

How Managers Perceive Real-Time Management:

THINKING FAST & FLOW

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SUMMARY

A new era of disruptive technologies and changing business practices is moving a number of industries toward the “real-time” enterprise. With the increased capabilities of online digital platforms, managers need to deliver goods and services faster and respond rapidly to customers. It is therefore critical to ask what “real time” means to managers, what real-time management entails, and learn how enterprises capture business value through real-time management, especially when the ability to adjust and operate in real time must be ingrained in an organization’s culture, structures, and processes. This article shows that managers who use “real time” in different ways can articulate different facets of experience and practices, leading to the “Fast & Flow” framework. Thinking of real time as “Fast & Flow” provides managers with insights for transitioning to real-time management that is better attuned to the organization, the market, and a technology-driven state of flux.

KEYWORDS: organizational change, organizational design, process innovation, strategic management, technological change, information technology, time-based competition, time pressure, agility, cognitive psychology

Since the scientific management days of Frederick Taylor and Henry Ford, managers have sought to increase business efficiency, to reduce unproductive time usage by analyzing temporal patterns of work behavior, and to adopt new technologies to move faster. “Real time” has been traditionally defined as the shortest amount of time it takes a system to

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react, communicate, or present data about an event. Although the sensemaking attributed to “real time” in management has varied as business practices have changed, it appears that the meaning of real time is self-evident, and thus does not pose problems of understanding.

Today, the goal of reducing time and moving fast in business is realized through the use of digital technologies, keeping the classical definition of real time as fast.¹ For example, Gartner defines the real-time savvy enterprise as one that can get the right information to the right people at the right time without latency or delay.² Advances in digital platforms, network connectivity, online processing, and big data analytics have consistently enabled real-time management capabilities.³ The ubiquity of networked sensors and the continued growth of the Internet of Things generate data that become available immediately. Social media (such as Facebook and Twitter) and online search engines (such as Google and Firefox) have increasingly conditioned people to want to know “now.” A slew of on-demand services with immediate online interaction and choices raises our expectations of what “now” means, whether it be viewing a Netflix movie or ordering an Uber ride. More data about customer behavior—and the means to process these data to generate actionable policies—are becoming available, leading managers to assume that real time enables better decision making and more agile and adaptable enterprises.

Undoubtedly, real-time management offers big opportunities for businesses to maximize their marketing and business effectiveness by eliminating turnaround time between data collection and reaching near-zero downtime in production. Real-time management also helps enterprises stay relevant and competitive, because managers have the ability to see how customers react to everything they do. In times of disruptive technologies and changing business practices, it is critical to ask what “real time” means to managers in order to understand how they can capture value from the development of real-time management capabilities.

Empirical research on real time is scarce. We have taken a Wittgensteinian approach⁴ of bringing to the surface the varieties of temporal facets and realities of real-time management. We conducted a comprehensive study (see the appendix) to better understand how managers sense real time, how they think they can meet market expectations with real time, and how they think that enterprises should successfully embrace real-time management. We have distilled and articulated some of those insights in the form of three “golden nuggets” that we believe are actionable and useful for managers.

The first nugget reveals managers’ individual perceptions of real time. We show that the meaning of real time depends on the manager’s perception of clock time; it is not fixed. Managers’ specific understandings of real time are intimately bound with the managers’ everyday practices and forms of competition. Their definitions reveal the limits of managers’ perceptions, leading to certain expectations of real-time management. From these findings, we present the Fast & Flow framework. The synthesis of the concepts within the framework helps broaden

the understanding of real time and its role in capturing business value through real-time management.

The second nugget focuses on corporate policies and interactions at the enterprise level, showing how Fast & Flow management, depending on the manager's focus, generates value in the enterprise. We show how area managers' diverse practices influence their forming of judgments regarding real-time business actions and interactions.

The third nugget reveals why the adoption of advanced technology is not a safe route to real-time management maturity; the adoption of the Fast & Flow approach is. We show how managers' interpretations of immediacy are related to the enterprise's profitability. Finally, we uncover how to improve real-time management performance to provide routes for transitioning to effective real-time management.

Revisiting the Concept of the Real-Time Enterprise

Market demands and the growing intensity of digital platforms create "real-time enterprises" in an increasing number of industries. For instance, Amazon and Alibaba have changed customer expectations to the possibility of buying almost any product and having it delivered immediately. Likewise, companies that publish information first on Google will receive information quickly and earn the search engine's top rankings. The real-time enterprise has been a rallying cry advanced by technology vendors since 1997 when TIBCO was founded, introducing event processing and the real-time information bus IT infrastructure.⁵ With dynamic and digitally hypercompetitive and intensive business environments, digitalized companies are expected to interact faster and to respond in real time to create business value.⁶ Untimely response to customers is a hallmark of poor service, so response time is significant in retaining users and customers. In some industries—for example, health care—a gap in customer demand and business capacity may even have fatal consequences. Therefore, when enterprises develop policies on standard response time, increase the speed of production and operation processes, or offer immediate purchase and other real-time services, they do so primarily to improve the customer experience by "saving time." But enterprises have widely varying expectations on response time; so do their customers. To better account for variations in demand and capacity, and to become market-responsive, managers demand and use real-time information. Here, real-time data flows enable managers to dissect events in real time, shortening the decision cycle, and deepening their insights.

The necessity for effective real-time management is no longer a stereotypical Silicon Valley issue: "While real-time adaptation has historically been the critical success factor in Silicon Valley, the same forces now confront many enterprises in different parts of the world."⁷ The accelerating pace keeps pushing enterprises closer to real-time management: to respond to customers and competition as quickly as they can, to gauge market trends in real time, and to deliver goods and

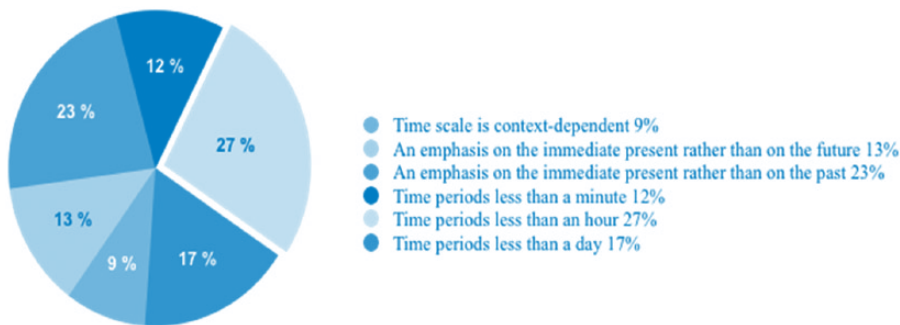
services at a faster pace. Enterprises must be ready to provide innovation in new products and services quickly to meet consumers' or business customers' expectations. Real time seems to be the answer to classical challenges in business operation, interaction, and decision making. But due to its reliance on highly tacit assumptions involving time, people, and technology, an understanding of how managers sense and make sense of real time should precede its application.

When managers become attentive to a variety of interpretations based on unique experiences, it is easier to define policies for occasions when a "time is money" approach or a "take your time" approach would be the more appropriate. Beyond focusing on efficient product and process operations, managers—regardless of responsibility area—should apply a broader "ambitemporal" lens.⁸ This enables operations managers to develop a readiness for advancing digital technologies and changing customer expectations, and to address these expectations while interactively optimizing operations with real time. Managers could therefore benefit from tools that provide them with perspectives on managing real time that better utilizes digital data streams from a customer perspective.⁹ For instance, an insurance company manager using real time for a process-to-actuate response can monitor weather forecast data and send text messages to customers located where hail is expected. Here, framing real time as "fast" enables customers to garage their vehicles, resulting in superior customer service and fewer insurance claims.¹⁰ On the contrary, a manager with a "real time as flow" perspective can use virtual reality to simulate in-person meetings, provide immersed gaming experiences, or solve problems of inefficient troubleshooting by having customers share what they see and do with the representative as if the representative were in the customers' shoes.¹¹

We have distilled some of our discovered insights in the form of three main "golden nuggets" that are actionable by managers. The nuggets explain why successful real-time management depends on alignment of perceptions, expectations, policies, and interactions rather than on adoption of advanced technologies.

Nugget 1: Real-Time Management Depends on the Managers' Interpretation of Clock Time

Time is often taken for granted in enterprises. Many managers think of time as clock time and define flow (or "process time") as a contrast.¹² A classical understanding of time is as a continuous, predictable, and measured by past, present, and future events on a clock scale.¹³ Clock time is integral to our personal identity, defining who we are in historical moments. Clock time is also integral to action and achievement. On an ordinary workday, managers define actions in past, present, and future: "Get me last year's annual report and the latest quarter budgets so we can make a decision before time runs out." This leads us to think that time is something that passes—a collective, measurable unit for precision, coordination, and control by the clock. While clock time denotes duration, real time denotes a fixed present moment, described by Mead as "the seat of reality."¹⁴ To learn how these definitions apply, we asked managers to define

FIGURE 1. Managers' definitions of real time.

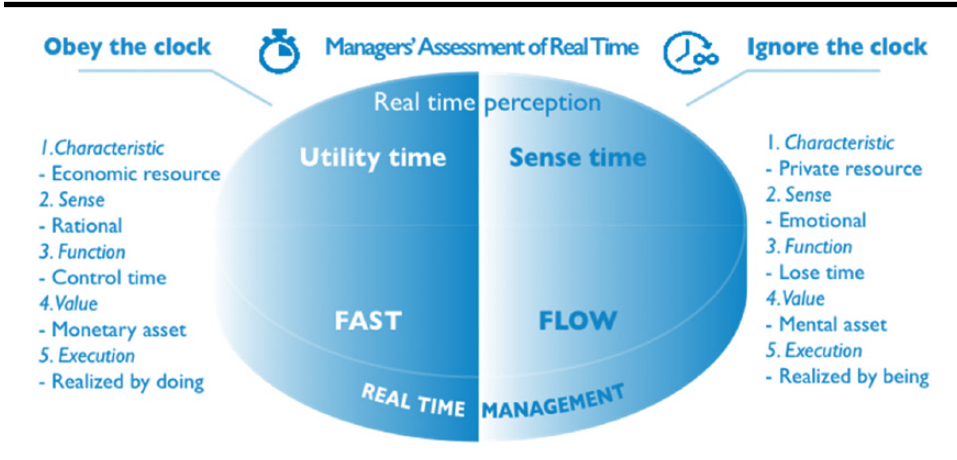
real time more closely. The data reveal a variety of understandings ranging from real time interpreted as immediacy to more pragmatic time scales—from “too fast to measure” to a day or even longer—depending on the particular business situation. Figure 1 illustrates the distribution of survey answers.

We found that the majority of the managers do not distinguish clock time from real time. Rather, they use clock time as a reference to specify two versions of real time (see Figure 2). The managers defined real time as either the duration of time in periods of seconds, minutes, hours, or days; or they assessed real time as describing events happening in a fixed moment of the present rather than in the future or past (an emphasis on the immediate present). We also found that managers process real time in distinct ways in different situations and contexts, even though their processing is rooted in Western arbitrary divisions of clock time.

Two inherently different managerial perceptions of real time emerged, *Utility Time* and *Sense Time*, leading to real-time management approaches of either fast or flow.¹⁵ *Utility Time* depicts time as linear and controllable. It is an externally measured version of clock time to be used strategically as a resource. *Utility Time* adheres to clock time (“obey the clock”), but *Sense Time* escapes it (“ignore the clock”), being a subjective and qualitative experience of time sensed by “the inner clock.”¹⁶ Both perception categories are constructed by individual (managerial) factors as well as by collective (enterprise and market) factors. From in-depth interviews, we elicited the five descriptive dimensions illustrated in Figure 2: *Characteristics, Sensing, Function, Value, and Execution*.

Utility Time

Characteristics. Because many managers characterize real time as an economic and strategic resource for enterprises to utilize, we call this category *Utility Time*. People who perceive time as an economic resource or a monetary asset use expressions such as “time is money” or “don’t waste my time.” Nearly half of the managers we surveyed defined real time within the range of immediacy: 13% defined real time as emphasizing the immediate present rather than the future, 23% associated immediacy in relation to the past, whereas 12% defined real time as periods of less than one minute. For example KG, a CIO working in the smart cities space, expresses immediacy and accuracy as critical for real time:

FIGURE 2. Real-time perceptions leading to fast or flow real-time management.

Obviously, real time is not zero but we are talking, yes could very well be easily under a second, so in a milliseconds range . . . I believe back to whatever the speed of radio waves is. It's near instantaneous.

KG's perception of real time aligns with managers who define real time on a clock scale ("under a second," "milliseconds") in the immediacy category.

Sensing. Managers dominated by a Utility Time logic sense real time rationally and associate it with being as fast as possible. They explain real time using logical reasoning and with reference to external physical measures, for example, "real time describes the way streaming media is processed." These managers tacitly assume that time is a scarce resource that they must save. They treat time as a monetary asset and invest it prudently. DO is a CEO who works with entrepreneurship. He measures real time in diminishing delays in business, as a resource that he must detect and utilize:

The world operates in a more of a real time environment than it used to, meaning there's less delays in the world, in the market place, whatever industry happens to be that you're starting in. In general, that's the key. To me it would be to find the critical elements where real time can play an advantage and rely on those or build advantage in those."—DO

Function. The function of Utility Time is to control real time by measuring speed and reducing latency. Managers who regard real time as something that can be rationally managed and controlled are encouraged to increase speed to save time, assuming that the time-economical enterprise can utilize real time better to save money. For example, SK explains how real-time management is done with schedules, recording, and planning tools:

For me, every single second counts in dollars spent on my sales process. I need to make sure every single dollar counts every minute that I've lost and every dollar that I've lost. So for me that's the most important on that point.

Value. In a cultural view, time is an entity of social and normative measurement. In most of the Western world, the value of real time is seen as a monetary asset, so managers bring as much discipline to their time budgets as to their capital budgets.¹⁷ In cultures such as the United States or Northern Europe, we structure time sequentially and do things one at a time; this approach is deemed most time efficient. The expectations of immediacy and control of time are high and we pay respect by not wasting people's time. A CEO (PS) sees real time as a precondition for generating services, not a service in itself:

Real-time is what generates all the different services. The data can be utilized for here-and-now action by either stopping the machine or call the operator or send him a mad smiley throwing up so that he can stop it or lose points on his CV. By real time we can stop unwanted behavior instantly, but the data generated over a longer period of time is also useful.

This quote stresses that when value creation becomes more complex, crosses platforms, and is perceived by customers as resulting in an integrated digital experience, it then takes a collective effort to recognize how the different functional responsibilities contribute to Fast & Flow management.

Execution. For managers holding a Utility Time view, the main challenges are managing data and reducing latency. Real-time management is realized by concrete measurement and management actions carried out through speedy and punctual processes by people in the enterprise. Successful effectuation can be achieved by transforming IT-driven work processes into value. Examples are reinventing work flows to run faster, or replacing traditional customer support services with virtual assistant or chatbot services like Apple's Siri. Managers tend to agree that real-time management is realized through fast human action and/or fast data processing. They believe real time improves management conditions by enabling managers to make faster decisions (44%), by executing the outcomes of decisions faster (41%), by sensing problems and opportunities faster (40%), and by improvising actions (35%). DO explains it this way:

I think the most fascinating thing is how many people take real time data and pre-make their decisions based on real time data. So, for example, if production numbers drop below x , this is exactly what we'll do.

At the strategic level, managers report that real time allows them to take advantage of the speed of digital platforms (35%), to ingrain rapid response culture into the workforce (34%), and to reorganize human resources quickly (34%).

However, depending on the specific context, there is no indication that the fast approach per se is profitable: "as-close-to-zero-as-possible" quests may waste

time and money if customers or clients do not demand immediacy but value a flow experience. Though immediacy may be seen as the ideal in some industries, there are other industries—for instance, shipping or the construction business—where immediacy is seldom accomplished due to numerous delaying factors, expected and unexpected.

Sense Time

Characteristics. Some managers characterize real time as an individual resource of private moments, that is, a sensed phenomenon of real time that may vary according to the context. We refer to this perception category as Sense Time. Managers with a Sense Time logic associate a real-time experience with a flow experience, that is, a source of value creation that relates to real time as an emotional and motivational state of mind. “To flow” or “a flow” refers to fast flow from process to outcome, whereas “be in flow” denotes a state of experience. Persons in flow have their own pace and sequences of events marking transitions from one state to another without regard to equal intervals of duration. Csikszentmihalyi has extensively studied the flow experience. He states that “the flow experience that resolves from the use of skills leads to growth; passive entertainment leads nowhere.”¹⁸ He mentions how the leisure industry designs enjoyable experiences by actively involving people’s skills. Flow in terms of *time transformation* suggests managers carefully consider Sense Time to expand real time beyond Utility Time:

One of the most common descriptions of optimal experience is that time no longer seems to pass the way it ordinarily does. The objective, external duration we measure with reference to outside events like night and day, or the orderly progression of clocks, is rendered irrelevant by the rhythms dictated by the activity. Often hours seem to pass by in minutes; in general, most people report that time seems to pass much faster. But occasionally the reverse occurs . . . after it’s passed it seems as if it passed really fast, but then while doing it, it seems like it’s been much longer than it really was. The safest generalization to make about this phenomenon is to say that during the flow of experience *the sense of time* bears little relation to *the passage of time* as measured by the absolute convention of the clock.¹⁹

The managers reflecting this real time perception consider the design of Flow experiences to provide for enjoyable growth both for their internal satisfaction and for their customers. They define real time more pragmatically: 17% regard real time as less than an hour. Real-time management is not about being as fast as possible; it is about being timely, insuring that the task or service occurs at a suitable time that is opportune for those involved. Hence, a few managers (9%) are unwilling to set a specific period for real time. Instead, they regard real time as a context-dependent phenomenon. A CEO, who works within business intelligence consulting, specifies how functional domains influence managers’ framing of real time:

Real time is different for different people, for different functions even. So far as real time may be anything to up a day, for others it may be anything up to the

minute—so real time is relative in my mind. Real time is a relative term based on the business you are in and the function you are working with, whatever the context of the real-time definition.—SK

Managers like SK find relevancy more important than immediacy and measure real time based on human expectations in the specific business situation, not on the clock. The representation of answers in this category can be due to managers' particular working contexts and professional experiences, which lead to the formation of specific and/or realistic expectations.

Sensing. Sense Time is a subjective experience or feeling expressed in emotional and/or metaphorical terms, for example, “real time is when you sense the moment and feel alive.” It is an emotional state of mind where time is elastic and fluid; it depends on the perceiving mind as opposed to rational measurement. As part of this perception category, some managers conceptualize real time as individual moments of private time, where they feel very present. To some, it can be hard to explain in words; you must experience real time to understand it. Managers like SK can only sense real time by “reading” the situation and the people with whom they are interacting.

Function. The underlying assumption or logic of this perception category is that time is a natural resource or mental asset, not a monetary asset. On some occasions we lose the sense of time, which is considered a positive experience and contrasts sharply with the ideal of controlling time. In a Sense Time framing, time cannot and should not be measured on an external clock; time *is* being present, experienced by the individual as a sensed flow.²⁰ PKA, the CEO of a consultancy firm, explains,

To the consulting industry, it's [real time] very much person-related and it's person to person, it's managing processes, manage people, manage projects, and it's not real time like here and now; it takes time, and urgency is less important.

The function of real time is to let go of time or to escape time pressure, even to lose time by reaching the state of effortless concentration and enjoyment.²¹ Flow thus presents a flexible supplement to fast. Sense Time moments tend to occur when someone faces clear goals requiring appropriate responses. Utility Time, assisted by Sense Time, can therefore improve lean manufacturing and establishment of logistics and distribution to get the product to the customer without measurable delays or interruptions.²²

Value. The value of real time for these managers is the growth of mental resources arising from qualitative experiences of flow or from controlling as many of one's mental facilities as possible. Innovation and creativity are central aspects of successful enterprises. Reinecke and Ansari found that a time orientation optimized for markets might be unsuitable for managing emergent, complex, and indeterminate processes such as development.²³ To foster creativity

or rethinking processes, people are almost completely dependent on their mental state. If they undergo too many mental processes or endure too much stress, it is difficult to be creative or visionary. Cultural studies²⁴ have noted the relevancy and value of Sense Time in business, encouraging managers to acknowledge differences in time orientation in the cultures in which they operate, namely, the relative importance people assign to the past, present, and future, and how they structure time. In synchronic time cultures of Mediterranean, Arab, and Asian countries, people view time as flexible and do several things at once. Past-oriented people look at the “quality of the waiting time” rather than expecting immediacy. It may take a long time to get down to business, as time-optimization is a token of disrespect.

Execution. Because Sense Time is realized by being, rather than by doing, the challenge is to create room for present moments and/or a flow state of mind. A success criterion is optimal performance, which could happen during a complicated operation or while closing a business deal. Real-time management is realized at the individual level by avoiding anxiety, rushing, stress, or boredom. Sense Time can even be supported by technologies, like virtual reality or augmented reality such as Pokémon Go. Effectuation can be achieved successfully by balancing one’s abilities with challenges in the work or entertainment processes.²⁵ Specific situations involving digital technology include gaming experiences or the use of gamification or virtual reality at work.

From such insights, managers can understand conceptual and managerial challenges, identify temporal gaps in their enterprise, and assess the impact on real-time management. Identifying these elements may trigger a rethinking process and provide a setoff for reconciling otherwise conflicting understandings and practices.²⁶ While managers are typically adept at measuring and managing time and tasks, they are not as clear about perceiving and sensing real time. In fact, managers in the same enterprise may not be on the same page—or even the same book—when it comes to understanding and defining real time. As the manager DO states, “I think everybody has an internal bias of one sort or another that impacts the value of real time.” Individual differences, the quiriness of time perception when events are sped up, and the psychological experience of time’s duration play a larger role than usual in perception.

When understandings and valuation of real time vary among individuals in the enterprise and across functional levels, different standards may conflict. Through the interviews, managers explicated their tacit assumptions. The Fast & Flow framework can help managers mind the temporal gap between Utility Time and Sense Time, which influences how they relate to—and manage—real time. It allows them to notice how individual perceptions of time affect their management style and decision making, to rethink their existing approach, and eventually to respond to a pull from customers with growing real-time expectations. From the findings, we develop a basis for telling managers that it pays to look at individual perceptions of real time to manage Fast & Flow successfully.

Nugget 2: Fast & Flow Real-Time Management Generates Value in the Enterprise

The first nugget revealed how managers experience both Utility Time and Sense Time, but not all managers are fully conscious about when and why they perceive time in a particular way. Another interesting finding is that managers' *general* perception of real time as either Utility Time or Sense Time is unconsciously applied to capture the meaning of real-time management in the *specific* working context of their particular functional responsibilities. So deeply rooted logics of time frame how managers relate to and manage real time in the enterprise. In that process, they develop a preference for fast (Utility Time) or flow (Sense Time) to improve either internal operations or customer interactions for increasing business profitability. Also, job positions influence how managers value fast or flow approaches. Thus, individual perceptions intermingle with shared understandings in the enterprise and across functional departments; they often remain tacit in daily operation and routines instead of being explicated.

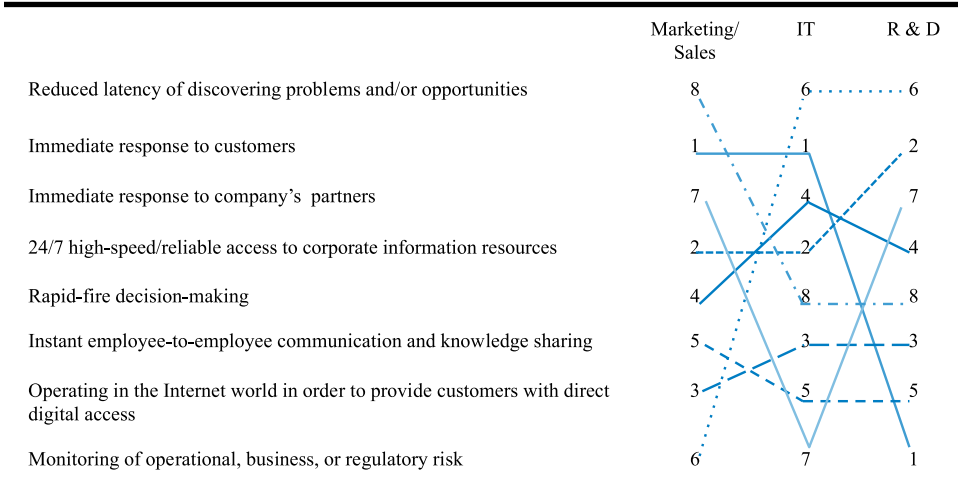
As a consequence, managers are more likely unaware of how their sense of time frames their management of real time. An interim CIO of an entertainment services company confirms how culture and context influence managers' perception of real time:

How the executives refer to real time, and with these people, the CEOs and VPs and COOs they are using that term real time, but it means different things in different industries . . . but again, it's very industry-specific that the term real time in expectation is very industry-specific and it even varies continent by continent sometimes . . . the cultural thing, you know.—RH

RH experiences how the perception of real time varies across departments, industries, and national borders. This is counter-productive to the Fast & Flow approach because managers tend to view real time narrowly. Moreover, more than half (55%) of IT managers believe that other managers share their perceptions of real time as an immediate response and action to problems; of Research & Development (R&D) managers, 43% agree. Conversely, 45% of marketing and sales managers think management peers perceive real time as beating competitors, while 41% think peers perceive it as operating in the Internet world to provide customers with direct digital access and rapid synchronization of multiple marketing channels. To adjust to this deeper aspect of real time, managers must understand how their peers and stakeholders frame real time, rather than just reducing latency or increasing speed in the enterprise without contesting the underlying assumptions of doing so. This is particularly important for managers who perceive real time as the immediate present or longer than an hour. The manager DO explains why it is important to consider alternative interpretations of real time as "as fast as possible" to avoid over investing:

Cellphones, they have ridiculous speed, people think process for power and that sort of thing. To me that just translates to "I want things faster, and I want less

FIGURE 3. Real-time management priority gaps.



delay. I want them in more real time than they were otherwise.” Do you really care whether your Twitter shows up in 3.6 seconds or 3.9 seconds? Well you could argue there’s value, if you accumulate multiple things you press on over the course of a week, that you saved four minutes over the course of the week and you can use that to cure cancer. Multiply that by other people in the world, you can do that, but in reality the real net effect is really not salient. I don’t need it that much faster, there’s not much value to it.

People tend to develop shared assumptions, beliefs, and preferences by working closely together.²⁷ Figure 3 reveals gaps in how marketing, sales, IT, and R&D managers prioritize the way real-time management generates business value; the number 1 indicates highest priority and number 8 represents the lowest.

The analysis reveals obvious gaps as well as some alignment in real-time management prioritization across three functional areas. For instance, managers in marketing, IT, and R&D all apply real-time management to enable immediate response to customers (first and second priorities). However, R&D managers find risk monitoring most important. Marketing and IT managers agree that assessing real-time success criteria depends on insight into customers’ needs, which requires high performance and low latency ensured by continuous improvement of technology-driven flows (second priority). Real-time management enables the enterprise to increase effectiveness and meet internally defined production demands, but it requires that managers respond appropriately to the pull for real-time products and services as experienced and defined by customers.²⁸

Fast & Flow Management Demands a Conscious and Collective Effort

An influential component of successful real-time management occurs when managers *individually* sense their own attention bias while *collectively* expanding their real-time management horizon to change or stay the course

between fast and flow. Thus, ambitemporal leadership capabilities, such as a high degree of cognitive agility to integrate fast and flow, can ease real-time management. Despite the influx of new technologies, the most critical task of real-time managers becomes integrating and managing paradoxes by asking: “How can we bring wholeness and balance to real-time management aspects and processes that might otherwise be fragmented, isolated, and confused?” The reality is that holding operations and customers in focus simultaneously, while uprooting your temporal assumptions, is easier said than done. We suggest that managers accommodate different temporalities by developing ambitemporal capabilities to bridge the operations focus and the customer focus, managing real time in the Fast & Flow way. This capacity enables enterprises to build a culture that can turn colliding perspectives to a strategic advantage.

A culture that supports conscious and continuous effort is key to successful real-time management. But managers do not fully agree what type of culture is best to support real-time management. They state that both hierarchical cultures and egalitarian open cultures can impel effective real-time management. Of IT managers, 40% find that a hierarchical culture best supports real-time management, whereas 28% of marketing managers prefer an egalitarian, open culture that encourages experimentation and iteration and that tolerates failure.

By looking at business performance, we found that some organizational mechanisms and cultures enable real-time management better than others. When it comes to culture, norm integration is not the optimal solution. Rather, the art is to develop a tolerant and transparent culture that allows for differentiation in capabilities and alignment in management priorities. This can be accomplished by setting different degrees of formalization and developing a culture that promotes information sharing, dialog, and feedback at the enterprise level. CEO MA shares his practice:

We have a management team in the house that brainstorms and throws everything strangely into the air—“What if we did that?” I know that sounds crazy, but sometimes we throw ideas into the air that are all crazy, but you can still shape some of the ideas into something useful . . . It is super-important to meet the customers 24/7, so we think “open.” I think it’s fun to go whole new ways and try something no one else has done before. We have worked on such things a lot and had good experience with this approach.—MA

By exploring ideas as MA does, management can more easily adapt real-time value propositions to the specific form of market interaction. Successful real-time managers are able to switch between different contexts to approach real time from a Fast & Flow perspective. FedEx takes such an approach. It uses Electronic Data Interchange to achieve the supply chain ideal where customer, manufacturer, and supplier perform as an integrated unit that operates with the barest inventory at the least possible cost, communicates seamlessly in real time, and makes flawless products.²⁹ Fast & Flow supply and demand chain management also sets the stage for mass customization; it is concerned with meeting the needs

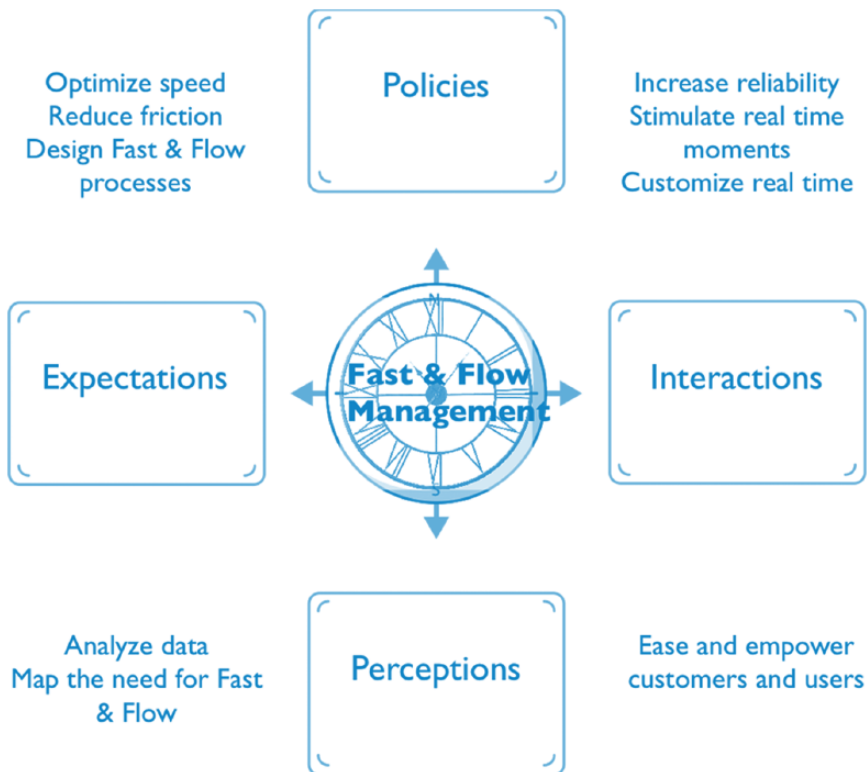
of an individualized customer market, for example, wherein a tailor laser-scans a client's body to deliver a customized jacket in a short time while the client enjoys the waiting time.³⁰ The benefits of Fast & Flow-based mass customization provide enterprises with a competitive advantage if the enterprise culture allows for differentiation in capabilities and alignment in management priorities.

Besides hiring people with an ambitemporal mind-set,³¹ executives can design and orchestrate real-time management as a collective effort involving different functional managers within the enterprise. Management should consider how they develop and market their products and services, coalescing this into a real-time experience to keep the cultural and functional gates open. This is central because functional bias instigates certain preferences in structures, routines, and assumptions of common ground. A challenge with real-time management performance is that enterprises cannot measure all the relevant time-flows that need to be measured as part of an integrated experience due to the different natures of flow combined with specialized (often siloed) functional department structures. For instance, CEO SK stresses visibility as focal in the demand chain:

Everything from what visibility do we have into our sales pipeline to our sales operations and then working backwards into our delivery capability that will fulfill our customers' needs. So just having that visibility into our core operations is key for us, and that's even outside of competitive pressures of any kind.—SK

The importance of transparency and of keeping customer focus is again underscored as important to successful real-time management. Real-time-driven value creation can be improved when managers at different levels of an enterprise carefully balance between operation modes and appreciate that fast and flow are interdependent and co-evolving processes. We identified the functional tasks needed to practice Fast & Flow real-time management by integrating perceptions, expectations, interactions, enterprise policies, and cultures. These factors are inextricably interwoven and are central for understanding how each action and interaction of the enterprise taps into real-time management. Figure 4 shows how the functional responsibilities of sales, marketing, IT, and R&D factors contribute to overcome individual and organizational barriers and transitioning to Fast & Flow real-time management.

Perceptions/expectations. Deeply rooted logics of time and position affect management style and decision making and influence fast or flow preferences and expectations. As individual perceptions often remain tacit instead of explicit, managers are more likely to be unaware of how their sense of time frames their management of real time. In some cases, managers don't know how to see the potential of real time. The first step to building real-time management capabilities is to learn how managers, peers, and stakeholders frame real time. Identifying perceptions and expectations may trigger a rethinking process and provide a starting point for reconciling otherwise conflicting perceptions and practices. R&D and IT can collect data on existing perceptions in the enterprise and help Sales

FIGURE 4. The Fast & Flow approach.

and Marketing analyze customers' real-time preferences. From those insights, IT can identify temporal gaps and map the expectations for fast and flow across the value chain of the enterprise.

Expectations/policies. People tend to develop shared assumptions, beliefs, and preferences by working closely together. At the same time, specialization and the lack of resources dedicated to cross-functional activities leave little understanding of the real-time processes across functional silos. Norm integration and lack of transparency are a barrier to real-time management. Overcoming this barrier can be a challenge, especially if the CEO does not see Fast & Flow as a route to competitive advantage. Moving from individual preferences and expectations to "real-time friendly" policies requires managers who are able to hold operations and customers in focus simultaneously. At the same time, they must acknowledge that they cannot design and measure all the relevant time-flows due to the different natures of flow and functional department structures. Management can develop ambitemporal capabilities by formulating policies and principles to guide R&D and IT decision making on meeting expectations of the speed and technology needed, on reducing friction and costs by prioritizing resources, and on designing the best real-time processes as either fast, flow, or both.

Policies/interactions. When value creation becomes more complex, crosses platforms, and is perceived by customers as resulting in an integrated digital experience, it then takes a collective effort to recognize how the different functional responsibilities contribute to Fast & Flow management. However, existing policies may limit freedom to experiment and innovate real-time practices. Because Sense Time is realized by *being* rather than by *doing*, the challenge is to create room for present moments and a flow state of mind to define performance measures that encompass Fast & Flow management capabilities. For Sales and Marketing to increase and maintain a steady level of product and service reliability, policies should be adjusted regularly by input from R&D and IT. This will enable the different functional areas to test and customize the need for Fast & Flow and to stimulate moments of real-time experience through interactions (such as face-to-face, mobile, and social media).

Interactions/perceptions. Managers who cannot combine technological possibilities with consumer needs are a barrier to developing real-time management capabilities. The lack of multidisciplinary skills can be addressed either through training or hiring. When Sales and Marketing learn to empower the customer by providing Fast & Flow quality moments, they can share this knowledge internally across the enterprise. It will enable IT to map expectations dynamically for Fast & Flow across the firm's value chain, enable R&D to develop the solutions needed, and help support functions such as HR to provide the proper conditions internally to maintain balance. In turn, the knowledge achieved may alter managerial perceptions. This can be helpful for the managers, who regard real time as hype and thus find it difficult to see the actual value of real time. Managers and employees who are able to strike the Fast & Flow balance are more adept at creating mutual value for the enterprise and its customers.

Nugget 3: Fast & Flow, Not Advanced Technology, Leads to Real-Time Maturity

Three out of four managers put effort into developing real-time management capabilities and establishing a real-time responsive culture. Not surprisingly, nearly half of IT and R&D managers believe that a culture that encourages development of digital technology skills is an important prerequisite for real-time management. Half of the Marketing and IT managers agree that it takes strong top management support to develop and maintain digital workforce capabilities for real-time management practices. Real-time management maturity means possessing a high degree of awareness and knowledge of what real time actually means, being able to signal how it adds value to people inside and outside the enterprise, and acting upon that knowledge. In 75% of the enterprises, real-time management plays an important strategic role, either as becoming a key part of their business strategy (34%), being at an advanced stage and implemented at the enterprise level (24%), or being an exemplar (14%). This indicates a high maturity level of real-time management.

Of the managers surveyed, 5% have not thought about real-time management, 6% decided it was not a priority now, and 17% just started experimenting with it. For example, PKA, a CEO for a consultancy company offering digital business solutions, describes real time as not important to some businesses or value proposition:

If you take large [shipping] clients like DFDS, it's not real time that you can go in and get information on where your goods are. You can follow your goods, but it doesn't have to be "where is it every second," where is it now, and it's being transported. It's not real-time monitoring; it's like a control system.

Managers who regard their enterprises as real-time mature can identify urgent needs to manage the demand chain and resources more effectively. They also experience increased profits across all functions and departments. Conversely, the 25% of enterprises in an early real-time maturity stage show a reverse pattern with decreasing profits. This tells us that real-time maturity has an impact on enterprise profitability.

Interestingly, maturity at the enterprise level only partly affects profitability. Managers generally expect real time to have an overall positive impact on all operational activities, but individual perceptions of real time are reflected in the numbers, too. Real-time perceptions differ in enterprises where profits are increasing versus enterprises where profits are decreasing. Although we found that the perceptions of real time are individually and culturally diverse, when comparing answers across different industrial and organizational contexts, the common finding for generating profit from real time is that managers perceive it as one hour or less.

The numbers also reveal that when managers perceive real time to be under a day, it seems to impact their business and profit negatively as profitable enterprises have more ambitious time scales expressed in fast response and speedy operations. In enterprises where profits are increasing, nearly one-third of the managers associated real time with time under an hour, as opposed to only 17% of the managers who associated real time with time under a day.

Managers' real-time perceptions seem to matter despite various other influences on an enterprise's profits, so what cognitive elements can slow real-time development? We found that managers who regard real time as *hype* neither see an actual value of it nor consider utilizing it to optimize business operations. Instead they regard "real time" as a positive word—one associated with analytics, excellence, and being visionary—that they add to value propositions to impress customers, partners, and sponsors. Such an approach reveals a low degree of real-time maturity and limited understanding of how to utilize real time apart from sales jargon. The executives CK and RH confirm that this is an issue for managers to address and question how some apply the real-time concept:

Real time is hype. Every second conference we go to is about smart technologies, but few people know what it actually is about.—CK

I think it's hyped a lot. I take real time literally back to my missile tracking days, that's real time and so I hear the term used a lot when I actually think that just-in-time is probably closer to what everybody wants, but every industry I've been around people are always using the term "real time."—RH

Technology

As traditional data management systems are incapable of handling huge data feeds in real time, managers who deal with streaming big data sources tend to look for technologies to create real-time intelligence from big data. But transitioning to real-time management is not a tech arms race, and advanced tech tools are no guarantee of successful real-time operations and decision making. Maturity can be better supported with the right digital platform capabilities. Initially, it is better to augment existing digital platform capabilities than to invest in advanced technology.

Customer relationship management (CRM) tools; commonly used social, mobile, analytics, and cloud (SMAC) technologies; and enterprise resource planning (ERP) tools are seen as most important for real-time management. We found no significant differences, for most technologies, in specifications for early-stage versus mature real-time management enterprises.

The functionality of mobile devices and social media enables businesses and consumers to interact and communicate, to produce and consume benefits, and to create value in new ways. For example, the real-time nature of Twitter enables prompt detection of earthquake occurrence by observing tweets related to the earthquake.³² The Internet of Things involves multiple sensors that generate loads of real-time information.³³ In isolation, no one platform is deemed more important than the others. Rather, it is the *integration* of the platforms that is critical to real-time management, particularly with help from the IT function. Seamless platform integration supports the application of a Fast & Flow approach so that management can more easily adapt real-time activities to specific forms of interaction at the market level.

Enterprises can leverage existing technologies for real-time management as long as the speed of innovation is supported by a high degree of awareness of Fast & Flow and by knowledge of how to conduct ambitemporal real-time management.

Taking Stock of the Nuggets and the Fast & Flow Approach

Although managers are well on their way with real-time practices, we found that real-time management in a number of enterprises is indeed tacit and ambitemporal.³⁴ So the final issue to address is how to develop effective practices for improving management in the enterprise from this new form of temporal reflexivity,³⁵ of thinking Fast & Flow?

From Nugget 1 we learn why real-time management success depends on the managers' interpretation of clock time. In general, managers tend to be biased

toward a Utility Time mind-set, believing that real time as fast is somehow better. This preference must be scrutinized because a Utility focus, reinforced by the advancement of technologies, may pressure managers to think shorter term and to lose focus because enterprises are moving at speed, for example, “I see a lot of people that I know can put away a phone, but they cannot, because they feel it has to be real time everything they do” (PKA). However, a long-term outlook combined with a Flow approach can reduce stress and increase profitability in the long run. The descriptive dimensions of Managers’ Assessment of Real Time in Figure 2 (Characteristics, Sense, Function, Value, and Execution) support the processes of identification and mapping of the managers’ perceptions. Such learning processes will eventually influence the capabilities and value propositions to develop Fast & Flow excellence.

From Nugget 2 we know how Fast & Flow real-time management generates business value in different managerial areas. Figure 3 can assist enterprises in revealing real-time management priority gaps and, depending on the gap analysis findings, managers can better decide how to design the collective effort of Fast & Flow management. An elaborate understanding of real time from an operations perspective vis-à-vis a customer perspective can help managers balance the domains of Fast & Flow. Planning and designing should not be done in a vacuum, so the Fast & Flow approach presented in Figure 4 can be helpful in the planning process of how ambitemporal flexibility can help reducing bottlenecks in the enterprise. It can assist managers in prioritizing and coordinating activities for a balanced and productive enterprise through increased business value and customer value. Area managers must consider key metrics for real-time management regarding product and service development processes and how these metrics can be mutually supportive. Besides tailoring Fast & Flow to their internal conditions, enterprises must analyze their customers’ real time expectations related to the enterprise’s particular offerings and business activities. How fast do they want it to be? How responsive must the enterprise be? How much do customers actually care about real time—and how and why do they care? From that, managers can design a real-time experience to meet those expectations.

Nugget 3 concludes that a conscious effort of Fast & Flow stands a better chance of increasing maturity, and hence profitability, than does adoption of advanced technology. Striving toward perfection by being as fast as possible may only harm the enterprise’s performance and block out the potential gains of thinking Fast & Flow. The fact that managers in profitable companies have real-time scale perceptions that are under one hour indicates that real-time perceptions affect the bottom line, but “under one hour” also leaves room for more flexible, real-time interpretations in that moment and allows continuity and freedom to operate and experiment for better coordination of Fast & Flow operations.

Real-time leadership becomes key to meeting future market expectations in a flexible manner.³⁶ Temporal reflexivity is an essential ingredient of strategic foresight because new competitive markets demand fast planning and action. An

ambitemporal planning of real-time priorities can prevent managers from solely striving for speed, and hence at risk of creating a treadmill of continually escalating performance expectations that overlook an option-rich expectancy of the present.³⁷ The social consequences of creating a sense of urgency when it is not needed can be addressed, ironically, by rethinking real time from fast to flow. For example, the design of flow in operations, as opposed to a design for the customer, may be more profitable because internal flow activities in enterprises have built-in goals, feedback, rules, and challenges; these all encourage people to concentrate and to be immersed in their work. Thus, the need for ambitemporal perspectives becomes obvious if enterprises want state-of-the-art management that creates value for customers, businesses, and society in general.

Appendix: The Real-Time Field Study

The purpose of the study was to better understand real-time management perceptions and issues and to gain insights into enabling technologies and organizational mechanisms in order to transition more effectively into real-time management. The Institute for Communication Technology Management (CTM) at the Marshall School of Business, University of Southern California, administered the survey. More than half (532) of the 1,004 respondents from U.S. companies were executives. Among the respondents, 178 were classified as owner/CEO, and 294 were managers or supervisors. The sample of managers was selected from different industries: Finance, Banking, and Insurance (25%); Healthcare and Social Assistance (25%); Manufacturing (25%); Retail Trade (17%); and Wholesale Trade (8%). Distribution by functional areas was Marketing/Sales (33%), IT/Information services (33%), and R&D (34%). They represented a spectrum of company sizes, ranging from 500 to 10,000+ employees.

We were not able to run a large-scale survey in Denmark, so we used a multiple-method approach by complementing the survey with in-depth interviews with other senior managers in Denmark and the United States for comparison and for better understanding of the real-time phenomenon at the managerial cognitive level. For consistency in the cultural influence on temporality³⁸ and to minimize potential language barriers, that is, to catch the subtle language variations (verbal and nonverbal), we focused on two Western countries that were the home countries of the authors. Interviews were thus conducted by native-speaking interviewers in late 2015 to mid-2016 with 14 senior managers in the B2B (business-to-business) space in a variety of industries in both the United States and Denmark. The interviews focused on managers' perceptions of real time, customer expectations, and real-time management as well as on the state of real-time management in their companies.³⁹ We used the Photo Elicitation Technique (ZMET [Zaltman metaphor elicitation technique])⁴⁰ to surface the managers' subconscious mental models, conceptualizations, and reasoning regarding real-time management.⁴¹ We coded the transcripts and used the first interviews to identify relevant survey questions covering individual, functional, and organizational levels. The second coding round included the remaining interviews, which helped us better interpret the survey results and to draw new insights.

By applying this approach, we include a quantitative method (designed to collect numbers) and a qualitative method (designed to collect words). This enabled us to uncover a complex issue that involves individual managerial (cognitive) and organizational (social) aspects to provide different perspectives in analyzing and interpreting data. We drew on insights about managerial perceptions of the relative immediacy of real time and analyzed

managers' conceptual understandings of time to explain why some view it as Utility Time, while others regard it as Sense Time. We identified functional biases in how the managers interpret, define, and negotiate meaning about what they consider to be real-time-driven value propositions. This chart lists the managers interviewed in Denmark (shaded in blue) and in the United States along with a description of their companies and the length of each interview (in minutes).

No.	Manager	Company Description	Min
1	PS (Vice President)	Telematics company	71
2	CK (Head of Innovation)	Intelligent power supply installations, operation, maintenance	70
3	MS (CEO)	Intelligent service solutions based on big data	90
4	JV (Head of Strategy & Analytics)	B2B and B2C search company	95
5	RMN (CEO, Co-founder)	Social media marketing solutions	65
6	ZS (Partner)	Social media marketing solutions	30
7	PKA (CEO)	Consultancy, solutions, experience, and insight	75
10	DO (Executive Director)	Entrepreneur center	65
11	KG (CIO)	Provider in the intelligent transportation management industry	45
12	RH (Interim CIO)	Entertainment services	48
13	RL (Senior Director)	IT finance systems & technology business applications	40
14	SM (CIO, President)	Building corporation, technology-augmenting products	35
15	SK (CEO)	Business intelligence consulting	55
16	RP (CSO)	High-tech electronics	60
Total interview time			844

Note: The blue shaded region indicates informants from Denmark and the unshaded region indicates informants from the United States. B2B = business to business; B2C = business to consumer.

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