



**KARTEN:DESIGN**

*A Visual White Paper Series*

Vol. / 01

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## **Change Is Hard: Motivating Healthy Behavior**

Healthcare is in flux. It can be an intimidating time, but it's also a time of great opportunity for companies that can understand the movement and the human needs driving it, and respond with meaningful innovation.



# KARTEN:DESIGN

*A Visual White Paper Series*

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For the past 30 years, Karten Design has been creating extraordinary experiences between people and products. In that time, we've learned a lot about people, emotion, and behavior. Our Outsights series takes these learnings and applies them to current trends in medicine and health, giving product developers the keys to creating exciting, successful solutions that stick.

## *Table of Contents*

- 3 • **Introduction**
- 4 • **State of the Industry**
- 5 • **Challenges**
- 9 • **Solutions**
- 15 • **Outsights In Action**
- 21 • **Industry In-Depth: Wearables**
- 24 • **Expert Interview: Dr. David Rhew**

Vol. / 01

## Change Is Hard: Motivating Healthy Behavior

Compliance is a multi-billion dollar problem in the medical industry. Too many sick people are failing to take medications or use medical devices as prescribed. As a result, they're not getting and staying well. This adds up to wasted money as consumers and insurers pay for doctor visits without any gains to health and quality of life.

At Karten Design, we believe that pharmaceutical, medical device and digital health companies can strategically address this problem through research and design.



## State of the Industry



**\$290  
BILLION**

In 2009, NEHI estimated the cost of non-compliance at as much as \$290 billion per year.<sup>1</sup>

**20-30%**

In 20-30% of cases, prescriptions for medication are never filled.<sup>2</sup>

**50%**

Half of medications aren't taken as prescribed.<sup>3</sup>



**125,000  
DEATHS**

Failure to follow prescriptions causes some 125,000 deaths a year and up to 10% of all hospitalizations.<sup>4</sup>

**50%**

Nonadherence rates for chronic illness regimens and for lifestyle changes are approximately 50%.<sup>5</sup>



**117  
MILLION  
PEOPLE**

About half of all adults—117 million people—had one or more chronic health conditions in 2012.<sup>6</sup>



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# Challenges

- ⊗ On its face, compliance is a logical proposition: “I’m sick,” plus “this solution can help me get well” leads to, “Ok, I’ll do it!”

The logic breaks down when you compare the ideal with today’s reality. Compliance is one of the biggest problems vexing the American medical system, costing billions of dollars per year and leading to unnecessary deaths and hospitalizations.

Most of the pharmaceutical and medical device companies producing solutions today view compliance as a logical decision that can be ascertained with functional, effective products. But compliance is, at its core, a human problem, with roots buried deep in human behavior and psychology. When we examine compliance from a human-focused perspective, we begin to understand why it seems to be an uphill battle.

## Emotion Trumps Logic

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Imagine your doctor has just diagnosed you with diabetes. In an instant, your life has changed. You're instructed to increase your exercise, give up sweets and starches, start monitoring your blood sugar, and take insulin. How do you respond? In large part, it depends on how you feel.



Behavior is heavily influenced by emotion. While a person's rational mind tells them to follow the logical path toward getting and staying well, it faces strong competition from the person's emotions. The emotional mind focuses on the cost of change—how painful it will be to give up the foods that have comforted you since childhood; how, in order to exercise, you'll have to give up sleep, or time with the family; how embarrassed you'll feel the first time you have to pull out a glucose monitor during a business lunch.

While logic is simple, emotion is complex and messy. Logic is the same for everyone, but people bring a wide range of emotions, behaviors, and attitudes to a health scenario. Upon receiving a diagnosis and a new prescription, one person may approach it with determination and engagement; others may be nervous, afraid, or in denial. It can be difficult to develop a solution that speaks to such a wide range of emotional responses.

## Habits Are Immune to Logic

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One thing that every patient brings into the doctor's office is inertia. People by nature are resistant to change. It's because of the way our brains are designed, with shortcuts that minimize the thought and effort we put into everyday behaviors. Individuals develop habits—well-worn paths that they build their lives around. Habits save time and energy so we don't have to reinvent behaviors all the time. Over time, many habits take on emotional meaning and become ceremonies that form a part of our identity. Asking people to change their habits and ceremonies creates friction as extrinsic logic battles people's deeply entrenched emotions.



## Self-Control is a Limited Resource

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The doctor's authority, and the logic behind it, begins to lose its pull the moment a patient leaves the clinical setting. Soon they're back in the context of their everyday lives, living with the triggers that activate their emotional decisions and unconscious habits. Today, patients receive little follow-up, support, or accountability from their care teams. It's easy for the doctor's admonitions and prescriptions to become a distant memory. This is a nightmare scenario for behavior change! Research has shown that self-control is an exhaustible resource. The brain can only control emotions for so long before a person becomes exhausted and lapses back into the old behaviors that come most naturally to them.



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### LEXICON

#### **Habits**

*Learned, automatic behavior patterns in which the mind's conscious decision-making is not engaged. Habits rely on a primitive area of the brain called the basal ganglia rather than the cerebral cortex. This is the brain's way of saving effort and freeing up space for more activity. A Duke University study showed that more than 40% of our daily behaviors are dictated by habit rather than conscious choice.*

#### **Ceremonies**

*A habit or routine that has become emotionally elevated. The behavior has become enjoyable, and something the perpetrator looks forward to.*

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# Solutions

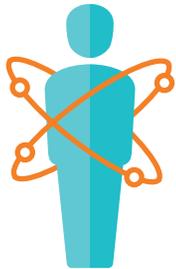
## ✓ Make It Sticky

If habits and emotions get in the way of behavior change and compliance, and both are difficult or nearly impossible to change, then successful health solutions need to work in harmony with the habits, ceremonies, and emotions that define patients' experiences and identities. Solutions that successfully resonate with emotions and are simple enough to become reduced to habits will become sticky.

Authors Chip and Dan Heath applied the term "sticky" in their book, *Made to Stick*, to describe unforgettable ideas that circulate and take hold effortlessly. Since then, businesses have adopted the term for products and ideas that are memorable, engage people, and hold their attention long enough to begin building a relationship.

During the past 30 years, Kartan Design has studied behavior change through sociological, anthropological, and cognitive science perspectives. We've developed proven strategies for developing sticky products that motivate healthy behavior.

## Change Attitudes, Not Just Behaviors



- *Life Stages and Experiences*
- *Social and Cultural Influencers*
- *Emerging Trends*
- *Habits and Ceremonies*

The very term “compliance” is negative and legalistic. It means conforming to a rule—bending yourself to fit an attitude or a standard. In this case, compliance pits the authority of a doctor against the natural desires of the patient. To get people to comply with their best health interests, solution providers must convince them that they want to change. Instead of setting the doctor and patient against each other in a battle of wills—logic versus emotion—bring the two into harmony and create a win/win solution.

This shifts the conversation from changing behavior to changing attitudes. Behavior is a surface-level manifestation of the attitudes people hold. Today, most solution providers don’t scratch below that surface. Changing attitudes requires a deep understanding of people and the complex motivations and values that they bring to a health scenario. It’s necessary to look holistically at patients as complex people, who are influenced by:

### **Life Stages and Experiences**

One’s life stage (puberty, dating, marriage, parenting, or aging) can affect their experience, and so can major life events like getting a new job or moving to a new location.

### **Social and Cultural Influencers**

Social influences, such as the desire to seek validation from peers, have a pronounced effect on people’s self worth and impacts their decision making.

### **Emerging Trends**

New developments in technology, business, design, and policy are influencing people’s expectations. For example, always-connected smart phones have changed people’s expectations about access to information.

### **Habits and Ceremonies**

It’s important to understand people’s existing habits and ceremonies. What are they, and what functional and emotional needs do they fulfill?

## Help People Fall in Love

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Most discussions about compliance today live in the realm of logic. Human factors experts studying physical and cognitive usability ask “can it be done?” and “does it make sense?” There is an untapped opportunity to appeal to people’s emotions.

We believe that successful products evoke feelings of love. Falling in love is one of the most emotionally intense experiences a person undergoes. By studying the different hormones, emotions, and feedback loops involved as people fall in love—from the attraction phase when lovers’ heart rates quicken and their palms sweat in a surge of adrenaline, to the retention phase where committed couples pursue common goals that add meaning to their lives—we can apply principles to help them fall in love with health products and services at every phase in the relationship.

### Aesthetics

The early phase of love is characterized by aesthetic enjoyment. Humans are visual creatures strongly motivated by appearance. Traditionally, health products have ignored this fact, relying on the logic of necessity to cement a relationship. With more choice, today’s consumer-patient has the luxury to experience attraction. Consider whether your product stands out in a crowd.

### Touch

Touch builds intimacy. Does your product invite interaction? Consider a product’s materials and finishes. Take advantage of texture and contrast to draw people in and invite touching.



### Reward

Whether physical or emotional, rewards unleash a surge of dopamine, a highly satisfying hormone that gives pleasure, produces powerful memories, and leaves a person craving more. People will alter their behavior to seek out the physiological and emotional high that it offers. Sticky health solutions leverage the mind and body’s natural desires. Set up a system of rewards. This may be done literally through gamification, offering points, badges and the like. A product may also offer emotional rewards, creating positive feelings like empowerment, validation, connection, or status.

## Help People Fall in Love

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### Surprise and Delight

Find ways to surprise users and exceed their expectations. Unexpected or random rewards multiply the pleasurable effects of dopamine, creating a highly motivated search for further such rewards. Automation and “smart” devices can create moments of delight as they learn and adapt to users’ behavior and produce unexpected insights. Health solution providers may also take cues from consumer companies that are relying on delight to build brand loyalty. For example, Zappos empowers its employees to create random moments of delight, such as sending flowers to customers.

### Meaning

To earn long-term engagement, a sticky product must grow with its user over various life and health stages. People want to know that their behavior has meaning and impact. Help users understand the meaning of their behaviors in context—that each small decision has a direct impact on larger health goals. Show the direct results of the desired behavior. Give a sense of accomplishment and forward motion. Let users sense how they’re making progress toward evolving health goals.

### Learning

People enjoy learning. Give them an intelligent product that can help them become more intelligent about their bodies. Today’s advanced sensors are capable of collecting millions of data points. Successful solutions will turn data into insights. Rather than collecting and communicating siloed data, these products make connections and offer specific recommendations that are relevant to users’ real-time experiences. They translate data into meaningful, actionable information.

## Minimize Change—One Habit at a Time

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Until recently, doctors believed that the best way to alter patients' behavior was to demand a complete behavioral makeover. Want to lose weight? Change your diet, go to the gym, and stay off the couch!

Recent research has provoked a reversal, showing that drastic behavior change is short-lived, at best. Most people who attempt to reform their behavior end up sliding back into their old well-worn habits. They simply exhaust their willpower. We now know that smaller changes stick longer.

### Start Simple

Today's technology is powerful. It has the potential to impact many areas of people's lives through information. Sensors can monitor how much a person sleeps or walks, whether or not they take their medication, how many calories they burn. It's tempting to offer all of this information in the service of change. But, just because you can, doesn't mean you should. Product developers should start simply, looking for small changes that make a big difference.

### Identify a Keystone Habit

Look at your users' existing behavior. What single change will make the biggest difference? Approach this "keystone habit" with laser focus. Draw the user into this keystone habit with effective appeals to both logic and emotion, and then build upon the keystone habit over time as the patient becomes more and more engaged.

### Maintain Life as Usual

In every aspect of life outside the keystone habit, the solution should be invisible—it should blend in with people's existing ceremonies and habits without distracting from the things they love.

### Leverage Multiple Platforms

When designing for a large user base, it's important to have options that relate to a wide range of ceremonies and habits. Some users may respond best to a self-contained app on a smart phone. Other users may prefer to access information on their own via a web portal. Some people may want information straight from a device.

### LEXICON

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#### Keystone Habit

*A single new habit, the formation of which has a ripple effect through someone's life. A keystone habit is a small behavior change that raises awareness and builds a mental framework around self-discipline. Charles Duhig popularized the term in his 2012 book, *The Power of Habit*, which explores why habits exist and how they can be changed. Duhig explains how introducing one small new behavior has paved the way for destiny-altering personal, corporate, and social change.*

## Make It Social

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People want to belong. Sticky solutions contribute to our feeling of connectedness with other people. Whether it's connecting with peers, caregivers, or doctors, interconnectedness gives people the support to manage difficult change.

Today, health care is a solitary experience. Patients rely on their own finite resources—time, knowledge, and self-control. Tomorrow's successful solutions will support patients and their personal caregivers with information, access, and emotional support.

### Create Accountability

Remember that scenario where the doctor's authority fades as the patient returns to her daily habits? Most people, at heart, want to be healthy. Helping them to change their behavior is a matter of connecting how their decisions relate to their health. Today's connected technology can keep the doctor in the picture. By improving access to physicians, patients gain more frequent exposure to their health goals. Creating accountability doesn't need to tax a doctor's resources. Digital tracking and push reminders can keep health goals at the top of users' minds.

### Create a Team

Communication with all team members enables better care. Digital health solutions have the potential to keep all team members on the same page by sharing automated data with a private health community. Patients enjoy support without the burden of sharing their status and challenges, while caregivers benefit from peace of mind.

### Create Significance

People find significance in sharing their experiences. They may be bolstered by the empathy they receive in commiserating with others in the same situation. They may receive validation and a boost to self-esteem from sharing their expertise with those earlier in their health journeys.

*Change is Hard: Outsights in Action*

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# Outsights in Action

How Karten Design is applying our Outsights  
to address pressing healthcare challenges

## Latitude Heart Coach App

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When it comes to heart health, simple behavior changes can make a big difference for heart failure patients. Guided by the clinical expertise of Dr. Leslie Saxon, Chief of Cardiology at the USC Keck School of Medicine, Karten Design imagined an app that leverages data from sensors in implanted cardiac defibrillators to help patients optimize four behaviors with the greatest effect on their heart health: medication compliance, diet, exercise, and emotional health.

To develop a “sticky” interface that motivates people to achieve the desired behavior change, we employed three strategies:

- » **Progressive Disclosure**
- » **Coaching**
- » **Algorithms**

## Latitude Heart Coach App



Heart Coach is designed to build one keystone habit—we wanted users to open and interact with the app every day. The app initially engages users by giving them one-of-a-kind access to data about their ICDs. Over time, it uses progressive disclosure to gradually introduce new dimensions of information related to behavior.



Once patients are engaged and make the commitment to behavior change, the app offers personal coaching to help users achieve their goals, and brings in support from a community of caregivers. Graphic trending charts help users envision their success and badges track their progress.



## Latitude Heart Coach App



The app can triangulate multiple input points from embedded sensors to produce new insights about personal behavior and health—for example, the app can combine data on weight, activity, and sleep to determine that the patient has missed a dose of medication.



At that point, it will proactively offer help in medication tracking. Algorithms will continue to produce unexpected insights developed to surprise and delight patients, engaging them further in new areas that support health.



### LEXICON

#### **Progressive Disclosure**

*An interaction design technique that maintains a user's focus by breaking complex, feature-rich interactions down into simple steps. It employs restraint, giving the user only information that is relevant to the immediate task at hand. New information is gradually revealed—building one piece at a time—as it becomes meaningful in the context of the user's goals and tasks. The intent is to prevent the user from feeling overwhelmed or distracted by too much information, reducing their cognitive workload to improve their focus.*

## Corporate Health and Wellness Innovation



Health, wellness, and sustainability are important initiatives at the Eastman Chemical Company. Located in Kingsport, Tennessee, a region where 29% of residents are obese and 69% are overweight, Eastman is dedicated to improving health on its campus and in the community. The company challenged Karter Design to use its proprietary plastics to develop new products that make a positive difference in health and wellness for Eastman employees.

We applied research and design thinking to a problem that affects all of corporate America. Design researchers spent a week immersed in Eastman's three-square-mile campus, interviewing and observing people in their offices, break rooms, and corporate cafeterias. Our research uncovered systematic and emotional barriers to health and wellness, such as time constraints, access, and personal identities connected with food.



## Corporate Health and Wellness Innovation



We developed a set of system-wide concepts, blending new products and services to reach people where they are in the moment. From wall-mounted bins designed to distribute locally-grown produce, to lunch trays that reframe healthy meals in terms that resonate authentically with people's identities, to take-home containers that let people eat some food now and save some for later, our concepts take advantage of the many small decision points throughout someone's day. By making healthy options ubiquitous across a campus the size of a small town, they nudge, rather than push people to make healthier decisions.



*Change is Hard: Industry In-Depth*

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# Industry In-Depth: Wearables

A closer look at how health challenges are  
impacting today's influential industries

# Wearables



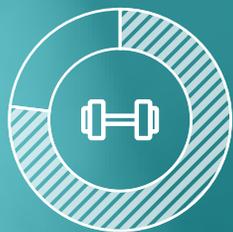
1 in 5 Americans is estimated to own some type of wearable device<sup>7</sup>



13% of consumers surveyed by Acquity Group plan to buy a wireless health/fitness device in the next year<sup>8</sup>

**52%** of consumers are interested in buying wearable technologies such as fitness monitors to track physical activity and manage personal health

The primary information US consumers want from health wearables is:



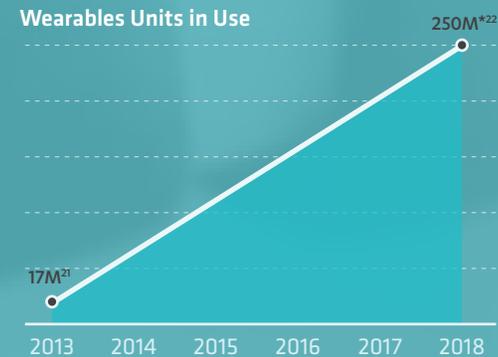
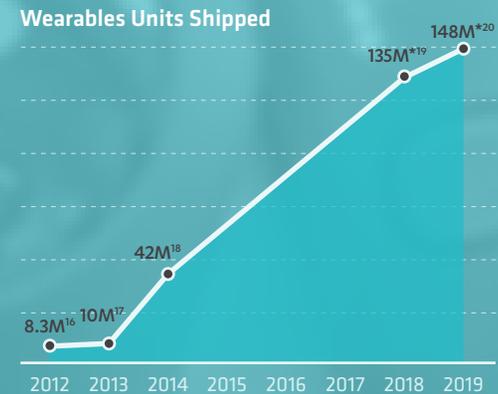
**77%**  
Exercising Smarter



**75%**  
Collecting and Tracking Medical Information



**67%**  
Eating Better



\* Prediction

## Wearables



**Most wearables fail to pass the “turnaround” test: if you left the product at home, would you turn around and go back for it?**

Device

Wearables is a product category with a compliance problem. Despite tremendous market growth in sensor-driven, body-worn technology, adherence remains unimpressively flat: **studies show that, within six months, one-third of consumers stop using their wearable devices.** That means that millions of sophisticated computers are sitting in drawers collecting dust! It also means a great deal of unrealized potential.

As sensor technology and ambient computing mature, wearables have the potential to affect health with detailed information that informs lasting behavior change. But there are some critical issues standing in the way. Most of today’s wearables demand quite a bit of change from users: they have to put a new product on their body, interact with it, recharge it, check in on the data being generated, and often make sense of that information. Today’s patients and consumers are simply not yet motivated to make the big behavior changes that wearable devices

Human

demand—the available devices haven’t provided a use case scenario that is worth the emotional cost of change. They are asking people to bend themselves to fit the technology.

When you design the technology to fit the human instead, you eliminate the friction between person and product, and enable them to operate as one. The key to success is to move technology into the background so that human elements can remain front and center. This requires product developers to understand the full range of emotions people bring to wearables. Get to know your end users—delve into their habits and ceremonies, their hopes and fears, to understand where and when you can realistically introduce new behaviors. Focus less on the device itself and more on the value and meaning it will provide. Today’s devices educate; tomorrow’s wearables must motivate.

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# Expert Interview: Dr. David Rhew

Outside perspectives from leading practitioners  
in the field



David Rhew, M.D., is an accomplished physician, computer scientist, and inventor who is passionate about the intersection of healthcare and digital technology. As Chief Medical Officer and Head of Healthcare and Fitness at Samsung Electronics America, Dr. Rhew oversees the development of technologies that engage patients, capture health and fitness data, and facilitate communication between patients and care teams.

We spoke with Dr. Rhew about the role of compliance in today's health environment, and ways he believes technology can improve patient care and adherence.



**Dr. David Rhew**

Chief Medical Officer and Head  
of Healthcare and Fitness,  
Samsung Electronics

***What’s your take on compliance in today’s medical system?***

With respect to adherence, first there’s an issue around healthcare providers adhering to standards of care. The level of adherence for providers is on average 50%, which is about the same as when you look at patients adhering to long-term treatment for chronic illnesses. Whether it’s healthcare providers or individuals, you’re losing half of the group on both ends, which leads to an incredible gap in care. This translates into lost opportunities for patients to get better. If you were to close that gap, and find ways to improve adherence, you’d create a much more powerful intervention than any specific medical treatment or drug.

With today’s focus on outcomes—any payment and reimbursement for better outcomes—we should spend more time thinking about, “How do you get individuals to adhere to the best practices?” It goes beyond technology in many cases.

***What do you think are the most promising technologies to improve adherence?***

At the end of the day, what you want is technology that’s easy, simple, and seamless – technology that you don’t have to worry or think about, and that doesn’t require the user to disrupt their workflow. The category that shows the most promise to achieve this is digital health, from mHealth to wearables to home-based technology. Digital health gives us this whole ecosystem of products that people use everyday, which makes it easier to get people to use something to monitor their own health and wellness.

***What tools do people need to make better decisions about their health? How can technology deliver?***

There a lot of barriers to proper adherence, and it’s important to address these barriers. First, you can simply forget things. At other times, it’s a lack of understanding, or demotivation, or life just gets busy. You have to make sure that technology isn’t designed with a “one size fits all” approach. Are you relying entirely on one individual to essentially take care of themselves, or are you leveraging the fact that there are

others who care about their well-being? Can you create a social support mechanism through technology?

***In your experience, how do people connect with technology? What makes a solution a good match for its user?***

Everyone responds to technology differently, but there are some common themes. People say they're addicted to TV, their smartphones, etc. In my mind, the one thing that creates that addiction—that desire to want to constantly use that technology and make that part of your life—is the fact that it connects you with other individuals. That emotional piece of staying connected allows users to feel part of a broader community. At the same time, it satisfies some internal needs people have: the need to know, the need to communicate, the need to feel good about themselves. Providing that community aspect in your technology or product can create a strong alliance between what people want and what technology can give them.

***Describe your vision for the future?***

I envision an infrastructure that would include technologies that allow you to capture data from patients, to exchange data between healthcare providers and patients, and for data to be interpreted—not just for healthcare providers, but also for patients. Patients won't need to be part of a certain system to gain access; it would be mobile and it would be easy—perhaps even cloud-based. You'd have to have an alliance of major technology vendors working together to enable the data exchange that's necessary to have this easy flow between healthcare providers and patients. Then you'd need to have systems that are built on top of it that allow for interpretation and decision support. Patients would have seamless access to data and have it interpreted for them. Through this, we will achieve greater transparency in terms of the overall cost and quality of care.

***“At the end of the day, what you want is technology that’s easy, simple, and seamless – technology that you don’t have to worry or think about, and that doesn’t require the user to disrupt their workflow.”***

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