**Study 1** found that people have to enter data from various sources, and that the IAC to these sources differed. **Study 2** found that people collect some of this information beforehand, but they do not always know which information they need and when they do look it up, they do not know what the associated cost is going to be. **Study 3** found that when people copy from one source, as IAC increases, they commit more to memory which makes them faster if information is easy enough to memorise, but slower and less accurate if the information is abstract.

**Study 4** found that if the costs are known, people will enter low IAC items first, in a batch, and then high IAC items, to minimise switching between the primary task interface and the information sources. **Study 5** found that having information on a second screen makes people faster, but less accurate because their visual attention is on the information source, rather than on their output. **Study 6** found that if the cost is unknown, people will always look up information as they need it. As the cost is higher, it will be more disruptive and people will take longer to resume. **Study 7** found that a lockout reduces number of switches between a primary and secondary task, but not number of switches between the primary task and related subtasks of looking up information. **Study 8** found that if people received visual feedback on the time left, they would look up information as they needed it, and as much information in one visit, but would come back if the information access cost increased.

**Previous experiment: people enter it in sequential order, but if differences in time they enter ‘easy’ ones first (which may not be desirable if balancing two tasks, but can help reduce switches if only one task)**

**Current experiment: people have to retrieve information from different tabs. They do not know the cost beforehand, but get feedback afterwards (but one item will always be less than the time threshold; can only exceed this if they choose to memorise and enter more).**

* **What I want to achieve: is it better if people do not interrupt themselves constantly, but enter easy items first, and do one long interruption where they look up everything at once**
* **If they do all in one go, they will probably write it down. But because they are so short, will keep in memory and more errors.**

**People have to enter the same information, but every trial they need to look up something unexpected, and they do not know how long this will take them. Place in the middle of task.**

* **What I want to show: if people have no feedback, they will address interruptions as soon as it arises and this is disruptive. If they have feedback, they will defer interruption until more convenient moment in task, because they are more aware of how long their interruptions last.**

**People have to enter information, get notification to do something additional, can address it immediately or defer until later.**

* **first finish task and then address interruption**

**People have to enter information which is next to their computer, every 5th trial it has something new which has to be retrieved elsewhere from a different tab. If they switch, get notification. Have to find it in spreadsheet so takes time. If takes longer, they will be logged out.**

* **But in this case, there is no benefit in deferring interruption.**
* **Only get notification if in the middle of task? ‘Are you sure? You have unsaved changes.’**

**People have to get easy and hard information. If no notification, interrupt as soon as they need it, if not, they defer.**

* **But already showed in Study 4/5 they do this without notification because they learn costs.**

**New would be if they do not know costs. Either variation in costs, or have to solve something: look something up from spreadsheet? What would benefit be if they first enter other things?**

**Field study**

**People have to enter information. Some they have to look up. Better to wait and finish majority of task first, because they will not lose everything, enter things in wrong fields, and maybe if they enter a lot they will write it down.**

Study 1

* What was done: a contextual inquiry with 10 users involved in processing expenses.
* What was found:
  + Information is spread across media; people use these media differently
    - Second screen: used to collect and project information beforehand
    - Paper: used to annotate (e.g. circle items, cross items, make notes, calculations)
    - Primary screen: used to look up information as they need it
    - Colleagues: used for instructions (procedural information, easier and quicker than the written instructions that are available), information that is not not centrally available
  + Users collect some information beforehand, some information when they need it; current system does not allow for this
  + Central information difficult to access, make and use their own local copies but not aware when information gets updated
  + Not all information centrally available; need to undertake action and contact individuals to access information
  + People maximise screen, no matter how large screen, so will rather go in and out
* Why does this matter
  + Paper: may not be desirable to make everything electronic because this functionality of annotation, scribbling will disappear
  + Second screen: good to display more information and improve access, but only useful for information they know they’ll need, often have to look up information and will still use main screen for this  
    => potential solution: not one big screen (because people will maximise screens), not two separate screens (because people have to know beforehand what information they’ll need), but two screens that are connected; make a search for information on main screen but it will pop-up on second screen
  + System: lockouts meant to prevent switching between tasks which is good, but often people need to switch within task as well and get out of system to look up information

Study 2

Problem:

Study 4a

* Problem: people have to retrieve information from several sources, some easy to access, some take more time and effort. Study 3 showed that the moment in a task that people decide to look up information differed: sometimes they collect information before entering anything, but most of the time they start the task and interrupt the task mid-way to look up information. To what extent is this influenced by the time it takes to access it? Previous work looked at the number and duration of visits, and showed that people take longer visits to high IAC sources. They did not look at the temporal aspect of a copying task, and when people decide to look it up.
* What was done: a 3x3 within-subjects lab experiment with 15 participants. Participants had to copy an item, financial amount and account number from three tabs and type this into a fourth tab. The delay to open a tab was 0, 1 and 2 s.
* What was found: people look up information when they need it. If the cost is high,

Study 4b:

* Problem: when information is difficult to access, people often have another device to display the information on. Participants in Study 3 had a second screen or paper. In other settings, people may have their phones or tablets. Studies have looked at people’s subjective explanations and experience working with multiple devices, but not the effect it has on people’s actual performance and if the strategies they carry out are influenced by the information. In Study 3, people projected some information on the second screen, but some information they looked up as they needed it on their main screen.
* What was done: A 2x3 mixed design with a no-choice and choice phase. In the no-choice phase, people either had all their information on one screen and had to access these via tabs, as in Study 4a, or all information was projected on a second screen. In the choice phase, people were free where they would put the second tab: on the main or second screen.
* What was found: People who have information on their second screen are faster, but less accurate. Their visual attention is on the second screen, so they are less likely to check their final output and see mistakes. When given choice, people keep everything on the same screen.

(Study 4c)

People do not always use all sources as frequently. If the access cost is high but people will use it frequently, they may look it up beforehand. In contrast, if they only use it sporadically, they may leave it until the end.

Study 4d

* Problem: above studies all assumed situations where information is presented to people and they know where to get it from. people do not always know which information they need beforehand, and furthermore how long it will take them to access the information.
* In previous studies, people know the IAC as it is fixed and always the same, and can adapt their strategies accordingly. As the previous study showed however, the IAC differs and people do not always know the cost beforehand.

Study 4e

* Problem: a lockout can make people more careful: if making an error, or switching to another task for too long, causes a lockout, people will be more careful in their entries or interleaving tasks. However, how does a lockout if people do not know how long they are going to be out of the system?
* Replication of 4d, but with a lockout.

Study 4f (has this been done before?)

* Problem: what is the effect of a lockout on switching between tasks?
* Replication of 4e, but with a secondary task.

Study 4g

* Lockout, time left before lockout is indicated on primary task interface, or not.
* Previous IAC studies have used eye-tracker to see how people allocate attention between source and output, but not if IAC is high how it affects whether people look at keyboard or on screen.