

Appendix to

Personas in Practice: Adapting Knowledge Worker Actions to Software Engineers

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Part 1: Interview Guide

Briefing

Thank you for joining us today _____. We appreciate your voluntary help with this research study. We are interested in hearing about your work tasks processes as a knowledge worker. Knowledge workers are people who think for a living.

This interview will be recorded for internal purposes only. In addition, throughout the interview I'll be taking notes. If at any time you want a portion of the interview to not be recorded just let me know and I will pause the recording. Your identity will remain anonymous as mentioned in the consent form.

With that being said, do you consent to participate? [Yes/No]

Great. I'll begin the interview.

Background

1. Tell me little about yourself and your role here at Microsoft?
2. What type of projects are you working on?

General Task Questions

So based on the projects can you tell me about some common tasks you go through.

1. What are 3 common tasks you complete in your role as a Software Engineer?
 - 1.
 - 2.
 - 3.
2. What are 3 important tasks that you complete in your role?(This could be a task you may complete once a year, but may be important)
 - 1.
 - 2.
 - 3.

Walk me through what you did yesterday?

- Interviewer then asks how much time did you spend doing each of those? Hours/Percentages
- Input/output

Knowledge Worker Actions

For each of the following questions I'm interested in how often, with who, and what exactly the task is.

- **[Acquisition]** Can you tell me about how/why you would gain a new skill *before a project*?
- **[Learning]** How do you acquire new knowledge or skills *while executing a task*? How do you acquire an understanding of what you're working on? This can include formalized material.
- 3. **[Analyze]** How often do you find yourself making sense of errors/code/etc.?
- 4. **[Authoring]** Can you tell me about creating media content or text documents as a task in your role?
 - a. **[Co-Authoring]**How about creating that content collaboratively?

- e. **[Dissemination]** Can you tell me about how you spread information such a results from work?
 - a. Do you share this work with the entire organization? social media? Or other venues?
- f. **[Expert Search]** How often do you find yourself looking for an expert to discuss/solve a problem with?
 - a. What is that process like? Do people come to you? Do you go to them?
- g. **[Information Organization]** Can you tell me about how you manage organizational information regarding tasks? Or personal information?
- 8. **[Information Search]** How do you look up information about a specific topic for your tasks?
- 9. **[Monitoring]** How do you keep you or your organization up-to-date about selected topics that regard your tasks?
 - a. Perhaps through scrum, weekly meetings, etc.?
- 10. **[Networking]** How do you interact with other people or organizations to exchange information and network?
- 11. **[Service Search]**Do you use any online tool that's specific to your work? For example, a translation service. <Could make this question about tools>

Collaboration

- 1. How do you collaborate with others colleagues?
 - 1. Can you describe what the process some projects for collaboration may follow?
 - 1. How do you collaborate with people in your role?
 - 2. How do you collaborate with people inside your role, but not in your field?
 - iii. How do you collaborate with people outside your role and in your field?
 - iv. How do you collaborate with people who are not in your role nor field?
- 2. Are there certain tools you use to collaborate on projects?

Debriefing

Thank you again for participating in today’s study. If you have any questions please don’t hesitate to email me. If you think of any other comments that you forgot to mention during today let me know.

ADDITIONAL QUESTIONS

The next set of questions are going to be about you think you may fulfill some roles

Controller
Helper
Learner
Linker
Networker
Organizer
Retriever
Sharer
Solver
Tracker

Task Execution

So based on <tasks mentioned above> can you tell me...

Task Construction:

- a. How do you prepare to complete a task?
- b. What is the process involved?
- c. Do you find yourself creating these tasks independently or with a team?
- d. Can you describe how you start on a project?
- e. What are your starting inputs? Where do your inputs/ starting points come from?
 - i. *Do you derive inputs from scratch? Do you get them from managers?*
- f. Who do you work/collaborate with to accomplish your task?
 - i. Are your tasks individual or team focused?

Task Performance:

- i. After you've begun working on <a task mentioned before> what are some of the steps taken to accomplish your goal?
- ii. How do you determine progress is being made towards your task completion?
 - i. Do you write down your progress in system? Does your team/managers know your (daily/weekly/etc.) progress or is it just for you?
- iii. What type of reoccurring actions do you take part in at work?
 - i. Do these reoccurring actions change with each project?

Task Completion:

- i. How do you know you have completed a task?

- i. Do you just stop at a particular date set prior? Does a manager decide that?
- ii. How are your outputs from your tasks used?
 - i. Who uses the output of your tasks and how do they use them?
- iii. After you complete a task, what are your next steps to begin another?
 - i. What does the transition period look like between tasks?

Self-Reflection

- i. How do you view yourself as a knowledge worker?
- ii. Would you consider yourself to be a knowledge worker?
3. What do you think makes you a knowledge worker?

Comparison to other workers

1. How would you compare yourself to other knowledge workers in law?
2. How would you compare yourself to other knowledge workers in finance?
3. How would you compare yourself to other knowledge workers in marketing?
4. How would you compare yourself to other knowledge workers who do research?
5. How would you compare yourself to other knowledge workers in engineering?

Part 2: Follow-Up Survey

Studying Software Engineers at Microsoft

Your answers will help us.

Thank you for agreeing to participate in this survey.

Microsoft Research is interested in better understanding the work patterns of software engineers. Responses to this survey are confidential. Please [click here](#) to review the privacy statement. The survey takes about 15 minutes to complete.

This survey is ANONYMOUS - no personal information will be collected. Aggregated information may be used in publications and shared with research collaborators outside of Microsoft. We selected you as part of a sample of Microsoft employees based on your job role. If you have any questions about this research project, please contact t-defor

After completing the survey, you can enter a raffle for one of FOUR \$75 AMAZON GIFT CARDS (official rules of the sweepstakes). Instructions for entering the raffle will be provided once you submit your response.

Thank you,
Denae Ford (T-DEFOR), Christian Bird (CBIRD), Nachi Nagappan (NACHIN), and Tom Zimmermann (TZIMMER)

ID: 45

Demographics

ID: 134

1) *What is your career stage? (required)**

- Software Engineer / SDE
- Software Engineer 2 / SDE 2
- Senior Software Engineer / Senior SDE
- Principal Software Engineer / Principal SDE
- Other - Please specify:

ID: 140

2) *What group do you primarily work in? (required)**

- ASG - Applications and Services Engineering Group (Qi Lu)
- Business Development Group (Peggy Johnson)
- CELA - Corporate, External, and Legal Affairs (Brad Smith)
- C&E - Cloud and Enterprise Engineering Group (Scott Guthrie)
- Corporate Strategy & Planning (Kurt DelBene)
- Finance Group (Amy Hood)
- HR Group (Kathleen Hogan)
- Marketing Group (Chris Capossela)
- Operations (Kevin Turner / Judson Althoff / Jean-Philippe Courtois)
- TnR - Technology and Research (Harry Shum)
- WDG - Windows and Devices Group (Terry Myerson)
- Other

ID: 139

3) *In what location do you work? (required)**

- North America: USA - WA (Puget Sound regions: Redmond, Bellevue, Seattle, Sammamish, etc.)
- North America: USA - Other

- North America: Canada, Mexico
- Central America and South America
- Europe
- Asia: China
- Asia: India
- Asia: Other
- Australia, New Zealand, Oceania
- Africa
- Other:

ID: 46

4) *What is your gender identity?*

- Female
- Male
- Other - Write In:
- Prefer not to say

Validation: Min = 0 Must be numeric

ID: 13

5) How many years in total have you been a professional software engineer? (required)*

Validation: Min = 0 Must be numeric

ID: 12

6) How many years have you worked at Microsoft? (required)*

Validation: Min = 0 Must be numeric

ID: 174

7) How many people report to your manager?

This is fine as an estimate.

ID: 186

Roles as a Software Engineer

ID: 60

8) *Would you consider yourself to be...*

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N/A
a thinker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
a doer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
creative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
an idea person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
a hard worker	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

a leader	<input type="radio"/>					
an innovator	<input type="radio"/>					
a planner	<input type="radio"/>					
an evangelist	<input type="radio"/>					
an artist	<input type="radio"/>					
a designer	<input type="radio"/>					

ID: 173

9) Please select all that apply.

- I am working on an Open Source project for Microsoft.
- I am working on an internal project. This is would be a project that is used only inside of Microsoft .
- I consider myself to be an expert on my team.
- I have changed from expert in one project to non-expert in another project.
- I have a lot of autonomy in my project.
- I interact with the customer of my project.
- I have flexibility to make decisions for my team.
- I am working on a product/service/feature that has not yet been released (pre-v1)

ID: 175

10) How often do you make independent decisions on the product?

- I make most decisions with a group 2 3 4 5 6 7 8
- 9 I make most decisions on my own

ID: 31

Time Spent

Validation: Must be numeric **Min. answers = 1** (if answered)

ID: 14

11) We want to get a sense of your work week. In the table below, please enter roughly HOW MANY HOURS PER WEEK you typically spend on each of the activities. (required)
 Estimates are fine. The sum of the hours listed DOES NOT have to equal 40 hours.
 If a question does not apply please leave blank. *

	Hours
Learning and acquiring new knowledge, skills, or understanding, for example taking courses, training, or observing others	<input type="text"/>
Examining something carefully in order to understand it, for example, understanding unfamiliar code, debugging, looking at log output.	<input type="text"/>
INDEPENDENTLY creating text or media content NOT with other people, for example, writing code for personal projects, documentation, tutorials, architecture documents, creating technical presentations, etc.	<input type="text"/>
COLLABORATIVELY creating text or media content with other people, for example, writing code with a team (such as Microsoft projects), documentation, tutorials, architecture documents, creating technical presentations, etc.	<input type="text"/>

Sharing information of work results, for example, presenting in technical meetings or brown bag lunches	<input type="text"/>
Finding an expert to help discuss/solve a problem, for example find someone to help fix a bug	<input type="text"/>
Providing feedback on technical documents and code, for example, code reviews, or architecture reviews	<input type="text"/>
Managing personal or organizational information, for example, taking notes, tracking and prioritizing work for yourself or others	<input type="text"/>
Retrieving specific information, for example, finding a bug report, wiki page, specification, or API documentation	<input type="text"/>
Keeping oneself or the organization up-to-date about selected topics, for example, task lists in TFS, reading status reports	<input type="text"/>
Interacting with other people and organizations to exchange information and develop contacts, for example, attending meet-ups, conferences, participating in Yammer discussions	<input type="text"/>
Finding specialized tools, for example tools to visualize data	<input type="text"/>

ID: 279

Time Spent (cont.)

Validation: Must be numeric

ID: 208

12) Of the [QUESTION("VALUE"), ID="TS2"] hours you spend examining something carefully for comprehension in a week, how many hours are spent DEBUGGING code?

Validation: Must be numeric

ID: 206

13) Of the [QUESTION("VALUE"), ID="TS3"] hours you spend INDEPENDENTLY creating text or media content in a week, how many hours are spent writing code for personal projects?

Validation: Must be numeric

ID: 207

14) Of the [QUESTION("VALUE"), ID="TS4"] hours you spend CO-AUTHORING text or media content in a week, how many of those hours are spent writing code?

ex. Writing code at Microsoft

Validation: Must be numeric

ID: 209

15) Of the [QUESTION("VALUE"), ID="TS7"] hours you spend providing feedback in a week, how many of those hours are spent in code reviews?

Validation: Must be numeric

ID: 267

16) How many hours do you spend in a week testing code?

Validation: Must be numeric

ID: 213

17) How many hours do you spend in a week reading, writing, and sending emails?

Validation: Must be numeric

ID: 214

18) How many hours do you spend in a week in meetings?

Validation: Must be numeric

ID: 215

19) How many hours a week are you being interrupted by others?

ID: 190

Tasks

Definitions

- INPUT: **Any resource information/documents/artifacts/data to accomplish a task**
 - ex. **tickets, API documentations, ad-hoc discussions in the team, technical directions for manager**
- OUTPUT: **Deliverable or result of accomplishing your task**
 - ex. **bug fix, feature, unit tests**

ID: 191

20) *What are the INPUTS for your various tasks?*

- Bug Reports
- Specifications
- Design Documents
- Business requirements
- User scenarios
- Customer concerns
- Management inquiries (technical directions from manager)
- Code from other engineers
- API documentations
- Ad-hoc discussions with the team
- Live issues I've noticed
- Other - Write In:

ID: 193

21) What are the *OUTPUTS* for your various tasks?

- Source code check-ins
- Bug fixes & work around solutions
- Source code documentation
- Presentations
- Design documents
- Data analysis result
- Internal tools
- Product feature
- Detailed reports for team
- Other - Write In:

ID: 247

22) Who selects the tasks you work on?

- I choose the tasks
- My Team
- Program Manager
- Engineering Manager
- Product Owner
- Team Lead
- Other - Write In:

ID: 194

23) How do you know you are done working on a task?

- When my deliverables satisfies all requirements

- When my deliverables has been tested
- When my code is checked into the local repository
- When my code is approved by Code Review
- When my code included in a release
- When a bug is fixed
- When I speak with my manager
- When there are no more known issues
- When I receive a formal agreement from a peer developer
- Other - Write In:

ID: 30

Collaborations

ID: 38

24) Please drag and drop the job titles of the people you regularly interact within your team , outside your team, or both.

For example, you may be working with a PM from another team or the Lead of your team.

	People I only regularly interact with within my team	People I only regularly interact with outside of my team	People I regularly interact with both within and outside my team
Project Manager			
Software Engineer/ SDE			

Software Engineer 2/ SDE 2			
Senior Software Engineer / Senior SDE			
Principal Software Engineer/ Principal SDE			
Software Engineering Lead			
Engineering Manager			
Architect			
Designer (i.e. UX Designer, Principal Designer, etc.)			
Scientist (i.e. Data Scientist, Applied Scientist, etc.)			
Operations Specialist (i.e. Business Ops, Senior			

Service Ops, etc.)			
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ID: 281

25) Are there job titles that we missed in the previous question of people who you regularly collaborate with?



Validation: Min = 0 Must be numeric

ID: 205

26) How many reviewers are typically included in code reviews of one of your changes?

ID: 196

27) Have you ever been brought on a different team to put out fires?

To clarify, were you ever selected to help mitigate an emergency situation on a different team?

Yes

No

ID: 198

Tool Usage

ID: 199

28) What are some of the tools you use in your day to day task as a software developer?

This may include but is not limited to: IDEs, data analysis tools, etc.



ID: 202

29) *Have you ever built an internal tool?*

Tools built outside of Microsoft may be included in this response.

- Yes
- No

ID: 216

Wrap Up

ID: 142

30) Please rate your agreement with the following statements.

Definitions

- "MY SOFTWARE": the software you develop at Microsoft
- "MY TEAM": the team of people with which you develop Microsoft software
- "MY MANAGER": the person who you report to

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N/A
From a technical perspective, it is easy to reuse others' code when creating my software.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most of the code I write is reviewed by other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My software has high technical debt (for example, a lot of hacks).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The technical debt is likely to be paid down in the future (for example, through refactoring).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most of the feature code	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I write will probably be included in the shipped software.						
My software has clear functional requirements.	<input type="radio"/>					
Whether requirements are met in my software is subjective.	<input type="radio"/>					
My software's architecture evolves significantly as the software gets more mature.	<input type="radio"/>					
My team uses a waterfall process, rather than an agile process.	<input type="radio"/>					
My team adheres strictly to a process (for example, scrum or waterfall).	<input type="radio"/>					

Creativity is valued on my team.	<input type="radio"/>					
Creating my software requires a team of people, each with different skills.	<input type="radio"/>					
Being able to communicate with non-engineers is valuable in my job.	<input type="radio"/>					
My team has flexible release deadlines.	<input type="radio"/>					
My team makes most of the tools I use.	<input type="radio"/>					
My software is well tested manually (e.g., paid testers thoroughly use the software).	<input type="radio"/>					
My software is well tested by manual simulation (e.g., scripts that	<input type="radio"/>					

thoroughly use the software).						
My software is well tested by unit tests.	<input type="radio"/>					
It's difficult to write thorough automated tests for my software because it's so complex.	<input type="radio"/>					
The last bug I fixed was difficult to diagnose.	<input type="radio"/>					
My manager has a lot of engineering experience.	<input type="radio"/>					
I often discuss technical issues with my manager.	<input type="radio"/>					
When my team introduces a software engineering practice, the initiative usually comes from managers.	<input type="radio"/>					

In my team, engineers are encouraged to move into management positions.	<input type="radio"/>					
Creating my software is challenging.	<input type="radio"/>					
When I tell people outside of my company about the software I work on, they are impressed.	<input type="radio"/>					
After my software is released, I would like to use it outside of work.	<input type="radio"/>					
My software creates value for society.	<input type="radio"/>					

ID: 282

31) Please rate your agreement with each of the following statements:

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N/A
I feel productive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

when I write code.						
I feel productive when I test or debug my code.	<input type="radio"/>					
I feel productive when I do code reviews.	<input type="radio"/>					
I feel productive when I read fewer emails than usual.	<input type="radio"/>					
I feel productive when I send more emails than usual.	<input type="radio"/>					
I feel I had a productive work day when my email inbox is emptier in the evening than in the morning.	<input type="radio"/>					
I feel productive on a day with little to no meetings.	<input type="radio"/>					
I feel productive	<input type="radio"/>					

when I help my co-workers.						
I feel productive when I visit social networks or news websites to do a quick break.	<input type="radio"/>					
I feel productive when I listen to music.	<input type="radio"/>					
Background noise distracts me from my work.	<input type="radio"/>					
If I have many program windows open on my screen, it decreases my perceived productivity.	<input type="radio"/>					
I feel productive when I am happy.	<input type="radio"/>					
I feel productive when I have	<input type="radio"/>					

fewer interruptions.						
I come early to work/work late to get some focused work hours.	<input type="radio"/>					
I feel productive on a particular day of the week (e.g. on Wednesdays).	<input type="radio"/>					
I feel more productive in the morning than in the afternoon.	<input type="radio"/>					
I feel more productive in the afternoon than in the morning.	<input type="radio"/>					
I feel less productive after lunch compared to the rest of the day.	<input type="radio"/>					
I feel productive when I work on one task at a time.	<input type="radio"/>					

ID: 324

32) Below are 15 attributes that interviews have indicated are important for great software engineers to have -- but, of course, opinions vary. WHAT DO YOU THINK, BASED ON YOUR EXPERIENCE?

Under each attribute you can find examples of the software engineering demonstrating that attribute.

Please rate how important you consider each attribute for DISTINGUISHING A GREAT SOFTWARE ENGINEER FROM A GOOD ONE, ranging from "critical" to "not important".

A great software engineer...

	Critical									Not important
<u>Personal Characteristics:</u> IS IMPROVING Not satisfied with the status quo: constantly looking to improve themselves, their product, and/or their surroundings	<input type="radio"/>									
IS PASSIONATE Intrinsically interested in the area they are working in (i.e. not just in it for extrinsic rewards like a pay check)	<input type="radio"/>									
IS OPEN-MINDED Willing to judiciously let new information change how they think	<input type="radio"/>									
IS DATA-DRIVEN Taking and evaluating measurements of their actions and of the software, often relative to expectations	<input type="radio"/>									
<u>Decision Making:</u> IS	<input type="radio"/>									

<p>KNOWLEDGEABLE ABOUT PEOPLE AND THE ORGANIZATION Informed about the people around them: their responsibilities (i.e. organizational structure), their knowledge, and their tendencies</p>										
<p>SEES THE FOREST AND THE TREES Considering situations at multiple levels, including technical details, industry trends, company vision, and customer/business needs</p>	<input type="radio"/>									
<p>UPDATES THEIR MENTAL MODELS Keeping up to-to-date their mental models through evaluating changes in their context</p>	<input type="radio"/>									
<p>HANDLES COMPLEXITY Able to grasp and reason about complex and intertwining ideas</p>	<input type="radio"/>									
<p><u>Engagement with Teammates:</u> CREATES SHARED CONTEXT Molding another person's understanding of the situation while tailoring the message to be relevant and comprehensible to the other person</p>	<input type="radio"/>									

<p>CREATES SHARED SUCCESS Enabling success for everyone involved, possibly involving personal compromises</p>	<input type="radio"/>									
<p>creates a safe haven Creating a safe setting where engineers can learn and improve from mistakes and situations without negative consequences</p>	<input type="radio"/>									
<p>IS HONEST Truthful (i.e. no sugar coating or spinning the situation for their own benefit)</p>	<input type="radio"/>									
<p><u>Software and Designs:</u> HAS ELEGANT SOFTWARE AND DESIGNS Simple and intuitive (i.e. not complex) software/designs that others can understand</p>	<input type="radio"/>									
<p>HAS CREATIVE SOFTWARE AND DESIGNS Novel solutions based on understanding of the context, existing solutions, and the limitations of existing solutions</p>	<input type="radio"/>									
<p>ANICIPATES NEEDS IN SOFTWARE AND DESIGNS Producing software that accommodate likely needs and problems based on contextual knowledge</p>	<input type="radio"/>									

ID: 212

After clicking "Submit" you will see instructions on how to enter the raffle for the gift cards. Good luck!

Thank You!

ID: 1

**Thank you very much for taking the time and answer our questions!
Your response is very important to us!**

**As another way of saying thanks, we're raffling off four \$75
AMAZON.COM GIFT CERTIFICATES (official rules of the sweepstakes).**

Click here to enter the raffle by email

Please contact t-defor in case you have any questions.

For Additional Information

Learn more about the Empirical Software Engineering group at Microsoft Research.

Recent papers:

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