

**Big Tech Coach**

# The SD Interview Blueprint

**How to prepare, run and reflect system design interviews**

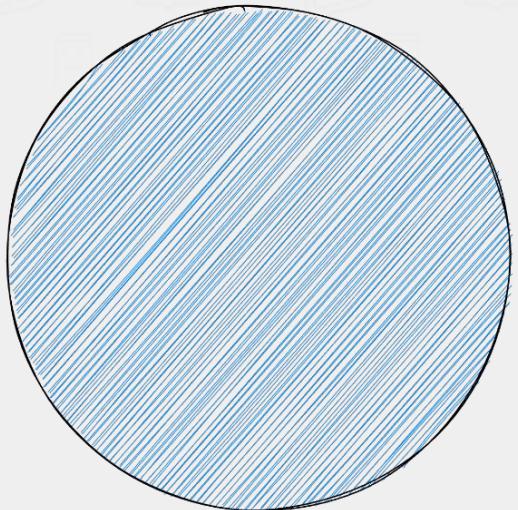
# What is the core challenge to pass a System Design Interview?

Write your opinion in the chat!

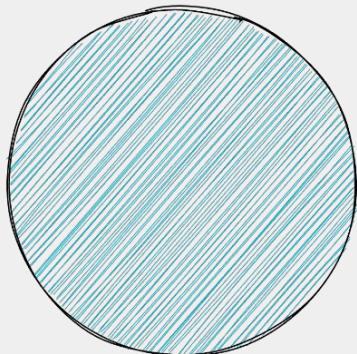
## Fundamental Problem

# Where to start and what to learn?

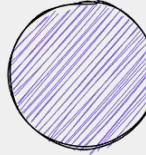
System Design Theory



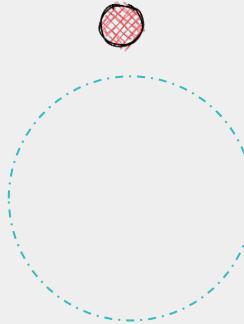
Common System Architectures



Interview Structure



Covered in a  
SD Interview



## Instructor

# Who am I?

- Fabian Hinsenkamp
- Based in Berlin, Germany
- Expectant father
- Hobby car mechanic



[/fabianhinsenkamp](https://www.linkedin.com/in/fabianhinsenkamp)



[@hinsencamp](https://twitter.com/hinsencamp)



# Instructor

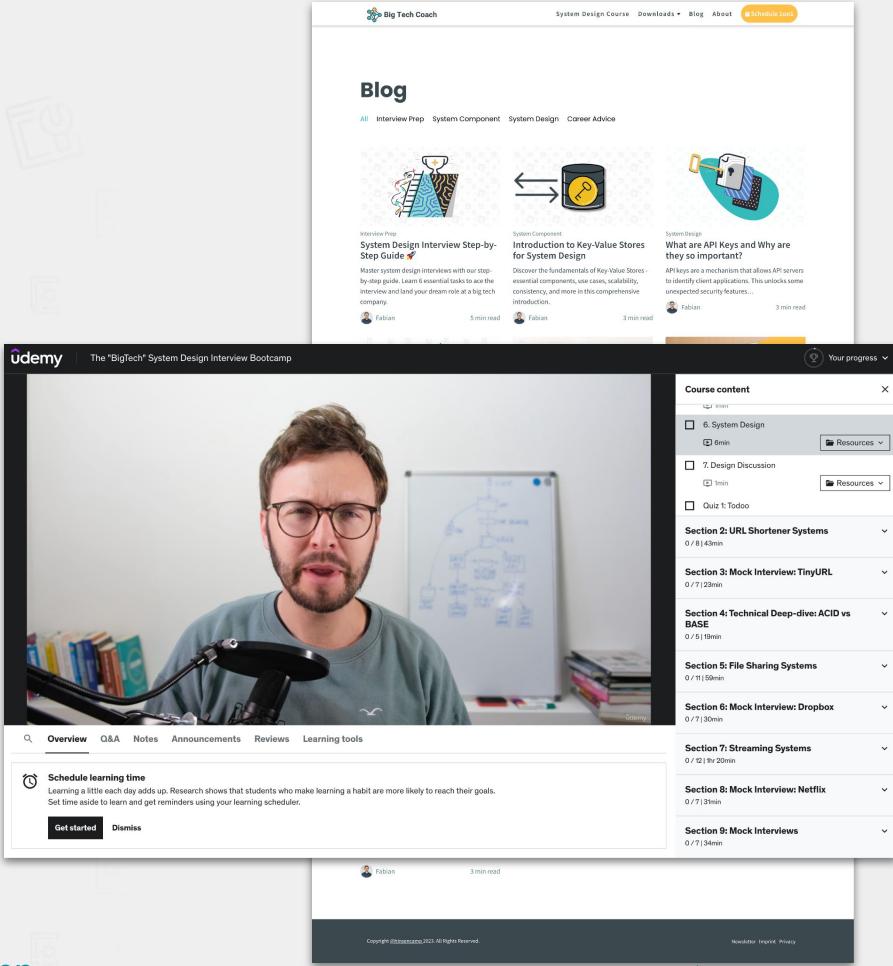
# What do I do?

- Senior Software Engineer @Microsoft
- +7 Years of Experience
- System Design Online Training
- 20k students, Ø4,7 ⭐ rating
- 1on1 System Design Mock Interviews
- Career Coaching

 [@big tech coach](#)

 [bigtech.coach](#)

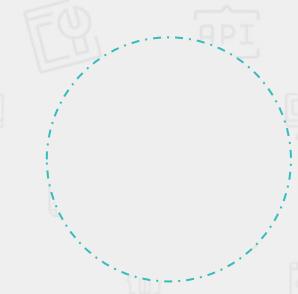
 [udemy/the-bigtech-system-design-interview-bootcamp](#)



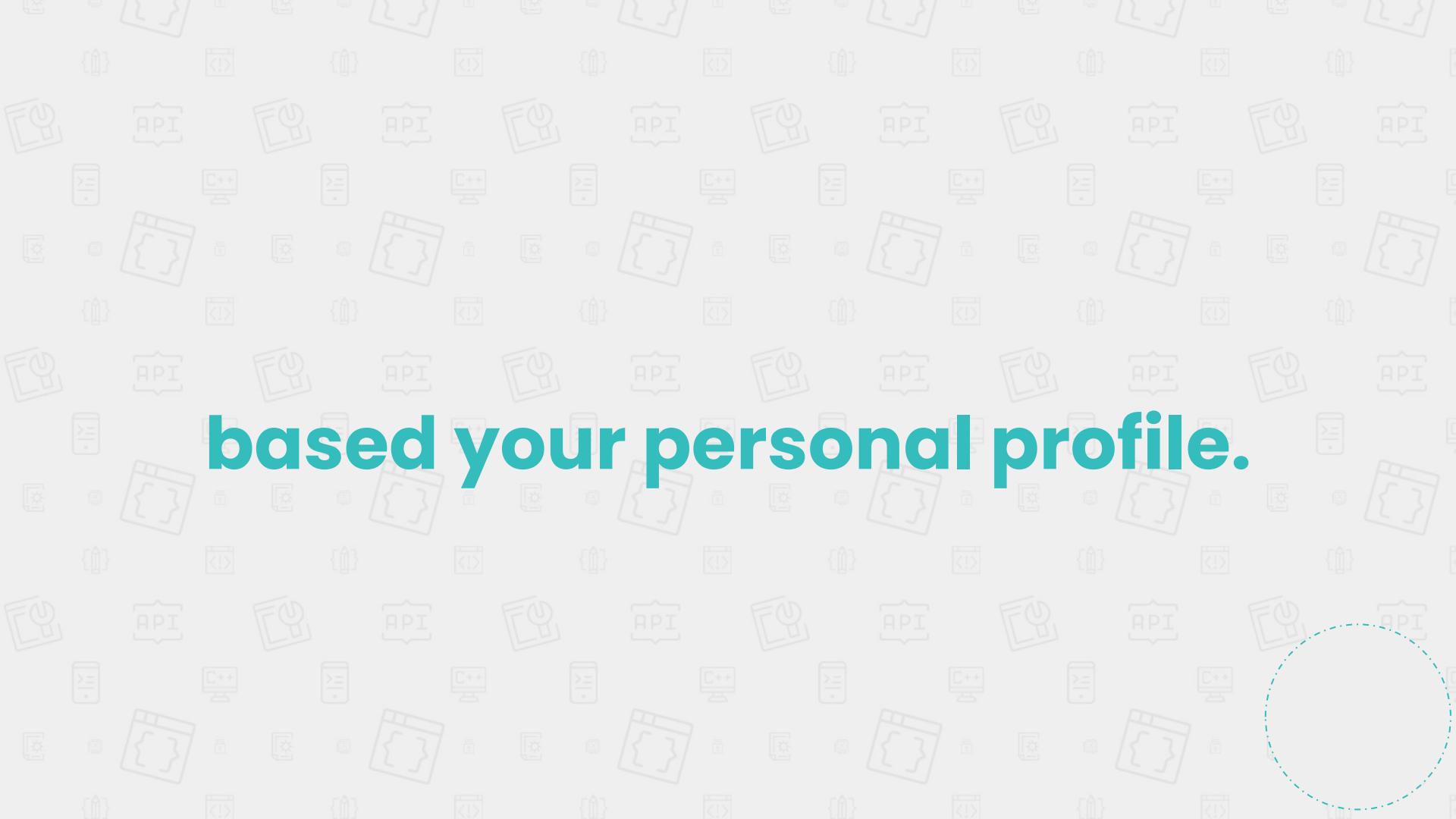
The image shows a composite screenshot of the Big Tech Coach website. At the top right is the header with the logo, navigation links for 'System Design Course', 'Downloads', 'Blog', and 'About', and a 'Schedule Call' button. Below the header is the 'Blog' section with three articles: 'System Design Interview Step-by-Step Guide', 'Introduction to Key-Value Stores for System Design', and 'What are API Keys and Why are they so important?'. The middle section is the 'Udemy' course page for 'The "BigTech" System Design Interview Bootcamp', featuring a video thumbnail of the instructor, course content outline, and a progress bar. The bottom section shows a snippet of a blog post about API keys.



# Equip you with a blueprint to...



**best prepare, run and reflect  
system design interviews...**

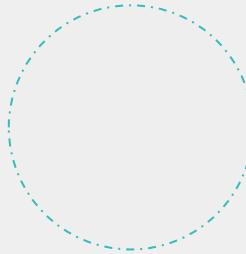


**based your personal profile.**

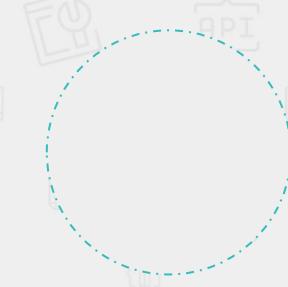
## The SD Interview Blueprint

# Today's Agenda

1. Who does the SD interview apply for?
2. Which kind of questions exist?
3. Which questions can YOU expect?
4. How to structure a comprehensive answer?
5. How to practice SD systematically?
6. How to best work with your interviewer?
7. How to deliver an comprehensive answer?
8. How to deal with stress, pressure and blackouts?
9. How to draw from every interview?



# regular Q&A Breaks



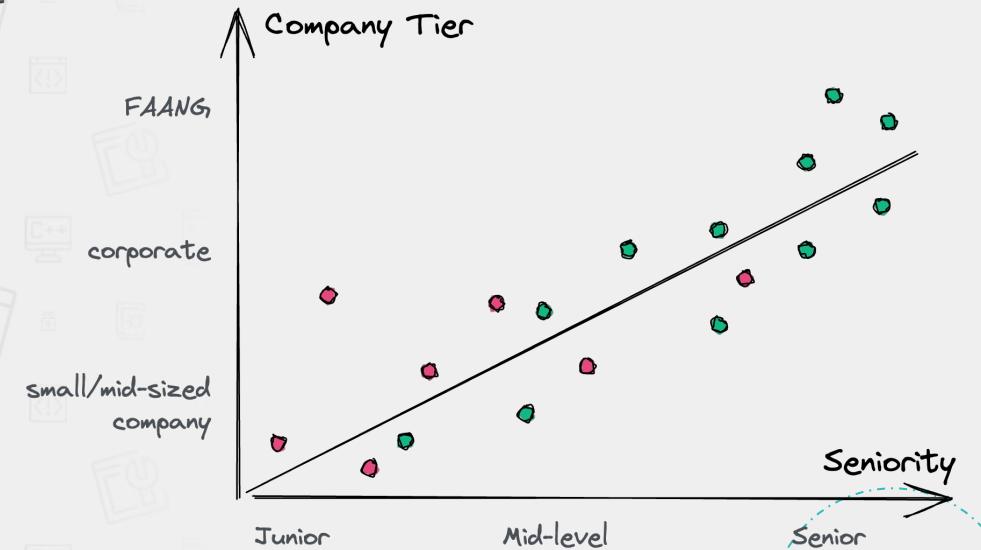
Tech Interviews

# Who does the SD interview apply for?

## Who does the SD interview apply for?

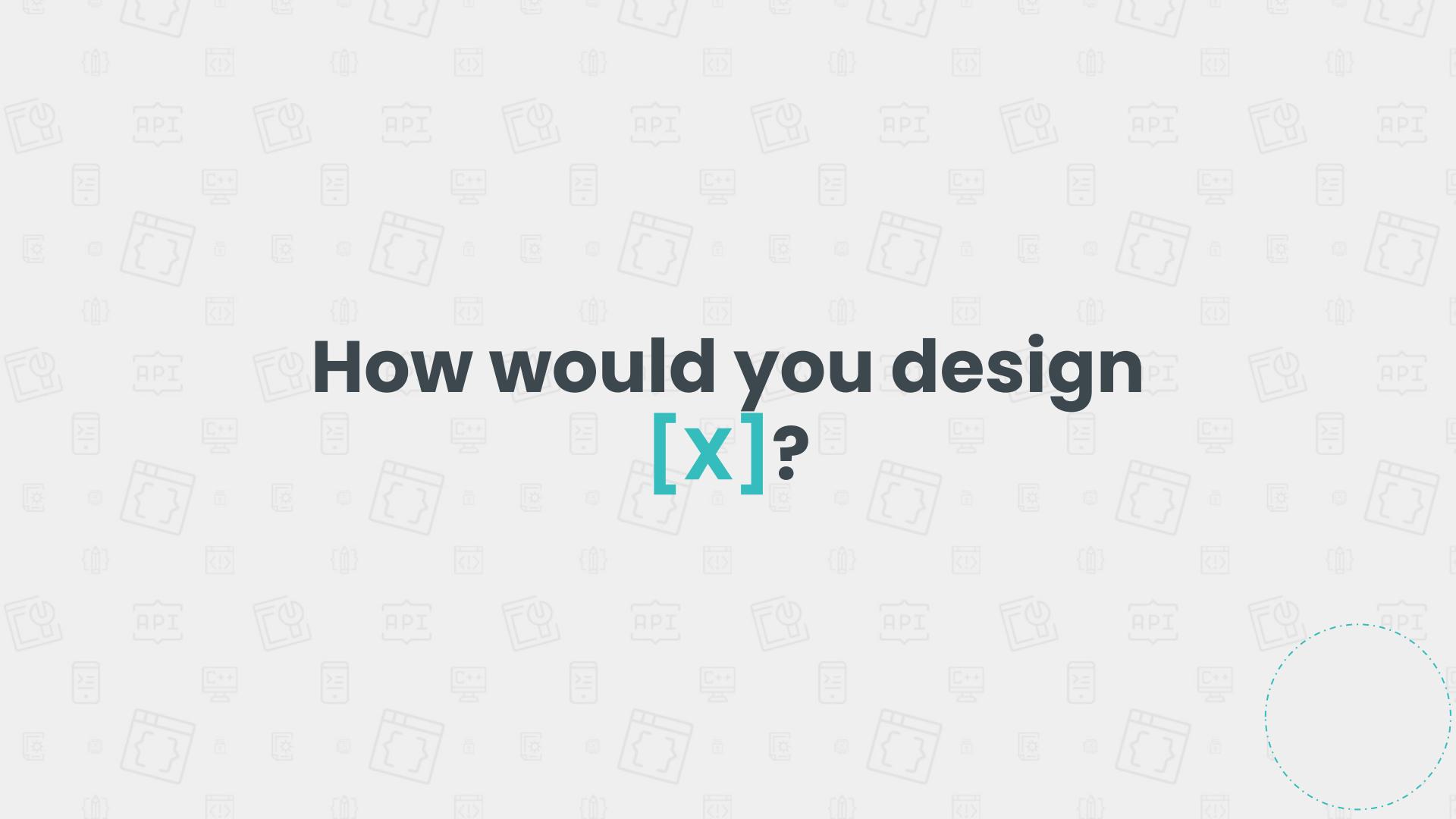
# Impact of Seniority & Company Tier

- Seniority and the company tier impact the likeness to face a SD interview round.
- Examples:
  - Google + Senior tech role ~ 100%
  - Local company + Junior role ~ 1%

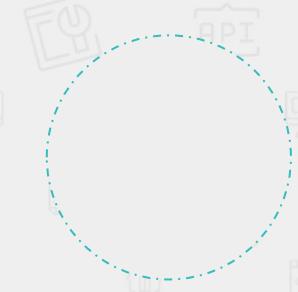


**Interview Questions**

# Which kind of questions exist?



# How would you design [x]?



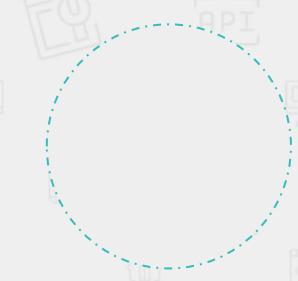
Which kind of questions exist?

## Examples

- How would you design a **vending machine**?
- How to design **Dropbox**?
- How to **file synchronization service**?
- How to design a **content delivery network (CDN)**?



# Let's put those questions into buckets!



Which kind of questions exist?

# High level design

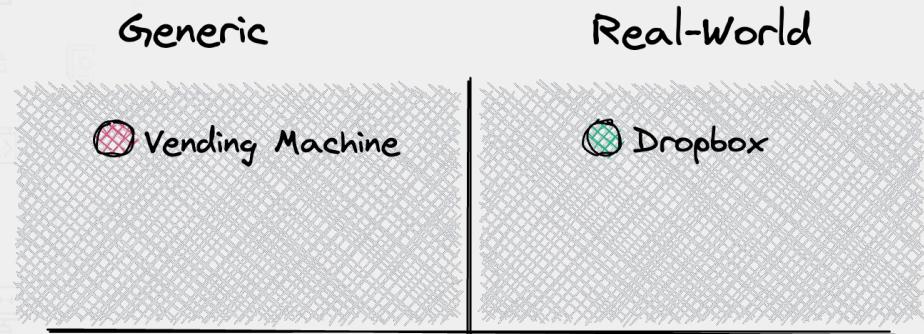
Provides an overview of a system's architecture, components, and their interactions.

## Generic Systems

- Identify requirements and constraints
- Propose suitable design

## Real-world Systems

- large-scale, complex real-world Implementations
- Require careful consideration of technical-, architectural aspects
- User experience matters as well.



## Which kind of questions exist?

# Low level design

The detailed implementation of a system, including algorithms, data structures, and interfaces.

Generic

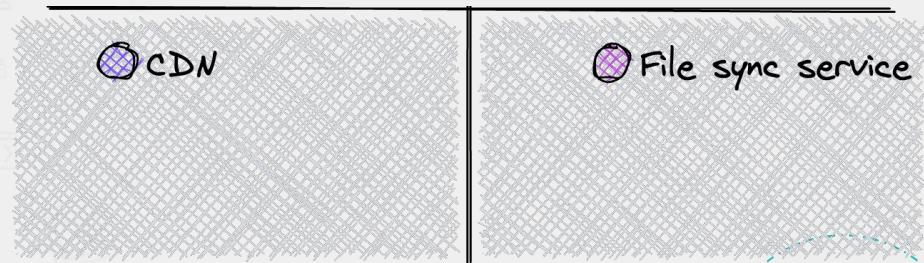
Real-World

### Generic Systems

- Design complex system components from scratch

### Real-world Systems

- Deep-dive into specific components of a large-scale, real-world system



Which kind of questions exist?

# The big picture

High Level  
Design

Low Level  
Design

Generic

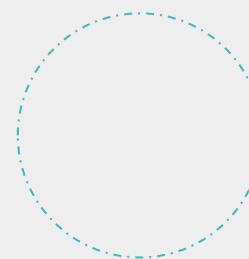
Real-World

○ Vending Machine

○ Dropbox

○ CDN

○ File sync service



**Free Bonus Resource**

# Personal Interview Prep Assessment

Unsure which question categories apply for you? Take this quiz to get a definite answer based on your personal profile.

**Link**

## Which kind of questions exist?

### Q&A

Your opportunity to ask clarifying questions about this chapter.



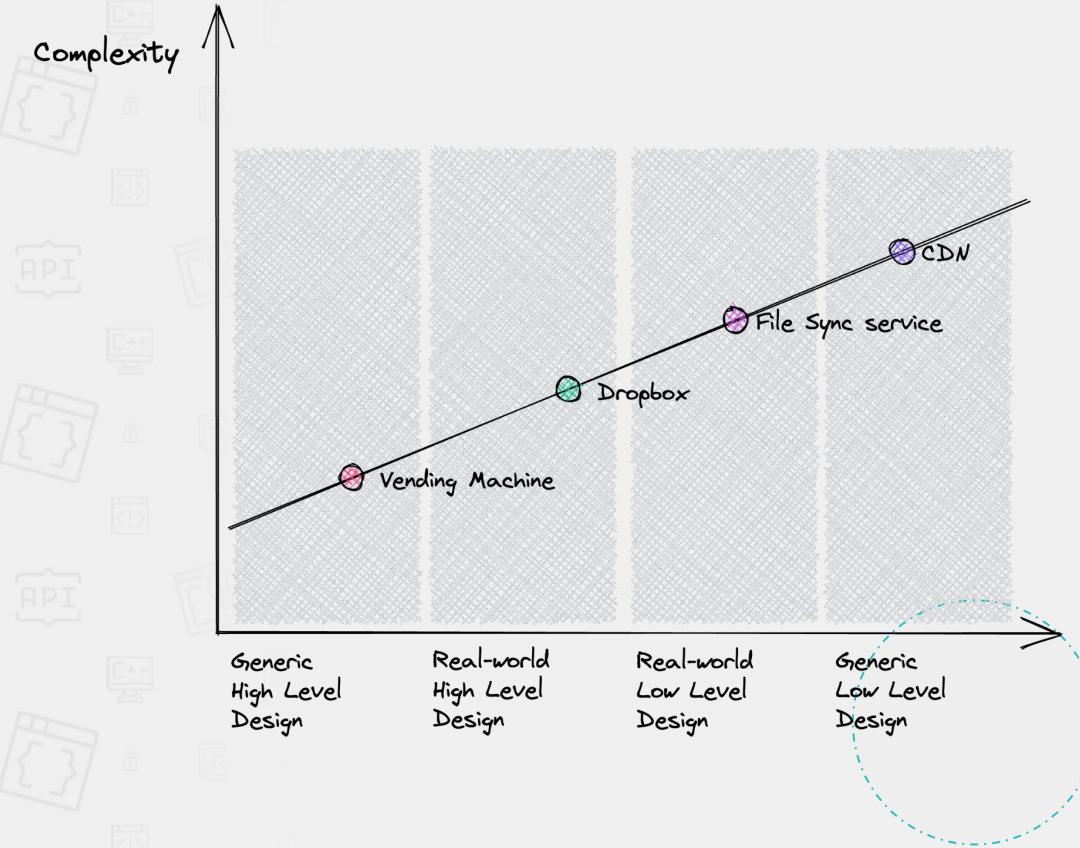
**Interview Questions**

**Which Questions can YOU  
expect?**

Which Questions can YOU expect?

# Questions sorted by technical Complexity

- Generic High Level Designs are least complex
- Generic Low Level Designs are most complex



Which Questions can YOU expect?

# Factors that impact which questions you get

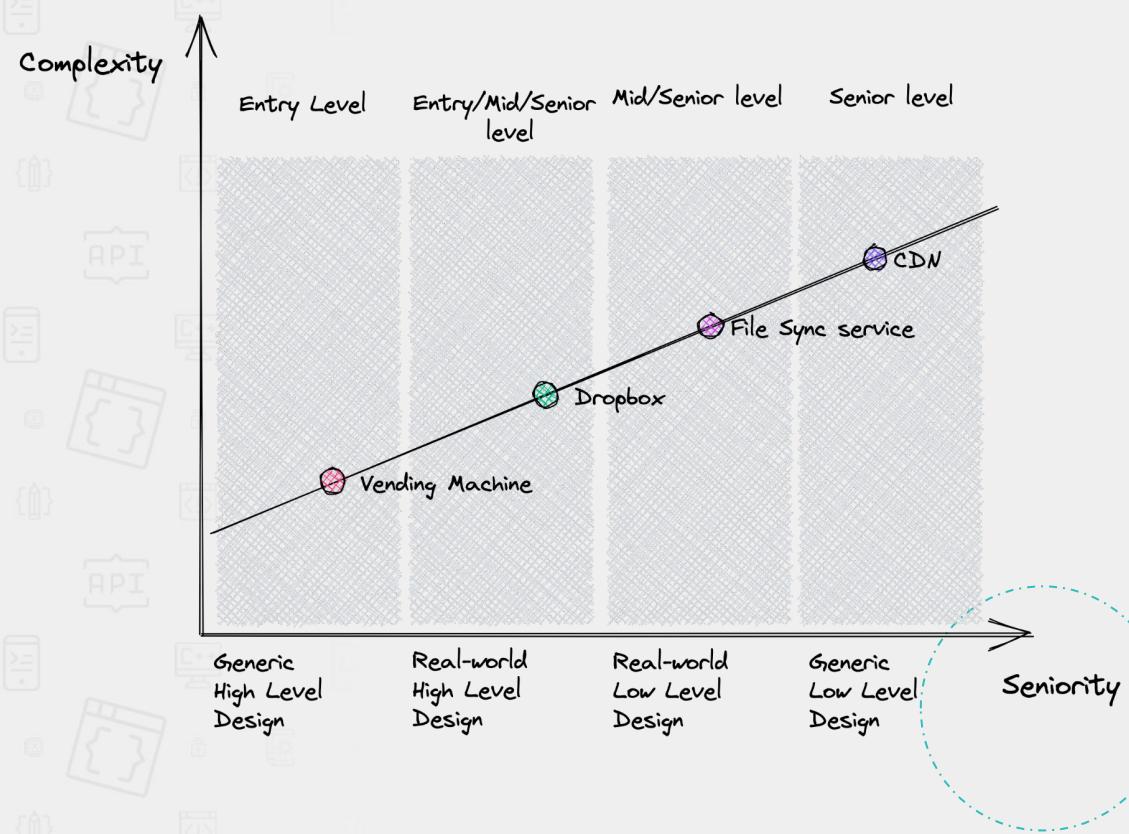
- Your **Seniority**
- Your **Role**
- The **Company** you interview with

Which Questions can YOU expect?

# The impact of seniority

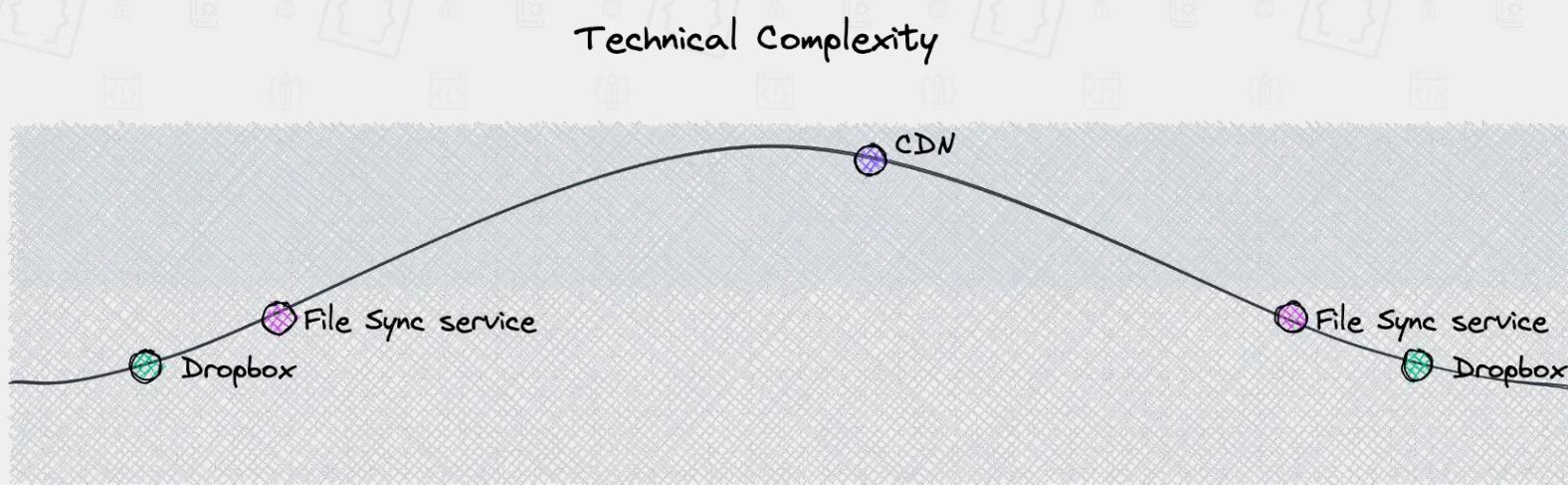
System complexity increases with seniority

- “generic high level design” questions only for junior candidates.
- “generic low level” designs only for senior candidates.



Which Questions can YOU expect?

# The impact of role



Data Engineer

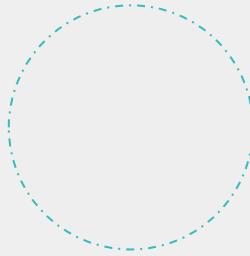
Distributed System Engineer

Program Manager

Which Questions can YOU expect?

# The impact of the company

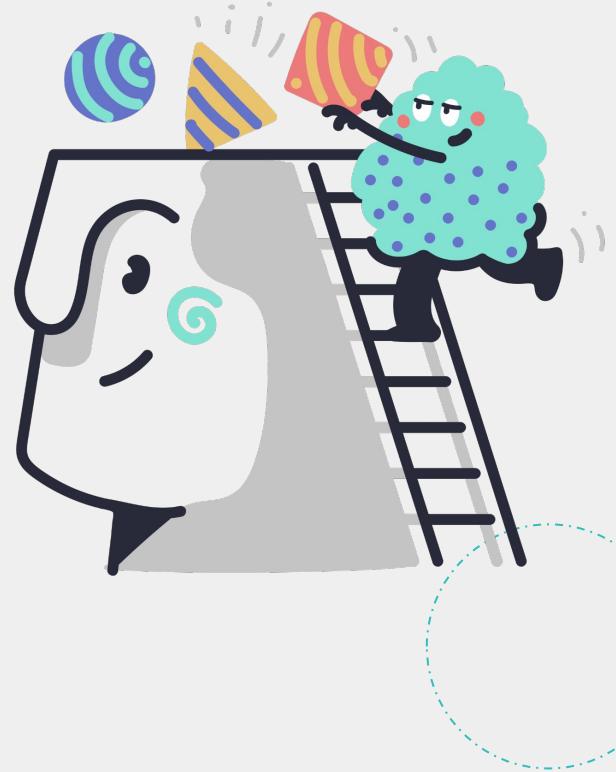
- **Netflix** likely asks streaming product questions.
- **Amazon** likely will ask marketplace / e-commerce questions.
- **Google** likely won't ask ChatGPT questions.



Which Questions can YOU expect?

# Preparation Strategy

- Evaluate
  - Your profile
  - Company tier
  - Product range
- Focus on preparing for the most likely question category.
- Start with systems related to the company you interview with.
- Extend to a broad range of systems if time allows.



## Free Bonus Resource

# 50+ Question Spreadsheet

<https://big-tech-coach.ck.page/system-design-interview-questions>

	A	B	C	D	E	F	G
1	Company	Difficulty	Kind of System	Industry	Question Type	Scope	Seniority
2	Tinder	4	Match-making	Dating	real-world system	high level	Entry/Mid/Senior Level
3	Uber	4	Map-based	Transportation	real-world system	high level	Entry/Mid/Senior Level
4	Whatsapp	3	Messenger	Collaboration/Communication	real-world system	high level	Entry/Mid/Senior Level
5	Google Duo	4	Video Call	Collaboration/Communication	real-world system	high level	Entry/Mid/Senior Level
6	Zoom	4	Video Call	Collaboration/Communication	real-world system	high level	Entry/Mid/Senior Level
7	Amazon	2	commenting system	Social Media	real-world system	low level	Senior Level
8	Twitter	4	-	Social Media	real-world system	high level	Entry/Mid/Senior Level
9	Facebook	5	-	Social Media	real-world system	high level	Entry/Mid/Senior Level
10	Snapchat	4	-	Social Media	real-world system	high level	Entry/Mid/Senior Level
11	Instagram	4	-	Social Media	real-world system	high level	Entry/Mid/Senior Level
12	Netflix	5	Movie/Series streaming	Media Streaming	real-world system	high level	Entry/Mid/Senior Level
13	Amazon	5	Marketplace	E-commerce	real-world system	low level	Senior Level
14	Amazon	5	Reviews	E-commerce	real-world system	low level	Senior Level
15	RedBus	3		E-commerce	real-world system	high level	Entry/Mid/Senior Level
16	Ticketmaster	3	Ticketing	E-commerce	real-world system	high level	Entry/Mid/Senior Level
17	BookMyShow	3	Ticketing	E-commerce	real-world system	high level	Entry/Mid/Senior Level
18	Amazon Locker	2		E-commerce	real-world system	high level	Entry/Mid/Senior Level
19	-	3	Movies Review Aggregator Syst	E-commerce	real-world system	high level	Entry/Mid/Senior Level
20	-	3	offline caching system for Ecomm	E-commerce	real-world system	low level	Senior Level
21	Zomato/Swiggy/Foodpanda	3		E-commerce	real-world system	high level	Entry/Mid/Senior Level
22	Google Docs	4	Collaborative Document Editing	Collaboration/Communication	real-world system	low level	Senior Level
23	Meeting Calendar system	2		Collaboration/Communication	real-world system	high level	Entry/Mid/Senior Level

Which Questions can YOU expect?

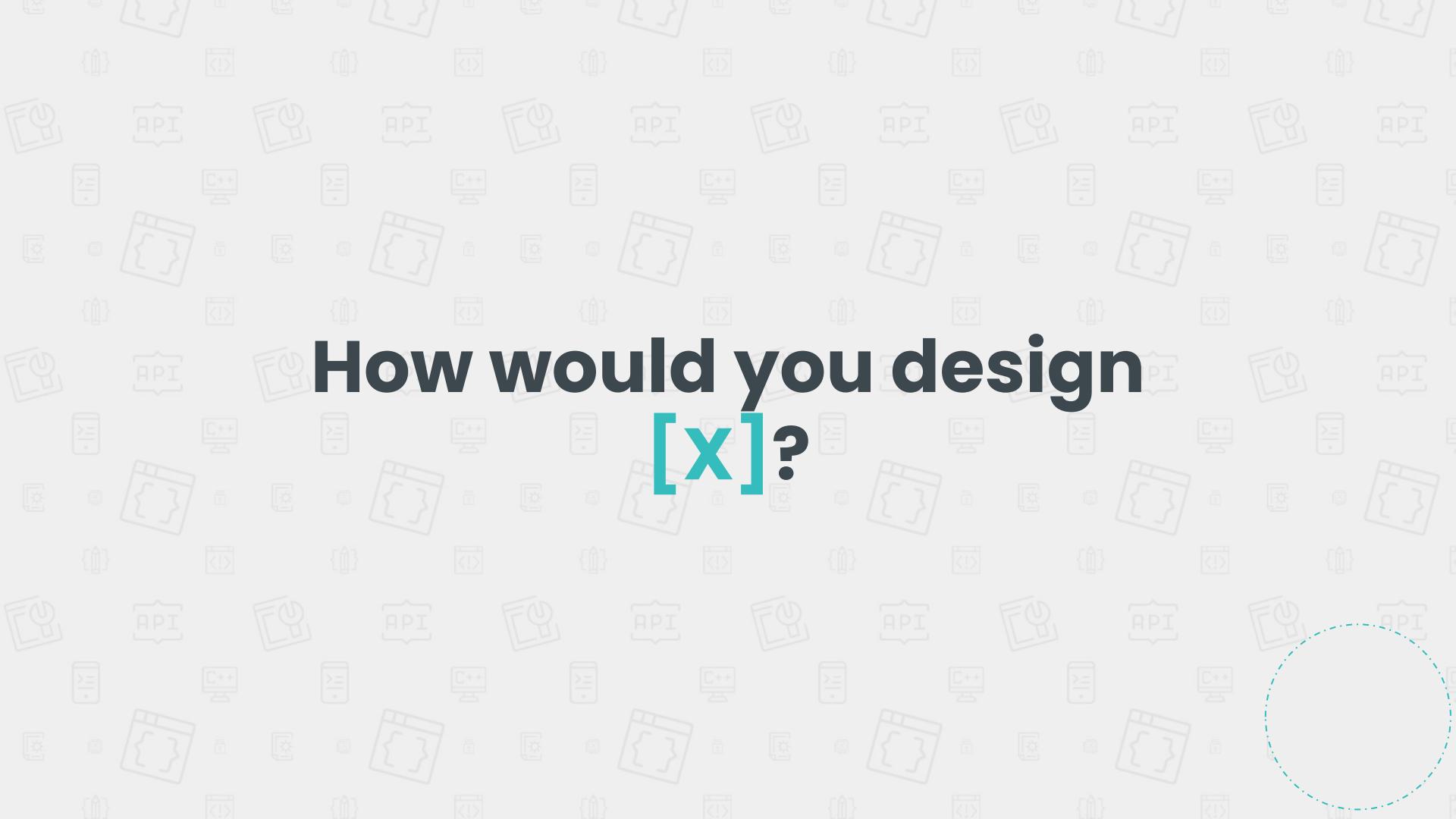
## Q&A

Your opportunity to ask clarifying questions  
about this chapter.

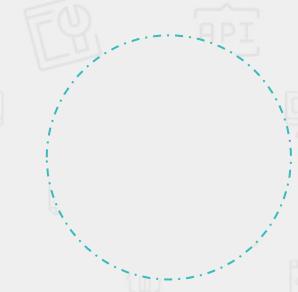


**Before the Interview**

# How to structure a comprehensive answer?



# How would you design [x]?



## Interactive Quiz

# What does a good answer need to provide?

Write your opinion in the chat!



## Interactive Quiz – Answers

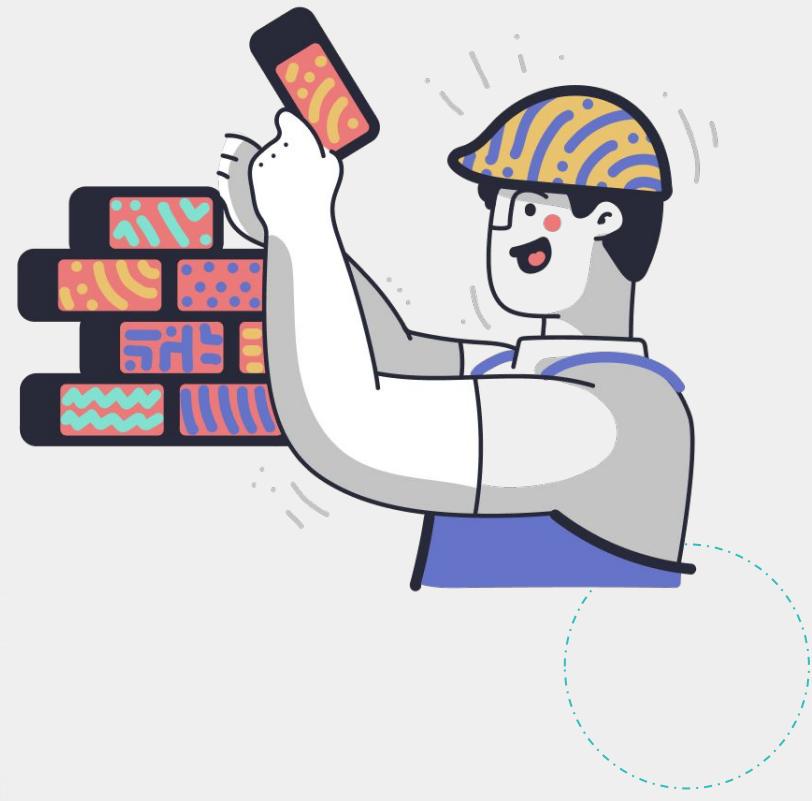
# What does a good answer need to provide?

- Alignment with the interviewer
- Clarification on what to design
- Opportunity to let you shine
- Structure

How to structure a comprehensive answer?

# 6 common steps to success

1. Requirements Engineering
2. Capacity Estimation
3. Data Model
4. API Design
5. System Design
6. Design Discussion



## How to structure a comprehensive answer?

# 1. Requirements Engineering

### Purpose

- Clarify system requirements and scale.
- Agree on scope for the interview.

### Expected outcome

1. Functional Requirements
2. Non-functional Requirements
3. Scale of the System

### Opportunity / Thread

- + Align on designing features you know inside-out
- Agree on a scope exceeding your time and knowledge.



## How to structure a comprehensive answer?

# 2. Capacity Estimation

### Purpose

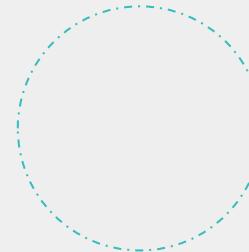
- Estimate the capacity your solution needs to handle the expected scale of the system.

### Expected outcome

1. Throughput (Requests per second)
2. Bandwidth (GB per second)
3. Storage (TB in 5 years)

### Opportunity / Thread

- + Get values to justify later design decisions.
- Lose time and nerves due to miscalculations.



## How to structure a comprehensive answer?

### 3. Data Model

#### Purpose

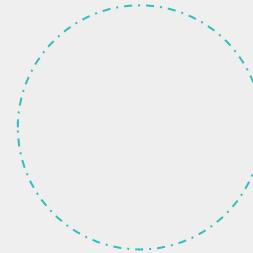
- Outline a data model that supports the system's feature set.

#### Expected outcome

1. Data Model (no perfect data schema)
2. Selection of suitable databases
3. Starting point to scale SQL DBs (Sharding etc.)

#### Opportunity / Thread

- + Clear understanding of data flow and the ideal storage options.
- Spend too much time creating a perfect schema.



## How to structure a comprehensive answer?

# 4. API Design

### Purpose

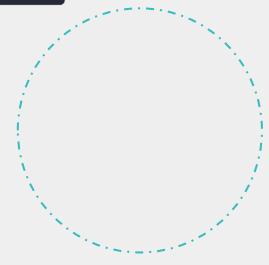
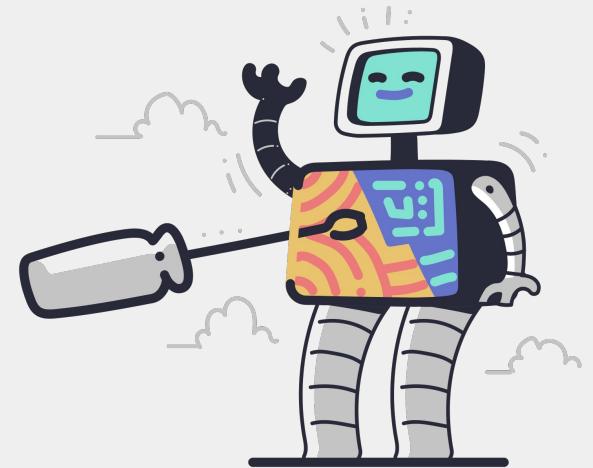
- Define how the system exposes its features

### Expected outcome

1. The 2-3 central API endpoints
2. Input / Output Parameters
3. URLs (optional)

### Opportunity / Thread

- + Showcase your ability to plan a system end-to-end.
- Spend too much time on details.



## How to structure a comprehensive answer?

# 5. System Design

### Purpose

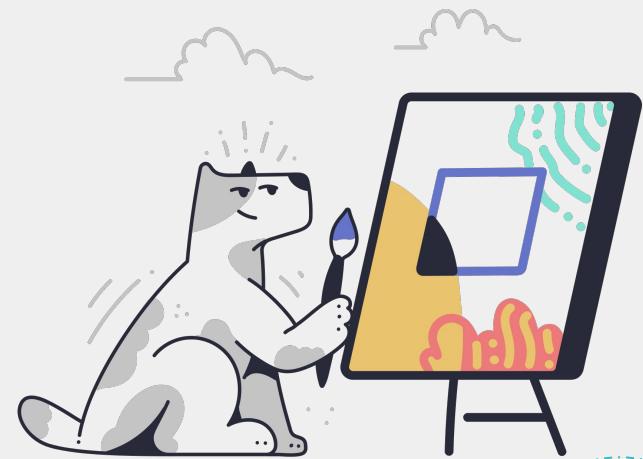
- Layout the architecture serving as the foundation for the following design discussion.

### Expected outcome

1. system design diagram

### Opportunity / Thread

- + Effectively convey your design idea and surface bottlenecks to optimize.  
Reveal knowledge gaps you tried to hide.



## How to structure a comprehensive answer?

# 6. Design Discussion

### Purpose

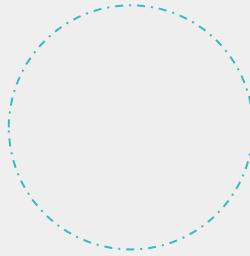
- Go deeper into details, discuss alternative designs and optimizations.

### Expected outcome

1. An improved system design

### Opportunity / Thread

- + Show off your technical expertise and ability of critical thinking and problem solving.  
Reveal the lack of the former.



**Free Bonus Resource**

# Structured Answer Cheat Sheet

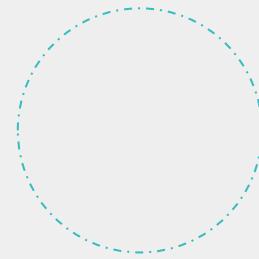
Want to recap this chapter? I got a cheat sheet for you that summarizes each of the 6. steps for you.

[Link](#)

## How to structure a comprehensive answer?

### Q&A

Your opportunity to ask clarifying questions  
about this chapter.



**Before the Interview**

# How to practice SD interviews systematically?

How to practice SD interviews systematically?

# The four ingredients of efficient Preparation

1. Learn and understand system components, concepts and technologies
2. Prioritize most likely questions
3. Internalize a standardized problem-Solving Strategy
4. Exercise and practice effectively.



## How to practice SD interviews systematically?

# Practice the 6 common steps

1. Requirements Engineering

requires system specific knowledge

2. Capacity Estimation

3. Data Model

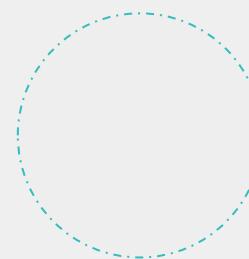
repetitive, requires mostly practice

4. API Design

5. System Design

requires system specific knowledge

6. Design Discussion



How to practice SD interviews systematically?

# Systems can be clustered by core features

- **Streaming**
  - Netflix
  - Youtube
  - Spotify
- **Map-based**
  - Uber
  - Deliveroo
  - Google Maps
- **News Feed**
  - Twitter
  - Instagram
  - Facebook
- ...

How to practice SD interviews systematically?

# Systems share support features across clusters

- **Recommendation Engine**

- Instagram
- Netflix
- Deliveroo

- **Proximity Estimation**

- Uber
- Whatsapp

- **Full Text Search**

- Facebook
- Youtube

## How to practice SD interviews systematically?

# “Cluster by Cluster” and “Mix & Match” Strategy

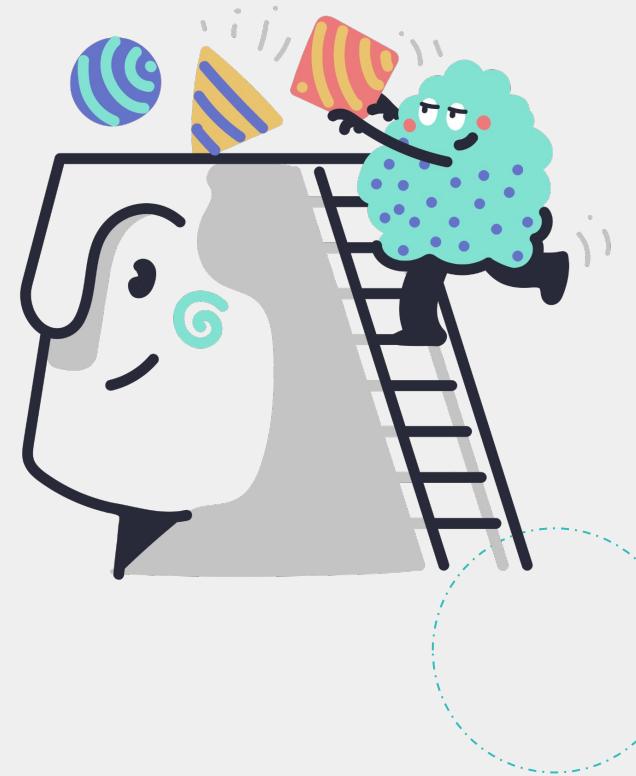
1. Work though increasingly complex system clusters, e.g.

1. File Sharing Systems
2. Streaming
3. ...
4. Map-based Systems

2. Understand the technical challenge of the unifying core feature, practice the different implementations, eg.

- Netflix
- Youtube
- Spotify

3. Build up a design “library” of support features by experimenting with different support features along the way.



## How to practice SD interviews systematically?

### Q&A

Your opportunity to ask clarifying questions about this section.



**Free Bonus Resource**

# SD Interview Exercise Journal

Made to keep all your notes and diagrams in one place. Allows you to connect the dots and efficiently exercise.

19 USD.

[Link](#)

**During the Interview**

# **How to best work with your interviewer?**

## How to best work with your interviewer?

# Hungry Judge Effect

### Findings

- Study of the decisions of Israeli parole boards (2011)
- Granting of parole was 65% at the start of a session but would drop to nearly 0% before meal breaks.

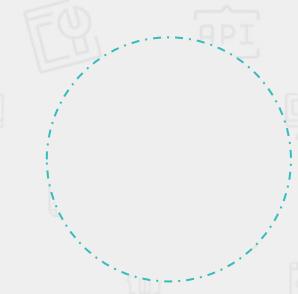
### Implications

- Tired people are more likely to stick with what they know instead of making brave choices.
- After resting and recovering, they become more willing to make daring decisions again.





# Your Interviewer is...





**the most influential person on your  
interview success!**

## Interactive Quiz

**How do you find out,  
how to best work with  
your interviewer?**

Write your opinion in the chat!



## Interactive Quiz – Answers

# How can you find out what the interviewer expects of you?

- Find out as much as possible upfront
  - Name
  - Role
  - Background
  - etc.
- In the first minutes of the interview
  - Name
  - Role
  - “Type”

How to best work with your interviewer?

# The Two Types of Interviewers



## Warm

- Enjoys collaboration
- Likes when you check-in
- Engages with you during the interview



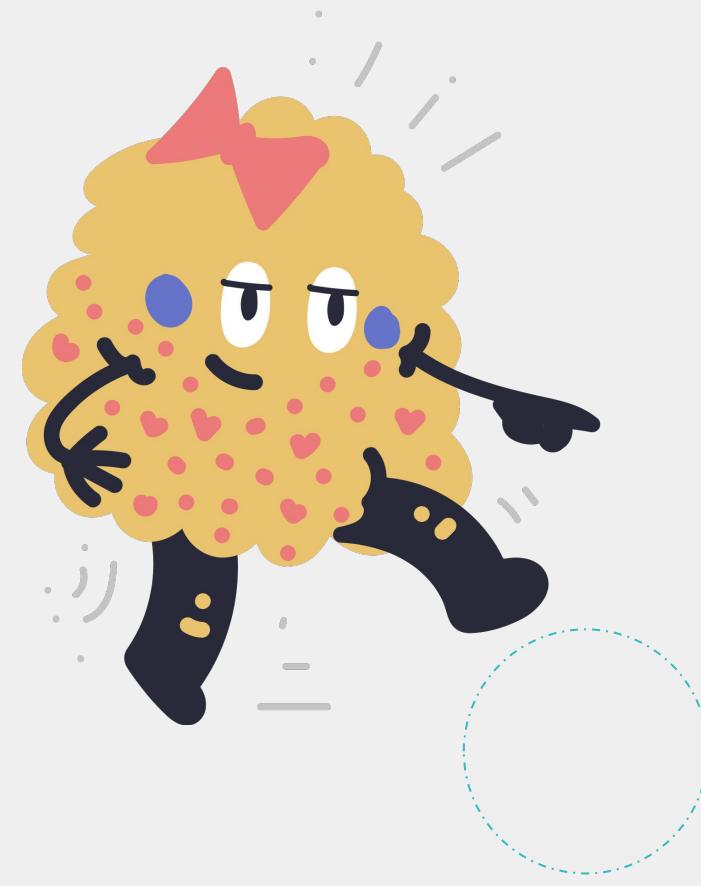
## Cold

- Wants you get thing done on your own
- Seem like they rather don't want to be here
- Withdraws after you start engaging (asking questions, think out loud)

How to best work with your interviewer?

# Handle the *warm* interviewer

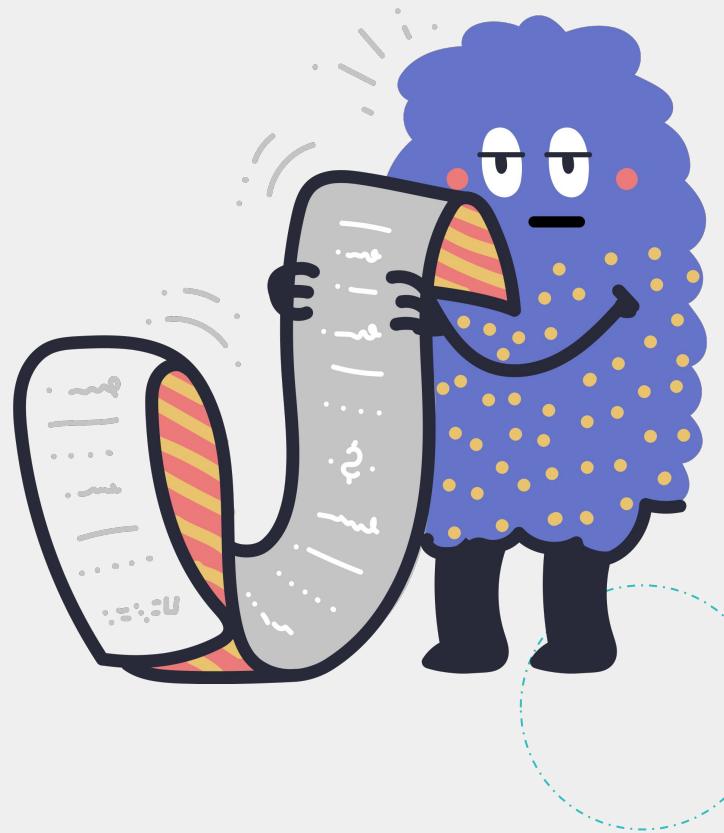
- Check-in with them
- Ask them qualified questions
- Act like you are a tech lead and they are a well-respected colleague you're working with.



How to best work with your interviewer?

# Handle the *cold* interviewer

- Do less thinking out loud too much.
- Wait until you're reasonably sure about what you're going to say.
- Well-worded statements are less work for the cold interviewer than questions.



## How to best work with your interviewer?

### Q&A

Your opportunity to ask clarifying questions about this chapter.



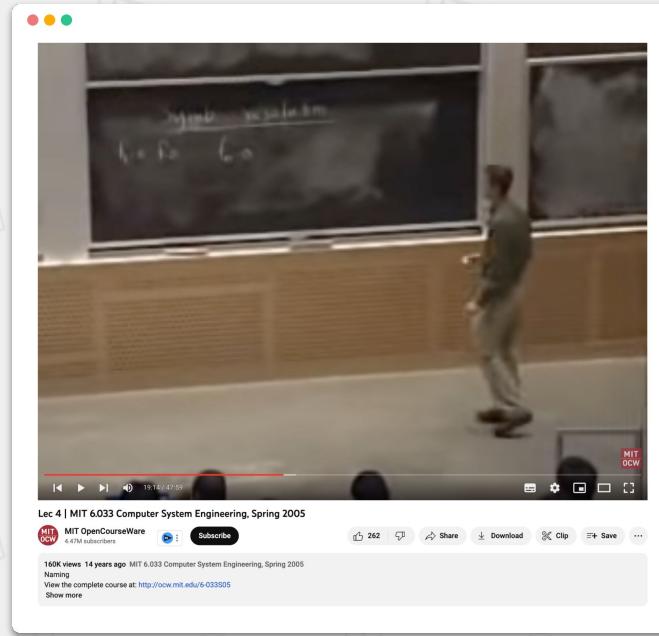
**During the interview**

# **How to deliver an comprehensive answer?**

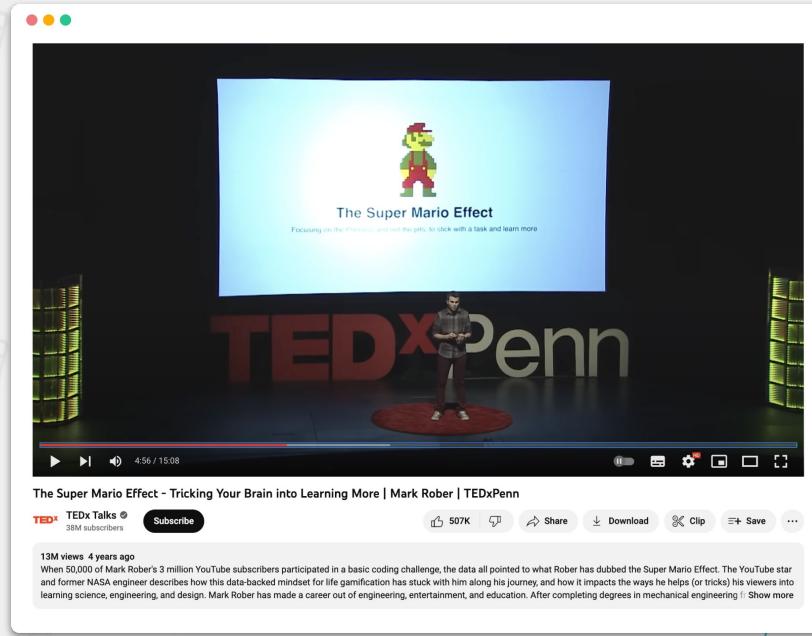
## How to deliver an comprehensive answer?

# Delivery matters

Free MIT Education



“Cool” Research Findings



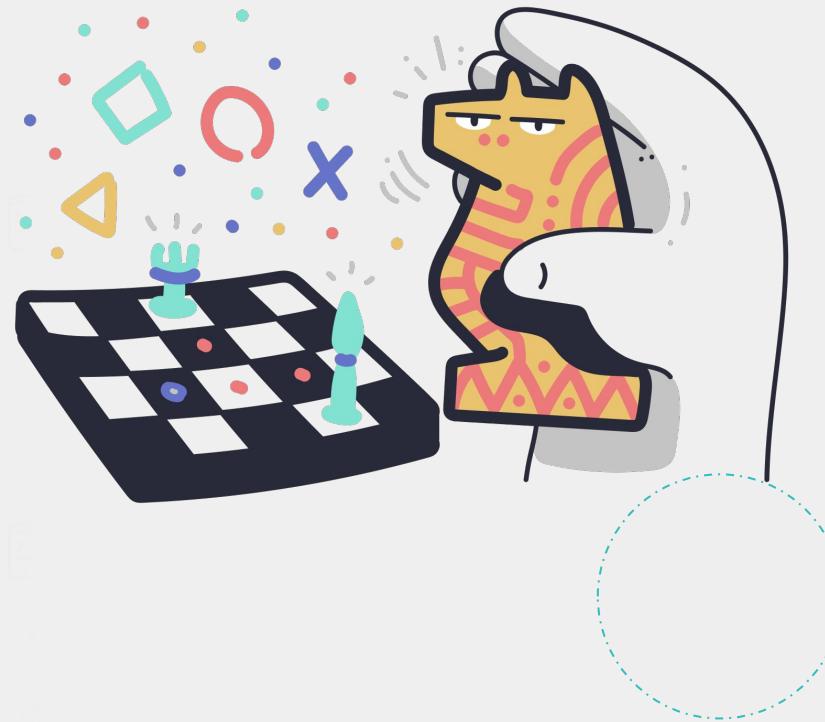
160.000 views in 14 Years

15.000.000 views in 4 years

How to deliver an comprehensive answer?

# You got all you need to plan your best answer!

-  You know which questions to expect
-  You know how to structure your answer
-  You know how to adjust to different interviewers
-  You know your strength and weaknesses





**Be smart, strategic and control the  
interview flow.**

How to deliver an comprehensive answer?

# 1. Requirements Engineering

## Do

- Identify if your interviewer is hot or cold and adjust.
- Select the support features you are most confident with.
- Pick easy to calculate with numbers to describe the system's scale.

## Don't

- Don't let control slip to the interviewer.



## How to deliver an comprehensive answer?

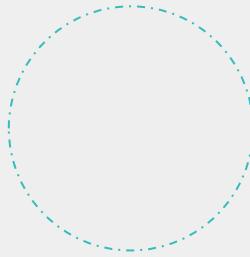
# 2. Capacity Estimation

### Do

- Use short hands to quickly estimate the required numbers.
- Explain your approach, don't let the Interviewer guess why you are doing a certain calculation.
- Double check each estimate before moving on.

### Don't

- Don't make it more complex than necessary. The process matters, not the result.



## How to deliver an comprehensive answer?

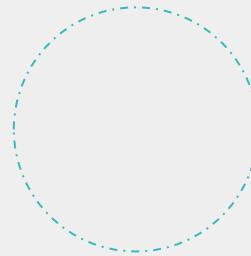
### 3. Data Model

#### Do

- Include both DB types in your design to highlight your ability to leverage their unique properties.
- Include your storage capacity estimation in your reasoning.
- Know your support features data layout.

#### Don't

- Don't perfectly normalize all tables when only a portion of it goes into a SQL database.



## How to deliver an comprehensive answer?

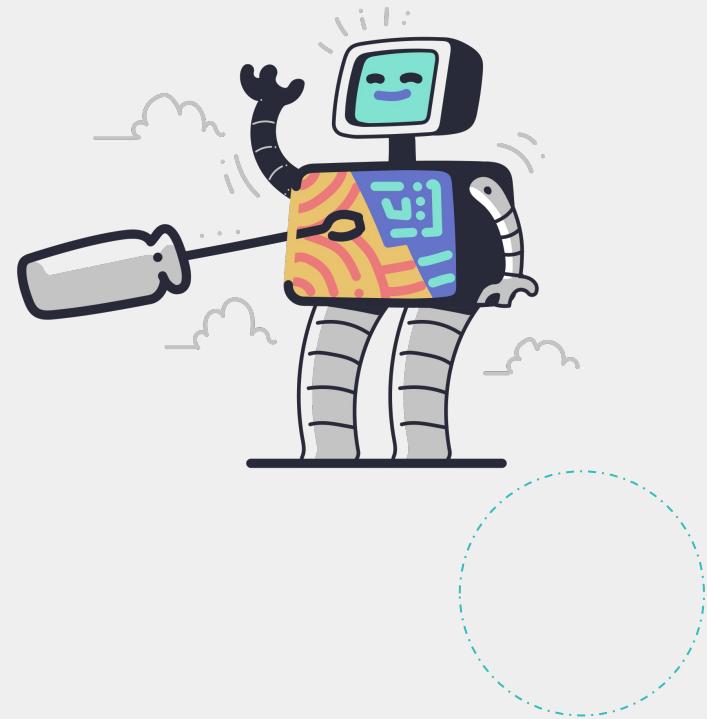
# 4. API Design

### Do

- Have the APIs for support features ready to recall.
- Explain the link between API endpoints, database calls.

### Don't

- Don't try to layout a complete API design, just be excellent on the core endpoints you cover.



## How to deliver an comprehensive answer?

# 5. System Design

### Do

- Start with designing the core feature end to end.
- Add support features in a second iteration.
- Aim for e2e competition. Defer optimizations to the the discussion.

### Don't

- Don't draw for 15 minutes in silence.
- Don't aim for perfection.
- Don't forget about all previous steps.



## How to deliver an comprehensive answer?

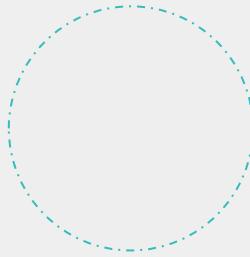
# 6. Design Discussion

### Do

- Do actively propose improvements to your current solution. Make sure to layout the trade-offs and justify your decision.
- Kill time by diving deep into details, where you are most knowledgeable.

### Don't

- Don't bring up any details when you can't stand a single follow up question.



## How to deliver an comprehensive answer?

### Q&A

Your opportunity to ask clarifying questions  
about this chapter.



**During the Interview**

# **How to deal with stress, pressure and blackouts?**

## Interactive Quiz

**How do you deal with  
stress, pressure and  
blackouts?**

Write your opinion in the chat!



## Interactive Quiz – Answers

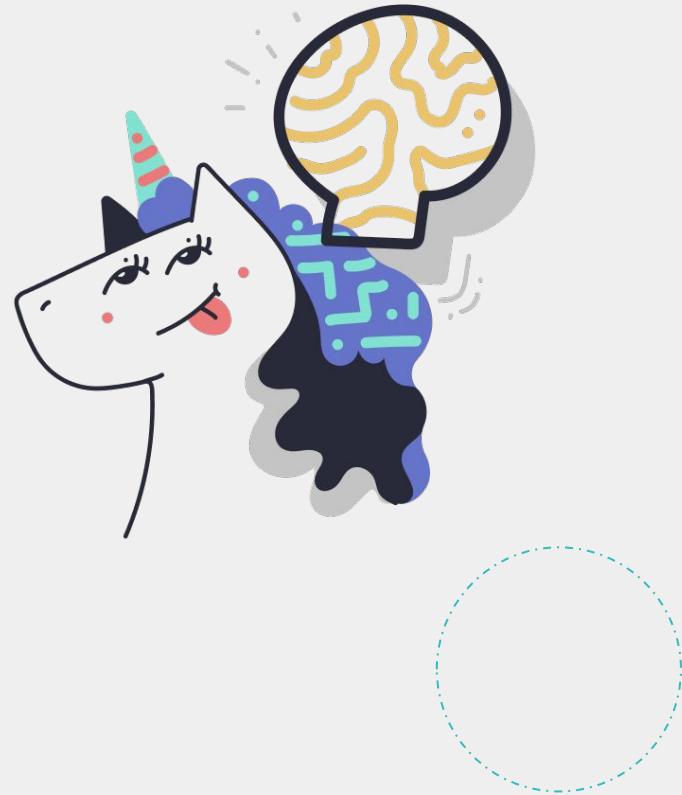
# How do you deal with stress, pressure and blackouts?

- Ask clarifying questions
- Think aloud
- Focus on progress
- Stay positive

How to deal with stress, pressure and blackouts?

## Ask Clarifying Questions

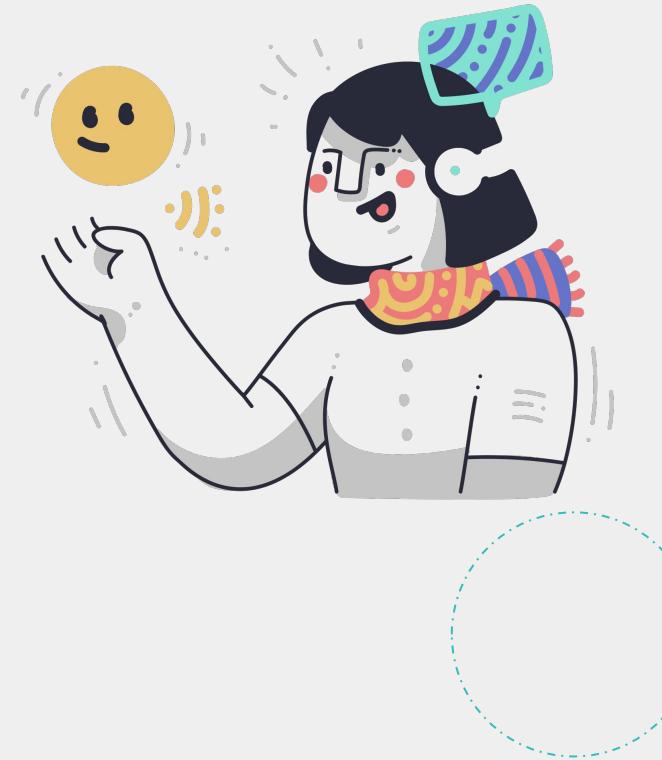
- Unsure about the problem or requirements?
  - Can help to better understand the problem
  - Reduces the chance of a mental blackout
- Isn't penalized but appreciated!



## How to deal with stress, pressure and blackouts?

# Think Aloud

- Verbalize your thought process while solving problems.
- Helps the interviewer understand your approach.
- Gives an opportunity to provide guidance if you are going off track.



How to deal with stress, pressure and blackouts?

## Focus on Progress

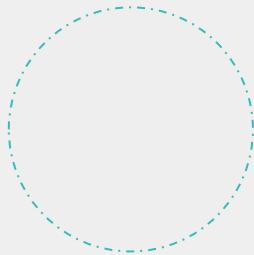
- Try to make incremental progress on the problem instead of attempting to solve it all at once.
- Can help you build momentum and regain your confidence.



## How to deal with stress, pressure and blackouts?

# Stay Positive

- Maintain a positive attitude during the interview.
- Interviewers are often most interested in:
  - Your problem-solving approach ability
  - How you learn from mistakes



## How to deal with stress, pressure and blackouts?

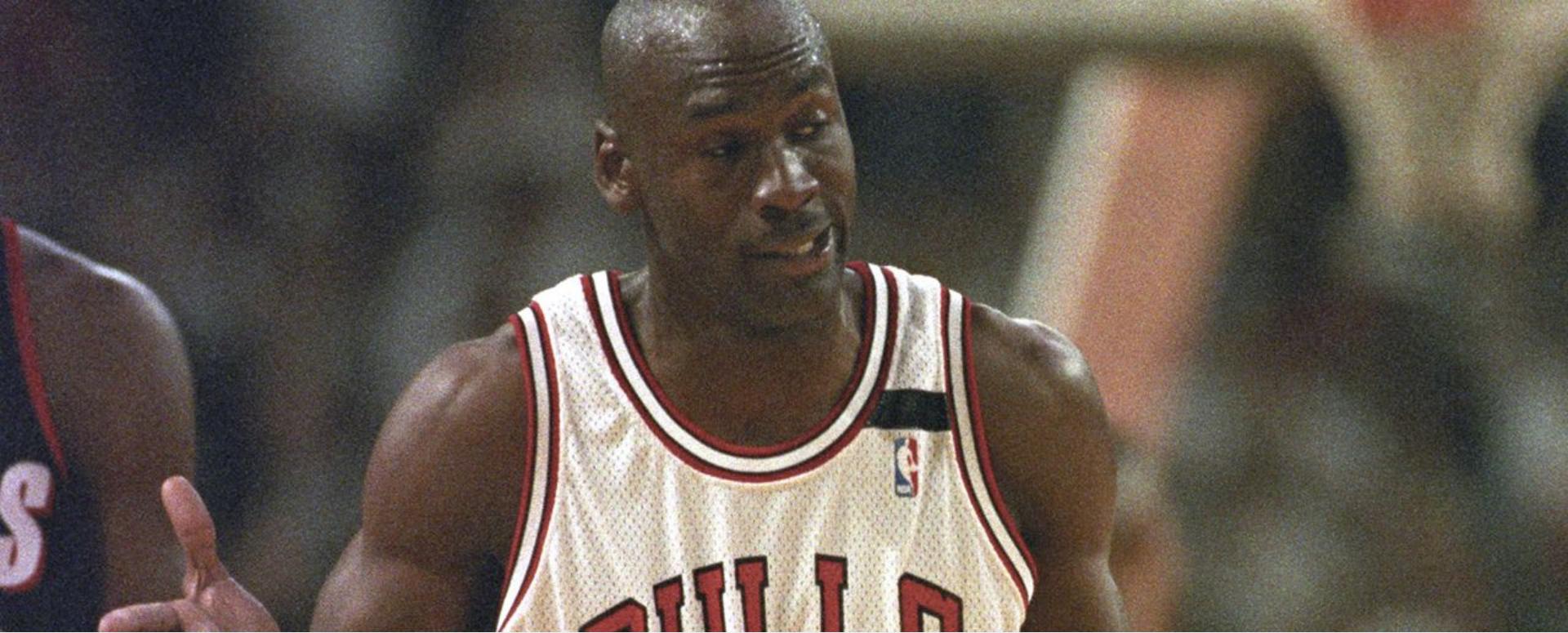
### Q&A

Your opportunity to ask clarifying questions  
about this chapter.



**After the Interview**

# How to draw from every interview?



Creator: Mike Blake | Credit: Reuters

"I've missed more than 9,000 shots in my career. I've lost almost 300 games. Twenty-six times, I've been trusted to take the game-winning shot and missed. I've failed over and over and over again in my life. And that is why I succeed."

Michael Jordan

How to draw from every interview?

# Learn from experience like Michael

To be effective, build a strong recap habit:

1. Take a Break
2. Write Down Your Impressions
3. Analyze Your Performance
4. Seek Feedback
5. Update your Preparation Strategy

How to draw from every interview?

# Write Down Your Impressions

- Write down your thoughts about the interview, while the experience is still fresh.
- Details to note down:
  - The questions you were asked,
  - how you felt during the interview,
  - any areas where you think you performed well or struggled.



## How to draw from every interview?

# Analyze Your Performance (1 / 2)

- **Technical Skills**
  - Effectively demonstrate your knowledge and problem-solving abilities?
  - Any areas where you need to improve understanding or practice more?
- **Communication Skills**
  - Did you clearly articulate your thought process and reasoning?
  - How well you explained your approach?
  - Did you engaged in active listening with the interviewer?



## How to draw from every interview?

# Analyze Your Performance (2 / 2)

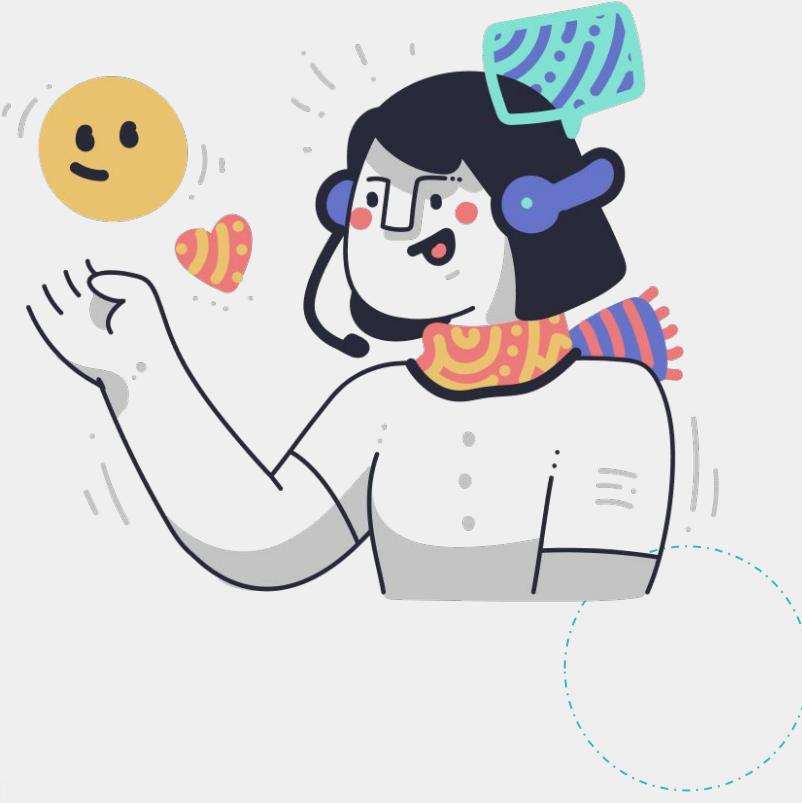
- **Time Management**
  - Did you manage your time well during the interview?
  - How you allocated time for each step?
  - Did you spent too much or too little time on specific problems?
- **Body Language and Attitude**
  - Were you confident and approachable, or did you come across as nervous or defensive?



## How to draw from every interview?

# Seek Feedback

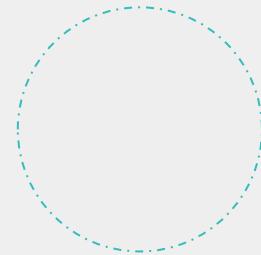
- Reach out to the interviewer or recruiter for detailed feedback on your performance.
- They may provide valuable insights that can help you improve for future interviews.
- Be friendly but persistent, you ask for a favour here.



How to draw from every interview?

# Update Your Preparation Strategy

- Adjust your strategy based on your identified areas for improvement.
  - Focus on specific technical topics
  - Practice your routines by designing more systems
  - Practice communication skills
- Don't stop practicing before you get positive feedback



## How to deal with stress, pressure and blackouts?

### Q&A

Your opportunity to ask clarifying questions  
about this chapter.



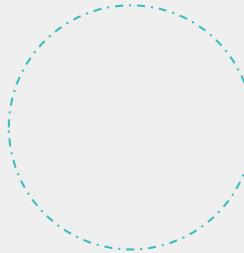
**Wrapping up...**

# The Key Takeaways

## The Key Takeaways

# Questions we answered today!

1. Who does the SD interview apply for?
2. Which kind of questions exist?
3. Which questions can YOU expect?
4. How to structure a comprehensive answer?
5. How to practice SD systematically?
6. How to best work with your interviewer?
7. How to deliver an comprehensive answer?
8. How to deal with stress, pressure and blackouts?
9. How to draw from every interview?



# Thank you!

Want to stay in touch?



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