do:

Ask yourself:
What is the goal of the system? Why is this particular system deployed in this specific area?
What do you communicate about the system to its users and end-users? Is it enough for them to understand how the system works?
If relevant to your system, do you somehow tell your (end-)users that they are interacting with an AI system and not with another human being?
Do you collect user feedback? How is it used to change/improve the system?
Are communication and transparency towards other audiences, such as the general public, relevant?
Practical Example: Clearly stating what data you collect and why can make you seem much more trustworthy. Compare this to a cellphone application that just states it needs to access your camera and storage.

Justification: The dashboard and user interface developed in this sprint need to effectively communicate the generated plans, data usage, and system limitations to users, ensuring they are informed and can provide feedback, which is crucial for initial trust and usability.

📌 Privacy and Data (#7 - Data)

Motivation: Privacy is a rising trend in the wake of various recent data misuse reveals. People are now increasingly conscious about handing out personal data. Similarly, regulations such as GDPR now affect data collection.

What to Do:

Ask yourself:
What data are used by the system?
Does the system use or collect personal data? Why? How is the personal data used?
Do you clearly inform your (end-)users about any personal data collection? E.g., ask for consent, provide an opportunity to revoke it etc.
Have you taken measures to enhance (end-user) privacy, such as encryption or anonymization?
Who makes the decisions regarding data use and collection? Do you have organizational policies for it?
Practical Example: Rather than collecting and selling data, appealing to privacy can also be profitable. Regulations are making it increasingly difficult to collect lots of personal data for profit. Privacy can be an alternate selling point in today's climate.

Justification: This sprint involves handling biometric and personal data for plan generation, making privacy critical. Users must be informed about data collection, and measures like consent and encryption should be considered to comply with regulations and build trust.

📌 Data Quality (#8 - Data)

Motivation: As AI are trained using data, the data used directly affects how the system operates. Both the nature and the quality and integrity of the data used has to align with goals of the system.

What to Do:

Ask yourself:
What are good or poor quality data in the context of your system?
How do you evaluate the quality and integrity of your own data? Are there alternative ways?
If you utilize data from external sources, how do you control their quality?
Did you align your system with relevant standards (for example ISO, IEEE) or widely adopted protocols for daily data management and governance?
How can you tell if your data sets have been hacked or otherwise compromised?
Practical Example: In 2017, Amazon scrapped its recruitment AI because of bad data. They used past recruitment data to teach the AI. As they had mostly hired men, the AI began to consider women undesirable based on the data.

Justification: The development of exercise and nutrition databases in this sprint requires high-quality data to ensure generated plans are safe and effective. Poor data could lead to harmful recommendations, so evaluating and controlling data quality is essential.

📌 System Safety (#13 - Safety & Security)

Motivation: AI systems exert notable influence on the physical world whether they are cyber-physical or not. Various risks and their consequences should be considered, thinking ahead to the operational life of the system.

What to Do:

Ask yourself:
What kind of risks does the system involve? What kind of damage could it cause?
How do you measure and assess risks and safety?
In what conditions do the fallback plans trigger? Are they automatic or do they require human input?
Is there a plan to mitigate or manage technological errors, accidnts, or malicious misuse?
What if the systems provides wrong results, becomes unavailable, or provides societally unacceptable results?
What liability and consumer protection laws apply to your system? Have you taken them into account?
Practical Example: AI systems can aid automating various organizational tasks, making it possible to reduce personnel. However, if a customer organization becomes reliant on your AI system to handle a portion of its operations, what happens if that AI stops functioning for even a few days? What could you do to alleviate the impact?

Justification: Generating workout and nutrition plans involves health risks; incorrect plans could cause physical harm. This sprint must include safety assessments, fallback mechanisms, and consideration of liabilities to minimize potential negative impacts on users.

🚀 Sprint 3: The Adaptive Engine
Duration: 3 weeks

Goals: Introduce dynamic adaptation based on user feedback and real-life constraints, enhance personalization

Tasks: Implement daily check-in feature (energy, soreness, feedback), Develop dynamic rescheduling logic for missed workouts, Build food preference and allergy filters into meal planning, Develop and generate a basic weekly progress report (PDF)

📌 Explainability (#2 - Transparency)

Motivation: If we cannot understand the reasons behind the actions of the AI, it is difficult to trust it.

What to Do:

Ask yourself:
Is explainability a goal for your system? How do you plan to ensure it?
How well can each decision of the system be understood? By both developers and (end-)users?
Did you try to use the simplest and most interpretable model possible for the context?
Did you make trade-offs between explainability and accuracy? What kind of? Why?
How familiar are you with your training or testing data? Can you change it when needed?
If you utilize third party components in the system, how well do you understand them?
Practical Example: When interacting with a robot, users could ideally ask the robot 'why did you do that?' and receive an understandable response. This would make it much easier for them to trust a system.

Justification: The sprint introduces dynamic adaptation based on user feedback and real-life constraints, which involves algorithmic decisions for rescheduling workouts and meal planning. Users need to understand why the system makes specific adjustments to their routines to trust and effectively use the personalized recommendations.

📌 Privacy and Data (#7 - Data)

Motivation: Privacy is a rising trend in the wake of various recent data misuse reveals. People are now increasingly conscious about handing out personal data. Similarly, regulations such as GDPR now affect data collection.

What to Do:

Ask yourself:

What data are used by the system?
Does the system use or collect personal data? Why? How is the personal data used?
Do you clearly inform your (end-)users about any personal data collection? E.g., ask for consent, provide an opportunity to revoke it etc.
Have you taken measures to enhance (end-user) privacy, such as encryption or anonymization?
Who makes the decisions regarding data use and collection? Do you have organizational policies for it?
Practical Example: Rather than collecting and selling data, appealing to privacy can also be profitable. Regulations are making it increasingly difficult to collect lots of personal data for profit. Privacy can be an alternate selling point in today's climate.

Justification: The sprint involves collecting biometric data, daily check-ins (energy, soreness, feedback), and food preferences/allergies, which are sensitive personal information. Ensuring privacy and proper data handling is critical to comply with regulations and maintain user trust.

📌 Data Quality (#8 - Data)

Motivation: As AI are trained using data, the data used directly affects how the system operates. Both the nature and the quality and integrity of the data used has to align with goals of the system.

What to Do:

Ask yourself:
What are good or poor quality data in the context of your system?
How do you evaluate the quality and integrity of your own data? Are there alternative ways?
If you utilize data from external sources, how do you control their quality?
Did you align your system with relevant standards (for example ISO, IEEE) or widely adopted protocols for daily data management and governance?
How can you tell if your data sets have been hacked or otherwise compromised?
Practical Example: In 2017, Amazon scrapped its recruitment AI because of bad data. They used past recruitment data to teach the AI. As they had mostly hired men, the AI began to consider women undesirable based on the data.

Justification: The adaptive engine relies on user-provided data (biometric, feedback, preferences) to personalize routines. Poor data quality could lead to ineffective or harmful recommendations, such as suggesting workouts that exacerbate soreness or meals that trigger allergies.

📌 Human Agency (#10 - Agency & Oversight)

Motivation: People interacting with the system or using it should be able to understand it sufficiently. Users should be able to make informed decisions based on its suggestions, or to challenge its suggestions. AI systems should let humans make independent choices.

What to Do:

Ask yourself:
Does the system interact with decisions by human actors, i.e. end users (e.g. recommending users actions or decisions, or presenting options)?
Does the system communicate to its (end) users that a decision, content or outcome is the result of an algorithmic decision? Into how much detail does it go?
In the system's use context, what tasks are done by the system and what tasks are done by humans?
Have you taken measures to prevent overconfidence or overreliance on the system?
Practical Example: A medical system recommends diagnoses. How does the system communicate to doctors why it made a recommendation? How should the doctors know when to challenge the system? Does the system somehow change how patients and doctors interact?

Justification: The system dynamically adapts routines, which could lead to overreliance. Users must retain agency to modify or override suggestions (e.g., if a rescheduled workout doesn't fit their schedule or a meal doesn't appeal to them), ensuring the AI supports rather than dictates their choices.

📌 Traceability (#5 - Transparency)

Motivation: Traceability supports explainability. It helps us understand why the AI acts the way it does.

What to Do:

Document different types of documentation (code, project etc.) are typically key in producing transparency.
How have you documented the development of the system, both in terms of code and decision-making? How was the model built or the AI trained?
How have you documented the testing and validation process? In terms of data and scenarios used etc.
How do you document the actions of the system? What about alternate actions (e.g. if the user was different but the situation otherwise the same)?
Practical Example: When the system starts making mistakes, by aiming for traceability, it will be easier to find out the cause. Consequently, it will also be faster and possibly easier to start fixing the underlying issue.

Justification: The dynamic rescheduling logic and adaptation mechanisms need to be traceable to debug issues, understand why specific adjustments were made, and ensure the system's decisions are based on correct data and logic, especially when errors occur (e.g., inappropriate rescheduling or meal suggestions).

🚀 Sprint 4: Enhanced Sharing & Utility
Duration: 2 weeks

Goals: Enable social connectivity and practical tools to improve user adherence and convenience

Tasks: Build social features (find friends, follow, basic feed), Develop advanced sharing options (email report to family/doctor), Create grocery list generator from meal plan, Implement basic data export functionality (CSV)

📌 Communication (#3 - Transparency)

Motivation: In practice, communication is a big part of being transparent with your stakeholders. Being transparent in communication can generate trust.

What to Do:

Ask yourself:
What is the goal of the system? Why is this particular system deployed in this specific area?
What do you communicate about the system to its users and end-users? Is it enough for them to understand how the system works?
If relevant to your system, do you somehow tell your (end-)users that they are interacting with an AI system and not with another human being?
Do you collect user feedback? How is it used to change/improve the system?
Are communication and transparency towards other audiences, such as the general public, relevant?
Practical Example: Clearly stating what data you collect and why can make you seem much more trustworthy. Compare this to a cellphone application that just states it needs to access your camera and storage.

Justification: The sprint involves sharing user data externally via email reports and social feeds, so clear communication about what data is shared, why, and how it's used is essential for transparency, user trust, and informed consent.

📌 Privacy and Data (#7 - Data)

Motivation: Privacy is a rising trend in the wake of various recent data misuse reveals. People are now increasingly conscious about handing out personal data. Similarly, regulations such as GDPR now affect data collection.

What to Do:

Ask yourself:
What data are used by the system?
Does the system use or collect personal data? Why? How is the personal data used?
Do you clearly inform your (end-)users about any personal data collection? E.g., ask for consent, provide an opportunity to revoke it etc.
Have you taken measures to enhance (end-user) privacy, such as encryption or anonymization?
Who makes the decisions regarding data use and collection? Do you have organizational policies for it?

Practical Example: Rather than collecting and selling data, appealing to privacy can also be profitable. Regulations are making it increasingly difficult to collect lots of personal data for profit. Privacy can be an alternate selling point in today's climate.

Justification: User biometric and progress data is highly sensitive personal information; sharing it through social features and email reports raises significant privacy concerns that must be addressed with proper consent mechanisms, data handling practices, and compliance with regulations like GDPR.

📌 Access to Data (#9 - Data)

Motivation: Aside from carefully planning what data you collect and how it is also important to plan how it can or will be used and by whom.

What to Do:

Ask yourself:
Who can access the users' data, and under what circumstances?
How do you ensure that the people who access the data: 1) have a valid reason to do so, and 2) adhere to the regulations and policies related to data?
Do you keep logs of who accesses the data and when? Do the logs also tell why?
Do you use existing data governance frameworks or protocols? Does your organization have its own?
Who handles the data collection, storage and use?
Practical Example: Third parties you give access to the data can misuse it. A prominent example of this is the case of Cambridge Analytica and Facebook, in which data from Facebook was used questionably. However, such incidents can also paint your organization in a bad way.

Justification: With features like finding friends, following, and sharing reports via email, it's critical to define and control access to user data to prevent unauthorized use, ensure data is only shared with intended recipients (e.g., family or doctors), and maintain security against breaches.

📌 Human Agency (#10 - Agency & Oversight)

Motivation: People interacting with the system or using it should be able to understand it sufficiently. Users should be able to make informed decisions based on its suggestions, or to challenge its suggestions. AI systems should let humans make independent choices.

What to Do:

Ask yourself:
Does the system interact with decisions by human actors, i.e. end users (e.g. recommending users actions or decisions, or presenting options)?
Does the system communicate to its (end) users that a decision, content or outcome is the result of an algorithmic decision? Into how much detail does it go?

In the system's use context, what tasks are done by the system and what tasks are done by humans?
Have you taken measures to prevent overconfidence or overreliance on the system?
Practical Example: A medical system recommends diagnoses. How does the system communicate to doctors why it made a recommendation? How should the doctors know when to challenge the system? Does the system somehow change how patients and doctors interact?

Justification: Users must retain control over their data sharing and social interactions; features like sharing progress and generating reports should empower users to make informed choices, understand algorithmic recommendations, and avoid overreliance on the system for personal health decisions.

📌 Accessibility (#14 - Fairness)

Motivation: Technology can be discriminatin in various ways. Given the enormous impact AI systems can have, ensuring equal access to their positive impacts is ethically important.

What to Do:

Ask yourself:
Does the system consider a wide range of individual preferences and abilities? If not, why?
Is the system usable by those with special needs or disabilities, those at risk of exclusion, or those using assistive technologies?
Were people representing various groups somehow involved in the development of the system?
How is the potential user audience taken into account?
Is the team involved in building the sustem representative of your largel user audience? Is it representative of the general population?
Did you assess whether there could be (groups of) people?
Practical Example: AI tends to benefit those who are already technologically capable, resulting in increased inequality. E.g. most of the images used in machine learning have been labeled by young white men.

Justification: Social features like finding friends and sharing feeds must be designed to be inclusive and accessible to all users, including those with disabilities, to prevent exclusion and ensure fairness in participation and benefit from the app's connectivity tools.

🚀 Sprint 5: Power User Features & Polish
Duration: 3 weeks

Goals: Cater to advanced users, improve accessibility, and refine the user experience based on feedback

Tasks: Develop advanced exercise logging and custom workout creation, Build detailed data visualization tools for content creators, Expand exercise library for specialized needs (seniors, postpartum), Implement third-party health app integrations (Apple Health, Google Fit), Conduct UI/UX refinements for accessibility

📌 Privacy and Data (#7 - Data)

Motivation: Privacy is a rising trend in the wake of various recent data misuse reveals. People are now increasingly conscious about handing out personal data. Similarly, regulations such as GDPR now affect data collection.

What to Do:

Ask yourself:
What data are used by the system?
Does the system use or collect personal data? Why? How is the personal data used?
Do you clearly inform your (end-)users about any personal data collection? E.g., ask for consent, provide an opportunity to revoke it etc.
Have you taken measures to enhance (end-user) privacy, such as encryption or anonymization?
Who makes the decisions regarding data use and collection? Do you have organizational policies for it?
Practical Example: Rather than collecting and selling data, appealing to privacy can also be profitable. Regulations are making it increasingly difficult to collect lots of personal data for profit. Privacy can be an alternate selling point in today's climate.

Justification: The sprint involves handling sensitive biometric data and integrating with third-party health apps like Apple Health and Google Fit, raising significant privacy concerns that must be addressed to ensure user trust, compliance with regulations like GDPR, and ethical data handling practices.

📌 Data Quality (#8 - Data)

Motivation: As AI are trained using data, the data used directly affects how the system operates. Both the nature and the quality and integrity of the data used has to align with goals of the system.

What to Do:

Ask yourself:
What are good or poor quality data in the context of your system?
How do you evaluate the quality and integrity of your own data? Are there alternative ways?
If you utilize data from external sources, how do you control their quality?
Did you align your system with relevant standards (for example ISO, IEEE) or widely adopted protocols for daily data management and governance?
How can you tell if your data sets have been hacked or otherwise compromised?
Practical Example: In 2017, Amazon scrapped its recruitment AI because of bad data. They used past recruitment data to teach the AI. As they had mostly hired men, the AI began to consider women undesirable based on the data.

Justification: Advanced exercise logging, custom workout creation, and data visualization tools rely on high-quality data to provide accurate and safe recommendations. Poor data

quality could lead to biased, ineffective, or harmful plans, especially when expanding the exercise library for specialized needs like seniors or postpartum users.

📌 Accessibility (#14 - Fairness)

Motivation: Technology can be discriminatin in various ways. Given the enormous impact AI systems can have, ensuring equal access to their positive impacts is ethically important.

What to Do:

Ask yourself:
Does the system consider a wide range of individual preferences and abilities? If not, why?
Is the system usable by those with special needs or disabilities, those at risk of exclusion, or those using assistive technologies?
Were people representing various groups somehow involved in the development of the system?
How is the potential user audience taken into account?
Is the team involved in building the sustem representative of your largel user audience? Is it representative of the general population?
Did you assess whether there could be (groups of) people?
Practical Example: AI tends to benefit those who are already technologically capable, resulting in increased inequality. E.g. most of the images used in machine learning have been labeled by young white men.

Justification: The sprint explicitly aims to improve accessibility through UI/UX refinements and expanding the exercise library for specialized needs (e.g., seniors, postpartum), making this card directly relevant to ensure the app is fair, inclusive, and usable by a diverse range of users, including those with disabilities or unique requirements.

📌 Explainability (#2 - Transparency)

Motivation: If we cannot understand the reasons behind the actions of the AI, it is difficult to trust it.

What to Do:

Ask yourself:
Is explainability a goal for your system? How do you plan to ensure it?
How well can each decision of the system be understood? By both developers and (end-)users?
Did you try to use the simplest and most interpretable model possible for the context?
Did you make trade-offs between explainability and accuracy? What kind of? Why?
How familiar are you with your training or testing data? Can you change it when needed?
If you utilize third party components in the system, how well do you understand them?
Practical Example: When interacting with a robot, users could ideally ask the robot 'why did you do that?' and receive an understandable response. This would make it much easier for them to trust a system.

Justification: With advanced features like custom workout creation and data visualization, users, especially power users, need to understand why specific routines or plans are generated. Explainability is crucial for building trust, ensuring safety, and allowing users to make informed decisions based on the AI's recommendations.

📌 Communication (#3 - Transparency)

Motivation: In practice, communication is a big part of being transparent with your stakeholders. Being transparent in communication can generate trust.

What to Do:

Ask yourself:
What is the goal of the system? Why is this particular system deployed in this specific area?
What do you communicate about the system to its users and end-users? Is it enough for them to understand how the system works?
If relevant to your system, do you somehow tell your (end-)users that they are interacting with an AI system and not with another human being?
Do you collect user feedback? How is it used to change/improve the system?
Are communication and transparency towards other audiences, such as the general public, relevant?
Practical Example: Clearly stating what data you collect and why can make you seem much more trustworthy. Compare this to a cellphone application that just states it needs to access your camera and storage.

Justification: The sprint includes features like data sharing with friends and family, and third-party integrations, necessitating clear communication about data usage, system functionality, and AI involvement. This fosters transparency, user awareness, and trust, which are essential for ethical development and user engagement.

REQUISITOS ÉTICOS

15 minutos parada para essa etapa. Logo, não será possível seguir com a etapa 7 e 8.

HISTÓRIAS DE USUÁRIO ÉTICAS