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FRONT-END CAREER GROWTH

Agenda

- Is front-end the right choice?
- A typical career path forward.
- Skills to pick up along the path.
- Who is your customer?

IS FRONT-END THE RIGHT CHOICE?

Product, infrastructure or product infrastructure?

- A better question: **what kind of customer do you want to serve?**
- Product: serving external users.
- Infrastructure: serving engineers in internal teams.
- Product infrastructure: serving internal and external engineers.
- There are no clear lines between these options.

Product: serving external users

- There is an **user problem** you want to solve.
- Many opportunities are open to companies at different scales, from start-ups to industry leaders.

Infrastructure: serving engineers in internal teams

- There is an engineering problem you want to solve by providing **a scalable service**.
- Your customers are engineers in the company:
  - It might be easier for you to **have empathy for customers** because you are an engineer;
  - It's easier to **talk to customers** because they are in the same company.
- Only companies at certain scale or above can afford an infrastructure team.

Product infrastructure: serving internal and external engineers

- There is an engineering problem you want to solve with **a reusable framework**.
- Your **core customers** are internal engineers.
- You can have external customers if you open source.
- External customers matter **only if** …
  - It improves the company's reputation in the industry;
  - It helps attract candidates and convince them to join.
- Company scale required to sustain a product infrastructure team is smaller.

Decision Tree

- Do you care about user problems or engineering problems (engineer as user)?
  - User problems => **Product**
  - Engineering problems =>
    - Do you want to build scalable service or reusable framework?
      - Scalable service => **Infrastructure**
      - Reusable framework => **Product Infrastructure**

Front-end, backend or full stack?

- A better question: **which one can make you work harder?**
- This choice only matters a lot in the first few years of your career.
- Everything converges in later stages of your career.
- Pick the one that can get you through the first few years faster.

A TYPICAL CAREER PATH FORWARD.

Career Path Metaphor

- If programming is just like driving, there are these stages:
  - Student driver
  - New driver
  - Experienced driver
  - Courier
  - Trip organizer
  - Expedition

Stage 0 – Student Driver

- Figure out whether you enjoy driving.
- Have fun practicing driving around.
- Not safe to drive by yourself in public road.

Stage 1 – New Driver

- Enjoy driving by yourself most of the time.
- Make mistakes from time to time.
- Receive advices from more experienced drivers.

Stage 2 – Experienced Driver

- Have a track record of driving safely and following rules.
- Can follow GPS to reach anywhere within a day's drive.
- May be irritated by new drivers on the road.

Stage 3 – Courier

- Drive from point A to point B reliably and speedy.
- Point B can be a few days drive away from point A.
- Figure out where to eat and sleep along the route.
- Make a detour if the route is affected by weather or construction.

Stage 4 – Trip Organizer

- Rally a group of people at point A and get them excited about point B.
- Get everybody working together to reach point B by driving, flying or whatever means.

Stage 5 – Expedition

- There might be a really amazing point B.
- It’s hidden in a place beyond the reach of civilization.
- Assemble an expedition force and find it.

HOW DOES THAT TRANSLATE BACK TO PROGRAMMING?

Stage 0 – Student Driver

- Figure out whether you enjoy programming.
- Have fun writing a lot of code.
- Have noticeable amount of bugs in code.

Stage 1 – New Driver

- Enjoy programming most of the time.
- Have some bugs or bad designs from time to time.
- Receive advices from more experienced programmers.

Stage 2 – Experienced Driver

- Have a track record of committing high quality codes:
  - Bug free;
  - Easy to understand and maintain.
- Can follow project plan to deliver projects that takes a month or so.
- May be irritated by new programmer's code.

Stage 3 – Courier

- Move business from point A to point B reliably and speedy.
- Point B can be a few months away from point A.
- Figure out how to divide the work into multiple projects.
- Have backup plans if the original plan doesn’t work out.

Stage 4 – Trip Organizer

- Rally a group of people at point A and get them excited about point B.
- Get everybody working together to reach point B by whatever means.

Stage 5 – Expedition

- There might be a really amazing point B.
- It’s hidden in a place beyond the reach of existing business.
- Assemble an expedition force and find it.

SKILLS TO PICK UP ALONG THE PATH.

Common questions around skills

- Should I focus on **technology or business**?
- How do I balance learning between **technical skills and soft skills**?

- The answers are "it depends".

Goals in Stage 0 (Student Driver)

- Write a lot of code as a practice.
- Have a low friction setup to reduce non-coding distraction.

Skills in Stage 0 (Student Driver)

- Gain efficiency in one programming language.
- Learn basic front-end stuff: HTML/CSS/JS.
- Get familiar with development environment:
  - IDE (any kind of IDE);
  - Linux commands;
  - Git.

Goals in Stage 1 (New Driver)

- Write high quality code.
- Learn from others in an efficient way.

Skills in Stage 1 (New Driver)

- Apply process and tools to improve code quality:
  - Coding style guidelines;
  - Testing: unit test, integration test, etc.
- Ask questions:
  - Get comfortable asking questions;
  - Balance between researching by yourself and asking others;
  - Ask concise question with enough context.

Goals in Stage 2 (Experienced Driver)

- Design and maintain high quality systems.
- Self-sufficiency in programming.
- Start mentoring programmers in earlier stages.

Skills in Stage 2 (Experienced Driver)

- System design:
  - Analysis of trade-offs;
  - Knowledge of wide range of modern technologies.
- Efficient debugging:
  - Get comfortable with large legacy codebase;
  - Bisect problems;
  - Chrome devtools (and counterpart in other browsers);
  - Server side debugger.

Skills in Stage 2 (Experienced Driver)

- Mentorship on programming:
  - Get comfortable with other people tinkering;
  - Share your experience and knowledge.

Goals in Stage 3 (Courier)

- Understand where point B is for the business.
- Have a solid plan to get to point B.
- Get to point B by executing the plan:
  - Measure your progress towards point B;
  - Manage unexpected events.

Skills in Stage 3 (Courier)

- Understanding of business goals:
  - Verbal and written communication;
  - Basic knowledge of the business you are in.
- Roadmap planning: mission, goals, timeline, stakeholders, dependencies, risks.

Skills in Stage 3 (Courier)

- Progress tracking:
  - Metric definition and logging;
  - Expectation management ("are we there yet?").
- Risk management:
  - Identify foreseeable risks and plan for mitigation;
  - Redundancy for unforeseeable risks.

Skills in Stage 3 (Courier)

- Broaden technical competence beyond front-end:
  - Networking: HTTP/1.1, HTTP/2, Wireshark debugging;
  - Scalability: web traffic load balance, POP, CDN;
  - Security: XSS, CSRF, HTTPS, TLS extensions;
  - Performance: instrumentation, optimization.

Skills in Stage 3 (Courier)

- Broaden non-technical role competence:
  - Design: interface, interaction, experience;
  - Data analysis;
  - Project management.

Goals in Stage 4 (Trip Organizer)

- Raise enough investment for your trip.
- Rally enough people for your trip.
- Get to point B:
  - By using your investment efficiently;
  - By getting everybody work together effectively.

Skills in Stage 4 (Trip Organizer)

- Leadership:
  - Vision: product vision and technology trend;
  - Understanding people: fact, emotion, belief.
- Salesmanship.
- Strategic thinking.
- Resource allocation and planning.

Skills in Stage 4 (Trip Organizer)

- Continue broadening technical competence:
  - Scalability: distributed computational power and storage;
  - Release: continuous integration and deployment;
  - Non-web front-end: iOS and Android.

Skills in Stage 4 (Trip Organizer)

- Continue broadening non-technical role competence:
  - Recruiting;
  - Coaching;
  - Managing.

Goals in Stage 5 (Expedition)

- Prove that there's a reasonable return on investment for finding and reaching point B.
- Get enough money and people for the expedition.
- Reach point B (or die trying).

Skills in Stage 5 (Expedition)

- Scale out existing skills.
- Inter-discipline between multiple roles and skills.

WHO IS YOUR CUSTOMER?

Who is your customer?

- To wrap up everything, one last question: **who is your customer?**
- To put it in another perspective: **whose life would be better in what way if you achieve your goal?**
- Your answer to this question determines everything else.

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