

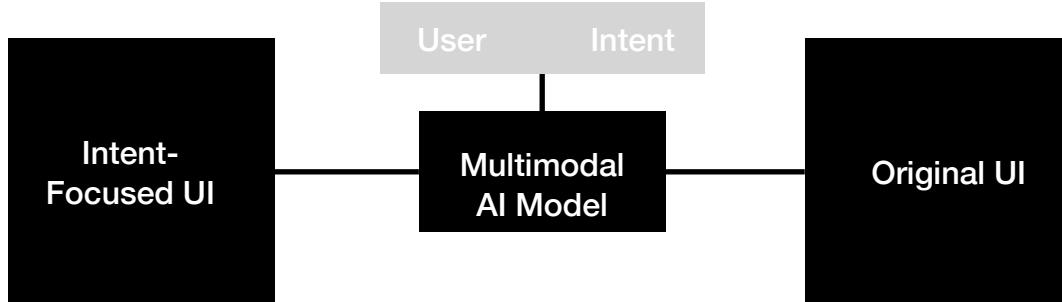
# The Rewritten Screen: AI Advocacy Providing Agency for Individuals

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Research & discussion draft. Informational only; not legal, regulatory, or technical advice.

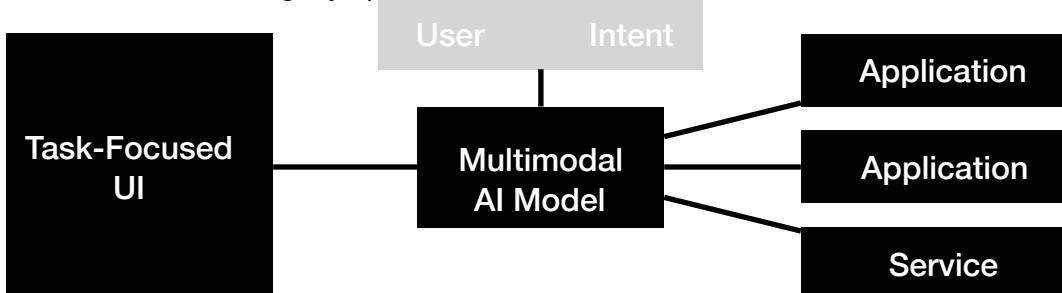
## Summary

Today's digital experience is structured around applications that prioritize engagement and platform lock-in, rather than acting in the best interest of the individual. This work proposes a user-side AI advocate that rewrites any interface into a task-first, intent-centric experience — reducing distraction, standardizing common tasks, and restoring agency to the individual. In the simplest case, this can be viewed as there being two user interfaces (UIs): 1) the original that was presented to the user by the operating system and content providers on websites, i.e., what is experienced today, and 2) the rewritten user interface that is organized by an AI to align better with the individual's intentions:



This methodology allows individual users to use any laptop, mobile, or other digital device to navigate information on the web with reduced advertising and platform self-promotion, focusing on the task the individual is trying to accomplish without distraction. It can particularly benefit the elderly and impaired groups by providing simpler user interfaces which isolate them from the complexities of frequent software updates, by providing a consistent user experience. There is also the promise of gaining the positive benefits of connection through social media while removing addictive elements designed to improve engagement. The vision is that the application of these technologies will have significant long-term benefits to individuals in society.

The broader vision of intent-centric computing is to no longer simply present information from applications designed by companies, but instead to treat these applications as content or tools which are reinterpreted into new user interfaces better aligned with user intentions. In other words, not simply to create a one-to-one mapping from an old to improved interface, but create new task-based user interfaces that dynamically pull information and connect with multiple sources, whether legacy applications or direct services:



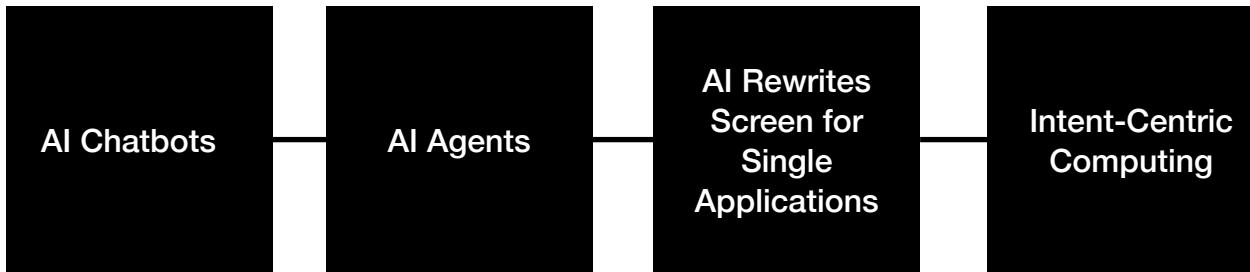
# Outline

This research explores what technological advancement is making possible through the use of AI to simplify and improve how people interface with technology. The second theme is to use AI to empower the interests of individuals, whose goals sometimes differ from the interests of the companies providing digital services and applications. The focus is on the overall paradigm, an introduction to high-level patterns, and discussion of the commercial implications, rather than implementation details, modeling enhancements, legal limitations, and other details:

- **Progression of AI Technology:** Place AI advocacy in the context of current and likely progressions in AI technology, currently in the form of chat programs and agent-based paradigms.
- **Misalignment of the Digital Experience:** Motivate the value of shifting fine-grained control over what is seen on a digital device to the individual and motivate how the digital experience today does not always align with individual interests. Discuss ways to reduce harmful patterns and distraction in advertising and self-promotion, especially for social media platforms which sometimes emphasize engagement and profitability over a strong focus on individual well-being. Shift the user experience to support aspirational objectives of individuals in the digital experience and explain how this differs from the typical engagement objectives of commercial companies.
- **Intent-Centric Paradigm and Patterns:** Introduce an intent-centric paradigm for how to customize the digital experience, prioritizing what users are trying to accomplish over commercial interests. Also simplify the digital experience for all users through the use of standard usage patterns, text- and voice-based controls, and dynamic AI customization.
- **Commercial Interests:** Suggest more equitable paradigms for handling advertising and self-promotion based on this new worldview.

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# Progression of AI Technology and Privacy



The transformation discussed in this paper has already begun. At this time large language models allow the use of simple ad-free text interfaces to perform intent-driven tasks on the web or derived from the web and other sources. In many ways, the use of LLMs in current chat interfaces is a very pure form of intent-driven work. The user states their intent, the AI infers additional intent, and results are provided — with minimal extraneous information provided by commercial interests. The models have intrinsic knowledge they have learned as part of their training, gather additional context through browsing and web tools, and sometimes receive specialized training for specific tasks.

Operating systems and individual applications such as browsers are moving toward accepting text commands powered by AI as the commodification of GPUs allows large language models to operate on progressively smaller devices. Users will be able to perform all types of tasks directly from a text prompt or via voice command: open an application, execute commands within an application, and so on. This capability does not need to be limited to simple commands, but can also allow users to specify their goals via text or voice and have AI agents sequence together multiple actions, queries, and reasoning steps to achieve these goals. Agent modes that exist in some chat interfaces today allow users to log into their own personal web services to perform shopping or other tasks, at least in an early stage form.

What is not as obvious is the idea that as the AI-advancement trajectory continues, AI technology can be used to completely change the user experience, dynamically presenting information and commands in a way to cater to individual interests. In other words, the AI may dynamically present an entirely different user interface to an individual. Ads can be removed, and distracting content from the user's goal may be filtered, essentially working to rewrite the content from a single application.

This approach becomes richer as an AI integrates information from multiple applications and services and provides additional reasoning and searches of external data. In this intent-centric perspective, applications and services become tools for the AI to use to accomplish user goals. The AI dynamically creates a user interface designed around these goals.

This work endorses a shift in privacy as AI usage becomes more integrated into daily life. Currently most AI computation happens on servers and exposes a significant amount of information about individuals, operating largely on unverified trust with the AI providers. In contrast, the approach advocated here is for the AI model to run directly on the user's device and minimize the amount of external information that leaves that device. The underlying operation of the LLM or a multimodal model is isolated and transient, and only access to external tools, such as browser calls, would result in externally visible information being shared. This is similar to the privacy models followed by some operating systems, which require sensitive information to be processed on the local machine and restrict how much individual information is shared over the internet. The timing of this level of privacy is dependent on continued GPU hardware and model performance enhancements to bring AI computing to the local device.

# Misalignment of the Digital Experience

A significant portion of the current digital experience does not serve the best interests of individuals. Many aspects of the digital experience are simply accepted as status quo, because computers are essential to everyday life and people have to adapt to digital reality. In many ways the complexity of digital reality greatly exceeds day-to-day physical reality, as every application is designed to follow its own sets of rules or digital physics, even when constrained somewhat by frameworks and web standards. Arguably, some advancements to web technology in recent years are designed to overcome limitations or standardizations of the original concepts, resulting in greater potential for deviation. The number of variations in user interfaces that consumers face is amplified as competitors each try to distinguish themselves and as vendors develop multiple versions of products.

Individuals using technology today have their user experience set by the people developing the platforms. That experience can be relatively positive or neutral, such as in the case of operating systems. But that experience can also be driven by agendas which do not necessarily benefit individuals, as is often the case in social media, news, and other platforms that have more negative aspects. Corporate and other interests creating media or other platforms have teams of people and algorithms at their disposal to influence how information is presented. Algorithms driving engagement may initially sound neutral in their impact on individuals but can influence behaviors away from paths that are healthy or in the best interest of individuals, increasing anxiety and wasting time.

Although objections to the pervasiveness of computer usage and concerns about harm from social media are frequent, the most commonly suggested solutions go little further than imposing time limits on usage. The methods discussed in this paper are especially powerful because they have the ability to redefine the digital experience without seeking the consensus of the organizations developing software and media. The objectives below will sometimes compete with the engagement objectives of companies.

Even when companies learn patterns that engage users in an optimal manner in terms of apparent user interest, it may not be in the best interest of those individuals. These individuals may be striving towards higher objectives, rather than wanting computer algorithms to reinforce bad habits that they are trying to overcome or reinforcing status quo in their behaviors. The objectives are defined as aspirational and highlight values which serve the common good, with acknowledgement that there will always be some level of subjectivity to this type of discussion:

- **Task Relevance vs. Distraction** - This principle is that when engagement starts with a digital tool, it should primarily focus on a specific user task, and that other options or activities should not be presented if they are not relevant to the task. This topic will be discussed extensively, especially in the context of advertising and self-promotion.
- **Disengagement vs. Engagement** - An important but related idea is that the digital experience should facilitate leaving the digital environment when the task is complete, i.e., it should be purposefully transitory. In other words, the digital experience should be designed so that when a task is finished, it is easy to disengage and move on to non-digital or other digital tasks. This aspirational objective often contradicts the design of most platforms — which try to maximize engagement and specifically extend engagement in their digital environment. A key if simple principle is to simply stop showing other options, i.e., cross selling digital tools. Wait until the user chooses to engage on a new task or expresses interest in seeking out new activities before showing unrelated activities.
- **Calm vs. Stimulus** - The idea is that most topics can be accomplished with calm and not to introduce hyperactivity or other stimulus, unless it is actually relevant to the primary task. Unnecessary stimulus can be obvious such as flashing, videos, clickbait titles, or other

methods. These methods are used to increase engagement without benefiting the individual.

- **Individual Values vs Corporate Assessed Values** - Large corporations routinely make judgment calls about what norms should be applied towards permitted content: violence and gore, sensuality, and even other concepts such as positivity vs dark content. This work allows another layer of selection through the AI operating on the individual's device. So they can potentially apply stricter filters across all content, including advertising, to match with their values or norms, without simply assigning these based only on some uniform concept of presumed societal norms, whose interpretation varies across corporations.
- **Purposeful Exploration vs. Passive Exploration** - This is the idea that exploratory activities can be more purpose-driven by an individual's values and goals as well as their specific immediate tasks rather than passive and subject to the counter-objectives of advertising, media, and algorithms. Contrast tools like Google Search, which are very purpose-driven against social media, which allows very little user guidance and is driven by advertising and engagement objectives and can become a form of self-reinforcement for current patterns of behavior.

Even when there is no conflicting agenda, the need to design a user interface for all types of people may limit the ability to customize the experience for individual needs. Application designs do not always perfectly match individual needs simply due to different design goals, such as a basic mismatch between the tool intent and what an individual is seeking. But often the tool can still provide some value; especially if it is re-tasked to do so. By shifting perspective to view these applications as tools for use by an AI advocate rather than being strictly limited to direct end use by individuals as part of a fixed user interface, a strong set of new possibilities arises.

An axiom of this work is that an individual should have the ability to choose what content they display on their digital devices. So if they subscribe to some service, for example a social media service, they can still selectively choose to view any portion of that service and to remove any portion that they do not wish to see. That said, any implementation of this software would need to comply with local regulations for how content is handled, which could impose constraints beyond the ideals advocated in this research.

Another core argument is that this content change needs to be handled through software, in this case a sophisticated AI, that is working for the individuals' interests. The number of sources of information that individuals interact with on a regular basis is simply too diverse and untrustworthy to only rely on content providers to provide this protection. And although content providers should continue to provide safeguards, it is an unnecessary burden for individuals to try to configure each provider in a way that suits them and in large part with controls that are inadequate, ill-defined, and inconsistent.

This work is about using AI to advocate for individuals' interests in terms of what they see on their devices. An AI working for an individual can reinterpret the information and controls presented by all of these diverse applications into new dynamic user interfaces. The mechanisms for accomplishing this are explored in the next section. But it is useful to motivate the work by pointing out specific areas where the current experience may not best match the needs of individuals:

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## Advertising

Products or services with minimal relationship to the platform being used let alone the tasks being worked on are presented for the financial gain of the platform serving the advertisement. Although platform providers have to balance the value provided by their platform against the level of distraction — videos, flashing, and many other highly disruptive methods are still regularly used. More subtle methods include embedding advertisements in text workflows, like

search results. In most cases, advertisements provide little or no benefit to the people using the platform. There have been efforts in the past to limit advertising, such as web browsers limiting pop-ups. But the shift of power has clearly moved towards the advertisers over individuals — resulting in ever more immersive and unlimited advertising. Although AI will certainly be used by advertisers to increase advertising immersion and marketing effectiveness, AI also provides an opportunity to shift some influence back to individuals, by allowing them to control what information is shown on their devices, recognizing and filtering advertisements in many different forms. This work can be used to establish a more equitable relationship between advertisers and individuals.

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## **Self-Promotion**

Many platforms also engage in significant self-promotion. This can be in the form of advertisements for their own platform, but is generally more subtle and pervasive. Many platforms will use significant user interface space for the company name, the title or logo of their product, and then a broad range of links and navigation tools to cross-sell other services or promote engagement. Many online news services provide extensive links to other articles, taking up 20-30% of the screen or more, presumably to keep users browsing the next article rather than context switching to another activity. This can be carried to an extreme where it is difficult to actually find the text for a news article and that text is broken up into sections which make it difficult to find the flow of the text and to know when the article is complete. For social media platforms this often takes the form of self-promotion of ever-growing sets of functionality. The user interfaces often contain dozens of pieces of functionality that most users never use. In streaming services, it is often difficult to continue watching a show that was watched previously. Instead, the platform providers make sure that users have to view and engage other shows that are available, presumably to maximize engagement and interest in other shows.

AI has the potential to completely reinterpret these user interfaces to simplify them and focus them on the main task, whether that is reading one article, watching a prior show, or navigating more effectively when a user is seeking new material. This becomes more powerful when AI is used to integrate information from multiple products. For example, an AI could present competing news views, or allow better integration across all streaming services. Self-promotion is often not even recognized for its potential distraction or waste, and it is a strong area for the improvements possible with this work. This paradigm shifts individual users away from being involuntary, passive participants to any new functionality that influential companies want to introduce and puts individuals on a more level relationship — where the companies need to show a value proposition before users choose to accept additional complexity and functionality.

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## **Application-Focused vs Task-Focused Workflows**

The current paradigm for using digital devices is largely application or platform first rather than task-first. In order to accomplish a task a user must select one or more applications and then navigate each of those interfaces, which requires specific skills and knowledge about the applications. Software companies must put significant effort to design and maintain user interfaces, rather than focusing on core services. And individuals must learn skills on how to use each of these applications, adapt as applications are upgraded, and perform competitive evaluations of competing services.

AI technology can adapt existing user interfaces to reduce complexity for individuals and integrate with multiple applications. This opens up the path for individuals to pick and choose what information and services they want to use rather than being locked into the bundled

services and user interfaces provided by commercial companies. Or they can view competing or supporting information from different applications in a single view, as this supports the specific task of the user.

**Example User Agenda:**

- I would like to see how my friends are doing (note that this task is not specific to any one social media platform and may not purely be the domain of social media platforms)
- I may want to send one or more friends a message (this messaging does not have to be on a social media platform)

**Example Social Media Platform Agenda:**

- Present activities from a subset of the user's friends, especially those that tend to engage their friends' attention
- Present the most current news that tends to maximize time spent on the platform
- Present paid advertisements, in particular those which hold attention
- Present other platform features for self-promotion, such as other types of groups or any new functionality provided by the platform
- Provide integrated messaging using platform-specific mechanisms

The movement towards providing platforms has a number of motivations including security, quality control, and regulatory factors. But the strongest motivation for platform focused workflows has been vendor lock-in. Platform or vendor lock-in is a strong strategic element of many commercial companies towards improving their profitability, with limited benefit to individuals. This can take many forms such as bundling services into one user interface, not directly supporting data import or export, and through simple details such as the overhead of learning how to use a competing platform. AI technologies already understand these interfaces very well, and LLMs can often provide explanations for how to use tools that are sometimes clearer than the documentation provided by the application developers.

This deep understanding by AI combined with adaptability through reasoning can allow AI to adapt existing applications into services which are then re-interpreted into new user interfaces. For web-based interfaces, the AI can be pulling out display elements and controls to accomplish specific work. For companies prioritizing vendor lock-in, this technology may compete with their interests. For companies prioritizing their services, this may streamline their work, allowing them to focus on the core services and allowing the AI to dynamically create user interfaces to their services for individual users. It is difficult for companies to develop user interfaces which both meet the needs of many users, but at the same time are not overly complex. By developing AI advocates that accomplish this work, user interfaces can be dynamically created which have the essential elements to accomplish individual tasks.

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## **Content Selection**

Content selection is another area where decisions tend to be made on an individual's behalf by an organization, potentially with its own set of interests. A classic example is the decision on what is newsworthy from all of the interesting events that are occurring in the world. A search engine result is another example of guided content selection, an example that is generally assumed to be relatively unbiased. Modern digital advertising is an example of content selection for which end readers are given very little control. As previewed in the prior example, social media contains many examples of content selection. Social media is particularly interesting because it involves content selection from information which is not public, the activities and details of a group of friends.

In social media, content selection is largely driven by algorithms optimized for the best interest of the platform designer, usually in terms of engagement and sometimes by prioritizing paid content. Although there is often some benefit to individuals in terms of discovering content

that is of interest to them, there are limitations. The quick win for these algorithms is often to magnify short-term trends with broad appeal rather than niche substantive content which may have more long-term value. Almost no effort is made and no mechanism is provided to adapt to individual intent on a specific day or time. For example, is an individual interested in seeing what events are happening this week or do they want to catch up on what their friends are doing? In each case, a different user interface and prioritization of content would be appropriate.

In some cases, algorithms for content selection magnify harmful patterns when their priority is engagement. An algorithm may correctly identify that an individual may spend hours engaging if they present certain types of content. But that individual may actually be interested in accomplishing a specific task and may be purposefully trying to reduce distraction in their life, so the algorithm is conflicting with a higher, more aspirational goal of the individual.

Content selection is a very powerful and important area to use AI to improve the digital experience for individuals. The focus of this work is to allow the AI advocate to: 1) select content focused on what a user is specifically trying to accomplish at the time and 2) present content to match an individual's aspirational goals (less distraction, more substance, and so on) rather than a company-focused goal such as engagement. It is possible to see many implications of improvements for reducing addiction and anxiety as well as increasing productivity and calm.

An AI advocate can filter and reorganize the material presented by a social media platform to partially accomplish these goals. But the AI would be limited to filtering and reorganizing content that has already been prioritized and filtered by the algorithms in the case of social media platforms where the information being presented is not necessarily public information, i.e., information about a group of individuals. Solving this implies a stronger level of cooperation from social media platforms to allow the AI to (a) either present the intent to the platform or (b) to receive more content and directly prioritize the content based on the intent prior to presenting to the user. There would likely be commercial resistance to the second approach, but open protocols for information sharing could supersede the current proprietary social media platforms and enable these mechanisms.

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## Versioning and Customization

Product designers are frequently striving to improve their products and make competitive changes which impact their user interfaces and functionality. In applications and operating systems, this takes the form of software updates. In web interfaces, this takes the form of rapid modifications to websites. As AI technology increases the ease at which companies can make changes to user interfaces, the frequency of changes may accelerate and even take the form of companies dynamically creating user interfaces for individuals.

Although power users may be interested in these changes, frequent changes can present distractions to many users and serious issues for the elderly or impaired. By creating separation between the underlying products and the interface presented to individual users, more consistency can be achieved, easing the digital experience for most users.

Additionally, the current state of the art makes it challenging to achieve a baseline level of consistency, even with simple configuration such as font sizes and margins. Even when configuration options are provided by the operating system or web browsers, they are not followed consistently by content providers. An active AI redrawing the views presented to individuals can take a stronger stance on how the information is presented, giving these users full control.

Additionally, finding all of the configuration options across operating systems, web browsers, and individual applications can be a difficult task with substantial variance. An AI acting on the individual's behalf can be a central point of control for this type of configuration, greatly simplifying the work.

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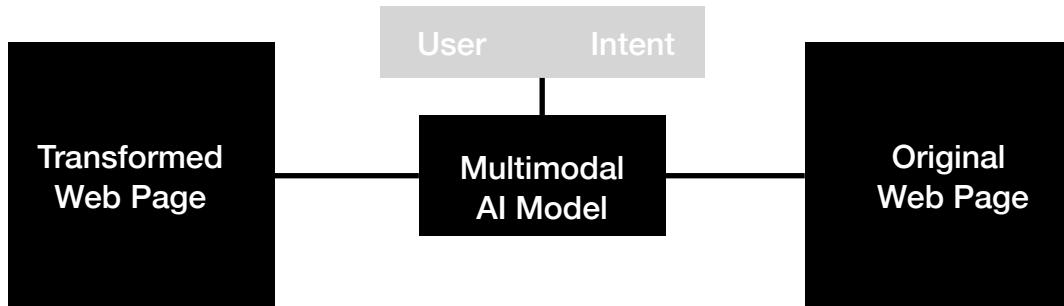
## **Agenda Awareness**

A more advanced use case is enhancing AI to detect and make individuals aware when they may be presented with a misleading agenda or be subjected to some form of manipulation. Some of this is the topic of large-scale meta-analysis of media and other content outside of the scope of this work, but these protections can be applied at a fine-grained level where an AI operating on an individual device can intervene. This includes the protection of elderly and vulnerable individuals based on web and email content, as phishing and other techniques increase in frequency and sophistication through AI used by fraudsters. And it can also include the detection of attempts to manipulate through how information is characterized or presented. On the softer side, it would be useful to detect when reward mechanisms are being used to influence individual behavior. Although some reward mechanisms can be useful, it is helpful to highlight and summarize all the agendas that are being imposed, especially as they become ever more sophisticated.

# Intent-Centric Paradigm

The prior section highlighted the differences between what is presented to users today and what is more beneficial to individuals. The method to rectify the two is not a coordinated effort to redefine existing applications or to change the philosophy or design principles of the organizations that are producing content and user interfaces. Instead, a paradigm is suggested which dynamically defines user interfaces, by re-interpreting the output from existing applications, by working directly with source data, or both. So permission or full cooperation is not sought from the thousands of organizations that produce content and applications. Instead, a sophisticated AI client is developed that operates on the end user's digital device, actively rewriting the output to meet the user's goals.

The primary mechanism for guiding this process is a text string that is used to control a multimodal large language model, where the text string defines the user intent. To keep the concepts straightforward, the explanation will focus on web content transformation, which may include text and images, with the understanding that this can be generalized:



This paradigm allows the problem to be framed into processes that are well supported by current text-to-text models, image-to-image models, and multimodal models. So even without customization, some of the tasks described here are supported by existing multimodal models, which already have a deep understanding of user intent and visual elements. A full working implementation would likely result from a combination of customizations for the tasks described here along with advancements that become available from the current trajectory of large language and multimodal models. Implementations would also need to provide infrastructure to seamlessly integrate the new views into the client device, with all the corresponding security and real-life considerations.

The intent can be directly specified by users through typed or spoken text, the most straightforward method. However, this paradigm is not dependent on the idea that a user specifies their intent as text. The user intent may also be inferred by user actions. For example, interactions with traditional user elements like drop-downs or buttons may be converted automatically into text intent strings. Clicking on a hyperlink may be interpreted more broadly than navigating to a web page, especially if the hyperlink text and the underlying linked content are not well matched. Or it may be inferred that a user has finished reading a news story and is interested in exploring other articles once they click out of the text or press the Escape key. These comments are not strong suggestions for methods of inferring intent from user actions, as this could be a sophisticated area of research. For the purposes of this work, it is assumed that the intent will be translated into a text string in an architecture before being presented to a model.

An important aspect of intent is the separation of stated or explicit intent and implied intent:

- **Explicit (Expressed) Intent:** Text which holds the primary tasks and details about how it may be accomplished, such as "I want to read the news articles XYZ." Explicit intent can be very specific like the prior example or broad: "I would like to browse news articles."
- **Implicit (Implied) Intent:** Things that may not be stated directly by the user, but are reasonable to be assumed as implied, or perhaps are common across all of that individual's experience.

"I do not want to see advertising"; "I want to accomplish my work without seeing any flashing or videos"; "I tend to like science news".

Existing large language and multimodal models already have significant abilities to infer implied intent and to interpret what purpose web content serves. By using these multimodal models as central to the methodology, the ability to redefine the digital experience will improve as the underlying models improve. It is likely that these advancements will be essential to the methods discussed here.

Although this work can eventually be done across the entire user interface and all applications at the operating system level, dynamic user-centered web content is likely a more immediate lower-friction and higher-reward path for implementing approaches based on this methodology. This can be illustrated by taking the content of a news article on the web and creating a streamlined version of the web page that more closely matches the user's goals. In this case the goal is simply to read the article without distraction. Below is an example prompt to a contemporary LLM model but this could be fully automated.

**LLM Prompt:**

**INTENT:** The user intent is to see the main story without distractions. Ads, navigation tools, and any extraneous unrelated content are not useful. The user would like to use a large font to help with vision. Remove any large margins so the screen is better utilized.

**READER FORM:** The produced html should be organized in the following order:

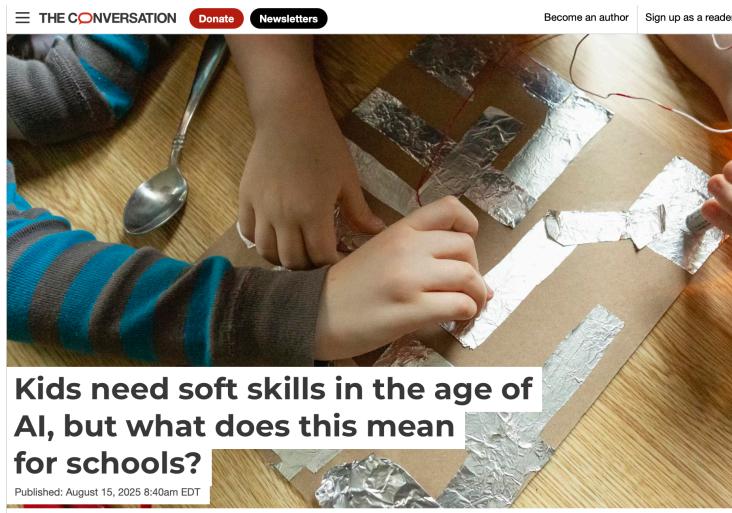
1. The title
  2. The full body of the text
  3. Authorship and reference to original article, shown last
- Do not include any items such as text describing the intent or reader form, navigation tools, ads, or anything else.

Start with the included html.

The goal is to create a new html page, which more closely matches the user <INTENT> using the <READER FORM> for the layout. Specifically you should remove any html elements which do not match the <INTENT> and <READER FORM>, so the user can have an experience focused purely on their goals. The html file should contain parts of the actual content from the original html file. The new html produced should be valid and runnable. You may also modify elements where necessary, but article text should be preserved as is.

Produce a filtered version of the html file, making sure that the ordering matches <READER FORM>.

The excerpt below from the article published under Creative Commons has limited advertising, but is useful to illustrate the research concepts of how an AI can reinterpret a news article. The image on the left is a direct screenshot from this link: <https://theconversation.com/kids-need-soft-skills-in-the-age-of-ai-but-what-does-this-mean-for-schools-261518>. The image on the right was reinterpreted by an AI based on the provided prompt and preserves the text.



**Kids need soft skills in the age of AI, but what does this mean for schools?**

Published: August 15, 2025 8:40am EDT

Generative AI is forcing K-12 schools to reconsider what key skills to teach students. Cavan Images via Getty Images

**For the past half-century, the jobs that have commanded the greatest earnings have increasingly concentrated on knowledge work, especially in science and technology.**

Now with the spread of generative artificial intelligence, that may no longer be true. Employers are beginning to report their intent to replace certain white-collar jobs with AI. This raises questions over whether the economy will need as many creative and analytic workers, such as computer programmers, or support as

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## Kids need soft skills in the age of AI, but what does this mean for schools?

For the past half-century, the jobs that have commanded the greatest earnings have increasingly concentrated on knowledge work, especially in science and technology.

Now with the spread of generative artificial intelligence, that may no longer be true. Employers are beginning to report their intent to replace certain white-collar jobs with AI. This raises questions over whether the economy will need as many creative and analytic workers, such as computer programmers, or support as many entry-level knowledge economy jobs.

This shift matters not just for workers but for K-12 teachers, who are accustomed to preparing students for white-collar work. Families, too, are concerned about the skills their children will need in an economy infused with generative AI.

As a professor of education policy who has studied AI's effect on jobs and a former K-12 teacher, I think the answer for teachers and families lies in understanding what AI cannot – and perhaps will not – be able to do.

Prior waves of automation replaced routine and manual jobs, boosting the earnings advantage of cognitively demanding work. But generative AI is different. It excels at pattern-matching in ways that allow it to simulate human coding, writing, drawing and data analysis, leaving the lower rungs of these occupations vulnerable to automation.

On the other hand, because its output mimics patterns in existing data, generative AI has a harder time handling complicated reasoning tasks, much less complex problems whose answers depend on many unknowns. Moreover, it has no understanding of how humans think and feel.

Even this straightforward example involves many decisions. The rewritten view on the right clearly is able to fit a significant amount of additional text, but details such as how to handle images, visual appeal, and other aspects of the presentation are also important. Some level of standardization and reuse would simplify and unify the work, which is a topic introduced in the next section.

# Patterns & Consistency

Another key proposal of this work is the establishment of patterns of usage that are more intent-centric. Many tasks on digital devices today are very similar but subject to large variations in their actual experience because different organizations are producing the user interfaces. A simple task like reading text varies unnecessarily across book readers, email programs, news websites, and many more applications. The methods outlined here can configure and present these more uniformly, shifting the computer experience from cognitive complexity towards the direction of simplicity and elegance.

There could be significant competition to win user interest in using specific patterns, especially if it is easy for users to switch between different styles of patterns. Different types of organizations could propose and publicize usage patterns and make them available for users to incorporate directly or adapt.

Having established patterns is also key to the practical application of the methods in this paper. Without guidance, multimodal large language models would tend to produce different user experiences in every situation. So, naively applied, this methodology could amplify rather than reduce the issue that exists today, where individuals have to learn a variety of interfaces for the same tasks. Without guidance, consistency is not well supported in current multimodal models or large language models. In the broader ecosystem of models, this issue is not unique and is an area of active focus — for example frame-level consistency is important to text-to-video generation models and in the consistency of character generation in text-to-image models.

An exciting concept that helps solve the consistency issue as well as providing many other benefits is intent-centric user interface patterns, with a consumer-first focus. Many companies spend an immense amount of time developing user interfaces to improve the user experience but technology and organizational constraints limit these to be from the narrow perspective of one product. In contrast, these patterns can be aligned around specific tasks such as reading text, editing text, exploration/navigation of new topics, and many more.

In many ways this capability can eventually obsolete or supersede aggregator services, or force these aggregation services to develop in new directions, whether they are news aggregators, financial aggregators, or any other type of aggregation services. These services might focus on providing value-added knowledge and connections, or other types of useful services. Although the patterns are deliberately presented in more of a pure manner towards specific tasks, realistic designs arguably may incorporate other elements. For example, even a text reading or text editing pattern may benefit from some navigation elements.

The following examples lightly sample the possibilities for task-based patterns and are intended to generate interest in more work in this area rather than present any type of finished work:

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## Reading Pattern

This pattern is one of the simplest and most classic where a user is engaged in reading a book, news article, reading mail, browsing the web, or looking at other static content. Despite the universality of this task, the current state of the art is that every application defines a different reading interface. And in practice, only determined users go to the effort to configure all of the various reading tools to meet their goals, even for trivialities like font size, color, or other basic modifications.

In this pattern, the content is the primary focus, with implied intent to minimize distractions caused by navigation tools or other elements. Generally, the goal is to maximize use of screen real estate in order to minimize the number of actions needed to navigate such as scrolling. And some level of user customization can impact all the normal details of color, text size, methods to exit this mode, methods to traverse the text, and so on. But the core idea is that individuals should not be required to adapt to all the variances in how different applications and websites wish to present read-only text content and do the work to customize each of these individually. More sophisticated versions can include hyperlinks, within document navigation, search, commentary, and other tools. Many of the concepts that originated in web-based technology could apply, prior to strong commercialization prioritizing self-promotion and advertising.

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## Explore Pattern

An essential element of this work is that the decision to explore other materials be a deliberate conscious decision rather than a default that is inherently added in every user interface. In other words, avoid design decisions which encourage users to continuously engage in a digital medium and give individuals the space to easily move away from the digital experience or re-engage as they choose. This has been discussed previously in the use of self-promotion through navigational tools, advertising, and similar. In many ways this perspective is the antithesis of how most modern social media is designed.

The conscious decision to explore new material, search, navigate articles, and similar activities is important. By actually treating this purposefully in a user interface, much better and consistent methods can be created. Classic design is to constantly present navigational tools as a background element, which limits how much screen space these elements can use. This results in awkward user interface tools like the drop-down menu, which requires designers to do extensive work to create drop-down headers that are likely to be meaningful to users, and users to actively search through multiple menus to find the command that is applicable to the task they are working to accomplish.

Additionally, classic constraints in application development as well as self-interest often result in navigation tools which are focused on one product. For many tasks, a broader view is in the best interest of individuals using the digital tool. A straightforward example would be an individual who finishes reading an article using some form of reading tool and they have indicated that they wish to read more articles. At this point, opening this up to multiple news sources is likely beneficial to the individual rather than forcing them to navigate from one source. This raises the question of how broadly the scope of exploration should be opened. In this pattern, this is intended to be a dynamic parameter controlled by the individual. Continuing the context of navigating news articles, a user may choose to broaden beyond news, expanding to books or even general content on their individual device or cloud account.

Regardless of the scope or nature of the exploration, the core idea of the explore pattern is to create a dedicated and consistent view which allows navigation of the underlying information. This lowers the burden on individual users to constantly have to adapt to new patterns of exploration for each application. The specifics of this are highly arguable and likely to follow several patterns rather than one pattern. But some core elements are highlighted below:

- **Screen Usage:** Use the full or majority of the screen for exploration. In the news example, if an individual has finished reading an article, identify this shift in intent and change the view to an explore pattern, which uses most of the screen. This enables the shift away from tools like the drop-down menu.
- **Primary Navigation:** Some form of primary navigation can be provided, such as an expanded tree of options, which provides a much clearer view of options without requiring searching a drop-down menu. The primary navigation system should also provide introspection into the full array of options that are available. In other words, there is value in

providing users with some method for systematically exploring the functionality or information that is available.

- **Chat-Style Input:** A text and microphone input for chat-style inputs specifying what is desired, in order to perform search or more intelligent filtering. It is difficult to overstate the value of this type of input in the context of specific applications. Some financial websites and operating systems have started exploring this ability for users to input what they are trying to do and then automatically navigating the user to the correct screen. The primary navigation view such as a tree of options or recommendations might be influenced by this text input as well.
- **Intent-Driven Recommendations:** Commercial navigational tools frequently provide recommendations which attempt to prioritize what may interest a user but also include paid or other forms of prioritization. A core tenet of this work is that the AI advocate can create a recommendation list based on user interest or requirements. The specifics of task-specific recommendations could be context-specific and a subject of research. This mechanism might include shortcuts as well, both manually and automatically created.

To reiterate a primary point, the concept of using an exploratory pattern is seen as useful across many spaces, likely with some amount of variation in the design:

- **News Exploration:** Individual is seeking out news of interest across many sources
- **Navigating Application Controls:** In the context of a single application, such as a word processor or a social media, having a purposeful and familiar exploratory pattern would allow easier use of the product
- **Navigating Operating System Controls:** Trying to control specific details of the operating system frequently involves some exploration and search to find the appropriate actions.
- **Exploring Updates from Social Circles:** Views and exploration across one or more social media sites or group email updates.
- **Communications Search:** A common task is searching communications to support a variety of activities.

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## Monitoring and Communication Patterns

Another useful pattern is the monitoring pattern, whose purpose is to provide the user with broader summaries and notification of important events, while minimizing details which are irrelevant to the user's interests at the time. Right now, individuals largely have two options:

- **Notifications:** Allow notification of important events but this can also interrupt workflows and concentration. Generally there are limited controls on what to prioritize and each communication method uses its own mechanisms to provide control.
- **Manual Search:** Manually search applications individually to see if there is something of interest - checking email, multiple social media platforms, and so on.

Regardless of which method is used, end users must often enter a specialized platform in order to read communications or receive notifications, which generally presents significant irrelevant content to the communication, interrupting workflows and presenting an opportunity for more advertising and self-promotion. This pattern is about centralizing notifications and information of interest in a single view with uniform control. An AI can provide this type of nuanced and centralized control over a broad variety of items:

- **Direct Communications:** email, text messages, communication apps, social media messages, phone calls, voicemail
- **Events:** important news, health events
- **Metrics:** financial prices, home temperature, personal health

Closely related to the monitor pattern is the concept of a communication pattern. There has been a shift away from using common communication channels such as email and text

messages. The motivations for this shift have been highly varied: overcoming limitations of traditional digital communication methods, enhanced privacy or reducing cost using communication apps, enhancing tracking for financial companies for regulatory reasons, allowing social media companies to use individual communications as a data source - and there are likely many more factors.

This work does not attempt to solve this issue by creating standardized communication protocols or platforms. In all likelihood there will continue to be innovation and other factors which drive further changes in communication technology. Instead the communication pattern operates by providing an intent-driven uniform view into communication, by dynamically having the AI operate across multiple application user interfaces and standardized protocols. The following principles are applied in this pattern:

- **Consistency Regardless of Source or Application:** The same or similar interface is provided for a variety of communication tasks rather than requiring the user to directly operate against multiple applications.
- **Uniform Controls:** This AI handles the details of controlling the underlying application or protocol. For example, the presented user interface may have a consistent send button for all communication media. And the AI would interface with each application or protocol to take the appropriate steps, hiding those details. More advanced versions of this pattern can provide specialized configuration for each application in one place, rather than requiring the user to drop to the individual application level to handle custom details of that application.
- **Integration with Other Patterns:** Communication is a core pattern and has clear connections to the monitoring pattern, explore pattern, and subscription pattern.

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## Subscription Pattern

A more specialized and sophisticated pattern related to the monitoring pattern is subscription maintenance, where an AI works across multiple applications and services to not only track all digital services in use by an individual but to provide one-click buttons to modify or cancel those services. The current status quo for subscription maintenance is complex and arbitrary, with users often having to search many nested user interface paths to change or cancel services, or even to track expenditures on services. A subscription pattern can create a single view that lists active and inactive services, providing ledgers or prior and upcoming costs, notify users of upcoming payments, and provide agent-based buttons that allow changes to or cancellation of services.

The subscription pattern can also provide uniform tracking and monitoring of service agreements and other legal documents, and highlight potential legal concerns with those documents. Current methods for handling these types of documents are strongly biased towards the provider of the documents. By collecting together and tracking all agreements in one place, the AI could provide essential services beyond cost tracking, such as privacy tracking. For instance, the AI could highlight changes to service agreements by comparing updates with prior versions. Or provide a privacy summary both in terms of what privacy is given up when initially signing an agreement, sharing publicized concerns from other individuals in terms of these documents as well as a summary of existing litigation, and provide a summary of what privacy has been given up across multiple documents. To be clear, this pattern is being suggested in the context of generic service agreements, where almost any level of discipline is an improvement to the current status quo of simply agreeing to any consumer service agreement that is presented by a well-known company, with little tracking. Customized legal documents such as home purchases, employment documents, and similar are highly specialized and are not being suggested as part of subscription patterns.

# Commercial Interests

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## Equitable Paradigms for Advertising and Self-Promotion

Many commercial companies use advertising and self-promotion in order to monetize their services. But current approaches to advertising and self-promotion in the digital experience are often arbitrary, obtrusive, and do not prioritize the impact on society, i.e., the long-term impact of distraction on how people work and live as well as lost productivity. This is seen most pervasively in social media and web advertising. If the methods discussed here were successfully implemented and users had strong control over what they see in digital hardware that they own, this opens up the question of how companies that generate revenue from advertising and self-promotion would adapt. This is difficult to predict and a rich subject, but it is useful to explore what methods may or may not be helpful. Two methods seem unhelpful: refusal of service and embedded advertising.

- **Refusal of Service:** In refusal of service, providers would attempt to detect and block individuals using AI advocates to filter their content, with similarities to how bot detection operates today. This seems unlikely to be effective or productive, as consumer and commercial interests would be entering an ever more sophisticated AI competition, with commercial AI technology trying to detect consumer AI advocates, and consumer AI advocates attempting to evade detection so they could operate in the individual's interests.
- **Embedded Advertising:** Alternatively, context providers may embed advertising in ever more sophisticated ways. But this also can lead to AI competitions, with commercial AI technology attempting to hide advertising in text and images, and consumer AI advocates working to detect and remove this advertising. These competitive activities seem largely unproductive and might also be subject to ethics concerns and legislation.

Instead, it seems useful to view user-level control over what is presented on their digital screens as a forcing function to reduce the arbitrary nature of current advertising practices into something which is negotiated by an AI on behalf of the user interests. This suggests more sophisticated versions of paywalls, where the AI operates for the user's interests and hides some of the underlying complexity. Or more upfront and open negotiation in general on the form of advertisements.

Some individuals may accept the status quo and receive the current level of advertising in order to receive free services and content. On the other extreme, some individuals may never be willing to accept advertising and can provide their AI with a budget and content preferences, so they can see their expected amount of content without advertising. This middle ground becomes more nuanced. Some individuals may be willing to accept some level of advertising, but refuse certain forms of advertising: flashing advertising, videos, advertising which dynamically shifts the existing content, advertising that is irrelevant or contains images that they find offensive or that are contradictory to their values. The last example is especially interesting for those whose religious or ideological views contradict common advertising content.

In many cases, platforms only provide controls at the most coarse level and the effort involved in trying to configure advertising preferences across many different websites quickly becomes unmanageable. But an AI operating on an individual's behalf can both make much finer distinctions and manage the complexity of preferences, keeping control local to the user's device to help protect privacy of the individual. This approach has the benefit of allowing an exchange of content for advertising, but to do it on the user's terms rather than the current open-ended methods for how advertising is presented. The specific paradigms would need to be developed, but one can imagine an AI negotiating on behalf of the individual to limit costs, perhaps even in a relatively seamless way with periodic monitoring from the user to adjust their

tolerances for advertising and costs. And of course, subscription-based content can continue to be provided.

The hope would be that less distracting or harmful forms of advertising would become the norm. In particular, a reduction in advertising that intersperses itself into otherwise productive workflows. And changes towards more educational and useful advertising, rather than a focus on making ads as eye-catching as possible.

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## Service-Based View

In many cases, the underlying application makes choices on what content is provided. And these choices limit what information an AI advocate has available to present to the end user. So filtering is always possible for an AI advocate, but in some cases it may be desirable to have access to additional content which is not presented by the original application, and may not be accessible via search. An example would be social media where the underlying platform makes many decisions about what content is presented, and the content is not available to general search, as may be the case for information about friends. Consumer pressure or regulation might push towards more of a service-level view where the AI advocate could be provided with additional information. It is unclear how much commercial cooperation there might be towards something which could be viewed as giving away competitive advantage. This would be a rich area of research and practice.

## Conclusion

Today's AI trajectory creates a rare chance to redesign the user experience around individual interests. A user-side AI advocate can rewrite what appears on a person's screen to align with their explicit and implicit intent, running on the local device to protect privacy. This work can happen by developing client-side advocates—without waiting for coordination across large numbers of apps and content providers. Expected benefits include healthier, simpler digital workflows and a catalyst for more equitable, open models of advertising and self-promotion. The shift from the current application-based paradigm to intent-centric computing is fundamental, with broad day-to-day productivity impacts and a shift toward a more equitable balance between individual and commercial interests. The goal is to introduce these concepts, motivate discussion, and accelerate their integration into software. For contact information and discussion, see: <https://purl.archive.org/rareaspect/the-rewritten-screen>.