HENRY LIEBERMAN_

Say hello to smarter apps that fulfil your wishes

How many applications do you have on your computer? I've got 159, with 34 on the sidebar. How many apps on your phone? I've got a few 20-icon screens of apps, and after five or six more, space will run out. Where will all the apps we haven't thought about yet go? As with the trend of fossil-fuel consumption, screen-space consumption is unsustainable.

What's the solution? A desktop is like a toolbox, full of hammers and screwdrivers. It's up to me to know what tool to use for the job, use it correctly and put it away. My toolbox shouldn't have to contain every possible tool for every possible job. And what happens if something goes wrong?

The alternative is what I call "goal-oriented interfaces". The interface should be designed around what the user wants to do, rather than what the computer wants. It should be the responsibility of the system to figure out how to get the job done. It should delve into the details only if it's not sure what the user wants, or if something should fail.

One way to achieve a goal-oriented interface is through the use of natural-language input. Perfect understanding isn't yet possible, but things are improving. I'm writing this column using speech recognition. As the user thinks of more things they want to do, natural-language interfaces can scale.

Apple's Siri is the first really popular commercial broad-spectrum natural-language interface. It was preceded by more than $100 million and a decade of government and academic research in AI. It represents a tremendous achievement, and we will certainly see more like it. But, presently, Siri has its limitations. It is specialised to a small set of potential tasks. It tries to match what the user says to one of the kinds of tasks that it knows about, and then calls a conventional phone/web application relevant to the task. But Siri's expertise stops at the boundary of the application. Then you're back to the conventional interface. You can't teach Siri how to do new tasks.

Siri cannot compose applications to do a multi-step job. And Siri doesn't have much ability to deal with situations where it misinterpreted, or something goes wrong.

At the MIT Media Lab, we're working on interfaces that, like Siri, are goal-oriented and use language. But we're interested in a broad spectrum of user goals, open-ended and context-sensitive interfaces, and recovery if things fail. A key ingredient is common sense. A computer will book you a plane from Boston to London, but it doesn't know you can't drive there. We're amassing a large common-sense knowledge base, and using it to figure out what "makes sense" in a situation.

Another key is to bring the power of programming to the end user. No application developer can make separate apps for everything a user might want to do. So we're going to have to give users the power to teach new capabilities to the computer themselves, without using a programming language or an "app store". Finally, no computer is going to get it right every single time. So we have to give users the ability to criticise the computer's behaviour, and fix it when it doesn't work. Just as a programmer uses a debugger, we need end-user debugging tools, to make our systems more resilient. Rather than simply filling up our screen space until it runs out, we need to start using the renewable resources of knowledge, language and human ingenuity.

⚡ *Henry Lieberman is principal research scientist at the Media Lab*

SEP KAMVAR_

We need more nourishing metrics than downloads

There is a Zen story about a man riding a horse galloping frantically down a path. His friend, who's sitting by the side of the road, calls out, "Where are you going?" The man replies, "I don't know. Ask the horse!"

When we build our tools, we often depend on metrics to guide development. We keep graphs of unique visitors and page views and watch them closely. This keeps us honest. It's hard to convince anybody that we're building a useful tool if our metrics show that nobody is using it.

But we must take care when we use metrics. Metrics can be like the horse in the Zen story. Once we decide on them, they have a habit of setting the agenda. As the adage goes, what gets measured gets managed.

The standard metric for a country's economic welfare is GDP. I find this strange. If the government decided to give millions of pounds to the country's richest people so that they can buy yachts from one another, that would increase GDP. So would felling national forests to build shopping malls, outsourcing the raising of children, and incarcerating large swaths of the poor.

If we temper the language a bit, we might find this description is not so far from reality.

My point is: metrics shape behaviour. Joseph Stiglitz, economist and professor at Columbia Business School, describes this mechanism nicely: "What we gather our information about, and how we describe success, affects what we strive for." Political leaders who want to grow the economy, he says, will focus policies on things that grow GDP, even when GDP does not correlate with societal well-being.

Which brings me to my second point: all metrics leave something out. Often, they leave out the most important things. In 2007, Stanford offered a course called *CS377W: Creating Engaging Facebook Apps*. The course assignment