Assignment P4

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Question 1

With the goal of contacting the professor regarding the explanation of a grade, the GOMS model can be applied to analyze the task based on the human processor model. To break down the steps, the initial situation is that the user wants to understand the rationale for a received grade. This establishes the goal of the user to be that they want to converse with the professor regarding their received grade. This leads to the formulation of multiple methods to which they can use to achieve that goal. This involves, but is not limited to, emailing the professor, sending a direct message through Slack to the professor, emailing a teaching assistant to reach out to the professor, or speaking with the professor in person. Each one of these methods require different operators to perform the task.

With email, assuming the user has an email application, they have to open it, which should take a few seconds (3-10), compose the message, which should take a few minutes (5~15), and then send off the message, which again is a few seconds (3~5) with a click. This process should require roughly 5 to 15 minutes depending on the contents of the email.

The next method of using Slack is similar to email but utilizes a specific application. The user first has to access Slack which can either be through the web or the application, each requires a few seconds (10~30) with the application usually being faster. The user will then have to enter the HCI Slack channel and find the professors username in the direct messages, which should take a few seconds to minutes (10~60 seconds). Composing a message in Slack may or may not be less formal and could take

anywhere from a few minutes to multiple (3~15). Lastly, the user has to click send or hit enter to send out the message, which should take a few seconds (1~10).

The next method of emailing the TA is similar to the first email method but includes an additional person in the loop. The operators for this approach are to first figure out the correct TA to email, which can take a few seconds to minutes (10~300 seconds) depending on the user's experience. They will then need to compose the message which should take a few minutes (5~15), and then send off the message, which again, is a few seconds (3~5).

The last method mentioned is to speak with the professor in person. Assuming that the user is not an on-campus student they will first have to travel out to Atlanta, which takes anywhere from a couple hours to days (2 ~ 48 hours). They then need to find the professors office location and hours, which should be available online and only take a few minutes (1~5). Afterwards, the user will need to walk (or run) to the office and wait, which can take a few minutes to hours (1~120 minutes). Lastly, they will need to speak with the professor to discuss their issue, which should take a few minutes (5~15).

Selection of one of these methods is based on specific selection rules. When discussing grades with a professor, it is often a time sensitive endeavor with earlier being better, and usually requires a formal line of communication. As such, these selection criteria rule out the in-person option and Slack for the respective reasons. Between the two email options the goal will be achieved faster with an email to the professor, both in terms of the number of operations as well as the direct communication. Figure 1 below displays the visualization of the GOMS analysis for this scenario.
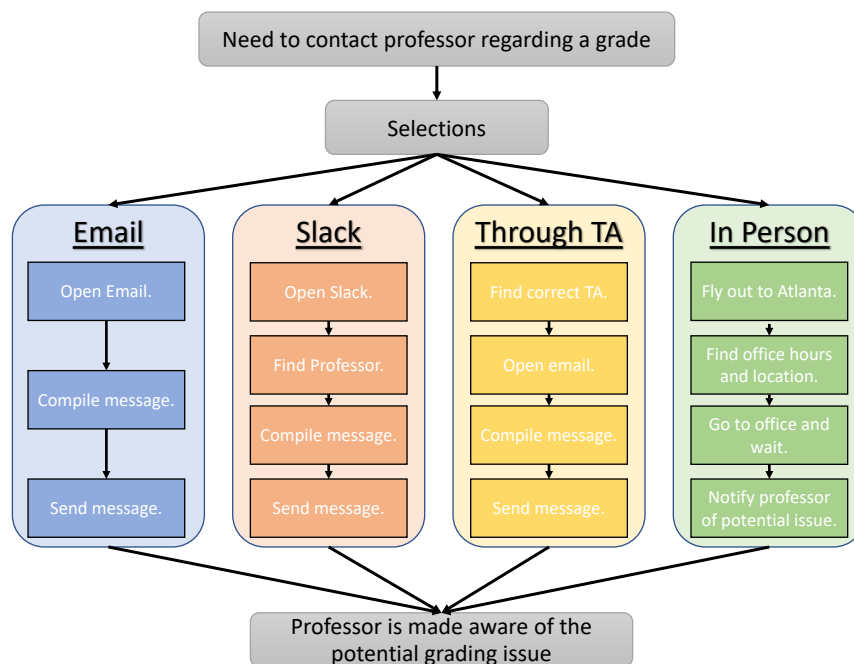
Figure 1: GOMS model visualization

Question 2

Submission of an assignment to the Canvas website can be described through the hierarchical task analysis method. This is displayed in a plaintext outline shown below.

1. Complete the assignment.
   a. View lecture material.
      i. Log into Udacity.
         1. Enter the Udacity homepage.
         2. Click the "Sign In" button at the upper middle of the page.
         3. Click on the Georgia Tech button on the bottom.

                4. Hit login or enter a Password and ID and hit login.

                    a. Acknowledge the login with your Duo keychain if prompt.

         ii. Click on the "View Course" on the Human-Computer Interaction card.

         iii. View lectures 2.7 and 2.8.

                1. Scroll down to the card for lesson 10.

                2. Click on the card.

                3. Click Play.

                4. View all lectures.

                5. Click the "<" button on the top left.

                6. Repeat steps 1-5 for lesson 11.

    b. View assignment P4.

        i. Log into Canvas.

                1. Open an internet browser.

                2. Navigate to http://canvas.gatech.edu/.

                3. Click "Login to Canvas".

                4. Hit login or enter a Password and ID and hit login.

        ii. Enter the HCI class page.

        iii. Click on the Assignments tab.

        iv. Click on Assignment P4.

        v. Click the link for the full assignment description.

    c. Type up the question responses.

        i. Download JDF format from the class files.

        ii. Replace text with responses.

    d. Review work.

        i. Reread responses and the questions.

        ii. Export file as a PDF.

2. Submit the assignment through Canvas.

    a. Return to the Canvas dashboard.

      b. Navigate to the HCI class homepage.

          i. Click on the "Dashboard" tab on the left of the Canvas site.

          ii. Click on the card for CS6750: HCI.

      c. Click the "Assignments" Tab.

      d. Click on "Assignment P4".

      e. Click the "Submit Assignment" button.

      f. Add the file.

          i. Click "Choose File".

          ii. Navigate through your computer to find the correct document.

          iii. Select the document.

      g. Click "Submit Assignment".

3. Wait for feedback and a grade.

      a. Drink coffee and refresh the assignments page daily.

      b. Receive email notification for posted grade.

      c. Return to the Canvas dashboard.

          i. Open a browser.

          ii. Navigate to http://canvas.gatech.edu/.

          iii. Log into Canvas.

      d. Click on "Assignment P4" on the "Recent Feedback" column

      e. Scroll down to the feedback and grades section.

      f. Review information.

      g. Celebrate!

Question 3

For the task of navigation prior to GPS, users often relied on either physical maps, printed directions from the internet, or relied on memory. More often than not this process is accomplished through two users which will be labeled in this discussion as the driver and passenger, whom are a married couple. The driver who operates the vehicle offloads their cognitive task of navigation to the passenger. This distribution of cognitive load allows the driver to focus on the task of operating the vehicle and the passenger acts as an artifact to process navigational directions for the driver. The passenger on the other hand, also utilizes the map as an artifact for offloading the cognitive task of memorizing specific actions to take to arrive at the goal destination.

From the perspective of the driver's cognition, the passenger frees up their perception, memory, reasoning, and situational acting to focus on the road and driving pieces of the system. Perception and the situated action of handling the map is alleviated as the passenger would be managing that task. Reasoning and memory are similarly freed up as the driver no longer has to determine what actions to take and remember the sequence.

From the perspective of the passenger, cognition for memory, reasoning, and situational acting is distributed onto the map artifact. The passenger does not need to memorize or reason the correct route to take from the driver's location, and during unexpected situations such as performing the incorrect action, the map provides guidance on how to return onto the correct route.

In addition to the concept of distributing cognition across artifacts this example also contains aspects of social cognition. Between the married couple, certain social connections may reveal aspects of the task and system that distributed cognition does not. For instance, from social cognition, the passenger may know that the driver is far sighted and will be able to point out specific landmarks as opposed to street names that the driver may have trouble seeing. Social relations may also affect the system as well, for instance, the driver now has auditory actions that they need to process as

opposed to visual. This may be detrimental or beneficial to the success of the system depending on the preference of the driver and the environment. With a convertible car for instance, auditory directions on the freeway may be extremely difficult, and the relationship does not free up the cognition for perception since the driver may have to look at the map regardless. On the contrary, success in this situation may improve with the implementation of auditory cues since it allows the driver to maintain their visual perception on the road and utilizes their more available auditory perception.

Question 4

Previously discussed in assignment P3 (Tong 2018), the task of navigating and manipulating documents and directories on a computer system can be daunting. Luckily, GUIs act as an artifact to distribute cognition. The system comprises of multiple nested directories, files, settings, functions, and many more. For this discussion, the task will be to locate and retrieve a specific file, let's call it "HCI.txt". With a GUI the file can be visually perceived as an icon within numerous directories as opposed to a string of characters, memorization of the file location can be replaced with a search bar artifact, and an electronic user manual can provide an artifact to support situational actions.

For perception, in comparison with, let's say a server that does not provide a GUI and instead uses a command line, the user must navigate through walls of text making it difficult to distinguish their specific file from the rest. With the GUI artifact, files are often distinguished by specific icons making it easier to visualize their contents. A text file may be presented as a pen and paper making it easier for the user to identify the file as being text.

In regard to memorization, a GUI will typically provide a search bar to ease the search process of the file. Without this artifact, the user would either have to remember the location of the file within the system, or the terminal command and syntax. The GUI

artifact in this scenario reduces the cognitive load for memory of the user through providing a bar that is labeled "search" which executes the intended commands as performed in the terminal; no special syntax or commands needed.

Similar to memory, if a user encounters a novel situation and is required to improvise on an action, for instance, if the HCI.txt file is hidden. GUIs often provide electronic manuals that provide solutions to all kinds of issues and may aid the user in reducing the cognitive demand of searching and testing multiple terminal commands in hopes it achieves their goal. The GUI again provides a search bar but allows the user to search for their particular issue, such as "hidden file", and will hopefully provide them with a solution.

With the implementation of GUIs for a computer system, the cognitive load imposed on a user is reduced. For the task of locating a specific file, it's discussed above that the GUI can assist in all three of these aspects by creating relatable icons, reducing the demands of memorization, and providing a resource to aid in unique situations.

References

1. Tong, M. (2018). Assignment P3. *OMS CS6750 Human- Computer Interaction*. Washington, DC.